



STOCK

PRECISIONE

La fabbrica delle idee



Catalogo
Generale



STOCK

Da più di 125 anni Robert Stock AG fornisce un'ampia gamma di utensili da taglio, tant'è vero che vanta una storia immersa nella tradizione.

Nel 1891 Stock produsse la prima punta elicoidale in Germania, ponendo così le fondamenta della manifattura utensile tedesca.



Tutt'oggi, Stock offre un' ampia gamma di utensili da taglio per uso industriale nel campo della foratura, della filettatura, alesatura e fresatura , sia come standard sia come speciale, in base alle richieste del cliente, sono fatti di metallo duro, HSS, HSS-E, HSS-E-PM, Cermet o PCB con un'opzione di altri rivestimenti più duri in concordanza con le ultime tecnologie.

Portautensili, sistemi di distribuzione utensili così come il servizio attorno agli stessi, come la riaffilatura e il rivestimento, completano la nostra gamma di servizi.



Utensili di precisione da più di 125 anni. Made in Germany.



1901



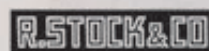
1908



1921



1953



1954



1956



1968



1969



1976





STOCK

UTENSILI DI PRECISIONE

Questo catalogo sostituisce tutti i precedenti. Ristampa, anche solo in parte non è consentita.

Sono vietate riproduzioni, anche parziali. Eventuali errori di stampa o modifiche di qualsiasi tipo, intervenute nel frattempo, non danno diritto ad alcuna pretesa. Tutti i prodotti a „DIN“ possono essere forniti con dimensioni lievemente differenti da quelle stampate sul catalogo, che comunque corrispondono sempre alle norme DIN.

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UTENSILI A FRESARE SUPER F-UT

Frese ad alto rendimento in MD

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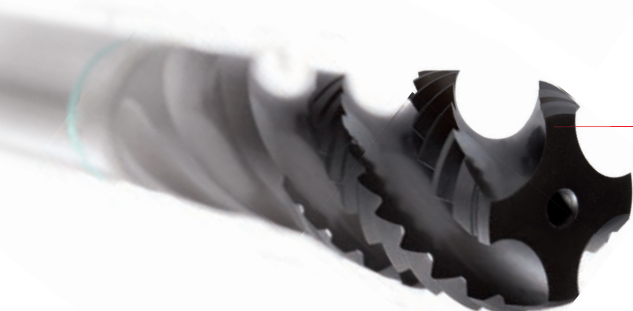
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51122	238	DIN 338	TiAIN nano	Punte elicoidali, corte	HSS-Co	V66 Ti
51132	261	Norma di fab.	TiAIN nano	Punte con codolo rinforzato	HSS-E-PM	V-PM
51158	251	DIN 338	TiAIN nano	Punte elicoidali, corte	HSS-Co	V97
51159	204	DIN 1897	TiAIN nano	Punte elicoidali, extra corte	HSS-Co	V97
51184	134	DIN 6539	TiAIN nano	Punte elicoidali, extra corte	Metallo duro	N
51720	108	Norma di fab.	AlTiN	Micropunte universale SuperV-M VHM	Metallo duro	SuperV-M
51764	97	Norma di fab.	AlTiN	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-T
51765	98	Norma di fab.	AlTiN	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-T
51766	99	Norma di fab.	AlTiN	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-T
51767	100	Norma di fab.	AlTiN	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-T
51768	101	Norma di fab.	AlTiN	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-T
51770	76	DIN 6537K	AlTiN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-VA
51771	78	DIN 6537K	AlTiN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-VA
51772	87	DIN 6537L	AlTiN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-VA
51773	89	DIN 6537L	AlTiN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-VA
51776	72	DIN 6537K	TiAIN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-IK-U
51781	83	DIN 6537L	TiAIN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-IK-U
51787	68	DIN 6537L	TiAIN nano	Punte SuperV senza fori di refrigerazione	Metallo duro	SuperV-U
51789	91	Norma di fab.	TiAIN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-IK-U
51871	66	DIN 6537K	TiAIN nano	Punte SuperV senza fori di refrigerazione	Metallo duro	SuperV-U
51873	64	DIN 6537K	TiAIN nano	Punte SuperV senza fori di refrigerazione	Metallo duro	SuperV-U
51876	74	DIN 6537K	TiAIN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-IK-U
51881	85	DIN 6537L	TiAIN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-IK-U
51887	70	DIN 6537L	TiAIN nano	Punte SuperV senza fori di refrigerazione	Metallo duro	SuperV-U
51889	92	Norma di fab.	TiAIN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-IK-U
51893	95	Norma di fab.	TiAIN nano	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-IK-U
51997	105	Norma di fab.	AlTiN	Micropunte ad alto rendimento in MD SuperV-NX con fori interni	Metallo duro	SuperV-IK-NX
51998	106	Norma di fab.	AlTiN	Micropunte ad alto rendimento in MD SuperV-NX con fori interni	Metallo duro	SuperV-IK-NX
51999	107	Norma di fab.	AlTiN	Micropunte ad alto rendimento in MD SuperV-NX con fori interni	Metallo duro	SuperV-IK-NX
52360	743	Norma di fab.	lucido	Utensili sbavatori	Metallo duro	SuperE-U
52365	651, 742	Norma di fab.	AlTiN nano	Sbavatori a 90° ad avanzamento ed estrazione	Metallo duro	SuperAD-90
53050	368	DIN 371	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Intensiv Synchro
53051	369	DIN 376	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Intensiv Synchro
53052	438	DIN 374	TiCN	Maschi a macchina per fil. metr. ISO passo fine	HSS-E-PM	Intensiv Synchro
53053	362	DIN 371	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv Synchro
53054	363	DIN 376	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv Synchro
53055	437	DIN 374	TiCN	Maschi a macchina per fil. metr. ISO passo fine	HSS-E-PM	Produktiv Synchro
53393	645, 736	Norma di fab.	AlTiN	Fresa frontali a 60° per sbavatura	Metallo duro	SuperAF-60
53394	646, 737	Norma di fab.	AlTiN	Fresa frontali a 60° per sbavatura	Metallo duro	SuperAF-60
53395	647, 738	Norma di fab.	AlTiN	Fresa frontali a 90° per sbavatura	Metallo duro	SuperAF-90
53396	648, 739	Norma di fab.	AlTiN	Fresa frontali a 90° per sbavatura	Metallo duro	SuperAF-90
53397	649, 740	Norma di fab.	AlTiN	Fresa frontali a 120° per sbavatura	Metallo duro	SuperAF-120
53398	650, 741	Norma di fab.	AlTiN	Fresa frontali a 120° per sbavatura	Metallo duro	SuperAF-120
53620	478	~DIN 371	AlCrN	Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO	HSS-E-PM	Durativ
53621	479	~DIN 371	AlCrN	Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO	HSS-E-PM	Durativ
53622	480	~DIN 376	AlCrN	Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO	HSS-E-PM	Durativ
53640	397	DIN 371	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv H
53641	412	DIN 371	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv HD
53642	398	DIN 371	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv H
53643	416	DIN 376	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv HD
53661	404	DIN 371	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv H
53662	420	DIN 371	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Intensiv HD
53665	424	DIN 376	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Intensiv HD
53666	382	DIN 371/DIN 376	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Intensiv HDX
53667	377	DIN 371/DIN 376	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv HDX
53668	381	DIN 371/DIN 376	AlTiN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Intensiv HX
53669	376	DIN 371/DIN 376	AlTiN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv HX
53670	383	DIN 371	TiCN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	HCX
53733	364	~DIN 371/~DIN 376	AlTiZrN	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv N-X
53746	370	~DIN 371/~DIN 376	TiAIN	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N-X
53778	436	DIN 374	AlTiZrN	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	Produktiv N-X
53780	435	DIN 374	TiAIN	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	Intensiv N-X
53787	471	DIN 5156	AlTiZrN	Maschi a macchina per filettatura Whitworth BSP	HSS-E	Produktiv N-X
53788	466	DIN 5156	TiAIN	Maschi a macchina per filettatura Whitworth BSP	HSS-E	Intensiv N-X
53810	486	Norma di fab.	TiCN	Frese a filettare con fase di svasatura per filettatura metrica ISO	Metallo duro	TMC SP
53820	487	Norma di fab.	TiCN	Frese a filettare con fase di svasatura per fil. metr. ISO passo fine	Metallo duro	TMC SP
53830	490	Norma di fab.	TiCN	Frese a filettare senza fase di svasatura per filettatura metrica ISO	Metallo duro	TM SP
54080	664	Norma di fab.	TiAIN	Mini frese frontali (a 3 taglienti)	M42	N
54180	665	Norma di fab.	TiAIN	Mini frese frontali (a 3 taglienti)	M42	N
54201	616	Norma di fab.	TiAIN	Frese frontali per finitura, taglienti multipli	Metallo duro	NH
54205	615	Norma di fab.	TiAIN	Frese frontali per finitura, taglienti multipli	Metallo duro	NH
54206	614	DIN 6527L	TiAIN	Frese frontali con spigolo raggato	Metallo duro	NH

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54207	619	Norma di fab.	TiAISIN	Frese per materiali duri, taglienti multipli	Metallo duro	H
54221	618	Norma di fab.	TiAIN	Frese frontali per finitura, taglienti multipli	Metallo duro	NH
54225	617	Norma di fab.	TiAIN	Frese frontali per finitura, taglienti multipli	Metallo duro	NH
54227	620	Norma di fab.	TiAISIN	Frese per materiali duri, taglienti multipli	Metallo duro	H
54275	680	DIN 327	TiAIN	Frese a raggio	M42	N
54276	681	Norma di fab.	TiAIN	Frese a raggio	M42	N
54294	662	DIN 844L	TiAIN	Frese frontali (a 3 taglienti)	M42	N
54300	642	Norma di fab.	TiAISIN	Frese a raggio per copiatori	Metallo duro	N
54301	643	Norma di fab.	TiAISIN	Frese a raggio per copiatori	Metallo duro	N
54302	638	Norma di fab.	TiAISIN	Frese per copiatori con affilatura torica	Metallo duro	N
54303	639	Norma di fab.	TiAISIN	Frese per copiatori con affilatura torica	Metallo duro	N
54304	636	Norma di fab.	TiAISIN	Frese per copiatori con affilatura torica	Metallo duro	H
54305	637	Norma di fab.	TiAISIN	Frese per copiatori con affilatura torica	Metallo duro	H
54306	640	Norma di fab.	TiAISIN	Frese a raggio per copiatori	Metallo duro	H
54307	641	Norma di fab.	TiAISIN	Frese a raggio per copiatori	Metallo duro	H
54404	594	Norma di fab.	TiAIN	Frese frontali (a 2 taglienti)	Metallo duro	N
54424	603	Norma di fab.	TiAIN	Frese frontali (a 3 taglienti)	Metallo duro	N
54444	611	Norma di fab.	TiAIN	Frese frontali (a 4 taglienti)	Metallo duro	N
54496	621	DIN 6527L	TiAIN	Frese a sgrassare	Metallo duro	NF
54497	622	DIN 6527L	TiAIN	Frese a sgrassare	Metallo duro	NF
54519	590	DIN 6527L	TiAIN	Frese frontali (a 2 taglienti)	Metallo duro	N
54520	589	DIN 6527K	TiAIN	Frese frontali (a 2 taglienti)	Metallo duro	N
54521	592	DIN 6527L	TiAIN	Frese frontali (a 2 taglienti)	Metallo duro	N
54522	612	DIN 6527L	TiAIN	Frese frontali con spigolo raggiato	Metallo duro	N
54523	599	DIN 6527L	TiAIN	Frese frontali (a 3 taglienti)	Metallo duro	N
54524	608	DIN 6527L	TiAIN	Frese frontali (a 4 taglienti)	Metallo duro	N
54526	613	DIN 6527L	TiAIN	Frese frontali con spigolo raggiato	Metallo duro	N
54531	633	DIN 6528	TiAIN	Frese a raggio	Metallo duro	N
54541	628	DIN 6527L	TiAIN	Frese a raggio	Metallo duro	N
54551	521	DIN 6527L	TiAIN	Frese SuperF-UT N	Metallo duro	SuperF-UT N
54552	525	Norma di fab.	TiAIN	Frese SuperF-UT N	Metallo duro	SuperF-UT N
54556	541	DIN 6527L	TiAIN	Frese SuperF-UT VA	Metallo duro	SuperF-UT VA
54558	535	DIN 6527L	AlTiN nano	Frese VA-X Super-UT	Metallo duro	SuperF-UT VA-X
54559	536	DIN 6527L	AlTiN nano	Frese VA-X Super-UT	Metallo duro	SuperF-UT VA-X
54560	532	DIN 6527L	AlTiN+	Frese SuperF-UT Ti	Metallo duro	SuperF-UT Ti
54561	533	DIN 6527L	AlTiN+	Frese SuperF-UT Ti	Metallo duro	SuperF-UT Ti
54562	523	Norma di fab.	TiAIN	Frese SuperF-UT N	Metallo duro	SuperF-UT N
54563	524	Norma di fab.	TiAIN	Frese SuperF-UT N	Metallo duro	SuperF-UT N
54564	528	Norma di fab.	TiAIN	Frese SuperF-UT N-3	Metallo duro	SuperF-UT N-3
54565	529	Norma di fab.	TiAIN	Frese SuperF-UT N-3	Metallo duro	SuperF-UT N-3
54566	526	DIN 6527L	TiAIN	Frese SuperF-UT N-F	Metallo duro	SuperF-UT N-F
54567	527	DIN 6527L	TiAIN	Frese SuperF-UT N-F	Metallo duro	SuperF-UT N-F
54568	539	DIN 6527L	AlTiN nano	Frese SuperF-UT VA-XF	Metallo duro	SuperF-UT VA-XF
54569	540	DIN 6527L	AlTiN nano	Frese SuperF-UT VA-XF	Metallo duro	SuperF-UT VA-XF
54570	546	Norma di fab.	lucido	Frese SuperF-UT Al-F	Metallo duro	SuperF-UT Al-F
54571	547	Norma di fab.	lucido	Frese SuperF-UT Al-F	Metallo duro	SuperF-UT Al-F
54572	550	DIN 6527L	TiAISIN	Frese SuperF-UT H	Metallo duro	SuperF-UT H
54573	551	DIN 6527L	TiAISIN	Frese SuperF-UT H	Metallo duro	SuperF-UT H
54574	537	DIN 6527L	AlTiN nano	Frese SuperF-UT VA-X IK	Metallo duro	SuperF-UT VA-X IK
54575	538	DIN 6527L	AlTiN nano	Frese SuperF-UT VA-X IK	Metallo duro	SuperF-UT VA-X IK
54576	534	DIN 6527K	AlTiN nano	Frese VA-X Super-UT	Metallo duro	SuperF-UT VA-X
54579	530	Norma di fab.	TiAIN	Frese SuperF-UT N-5	Metallo duro	SuperF-UT N-5
54580	531	Norma di fab.	TiAIN	Frese SuperF-UT N-5	Metallo duro	SuperF-UT N-5
54590	518	DIN 6527L	TiAISIN	Frese SuperF-UT NX	Metallo duro	SuperF-UT NX
54591	519	DIN 6527L	TiAISIN	Frese SuperF-UT NX	Metallo duro	SuperF-UT NX
54700	644	DIN 6527L	AlTiN+	Fresa pilota	Metallo duro	N
54815	671	DIN 844K	TiAIN	Frese di semifinitura	M42	NF
54816	675	DIN 844K	TiAIN	Frese a sgrassare (4 taglienti)	M42	NR
54825	673	DIN 844K	TiAIN	Frese a sgrassare (3 taglienti)	HSS-E-PM	NRf
54836	679	DIN 844L	TiAIN	Frese a sgrassare (4 taglienti)	M42	NR
54845	677	DIN 844K	TiAIN	Frese a sgrassare (4 taglienti)	HSS-E-PM	NRf
54847	669	DIN 844L	TiAIN	Frese universali, taglienti multipli	M42	N
55017	151	Norma di fab.	TiCN	Punte a cannone ad 1 tagliente SuperT-NX	Metallo duro	SuperT-NX
55018	150	Norma di fab.	TiCN	Punte a cannone ad 1 tagliente SuperT-NX	Metallo duro	SuperT-NX
55020	157	Norma di fab.	AlTiN+	Punte a cannone ad 1 tagliente TBE-VHM	Metallo duro	TBE-VHM
55021	161	Norma di fab.	AlTiN+	Punte a cannone ad 1 tagliente TBE-VHM	Metallo duro	TBE-VHM
55022	152	Norma di fab.	TiCN	Punte a cannone ad 1 tagliente SuperT-NX	Metallo duro	SuperT-NX
55023	153	Norma di fab.	TiCN	Punte a cannone ad 1 tagliente SuperT-NX	Metallo duro	SuperT-NX
55024	155	Norma di fab.	AlTiN+	Punte a cannone ad 1 tagliente TBE-VHM	Metallo duro	TBE-VHM
55026	159	Norma di fab.	AlTiN+	Punte a cannone ad 1 tagliente TBE-VHM	Metallo duro	TBE-VHM
55027	143	Norma di fab.	AlTiN nano	Punte a cannone ad 1 tagliente SuperT-AL	Metallo duro	SuperT-AL
55028	144	Norma di fab.	AlTiN nano	Punte a cannone ad 1 tagliente SuperT-AL	Metallo duro	SuperT-AL

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55029	145	Norma di fab.	AlTiN nano	Punte a cannone ad 1 tagliente SuperT-AL	Metallo duro	SuperT-AL
56011	129	Norma di fab.	TiAlN	Inseriti intercambiabili per SuperV-AP maxi	Metallo duro	SuperV-AP maxi
61112	207	DIN 1897	TiN	Punte elicoidali, extra corte	HSS-Co	VX
61115	220	DIN 338	TiN - testa	Punte elicoidali, corte	HSS	N
61116	218	DIN 338	TiN	Punte elicoidali, corte	HSS	N
61118	197	DIN 1897	TiN	Punte elicoidali, extra corte	HSS	N
61120	257	Norma di fab.	TiN	Punte con codolo rinforzato	HSS-Co	NX
61121	259	Norma di fab.	TiN	Punte con codolo rinforzato	HSS-Co	NX
61124	243	DIN 338	TiN	Punte elicoidali, corte	HSS	V70
61131	205	DIN 1897	TiN	Punte elicoidali, extra corte	HSS-E-PM	V-PM
61136	268	DIN 340	TiN	Punte elicoidali, lunghe	HSS	N
61150	277	DIN 340	TiN	Punte elicoidali, lunghe	HSS	V70
61158	247	DIN 338	TiN	Punte elicoidali, corte	HSS-Co	V70
61175	294	Norma di fab.	TiN	Punte cilindriche per centri CN	HSS	N
61220	202	DIN 1897	TiN	Punte elicoidali, extra corte	HSS-Co	NX
61221	230	DIN 338	TiN	Punte elicoidali, corte	HSS-Co	NX
61222	272	DIN 340	TiN	Punte elicoidali, lunghe	HSS-Co	NX
61223	236	DIN 338	TiN	Punte elicoidali, corte	HSS-Co	V66 Ti
61232	253	DIN 338	TiN	Punte elicoidali, corte	HSS-E-PM	V-PM
61602	325	DIN 333	TiN	Punte a centrare senza piano	HSS	N
61880	82	DIN 6537L	TiN	Punte con refrigerazione interna SuperV	Metallo duro	SuperV-IK-F
61888	63	DIN 6539	TiN	Punte SuperV senza fori di refrigerazione	Metallo duro	SuperV-F
62327	727	DIN 334	TiN	Svasatori 60°	HSS	
62347	729	DIN 335	TiN	Svasatori 90°	HSS	
62399	733	DIN 335	TiN	Assortimenti di svasatori cilindrici a 90°	HSS	
63010	411	~DIN 371	TiCN	Maschi a macchina per filettatura metrica ISO	Metallo duro	H
63013	481	~DIN 371	TiCN	Maschi a rullare forati e c.canalini di lubr. per fil. metrica ISO	Metallo duro	Durativ
63033	365	DIN 371	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv N
63046	371	DIN 371	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
63048	373	DIN 376	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
63119	476	~DIN 371	TiN	Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO	HSS-E	Durativ
63120	475	~DIN 371	TiN	Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO	HSS-E	Durativ
63121	483	DIN 371	TiN	Maschi a macchina a rullare senza canalini di lubr. per fil. metrica ISO	HSS-E	Durativ
63122	477	~DIN 376	TiN	Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO	HSS-E	Durativ
63123	484	~DIN 376	TiN	Maschi a macchina a rullare senza canalini di lubr. per fil. metrica ISO	HSS-E	Durativ
63133	385	DIN 371	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv N
63138	388	DIN 376	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv N
63146	390	DIN 371	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
63148	394	DIN 376	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
63173	444	DIN 374	TiN	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	Intensiv N
63176	413	DIN 371	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv HD
63177	417	DIN 376	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv HD
63201	428	DIN 371	AlTiN	Maschi a macchina per filettatura metrica ISO	HSS-E	GG
63641	399	DIN 371	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv H
63643	402	DIN 376	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv H
63662	421	DIN 371	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Intensiv HD
63665	425	DIN 376	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Intensiv HD
63674	405	DIN 371	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv H
63675	408	DIN 376	TiN	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv H
64080	595	Norma di fab.	TiAlN	Mini frese frontali (a 3 taglienti)	Metallo duro	N
64180	596	Norma di fab.	TiAlN	Mini frese frontali (a 3 taglienti)	Metallo duro	NH
64478	606	DIN 6527L	TiAlN	Frese frontali (a 3 taglienti) NH	Metallo duro	NH
64495	625	DIN 6527L	TiAlN	Frese a sgrossare	Metallo duro	NRf
64497	626	DIN 6527L	TiAlSiN	Frese a sgrossare	Metallo duro	HR
64522	598	DIN 6527K	TiAlN	Frese frontali (a 3 taglienti)	Metallo duro	N
64523	601	DIN 6527L	TiAlN	Frese frontali (a 3 taglienti)	Metallo duro	N
64525	610	DIN 6527L	TiAlN	Frese frontali (a 4 taglienti)	Metallo duro	N
64532	634	DIN 6527L	TiAlN	Frese a raggio	Metallo duro	N
64535	635	Norma di fab.	TiAlN	Frese a raggio	Metallo duro	N
64542	629	DIN 6527L	TiAlN	Frese a raggio	Metallo duro	N
64545	631	Norma di fab.	TiAlN	Frese a raggio	Metallo duro	N
64550	520	DIN 6527K	TiAlN	Frese SuperF-UT N	Metallo duro	SuperF-UT N
64551	522	DIN 6527L	TiAlN	Frese SuperF-UT N	Metallo duro	SuperF-UT N
64557	542	DIN 6527L	TiAlN	Frese SuperF-UT VA	Metallo duro	SuperF-UT VA
64558	552	Norma di fab.	TiAlN	Frese SuperF-UT FS	Metallo duro	SuperF-UT FS
64559	553	Norma di fab.	TiAlN	Frese SuperF-UT FS	Metallo duro	SuperF-UT FS
64567	543	DIN 6527L	TiAlN	Frese SuperF-UT VA-IK	Metallo duro	SuperF-UT VA-IK
64570	604	DIN 6527K	TiAlN	Frese frontali (a 3 taglienti) NH	Metallo duro	NH
64571	607	DIN 6527L	TiAlN	Frese frontali (a 3 taglienti) NH	Metallo duro	NH
64604	659	DIN 327	TiAlN	Frese frontali (a 3 taglienti)	M42	N
64640	653	DIN 327	TiAlN	Frese frontali (a 2 taglienti)	M42	N
64641	661	DIN 844K	TiAlN	Frese frontali (a 3 taglienti)	M42	N

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64667	667	DIN 844K	TiAIN	Frese universali, taglienti multipli	M42	N
64670	655	DIN 844K	TiAIN	Frese frontali (a 2 taglienti)	M42	N
64671	657	DIN 844L	TiAIN	Frese frontali (a 2 taglienti)	M42	N
67011	114	Norma di fab.	TiAIN nano	Inseri intercambiabili per SuperV-AP mini	Metallo duro	SuperV-AP mini U
67012	117	Norma di fab.	AlTiN nano	Inseri intercambiabili per SuperV-AP mini	Metallo duro	SuperV-AP mini VA
71106	199	DIN 1897	lucido	Punte elicoidali, extra corte	M42	N
71108	194	DIN 1897	trattati a vapore	Punte elicoidali, extra corte	HSS	N
71109	196	DIN 1897	trattati a vapore	Punte elicoidali, extra corte	HSS	N
71110	190	DIN 1897	lucido	Punte elicoidali, extra corte	HSS	N
71111	192	DIN 1897	lucido	Punte elicoidali, extra corte	HSS	N
71112	206	DIN 1897	trattati a vapore	Punte elicoidali, extra corte	HSS-Co	VX
71113	210	Norma di fab.	lucido	Punte elicoidali, extra corte	HSS	V72
71114	209	Norma di fab.	lucido	Punte elicoidali, extra corte	HSS	V72
71115	215	DIN 338	trattati a vapore	Punte elicoidali, corte	HSS	N
71116	212	DIN 338	lucido	Punte elicoidali, corte	HSS	N
71117	226	DIN 338	lucido	Punte elicoidali, corte	HSS	H
71119	214	DIN 338	lucido	Punte elicoidali, corte	HSS	N
71122	234	DIN 338	lucido	Punte elicoidali, corte	HSS-Co	V66 Ti
71123	232	DIN 338	fasi nitrurate	Punte elicoidali, corte	HSS-Co	V66
71124	239	DIN 338	lucido	Punte elicoidali, corte	HSS	V70
71126	241	DIN 338	lucido	Punte elicoidali, corte	HSS	V70
71128	248	DIN 338	lucido	Punte elicoidali, corte	HSS	V72
71129	250	DIN 338	lucido	Punte elicoidali, corte	HSS	V72
71130	264	DIN 339	trattati a vapore	Punte per foratura con bussola di guida	HSS	N
71135	266	DIN 340	trattati a vapore	Punte elicoidali, lunghe	HSS	N
71136	265	DIN 340	lucido	Punte elicoidali, lunghe	HSS	N
71145	282	DIN 1869	fasi nitrurate	Punte elicoidali in lunghezze speciali, grandezza 1	HSS	V63
71146	285	DIN 1869	fasi nitrurate	Punte elicoidali in lunghezze speciali, grandezza 2	HSS	V63
71147	287	DIN 1869	fasi nitrurate	Punte elicoidali in lunghezze speciali, grandezza 3	HSS	V63
71148	224	DIN 338	lucido	Punte elicoidali, corte	M42	N
71149	222	DIN 338	trattati a vapore	Punte elicoidali, corte	HSS-Co	N
71150	275	DIN 340	lucido	Punte elicoidali, lunghe	HSS	V70
71152	276	DIN 340	lucido	Punte elicoidali, lunghe	HSS	V70
71154	278	DIN 340	fasi nitrurate	Punte elicoidali, lunghe	HSS	V73
71156	280	DIN 340	fasi nitrurate	Punte elicoidali, lunghe	HSS-Co	V73
71158	245	DIN 338	fasi nitrurate	Punte elicoidali, corte	HSS-Co	V70
71168	262	Norma di fab.	lucido	Punte corte, con codolo cil. Ø 16,0 mm	HSS-Co	V72
71169	263	Norma di fab.	lucido	Punte corte, con codolo cil. Ø 25,4 mm	HSS-Co	V72
71175	293	Norma di fab.	lucido	Punte cilindriche per centri CN	HSS	N
71176	295	Norma di fab.	lucido	Punte cilindriche per centri CN	HSS	N
71180	140	DIN 8037	lucido	Punte speciali, con taglienti in MD	Metallo duro	N
71184	132	DIN 6539	lucido	Punte elicoidali, extra corte	Metallo duro	N
71187	291	DIN 1899	lucido	Microspunte	HSS-E-PM	N
71189	139	Norma di fab.	lucido	Punte cilindriche per centri CN	Metallo duro	N
71190	137	Norma di fab.	lucido	Punte cilindriche per centri CN	Metallo duro	N
71191	138	Norma di fab.	lucido	Punte cilindriche per centri CN	Metallo duro	N
71192	284	DIN 1869	fasi nitrurate	Punte elicoidali in lunghezze speciali, grandezza 1	HSS-Co	V63
71193	286	DIN 1869	fasi nitrurate	Punte elicoidali in lunghezze speciali, grandezza 2	HSS-Co	V63
71195	288	Norma di fab.	fasi nitrurate	Punte elicoidali, extra lunghe	HSS	V63
71196	289	Norma di fab.	lucido	Punte elicoidali, extra lunghe	HSS	V63
71220	200	DIN 1897	lucido	Punte elicoidali, extra corte	HSS-Co	NX
71221	228	DIN 338	lucido	Punte elicoidali, corte	HSS-Co	NX
71222	270	DIN 340	lucido	Punte elicoidali, lunghe	HSS-Co	NX
71225	274	DIN 340	lucido	Punte elicoidali, lunghe	HSS-Co	V66
71290	135	Norma di fab.	lucido	Punte elicoidali, corte	Metallo duro	N
71300	298	DIN 345	trattati a vapore	Punte elicoidali	HSS	N
71303	296	Norma di fab.	lucido	Punte elicoidali, corte	HSS-Co8	N
71304	297	Norma di fab.	lucido	Punte elicoidali, corte	HSS-Co8	N
71305	302	DIN 345	lucido	Punte elicoidali	HSS	V70
71312	303	DIN 345	lucido	Punte elicoidali	HSS-Co	V66 Ti
71313	304	DIN 346	lucido	Punte elicoidali	HSS-Co	V66 Ti
71320	305	DIN 341	trattati a vapore	Punte per foratura con bussola di guida	HSS	N
71322	306	DIN 341	lucido	Punte per foratura con bussola di guida	HSS	V70
71325	307	DIN 1870	fasi nitrurate	Punte elicoidali in lunghezze speciali, grandezza 1	HSS	V63
71326	308	DIN 1870	fasi nitrurate	Punte elicoidali in lunghezze speciali, grandezza 2	HSS	V63
71380	141	DIN 8041	lucido	Punte speciali, con taglienti in MD	Metallo duro	N
71416	301	DIN 345	trattati a vapore	Punte elicoidali	HSS-Co	N
71500	319	DIN 8376	trattati a vapore	Punte a gradino ad eliche indipendenti, cil.	HSS	N
71501	317	DIN 8374	trattati a vapore	Punte a gradino ad eliche indipendenti, cil.	HSS	N
71503	318	DIN 8378	trattati a vapore	Punte a gradino ad eliche indipendenti, cil.	HSS	N
71520	321	DIN 8377	trattati a vapore	Punte a gradino ad eliche indipendenti, CM	HSS	N
71523	320	DIN 8379	trattati a vapore	Punte a gradino ad eliche indipendenti, CM	HSS	N

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71550	310	Norma di fab.	trattati a vapore	Punte elicoidali lunghe con refrigerazione interna	HSS-Co	V70-IK
71553	311	Norma di fab.	trattati a vapore	Punte elicoidali lunghe con refrigerazione interna	HSS-Co	V70-IK
71554	309	Norma di fab.	trattati a vapore	Punte con fori di refrigerazione	HSS	N-IK
71560	316	Norma di fab.		Alimentatori per punte con fori di refrigerazione		
71565	312	Norma di fab.	trattati a vapore	Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.	HSS-Co	V63-IK
71566	314	Norma di fab.	trattati a vapore	Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.	HSS-Co	V63-IK
71567	313	Norma di fab.	trattati a vapore	Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.	HSS-Co	V63-IK
71568	315	Norma di fab.	trattati a vapore	Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.	HSS-Co	V63-IK
71584	290	Norma di fab.	lucido	Punte con fori di refrigerazione	HSS	V73-IK
71600	322	DIN 333	lucido	Punte a centrare senza piano	HSS	N
71601	323	DIN 333	lucido	Punte a centrare senza piano	HSS	N
71602	324	DIN 333	lucido	Punte a centrare senza piano	HSS	N
71604	327	DIN 333	lucido	Punte a centrare senza piano	HSS	N
71605	326	Norma di fab.	lucido	Punte a centrare senza piano	HSS	N
71607	328	Norma di fab.	lucido	Punte a centrare con piano	HSS	N
71609	329	Norma di fab.	lucido	Punte a centrare con piano	HSS	N
71616	142	Norma di fab.	lucido	Punte a centrare senza piano	Metallo duro	N
71862	102	DIN 6537L	lucido	Punte SuperV, 3 taglienti	Metallo duro	SuperV83-GAL
71994	93	Norma di fab.	lucido	Punte con refrigerazione interna SuperV	Metallo duro	SuperV95-GG
71995	80	Norma di fab.	lucido	Punte con refrigerazione interna SuperV	Metallo duro	SuperV95-GG
71996	94	Norma di fab.	lucido	Punte con refrigerazione interna SuperV	Metallo duro	SuperV95-GG
71997	96	Norma di fab.	lucido	Punte con refrigerazione interna SuperV	Metallo duro	SuperV95-GN
71998	103	Norma di fab.	AlTiN+	Micropunte ad alto rendimento in MD SuperV-NX senza fori interni	Metallo duro	SuperV-NX
71999	104	Norma di fab.	AlTiN+	Micropunte ad alto rendimento in MD SuperV-NX senza fori interni	Metallo duro	SuperV-NX
72200	330	DIN 344	trattati a vapore	Allargatori cilindrici	HSS	N
72210	331	DIN 343	trattati a vapore	Allargatori con attacco cono morse	HSS	N
72304	734	DIN 373	lucido	Frese per sedi viti con guide, esecuzione fine	HSS	
72305	735	DIN 373	lucido	Frese per sedi viti con guide, esecuzione media	HSS	
72326	726	DIN 334	lucido	Svasatori 60°	HSS	
72345	731	DIN 335	trattati a vapore	Svasatori 90°	HSS	
72346	728	DIN 335	lucido	Svasatori 90°	HSS	
72356	730	DIN 335	lucido	Svasatori 90°	HSS	
72399	732	DIN 335	lucido	Assortimenti di svasatori cilindrici a 90°	HSS	
72600	724	DIN 206	lucido	Alesatori a mano	HSS	
72610	725	DIN 206	lucido	Alesatori a mano	HSS	
72640	716	DIN 212-2	lucido	Alesatori a macchina	HSS-E	
72650	717	DIN 212-2	lucido	Alesatori a macchina	HSS-E	
72654	714	DIN 212-2	lucido	Alesatori a macchina	HSS-E	
72660	718	DIN 208	lucido	Alesatori a macchina	HSS-E	
72670	719	DIN 208	lucido	Alesatori a macchina	HSS-E	
72680	721	DIN 311	nitrurato	Alesatori a macchina per chiodi	HSS	
72690	720	DIN 212-2	lucido	Alesatori a macchina a forte torsione	HSS-E	
72730	723	DIN 9	lucido	Alesatori a mano cilindrici, per spine coniche	HSS	
72741	722	DIN 2179	lucido	Alesatori a macchina per spine coniche	HSS-E	
72859	709	~DIN 8051	lucido	Alesatori a macchina in MD	Metallo duro	
72860	708	~DIN 8051	lucido	Alesatori a macchina in MD	Metallo duro	
72867	705	~DIN 8050	lucido	Alesatori a macchina in MD	Metallo duro	
72868	704	~DIN 8050	lucido	Alesatori a macchina in MD	Metallo duro	
72870	694	Norma di fab.	AlTiN nano	Alesatori ad alto rendimento VHM	Metallo duro	SuperR-HS-S
72871	695	Norma di fab.	AlTiN nano	Alesatori ad alto rendimento VHM	Metallo duro	SuperR-HS-D
72872	696	Norma di fab.	AlTiN nano	Alesatori ad alto rendimento VHM	Metallo duro	SuperR-HS-S
72873	698	Norma di fab.	AlTiN nano	Alesatori ad alto rendimento VHM	Metallo duro	SuperR-HS-D
72880	706	~DIN 8093	lucido	Alesatori a macchina in MD	Metallo duro	
72881	707	~DIN 8093	lucido	Alesatori a macchina in MD	Metallo duro	
72900	710	DIN 212-3	lucido	Alesatori a macchina NC	HSS-E	
72910	712	DIN 212-3	lucido	Alesatori a macchina NC	HSS-E	
72920	700	Norma di fab.	lucido	Alesatori a macchina NC	Metallo duro	
72930	702	Norma di fab.	lucido	Alesatori a macchina NC	Metallo duro	
73011	384	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	Metallo duro	H
73033	366	DIN 371	trattati a vapore	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv N
73038	367	DIN 376	trattati a vapore	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv N
73046	372	DIN 371	trattati a vapore	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
73047	375	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
73048	374	DIN 376	trattati a vapore	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
73120	474	~DIN 371	lucido	Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO	HSS-E	Durativ
73121	482	DIN 371	lucido	Maschi a macchina a rullare senza canalini di lub. per fil. metrica ISO	HSS-E	Durativ
73126	380	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Massiv N
73131	431	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv W
73132	386	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv N
73133	387	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv N
73136	434	DIN 376	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv W
73138	389	DIN 376	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv N

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73145	391	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
73146	392	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
73148	395	DIN 376	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
73156	433	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv W
73173	443	DIN 374	lucido	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	Intensiv N
73176	414	DIN 371	trattati a vapore	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv HD
73177	418	DIN 376	trattati a vapore	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv HD
73178	446	DIN 374	trattati a vapore	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	Produktiv HD
73180	447	DIN 374	trattati a vapore	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	Intensiv HD
73183	439	DIN 374	trattati a vapore	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	Produktiv N
73185	378	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	N
73187	440	DIN 374	trattati a vapore	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	Intensiv N
73189	432	DIN 376	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv W
73191	379	DIN 376	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	N
73194	448	DIN 374	nitruato	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	GG
73201	429	DIN 371	nitruato	Maschi a macchina per filettatura metrica ISO	HSS-E	GG
73211	430	DIN 376	nitruato	Maschi a macchina per filettatura metrica ISO	HSS-E	GG
73221	393	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
73227	396	DIN 376	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv N
73237	441	DIN 374	lucido	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	N
73243	498	DIN 357	lucido	Maschi a macchina per dadi per fil. metrica ISO	HSS-E	N
73248	497	Norma di fab.	lucido	Utensili combinati per fil. metrica ISO	HSS-E	N
73250	442	DIN 374	lucido	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	Produktiv N
73286	467	DIN 5156	lucido	Maschi a macchina per filettatura Whitworth BSP	HSS-E	Intensiv N
73288	469	DIN 5156	trattati a vapore	Maschi a macchina per filettatura Whitworth BSP	HSS-E	Intensiv HD
73293	463	Norma di fab.	trattati a vapore	Maschi a macchina per filettatura NPT	HSS-E	VA
73295	473	Norma di fab.	lucido	Maschi corti per filettatura NPT	HSS-E	N
73296	472	DIN 40432	lucido	Maschi a macchina per filettatura Pg	HSS-E	N
73297	453	~DIN 371	trattati a vapore	Maschi a macchina per filettatura UNC	HSS-E	Produktiv HD
73298	454	~DIN 376	trattati a vapore	Maschi a macchina per filettatura UNC	HSS-E	Produktiv HD
73299	461	~DIN 374	trattati a vapore	Maschi a macchina per filettatura UNF	HSS-E	Produktiv HD
73300	468	DIN 5156	trattati a vapore	Maschi a macchina per filettatura Whitworth BSP	HSS-E	Produktiv HD
73304	455	~DIN 371	trattati a vapore	Maschi a macchina per filettatura UNC	HSS-E	Intensiv HD
73305	456	~DIN 376	trattati a vapore	Maschi a macchina per filettatura UNC	HSS-E	Intensiv HD
73306	462	~DIN 374	trattati a vapore	Maschi a macchina per filettatura UNF	HSS-E	Intensiv HD
73308	449	~DIN 371	trattati a vapore	Maschi a macchina per filettatura UNC	HSS-E	Produktiv N
73309	450	~DIN 376	trattati a vapore	Maschi a macchina per filettatura UNC	HSS-E	Produktiv N
73310	459	~DIN 374	trattati a vapore	Maschi a macchina per filettatura UNF	HSS-E	Produktiv N
73321	464	DIN 5156	trattati a vapore	Maschi a macchina per filettatura Whitworth BSP	HSS-E	Produktiv N
73322	451	~DIN 371	trattati a vapore	Maschi a macchina per filettatura UNC	HSS-E	Intensiv N
73323	452	~DIN 376	trattati a vapore	Maschi a macchina per filettatura UNC	HSS-E	Intensiv N
73324	460	~DIN 374	trattati a vapore	Maschi a macchina per filettatura UNF	HSS-E	Intensiv N
73325	465	DIN 5156	trattati a vapore	Maschi a macchina per filettatura Whitworth BSP	HSS-E	Intensiv N
73326	457	~DIN 371	nitruato	Maschi a macchina per filettatura UNC	HSS-E	GG
73327	458	~DIN 376	nitruato	Maschi a macchina per filettatura UNC	HSS-E	GG
73345	470	DIN 5156	nitruato	Maschi a macchina per filettatura Whitworth BSP	HSS-E	GG
73400	499	DIN EN 22568	lucido	Filiere per filettatura metrica ISO	HSS	
73410	500	DIN EN 22568	lucido	Filiere per filettatura metrica ISO	HSS	
73413	501	DIN EN 22568	nitruato	Filiere per filettatura metrica ISO	HSS-E	
73521	493	DIN 2181	lucido	Maschio a mano per filettatura metrica fine ISO, kit	HSS	N
73522	496	DIN 5157	lucido	Maschio a mano per filettatura gas, kit	HSS	N
73531	491	DIN 352	lucido	Serie di maschi a mano per filettature metriche ISO destri	HSS	N
73532	492	DIN 352	lucido	Serie di maschi a mano per filettature metriche ISO sinistri	HSS	N
73534	495	~DIN 352	lucido	Maschio a macchina per filettatura BSW, kit	HSS	N
73535	494	~DIN 352	lucido	Maschio a macchina per filettatura UNC, kit	HSS	N
73619	406	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	H R15
73640	400	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv H
73641	415	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv HD
73642	401	DIN 371	nitruato	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv H
73643	419	DIN 376	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Produktiv HD
73645	403	DIN 376	nitruato	Maschi a macchina per filettatura metrica ISO	HSS-E	Produktiv H
73646	445	DIN 374	nitruato	Maschi a macchina per fil. metr. ISO passo fine	HSS-E	Produktiv H
73659	426	DIN 376	trattati a vapore	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv HD
73660	422	DIN 371	trattati a vapore	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv HD
73661	407	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv H
73662	423	DIN 371	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Intensiv HD
73664	409	DIN 376	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E	Intensiv H
73665	427	DIN 376	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	Intensiv HD
73666	410	DIN 376	lucido	Maschi a macchina per filettatura metrica ISO	HSS-E-PM	H R15
73810	485	Norma di fab.	lucido	Frese a filettare con fase di svasatura per filettatura metrica ISO	Metallo duro	TMC SP
73820	488	Norma di fab.	lucido	Frese a filettare con fase di svasatura per fil. metr. ISO passo fine	Metallo duro	TMC SP
73830	489	Norma di fab.	lucido	Frese a filettare senza fase di svasatura per filettatura metrica ISO	Metallo duro	TM SP

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Catalogo n°	Pagina	Norma	Superficie	Descrizione	Materiale tagliente	Tipo
74202	585	DIN 6527L	lucido	Frese frontali alluminio	Metallo duro	W
74203	623	DIN 6527L	lucido	Frese a sgrassare	Metallo duro	WR
74204	584	DIN 6527K	lucido	Frese frontali alluminio	Metallo duro	W
74206	586	Norma di fab.	lucido	Frese frontali alluminio	Metallo duro	W
74231	652	DIN 327	lucido	Frese frontali (a 2 taglienti)	M42	N
74243	654	DIN 844K	lucido	Frese frontali (a 2 taglienti)	M42	N
74244	656	DIN 844L	lucido	Frese frontali (a 2 taglienti)	M42	N
74280	658	DIN 327	lucido	Frese frontali (a 3 taglienti)	M42	N
74282	660	DIN 844K	lucido	Frese frontali (a 3 taglienti)	M42	N
74294	663	DIN 844L	lucido	Frese frontali (a 3 taglienti)	M42	N
74303	624	DIN 6527L	lucido	Frese a sgrassare	Metallo duro	WR
74404	593	Norma di fab.	lucido	Frese frontali (a 2 taglienti)	Metallo duro	N
74424	602	Norma di fab.	lucido	Frese frontali (a 3 taglienti)	Metallo duro	N
74478	605	DIN 6527L	lucido	Frese frontali (a 3 taglienti) NH	Metallo duro	NH
74479	587	Norma di fab.	lucido	Frese frontali alluminio	Metallo duro	W
74520	588	DIN 6527K	lucido	Frese frontali (a 2 taglienti)	Metallo duro	N
74521	591	DIN 6527L	lucido	Frese frontali (a 2 taglienti)	Metallo duro	N
74522	597	DIN 6527K	lucido	Frese frontali (a 3 taglienti)	Metallo duro	N
74523	600	DIN 6527L	lucido	Frese frontali (a 3 taglienti)	Metallo duro	N
74525	609	DIN 6527L	lucido	Frese frontali (a 4 taglienti)	Metallo duro	N
74531	632	DIN 6528	lucido	Frese a raggio	Metallo duro	N
74543	627	DIN 6527L	lucido	Frese a raggio	Metallo duro	N
74545	630	Norma di fab.	lucido	Frese a raggio	Metallo duro	N
74552	548	Norma di fab.	lucido	Frese SuperF-UT AI-3	Metallo duro	SuperF-UT AI-3
74553	549	Norma di fab.	lucido	Frese SuperF-UT AI-3	Metallo duro	SuperF-UT AI-3
74554	544	DIN 6527L	lucido	Frese SuperF-UT Alluminio	Metallo duro	SuperF-UT AI
74555	545	DIN 6527L	lucido	Frese SuperF-UT Alluminio	Metallo duro	SuperF-UT AI
74617	666	DIN 844K	lucido	Frese universali, taglienti multipli	M42	N
74800	670	Norma di fab.	lucido	Frese frontali (a 4 taglienti)	M42	N
74816	674	DIN 844K	lucido	Frese a sgrassare (4 taglienti)	M42	NR
74825	672	DIN 844K	lucido	Frese a sgrassare (3 taglienti)	HSS-E-PM	NRf
74836	678	DIN 844L	lucido	Frese a sgrassare (4 taglienti)	M42	NR
74845	676	DIN 844K	lucido	Frese a sgrassare (4 taglienti)	HSS-E-PM	NRf
74847	668	DIN 844L	lucido	Frese universali, taglienti multipli	M42	N
75017	147	Norma di fab.	TiN	Punte a cannone ad 1 tagliente SuperT-N	Metallo duro	SuperT-N
75018	146	Norma di fab.	TiN	Punte a cannone ad 1 tagliente SuperT-N	Metallo duro	SuperT-N
75020	156	Norma di fab.	lucido	Punte a cannone ad 1 tagliente TBE-VHM	Metallo duro	TBE-VHM
75021	160	Norma di fab.	lucido	Punte a cannone ad 1 tagliente TBE-VHM	Metallo duro	TBE-VHM
75022	148	Norma di fab.	TiN	Punte a cannone ad 1 tagliente SuperT-N	Metallo duro	SuperT-N
75023	149	Norma di fab.	TiN	Punte a cannone ad 1 tagliente SuperT-N	Metallo duro	SuperT-N
75024	154	Norma di fab.	lucido	Punte a cannone ad 1 tagliente TBE-VHM	Metallo duro	TBE-VHM
75026	158	Norma di fab.	lucido	Punte a cannone ad 1 tagliente TBE-VHM	Metallo duro	TBE-VHM
76000	125	Norma di fab.	nichelato	Porta utensili SuperV-AP maxi		SuperV-AP maxi
76001	126	Norma di fab.	nichelato	Porta utensili SuperV-AP maxi		SuperV-AP maxi
76003	127	Norma di fab.	nichelato	Porta utensili SuperV-AP maxi		SuperV-AP maxi
76011	128	Norma di fab.	TiN	Inseriti intercambiabili per SuperV-AP maxi	Metallo duro	SuperV-AP maxi
76020	130	Norma di fab.		Viti di serraggio		
76021	131	Norma di fab.		Giravite Torx		
77000	110	Norma di fab.	nichelato	Porta utensili SuperV-AP mini		SuperV-AP mini
77001	111	Norma di fab.	nichelato	Porta utensili SuperV-AP mini		SuperV-AP mini
77003	112	Norma di fab.	nichelato	Porta utensili SuperV-AP mini		SuperV-AP mini
77004	113	Norma di fab.	nichelato	Porta utensili SuperV-AP mini		SuperV-AP mini
77007	109	Norma di fab.	nichelato	Porta utensili SuperV-AP mini		SuperV-AP mini
77011	123	Norma di fab.	AlTiN nano	Inseriti intercambiabili per SuperV-AP mini	Metallo duro	SuperV-AP mini NC
77012	120	Norma di fab.	lucido	Inseriti intercambiabili per SuperV-AP mini	Metallo duro	SuperV-AP mini AL
77020	130	Norma di fab.		Viti di serraggio		
77021	131	Norma di fab.		Spine Torx		
77022	131	Norma di fab.		Chiavi dinamometriche		
78206	770			Attacchi intercambiabili per mandrini		
78213	749	Norma di fab.	lucido	Mandrini ad espan. idraulica SK, maggiore forza di serraggio		
78221	750	Norma di fab.	lucido	Mandrini ad espan. idraulica MAS/BT, maggiore forza di serr.		
78232	758	DIN 69882-4	lucido	Attacchi cilindrici Weldon HSK-A		
78233	762	Norma di fab.	brunito	Attacchi per codolo cilindrico WhistleNotch MAS/BT		
78234	763	Norma di fab.	brunito	Attacchi cilindrici Weldon MAS/BT		
78240	766	Norma di fab.		Mandrini portapunte CN MAS/BT con raffreddamento interno		
78242	765	Norma di fab.		Mandrini portapunte CN ISO.DIN.96871 raffreddamento interno		
78299	748	DIN 69882-7	lucido	Mandrini ad espans. idraulica HSK-A c. maggiore forza di serr.		
78308	768	Norma di fab.		Pinza di serraggio		
78317	760	Norma di fab.	brunito	Attacchi cilindrici Weldon SK		
78322	761	Norma di fab.	brunito	Attacchi per codolo cilindrico Whistle Notch SK		
78326	767	Norma di fab.		Mandrini di maschiatura sincrona cil. con raffr. interno		
78334	759	DIN 69882-5	lucido	Attacchi per codolo cilindrico Whistle Notch HSK-A		

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Catalogo n°	Pagina	Norma	Superficie	Descrizione	Materiale tagliente	Tipo
78335	772	Norma di fab.		Dischi di tenuta		
78340	769	Norma di fab.		Mandrini di masch. cambio rapido no refrig. interno		
78346	764	Norma di fab.		Mandrini portapunte CN HSK-A con raffreddamento interno		
78364	771	Norma di fab.		Viti di regolazione „plan“ per masch. sincro con raffr. interno		
78368	751	Norma di fab.		Bussole rid. per mandrini ad espansione idraulica, no refr perif		
78369	752	Norma di fab.		Bussole di riduzione per mandrini ad esp. Idraul.		
78729	756	Norma di fab.	lucido	Mandrini di calettamento ISO		
78736	753	DIN 69882-8	lucido	Mandrini di calettamento HSK-A		
78738	755	Norma di fab.	lucido	Mandrini di calettamento SK		
78739	757	Norma di fab.	lucido	Mandrini di calettamento MAS/BT		
78755	754	Norma di fab.	lucido	Mandrini a calettamento HSK-A con raffreddamento periferico		
78877	256	Norma di fab.		Serie di punte		
78878	256	Norma di fab.		Serie di punte		
78879	254	DIN 338	trattati a vapore	Serie di punte	HSS	N
78880	255	DIN 338	TiN - testa	Serie di punte	HSS	N
79012	254	DIN 338	lucido	Serie di punte	HSS-Co	NX





MD

UTENSILI A FORARE



CODICI ISO

P	acciaio, acciaio legato in alta percentuale
M	acciaio inossidabile
K	ghisa grigia, ghisa sferoidale e ghisa malleabile
N	alluminio ed altri metalli non ferrosi
S	leghe speciali, superleghe e leghe di titanio
H	acciaio temprato e ghisa temprata

Nelle pagine successive, contenenti programma trovate per ciascun utensile consigli sull'idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata



LEGENDA DEI PITTOGRAMMI

MATERIALE TAGLIANTE	VHM										HM	
	Int. in metallo duro				Metallo duro							
TRATT. DI SUPERFICIE	lucido	niche-lato	TiN	TiAlN nano	AlTiN nano	Al-TiN	TiAlN	TiCN	Al-TiN+			
TOLLERANZA SUL Ø	h5	h6	h7	h8	m7							
PROFONDITÀ DI FORO	1,5xD	3xD	4xD	5xD	7xD	8xD	10xD	12xD	15xD			
	20xD	25xD	30xD	40xD	50xD	75xD	80xD	~3xD	~5xD			
DIREZIONE DI TAGLIO												
	a destra											
FORMA DEL CODOLO	Cyl	HA	HE	MK								
	Conico Morse											
ANGOLI DI AFFILATURA	90°	118°	120°	130°	135°	140°	142°	145°				
NORMA	DIN 6539	DIN 6537K	DIN 6537L	DIN 8037	DIN 8041	WN						
	Norma di fabbrica											
TIPO	SuperV-F	SuperV-U	SuperV-IK-U	SuperV-VA	SuperV-95-GG	SuperV-IK-F	SuperV-95-GN	SuperV-T	SuperV-83-GAL	N	TBE-VHM	
	SuperV-NX	SuperV-IK-NX	SuperV-M	SuperV-AP mini	SuperV-AP mini U	SuperV-AP mini VA	SuperV-AP mini AL	SuperV-AP mini NC	SuperV-APmaxi	SuperT-AL	SuperT-N	SuperT-NX

P	M	K	N	S	H	Tipo	Forma dell'attacco	Profondità di foro	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte SuperV senza fori di refrigerazione

	○	●	○	○	●	●	SuperV-F	cil.	3xD	Metallo duro	TiN	DIN 6539	3,000 - 12,000	61888	63
	●	○	○	○	○	○	SuperV-U	HA	3xD	Metallo duro	TiAlN-nano	DIN 6537K	3,000 - 20,000	51873	64
	●	○	○	○	○	○	SuperV-U	HE	3xD	Metallo duro	TiAlN-nano	DIN 6537K	3,000 - 20,000	51871	66
	●	○	○	○	○	○	SuperV-U	HA	5xD	Metallo duro	TiAlN-nano	DIN 6537L	3,000 - 20,000	51787	68
	●	○	○	○	○	○	SuperV-U	HE	5xD	Metallo duro	TiAlN-nano	DIN 6537L	3,000 - 20,000	51887	70

Punte con refrigerazione interna SuperV

	●	○	○	○	○	○	SuperV-IK-U	HA	3xD	Metallo duro	TiAlN-nano	DIN 6537K	3,000 - 20,000	51776	72
	●	○	○	○	○	○	SuperV-IK-U	HE	3xD	Metallo duro	TiAlN-nano	DIN 6537K	3,000 - 20,000	51876	74
	○	○	○	○	○	○	SuperV-VA	HA	3xD	Metallo duro	AlTiN nano	DIN 6537K	3,000 - 20,000	51770	76
	○	○	○	○	○	○	SuperV-VA	HE	3xD	Metallo duro	AlTiN nano	DIN 6537K	3,000 - 20,000	51771	78
	○	○	○	○	○	○	SuperV95-GG	HA	4xD	Metallo duro	lucido	Norma di fab.	3,000 - 21,500	71995	80
	○	●	○	○	●	●	SuperV-IK-F	HE	5xD	Metallo duro	TiN	DIN 6537L	4,000 - 25,000	61880	82
	●	○	○	○	○	○	SuperV-IK-U	HA	5xD	Metallo duro	TiAlN-nano	DIN 6537L	3,000 - 20,000	51781	83
	●	○	○	○	○	○	SuperV-IK-U	HE	5xD	Metallo duro	TiAlN-nano	DIN 6537L	3,000 - 20,000	51881	85
	○	○	○	○	○	○	SuperV-VA	HA	5xD	Metallo duro	AlTiN nano	DIN 6537L	3,000 - 20,000	51772	87
	○	○	○	○	○	○	SuperV-VA	HE	5xD	Metallo duro	AlTiN nano	DIN 6537L	3,000 - 20,000	51773	89

P	M	K	N	S	H	Tipo	Forma dell'attacco	Profondità di foro	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte con refrigerazione interna SuperV

						SuperV-IK-U	HA	7xD	Metallo duro	TiAlN-nano	Norma di fab.	3,000 - 20,000	51789	91
						SuperV-IK-U	HE	7xD	Metallo duro	TiAlN-nano	Norma di fab.	3,000 - 20,000	51889	92
						SuperV95-GG	HA	7xD	Metallo duro	lucido	Norma di fab.	3,000 - 20,000	71994	93
						SuperV95-GG	HA	10xD	Metallo duro	lucido	Norma di fab.	3,000 - 20,000	71996	94
						SuperV-IK-U	HA	12xD	Metallo duro	TiAlN-nano	Norma di fab.	3,000 - 20,000	51893	95
						SuperV95-GN	HA	15xD	Metallo duro	lucido	Norma di fab.	5,000 - 14,000	71997	96
						SuperV-T	HA	15xD	Metallo duro	AlTiN	Norma di fab.	3,000 - 14,000	51764	97
						SuperV-T	HA	20xD	Metallo duro	AlTiN	Norma di fab.	3,000 - 14,000	51765	98
						SuperV-T	HA	25xD	Metallo duro	AlTiN	Norma di fab.	3,000 - 12,000	51766	99
						SuperV-T	HA	30xD	Metallo duro	AlTiN	Norma di fab.	3,000 - 10,000	51767	100
						SuperV-T	HA	40xD	Metallo duro	AlTiN	Norma di fab.	3,000 - 8,000	51768	101

Punte SuperV, 3 taglienti

						SuperV83-GAL	HA	5xD	Metallo duro	lucido	DIN 6537L	3,000 - 20,000	71862	102
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Micropunte ad alto rendimento in MD SuperV-NX senza fori interni

						SuperV-NX	cil.	4xD	Metallo duro	AlTiN+	Norma di fab.	0,500 - 3,000	71998	103
						SuperV-NX	HA	7xD	Metallo duro	AlTiN+	Norma di fab.	0,500 - 3,000	71999	104

P	M	K	N	S	H	Tipo	Forma dell'attacco	Profondità di foro	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Micropunte ad alto rendimento in MD SuperV-NX con fori interni

	•	•	•	○	○	SuperV-IK-NX	HA	5xD	Metallo duro	AlTiN	Norma di fab.	1,400 - 3,000	51997	105
	•	•	•	○	○	SuperV-IK-NX	HA	8xD	Metallo duro	AlTiN	Norma di fab.	1,400 - 3,000	51998	106
	•	•	•	○	○	SuperV-IK-NX	HA	15xD	Metallo duro	AlTiN	Norma di fab.	1,400 - 3,000	51999	107

Micropunte universale SuperV-M VHM

	•	•	•	○	○	SuperV-M	HA		Metallo duro	AlTiN	Norma di fab.	0,100 - 3,000	51720	108
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Porta utensili SuperV-AP mini

						SuperV-AP mini	HE	1,5xD		nichelato	Norma di fab.		77007	109
						SuperV-AP mini	HE	3xD		nichelato	Norma di fab.		77000	110
						SuperV-AP mini	HE	5xD		nichelato	Norma di fab.		77001	111
						SuperV-AP mini	HE	7xD		nichelato	Norma di fab.		77003	112
						SuperV-AP mini	HE	10xD		nichelato	Norma di fab.		77004	113

Inserti intercambiabili per SuperV-AP mini

	•	○	○	○		SuperV-AP mini U			Metallo duro	TiAlN-nano	Norma di fab.	11,000 - 40,000	67011	114
	•	○	○	○		SuperV-AP mini VA			Metallo duro	AlTiN nano	Norma di fab.	11,000 - 40,000	67012	117
	•	○	○	○		SuperV-AP mini AL			Metallo duro	lucido	Norma di fab.	11,000 - 40,000	77012	120

P	M	K	N	S	H	Tipo	Forma dell'attacco	Profondità di foro	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Inserti intercambiabili per SuperV-AP mini



	SuperV-AP mini.NC	Metallo duro	AlTiN nano	Norma di fab.	11,000 - 40,000	77011	123
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Porta utensili SuperV-AP maxi



SuperV-AP maxi	HE	3xD	nichelato	Norma di fab.		76000	125
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SuperV-AP maxi	HE	5xD	nichelato	Norma di fab.		76001	126
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SuperV-AP maxi	HE	7xD	nichelato	Norma di fab.		76003	127
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Inserti intercambiabili per SuperV-AP maxi



	SuperV-AP maxi	Metallo duro	TiN	Norma di fab.	16,000 - 40,500	76011	128
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	SuperV-AP maxi	Metallo duro	TiAlN	Norma di fab.	16,000 - 40,500	56011	129
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Accessori



Norma di fab.	76020	130
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Norma di fab.	77020	130
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Norma di fab.	77022	131
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Norma di fab.	77021	131
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Norma di fab.	76021	131
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P	M	K	N	S	H	Tipo	Forma dell'attacco	Profondità di foro	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte elicoidali, extra corte



•	•	•	•	•		N	cil.	~3xD	Metallo duro	lucido	DIN 6539	1,000 - 15,000	71184	132
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•	•	•	•	•		N	cil.	~3xD	Metallo duro	TiAlN-nano	DIN 6539	1,000 - 12,000	51184	134
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Punte elicoidali, corte



•	•	•	•	•		N	cil.	~5xD	Metallo duro	lucido	Norma di fab.	1,000 - 12,000	71290	135
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Punte cilindriche per centri CN



•	•	•	•	•		N	HA		Metallo duro	lucido	Norma di fab.	5,000 - 20,000	71190	137
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•	•	•	•	•		N	HA		Metallo duro	lucido	Norma di fab.	5,000 - 20,000	71191	138
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•	•	•	•	•		N	HB		Metallo duro	lucido	Norma di fab.	4,000 - 20,000	71189	139
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Punte speciali, con taglienti in MD



○	○	○	○	○		N	cil.		Metallo duro	lucido	DIN 8037	3,000 - 20,000	71180	140
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○	•	○	○	○		N	CM		Metallo duro	lucido	DIN 8041	11,000 - 33,000	71380	141
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Punte a centrare senza piano



•	○	•	•	○		N			Metallo duro	lucido	Norma di fab.	1,000 - 6,300	71616	142
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P	M	K	N	S	H	Tipo	Forma dell'attacco	Profondità di foro	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte a cannone ad 1 tagliente SuperT-AL

						SuperT-AL	HA	25xD	Metallo duro	AlTiN nano	Norma di fab.	2,380 - 12,000	55027	143
						SuperT-AL	HA	50xD	Metallo duro	AlTiN nano	Norma di fab.	2,380 - 8,000	55028	144
						SuperT-AL	HA	75xD	Metallo duro	AlTiN nano	Norma di fab.	2,380 - 6,000	55029	145

Punte a cannone ad 1 tagliente SuperT-N

						SuperT-N	HA	20xD	Metallo duro	TiN	Norma di fab.	4,000 - 12,000	75018	146
						SuperT-N	HA	30xD	Metallo duro	TiN	Norma di fab.	4,000 - 12,000	75017	147
						SuperT-N	HA	40xD	Metallo duro	TiN	Norma di fab.	4,000 - 12,000	75022	148
						SuperT-N	HA	80xD	Metallo duro	TiN	Norma di fab.	4,950 - 11,950	75023	149

Punte a cannone ad 1 tagliente SuperT-NX

						SuperT-NX	HA	20xD	Metallo duro	TiCN	Norma di fab.	3,970 - 12,700	55018	150
						SuperT-NX	HA	30xD	Metallo duro	TiCN	Norma di fab.	3,970 - 12,700	55017	151
						SuperT-NX	HA	40xD	Metallo duro	TiCN	Norma di fab.	3,970 - 12,700	55022	152
						SuperT-NX	HA	80xD	Metallo duro	TiCN	Norma di fab.	4,950 - 12,650	55023	153

Punte a cannone ad 1 tagliente TBE-VHM

						TBE-VHM	HA	45.000	Metallo duro	lucido	Norma di fab.	1,200 - 3,200	75024	154
						TBE-VHM	HA	45.000	Metallo duro	AlTiN+	Norma di fab.	2,000 - 3,200	55024	155

P	M	K	N	S	H	Tipo	Forma dell'attacco	Profondità di foro	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte a cannone ad 1 tagliente TBE-VHM

	•	•	○	○	○	TBE-VHM	HA	80.000	Metallo duro	lucido	Norma di fab.	1,200 - 5,000	75020	156
	•	•	•	○	○	TBE-VHM	HA	80.000	Metallo duro	AlTiN+	Norma di fab.	2,000 - 5,000	55020	157
	•	•	○	•	○	TBE-VHM	HA	120.000	Metallo duro	lucido	Norma di fab.	1,500 - 5,000	75026	158
	•	•	•	○	○	TBE-VHM	HA	120.000	Metallo duro	AlTiN+	Norma di fab.	2,000 - 5,000	55026	159
	•	•	○	•	○	TBE-VHM	HA	160.000	Metallo duro	lucido	Norma di fab.	1,500 - 8,000	75021	160
	•	•	•	○	○	TBE-VHM	HA	160.000	Metallo duro	AlTiN+	Norma di fab.	2,000 - 8,000	55021	161

Applicazione

Per materiale

Tipo	Tipo di catalogo		metalli non ferrosi, aluminiumio	acciaio	ghisa	acciaio inossidabile resistente e acido	nichel, leghe di titanio	acciai temprati
	senza refr.	con refrig.						
SuperV-U	51873	51776						
	51871	51876						
	51787	51781						
	51887	51881						
		51789						
		51889						
		51893						
SuperV-VA		51770						
		51771						
		51772						
		51773						
SuperV-F	61888	61880						
SuperV-NX		51997						
	71998	51998						
	71999	51999						
SuperV-M		51720						
SuperV-T		51764						
		51765						
		51766						
		51767						
		51768						
SuperV95-GG		71995						
		71994						
		71996						
SuperV95-GN		71997						
SuperV83-GAL		71862						
SuperV-AP mini		67011						
		77012						
		67012						
		77011	inserti NC per foro pilota/svasatura					
SuperV-AP maxi		76011						
		56011						

■ ottimale ■ adatto bene

Per resistenza alla trazione



Parametri di lavoro indicativi per punte SuperV

Serie d'avanzamento											
Lettera d'identi.	A	B	C	D	E	F	G	H	I		
Diametro utensile mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	Avanzamenti f (mm/giri)
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160	
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200	
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	
	50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250	
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600		
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000		

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P

l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

≤3×D Profondità

≤4×D

Catalogo n°	61888	51873	51871	51770	51771	51776	51876	71995
Mat. da taglio	M.D.I.	M.D.I.	M.D.I.	M.D.I.	M.D.I.	M.D.I.	M.D.I.	M.D.I.
Gruppo impiego	K/P	K/P	K/P	K/P	K/P	K/P	K/P	K
Superficie	TiN	TiAlN nano	TiAlN nano	AlTiN nano	AlTiN nano	TiAlN nano	TiAlN nano	lucide
DIN/Forma	6539	6537K	6537K	6537K	6537K	6537K	6537K	Stock std
Tipo	F	U	U	VA	VA	U	U	GG
Refrig. interna				axial	axial	axial	axial	axial
Pagina	63	64	66	76	78	72	74	80



V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.		V _c m/min	Codice d'avanz.		V _c m/min	Codice d'avanz.		V _c m/min	Codice d'avanz.
100	F	130	G	G				145	G	G		
85	E	110	F	F				120	F	F		
110	G	145	H	H				170	H	H		
85	F	110	G	G				145	H	H		
90	F	120	G	G				130	H	H		
85	F	110	G	G				125	G	G		
80	F	105	G	G				120	G	G		
80	F	105	G	G				120	G	G		
75	E	100	F	F				105	G	G		
100	G	130	H	H				145	H	H		
90	F	120	G	G				120	G	G		
65	D	85	E	E				85	E	E		
75	E	100	F	F				110	G	G		
70	D	90	E	E				105	E	E		
50	E	65	F	F				80	F	F		
40	D	55	E	E				65	E	E		
40	C							60	D	D		
45	B	45	C	C				60	C	C		
35	B	40	A	A				55	C	C		
20	A	20	A	A				35	B	B		
40	C	40	B	B	80	E	E	60	E	E		
35	C	15	A	A	60	B-C	B-C	55	B	B		
35	B	35	B	B	80	E	E	45	E	E		
160	G	210	H	H				210	I	I	120	G
120	G	155	H	H				160	I	I	100	G
120	G	155	G	G				140	I	I	90	G
95	G	125	G	G				130	H	H	80	G
25	B	35	C	C				40	C	C	40	B
20	C	25	D	D	30	D	D	30	D	D		
30	B	15	A	A	45	D	D	45	D	D		
25	B	15	A	A	40	C	C	40	C	C		
200	H	260	I	I				310	I	I	410	I
200	H	260	I	I				310	I	I	410	I
170	H	220	H	H				260	I	I	380	I
140	G	180	H	H				220	I	I	330	I
200	G	260	H	H				280	H	H		
80	F	105	G	G				125	G	G		
210	G	270	H	H				325	H	H	280	I
140	F	180	G	G				220	G	G		
80	E	105	F	F				125	G	G	110	F
65	E	85	F	F				105	F	F	80	E
60	D	80	E	E				90	F	F		
45	D	60	E	E				80	F	F		

Parametri di lavoro indicativi per punte SuperV

Serie d'avanzamento											
Lettera d'identi.	A	B	C	D	E	F	G	H	I		
Diametro utensile mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	Avanzamenti f (mm/giri)
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160	
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200	
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	
	50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250	
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600		
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000		

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P

l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

≤5×D Profondità

Catalogo n°	51887	51787
Mat. da taglio	M.D.I.	M.D.I.
Gruppo impiego	K/P	K/P
Superficie	TiAlN nano	TiAlN nano
DIN/Forma	6537L	6537L
Tipo	U	U
Refrig. interna		
Pagina	70	68

51781	51881
M.D.I.	M.D.I.
K/P	K/P
TiAlN nano	TiAlN nano
6537L	6537L
U	U
axial	axial
83	85

71862
M.D.I.
K
blank
6537L
GAL
102

51772	51773
M.D.I.	M.D.I.
K/P	K/P
AlTiN nano	AlTiN nano
6537L	6537L
VA	VA
axial	axial
87	89

61880
M.D.I.
K/P
TiN
6537L
F
axial
82



V _c m/min	Codice d'avanzamento	
130	G	G
110	F	F
145	H	H
110	G	G
120	G	G
110	G	G
105	G	G
105	G	G
100	F	F
130	H	H
120	G	G
85	E	E
100	F	F
90	E	E
65	F	F
55	E	E
45	C	C
35	A	A
20	A	A
40	B	B
15	A	A
35	B	B
210	H	H
155	H	H
145	G	G
125	G	G
35	C	C
25	D	D
15	A	A
15	A	C
260	I	I
260	I	I
235	I	I
170	H	H
260	H	H
105	G	G
270	H	H
180	G	G
105	F	F
85	F	F
80	E	E
60	E	E

V _c m/min	Codice d'avanzamento	
145	G	G
120	F	F
170	H	H
145	H	H
130	H	H
125	G	G
120	G	G
120	G	G
105	G	G
145	H	H
120	G	G
85	E	E
105	G	G
100	E	E
70	F	F
55	E	E
60	E	E
60	C	C
55	C	C
35	B	B
60	E	E
55	B	B
50	E	E
195	I	I
160	I	I
140	I	I
130	H	H
40	C	C
35	D	D
45	D	D
40	C	C
310	I	I
310	I	I
260	I	I
220	I	I
280	H	H
125	G	G
325	H	H
220	G	G
125	G	G
105	F	F
90	F	F
80	F	F

V _c m/min	Codice d'avanz.
100	F
80	F
80	F
70	F
180	G
160	G
150	G
120	F
180	F
180	F

V _c m/min	Codice d'avanzamento	
80	E	E
60	B-C	B-C
80	E	E
30	D	D
45	D	D
40	C	C

V _c m/min	Codice d'avanz.
110	F
90	E
130	G
110	G
100	G
95	F
90	F
90	F
80	F
110	G
90	F
65	D
85	F
80	E
60	E
50	D
45	D
45	B
40	B
25	A
45	D
40	B
35	D
160	H
120	H
100	H
95	G
30	B
25	C
35	C
30	B
240	H
240	H
200	H
170	H
230	G
95	F
250	G
170	F
95	F
80	E
70	E
60	E

Parametri di lavoro indicativi per punte SuperV

Serie d'avanzamento											
Lettera d'identi.	A	B	C	D	E	F	G	H	I		
Diametro utensile mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	Avanzamenti f (mm/giri)
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160	
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200	
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	
	50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250	
63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600		
80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000		

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P

l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

≤7×D Profondità

≤10×D

≤12×D

≤15×D

Catalogo n°	51789	51889
Mat. da taglio	M.D.	M.D.I.
Gruppo impiego	K/P	K/P
Superficie	TiAlN nano	
DIN/Forma	Stock std	Stock std
Tipo	U	U
Refrig. interna	axial	axial
Pagina	91	92

71994
M.D.I.
K
blank
Stock std
GG
axial
93

71996
M.D.I.
K
blank
Stock std
GG
axial
94

51893
M.D.I.
K/P
TiAlN nano
Stock std
U
axial
95

71997
M.D.I.
K
blank
Stock std
GN
axial
96



V _c m/min	Codice d'avanzamento	
145	F	F
120	E	E
170	G	G
145	G	G
130	G	G
125	F	F
120	F	F
120	F	F
105	F	F
145	G	G
120	F	F
85	D	D
110	F	F
105	D	D
80	E	E
65	D	D
60	D	D
60	B	B
55	B	B
195	H	H
160	H	H
140	H	H
130	G	G
40	B	B
35	C	C
310	H	H
310	H	H
260	H	H
220	H	H
280	G	G
125	F	F
325	G	G
220	F	F
125	F	F
105	E	E
90	E	E
80	E	E

V _c m/min	Codice d'avanz.
120	F
100	F
90	F
80	F
40	B
120	F
100	F
90	F
80	F
40	B
410	H
410	H
380	H
330	H
280	G
110	F
80	E

V _c m/min	Codice d'avanz.
120	F
100	F
90	F
80	F
40	A
120	F
100	F
90	F
80	F
40	A
410	H
410	H
380	H
330	H
280	G
110	F
80	E

V _c m/min	Codice d'avanz.
110	F
110	E
110	G
100	G
110	G
110	F
100	F
110	F
105	F
110	G
110	F
85	D
100	F
80	D
80	E
65	D
50	D
50	B
60	D
55	B
45	D
120	H
120	H
100	H
90	G
90	G
40	A
150	H
150	H
150	H
120	H
150	G
80	F
120	G
120	F
40	F
110	E
40	E

V _c m/min	Codice d'avanz.
120	E
100	E
90	E
80	E
40	A
120	E
100	E
90	E
80	E
40	A
410	F
410	F
380	G
330	G
280	F
110	E
80	D

Parametri di lavoro indicativi per punte SuperV

Serie d'avanzamento										
Lettera d'identi.	A	B	C	D	E	F	G	H	I	
Diametro utensile mm	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P

l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

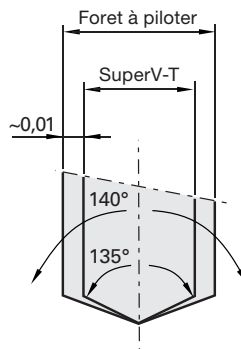
Indicazioni generali:

Molto importante è che per motivi di sicurezza nessuna punta possa ruotare liberamente senza supporto, con un numero maggiore di $n = 6000$ giri/min! La forza centrifuga potrebbe altrimenti rompere gli utensili già prima del raggiungimento della finitura superficiale del pezzo!

Procedimento per punte SuperV-T:

Per produrre fori profondi con la RT 100 T con risultati ottimali consigliamo di procedere con i seguenti passi:

1. fresare una superficie, p. es. con fresa Ratio Gühring RF 100 U con tagliente al centro. La superficie deve essere eseguita con angolo a destra, rispetto all'angolo di entrata del foro da produrre.
2. Eseguire un foro pilota cilindrico (tolleranza F9), con una profondità di almeno $1 \times D$. Consigliamo le nostre punte Ratio RT 100 U oppure RT 100 F. Per il loro angolo di affilatura a 140° e la tolleranza sul $\varnothing m7$, queste punte Ratio sono le più indicate per tale operazione.
3. Entrare con la punta elic. per fori profondi RT 100 T nel foro pilota con un nr di giri di ca 300 giri/min ed un avanzamento di ca. 500 mm/min.
4. Regolare la pressione del refrigerante ed il numero di giri.
5. Forare in continuo sull'intera lunghezza, senza scaricare.
6. Per fori passanti con uscita del foro obliqua, ridurre la velocità di avanzamento v_f del 40% a ca. 1 mm prima dell'uscita.
7. Al raggiungimento della profondità di foro, spegnere giri ed adduzione refrigerante; corsa di ritorno con max. 5000 mm/min.



Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

$\leq 15 \times D$
 $\leq 20 \times D$
 $\leq 25 \times D$
 $\leq 30 \times D$
 $\leq 40 \times D$

Catalogo n°	51764
Mat. da taglio	M.D.I.
Gruppo impiego	K/P
Superficie	AlTiN
DIN/Forma	Stock std
Tipo	T
Refrig. interna	assiale
Pagina	97

Catalogo n°	51765
Mat. da taglio	M.D.I.
Gruppo impiego	K/P
Superficie	AlTiN
DIN/Forma	Stock std
Tipo	T
Refrig. interna	assiale
Pagina	98

Catalogo n°	51766
Mat. da taglio	M.D.I.
Gruppo impiego	K/P
Superficie	AlTiN
DIN/Forma	Stock std
Tipo	T
Refrig. interna	assiale
Pagina	99

Catalogo n°	51767
Mat. da taglio	M.D.I.
Gruppo impiego	K/P
Superficie	AlTiN
DIN/Forma	Stock std
Tipo	T
Refrig. interna	assiale
Pagina	100

Catalogo n°	51768
Mat. da taglio	M.D.I.
Gruppo impiego	K/P
Superficie	AlTiN
DIN/Forma	Stock std
Tipo	T
Refrig. interna	assiale
Pagina	101

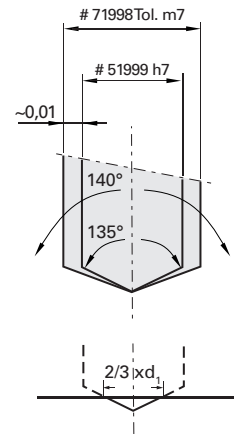


V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.
110	H	110	H	100	H	80	G	80	G
110	H	110	H	100	H	80	G	80	G
120	H	120	H	120	H	100	H	100	H
120	H	120	H	100	H	100	H	100	H
110	F	110	F	110	F	110	F	110	F
110	H	110	H	100	H	80	G	80	G
100	G	100	G	100	G	80	G	80	G
110	G	110	G	100	G	80	G	80	F-G
110	F	110	F	100	F	80	F	80	F
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100	E	100	E	80	E	80	E	80	E
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100	F-G	100	F	90	F	80	F	80	F-G
80	E	80	E	70	D	70	D	70	D
50	E	50	E	50	D	50	D	50	D
50	E	50	E	50	D	50	D	50	D
50	D	50	D	50	D	50	D	50	D
100	E	100	E	100	E	80	E	80	E
70	B-C	60	C	60	C	60	C	60	C
100	E	100	E	100	E	80	E	80	E
140	H	140	H	130	H	120	H	120	H
100	H	100	H	90	H	80	H	80	H
140	H	140	H	130	H	120	H	120	H
100	H	100	H	90	H	80	H	80	H
100	F	100	F	90	F	80	F	80	F
100	F	100	F	90	F	80	F	80	F
90	H	90	H	80	H	70	H	70	H
30	B	30	B	30	B	30	B	30	B
120	A	120	A	120	A	120	A	120	A
120	H	120	H	110	H	100	H	100	H

Micropunta SuperV-NX in metallo duro ad alte prestazioni

Parametri di lavoro indicativi

Serie d'avanzamento														
Lettera d'identi.	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	
Diametro utensile mm	0,50	0,006	0,012	0,018	0,022	0,030	0,035	0,040	0,045	0,050	0,050	0,055	0,060	0,060
	0,80	0,008	0,016	0,024	0,032	0,040	0,050	0,060	0,070	0,080	0,080	0,080	0,090	0,090
	1,00	0,012	0,022	0,032	0,042	0,060	0,070	0,080	0,090	0,100	0,100	0,110	0,110	0,120
	1,50	0,021	0,036	0,051	0,066	0,090	0,100	0,120	0,130	0,150	0,150	0,160	0,170	0,180
	2,00	0,032	0,052	0,072	0,092	0,120	0,140	0,160	0,180	0,200	0,210	0,220	0,230	0,240
	2,50	0,045	0,070	0,095	0,120	0,150	0,170	0,200	0,220	0,250	0,260	0,270	0,280	0,300
	3,00	0,060	0,090	0,120	0,150	0,180	0,210	0,240	0,270	0,300	0,310	0,330	0,340	0,360
														Avanzamenti f (mm/giri)



K, P, K/P l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

Consigli per la sicurezza: molto importante: per motivi di sicurezza nessuna punta può ruotare liberamente senza un numero di giri più elevato di $n = 6000$ giri al minuto. Altrimenti le forze centrifughe potrebbero rompere gli utensili lunghi già prima di ottenere la finitura del pezzo!

Indicazioni generali: Mandrini con poco gioco, attacchi utensili con allineamento preciso. Consigliamo l'utilizzo di mandrini ad espansione idraulica o di mandrini di calettamento. Consigliamo di refrigerare

con emulsione od olio; pressione minima del refrigerante 40 bar.

Foro pilota

Impiegando la micropunta in MD 15xD consigliamo di produrre un foro pilota con profondità da 1xD fino a 2xD. La micropunta in MD da 4xD è l'utensile ottimale per questo foro pilota, dato che il suo angolo di affilatura e la sua tolleranza sul diametro sono specifici che per questo scopo.

Centrare

Per potere sfruttare a pieno il rendimento delle micropunte per profondità di foro da 8xD, consigliamo una centratura. A questo scopo si può usare la micropunta da 4xD, articolo 6400. Il diametro di centratura dovrebbe essere ca. 2/3xD. In alternativa, il centraggio essere creato con Stock

punte cilindriche per centri CN 142°, catalogo no. 71189.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Acciai inossidabili, solforati martensitici	1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2			<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMw-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		<input checked="" type="checkbox"/>
Leghe ghisa alluminio > 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>

$\leq 4 \times D$

$\leq 7 \times D$

$\leq 5 \times D$

$\leq 8 \times D$

$\leq 15 \times D$

Catalogo n°	51720	71998	71999	51997	51998	51999
Mat. da taglio	MDI	MDI	MDI	MDI	MDI	MDI
Superficie	AlTiN	AlTiN+	AlTiN+	AlTiN	AlTiN	AlTiN
DIN	Stock std	Stock std	Stock std	Stock std	Stock std	Stock std
Tipo	M	NX	NX	NX	NX	NX
Refrig. interna	-	-	-	assiale	assiale	assiale
Pagina	108	103	104	105	106	107



Vc m/min	Codice d'avanz.	Vc m/min	Codice d'avanz.	Vc m/min	Codice d'avanz.	Vc m/min	Codice d'avanz.	Vc m/min	Codice d'avanz.	Vc m/min	Codice d'avanz.
100	G	100	I	100	G	105	G	105	C	105	C
100	G	100	I	100	G	100	G	100	C	100	C
100	G	100	I	100	G	105	G	105	D	105	D
90	F	90	H	90	F	90	F	90	D	90	D
90	G	90	I	90	G	95	G	95	C	95	C
90	G	90	I	90	G	95	G	95	C	95	C
90	F	90	H	90	F	90	F	90	C	90	C
90	F	90	H	90	F	90	F	90	C	90	C
70	E	70	G	70	E	70	E	70	C	70	C
100	F	100	H	100	F	100	F	100	B	100	B
85	F	85	H	85	F	85	F	85	C	85	C
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		30	B	30	B	70	B	70	B	70	B
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		30	B	30	B	70	B	70	B	70	B
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130	K	130	M	130	K	140	E	140	E	140	E
130	K	130	M	130	K	140	E	140	E	140	E
120	J	120	L	120	J	130	E	130	E	130	E
		10	A	10	A	25	A	25	A	25	A
		15	A	15	A	35	A	35	A	35	A
		15	A	15	A	35	A	35	A	35	A
		70	M	70	M	70	M	70	M	70	M
		70	M	70	M	70	M	70	M	70	M
		135	D	135	D	135	D	135	D	135	D
		135	D	135	D	135	D	135	D	135	D

Il sistema di foratura tipo V-AP mini

Parametri di lavoro indicativi

Serie d'avanzamento											
Codice lettera	A	B	C	D	E	F	G	H	I		
Dia. utensile mm	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	Avanzamenti f (mm/giro)
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

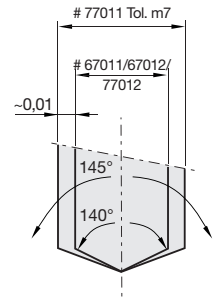
- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Si prega di seguire le istruzioni per l'applicazione a pagina 55!

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Portainsero $\leq 1,5 \times D$, utensile pilota

Catalogo n° 77007



Catalogo n°	67011	67012	77012	77011
Mat. da taglio	MDI	MDI	MDI	MDI
Gruppo d'imp. MD	K/P	K/P	K/P	K/P
Superficie	TiAlN nano	AlTiN nano	lucide	AlTiN nano
Tipo	U	VA	AL	NC
Refrig. interna	assiale	assiale	assiale	assiale
Pagina	114	117	120	123



v_c m/min	Codigo avanzamento	v_c m/min	Codigo avanzamento	v_c m/min	Codigo avanzamento	v_c m/min	Codigo avanzamento
130	F					130	F
110	E					110	E
130	G					130	G
110	F					110	F
130	F					130	F
125	F					125	F
110	E					110	E
110	F					110	F
90	E					90	E
130	G					130	G
110	F					110	F
70	D					70	D
105	E					105	E
70	D					70	D
60	E					60	E
55	D					55	D
55	C					55	C
50	B					50	B
		25	B			25	B
		55	C			55	C
		40	C			40	C
		35	C			35	C
						100	F
						90	F
						120	G
						100	F
		90	F			80	E
						80	E
						80	E
						80	E
						90	F
		25	B			25	B
		40	C			40	C
		35	B			35	B
				200	G	200	G
				180	G	180	G
				150	G	150	G
				120	G	120	G
				180	G	180	G
				70	F	70	F
				180	G	180	G
				120	F	120	F
				70	F	70	F
				50	F	50	F
				45	F	45	F
				35	E	35	E

Il sistema di foratura tipo V-AP mini

Parametri di lavoro indicativi

Serie d'avanzamento										
Codice lettera	A	B	C	D	E	F	G	H	I	
Dia. utensile mm	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Si prega di seguire le istruzioni per l'applicazione a pagina 55!

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Portainsero $\leq 3 \times D$

Catalogo n° 77000



Catalogo n°	67011
Mat. da taglio	MDI
Gruppo d'imp. MD	K/P
Superficie	TiAlN nano
Tip	U
Refrig. interna	assiale
Pagina	114

67012
MDI
K/P
AlTiN nano
VA
assiale
117

77012
MDI
K
lucide
AL
assiale
120



v _c m/min	Codigo avanzamento
130	F
110	E
130	G
110	F
130	F
125	F
110	E
110	F
90	E
130	G
110	F
70	D
105	E
70	D
60	E
55	D
55	C
50	B

v _c m/min	Codigo avanzamento
25	B
55	C
40	C
35	C

v _c m/min	Codigo avanzamento
200	G
180	G
150	G
120	G
180	G
70	F
180	G
120	F
70	F
50	F
45	F
35	E

Il sistema di foratura tipo V-AP mini

Parametri di lavoro indicativi

Serie d'avanzamento											
Codice lettera	A	B	C	D	E	F	G	H	I		
Dia. utensile mm	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	Avanzamenti f (mm/giro)
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Si prega di seguire le istruzioni per l'applicazione a pagina 55!

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Il sistema di foratura tipo V-AP mini

Parametri di lavoro indicativi

Serie d'avanzamento											
Codice lettera	A	B	C	D	E	F	G	H	I		
Dia. utensile mm	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	Avanzamenti f (mm/giro)
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Si prega di seguire le istruzioni per l'applicazione a pagina 55!

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Il sistema di foratura tipo V-AP mini

Parametri di lavoro indicativi

Serie d'avanzamento											
Codice lettera	A	B	C	D	E	F	G	H	I		
Dia. utensile mm	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	Avanzamenti f (mm/giro)
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Si prega di seguire le istruzioni per l'applicazione a pagina 55!

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Portainsero $\leq 10 \times D$ Catalogo n° 77004



Catalogo n°	67011
Mat. da taglio	MDI
Gruppo d'imp. MD	K/P
Superficie	TiAIN nano
Tip	U
Refrig. interna	assiale
Pagina	114

67012
MDI
K/P
AITiN nano
VA
assiale
117

77012
MDI
K
lucide
AL
assiale
120



v m/min	Codigo avanzamento
100	E
95	D
100	F
95	E
100	E
95	E
90	D
90	E
85	D
100	F
90	E
70	D
95	D
70	C
55	D
50	C
55	B
50	B
25	A
55	B
40	B
35	B
70	F
25	A
40	B
35	A
150	F
150	F
130	F
105	F
150	F
70	E
150	F
110	E
70	E
50	E
45	E
35	D

v m/min	Codigo avanzamento
25	A
55	B
40	B
35	B
70	F
25	A
40	B
35	A

v m/min	Codigo avanzamento
150	F
150	F
130	F
105	F
150	F
70	E
150	F
110	E
70	E
50	E
45	E
35	D

Il sistema di foratura tipo V-AP maxi

Parametri di lavoro indicativi

Serie d'avanzamento											
Codice lettera	A	B	C	D	E	F	G	H	I		
Dia. utensile mm	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	Avanzamenti f (mm/giro)
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in **grassetto**, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Portainserito $\leq 3 \times D$

Catalogo n° 76000



Catalogo n°	56011
Mat. da taglio	MDI
Gruppo d'imp. MD	K/P
Superficie	TiAIN
Tipo	SuperV-AP maxi
Refrig. interna	axial
Pagina	129

	76011
	MDI
	K/P
	TiN
	SuperV-AP maxi
	axial
	128



v _c m/min	Codigo avanzamento
130	F
110	E
130	G
110	F
130	F
125	F
110	E
110	F
90	E
130	G
110	F
70	D
105	E
70	D
55	E
50	D
55	C
50	B
25	B
55	C
40	C
35	C
210	G
155	G
155	G
130	F
35	B
40	C
35	B
290	G
260	G
235	G
195	G
260	G
105	F
270	G
180	F
105	F
85	F
65	F
55	E
105	E
105	E
105	E
105	E

v _c m/min	Codigo avanzamento
100	F
85	E
100	G
85	F
100	F
95	F
85	E
85	F
70	E
100	G
85	F
55	D
80	E
55	D
40	E
35	D
40	C
35	B
20	B
40	C
30	C
25	C
160	G
80	G
120	G
100	F
25	B
30	C
25	B
220	G
200	G
180	G
150	G
200	G
80	F
210	G
140	F
80	F
65	F
50	F
40	E
80	E
80	E
80	E
80	E

Il sistema di foratura tipo V-AP maxi

Parametri di lavoro indicativi

Serie d'avanzamento											
Codice lettera	A	B	C	D	E	F	G	H	I		
Dia. utensile mm	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	Avanzamenti f (mm/giro)
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Portainsero $\leq 5 \times D$

Catalogo n° 76001



Catalogo n°	56011
Mat. da taglio	MDI
Gruppo d'imp. MD	K/P
Superficie	TiAIN
Tipo	SuperV-AP maxi
Refrig. interna	axial
Pagina	129

	76011
	MDI
	K/P
	TiN
	SuperV-AP maxi
	axial
	128



v _c m/min	Codigo avanzamento
125	F
105	E
125	G
105	F
125	F
120	F
105	E
105	F
85	E
125	G
105	F
70	D
105	E
70	D
55	E
50	D
55	C
50	B
25	B
55	C
40	C
35	C
195	G
145	G
145	G
120	F
35	B
25	B
40	C
35	B
260	G
260	G
220	G
180	G
260	G
105	F
270	G
180	F
105	F
85	F
65	F
55	E
105	E
105	E
105	E
105	E

v _c m/min	Codigo avanzamento
95	F
80	E
95	G
80	F
95	F
90	F
80	E
80	F
65	E
95	G
80	F
55	D
80	E
55	D
40	E
35	D
40	C
35	B
20	B
40	C
30	C
25	C
150	G
110	G
110	G
90	F
25	B
20	B
30	C
25	B
200	G
200	G
170	G
140	G
200	G
80	F
210	G
140	F
80	F
65	F
50	F
40	E
80	E
80	E
80	E
80	E

Il sistema di foratura tipo V-AP maxi

Parametri di lavoro indicativi

Serie d'avanzamento											
Codice lettera	A	B	C	D	E	F	G	H	I		
Dia. utensile mm	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	Avanzamenti f (mm/giro)
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in **grassetto**, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Portainserito $\leq 7 \times D$

Catalogo n° 76003



Catalogo n°	56011
Mat. da taglio	MDI
Gruppo d'imp. MD	K/P
Superficie	TiAlN
Tipo	SuperV-AP maxi
Refrig. interna	axial
Pagina	129

Catalogo n°	76011
Mat. da taglio	MDI
Gruppo d'imp. MD	K/P
Superficie	TiN
Tipo	SuperV-AP maxi
Refrig. interna	axial
Pagina	128



v _c m/min	Codigo avanzamento
120	E
105	D
120	F
105	E
120	E
110	E
100	D
100	E
85	D
120	F
100	E
70	D
105	D
70	C
55	D
50	C
55	B
50	B
25	A
55	B
40	B
35	B
195	F
145	F
145	F
120	E
35	B
25	A
40	B
35	A
260	F
260	F
220	F
180	F
260	F
105	E
270	F
180	E
105	E
85	E
65	E
55	D
105	D
105	D
105	D
105	D

v _c m/min	Codigo avanzamento
90	E
80	D
90	F
80	E
90	E
85	E
75	D
75	E
65	D
90	F
75	E
55	D
80	D
55	C
40	D
35	C
40	B
35	B
20	A
40	B
30	B
25	B
150	F
110	F
110	F
90	E
25	B
20	A
30	B
25	A
200	F
200	F
170	F
140	F
200	F
80	E
210	F
140	E
80	E
65	E
50	E
40	D
80	D
80	D
80	D
80	D

Parametri di lavoro indicativi per punte in MD

Serie d'avanzamento											
Lettera d'identi.	A	B	C	D	E	F	G	H	I		
Diametro utensile mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	Avanzamenti f (mm/giri)
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160	
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200	
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	
	50,00	0,250	0,310	0,400	0,500	0,630	0,800	1,000	1,250	1,250	
	63,00	0,315	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	
	80,00	0,400	0,500	0,630	0,800	1,000	1,250	1,600	1,600	2,000	

Con le lettere d'identificazione d'avanzamento stampate **in grassetto**, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

K, P, K/P

l'impiego universale delle nuove qualità in metallo duro K consente tra l'altro, di definire i gruppi di utilizzo del metallo duro con K e K/P.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitici	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lav. plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

≤3×D prof. di foro

≤5×D

Catalogo no.	71184
Mat. da taglio	M.D.I.
Gruppo impiego	K10/K20
Superficie	lucida
DIN/Forma	6539
Tipo	N
Refrig. interna	
Pagina	132

Catalogo no.	51184
Mat. da taglio	M.D.I.
Gruppo impiego	K/P
Superficie	TiAlN nano
DIN/Forma	6539
Tipo	N
Refrig. interna	
Pagina	134

Catalogo no.	71380	71180
Mat. da taglio	M.D.	M.D.
Gruppo impiego	K10/K20	K10/K20
Superficie	lucida	lucida
DIN/Forma	8041	8037
Tipo	N	N
Refrig. interna		
Pagina	141	140

Catalogo no.	71290
Mat. da taglio	M.D.I.
Gruppo impiego	K10/K20
Superficie	lucida
DIN/Forma	Stock std
Tipo	N
Refrig. interna	
Pagina	135



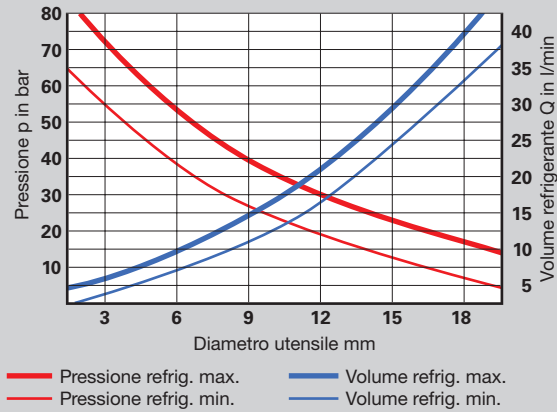
V _c m/min	Codice d'avanzamento	V _c m/min	Codice d'avanzamento	V _c m/min	Codice d'avanzamento		V _c m/min	Codice d'avanzamento
80	D	104	E				80	D
70	D	91	E				70	D
80	E	104	F	80	D	D	80	E
70	D	91	E	70	C	C	70	D
80	D	104	E				80	D
70	D	91	E				70	D
60	D	78	E				60	D
60	D	78	E				60	D
80	E	104	F				80	E
60	D	78	E				60	D
50	D	65	E				50	D
50	C	65	D				50	C
25	B	32	C	25	B	B	25	B
20	C	26	D	20	C	C	20	B
				10	B	B		
25	B	32	E				25	B
15	A	32	D				15	A
25	B	32	D				25	B
90	D	117	E	90	D	D	90	D
80	D	104	E	80	D	D	80	D
80	D	91	E	80	D	D	70	D
70	D	104	E	70	D	D	80	D
				10	A	A		
15	B	20	C				15	B
15	A	26	D				15	A
15	A	20	C				15	A
200	G	260	H				200	G
200	G	260	H				200	G
150	F	195	G				150	F
120	F	156	G				120	F
180	F	234	F				180	E
80	E	104	F				80	E
180	E	234	F	180	E	E	180	E
180	E	234	F	180	E	E	180	E
120	E	156	F				120	E
120	E	156	F				120	E
70	D	91	E				70	D
50	C	65	D				50	C
50	D	65	E				50	D
40	C	52	D				40	C
80	C	104	D				80	C

Stock Punte SuperV

Valori per la refrigerazione

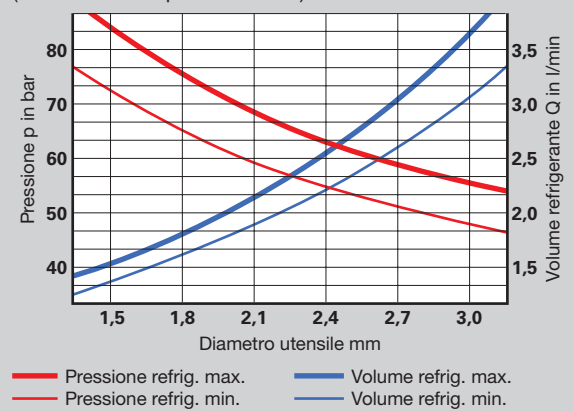
Valori refrigerante SuperV-T

(Valori indicativi per emulsione)



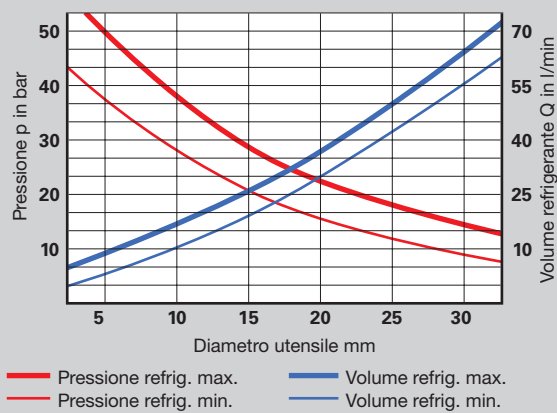
Valori refrigerante SuperV-NX

(Valori indicativi per emulsione)



Valori refrigerante SuperV 95-GG/GN

(Valori indicativi per emulsione)



Sistema di foratura V-AP

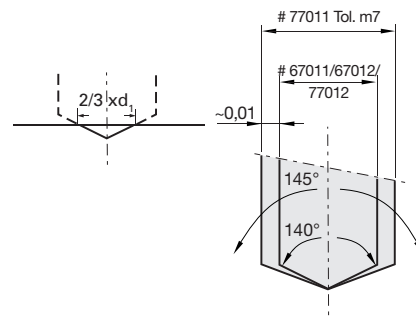
Raccomandazione generali

per tutti i portautensili

- Per fori passanti
- Non utilizzare l'utensile di foratura senza il processo per i tagli interrotti (scanalature, fori trasversali). Per taglio interrotto (max. $0.2 \times D$) è raccomandato ridurre l'avanzamento appena è possibile.
- In contrasto con gli inserti convenzionali, l'utensile Super V-AP è adatto anche per la foratura di lamiera.
- Sul tornio (utensile fisso) occorre garantire che l'utensile sia accuratamente centrato.
- Pre-condizione per un'ottimale lavorazione è un'alimentazione del refrigerante a olio intero o emulsionato.
- L'utensile è adatto solo per lavorazione a secco o MQL. Contattate i nostri ingegneri per ulteriori informazioni.

Raccomandazione aggiuntive per portautensili a partire **da $5 \times D$**

- Per profondità di foro da $5 \times D$ noi raccomandiamo per l'utensile la foratura da centro o pilota. Catalogo n° 77007 ed inserti pilota catalogo n° 77011.
In alternativa - dipendente dal materiale da lavorare - Punta SuperV tipo U, GG o VA oppure le punte NC catalogo n° 71189.
- Per fori passanti raccomandando la riduzione dell'avanzamento prima dell'uscita dal foro.



Per SuperV-AP mini:

Quando si cambia l'inserto osservare le seguenti coppie di serraggio per la vite di serraggio. E' assolutamente necessario rispettarle per ottenere ottimi risultati di lavorazione.

Gamma diametrale mm	11,0 - 12,99	13,0 - 13,99	14,0 - 15,99	16,0 - 17,99	18,0 - 19,99	20,0 - 21,99	22,0 - 29,99	30,0 - 40,0
Filetto	M2,2	M2,5	M3	M3,5	M4	M4,5	M5	M6
Dimensioni Torx	T7	T8	T9	T10	T15	T15	T20	T25
Coppia di serraggio (Nm)	0,8	1,0	1,7	2,7	4,0	6,0	8,0	14,0

Dettagli applicazione vite di bloccaggio (Loctite).

Parametri di lavoro indicativi per punte a cannone

Serie d'avanzamento										
Codice lettera	K	L	M	N	O	P	Q	R		
Ø utensile mm	1,50	0,002	0,004	0,006	0,008	0,012	0,020	0,032	0,045	Avanzamento f (mm/giro)
	2,00	0,003	0,005	0,007	0,010	0,016	0,028	0,046	0,055	
	2,50	0,004	0,006	0,008	0,012	0,018	0,030	0,054	0,070	
	4,00	0,005	0,007	0,010	0,016	0,025	0,043	0,065	0,085	
	6,00	0,007	0,009	0,013	0,024	0,035	0,061	0,085	0,120	
	8,00	0,010	0,014	0,022	0,032	0,045	0,068	0,100	0,150	
	10,00	0,012	0,016	0,028	0,040	0,055	0,075	0,120	0,160	
	14,00	0,020	0,025	0,035	0,050	0,065	0,085	0,130	0,180	
	18,00	0,025	0,030	0,040	0,055	0,070	0,095	0,145	0,200	
	20,00	0,026	0,035	0,045	0,060	0,080	0,110	0,180	0,250	
	24,00	0,027	0,036	0,047	0,065	0,085	0,130	0,185	0,300	
	28,00	0,028	0,038	0,049	0,068	0,090	0,140	0,195	0,350	
	30,00	0,030	0,040	0,050	0,070	0,100	0,150	0,200	0,400	
	35,00	0,035	0,045	0,055	0,075	0,120	0,180	0,250	0,450	
	40,00	0,040	0,050	0,060	0,080	0,150	0,200	0,300	0,500	

** I valori di avanzamento di basano sempre su utensili con il rivestimento consigliato.
In alcuni casi la funzionalità degli utensili non può essere garantita senza rivestimento.



Tutte le punte a cannone devono essere guidate da un foro pilota. Le punte a cannone non devono essere mai mosse libere al massimo dei giri nello spazio macchina.

Informazioni aggiuntive a pagina 62!

Lubrificanti:

olio da taglio, attivo ■
olio da taglio attivo, lubrificanti con additivi che reagiscono chimicamente causando uno speciale strato adesivo e abrasivo riducendo il film del lubrificante.

emulsione ■

senza lubrificante □

solo refrigerazione ad aria □

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■
Acciai temprati	-		≤40-48 HRC >48-60 HRC	■
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Ghisa dura	-		≤350 HB	■
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		■
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		■
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	□
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	■ □
Mat. plast. a fibre aramidiche	Kevlar		-	□
a fibre di vetro/C rinforzate	GFK/CFK		-	□

Catalogo n°	55027	55028 55029	75024 75020 75026 75021	55024 55020 55026 55021	75018 75017 75022 75023	55018 55017 55022 55023
Materiale tagliente	M.D.I.	M.D.I.	M.D.I.	M.D.I.	M.D. testa	M.D. testa
Superficie	AlTiN nano	AlTiN nano	lucido	AlTiN +	TiN	TiCN
Tipo	SuperT-AI	SuperT-AI	TBE-VHM	TBE-VHM	SuperT-N	SuperT-NX
Pagina	143	144/145	154/156/158/160	155/157/159/161	146/147/148/149	150/151/152/153



v_c m/min	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code
100	O	95	N	95	N	95	N	95	M	95	M
85	O	80	N	80	N	80	N	80	M	80	M
90	O	85	N	85	N	85	N	85	M	85	M
80	O	75	N	75	N	75	N	75	M	75	M
90	N	85	M	85	M	85	M	85	L	85	L
80	N	75	M	75	M	75	M	75	L	75	L
75	N	70	M	70	M	70	M	70	L	70	L
75	N	70	M	70	M	70	M	70	L	70	L
65	N	60	M	60	M	60	M	60	L	60	L
80	O	75	N	75	N	75	N	75	M	75	M
75	N	70	M	70	M	70	M	70	L	70	L
65	N	60	M	60	M	60	M	60	L	60	L
75	N	70	M	70	M	70	M	70	L	70	L
65	N	60	M	60	M	60	M	60	L	60	L
75	M	70	L	70	L	70	L	70	K	70	K
65	M	60	L	60	L	60	L	60	K	60	K
55	L	50	K	50	K	50	K	50	K	50	K
65	M	60	L	60	L	60	L	60	L	60	L
30	M	25	L	25	L	25	L	25	K	25	K
55	N	50	M	50	M	50	M	50	L	50	L
45	N	40	M	40	M	40	M	40	L	40	L
35	N	35	M	35	M	35	M	35	L	35	L
85	P	80	O	80	O	80	O	80	N	80	N
80	P	75	O	75	O	75	O	75	N	75	N
80	O	75	N	75	N	75	N	75	M	75	M
70	O	65	N	65	N	65	N	65	M	65	M
55	N	50	M	50	M	50	M	50	L	50	L
80	P	70	O	70	N	70	N	70	M	70	M
70	P	65	O	65	N	65	N	65	M	65	M
65	O	60	N	65	M	65	M	65	L	65	L
60	O	55	N	55	M	55	M	55	L	55	L
25	L	20	K	20	K	20	K	20	K	20	K
35	L	30	K	30	K	30	K	30	K	30	K
30	L	25	K	25	K	25	K	25	K	25	K
150	Q	140	P	140	P	140	P	140	N	140	N
120	Q	115	P	115	P	115	P	115	N	115	N
150	R	140	Q	140	Q	140	Q	140	P	140	P
130	R	120	Q	120	Q	120	Q	120	P	120	P
110	Q	100	P	100	P	100	P	90	O	90	O
75	O	70	N	70	N	70	N	70	M	70	M
120	R	115	Q	115	Q	115	Q	115	P	115	P
90	R	85	Q	85	Q	85	Q	85	P	85	P
95	Q	90	P	90	P	90	P	90	O	90	O
75	Q	70	P	70	P	70	P	70	O	70	O
70	Q	65	P	65	P	65	P	65	O	65	O
60	Q	55	P	55	P	55	P	55	O	55	O
75	O	70	N	70	N	70	N	70	M	70	M
70	O	65	N	65	N	65	N	65	M	65	M
60	N	55	M	55	M	55	M	55	L	55	L
50	N	45	M	45	M	45	M	45	L	45	L

Punte a cannone ad 1 tagl. SuperT-N/SuperT-NX

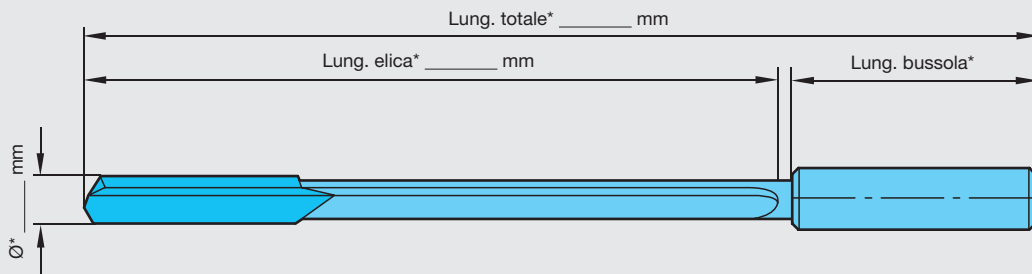
Modulo soluzione speciali

Punte a cannone:

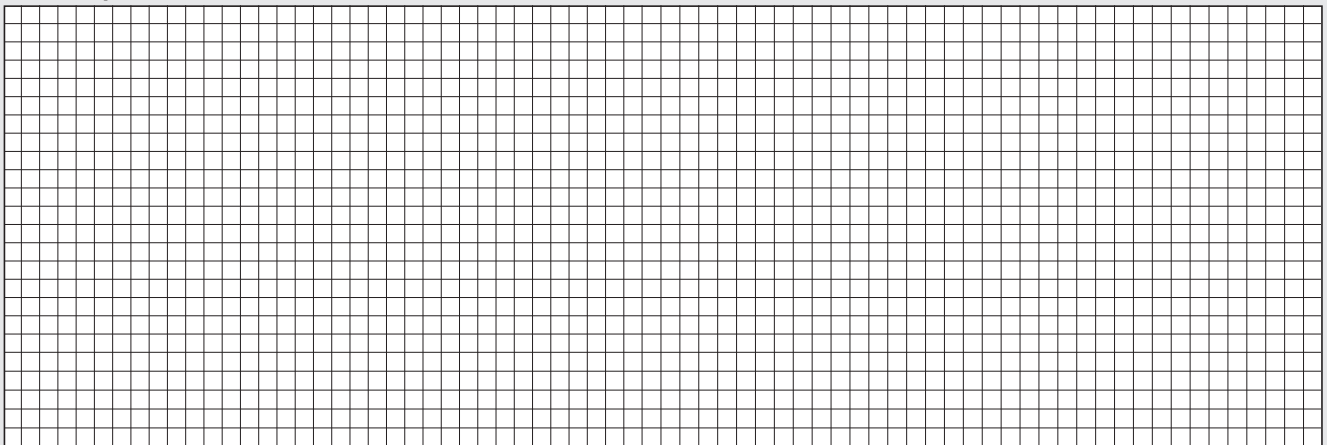
- SuperT-N
 SuperT-NX

Quantità richiesta: Utensile _____ pezzi

* Ø 2,0 - 40,0 mm
 Lung. totale max. 3000 mm
 Lung. totale e lung. bussola dipendono
 dalla bussola di serraggio scelta



Schizzo posizione di foratura



necessario solo per casi speciali

Bussola di serraggio:

- nessuna nr. ident.: _____ a disegno allegato

Rivestimento:

- TiN TiCN lucide _____

Pezzo da lavorare:

Prof. di foro: _____ Tolleranza del foro: _____ Mat./designazione: _____
 Resist. a traz./Durezza: _____

Macchina-tipo:

- macc. per punte a cannone macchina utensile convenz.

Lubrorefrigerante:

- olio per punte a cannone emulsione
 Pressione _____ bar Quantità _____ l/min

Ditta: _____

Timbro società: _____

Telefono/Fax: _____

Responsabile: _____

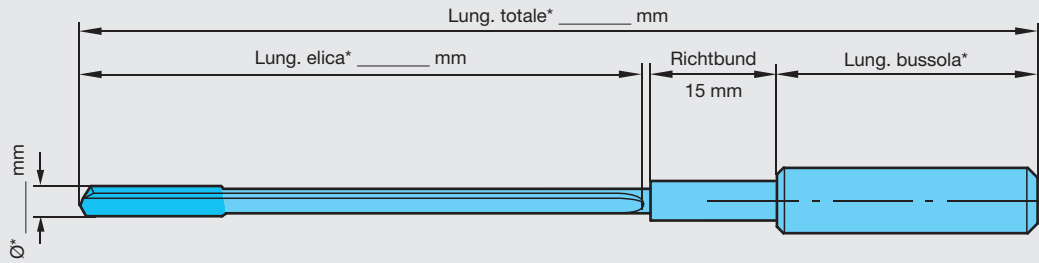
Firma: _____

Punte a cannone ad 1 tagl. TBE-VHM

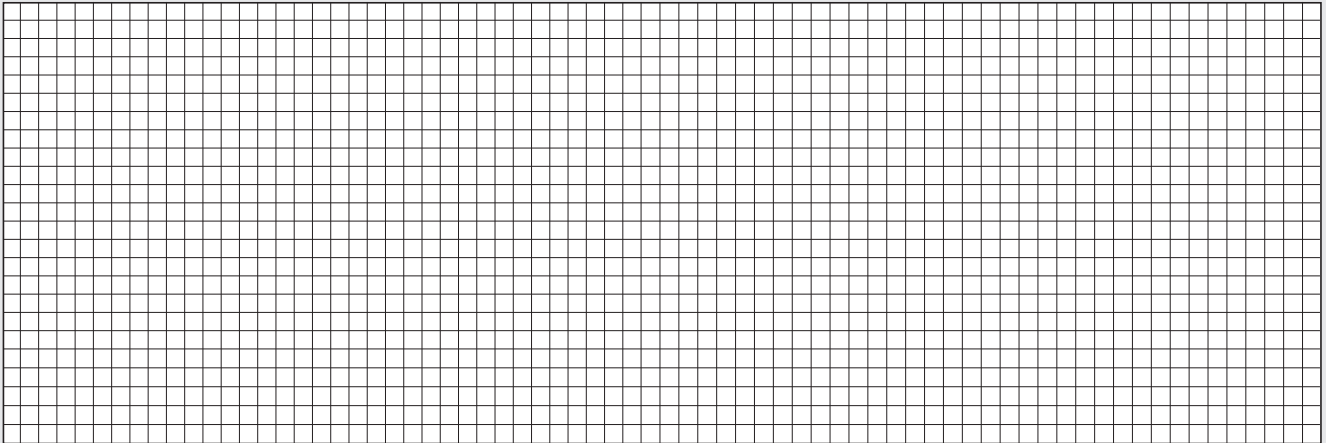
Modulo soluzione speciali

Punte a cannone: TBE-VHM  Quantità richiesta: Utensile _____ pezzi

* Ø 0,9 - 12,0 mm
 Lung. elica max. 500 mm
 Lung. totale e lung. bussola dipendono
 dalla bussola di serraggio scelta



Schizzo posizione di foratura



necessario solo per casi speciali

Bussola di serraggio: nessuna nr. ident.: _____ a disegno allegato

Rivestimento: TiN TiAlN AlTiN nano AlTiN+ lucide _____

Pezzo da lavorare: Prof. di foro: _____ Tolleranza del foro: _____ Mat./designazione: _____
 Resist. a traz./Durezza: _____

Macchina-tipo: macc. per punte a cannone macchina utensile convenz.

Lubrorefrigerante: olio per punte a cannone emulsione
 Pressione _____ bar Quantità _____ l/min

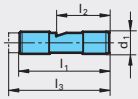
Ditta: _____ **Timbro società:** _____

Telefono/Fax: _____

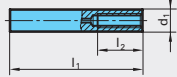
Responsabile: _____ **Firma:** _____

Accessori

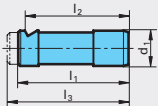
Bussole per forature profonde



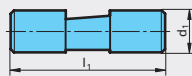
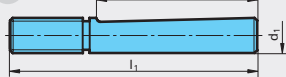
5



6

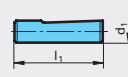


7



Bussole a DIN 1835

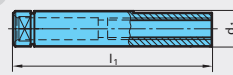
9 forma E



codice	d ₁	l ₁
9,1	8	36
9,2	10	40
9,3	12	45
9,4	16	48
9,5	20	50
9,6	25	56
9,7	32	60
9,8	31,75	70
9,9	38,1	70
9,10	40	70

Bussole a VDI-progetto

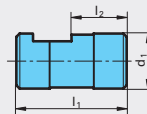
12



codice	d ₁	l ₁
12,1	10	68
12,2	16	90
12,3	25	112

Bussole a sistema Speed-Bit

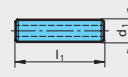
13



codice	d ₁	l ₁	l ₂
13,1	16	40	16
13,2	25	50	25
13,3	35,6	60	

Bussole a DIN 6535

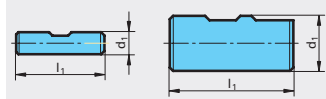
10 forma HA



codice	d ₁	l ₁
10,1	8	36
10,2	10	40
10,3	12	45
10,4	16	48
10,5	20	50
10,6	25	56
10,7	32	60
10,8	25	70
10,9	40	70

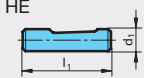
8 forma HB

con codice 8,6, 8,7, 8,8



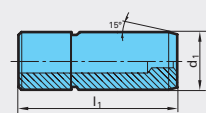
codice	d ₁	l ₁
8,1	8	36
8,2	10	40
8,3	12	45
8,4	16	48
8,5	20	50
8,6	25	56
8,7	32	60
8,8	40	70

11 forma HE



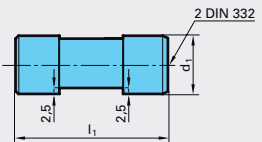
codice	d ₁	l ₁
11,1	8	36
11,2	10	40
11,3	12	45
11,4	16	48
11,5	20	50
11,6	25,4	70
11,7	25	56
11,8	32	60
11,9	40	70

16 sim. forma HA



code no.	d ₁	l ₁
16,1	10	50
16,2	16	64
16,3	20	70
16,4	25	81
16,5	32	92

17 sim. forma HE



code no.	d ₁	l ₁
17,1	19,05	70
17,2	25,40	70
17,3	31,75	70
17,4	38,1	70

Abbiamo a magazzino le bussole del programma qui raffigurato, esso rappresenta però solo una scelta di bussole. Naturalmente noi produciamo anche bussole di massima precisione a disegno del cliente.

Attenzione! Per TBE-VHM sono necessarie bussole con perno di allineamento. Informazioni a richiesta



Accessori per macchine per punte a cannone

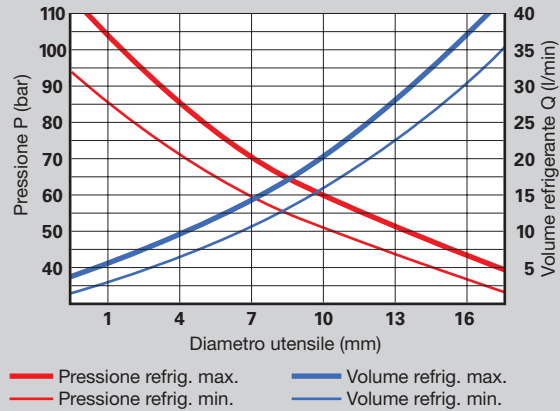
Contrariamente all'uso su macchine convenzionali, per impiego su specifiche macchine per punte a cannone occorrono determinati accessori, p.es.: bussole di guida, dischi a tenuta stagna, bussole a lunetta, ecc., che appartengono alla dotazione standard. Nella figura a lato trovate una scelta di tali prodotti.

Stock Punte a cannone

Valori per la refrigerazione

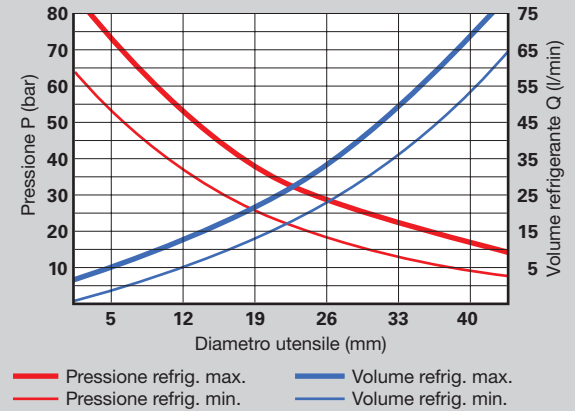
Valori refrigerante TBE-VHM/SuperT-AL

(Valori indicativi per emulsione)



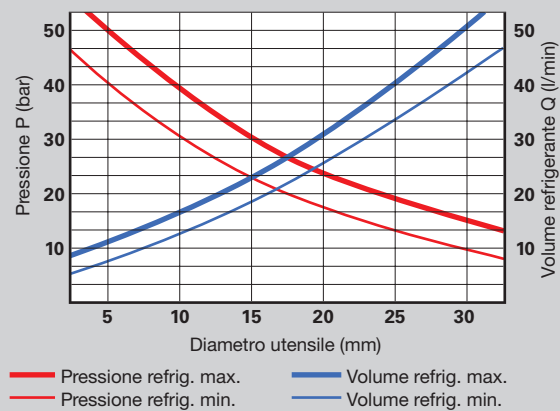
Valori refrigerante SuperT-N/-NX

(Valori indicativi per emulsione)



Valori refrigerante SuperT-GG

(Valori indicativi per emulsione)



Stock Punta a cannone

Valori per la refrigerazione

Procedimento per impiego di tutte le punte a cannone

- Produzione di un foro pilota (tolleranza H8).
- Entrare con un numero di giri di ca. 200 giri/min, avanzamento ca. 500 mm/min
- Regolazione della pressione del lubrificante e del nr. di giri
- Foratura in continuo sull'intera lunghezza, senza scaricare. Impiegando punte a cannone con un grosso rapporto lunghezza-diametro (p. es. EB 100 da lunghezza elica 160 mm), consigliamo di lavorare fino ad una profondità di foro di ca. 25 mm con parametri di taglio ridotti (ca. 75% della velocità di taglio ottimale).
- Spegnimento dell'adduzione refrigerante al raggiungimento della profondità di foro voluta
- Corsa di ritorno rapida con mandrino fermo.

I parametri di taglio possono essere ridotti se i parametri di refrigerazione sono insufficienti.

Un'altra opzione è aumentare la pressione del sistema.

Procedimento

Per produrre fori profondi con la SuperV-T con risultati ottimali, specialmente con entrata su raggi o su una struttura superficiale non livellata, consigliamo di procedere con i seguenti passi:

1. Fresare una superficie, p. es. con fresa tipo SuperF-UT-N con tagliente al centro. La superficie deve essere eseguita con angolo a destra, rispetto all'angolo di entrata del foro da produrre.
2. Eseguire un foro pilota cilindrico (tolleranza F9), con una profondità di almeno $1 \times D$. Consigliamo le nostre punte SuperV. Per il loro angolo di affilatura a 140° e la tolleranza sul $\varnothing m7$, queste punte sono le più indicate per tale operazione.
3. Entrare con la punta elicoidale per fori profondi nel foro pilota con un numero di giri di ca. 300 giri/min ed un avanzamento di ca. 500 mm/min.
4. Regolare la pressione del refrigerante ed il numero di giri.
5. Forare in continuo sull'intera lunghezza, senza scaricare.
6. Per fori passanti con uscita a 90° ridurre la velocità di avanzamento al 50% a circa 1 mm prima dell'uscita.
7. Per fori passanti con uscita del foro obliqua, ridurre la velocità di avanzamento v_f del 40% a ca. 1 mm prima dell'uscita.
8. Al raggiungimento della profondità di foro, spegnere giri ed adduzione refrigerante; corsa di ritorno rapida con max. 5000 mm/min.

Punte SuperV

Punte SuperV senza fori di refrigerazione



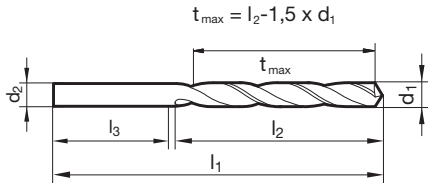
Catalogo n° 61888



P	M	K	N	S	H
○	●	○	○	●	●

Parametri di lav.
ind. a pag. 26

- Assott. del noc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- tagliente principale forma concava
- geometria dei taglienti ottimizzata
- sharp cutting behaviour



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	3,000	46,000	16,000	30,000
3,100	3,100	49,000	18,000	31,000
3,200	3,200	49,000	18,000	31,000
3,400	3,400	52,000	20,000	32,000
3,500	3,500	52,000	20,000	32,000
3,600	3,600	52,000	20,000	32,000
4,000	4,000	55,000	22,000	33,000
4,200	4,200	55,000	22,000	33,000
4,300	4,300	58,000	24,000	34,000
4,500	4,500	58,000	24,000	34,000
4,700	4,700	58,000	24,000	34,000
5,000	5,000	62,000	26,000	36,000
5,100	5,100	62,000	26,000	36,000
5,200	5,200	62,000	26,000	36,000
5,500	5,500	66,000	28,000	38,000
5,700	5,700	66,000	28,000	38,000
5,800	5,800	66,000	28,000	38,000
6,000	6,000	66,000	28,000	38,000
6,100	6,100	70,000	31,000	39,000
6,200	6,200	70,000	31,000	39,000
6,400	6,400	70,000	31,000	39,000
6,500	6,500	70,000	31,000	39,000
6,600	6,600	70,000	31,000	39,000
6,700	6,700	70,000	31,000	39,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,800	6,800	74,000	34,000	40,000
7,000	7,000	74,000	34,000	40,000
7,200	7,200	74,000	34,000	40,000
7,300	7,300	74,000	34,000	40,000
7,500	7,500	74,000	34,000	40,000
7,700	7,700	79,000	37,000	42,000
7,800	7,800	79,000	37,000	42,000
8,000	8,000	79,000	37,000	42,000
8,400	8,400	79,000	37,000	42,000
8,500	8,500	79,000	37,000	42,000
8,700	8,700	84,000	40,000	44,000
8,900	8,900	84,000	40,000	44,000
9,000	9,000	84,000	40,000	44,000
9,100	9,100	84,000	40,000	44,000
9,200	9,200	84,000	40,000	44,000
9,300	9,300	84,000	40,000	44,000
9,400	9,400	84,000	40,000	44,000
9,500	9,500	84,000	40,000	44,000
9,700	9,700	89,000	43,000	46,000
10,000	10,000	89,000	43,000	46,000
10,100	10,100	89,000	43,000	46,000
10,200	10,200	89,000	43,000	46,000
12,000	12,000	102,000	51,000	51,000

Punte SuperV

Punte SuperV senza fori di refrigerazione



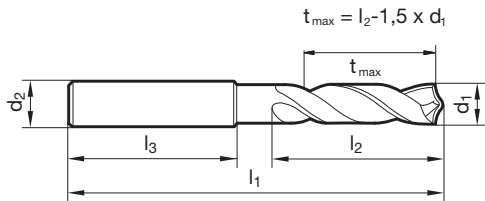
Catalogo n° 51873



P	M	K	N	S	H
●		●	○	○	○

Parametri di lav.
ind. a pag. 26

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	62,000	20,000	36,000
3,100	6,000	62,000	20,000	36,000
3,200	6,000	62,000	20,000	36,000
3,300	6,000	62,000	20,000	36,000
3,400	6,000	62,000	20,000	36,000
3,500	6,000	62,000	20,000	36,000
3,600	6,000	62,000	20,000	36,000
3,700	6,000	62,000	20,000	36,000
3,800	6,000	66,000	24,000	36,000
3,900	6,000	66,000	24,000	36,000
4,000	6,000	66,000	24,000	36,000
4,100	6,000	66,000	24,000	36,000
4,200	6,000	66,000	24,000	36,000
4,300	6,000	66,000	24,000	36,000
4,400	6,000	66,000	24,000	36,000
4,500	6,000	66,000	24,000	36,000
4,600	6,000	66,000	24,000	36,000
4,650	6,000	66,000	24,000	36,000
4,700	6,000	66,000	24,000	36,000
4,800	6,000	66,000	28,000	36,000
4,900	6,000	66,000	28,000	36,000
5,000	6,000	66,000	28,000	36,000
5,100	6,000	66,000	28,000	36,000
5,200	6,000	66,000	28,000	36,000
5,300	6,000	66,000	28,000	36,000
5,400	6,000	66,000	28,000	36,000
5,500	6,000	66,000	28,000	36,000
5,550	6,000	66,000	28,000	36,000
5,600	6,000	66,000	28,000	36,000
5,700	6,000	66,000	28,000	36,000
5,800	6,000	66,000	28,000	36,000
5,900	6,000	66,000	28,000	36,000
6,000	6,000	66,000	28,000	36,000
6,100	8,000	79,000	34,000	36,000
6,200	8,000	79,000	34,000	36,000
6,300	8,000	79,000	34,000	36,000
6,400	8,000	79,000	34,000	36,000
6,500	8,000	79,000	34,000	36,000
6,600	8,000	79,000	34,000	36,000
6,700	8,000	79,000	34,000	36,000
6,800	8,000	79,000	34,000	36,000
6,900	8,000	79,000	34,000	36,000
7,000	8,000	79,000	34,000	36,000
7,100	8,000	79,000	41,000	36,000
7,200	8,000	79,000	41,000	36,000
7,300	8,000	79,000	41,000	36,000
7,400	8,000	79,000	41,000	36,000
7,500	8,000	79,000	41,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
7,600	8,000	79,000	41,000	36,000
7,700	8,000	79,000	41,000	36,000
7,800	8,000	79,000	41,000	36,000
7,900	8,000	79,000	41,000	36,000
8,000	8,000	79,000	41,000	36,000
8,100	10,000	89,000	47,000	40,000
8,200	10,000	89,000	47,000	40,000
8,300	10,000	89,000	47,000	40,000
8,400	10,000	89,000	47,000	40,000
8,500	10,000	89,000	47,000	40,000
8,600	10,000	89,000	47,000	40,000
8,700	10,000	89,000	47,000	40,000
8,800	10,000	89,000	47,000	40,000
8,900	10,000	89,000	47,000	40,000
9,000	10,000	89,000	47,000	40,000
9,100	10,000	89,000	47,000	40,000
9,200	10,000	89,000	47,000	40,000
9,250	10,000	89,000	47,000	40,000
9,300	10,000	89,000	47,000	40,000
9,400	10,000	89,000	47,000	40,000
9,500	10,000	89,000	47,000	40,000
9,600	10,000	89,000	47,000	40,000
9,700	10,000	89,000	47,000	40,000
9,800	10,000	89,000	47,000	40,000
9,900	10,000	89,000	47,000	40,000
10,000	10,000	89,000	47,000	40,000
10,100	12,000	102,000	55,000	45,000
10,200	12,000	102,000	55,000	45,000
10,300	12,000	102,000	55,000	45,000
10,400	12,000	102,000	55,000	45,000
10,500	12,000	102,000	55,000	45,000
10,600	12,000	102,000	55,000	45,000
10,700	12,000	102,000	55,000	45,000
10,800	12,000	102,000	55,000	45,000
10,900	12,000	102,000	55,000	45,000
11,000	12,000	102,000	55,000	45,000
11,100	12,000	102,000	55,000	45,000
11,200	12,000	102,000	55,000	45,000
11,300	12,000	102,000	55,000	45,000
11,400	12,000	102,000	55,000	45,000
11,500	12,000	102,000	55,000	45,000
11,600	12,000	102,000	55,000	45,000
11,700	12,000	102,000	55,000	45,000
11,800	12,000	102,000	55,000	45,000
11,900	12,000	102,000	55,000	45,000
12,000	12,000	102,000	55,000	45,000
12,200	14,000	107,000	60,000	45,000
12,500	14,000	107,000	60,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
12,700	14,000	107,000	60,000	45,000	16,000	16,000	115,000	65,000	48,000
13,000	14,000	107,000	60,000	45,000	16,500	18,000	123,000	73,000	48,000
13,500	14,000	107,000	60,000	45,000	17,000	18,000	123,000	73,000	48,000
13,700	14,000	107,000	60,000	45,000	17,500	18,000	123,000	73,000	48,000
14,000	14,000	107,000	60,000	45,000	18,000	18,000	123,000	73,000	48,000
14,200	16,000	115,000	65,000	48,000	18,500	20,000	131,000	79,000	50,000
14,500	16,000	115,000	65,000	48,000	19,000	20,000	131,000	79,000	50,000
14,700	16,000	115,000	65,000	48,000	19,500	20,000	131,000	79,000	50,000
15,000	16,000	115,000	65,000	48,000	20,000	20,000	131,000	79,000	50,000
15,200	16,000	115,000	65,000	48,000					
15,500	16,000	115,000	65,000	48,000					
15,700	16,000	115,000	65,000	48,000					

Punte SuperV

Punte SuperV senza fori di refrigerazione



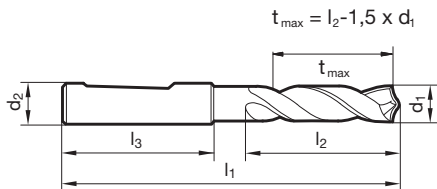
Catalogo n° 51871



P	M	K	N	S	H
●		●	○	○	○

Parametri di lav.
ind. a pag. 26

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	62,000	20,000	36,000	6,750	8,000	79,000	34,000	36,000
3,100	6,000	62,000	20,000	36,000	6,800	8,000	79,000	34,000	36,000
3,170	6,000	62,000	20,000	36,000	6,900	8,000	79,000	34,000	36,000
3,200	6,000	62,000	20,000	36,000	7,000	8,000	79,000	34,000	36,000
3,300	6,000	62,000	20,000	36,000	7,100	8,000	79,000	41,000	36,000
3,400	6,000	62,000	20,000	36,000	7,140	8,000	79,000	41,000	36,000
3,500	6,000	62,000	20,000	36,000	7,200	8,000	79,000	41,000	36,000
3,570	6,000	62,000	20,000	36,000	7,300	8,000	79,000	41,000	36,000
3,600	6,000	62,000	20,000	36,000	7,400	8,000	79,000	41,000	36,000
3,700	6,000	62,000	20,000	36,000	7,500	8,000	79,000	41,000	36,000
3,800	6,000	66,000	24,000	36,000	7,540	8,000	79,000	41,000	36,000
3,900	6,000	66,000	24,000	36,000	7,600	8,000	79,000	41,000	36,000
3,970	6,000	66,000	24,000	36,000	7,700	8,000	79,000	41,000	36,000
4,000	6,000	66,000	24,000	36,000	7,800	8,000	79,000	41,000	36,000
4,100	6,000	66,000	24,000	36,000	7,900	8,000	79,000	41,000	36,000
4,200	6,000	66,000	24,000	36,000	7,940	8,000	79,000	41,000	36,000
4,300	6,000	66,000	24,000	36,000	8,000	8,000	79,000	41,000	36,000
4,370	6,000	66,000	24,000	36,000	8,100	10,000	89,000	47,000	40,000
4,400	6,000	66,000	24,000	36,000	8,200	10,000	89,000	47,000	40,000
4,500	6,000	66,000	24,000	36,000	8,300	10,000	89,000	47,000	40,000
4,600	6,000	66,000	24,000	36,000	8,330	10,000	89,000	47,000	40,000
4,700	6,000	66,000	24,000	36,000	8,400	10,000	89,000	47,000	40,000
4,760	6,000	66,000	28,000	36,000	8,500	10,000	89,000	47,000	40,000
4,800	6,000	66,000	28,000	36,000	8,600	10,000	89,000	47,000	40,000
4,900	6,000	66,000	28,000	36,000	8,700	10,000	89,000	47,000	40,000
5,000	6,000	66,000	28,000	36,000	8,730	10,000	89,000	47,000	40,000
5,100	6,000	66,000	28,000	36,000	8,800	10,000	89,000	47,000	40,000
5,160	6,000	66,000	28,000	36,000	8,900	10,000	89,000	47,000	40,000
5,200	6,000	66,000	28,000	36,000	9,000	10,000	89,000	47,000	40,000
5,300	6,000	66,000	28,000	36,000	9,100	10,000	89,000	47,000	40,000
5,400	6,000	66,000	28,000	36,000	9,130	10,000	89,000	47,000	40,000
5,500	6,000	66,000	28,000	36,000	9,200	10,000	89,000	47,000	40,000
5,550	6,000	66,000	28,000	36,000	9,250	10,000	89,000	47,000	40,000
5,560	6,000	66,000	28,000	36,000	9,300	10,000	89,000	47,000	40,000
5,600	6,000	66,000	28,000	36,000	9,400	10,000	89,000	47,000	40,000
5,700	6,000	66,000	28,000	36,000	9,500	10,000	89,000	47,000	40,000
5,800	6,000	66,000	28,000	36,000	9,520	10,000	89,000	47,000	40,000
5,900	6,000	66,000	28,000	36,000	9,600	10,000	89,000	47,000	40,000
5,950	6,000	66,000	28,000	36,000	9,700	10,000	89,000	47,000	40,000
6,000	6,000	66,000	28,000	36,000	9,800	10,000	89,000	47,000	40,000
6,100	8,000	79,000	34,000	36,000	9,900	10,000	89,000	47,000	40,000
6,200	8,000	79,000	34,000	36,000	9,920	10,000	89,000	47,000	40,000
6,300	8,000	79,000	34,000	36,000	10,000	10,000	89,000	47,000	40,000
6,350	8,000	79,000	34,000	36,000	10,100	12,000	102,000	55,000	45,000
6,400	8,000	79,000	34,000	36,000	10,200	12,000	102,000	55,000	45,000
6,500	8,000	79,000	34,000	36,000	10,300	12,000	102,000	55,000	45,000
6,600	8,000	79,000	34,000	36,000	10,400	12,000	102,000	55,000	45,000
6,700	8,000	79,000	34,000	36,000	10,500	12,000	102,000	55,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,600	12,000	102,000	55,000	45,000	14,200	16,000	115,000	65,000	48,000
10,700	12,000	102,000	55,000	45,000	14,300	16,000	115,000	65,000	48,000
10,800	12,000	102,000	55,000	45,000	14,400	16,000	115,000	65,000	48,000
10,900	12,000	102,000	55,000	45,000	14,500	16,000	115,000	65,000	48,000
11,000	12,000	102,000	55,000	45,000	14,700	16,000	115,000	65,000	48,000
11,100	12,000	102,000	55,000	45,000	15,000	16,000	115,000	65,000	48,000
11,200	12,000	102,000	55,000	45,000	15,200	16,000	115,000	65,000	48,000
11,300	12,000	102,000	55,000	45,000	15,500	16,000	115,000	65,000	48,000
11,400	12,000	102,000	55,000	45,000	15,600	16,000	115,000	65,000	48,000
11,500	12,000	102,000	55,000	45,000	15,700	16,000	115,000	65,000	48,000
11,600	12,000	102,000	55,000	45,000	15,800	16,000	115,000	65,000	48,000
11,700	12,000	102,000	55,000	45,000	16,000	16,000	115,000	65,000	48,000
11,800	12,000	102,000	55,000	45,000	16,100	18,000	123,000	73,000	48,000
11,900	12,000	102,000	55,000	45,000	16,200	18,000	123,000	73,000	48,000
12,000	12,000	102,000	55,000	45,000	16,300	18,000	123,000	73,000	48,000
12,100	14,000	107,000	60,000	45,000	16,500	18,000	123,000	73,000	48,000
12,200	14,000	107,000	60,000	45,000	17,000	18,000	123,000	73,000	48,000
12,300	14,000	107,000	60,000	45,000	17,500	18,000	123,000	73,000	48,000
12,400	14,000	107,000	60,000	45,000	18,000	18,000	123,000	73,000	48,000
12,500	14,000	107,000	60,000	45,000	18,300	20,000	131,000	79,000	50,000
12,600	14,000	107,000	60,000	45,000	18,500	20,000	131,000	79,000	50,000
12,700	14,000	107,000	60,000	45,000	19,000	20,000	131,000	79,000	50,000
13,000	14,000	107,000	60,000	45,000	19,500	20,000	131,000	79,000	50,000
13,200	14,000	107,000	60,000	45,000	20,000	20,000	131,000	79,000	50,000
13,300	14,000	107,000	60,000	45,000					
13,500	14,000	107,000	60,000	45,000					
13,700	14,000	107,000	60,000	45,000					
13,800	14,000	107,000	60,000	45,000					
14,000	14,000	107,000	60,000	45,000					
14,100	16,000	115,000	65,000	48,000					

Punte SuperV

Punte SuperV senza fori di refrigerazione



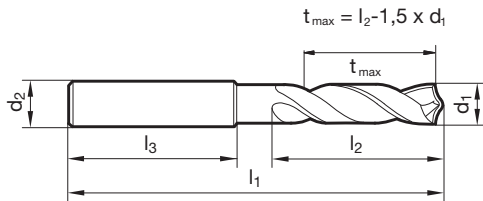
Catalogo n° 51787



P	M	K	N	S	H
●		●	○	○	○

Parametri di lav.
ind. a pag. 28

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	66,000	28,000	36,000	7,600	8,000	91,000	53,000	36,000
3,100	6,000	66,000	28,000	36,000	7,700	8,000	91,000	53,000	36,000
3,200	6,000	66,000	28,000	36,000	7,800	8,000	91,000	53,000	36,000
3,300	6,000	66,000	28,000	36,000	7,900	8,000	91,000	53,000	36,000
3,400	6,000	66,000	28,000	36,000	8,000	8,000	91,000	53,000	36,000
3,500	6,000	66,000	28,000	36,000	8,100	10,000	103,000	61,000	40,000
3,600	6,000	66,000	28,000	36,000	8,200	10,000	103,000	61,000	40,000
3,700	6,000	66,000	28,000	36,000	8,300	10,000	103,000	61,000	40,000
3,800	6,000	74,000	36,000	36,000	8,330	10,000	103,000	61,000	40,000
3,900	6,000	74,000	36,000	36,000	8,400	10,000	103,000	61,000	40,000
4,000	6,000	74,000	36,000	36,000	8,500	10,000	103,000	61,000	40,000
4,100	6,000	74,000	36,000	36,000	8,600	10,000	103,000	61,000	40,000
4,200	6,000	74,000	36,000	36,000	8,700	10,000	103,000	61,000	40,000
4,300	6,000	74,000	36,000	36,000	8,800	10,000	103,000	61,000	40,000
4,400	6,000	74,000	36,000	36,000	8,900	10,000	103,000	61,000	40,000
4,500	6,000	74,000	36,000	36,000	9,000	10,000	103,000	61,000	40,000
4,600	6,000	74,000	36,000	36,000	9,100	10,000	103,000	61,000	40,000
4,700	6,000	74,000	36,000	36,000	9,200	10,000	103,000	61,000	40,000
4,760	6,000	82,000	44,000	36,000	9,300	10,000	103,000	61,000	40,000
4,800	6,000	82,000	44,000	36,000	9,400	10,000	103,000	61,000	40,000
4,900	6,000	82,000	44,000	36,000	9,500	10,000	103,000	61,000	40,000
5,000	6,000	82,000	44,000	36,000	9,600	10,000	103,000	61,000	40,000
5,100	6,000	82,000	44,000	36,000	9,700	10,000	103,000	61,000	40,000
5,200	6,000	82,000	44,000	36,000	9,800	10,000	103,000	61,000	40,000
5,300	6,000	82,000	44,000	36,000	9,900	10,000	103,000	61,000	40,000
5,400	6,000	82,000	44,000	36,000	10,000	10,000	103,000	61,000	40,000
5,500	6,000	82,000	44,000	36,000	10,100	12,000	118,000	71,000	45,000
5,600	6,000	82,000	44,000	36,000	10,200	12,000	118,000	71,000	45,000
5,700	6,000	82,000	44,000	36,000	10,300	12,000	118,000	71,000	45,000
5,800	6,000	82,000	44,000	36,000	10,400	12,000	118,000	71,000	45,000
5,900	6,000	82,000	44,000	36,000	10,500	12,000	118,000	71,000	45,000
6,000	6,000	82,000	44,000	36,000	10,600	12,000	118,000	71,000	45,000
6,100	8,000	91,000	53,000	36,000	10,700	12,000	118,000	71,000	45,000
6,200	8,000	91,000	53,000	36,000	10,800	12,000	118,000	71,000	45,000
6,300	8,000	91,000	53,000	36,000	10,900	12,000	118,000	71,000	45,000
6,350	8,000	91,000	53,000	36,000	11,000	12,000	118,000	71,000	45,000
6,400	8,000	91,000	53,000	36,000	11,100	12,000	118,000	71,000	45,000
6,500	8,000	91,000	53,000	36,000	11,200	12,000	118,000	71,000	45,000
6,600	8,000	91,000	53,000	36,000	11,300	12,000	118,000	71,000	45,000
6,700	8,000	91,000	53,000	36,000	11,400	12,000	118,000	71,000	45,000
6,800	8,000	91,000	53,000	36,000	11,500	12,000	118,000	71,000	45,000
6,900	8,000	91,000	53,000	36,000	11,600	12,000	118,000	71,000	45,000
7,000	8,000	91,000	53,000	36,000	11,700	12,000	118,000	71,000	45,000
7,100	8,000	91,000	53,000	36,000	11,800	12,000	118,000	71,000	45,000
7,200	8,000	91,000	53,000	36,000	11,900	12,000	118,000	71,000	45,000
7,300	8,000	91,000	53,000	36,000	12,000	12,000	118,000	71,000	45,000
7,400	8,000	91,000	53,000	36,000	12,200	14,000	124,000	77,000	45,000
7,500	8,000	91,000	53,000	36,000	12,500	14,000	124,000	77,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
12,700	14,000	124,000	77,000	45,000	16,000	16,000	133,000	83,000	48,000
13,000	14,000	124,000	77,000	45,000	16,500	18,000	143,000	93,000	48,000
13,500	14,000	124,000	77,000	45,000	17,000	18,000	143,000	93,000	48,000
13,700	14,000	124,000	77,000	45,000	17,500	18,000	143,000	93,000	48,000
14,000	14,000	124,000	77,000	45,000	18,000	18,000	143,000	93,000	48,000
14,200	16,000	133,000	83,000	48,000	18,500	20,000	153,000	101,000	50,000
14,500	16,000	133,000	83,000	48,000	19,000	20,000	153,000	101,000	50,000
14,700	16,000	133,000	83,000	48,000	19,500	20,000	153,000	101,000	50,000
15,000	16,000	133,000	83,000	48,000	20,000	20,000	153,000	101,000	50,000
15,200	16,000	133,000	83,000	48,000					
15,500	16,000	133,000	83,000	48,000					
15,700	16,000	133,000	83,000	48,000					

Punte SuperV

Punte SuperV senza fori di refrigerazione



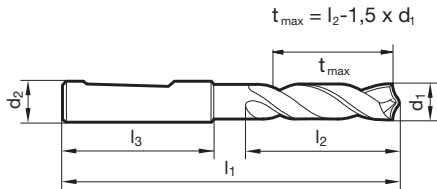
Catalogo n° 51887



P	M	K	N	S	H
●		●	○	○	○

Parametri di lav.
ind. a pag. 28

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	66,000	28,000	36,000
3,100	6,000	66,000	28,000	36,000
3,170	6,000	66,000	28,000	36,000
3,200	6,000	66,000	28,000	36,000
3,300	6,000	66,000	28,000	36,000
3,400	6,000	66,000	28,000	36,000
3,500	6,000	66,000	28,000	36,000
3,570	6,000	66,000	28,000	36,000
3,600	6,000	66,000	28,000	36,000
3,700	6,000	66,000	28,000	36,000
3,800	6,000	74,000	36,000	36,000
3,900	6,000	74,000	36,000	36,000
3,970	6,000	74,000	36,000	36,000
4,000	6,000	74,000	36,000	36,000
4,100	6,000	74,000	36,000	36,000
4,200	6,000	74,000	36,000	36,000
4,300	6,000	74,000	36,000	36,000
4,370	6,000	74,000	36,000	36,000
4,400	6,000	74,000	36,000	36,000
4,500	6,000	74,000	36,000	36,000
4,600	6,000	74,000	36,000	36,000
4,700	6,000	74,000	36,000	36,000
4,760	6,000	82,000	44,000	36,000
4,800	6,000	82,000	44,000	36,000
4,900	6,000	82,000	44,000	36,000
5,000	6,000	82,000	44,000	36,000
5,100	6,000	82,000	44,000	36,000
5,160	6,000	82,000	44,000	36,000
5,200	6,000	82,000	44,000	36,000
5,300	6,000	82,000	44,000	36,000
5,400	6,000	82,000	44,000	36,000
5,500	6,000	82,000	44,000	36,000
5,560	6,000	82,000	44,000	36,000
5,600	6,000	82,000	44,000	36,000
5,700	6,000	82,000	44,000	36,000
5,800	6,000	82,000	44,000	36,000
5,900	6,000	82,000	44,000	36,000
5,950	6,000	82,000	44,000	36,000
6,000	6,000	82,000	44,000	36,000
6,100	8,000	91,000	53,000	36,000
6,200	8,000	91,000	53,000	36,000
6,300	8,000	91,000	53,000	36,000
6,350	8,000	91,000	53,000	36,000
6,400	8,000	91,000	53,000	36,000
6,500	8,000	91,000	53,000	36,000
6,600	8,000	91,000	53,000	36,000
6,700	8,000	91,000	53,000	36,000
6,750	8,000	91,000	53,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,800	8,000	91,000	53,000	36,000
6,900	8,000	91,000	53,000	36,000
7,000	8,000	91,000	53,000	36,000
7,100	8,000	91,000	53,000	36,000
7,140	8,000	91,000	53,000	36,000
7,200	8,000	91,000	53,000	36,000
7,300	8,000	91,000	53,000	36,000
7,400	8,000	91,000	53,000	36,000
7,500	8,000	91,000	53,000	36,000
7,540	8,000	91,000	53,000	36,000
7,600	8,000	91,000	53,000	36,000
7,700	8,000	91,000	53,000	36,000
7,800	8,000	91,000	53,000	36,000
7,900	8,000	91,000	53,000	36,000
7,940	8,000	91,000	53,000	36,000
8,000	8,000	91,000	53,000	36,000
8,100	10,000	103,000	61,000	40,000
8,200	10,000	103,000	61,000	40,000
8,300	10,000	103,000	61,000	40,000
8,330	10,000	103,000	61,000	40,000
8,400	10,000	103,000	61,000	40,000
8,500	10,000	103,000	61,000	40,000
8,600	10,000	103,000	61,000	40,000
8,700	10,000	103,000	61,000	40,000
8,730	10,000	103,000	61,000	40,000
8,800	10,000	103,000	61,000	40,000
8,900	10,000	103,000	61,000	40,000
9,000	10,000	103,000	61,000	40,000
9,100	10,000	103,000	61,000	40,000
9,130	10,000	103,000	61,000	40,000
9,200	10,000	103,000	61,000	40,000
9,300	10,000	103,000	61,000	40,000
9,400	10,000	103,000	61,000	40,000
9,500	10,000	103,000	61,000	40,000
9,520	10,000	103,000	61,000	40,000
9,600	10,000	103,000	61,000	40,000
9,700	10,000	103,000	61,000	40,000
9,800	10,000	103,000	61,000	40,000
9,900	10,000	103,000	61,000	40,000
9,920	10,000	103,000	61,000	40,000
10,000	10,000	103,000	61,000	40,000
10,100	12,000	118,000	71,000	45,000
10,200	12,000	118,000	71,000	45,000
10,300	12,000	118,000	71,000	45,000
10,400	12,000	118,000	71,000	45,000
10,500	12,000	118,000	71,000	45,000
10,600	12,000	118,000	71,000	45,000
10,700	12,000	118,000	71,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
10,800	12,000	118,000	71,000	45,000	14,700	16,000	133,000	83,000	48,000
10,900	12,000	118,000	71,000	45,000	15,000	16,000	133,000	83,000	48,000
11,000	12,000	118,000	71,000	45,000	15,200	16,000	133,000	83,000	48,000
11,100	12,000	118,000	71,000	45,000	15,500	16,000	133,000	83,000	48,000
11,200	12,000	118,000	71,000	45,000	15,700	16,000	133,000	83,000	48,000
11,300	12,000	118,000	71,000	45,000	16,000	16,000	133,000	83,000	48,000
11,400	12,000	118,000	71,000	45,000	16,500	18,000	143,000	93,000	48,000
11,500	12,000	118,000	71,000	45,000	17,000	18,000	143,000	93,000	48,000
11,600	12,000	118,000	71,000	45,000	17,500	18,000	143,000	93,000	48,000
11,700	12,000	118,000	71,000	45,000	18,000	18,000	143,000	93,000	48,000
11,800	12,000	118,000	71,000	45,000	18,500	20,000	153,000	101,000	50,000
11,900	12,000	118,000	71,000	45,000	19,000	20,000	153,000	101,000	50,000
12,000	12,000	118,000	71,000	45,000	19,500	20,000	153,000	101,000	50,000
12,100	14,000	124,000	77,000	45,000	20,000	20,000	153,000	101,000	50,000
12,200	14,000	124,000	77,000	45,000					
12,500	14,000	124,000	77,000	45,000					
12,700	14,000	124,000	77,000	45,000					
13,000	14,000	124,000	77,000	45,000					
13,500	14,000	124,000	77,000	45,000					
13,700	14,000	124,000	77,000	45,000					
14,000	14,000	124,000	77,000	45,000					
14,100	16,000	133,000	83,000	48,000					
14,200	16,000	133,000	83,000	48,000					
14,500	16,000	133,000	83,000	48,000					

Punte SuperV

Punte con refrigerazione interna SuperV



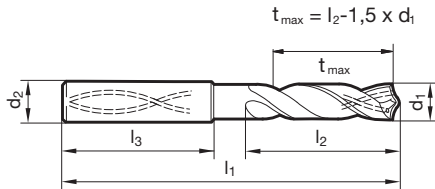
Catalogo n° 51776



P	M	K	N	S	H
●	○	●	○	○	○

Parametri di lav.
ind. a pag. 26

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



d1	inch	d2	l1	l2	l3	d1	inch	d2	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	7,500		8,000	79,000	41,000	36,000
3,100		6,000	62,000	20,000	36,000	7,600		8,000	79,000	41,000	36,000
3,200		6,000	62,000	20,000	36,000	7,700		8,000	79,000	41,000	36,000
3,300		6,000	62,000	20,000	36,000	7,800		8,000	79,000	41,000	36,000
3,400		6,000	62,000	20,000	36,000	7,900		8,000	79,000	41,000	36,000
3,500		6,000	62,000	20,000	36,000	8,000		8,000	79,000	41,000	36,000
3,600		6,000	62,000	20,000	36,000	8,100		10,000	89,000	47,000	40,000
3,700		6,000	62,000	20,000	36,000	8,200		10,000	89,000	47,000	40,000
3,800		6,000	66,000	24,000	36,000	8,300		10,000	89,000	47,000	40,000
3,900		6,000	66,000	24,000	36,000	8,400		10,000	89,000	47,000	40,000
4,000		6,000	66,000	24,000	36,000	8,500		10,000	89,000	47,000	40,000
4,100		6,000	66,000	24,000	36,000	8,600		10,000	89,000	47,000	40,000
4,200		6,000	66,000	24,000	36,000	8,700		10,000	89,000	47,000	40,000
4,300		6,000	66,000	24,000	36,000	8,800		10,000	89,000	47,000	40,000
4,400		6,000	66,000	24,000	36,000	8,900		10,000	89,000	47,000	40,000
4,500		6,000	66,000	24,000	36,000	9,000		10,000	89,000	47,000	40,000
4,600		6,000	66,000	24,000	36,000	9,100		10,000	89,000	47,000	40,000
4,650		6,000	66,000	24,000	36,000	9,200		10,000	89,000	47,000	40,000
4,700		6,000	66,000	24,000	36,000	9,250		10,000	89,000	47,000	40,000
4,800		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	9,400		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	9,500		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	9,600		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	9,700		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	9,800		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	9,900		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	10,000		10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	10,100		12,000	102,000	55,000	45,000
5,600		6,000	66,000	28,000	36,000	10,200		12,000	102,000	55,000	45,000
5,700		6,000	66,000	28,000	36,000	10,300		12,000	102,000	55,000	45,000
5,800		6,000	66,000	28,000	36,000	10,400		12,000	102,000	55,000	45,000
5,900		6,000	66,000	28,000	36,000	10,500		12,000	102,000	55,000	45,000
6,000		6,000	66,000	28,000	36,000	10,600		12,000	102,000	55,000	45,000
6,100		8,000	79,000	34,000	36,000	10,700		12,000	102,000	55,000	45,000
6,200		8,000	79,000	34,000	36,000	10,800		12,000	102,000	55,000	45,000
6,300		8,000	79,000	34,000	36,000	10,900		12,000	102,000	55,000	45,000
6,350	1/4	8,000	79,000	34,000	36,000	11,000		12,000	102,000	55,000	45,000
6,400		8,000	79,000	34,000	36,000	11,100		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	11,200		12,000	102,000	55,000	45,000
6,600		8,000	79,000	34,000	36,000	11,300		12,000	102,000	55,000	45,000
6,700		8,000	79,000	34,000	36,000	11,400		12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	11,500		12,000	102,000	55,000	45,000
6,900		8,000	79,000	34,000	36,000	11,600		12,000	102,000	55,000	45,000
7,000		8,000	79,000	34,000	36,000	11,700		12,000	102,000	55,000	45,000
7,100		8,000	79,000	41,000	36,000	11,800		12,000	102,000	55,000	45,000
7,200		8,000	79,000	41,000	36,000	11,900		12,000	102,000	55,000	45,000
7,300		8,000	79,000	41,000	36,000	12,000		12,000	102,000	55,000	45,000
7,400		8,000	79,000	41,000	36,000	12,200		14,000	107,000	60,000	45,000

d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
12,500		14,000	107,000	60,000	45,000	18,000		18,000	123,000	73,000	48,000
12,700	1/2	14,000	107,000	60,000	45,000	18,500		20,000	131,000	79,000	50,000
13,000		14,000	107,000	60,000	45,000	18,700		20,000	131,000	79,000	50,000
13,500		14,000	107,000	60,000	45,000	19,000		20,000	131,000	79,000	50,000
13,700		14,000	107,000	60,000	45,000	19,500		20,000	131,000	79,000	50,000
14,000		14,000	107,000	60,000	45,000	19,700		20,000	131,000	79,000	50,000
14,200		16,000	115,000	65,000	48,000	20,000		20,000	131,000	79,000	50,000
14,500		16,000	115,000	65,000	48,000						
14,700		16,000	115,000	65,000	48,000						
15,000		16,000	115,000	65,000	48,000						
15,200		16,000	115,000	65,000	48,000						
15,500		16,000	115,000	65,000	48,000						
15,700		16,000	115,000	65,000	48,000						
16,000		16,000	115,000	65,000	48,000						
16,500		18,000	123,000	73,000	48,000						
16,700		18,000	123,000	73,000	48,000						
17,000		18,000	123,000	73,000	48,000						
17,500		18,000	123,000	73,000	48,000						

Punte SuperV

Punte con refrigerazione interna SuperV



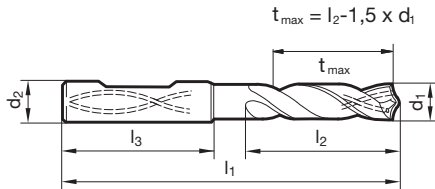
Catalogo n° 51876



P	M	K	N	S	H
●	○	●	○	○	○

Parametri di lav.
ind. a pag. 26

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	7,100		8,000	79,000	41,000	36,000
3,100		6,000	62,000	20,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
3,200		6,000	62,000	20,000	36,000	7,200		8,000	79,000	41,000	36,000
3,300		6,000	62,000	20,000	36,000	7,300		8,000	79,000	41,000	36,000
3,400		6,000	62,000	20,000	36,000	7,400		8,000	79,000	41,000	36,000
3,500		6,000	62,000	20,000	36,000	7,500		8,000	79,000	41,000	36,000
3,600		6,000	62,000	20,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
3,700		6,000	62,000	20,000	36,000	7,600		8,000	79,000	41,000	36,000
3,800		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
3,900		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	8,000		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	8,100		10,000	89,000	47,000	40,000
4,370	11/64	6,000	66,000	24,000	36,000	8,200		10,000	89,000	47,000	40,000
4,400		6,000	66,000	24,000	36,000	8,300		10,000	89,000	47,000	40,000
4,500		6,000	66,000	24,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
4,600		6,000	66,000	24,000	36,000	8,400		10,000	89,000	47,000	40,000
4,700		6,000	66,000	24,000	36,000	8,500		10,000	89,000	47,000	40,000
4,760	3/16	6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
4,800		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	9,400		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,500		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,520	3/8	10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,600		10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,700		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,800		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,900		10,000	89,000	47,000	40,000
6,100		8,000	79,000	34,000	36,000	9,920	25/64	10,000	89,000	47,000	40,000
6,200		8,000	79,000	34,000	36,000	10,000		10,000	89,000	47,000	40,000
6,300		8,000	79,000	34,000	36,000	10,100		12,000	102,000	55,000	45,000
6,350	1/4	8,000	79,000	34,000	36,000	10,200		12,000	102,000	55,000	45,000
6,400		8,000	79,000	34,000	36,000	10,300		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	10,320	13/32	12,000	102,000	55,000	45,000
6,600		8,000	79,000	34,000	36,000	10,400		12,000	102,000	55,000	45,000
6,700		8,000	79,000	34,000	36,000	10,500		12,000	102,000	55,000	45,000
6,750	17/64	8,000	79,000	34,000	36,000	10,600		12,000	102,000	55,000	45,000
6,800		8,000	79,000	34,000	36,000	10,700		12,000	102,000	55,000	45,000
6,900		8,000	79,000	34,000	36,000	10,800		12,000	102,000	55,000	45,000
7,000		8,000	79,000	34,000	36,000	10,900		12,000	102,000	55,000	45,000

d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
11,000		12,000	102,000	55,000	45,000	14,100		16,000	115,000	65,000	48,000
11,100		12,000	102,000	55,000	45,000	14,200		16,000	115,000	65,000	48,000
11,110	7/16	12,000	102,000	55,000	45,000	14,290	9/16	16,000	115,000	65,000	48,000
11,200		12,000	102,000	55,000	45,000	14,300		16,000	115,000	65,000	48,000
11,300		12,000	102,000	55,000	45,000	14,500		16,000	115,000	65,000	48,000
11,400		12,000	102,000	55,000	45,000	14,700		16,000	115,000	65,000	48,000
11,500		12,000	102,000	55,000	45,000	14,900		16,000	115,000	65,000	48,000
11,600		12,000	102,000	55,000	45,000	15,000		16,000	115,000	65,000	48,000
11,700		12,000	102,000	55,000	45,000	15,200		16,000	115,000	65,000	48,000
11,800		12,000	102,000	55,000	45,000	15,500		16,000	115,000	65,000	48,000
11,900		12,000	102,000	55,000	45,000	15,600		16,000	115,000	65,000	48,000
11,910	15/32	12,000	102,000	55,000	45,000	15,700		16,000	115,000	65,000	48,000
12,000		12,000	102,000	55,000	45,000	16,000		16,000	115,000	65,000	48,000
12,100		14,000	107,000	60,000	45,000	16,100		18,000	123,000	73,000	48,000
12,200		14,000	107,000	60,000	45,000	16,200		18,000	123,000	73,000	48,000
12,300	31/64	14,000	107,000	60,000	45,000	16,500		18,000	123,000	73,000	48,000
12,400		14,000	107,000	60,000	45,000	17,000		18,000	123,000	73,000	48,000
12,500		14,000	107,000	60,000	45,000	17,500		18,000	123,000	73,000	48,000
12,700	1/2	14,000	107,000	60,000	45,000	17,700		18,000	123,000	73,000	48,000
13,000		14,000	107,000	60,000	45,000	18,000		18,000	123,000	73,000	48,000
13,200		14,000	107,000	60,000	45,000	18,500		20,000	131,000	79,000	50,000
13,500		14,000	107,000	60,000	45,000	19,000		20,000	131,000	79,000	50,000
13,700		14,000	107,000	60,000	45,000	19,500		20,000	131,000	79,000	50,000
14,000		14,000	107,000	60,000	45,000	20,000		20,000	131,000	79,000	50,000

Punte SuperV

Punte con refrigerazione interna SuperV



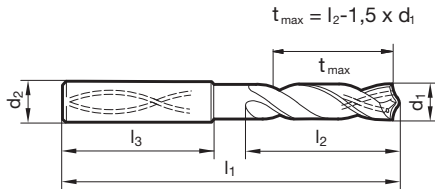
Catalogo n° 51770



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 26

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- adatto in particolare per acciai inossidabile



d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	7,000		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	7,100		8,000	79,000	41,000	36,000
3,500		6,000	62,000	20,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	7,200		8,000	79,000	41,000	36,000
3,600		6,000	62,000	20,000	36,000	7,300		8,000	79,000	41,000	36,000
3,700		6,000	62,000	20,000	36,000	7,400		8,000	79,000	41,000	36,000
3,800		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
3,900		6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	8,000		8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	8,100		10,000	89,000	47,000	40,000
4,500		6,000	66,000	24,000	36,000	8,200		10,000	89,000	47,000	40,000
4,600		6,000	66,000	24,000	36,000	8,300		10,000	89,000	47,000	40,000
4,650		6,000	66,000	24,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
4,700		6,000	66,000	24,000	36,000	8,400		10,000	89,000	47,000	40,000
4,760	3/16	6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
4,800		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,400		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,500		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,520	3/8	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,600		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,700		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,800		10,000	89,000	47,000	40,000
6,100		8,000	79,000	34,000	36,000	9,900		10,000	89,000	47,000	40,000
6,200		8,000	79,000	34,000	36,000	9,920	25/64	10,000	89,000	47,000	40,000
6,300		8,000	79,000	34,000	36,000	10,000		10,000	89,000	47,000	40,000
6,350	1/4	8,000	79,000	34,000	36,000	10,100		12,000	102,000	55,000	45,000
6,400		8,000	79,000	34,000	36,000	10,200		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	10,300		12,000	102,000	55,000	45,000

d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
10,320	13/32	12,000	102,000	55,000	45,000	14,290	9/16	16,000	115,000	65,000	48,000
10,400		12,000	102,000	55,000	45,000	14,300		16,000	115,000	65,000	48,000
10,500		12,000	102,000	55,000	45,000	14,500		16,000	115,000	65,000	48,000
10,600		12,000	102,000	55,000	45,000	14,700		16,000	115,000	65,000	48,000
10,700		12,000	102,000	55,000	45,000	15,000		16,000	115,000	65,000	48,000
10,800		12,000	102,000	55,000	45,000	15,200		16,000	115,000	65,000	48,000
10,900		12,000	102,000	55,000	45,000	15,300		16,000	115,000	65,000	48,000
11,000		12,000	102,000	55,000	45,000	15,500		16,000	115,000	65,000	48,000
11,100		12,000	102,000	55,000	45,000	15,700		16,000	115,000	65,000	48,000
11,110	7/16	12,000	102,000	55,000	45,000	16,000		16,000	115,000	65,000	48,000
11,200		12,000	102,000	55,000	45,000	16,300		18,000	123,000	73,000	48,000
11,300		12,000	102,000	55,000	45,000	16,500		18,000	123,000	73,000	48,000
11,400		12,000	102,000	55,000	45,000	16,900		18,000	123,000	73,000	48,000
11,500		12,000	102,000	55,000	45,000	17,000		18,000	123,000	73,000	48,000
11,600		12,000	102,000	55,000	45,000	17,300		18,000	123,000	73,000	48,000
11,700		12,000	102,000	55,000	45,000	17,500		18,000	123,000	73,000	48,000
11,800		12,000	102,000	55,000	45,000	18,000		18,000	123,000	73,000	48,000
11,900		12,000	102,000	55,000	45,000	18,500		20,000	131,000	79,000	50,000
11,910	15/32	12,000	102,000	55,000	45,000	18,900		20,000	131,000	79,000	50,000
12,000		12,000	102,000	55,000	45,000	19,000		20,000	131,000	79,000	50,000
12,200		14,000	107,000	60,000	45,000	19,300		20,000	131,000	79,000	50,000
12,500		14,000	107,000	60,000	45,000	19,500		20,000	131,000	79,000	50,000
12,700	1/2	14,000	107,000	60,000	45,000	20,000		20,000	131,000	79,000	50,000
12,800		14,000	107,000	60,000	45,000						
13,000		14,000	107,000	60,000	45,000						
13,300		14,000	107,000	60,000	45,000						
13,500		14,000	107,000	60,000	45,000						
13,700		14,000	107,000	60,000	45,000						
14,000		14,000	107,000	60,000	45,000						
14,200		16,000	115,000	65,000	48,000						

Punte SuperV

Punte con refrigerazione interna SuperV



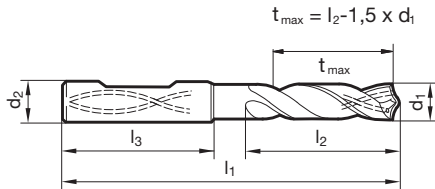
Catalogo n° 51771



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 26

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- adatto in particolare per acciai inossidabile



d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	62,000	20,000	36,000	6,600		8,000	79,000	34,000	36,000
3,100		6,000	62,000	20,000	36,000	6,700		8,000	79,000	34,000	36,000
3,170	1/8	6,000	62,000	20,000	36,000	6,750	17/64	8,000	79,000	34,000	36,000
3,200		6,000	62,000	20,000	36,000	6,800		8,000	79,000	34,000	36,000
3,250		6,000	62,000	20,000	36,000	6,900		8,000	79,000	34,000	36,000
3,300		6,000	62,000	20,000	36,000	7,000		8,000	79,000	34,000	36,000
3,400		6,000	62,000	20,000	36,000	7,100		8,000	79,000	41,000	36,000
3,500		6,000	62,000	20,000	36,000	7,140	9/32	8,000	79,000	41,000	36,000
3,570	9/64	6,000	62,000	20,000	36,000	7,200		8,000	79,000	41,000	36,000
3,600		6,000	62,000	20,000	36,000	7,300		8,000	79,000	41,000	36,000
3,700		6,000	62,000	20,000	36,000	7,400		8,000	79,000	41,000	36,000
3,800		6,000	66,000	24,000	36,000	7,500		8,000	79,000	41,000	36,000
3,900		6,000	66,000	24,000	36,000	7,540	19/64	8,000	79,000	41,000	36,000
3,970	5/32	6,000	66,000	24,000	36,000	7,600		8,000	79,000	41,000	36,000
4,000		6,000	66,000	24,000	36,000	7,700		8,000	79,000	41,000	36,000
4,100		6,000	66,000	24,000	36,000	7,800		8,000	79,000	41,000	36,000
4,200		6,000	66,000	24,000	36,000	7,900		8,000	79,000	41,000	36,000
4,300		6,000	66,000	24,000	36,000	7,940	5/16	8,000	79,000	41,000	36,000
4,370	11/64	6,000	66,000	24,000	36,000	8,000		8,000	79,000	41,000	36,000
4,400		6,000	66,000	24,000	36,000	8,100		10,000	89,000	47,000	40,000
4,500		6,000	66,000	24,000	36,000	8,200		10,000	89,000	47,000	40,000
4,600		6,000	66,000	24,000	36,000	8,300		10,000	89,000	47,000	40,000
4,650		6,000	66,000	24,000	36,000	8,330	21/64	10,000	89,000	47,000	40,000
4,700		6,000	66,000	24,000	36,000	8,400		10,000	89,000	47,000	40,000
4,760	3/16	6,000	66,000	28,000	36,000	8,500		10,000	89,000	47,000	40,000
4,800		6,000	66,000	28,000	36,000	8,600		10,000	89,000	47,000	40,000
4,900		6,000	66,000	28,000	36,000	8,700		10,000	89,000	47,000	40,000
5,000		6,000	66,000	28,000	36,000	8,730	11/32	10,000	89,000	47,000	40,000
5,100		6,000	66,000	28,000	36,000	8,800		10,000	89,000	47,000	40,000
5,160	13/64	6,000	66,000	28,000	36,000	8,900		10,000	89,000	47,000	40,000
5,200		6,000	66,000	28,000	36,000	9,000		10,000	89,000	47,000	40,000
5,300		6,000	66,000	28,000	36,000	9,100		10,000	89,000	47,000	40,000
5,400		6,000	66,000	28,000	36,000	9,130	23/64	10,000	89,000	47,000	40,000
5,500		6,000	66,000	28,000	36,000	9,200		10,000	89,000	47,000	40,000
5,550		6,000	66,000	28,000	36,000	9,250		10,000	89,000	47,000	40,000
5,560	7/32	6,000	66,000	28,000	36,000	9,300		10,000	89,000	47,000	40,000
5,600		6,000	66,000	28,000	36,000	9,400		10,000	89,000	47,000	40,000
5,700		6,000	66,000	28,000	36,000	9,500		10,000	89,000	47,000	40,000
5,800		6,000	66,000	28,000	36,000	9,520	3/8	10,000	89,000	47,000	40,000
5,900		6,000	66,000	28,000	36,000	9,600		10,000	89,000	47,000	40,000
5,950	15/64	6,000	66,000	28,000	36,000	9,700		10,000	89,000	47,000	40,000
6,000		6,000	66,000	28,000	36,000	9,800		10,000	89,000	47,000	40,000
6,100		8,000	79,000	34,000	36,000	9,900		10,000	89,000	47,000	40,000
6,200		8,000	79,000	34,000	36,000	9,920	25/64	10,000	89,000	47,000	40,000
6,300		8,000	79,000	34,000	36,000	10,000		10,000	89,000	47,000	40,000
6,350	1/4	8,000	79,000	34,000	36,000	10,100		12,000	102,000	55,000	45,000
6,400		8,000	79,000	34,000	36,000	10,200		12,000	102,000	55,000	45,000
6,500		8,000	79,000	34,000	36,000	10,300		12,000	102,000	55,000	45,000

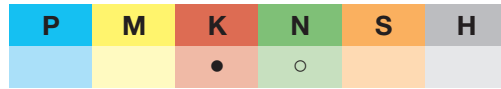
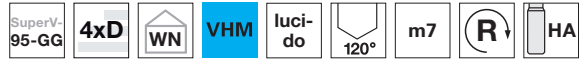
d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
10,320	13/32	12,000	102,000	55,000	45,000	14,290	9/16	16,000	115,000	65,000	48,000
10,400		12,000	102,000	55,000	45,000	14,300		16,000	115,000	65,000	48,000
10,500		12,000	102,000	55,000	45,000	14,500		16,000	115,000	65,000	48,000
10,600		12,000	102,000	55,000	45,000	14,700		16,000	115,000	65,000	48,000
10,700		12,000	102,000	55,000	45,000	15,000		16,000	115,000	65,000	48,000
10,800		12,000	102,000	55,000	45,000	15,200		16,000	115,000	65,000	48,000
10,900		12,000	102,000	55,000	45,000	15,300		16,000	115,000	65,000	48,000
11,000		12,000	102,000	55,000	45,000	15,500		16,000	115,000	65,000	48,000
11,100		12,000	102,000	55,000	45,000	15,700		16,000	115,000	65,000	48,000
11,110	7/16	12,000	102,000	55,000	45,000	16,000		16,000	115,000	65,000	48,000
11,200		12,000	102,000	55,000	45,000	16,300		18,000	123,000	73,000	48,000
11,300		12,000	102,000	55,000	45,000	16,500		18,000	123,000	73,000	48,000
11,400		12,000	102,000	55,000	45,000	16,900		18,000	123,000	73,000	48,000
11,500		12,000	102,000	55,000	45,000	17,000		18,000	123,000	73,000	48,000
11,600		12,000	102,000	55,000	45,000	17,300		18,000	123,000	73,000	48,000
11,700		12,000	102,000	55,000	45,000	17,500		18,000	123,000	73,000	48,000
11,800		12,000	102,000	55,000	45,000	18,000		18,000	123,000	73,000	48,000
11,900		12,000	102,000	55,000	45,000	18,500		20,000	131,000	79,000	50,000
11,910	15/32	12,000	102,000	55,000	45,000	18,900		20,000	131,000	79,000	50,000
12,000		12,000	102,000	55,000	45,000	19,000		20,000	131,000	79,000	50,000
12,200		14,000	107,000	60,000	45,000	19,300		20,000	131,000	79,000	50,000
12,500		14,000	107,000	60,000	45,000	19,500		20,000	131,000	79,000	50,000
12,700	1/2	14,000	107,000	60,000	45,000	20,000		20,000	131,000	79,000	50,000
12,800		14,000	107,000	60,000	45,000						
13,000		14,000	107,000	60,000	45,000						
13,300		14,000	107,000	60,000	45,000						
13,500		14,000	107,000	60,000	45,000						
13,700		14,000	107,000	60,000	45,000						
14,000		14,000	107,000	60,000	45,000						
14,200		16,000	115,000	65,000	48,000						

Punte SuperV

Punte con refrigerazione interna SuperV

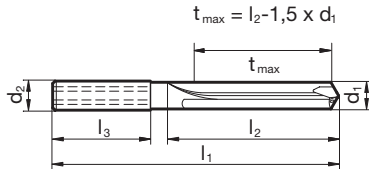


Catalogo n° 71995



Parametri di lav.
ind. a pag. 26

- Assott. del noc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- strette tolleranze sul diametro
- ottima finitura di superf. del foro
- osservare la pressione del lubrificante (vedere diagramma)



d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	24,000	36,000	7,200		8,000	91,000	53,000	36,000
3,100		6,000	66,000	24,000	36,000	7,300		8,000	91,000	53,000	36,000
3,200		6,000	66,000	24,000	36,000	7,400		8,000	91,000	53,000	36,000
3,300		6,000	66,000	24,000	36,000	7,500		8,000	91,000	53,000	36,000
3,400		6,000	66,000	24,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
3,500		6,000	66,000	24,000	36,000	7,600		8,000	91,000	53,000	36,000
3,600		6,000	66,000	24,000	36,000	7,700		8,000	91,000	53,000	36,000
3,700		6,000	66,000	24,000	36,000	7,800		8,000	91,000	53,000	36,000
3,800		6,000	74,000	30,000	36,000	7,900		8,000	91,000	53,000	36,000
3,900		6,000	74,000	30,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,000		6,000	74,000	30,000	36,000	8,000		8,000	91,000	53,000	36,000
4,100		6,000	74,000	30,000	36,000	8,100		10,000	103,000	61,000	40,000
4,200		6,000	74,000	30,000	36,000	8,200		10,000	103,000	61,000	40,000
4,300		6,000	74,000	30,000	36,000	8,300		10,000	103,000	61,000	40,000
4,400		6,000	74,000	30,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
4,500		6,000	74,000	30,000	36,000	8,400		10,000	103,000	61,000	40,000
4,600		6,000	74,000	30,000	36,000	8,500		10,000	103,000	61,000	40,000
4,700		6,000	74,000	30,000	36,000	8,600		10,000	103,000	61,000	40,000
4,800		6,000	74,000	36,000	36,000	8,700		10,000	103,000	61,000	40,000
4,900		6,000	74,000	36,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,000		6,000	74,000	36,000	36,000	8,800		10,000	103,000	61,000	40,000
5,100		6,000	74,000	36,000	36,000	8,900		10,000	103,000	61,000	40,000
5,160	13/64	6,000	74,000	36,000	36,000	9,000		10,000	103,000	61,000	40,000
5,200		6,000	74,000	36,000	36,000	9,100		10,000	103,000	61,000	40,000
5,300		6,000	74,000	36,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,400		6,000	74,000	36,000	36,000	9,200		10,000	103,000	61,000	40,000
5,500		6,000	74,000	36,000	36,000	9,300		10,000	103,000	61,000	40,000
5,560	7/32	6,000	74,000	36,000	36,000	9,400		10,000	103,000	61,000	40,000
5,600		6,000	74,000	36,000	36,000	9,500		10,000	103,000	61,000	40,000
5,700		6,000	74,000	36,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
5,800		6,000	74,000	36,000	36,000	9,600		10,000	103,000	61,000	40,000
5,900		6,000	74,000	36,000	36,000	9,700		10,000	103,000	61,000	40,000
5,950	15/64	6,000	74,000	36,000	36,000	9,800		10,000	103,000	61,000	40,000
6,000		6,000	74,000	36,000	36,000	9,900		10,000	103,000	61,000	40,000
6,100		8,000	91,000	53,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
6,200		8,000	91,000	53,000	36,000	10,000		10,000	103,000	61,000	40,000
6,300		8,000	91,000	53,000	36,000	10,200		12,000	118,000	71,000	45,000
6,350	1/4	8,000	91,000	53,000	36,000	10,500		12,000	118,000	71,000	45,000
6,400		8,000	91,000	53,000	36,000	10,720	27/64	12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	11,000		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	11,110	7/16	12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	11,200		12,000	118,000	71,000	45,000
6,750	17/64	8,000	91,000	53,000	36,000	11,500		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	11,510	29/64	12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	11,910	15/32	12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	12,000		12,000	118,000	71,000	45,000
7,100		8,000	91,000	53,000	36,000	12,300	31/64	14,000	124,000	74,000	45,000
7,140	9/32	8,000	91,000	53,000	36,000	12,500		14,000	124,000	74,000	45,000

d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
12,700	1/2	14,000	124,000	74,000	45,000
13,000		14,000	124,000	74,000	45,000
13,500		14,000	124,000	74,000	45,000
14,000		14,000	124,000	74,000	45,000
14,500		16,000	133,000	83,000	48,000
15,000		16,000	133,000	83,000	48,000
15,500		16,000	133,000	83,000	48,000
16,000		16,000	133,000	83,000	48,000
16,500		18,000	143,000	93,000	48,000
17,000		18,000	143,000	93,000	48,000
17,500		18,000	143,000	93,000	48,000
18,000		18,000	143,000	93,000	48,000

d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
18,500		20,000	153,000	101,000	50,000
19,000		20,000	153,000	101,000	50,000
19,500		20,000	153,000	101,000	50,000
20,000		20,000	153,000	101,000	50,000
21,500		25,000	168,000	110,000	56,000

Punte SuperV

Punte con refrigerazione interna SuperV



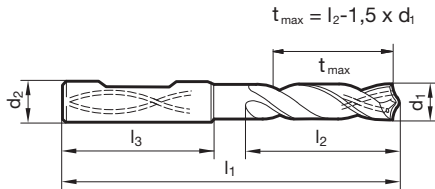
Catalogo n° 61880



P	M	K	N	S	H
○	●	○	○	●	●

Parametri di lav.
ind. a pag. 28

- Assott. del noc. $\geq \varnothing 4,000$
- spoglia sul cono tagliente
- tagliente principale forma concava
- geometria dei taglienti ottimizzata
- sharp cutting behaviour



d1	inch	d2	l1	l2	l3	d1	inch	d2	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
4,000		6,000	74,000	36,000	36,000	11,000		12,000	118,000	71,000	45,000
4,100		6,000	74,000	36,000	36,000	11,400		12,000	118,000	71,000	45,000
4,200		6,000	74,000	36,000	36,000	11,500		12,000	118,000	71,000	45,000
4,300		6,000	74,000	36,000	36,000	11,600		12,000	118,000	71,000	45,000
4,500		6,000	74,000	36,000	36,000	11,700		12,000	118,000	71,000	45,000
4,800		6,000	82,000	44,000	36,000	11,800		12,000	118,000	71,000	45,000
4,900		6,000	82,000	44,000	36,000	12,000		12,000	118,000	71,000	45,000
5,000		6,000	82,000	44,000	36,000	12,100		14,000	124,000	77,000	45,000
5,100		6,000	82,000	44,000	36,000	12,200		14,000	124,000	77,000	45,000
5,200		6,000	82,000	44,000	36,000	12,500		14,000	124,000	77,000	45,000
5,400		6,000	82,000	44,000	36,000	12,800		14,000	124,000	77,000	45,000
5,500		6,000	82,000	44,000	36,000	12,900		14,000	124,000	77,000	45,000
5,700		6,000	82,000	44,000	36,000	13,000		14,000	124,000	77,000	45,000
5,800		6,000	82,000	44,000	36,000	13,200		14,000	124,000	77,000	45,000
5,900		6,000	82,000	44,000	36,000	13,500		14,000	124,000	77,000	45,000
6,000		6,000	82,000	44,000	36,000	13,800		14,000	124,000	77,000	45,000
6,100		8,000	91,000	53,000	36,000	14,000		14,000	124,000	77,000	45,000
6,200		8,000	91,000	53,000	36,000	14,100		16,000	133,000	83,000	48,000
6,500		8,000	91,000	53,000	36,000	14,200		16,000	133,000	83,000	48,000
6,600		8,000	91,000	53,000	36,000	14,500		16,000	133,000	83,000	48,000
6,750	17/64	8,000	91,000	53,000	36,000	15,000		16,000	133,000	83,000	48,000
6,800		8,000	91,000	53,000	36,000	15,500		16,000	133,000	83,000	48,000
6,900		8,000	91,000	53,000	36,000	15,800		16,000	133,000	83,000	48,000
7,000		8,000	91,000	53,000	36,000	16,000		16,000	133,000	83,000	48,000
7,140	9/32	8,000	91,000	53,000	36,000	16,500		18,000	143,000	93,000	48,000
7,200		8,000	91,000	53,000	36,000	17,000		18,000	143,000	93,000	48,000
7,500		8,000	91,000	53,000	36,000	17,500		18,000	143,000	93,000	48,000
7,600		8,000	91,000	53,000	36,000	18,000		18,000	143,000	93,000	48,000
7,700		8,000	91,000	53,000	36,000	18,500		20,000	153,000	101,000	50,000
7,800		8,000	91,000	53,000	36,000	19,000		20,000	153,000	101,000	50,000
7,900		8,000	91,000	53,000	36,000	20,000		20,000	153,000	101,000	50,000
8,000		8,000	91,000	53,000	36,000	21,000		25,000	165,000	105,000	56,000
8,100		10,000	103,000	61,000	40,000	22,000		25,000	165,000	105,000	56,000
8,200		10,000	103,000	61,000	40,000	23,500		25,000	180,000	117,000	56,000
8,300		10,000	103,000	61,000	40,000	24,000		25,000	180,000	117,000	56,000
8,500		10,000	103,000	61,000	40,000	24,500		25,000	180,000	117,000	56,000
8,600		10,000	103,000	61,000	40,000	25,000	63/64	25,000	180,000	117,000	56,000
8,700		10,000	103,000	61,000	40,000						
8,800		10,000	103,000	61,000	40,000						
9,000		10,000	103,000	61,000	40,000						
9,100		10,000	103,000	61,000	40,000						
9,300		10,000	103,000	61,000	40,000						
9,500		10,000	103,000	61,000	40,000						
9,700		10,000	103,000	61,000	40,000						
10,000		10,000	103,000	61,000	40,000						
10,200		12,000	118,000	71,000	45,000						
10,500		12,000	118,000	71,000	45,000						
10,800		12,000	118,000	71,000	45,000						

Punte SuperV

Punte con refrigerazione interna SuperV



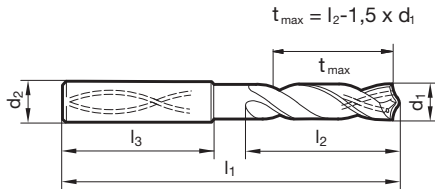
Catalogo n° 51781



P	M	K	N	S	H
●	○	●	○	○	○

Parametri di lav.
ind. a pag. 28

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	7,000		8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	7,100		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	7,200		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	7,300		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	7,400		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	7,500		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	8,000		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	8,100		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	8,200		10,000	103,000	61,000	40,000
4,600		6,000	74,000	36,000	36,000	8,300		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	8,400		10,000	103,000	61,000	40,000
4,760	3/16	6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,600		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,800		10,000	103,000	61,000	40,000
6,100		8,000	91,000	53,000	36,000	9,900		10,000	103,000	61,000	40,000
6,200		8,000	91,000	53,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
6,300		8,000	91,000	53,000	36,000	10,000		10,000	103,000	61,000	40,000
6,350	1/4	8,000	91,000	53,000	36,000	10,100		12,000	118,000	71,000	45,000
6,400		8,000	91,000	53,000	36,000	10,200		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	10,300		12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	10,320	13/32	12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	10,400		12,000	118,000	71,000	45,000
6,750	17/64	8,000	91,000	53,000	36,000	10,500		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	10,600		12,000	118,000	71,000	45,000

d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
10,700		12,000	118,000	71,000	45,000	14,000		14,000	124,000	77,000	45,000
10,720	27/64	12,000	118,000	71,000	45,000	14,100		16,000	133,000	83,000	48,000
10,800		12,000	118,000	71,000	45,000	14,200		16,000	133,000	83,000	48,000
10,900		12,000	118,000	71,000	45,000	14,290	9/16	16,000	133,000	83,000	48,000
11,000		12,000	118,000	71,000	45,000	14,500		16,000	133,000	83,000	48,000
11,100		12,000	118,000	71,000	45,000	14,700		16,000	133,000	83,000	48,000
11,110	7/16	12,000	118,000	71,000	45,000	15,000		16,000	133,000	83,000	48,000
11,200		12,000	118,000	71,000	45,000	15,200		16,000	133,000	83,000	48,000
11,300		12,000	118,000	71,000	45,000	15,500		16,000	133,000	83,000	48,000
11,400		12,000	118,000	71,000	45,000	15,600		16,000	133,000	83,000	48,000
11,500		12,000	118,000	71,000	45,000	15,700		16,000	133,000	83,000	48,000
11,600		12,000	118,000	71,000	45,000	15,800		16,000	133,000	83,000	48,000
11,700		12,000	118,000	71,000	45,000	16,000		16,000	133,000	83,000	48,000
11,800		12,000	118,000	71,000	45,000	16,500		18,000	143,000	93,000	48,000
11,900		12,000	118,000	71,000	45,000	16,700		18,000	143,000	93,000	48,000
11,910	15/32	12,000	118,000	71,000	45,000	17,000		18,000	143,000	93,000	48,000
12,000		12,000	118,000	71,000	45,000	17,500		18,000	143,000	93,000	48,000
12,100		14,000	124,000	77,000	45,000	17,700		18,000	143,000	93,000	48,000
12,200		14,000	124,000	77,000	45,000	18,000		18,000	143,000	93,000	48,000
12,300	31/64	14,000	124,000	77,000	45,000	18,500		20,000	153,000	101,000	50,000
12,400		14,000	124,000	77,000	45,000	18,700		20,000	153,000	101,000	50,000
12,500		14,000	124,000	77,000	45,000	19,000		20,000	153,000	101,000	50,000
12,700	1/2	14,000	124,000	77,000	45,000	19,500		20,000	153,000	101,000	50,000
13,000		14,000	124,000	77,000	45,000	19,700		20,000	153,000	101,000	50,000
13,200		14,000	124,000	77,000	45,000	20,000		20,000	153,000	101,000	50,000
13,500		14,000	124,000	77,000	45,000						
13,600		14,000	124,000	77,000	45,000						
13,700		14,000	124,000	77,000	45,000						
13,800		14,000	124,000	77,000	45,000						
13,900		14,000	124,000	77,000	45,000						

Punte SuperV

Punte con refrigerazione interna SuperV



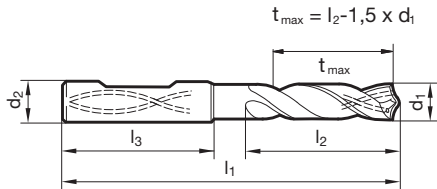
Catalogo n° 51881



P	M	K	N	S	H
●	○	●	○	○	○

Parametri di lav.
ind. a pag. 28

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata



d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	7,100		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	7,200		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	7,300		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	7,400		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	7,500		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	7,600		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	8,000		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	8,100		10,000	103,000	61,000	40,000
4,370	11/64	6,000	74,000	36,000	36,000	8,200		10,000	103,000	61,000	40,000
4,400		6,000	74,000	36,000	36,000	8,300		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
4,600		6,000	74,000	36,000	36,000	8,400		10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	8,500		10,000	103,000	61,000	40,000
4,760	3/16	6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,600		10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,800		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,900		10,000	103,000	61,000	40,000
6,100		8,000	91,000	53,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
6,200		8,000	91,000	53,000	36,000	10,000		10,000	103,000	61,000	40,000
6,300		8,000	91,000	53,000	36,000	10,100		12,000	118,000	71,000	45,000
6,350	1/4	8,000	91,000	53,000	36,000	10,200		12,000	118,000	71,000	45,000
6,400		8,000	91,000	53,000	36,000	10,300		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	10,320	13/32	12,000	118,000	71,000	45,000
6,600		8,000	91,000	53,000	36,000	10,400		12,000	118,000	71,000	45,000
6,700		8,000	91,000	53,000	36,000	10,500		12,000	118,000	71,000	45,000
6,750	17/64	8,000	91,000	53,000	36,000	10,600		12,000	118,000	71,000	45,000
6,800		8,000	91,000	53,000	36,000	10,700		12,000	118,000	71,000	45,000
6,900		8,000	91,000	53,000	36,000	10,800		12,000	118,000	71,000	45,000
7,000		8,000	91,000	53,000	36,000	10,900		12,000	118,000	71,000	45,000

d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
11,000		12,000	118,000	71,000	45,000	14,000		14,000	124,000	77,000	45,000
11,100		12,000	118,000	71,000	45,000	14,100		16,000	133,000	83,000	48,000
11,110	7/16	12,000	118,000	71,000	45,000	14,200		16,000	133,000	83,000	48,000
11,200		12,000	118,000	71,000	45,000	14,290	9/16	16,000	133,000	83,000	48,000
11,300		12,000	118,000	71,000	45,000	14,500		16,000	133,000	83,000	48,000
11,400		12,000	118,000	71,000	45,000	14,700		16,000	133,000	83,000	48,000
11,500		12,000	118,000	71,000	45,000	15,000		16,000	133,000	83,000	48,000
11,600		12,000	118,000	71,000	45,000	15,200		16,000	133,000	83,000	48,000
11,700		12,000	118,000	71,000	45,000	15,500		16,000	133,000	83,000	48,000
11,800		12,000	118,000	71,000	45,000	15,700		16,000	133,000	83,000	48,000
11,900		12,000	118,000	71,000	45,000	15,800		16,000	133,000	83,000	48,000
11,910	15/32	12,000	118,000	71,000	45,000	16,000		16,000	133,000	83,000	48,000
12,000		12,000	118,000	71,000	45,000	16,500		18,000	143,000	93,000	48,000
12,100		14,000	124,000	77,000	45,000	17,000		18,000	143,000	93,000	48,000
12,200		14,000	124,000	77,000	45,000	17,300		18,000	143,000	93,000	48,000
12,300	31/64	14,000	124,000	77,000	45,000	17,500		18,000	143,000	93,000	48,000
12,400		14,000	124,000	77,000	45,000	18,000		18,000	143,000	93,000	48,000
12,500		14,000	124,000	77,000	45,000	18,200		20,000	153,000	101,000	50,000
12,700	1/2	14,000	124,000	77,000	45,000	18,500		20,000	153,000	101,000	50,000
13,000		14,000	124,000	77,000	45,000	18,600		20,000	153,000	101,000	50,000
13,500		14,000	124,000	77,000	45,000	19,000		20,000	153,000	101,000	50,000
13,700		14,000	124,000	77,000	45,000	19,500		20,000	153,000	101,000	50,000
13,800		14,000	124,000	77,000	45,000	20,000		20,000	153,000	101,000	50,000
13,900		14,000	124,000	77,000	45,000						

Punte SuperV

Punte con refrigerazione interna SuperV



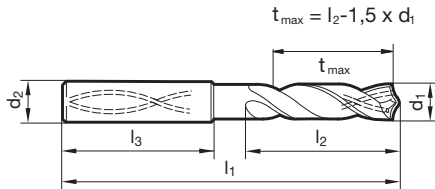
Catalogo n° 51772



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 28

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- adatto in particolare per acciai inossidabile



d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	7,000		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	7,100		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	7,200		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	7,300		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	7,400		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	8,000		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	8,100		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	8,200		10,000	103,000	61,000	40,000
4,600		6,000	74,000	36,000	36,000	8,300		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	8,400		10,000	103,000	61,000	40,000
4,760	3/16	6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,600		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,800		10,000	103,000	61,000	40,000
6,100		8,000	91,000	53,000	36,000	9,900		10,000	103,000	61,000	40,000
6,200		8,000	91,000	53,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
6,300		8,000	91,000	53,000	36,000	10,000		10,000	103,000	61,000	40,000
6,350	1/4	8,000	91,000	53,000	36,000	10,100		12,000	118,000	71,000	45,000
6,400		8,000	91,000	53,000	36,000	10,200		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	10,300		12,000	118,000	71,000	45,000

d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
10,320	13/32	12,000	118,000	71,000	45,000	14,290	9/16	16,000	133,000	83,000	48,000
10,400		12,000	118,000	71,000	45,000	14,300		16,000	133,000	83,000	48,000
10,500		12,000	118,000	71,000	45,000	14,500		16,000	133,000	83,000	48,000
10,600		12,000	118,000	71,000	45,000	14,700		16,000	133,000	83,000	48,000
10,700		12,000	118,000	71,000	45,000	15,000		16,000	133,000	83,000	48,000
10,800		12,000	118,000	71,000	45,000	15,200		16,000	133,000	83,000	48,000
10,900		12,000	118,000	71,000	45,000	15,300		16,000	133,000	83,000	48,000
11,000		12,000	118,000	71,000	45,000	15,500		16,000	133,000	83,000	48,000
11,100		12,000	118,000	71,000	45,000	15,700		16,000	133,000	83,000	48,000
11,110	7/16	12,000	118,000	71,000	45,000	16,000		16,000	133,000	83,000	48,000
11,200		12,000	118,000	71,000	45,000	16,300		18,000	143,000	93,000	48,000
11,300		12,000	118,000	71,000	45,000	16,500		18,000	143,000	93,000	48,000
11,400		12,000	118,000	71,000	45,000	16,900		18,000	143,000	93,000	48,000
11,500		12,000	118,000	71,000	45,000	17,000		18,000	143,000	93,000	48,000
11,600		12,000	118,000	71,000	45,000	17,300		18,000	143,000	93,000	48,000
11,700		12,000	118,000	71,000	45,000	17,500		18,000	143,000	93,000	48,000
11,800		12,000	118,000	71,000	45,000	18,000		18,000	143,000	93,000	48,000
11,900		12,000	118,000	71,000	45,000	18,500		20,000	153,000	101,000	50,000
11,910	15/32	12,000	118,000	71,000	45,000	18,900		20,000	153,000	101,000	50,000
12,000		12,000	118,000	71,000	45,000	19,000		20,000	153,000	101,000	50,000
12,200		14,000	124,000	77,000	45,000	19,050	3/4	20,000	153,000	101,000	50,000
12,500		14,000	124,000	77,000	45,000	19,300		20,000	153,000	101,000	50,000
12,700	1/2	14,000	124,000	77,000	45,000	19,500		20,000	153,000	101,000	50,000
12,800		14,000	124,000	77,000	45,000	20,000		20,000	153,000	101,000	50,000
13,000		14,000	124,000	77,000	45,000						
13,300		14,000	124,000	77,000	45,000						
13,500		14,000	124,000	77,000	45,000						
13,700		14,000	124,000	77,000	45,000						
14,000		14,000	124,000	77,000	45,000						
14,200		16,000	133,000	83,000	48,000						

Punte SuperV

Punte con refrigerazione interna SuperV



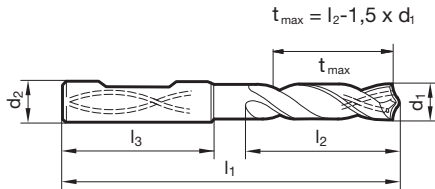
Catalogo n° 51773



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 28

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- adatto in particolare per acciai inossidabile



d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	66,000	28,000	36,000	6,600		8,000	91,000	53,000	36,000
3,100		6,000	66,000	28,000	36,000	6,700		8,000	91,000	53,000	36,000
3,170	1/8	6,000	66,000	28,000	36,000	6,750	17/64	8,000	91,000	53,000	36,000
3,200		6,000	66,000	28,000	36,000	6,800		8,000	91,000	53,000	36,000
3,250		6,000	66,000	28,000	36,000	6,900		8,000	91,000	53,000	36,000
3,300		6,000	66,000	28,000	36,000	7,000		8,000	91,000	53,000	36,000
3,400		6,000	66,000	28,000	36,000	7,100		8,000	91,000	53,000	36,000
3,500		6,000	66,000	28,000	36,000	7,140	9/32	8,000	91,000	53,000	36,000
3,570	9/64	6,000	66,000	28,000	36,000	7,200		8,000	91,000	53,000	36,000
3,600		6,000	66,000	28,000	36,000	7,300		8,000	91,000	53,000	36,000
3,700		6,000	66,000	28,000	36,000	7,400		8,000	91,000	53,000	36,000
3,800		6,000	74,000	36,000	36,000	7,500		8,000	91,000	53,000	36,000
3,900		6,000	74,000	36,000	36,000	7,540	19/64	8,000	91,000	53,000	36,000
3,970	5/32	6,000	74,000	36,000	36,000	7,600		8,000	91,000	53,000	36,000
4,000		6,000	74,000	36,000	36,000	7,700		8,000	91,000	53,000	36,000
4,100		6,000	74,000	36,000	36,000	7,800		8,000	91,000	53,000	36,000
4,200		6,000	74,000	36,000	36,000	7,900		8,000	91,000	53,000	36,000
4,300		6,000	74,000	36,000	36,000	7,940	5/16	8,000	91,000	53,000	36,000
4,370	11/64	6,000	74,000	36,000	36,000	8,000		8,000	91,000	53,000	36,000
4,400		6,000	74,000	36,000	36,000	8,100		10,000	103,000	61,000	40,000
4,500		6,000	74,000	36,000	36,000	8,200		10,000	103,000	61,000	40,000
4,600		6,000	74,000	36,000	36,000	8,300		10,000	103,000	61,000	40,000
4,650		6,000	74,000	36,000	36,000	8,330	21/64	10,000	103,000	61,000	40,000
4,700		6,000	74,000	36,000	36,000	8,400		10,000	103,000	61,000	40,000
4,760	3/16	6,000	82,000	44,000	36,000	8,500		10,000	103,000	61,000	40,000
4,800		6,000	82,000	44,000	36,000	8,600		10,000	103,000	61,000	40,000
4,900		6,000	82,000	44,000	36,000	8,700		10,000	103,000	61,000	40,000
5,000		6,000	82,000	44,000	36,000	8,730	11/32	10,000	103,000	61,000	40,000
5,100		6,000	82,000	44,000	36,000	8,800		10,000	103,000	61,000	40,000
5,160	13/64	6,000	82,000	44,000	36,000	8,900		10,000	103,000	61,000	40,000
5,200		6,000	82,000	44,000	36,000	9,000		10,000	103,000	61,000	40,000
5,300		6,000	82,000	44,000	36,000	9,100		10,000	103,000	61,000	40,000
5,400		6,000	82,000	44,000	36,000	9,130	23/64	10,000	103,000	61,000	40,000
5,500		6,000	82,000	44,000	36,000	9,200		10,000	103,000	61,000	40,000
5,550		6,000	82,000	44,000	36,000	9,250		10,000	103,000	61,000	40,000
5,560	7/32	6,000	82,000	44,000	36,000	9,300		10,000	103,000	61,000	40,000
5,600		6,000	82,000	44,000	36,000	9,400		10,000	103,000	61,000	40,000
5,700		6,000	82,000	44,000	36,000	9,500		10,000	103,000	61,000	40,000
5,800		6,000	82,000	44,000	36,000	9,520	3/8	10,000	103,000	61,000	40,000
5,900		6,000	82,000	44,000	36,000	9,600		10,000	103,000	61,000	40,000
5,950	15/64	6,000	82,000	44,000	36,000	9,700		10,000	103,000	61,000	40,000
6,000		6,000	82,000	44,000	36,000	9,800		10,000	103,000	61,000	40,000
6,100		8,000	91,000	53,000	36,000	9,900		10,000	103,000	61,000	40,000
6,200		8,000	91,000	53,000	36,000	9,920	25/64	10,000	103,000	61,000	40,000
6,300		8,000	91,000	53,000	36,000	10,000		10,000	103,000	61,000	40,000
6,350	1/4	8,000	91,000	53,000	36,000	10,100		12,000	118,000	71,000	45,000
6,400		8,000	91,000	53,000	36,000	10,200		12,000	118,000	71,000	45,000
6,500		8,000	91,000	53,000	36,000	10,300		12,000	118,000	71,000	45,000

d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
10,320	13/32	12,000	118,000	71,000	45,000	14,290	9/16	16,000	133,000	83,000	48,000
10,400		12,000	118,000	71,000	45,000	14,300		16,000	133,000	83,000	48,000
10,500		12,000	118,000	71,000	45,000	14,500		16,000	133,000	83,000	48,000
10,600		12,000	118,000	71,000	45,000	14,700		16,000	133,000	83,000	48,000
10,700		12,000	118,000	71,000	45,000	15,000		16,000	133,000	83,000	48,000
10,800		12,000	118,000	71,000	45,000	15,200		16,000	133,000	83,000	48,000
10,900		12,000	118,000	71,000	45,000	15,300		16,000	133,000	83,000	48,000
11,000		12,000	118,000	71,000	45,000	15,500		16,000	133,000	83,000	48,000
11,100		12,000	118,000	71,000	45,000	15,700		16,000	133,000	83,000	48,000
11,110	7/16	12,000	118,000	71,000	45,000	16,000		16,000	133,000	83,000	48,000
11,200		12,000	118,000	71,000	45,000	16,300		18,000	143,000	93,000	48,000
11,300		12,000	118,000	71,000	45,000	16,500		18,000	143,000	93,000	48,000
11,400		12,000	118,000	71,000	45,000	16,900		18,000	143,000	93,000	48,000
11,500		12,000	118,000	71,000	45,000	17,000		18,000	143,000	93,000	48,000
11,600		12,000	118,000	71,000	45,000	17,300		18,000	143,000	93,000	48,000
11,700		12,000	118,000	71,000	45,000	17,500		18,000	143,000	93,000	48,000
11,800		12,000	118,000	71,000	45,000	18,000		18,000	143,000	93,000	48,000
11,900		12,000	118,000	71,000	45,000	18,500		20,000	153,000	101,000	50,000
11,910	15/32	12,000	118,000	71,000	45,000	18,900		20,000	153,000	101,000	50,000
12,000		12,000	118,000	71,000	45,000	19,000		20,000	153,000	101,000	50,000
12,200		14,000	124,000	77,000	45,000	19,050	3/4	20,000	153,000	101,000	50,000
12,500		14,000	124,000	77,000	45,000	19,300		20,000	153,000	101,000	50,000
12,700	1/2	14,000	124,000	77,000	45,000	19,500		20,000	153,000	101,000	50,000
12,800		14,000	124,000	77,000	45,000	20,000		20,000	153,000	101,000	50,000
13,000		14,000	124,000	77,000	45,000						
13,300		14,000	124,000	77,000	45,000						
13,500		14,000	124,000	77,000	45,000						
13,700		14,000	124,000	77,000	45,000						
14,000		14,000	124,000	77,000	45,000						
14,200		16,000	133,000	83,000	48,000						

Punte SuperV

Punte con refrigerazione interna SuperV



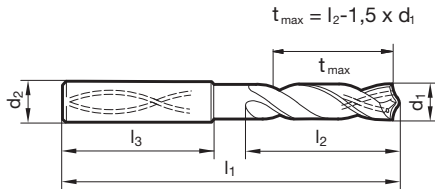
Catalogo n° 51789



P	M	K	N	S	H
●	○	●	○	○	○

Parametri di lav. ind. a pag. 30

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- 4 fasi di guida



d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	8,000		8,000	116,000	76,000	36,000
3,100		6,000	70,000	30,000	36,000	8,100		10,000	131,000	87,000	40,000
3,170	1/8	6,000	70,000	30,000	36,000	8,200		10,000	131,000	87,000	40,000
3,200		6,000	70,000	30,000	36,000	8,400		10,000	131,000	87,000	40,000
3,250		6,000	70,000	30,000	36,000	8,500		10,000	131,000	87,000	40,000
3,300		6,000	70,000	30,000	36,000	8,600		10,000	131,000	87,000	40,000
3,400		6,000	75,000	35,500	36,000	8,700		10,000	131,000	87,000	40,000
3,500		6,000	75,000	35,500	36,000	8,800		10,000	131,000	87,000	40,000
3,570	9/64	6,000	75,000	35,500	36,000	8,900		10,000	131,000	87,000	40,000
3,600		6,000	75,000	35,500	36,000	9,100		10,000	139,000	95,000	40,000
3,700		6,000	75,000	35,500	36,000	9,200		10,000	139,000	95,000	40,000
3,800		6,000	75,000	37,500	36,000	9,300		10,000	139,000	95,000	40,000
3,900		6,000	75,000	37,500	36,000	9,400		10,000	139,000	95,000	40,000
3,970	5/32	6,000	75,000	37,500	36,000	9,500		10,000	139,000	95,000	40,000
4,000		6,000	75,000	37,500	36,000	9,700		10,000	139,000	95,000	40,000
4,100		6,000	75,000	37,500	36,000	9,800		10,000	139,000	95,000	40,000
4,200		6,000	75,000	37,500	36,000	9,900		10,000	139,000	95,000	40,000
4,300		6,000	85,000	45,000	36,000	10,000		10,000	139,000	95,000	40,000
4,400		6,000	85,000	45,000	36,000	10,200		12,000	155,000	106,000	45,000
4,500		6,000	85,000	45,000	36,000	10,500		12,000	155,000	106,000	45,000
4,600		6,000	85,000	45,000	36,000	10,800		12,000	155,000	106,000	45,000
4,700		6,000	85,000	45,000	36,000	11,000		12,000	155,000	106,000	45,000
4,800		6,000	90,000	50,000	36,000	11,200		12,000	163,000	114,000	45,000
4,900		6,000	90,000	50,000	36,000	11,500		12,000	163,000	114,000	45,000
5,000		6,000	90,000	50,000	36,000	11,800		12,000	163,000	114,000	45,000
5,100		6,000	90,000	50,000	36,000	12,000		12,000	163,000	114,000	45,000
5,200		6,000	90,000	50,000	36,000	12,200		14,000	182,000	133,000	45,000
5,300		6,000	90,000	50,000	36,000	12,500		14,000	182,000	133,000	45,000
5,400		6,000	97,000	57,000	36,000	12,700	1/2	14,000	182,000	133,000	45,000
5,500		6,000	97,000	57,000	36,000	13,000		14,000	182,000	133,000	45,000
5,700		6,000	97,000	57,000	36,000	13,500		14,000	182,000	133,000	45,000
5,800		6,000	97,000	57,000	36,000	14,000		14,000	182,000	133,000	45,000
5,900		6,000	97,000	57,000	36,000	14,200		16,000	204,000	152,000	48,000
6,000		6,000	97,000	57,000	36,000	14,500		16,000	204,000	152,000	48,000
6,200		8,000	106,000	66,000	36,000	15,000		16,000	204,000	152,000	48,000
6,300		8,000	106,000	66,000	36,000	15,500		16,000	204,000	152,000	48,000
6,500		8,000	106,000	66,000	36,000	16,000		16,000	204,000	152,000	48,000
6,600		8,000	106,000	66,000	36,000	16,500		18,000	223,000	171,000	48,000
6,700		8,000	106,000	66,000	36,000	17,000		18,000	223,000	171,000	48,000
6,800		8,000	106,000	66,000	36,000	17,500		18,000	223,000	171,000	48,000
6,900		8,000	116,000	76,000	36,000	18,000		18,000	223,000	171,000	48,000
7,000		8,000	116,000	76,000	36,000	18,500		20,000	244,000	190,000	50,000
7,100		8,000	116,000	76,000	36,000	19,000		20,000	244,000	190,000	50,000
7,200		8,000	116,000	76,000	36,000	19,500		20,000	244,000	190,000	50,000
7,500		8,000	116,000	76,000	36,000	20,000		20,000	244,000	190,000	50,000
7,600		8,000	116,000	76,000	36,000						
7,700		8,000	116,000	76,000	36,000						
7,800		8,000	116,000	76,000	36,000						

Punte SuperV

Punte con refrigerazione interna SuperV



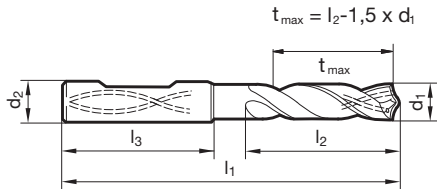
Catalogo n° 51889



P	M	K	N	S	H
●	○	●	○	○	○

Parametri di lav. ind. a pag. 30

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- 4 fasi di guida



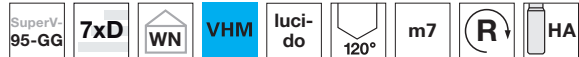
d1		d2	l1	l2	l3	d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm	mm	inch	mm	mm	mm	mm
3,000		6,000	70,000	30,000	36,000	8,000		8,000	116,000	76,000	36,000
3,100		6,000	70,000	30,000	36,000	8,100		10,000	131,000	87,000	40,000
3,170	1/8	6,000	70,000	30,000	36,000	8,200		10,000	131,000	87,000	40,000
3,200		6,000	70,000	30,000	36,000	8,400		10,000	131,000	87,000	40,000
3,250		6,000	70,000	30,000	36,000	8,500		10,000	131,000	87,000	40,000
3,300		6,000	70,000	30,000	36,000	8,600		10,000	131,000	87,000	40,000
3,400		6,000	75,000	35,500	36,000	8,700		10,000	131,000	87,000	40,000
3,500		6,000	75,000	35,500	36,000	8,800		10,000	131,000	87,000	40,000
3,570	9/64	6,000	75,000	35,500	36,000	9,000		10,000	131,000	87,000	40,000
3,600		6,000	75,000	35,500	36,000	9,100		10,000	139,000	95,000	40,000
3,700		6,000	75,000	35,500	36,000	9,200		10,000	139,000	95,000	40,000
3,800		6,000	75,000	37,500	36,000	9,300		10,000	139,000	95,000	40,000
3,900		6,000	75,000	37,500	36,000	9,400		10,000	139,000	95,000	40,000
3,970	5/32	6,000	75,000	37,500	36,000	9,500		10,000	139,000	95,000	40,000
4,000		6,000	75,000	37,500	36,000	9,700		10,000	139,000	95,000	40,000
4,100		6,000	75,000	37,500	36,000	9,800		10,000	139,000	95,000	40,000
4,200		6,000	75,000	37,500	36,000	9,900		10,000	139,000	95,000	40,000
4,300		6,000	85,000	45,000	36,000	10,000		10,000	139,000	95,000	40,000
4,400		6,000	85,000	45,000	36,000	10,200		12,000	155,000	106,000	45,000
4,500		6,000	85,000	45,000	36,000	10,300		12,000	155,000	106,000	45,000
4,600		6,000	85,000	45,000	36,000	10,500		12,000	155,000	106,000	45,000
4,700		6,000	85,000	45,000	36,000	10,800		12,000	155,000	106,000	45,000
4,800		6,000	90,000	50,000	36,000	11,000		12,000	155,000	106,000	45,000
4,900		6,000	90,000	50,000	36,000	11,200		12,000	163,000	114,000	45,000
5,000		6,000	90,000	50,000	36,000	11,500		12,000	163,000	114,000	45,000
5,100		6,000	90,000	50,000	36,000	11,800		12,000	163,000	114,000	45,000
5,200		6,000	90,000	50,000	36,000	12,000		12,000	163,000	114,000	45,000
5,300		6,000	90,000	50,000	36,000	12,100		14,000	182,000	133,000	45,000
5,400		6,000	97,000	57,000	36,000	12,200		14,000	182,000	133,000	45,000
5,500		6,000	97,000	57,000	36,000	12,500		14,000	182,000	133,000	45,000
5,700		6,000	97,000	57,000	36,000	12,700	1/2	14,000	182,000	133,000	45,000
5,800		6,000	97,000	57,000	36,000	13,000		14,000	182,000	133,000	45,000
5,900		6,000	97,000	57,000	36,000	13,500		14,000	182,000	133,000	45,000
6,000		6,000	97,000	57,000	36,000	14,000		14,000	182,000	133,000	45,000
6,200		8,000	106,000	66,000	36,000	14,100		16,000	204,000	152,000	48,000
6,300		8,000	106,000	66,000	36,000	14,200		16,000	204,000	152,000	48,000
6,500		8,000	106,000	66,000	36,000	14,500		16,000	204,000	152,000	48,000
6,600		8,000	106,000	66,000	36,000	15,000		16,000	204,000	152,000	48,000
6,700		8,000	106,000	66,000	36,000	15,500		16,000	204,000	152,000	48,000
6,800		8,000	106,000	66,000	36,000	16,000		16,000	204,000	152,000	48,000
6,900		8,000	116,000	76,000	36,000	16,500		18,000	223,000	171,000	48,000
7,000		8,000	116,000	76,000	36,000	17,000		18,000	223,000	171,000	48,000
7,100		8,000	116,000	76,000	36,000	17,500		18,000	223,000	171,000	48,000
7,200		8,000	116,000	76,000	36,000	18,000		18,000	223,000	171,000	48,000
7,500		8,000	116,000	76,000	36,000	18,500		20,000	244,000	190,000	50,000
7,600		8,000	116,000	76,000	36,000	19,000		20,000	244,000	190,000	50,000
7,700		8,000	116,000	76,000	36,000	19,500		20,000	244,000	190,000	50,000
7,800		8,000	116,000	76,000	36,000	20,000		20,000	244,000	190,000	50,000

Punte SuperV

Punte con refrigerazione interna SuperV



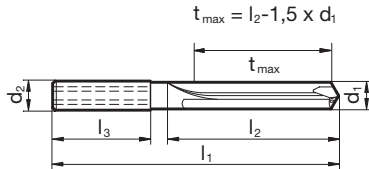
Catalogo n° 71994



P	M	K	N	S	H
		●	○		

Parametri di lav.
ind. a pag. 30

- Assott. del nocch. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- strette tolleranze sul diametro
- ottima finitura di superf. del foro
- osservare la pressione del lubrificante (vedere diagramma)



d1	inch	d2	l1	l2	l3
mm		mm	mm	mm	mm
3,000		6,000	74,000	32,000	36,000
3,100		6,000	74,000	32,000	36,000
3,200		6,000	74,000	32,000	36,000
3,300		6,000	74,000	32,000	36,000
3,400		6,000	74,000	34,000	36,000
3,500		6,000	74,000	34,000	36,000
3,600		6,000	74,000	34,000	36,000
3,700		6,000	74,000	34,000	36,000
3,800		6,000	97,000	45,000	36,000
3,900		6,000	97,000	45,000	36,000
4,000		6,000	97,000	45,000	36,000
4,100		6,000	97,000	45,000	36,000
4,200		6,000	97,000	45,000	36,000
4,300		6,000	97,000	45,000	36,000
4,400		6,000	97,000	45,000	36,000
4,500		6,000	97,000	45,000	36,000
4,700		6,000	97,000	45,000	36,000
4,800		6,000	97,000	57,000	36,000
4,900		6,000	97,000	57,000	36,000
5,000		6,000	97,000	57,000	36,000
5,500		6,000	97,000	57,000	36,000
6,000		6,000	97,000	57,000	36,000
6,500		8,000	116,000	76,000	36,000
6,800		8,000	116,000	76,000	36,000
7,000		8,000	116,000	76,000	36,000
7,500		8,000	116,000	76,000	36,000
7,800		8,000	116,000	76,000	36,000
8,000		8,000	116,000	76,000	36,000
8,500		10,000	139,000	95,000	40,000
9,000		10,000	139,000	95,000	40,000

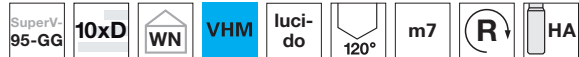
d1	inch	d2	l1	l2	l3
mm		mm	mm	mm	mm
9,500		10,000	139,000	95,000	40,000
10,000		10,000	139,000	95,000	40,000
10,200		12,000	163,000	114,000	45,000
10,500		12,000	163,000	114,000	45,000
11,000		12,000	163,000	114,000	45,000
11,500		12,000	163,000	114,000	45,000
12,000		12,000	163,000	114,000	45,000
12,300	31/64	14,000	182,000	133,000	45,000
12,500		14,000	182,000	133,000	45,000
12,700	1/2	14,000	182,000	133,000	45,000
13,000		14,000	182,000	133,000	45,000
13,500		14,000	182,000	133,000	45,000
14,000		14,000	182,000	133,000	45,000
14,500		16,000	204,000	152,000	48,000
15,000		16,000	204,000	152,000	48,000
15,500		16,000	204,000	152,000	48,000
16,000		16,000	204,000	152,000	48,000
16,500		18,000	223,000	171,000	48,000
17,000		18,000	223,000	171,000	48,000
17,500		18,000	223,000	171,000	48,000
18,000		18,000	223,000	171,000	48,000
18,500		20,000	244,000	190,000	50,000
19,000		20,000	244,000	190,000	50,000
19,500		20,000	244,000	190,000	50,000
20,000		20,000	244,000	190,000	50,000

Punte SuperV

Punte con refrigerazione interna SuperV



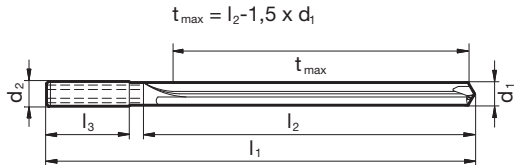
Catalogo n° 71996



P	M	K	N	S	H
		●	○		

Parametri di lav.
ind. a pag. 30

- Assott. del noc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- strette tolleranze sul diametro
- ottima finitura di superf. del foro
- osservare la pressione del lubrificante (vedere diagramma)



d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	91,000	42,000	36,000
3,300		6,000	91,000	42,000	36,000
3,500		6,000	91,000	48,000	36,000
3,800		6,000	121,000	77,000	36,000
4,000		6,000	121,000	77,000	36,000
4,200		6,000	121,000	77,000	36,000
4,500		6,000	121,000	77,000	36,000
4,700		6,000	121,000	77,000	36,000
4,800		6,000	121,000	82,000	36,000
5,000		6,000	121,000	82,000	36,000
5,500		6,000	121,000	82,000	36,000
6,000		6,000	121,000	82,000	36,000
6,350	1/4	8,000	146,000	106,000	36,000
6,500		8,000	146,000	106,000	36,000
6,800		8,000	146,000	106,000	36,000
7,000		8,000	146,000	106,000	36,000
7,500		8,000	146,000	106,000	36,000
7,800		8,000	146,000	106,000	36,000
8,000		8,000	146,000	106,000	36,000
8,500		10,000	175,000	130,000	40,000
9,000		10,000	175,000	130,000	40,000
9,500		10,000	175,000	130,000	40,000
10,000		10,000	175,000	130,000	40,000
10,200		12,000	209,000	159,000	45,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
10,500		12,000	209,000	159,000	45,000
11,000		12,000	209,000	159,000	45,000
11,500		12,000	209,000	159,000	45,000
12,000		12,000	209,000	159,000	45,000
12,500		14,000	233,000	183,000	45,000
12,700	1/2	14,000	233,000	183,000	45,000
13,000		14,000	233,000	183,000	45,000
13,500		14,000	233,000	183,000	45,000
14,000		14,000	233,000	183,000	45,000
14,500		16,000	260,000	207,000	48,000
15,000		16,000	260,000	207,000	48,000
15,500		16,000	260,000	207,000	48,000
16,000		16,000	260,000	207,000	48,000
16,500		18,000	284,000	231,000	48,000
17,000		18,000	284,000	231,000	48,000
17,500		18,000	284,000	231,000	48,000
18,000		18,000	284,000	231,000	48,000
18,500		20,000	308,000	255,000	50,000
19,000		20,000	308,000	255,000	50,000
19,500		20,000	308,000	255,000	50,000
20,000		20,000	308,000	255,000	50,000

Punte SuperV

Punte con refrigerazione interna SuperV



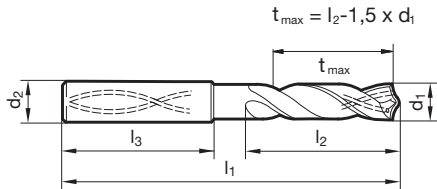
Catalogo n° 51893



P	M	K	N	S	H
●	○	●	○	○	○

Parametri di lav.
ind. a pag. 30

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura su piani
- rivestimento in testa
- forma del tagliente principale dritta
- geometria dei taglienti ottimizzata
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



d1	inch	d2	l1	l2	l3	d1	inch	d2	l1	l2	l3
mm		mm	mm	mm	mm	mm		mm	mm	mm	mm
3,000		6,000	90,000	50,000	36,000	7,800		8,000	146,000	108,000	36,000
3,100		6,000	90,000	50,000	36,000	7,900		8,000	146,000	108,000	36,000
3,200		6,000	90,000	50,000	36,000	8,000		8,000	146,000	108,000	36,000
3,300		6,000	90,000	50,000	36,000	8,100		10,000	162,000	120,000	40,000
3,400		6,000	90,000	50,000	36,000	8,200		10,000	162,000	120,000	40,000
3,500		6,000	90,000	50,000	36,000	8,300		10,000	162,000	120,000	40,000
3,600		6,000	90,000	50,000	36,000	8,400		10,000	162,000	120,000	40,000
3,700		6,000	90,000	50,000	36,000	8,500		10,000	162,000	120,000	40,000
3,800		6,000	102,000	64,000	36,000	8,600		10,000	162,000	120,000	40,000
3,900		6,000	102,000	64,000	36,000	8,700		10,000	162,000	120,000	40,000
4,000		6,000	102,000	64,000	36,000	8,800		10,000	162,000	120,000	40,000
4,100		6,000	102,000	64,000	36,000	8,900		10,000	162,000	120,000	40,000
4,200		6,000	102,000	64,000	36,000	9,000		10,000	162,000	120,000	40,000
4,300		6,000	102,000	64,000	36,000	9,100		10,000	162,000	120,000	40,000
4,400		6,000	102,000	64,000	36,000	9,200		10,000	162,000	120,000	40,000
4,500		6,000	102,000	64,000	36,000	9,300		10,000	162,000	120,000	40,000
4,600		6,000	102,000	64,000	36,000	9,400		10,000	162,000	120,000	40,000
4,700		6,000	102,000	64,000	36,000	9,500		10,000	162,000	120,000	40,000
4,800		6,000	116,000	78,000	36,000	9,600		10,000	162,000	120,000	40,000
4,900		6,000	116,000	78,000	36,000	9,700		10,000	162,000	120,000	40,000
5,000		6,000	116,000	78,000	36,000	9,800		10,000	162,000	120,000	40,000
5,100		6,000	116,000	78,000	36,000	9,900		10,000	162,000	120,000	40,000
5,200		6,000	116,000	78,000	36,000	10,000		10,000	162,000	120,000	40,000
5,300		6,000	116,000	78,000	36,000	10,200		12,000	204,000	156,000	45,000
5,400		6,000	116,000	78,000	36,000	10,500		12,000	204,000	156,000	45,000
5,500		6,000	116,000	78,000	36,000	11,000		12,000	204,000	156,000	45,000
5,600		6,000	116,000	78,000	36,000	11,500		12,000	204,000	156,000	45,000
5,700		6,000	116,000	78,000	36,000	12,000		12,000	204,000	156,000	45,000
5,800		6,000	116,000	78,000	36,000	12,500		14,000	230,000	182,000	45,000
5,900		6,000	116,000	78,000	36,000	12,700	1/2	14,000	230,000	182,000	45,000
6,000		6,000	116,000	78,000	36,000	13,000		14,000	230,000	182,000	45,000
6,100		8,000	146,000	108,000	36,000	13,500		14,000	230,000	182,000	45,000
6,200		8,000	146,000	108,000	36,000	14,000		14,000	230,000	182,000	45,000
6,300		8,000	146,000	108,000	36,000	14,500		16,000	260,000	208,000	48,000
6,400		8,000	146,000	108,000	36,000	15,000		16,000	260,000	208,000	48,000
6,500		8,000	146,000	108,000	36,000	15,500		16,000	260,000	208,000	48,000
6,600		8,000	146,000	108,000	36,000	16,000		16,000	260,000	208,000	48,000
6,700		8,000	146,000	108,000	36,000	16,500		18,000	285,000	234,000	48,000
6,800		8,000	146,000	108,000	36,000	17,000		18,000	285,000	234,000	48,000
6,900		8,000	146,000	108,000	36,000	17,500		18,000	285,000	234,000	48,000
7,000		8,000	146,000	108,000	36,000	18,000		18,000	285,000	234,000	48,000
7,100		8,000	146,000	108,000	36,000	18,500		20,000	310,000	258,000	50,000
7,200		8,000	146,000	108,000	36,000	19,000		20,000	310,000	258,000	50,000
7,300		8,000	146,000	108,000	36,000	19,500		20,000	310,000	258,000	50,000
7,400		8,000	146,000	108,000	36,000	20,000		20,000	310,000	258,000	50,000
7,500		8,000	146,000	108,000	36,000						
7,600		8,000	146,000	108,000	36,000						
7,700		8,000	146,000	108,000	36,000						

Punte SuperV

Punte con refrigerazione interna SuperV



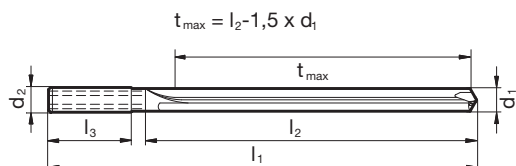
Catalogo n° 71997



P	M	K	N	S	H
		•	○		

Parametri di lav.
ind. a pag. 30

- Assott. del nocc. $\geq \varnothing 5,000$
- spoglia sul cono tagliente
- passo negativo
- per fori molto precisi
- ottima finitura di superf. del foro
- osservare la pressione del lubrificante (vedere diagramma)



d1	inch	d2	l1	l2	l3
mm		mm	mm	mm	mm
5,000		6,000	145,000	105,000	36,000
6,000		6,000	145,000	105,000	36,000
8,000		8,000	180,000	137,000	36,000
9,000		10,000	217,000	170,000	40,000
10,000		10,000	217,000	170,000	40,000
11,000		12,000	258,000	205,000	45,000

d1	inch	d2	l1	l2	l3
mm		mm	mm	mm	mm
12,000		12,000	258,000	205,000	45,000
14,000		14,000	290,000	236,000	45,000

Punte SuperV

Punte con refrigerazione interna SuperV



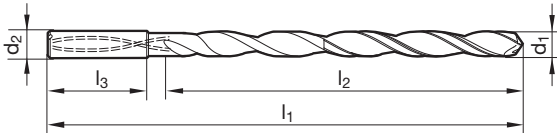
Catalogo n° 51764



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 32

- Assott. del noc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- rivestimento in testa
- tagliente principale forma concava
- taglio trasversale della scanalatura ottimizzato
- max. taglio trasversale del foro
- applicazione nei mandrini idraulici
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	95,000	55,000	36,000
3,170	1/8	6,000	106,000	67,000	36,000
3,500		6,000	116,000	76,000	36,000
3,570	9/64	6,000	116,000	76,000	36,000
3,970	5/32	6,000	116,000	76,000	36,000
4,000		6,000	116,000	76,000	36,000
4,370	11/64	6,000	133,000	93,000	36,000
4,500		6,000	133,000	93,000	36,000
4,760	3/16	6,000	133,000	93,000	36,000
5,000		6,000	133,000	93,000	36,000
5,100		6,000	150,000	110,000	36,000
5,160	13/64	6,000	150,000	110,000	36,000
5,410		6,000	150,000	110,000	36,000
5,500		6,000	150,000	110,000	36,000
5,560	7/32	6,000	150,000	110,000	36,000
5,950	15/64	6,000	150,000	110,000	36,000
6,000		6,000	150,000	110,000	36,000
6,350	1/4	8,000	167,000	127,000	36,000
6,500		8,000	167,000	127,000	36,000
6,750	17/64	8,000	167,000	127,000	36,000
7,000		8,000	167,000	127,000	36,000
7,140	9/32	8,000	183,000	143,000	36,000
7,500		8,000	183,000	143,000	36,000
7,540	19/64	8,000	183,000	143,000	36,000

d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
7,940	5/16	8,000	183,000	143,000	36,000
8,000		8,000	183,000	143,000	36,000
8,330	21/64	10,000	204,000	160,000	40,000
8,500		10,000	204,000	160,000	40,000
8,730	11/32	10,000	204,000	160,000	40,000
9,000		10,000	204,000	160,000	40,000
9,130	23/64	10,000	221,000	177,000	40,000
9,520	3/8	10,000	221,000	177,000	40,000
9,920	25/64	10,000	221,000	177,000	40,000
10,000		10,000	221,000	177,000	40,000
10,320	13/32	12,000	247,000	198,000	45,000
10,720	27/64	12,000	247,000	198,000	45,000
11,000		12,000	247,000	198,000	45,000
11,110	7/16	12,000	263,000	214,000	45,000
11,510	29/64	12,000	263,000	214,000	45,000
11,910	15/32	12,000	263,000	214,000	45,000
12,000		12,000	263,000	214,000	45,000
12,300	31/64	14,000	297,000	248,000	45,000
12,700	1/2	14,000	297,000	248,000	45,000
13,100	33/64	14,000	297,000	248,000	45,000
13,490	17/32	14,000	297,000	248,000	45,000
13,890	35/64	14,000	297,000	248,000	45,000
14,000		14,000	297,000	248,000	45,000

Punte SuperV

Punte con refrigerazione interna SuperV



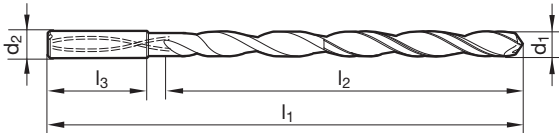
Catalogo n° 51765



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 32

- Assott. del noc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- rivestimento in testa
- tagliente principale forma concava
- taglio trasversale della scanalatura ottimizzato
- max. taglio trasversale del foro
- application in hydraulic chucks
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	110,000	70,000	36,000
3,500		6,000	136,000	96,000	36,000
3,970	5/32	6,000	136,000	96,000	36,000
4,000		6,000	136,000	96,000	36,000
4,500		6,000	158,000	118,000	36,000
4,760	3/16	6,000	158,000	118,000	36,000
5,000		6,000	158,000	118,000	36,000
5,100		6,000	180,000	140,000	36,000
5,500		6,000	180,000	140,000	36,000
5,560	7/32	6,000	180,000	140,000	36,000
6,000		6,000	180,000	140,000	36,000
6,350	1/4	8,000	202,000	162,000	36,000
6,500		8,000	202,000	162,000	36,000
7,000		8,000	202,000	162,000	36,000
7,140	9/32	8,000	223,000	183,000	36,000
7,500		8,000	223,000	183,000	36,000
8,000		8,000	223,000	183,000	36,000
8,500		10,000	249,000	205,000	40,000

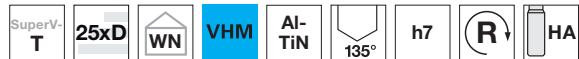
d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
9,000		10,000	249,000	205,000	40,000
10,000		10,000	271,000	227,000	40,000
11,000		12,000	302,000	253,000	45,000
12,000		12,000	323,000	274,000	45,000
12,700	1/2	14,000	367,000	318,000	45,000
13,490	17/32	14,000	367,000	318,000	45,000
14,000		14,000	367,000	318,000	45,000

Punte SuperV

Punte con refrigerazione interna SuperV



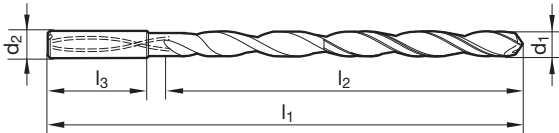
Catalogo n° 51766



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 32

- Assott. del noc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- rivestimento in testa
- tagliente principale forma concava
- taglio trasversale della scanalatura ottimizzato
- max. taglio trasversale del foro
- application in hydraulic chucks
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	125,000	85,000	36,000
3,100		6,000	141,000	101,000	36,000
3,500		6,000	156,000	116,000	36,000
3,800		6,000	156,000	116,000	36,000
3,970	5/32	6,000	156,000	116,000	36,000
4,000		6,000	156,000	116,000	36,000
4,200		6,000	183,000	143,000	36,000
4,500		6,000	183,000	143,000	36,000
4,760	3/16	6,000	183,000	143,000	36,000
5,000		6,000	183,000	143,000	36,000
5,100		6,000	210,000	170,000	36,000
5,500		6,000	210,000	170,000	36,000
5,560	7/32	6,000	210,000	170,000	36,000
6,000		6,000	210,000	170,000	36,000
6,300		8,000	237,000	197,000	36,000
6,350	1/4	8,000	237,000	197,000	36,000
6,500		8,000	237,000	197,000	36,000
7,000		8,000	237,000	197,000	36,000

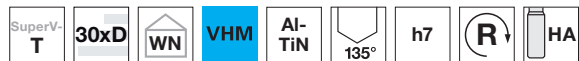
d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
7,140	9/32	8,000	263,000	223,000	36,000
7,500		8,000	263,000	223,000	36,000
8,000		8,000	263,000	223,000	36,000
8,500		10,000	294,000	250,000	40,000
8,800		10,000	294,000	250,000	40,000
9,000		10,000	294,000	250,000	40,000
10,000		10,000	321,000	277,000	40,000
11,000		12,000	359,000	310,000	45,000
12,000		12,000	386,000	337,000	45,000

Punte SuperV

Punte con refrigerazione interna SuperV



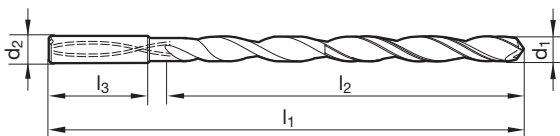
Catalogo n° 51767



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 32

- Assott. del noc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- rivestimento in testa
- tagliente principale forma concava
- taglio trasversale della scanalatura ottimizzato
- max. taglio trasversale del foro
- application in hydraulic chucks
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
3,000		6,000	140,000	100,000	36,000
3,100		6,000	158,000	118,000	36,000
3,500		6,000	176,000	136,000	36,000
3,800		6,000	176,000	136,000	36,000
3,970	5/32	6,000	176,000	136,000	36,000
4,000		6,000	176,000	136,000	36,000
4,200		6,000	208,000	168,000	36,000
4,500		6,000	208,000	168,000	36,000
4,760	3/16	6,000	208,000	168,000	36,000
5,000		6,000	208,000	168,000	36,000
5,100		6,000	240,000	200,000	36,000
5,500		6,000	240,000	200,000	36,000
5,560	7/32	6,000	240,000	200,000	36,000
6,000		6,000	240,000	200,000	36,000
6,300		8,000	272,000	232,000	36,000
6,350	1/4	8,000	272,000	232,000	36,000
6,500		8,000	272,000	232,000	36,000
7,000		8,000	272,000	232,000	36,000

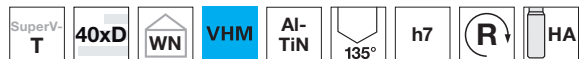
d1		d2	l1	l2	l3
mm	inch	mm	mm	mm	mm
7,140	9/32	8,000	303,000	263,000	36,000
7,500		8,000	303,000	263,000	36,000
8,000		8,000	303,000	263,000	36,000
8,500		10,000	339,000	295,000	40,000
8,800		10,000	339,000	295,000	40,000
9,000		10,000	339,000	295,000	40,000
10,000		10,000	371,000	327,000	40,000

Punte SuperV

Punte con refrigerazione interna SuperV



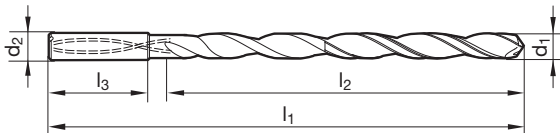
Catalogo n° 51768



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 32

- Assott. del noc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- rivestimento in testa
- tagliente principale forma concava
- taglio trasversale della scanalatura ottimizzato
- max. taglio trasversale del foro
- application in hydraulic chucks
- 4 fasi di guida
- osservare la pressione del lubrificante (vedere diagramma)



d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
3,000		6,000	170,000	130,000	36,000
3,100		6,000	193,000	153,000	36,000
3,170	1/8	6,000	193,000	153,000	36,000
3,500		6,000	193,000	153,000	36,000
3,800		6,000	216,000	176,000	36,000
3,970	5/32	6,000	216,000	176,000	36,000
4,000		6,000	216,000	176,000	36,000
4,200		6,000	238,000	198,000	36,000
4,500		6,000	238,000	198,000	36,000
4,760	3/16	6,000	258,000	218,000	36,000
5,000		6,000	258,000	218,000	36,000
5,100		6,000	280,000	240,000	36,000

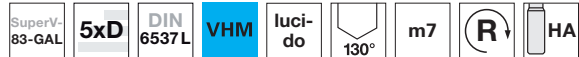
d1 mm	inch	d2 mm	l1 mm	l2 mm	l3 mm
5,500		6,000	280,000	240,000	36,000
5,560	7/32	6,000	300,000	260,000	36,000
6,000		6,000	300,000	260,000	36,000
6,300		8,000	322,000	282,000	36,000
6,350	1/4	8,000	322,000	282,000	36,000
6,500		8,000	322,000	282,000	36,000
7,000		8,000	342,000	302,000	36,000
7,140	9/32	8,000	363,000	323,000	36,000
7,500		8,000	363,000	323,000	36,000
8,000		8,000	383,000	343,000	36,000

Punte SuperV

Punte SuperV, 3 taglienti



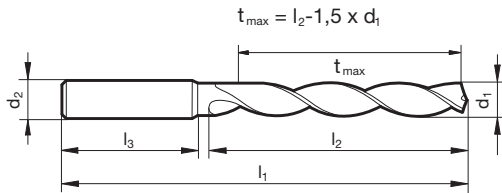
Catalogo n° 71862



P	M	K	N	S	H
		•	•		

Parametri di lav.
ind. a pag. 28

- Assott. del noc. $\geq \varnothing 3,000$
- affilatura spiropoint
- scanalature larghe
- ottimale centraggio
- utilizzabile per taglio interrotto



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	6,000	66,000	28,000	36,000
3,100	6,000	66,000	28,000	36,000
3,200	6,000	66,000	28,000	36,000
3,300	6,000	66,000	28,000	36,000
3,500	6,000	66,000	28,000	36,000
3,700	6,000	66,000	28,000	36,000
3,800	6,000	74,000	36,000	36,000
4,000	6,000	74,000	36,000	36,000
4,100	6,000	74,000	36,000	36,000
4,200	6,000	74,000	36,000	36,000
4,500	6,000	74,000	36,000	36,000
4,800	6,000	82,000	44,000	36,000
5,000	6,000	82,000	44,000	36,000
5,100	6,000	82,000	44,000	36,000
5,200	6,000	82,000	44,000	36,000
5,300	6,000	82,000	44,000	36,000
5,500	6,000	82,000	44,000	36,000
5,800	6,000	82,000	44,000	36,000
6,000	6,000	82,000	44,000	36,000
6,100	8,000	91,000	53,000	36,000
6,200	8,000	91,000	53,000	36,000
6,400	8,000	91,000	53,000	36,000
6,500	8,000	91,000	53,000	36,000
6,700	8,000	91,000	53,000	36,000
6,800	8,000	91,000	53,000	36,000
6,900	8,000	91,000	53,000	36,000
7,000	8,000	91,000	53,000	36,000
7,100	8,000	91,000	53,000	36,000
7,400	8,000	91,000	53,000	36,000
7,500	8,000	91,000	53,000	36,000
7,800	8,000	91,000	53,000	36,000
8,000	8,000	91,000	53,000	36,000
8,100	10,000	103,000	61,000	40,000
8,200	10,000	103,000	61,000	40,000
8,400	10,000	103,000	61,000	40,000
8,500	10,000	103,000	61,000	40,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
8,600	10,000	103,000	61,000	40,000
8,700	10,000	103,000	61,000	40,000
8,800	10,000	103,000	61,000	40,000
9,000	10,000	103,000	61,000	40,000
9,100	10,000	103,000	61,000	40,000
9,500	10,000	103,000	61,000	40,000
9,800	10,000	103,000	61,000	40,000
10,000	10,000	103,000	61,000	40,000
10,100	12,000	118,000	71,000	45,000
10,200	12,000	118,000	71,000	45,000
10,300	12,000	118,000	71,000	45,000
10,500	12,000	118,000	71,000	45,000
11,000	12,000	118,000	71,000	45,000
11,200	12,000	118,000	71,000	45,000
11,500	12,000	118,000	71,000	45,000
11,800	12,000	118,000	71,000	45,000
12,000	12,000	118,000	71,000	45,000
12,100	14,000	124,000	77,000	45,000
12,500	14,000	124,000	77,000	45,000
13,000	14,000	124,000	77,000	45,000
13,500	14,000	124,000	77,000	45,000
14,000	14,000	124,000	77,000	45,000
14,100	16,000	133,000	83,000	48,000
14,500	16,000	133,000	83,000	48,000
15,000	16,000	133,000	83,000	48,000
15,500	16,000	133,000	83,000	48,000
16,000	16,000	133,000	83,000	48,000
16,500	18,000	143,000	93,000	48,000
17,000	18,000	143,000	93,000	48,000
17,500	18,000	143,000	93,000	48,000
18,000	18,000	143,000	93,000	48,000
18,500	20,000	153,000	101,000	50,000
19,000	20,000	153,000	101,000	50,000
19,500	20,000	153,000	101,000	50,000
20,000	20,000	153,000	101,000	50,000

Punte SuperV

Micropunte ad alto rendimento in MD SuperV-NX senza fori interni



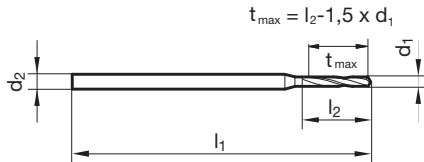
Catalogo n° 71998



P	M	K	N	S	H
●	○	●	○	○	

Parametri di lav.
ind. a pag. 34

- Assott. del noc. $\geq \varnothing 0,500$
- affilatura su piani
- forma del tagliente principale dritta
- fresatura dei taglienti ridotti



d1	inch	d2	l1	l2	d1	inch	d2	l1	l2
mm		mm	mm	mm	mm		mm	mm	mm
0,500		3,000	47,000	3,000	1,950		3,000	52,000	11,700
0,550		3,000	47,000	3,300	1,980	5/64	4,000	59,000	12,000
0,600		3,000	47,000	3,600	2,000		4,000	59,000	12,000
0,650		3,000	47,000	3,900	2,050		4,000	59,000	12,300
0,700		3,000	47,000	4,200	2,100		4,000	59,000	12,600
0,750		3,000	47,000	4,500	2,150		4,000	59,000	12,900
0,800		3,000	47,000	4,800	2,200		4,000	59,000	13,200
0,850		3,000	47,000	5,100	2,250		4,000	59,000	13,500
0,900		3,000	47,000	5,400	2,300		4,000	59,000	13,800
0,950		3,000	47,000	5,700	2,350		4,000	59,000	14,100
1,000		3,000	47,000	6,000	2,380	3/32	4,000	59,000	14,400
1,050		3,000	47,000	6,300	2,400		4,000	59,000	14,400
1,100		3,000	47,000	6,600	2,450		4,000	59,000	14,700
1,150		3,000	47,000	6,900	2,500		4,000	59,000	15,000
1,200		3,000	47,000	7,200	2,550		4,000	59,000	15,300
1,250		3,000	47,000	7,500	2,600		4,000	59,000	15,600
1,300		3,000	47,000	7,800	2,650		4,000	59,000	15,900
1,350		3,000	47,000	8,100	2,700		4,000	59,000	16,200
1,400		3,000	47,000	8,400	2,750		4,000	59,000	16,500
1,450		3,000	47,000	8,700	2,780	7/64	4,000	59,000	16,800
1,500		3,000	47,000	9,000	2,800		4,000	59,000	16,800
1,550		3,000	47,000	9,300	2,850		4,000	59,000	17,100
1,590	1/16	3,000	47,000	9,600	2,900		4,000	59,000	17,400
1,600		3,000	47,000	9,600	2,950		4,000	59,000	17,700
1,650		3,000	47,000	9,900	3,000		4,000	59,000	18,000
1,700		3,000	47,000	10,200					
1,750		3,000	47,000	10,500					
1,800		3,000	52,000	10,800					
1,850		3,000	52,000	11,100					
1,900		3,000	52,000	11,400					

Punte SuperV

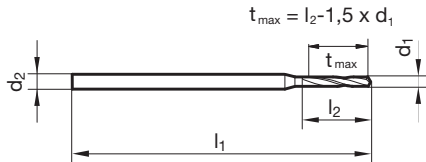
Micropunte ad alto rendimento in MD SuperV-NX senza fori interni



Catalogo n° 71999

SuperV-NX	7xD	WN	VHM	Al-TiN+	140°	m7	R	HA
P	M	K	N	S	H	Parametri di lav. ind. a pag. 34		
●	○	●	○	○				

- Assott. del noc. $\geq \varnothing 0,500$
- affilatura su piani
- forma del tagliente principale dritta
- fresatura dei taglienti ridotti



d1	inch	d2	l1	l2	d1	inch	d2	l1	l2
mm		mm	mm	mm	mm		mm	mm	mm
0,500		3,000	47,000	4,000	1,950		3,000	52,000	17,600
0,550		3,000	47,000	4,400	1,980	5/64	4,000	63,000	18,000
0,600		3,000	47,000	4,800	2,000		4,000	63,000	18,000
0,650		3,000	47,000	5,200	2,050		4,000	63,000	18,500
0,700		3,000	47,000	5,600	2,100		4,000	63,000	18,900
0,750		3,000	47,000	6,000	2,150		4,000	63,000	19,400
0,800		3,000	47,000	6,400	2,200		4,000	63,000	19,800
0,850		3,000	47,000	6,800	2,250		4,000	63,000	20,300
0,900		3,000	47,000	7,200	2,300		4,000	63,000	20,700
0,950		3,000	47,000	7,600	2,350		4,000	63,000	21,200
1,000		3,000	47,000	8,000	2,380	3/32	4,000	63,000	21,600
1,050		3,000	47,000	8,400	2,400		4,000	63,000	21,600
1,100		3,000	47,000	8,800	2,450		4,000	63,000	22,100
1,150		3,000	47,000	9,200	2,500		4,000	63,000	22,500
1,200		3,000	52,000	10,800	2,550		4,000	63,000	23,000
1,250		3,000	52,000	11,300	2,600		4,000	67,000	23,400
1,300		3,000	52,000	11,700	2,650		4,000	67,000	23,900
1,350		3,000	52,000	12,200	2,700		4,000	67,000	24,300
1,400		3,000	52,000	12,600	2,750		4,000	67,000	24,800
1,450		3,000	52,000	13,100	2,780	7/64	4,000	67,000	25,200
1,500		3,000	52,000	13,500	2,800		4,000	67,000	25,200
1,550		3,000	52,000	14,000	2,850		4,000	67,000	25,700
1,590	1/16	3,000	52,000	14,400	2,900		4,000	67,000	26,100
1,600		3,000	52,000	14,400	2,950		4,000	67,000	26,600
1,650		3,000	52,000	14,900	3,000		4,000	67,000	27,000
1,700		3,000	52,000	15,300					
1,750		3,000	52,000	15,800					
1,800		3,000	52,000	16,200					
1,850		3,000	52,000	16,700					
1,900		3,000	52,000	17,100					

Punte SuperV

Micropunte ad alto rendimento in MD SuperV-NX con fori interni



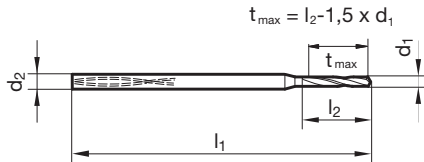
Catalogo n° 51997



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 34

- Assott. del noc. $\geq \varnothing 1,400$
- affilatura su piani
- forma del tagliente principale dritta
- fresatura dei taglienti ridotti
- osservare la pressione del lubrificante (vedere diagramma)



d1 mm	inch	d2 mm	l1 mm	l2 mm
1,400		4,000	52,000	11,000
1,450		4,000	52,000	12,000
1,500		4,000	52,000	12,000
1,550		4,000	52,000	12,000
1,590	1/16	4,000	52,000	13,000
1,600		4,000	52,000	13,000
1,650		4,000	52,000	13,000
1,700		4,000	56,000	14,000
1,750		4,000	56,000	14,000
1,800		4,000	56,000	14,000
1,850		4,000	56,000	15,000
1,900		4,000	56,000	15,000
1,950		4,000	56,000	16,000
1,980	5/64	4,000	56,000	16,000
2,000		4,000	56,000	16,000
2,050		4,000	56,000	16,000
2,100		4,000	62,000	17,000
2,150		4,000	62,000	17,000
2,200		4,000	62,000	18,000
2,250		4,000	62,000	18,000
2,300		4,000	62,000	18,000
2,350		4,000	62,000	19,000
2,380	3/32	4,000	62,000	19,000
2,400		4,000	62,000	19,000

d1 mm	inch	d2 mm	l1 mm	l2 mm
2,450		4,000	62,000	20,000
2,500		4,000	62,000	20,000
2,550		4,000	62,000	20,000
2,600		4,000	66,000	21,000
2,650		4,000	66,000	21,000
2,700		4,000	66,000	22,000
2,750		4,000	66,000	22,000
2,780	7/64	4,000	66,000	22,000
2,800		4,000	66,000	22,000
2,850		4,000	66,000	23,000
2,900		4,000	66,000	23,000
2,950		4,000	66,000	24,000
3,000		4,000	66,000	24,000

Punte SuperV

Micropunte ad alto rendimento in MD SuperV-NX con fori interni



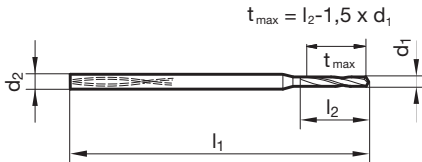
Catalogo n° 51998



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 34

- Assott. del noc. $\geq \varnothing 1,400$
- affilatura su piani
- forma del tagliente principale dritta
- fresatura dei taglienti ridotti
- osservare la pressione del lubrificante (vedere diagramma)



d1	inch	d2	l1	l2
mm		mm	mm	mm
1,400		4,000	52,000	15,000
1,450		4,000	52,000	16,000
1,500		4,000	52,000	17,000
1,550		4,000	52,000	17,000
1,590	1/16	4,000	52,000	18,000
1,600		4,000	52,000	18,000
1,650		4,000	52,000	18,000
1,700		4,000	56,000	19,000
1,750		4,000	56,000	19,000
1,800		4,000	56,000	20,000
1,850		4,000	56,000	20,000
1,900		4,000	56,000	21,000
1,950		4,000	56,000	21,000
1,980	5/64	4,000	56,000	22,000
2,000		4,000	56,000	22,000
2,050		4,000	56,000	23,000
2,100		4,000	62,000	23,000
2,150		4,000	62,000	24,000
2,200		4,000	62,000	24,000
2,250		4,000	62,000	25,000
2,300		4,000	62,000	25,000
2,350		4,000	62,000	26,000
2,380	3/32	4,000	62,000	26,000
2,400		4,000	62,000	26,000

d1	inch	d2	l1	l2
mm		mm	mm	mm
2,450		4,000	62,000	27,000
2,500		4,000	62,000	28,000
2,550		4,000	62,000	28,000
2,600		4,000	66,000	29,000
2,650		4,000	66,000	29,000
2,700		4,000	66,000	30,000
2,750		4,000	66,000	30,000
2,780	7/64	4,000	66,000	31,000
2,800		4,000	66,000	31,000
2,850		4,000	66,000	31,000
2,900		4,000	66,000	32,000
2,950		4,000	66,000	32,000
3,000		4,000	66,000	33,000

Punte SuperV

Micropunte ad alto rendimento in MD SuperV-NX con fori interni



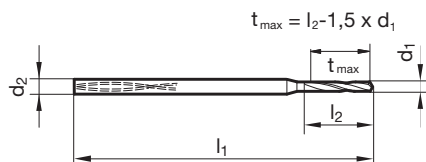
Catalogo n° 51999



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 34

- Assott. del noc. $\geq \varnothing 1,400$
- affilatura su piani
- rivestimento in testa
- forma del tagliente principale diritta
- fresatura dei taglienti ridotti
- osservare la pressione del lubrificante (vedere diagramma)



d1		d2	l1	l2
mm	inch	mm	mm	mm
1,400		4,000	62,000	25,000
1,500		4,000	62,000	27,000
1,590	1/16	4,000	62,000	29,000
1,600		4,000	62,000	29,000
1,700		4,000	70,000	31,000
1,800		4,000	70,000	32,000
1,900		4,000	70,000	34,000
1,980	5/64	4,000	70,000	36,000
2,000		4,000	70,000	36,000
2,100		4,000	78,000	38,000
2,200		4,000	78,000	40,000
2,300		4,000	78,000	42,000

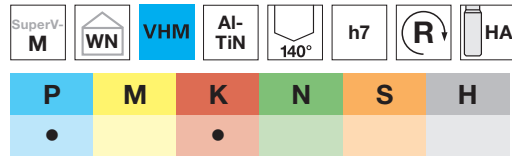
d1		d2	l1	l2
mm	inch	mm	mm	mm
2,380	3/32	4,000	78,000	44,000
2,400		4,000	78,000	44,000
2,500		4,000	78,000	45,000
2,600		4,000	87,000	47,000
2,700		4,000	87,000	48,000
2,780	7/64	4,000	87,000	50,000
2,800		4,000	87,000	50,000
2,900		4,000	87,000	52,000
3,000		4,000	87,000	54,000

Punte SuperV

Micropunte universale SuperV-M VHM



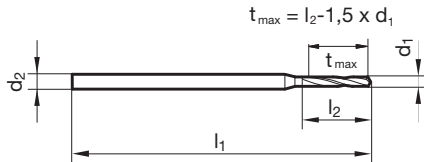
Catalogo n° 51720



P	M	K	N	S	H
●		●			

Parametri di lav.
ind. a pag. 34

- Assott. del noc. $\geq \varnothing 0,800$
- affilatura su piani
- forma del tagliente principale dritta



d1	inch	d2	l1	l2	d1	inch	d2	l1	l2
mm		mm	mm	mm	mm		mm	mm	mm
0,100		3,000	38,000	1,200	1,400		3,000	38,000	10,000
0,150		3,000	38,000	2,000	1,450		3,000	38,000	10,000
0,200		3,000	38,000	2,500	1,500		3,000	38,000	10,000
0,250		3,000	38,000	3,000	1,510		3,000	38,000	10,000
0,300		3,000	38,000	5,000	1,520		3,000	38,000	10,000
0,310		3,000	38,000	5,000	1,550		3,000	38,000	10,000
0,350		3,000	38,000	6,000	1,600		3,000	38,000	12,000
0,370		3,000	38,000	6,000	1,650		3,000	38,000	12,000
0,400		3,000	38,000	7,000	1,700		3,000	38,000	12,000
0,450		3,000	38,000	7,000	1,800		3,000	38,000	12,000
0,500		3,000	38,000	7,000	1,810		3,000	38,000	12,000
0,550		3,000	38,000	7,000	1,830		3,000	38,000	12,000
0,600		3,000	38,000	7,000	1,850		3,000	38,000	12,000
0,640		3,000	38,000	7,000	1,900		3,000	38,000	12,000
0,650		3,000	38,000	7,000	1,920		3,000	38,000	12,000
0,700		3,000	38,000	8,000	1,950		3,000	38,000	12,000
0,710		3,000	38,000	8,000	1,980	5/64	3,000	38,000	12,000
0,720		3,000	38,000	8,000	2,000		3,000	38,000	12,000
0,740		3,000	38,000	8,000	2,100		3,000	38,000	12,000
0,750		3,000	38,000	8,000	2,400		3,000	38,000	12,000
0,790	1/32	3,000	38,000	8,000	2,500		3,000	38,000	12,000
0,800		3,000	38,000	10,000	2,600		3,000	38,000	12,000
0,810		3,000	38,000	10,000	2,750		3,000	38,000	12,000
0,820		3,000	38,000	10,000	2,950		3,000	38,000	12,000
0,840		3,000	38,000	10,000	3,000		3,000	38,000	12,000
0,900		3,000	38,000	10,000					
0,910		3,000	38,000	10,000					
0,920		3,000	38,000	10,000					
0,930		3,000	38,000	10,000					
0,940		3,000	38,000	10,000					
0,950		3,000	38,000	10,000					
0,990		3,000	38,000	10,000					
1,000		3,000	38,000	10,000					
1,100		3,000	38,000	10,000					
1,150		3,000	38,000	10,000					
1,200		3,000	38,000	10,000					

Sistema di foratura SuperV

Porta utensili SuperV-AP mini

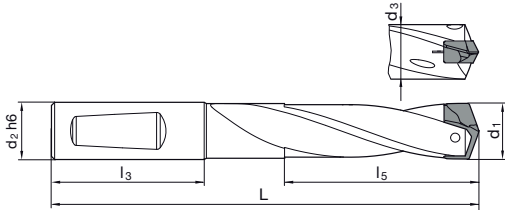


Catalogo n° 77007



Parametri di lav. ind. a pag. 36

- specialmente per resistenza all'usura
- taglio trasversale della scanalatura ottimizzato
- uscita del lubrificante ottimizzata
- vite di serraggio catalogo-Nr. 77020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



d1 mm	Codice	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	Grandezza
11,00-11,49	11,000	12,000	10,700	84,000	45,000	19,300	110
11,50-11,99	11,500	12,000	11,200	85,000	45,000	20,100	115
12,00-12,49	12,000	12,000	11,700	87,000	45,000	21,000	120
12,50-12,99	12,500	14,000	12,200	89,000	45,000	21,900	125
13,00-13,49	13,000	14,000	12,700	90,000	45,000	22,600	130
13,50-13,99	13,500	14,000	13,200	92,000	45,000	23,600	135
14,00-14,49	14,000	14,000	13,700	93,000	45,000	24,500	140
14,50-14,99	14,500	16,000	14,200	98,000	48,000	25,300	145
15,00-15,49	15,000	16,000	14,700	100,000	48,000	26,100	150
15,50-15,99	15,500	16,000	15,200	101,000	48,000	27,000	155
16,00-16,49	16,000	16,000	15,700	102,000	48,000	27,800	160
16,50-16,99	16,500	18,000	16,200	105,000	48,000	28,700	165
17,00-17,49	17,000	18,000	16,700	106,000	48,000	29,600	170
17,50-17,99	17,500	18,000	17,200	107,000	48,000	30,400	175
18,00-18,49	18,000	18,000	17,700	109,000	48,000	31,200	180
18,50-18,99	18,500	20,000	18,200	113,000	50,000	32,100	185
19,00-19,49	19,000	20,000	18,700	114,000	50,000	32,900	190
19,50-19,99	19,500	20,000	19,200	116,000	50,000	33,700	195
20,00-20,49	20,000	20,000	19,700	117,000	50,000	34,600	200
20,50-20,99	20,500	25,000	20,200	128,000	56,000	35,500	205
21,00-21,49	21,000	25,000	20,700	129,000	56,000	36,400	210
21,50-21,99	21,500	25,000	21,200	130,000	56,000	37,200	215
22,00-22,49	22,000	25,000	21,700	131,000	56,000	38,000	220
22,50-22,99	22,500	25,000	22,200	134,000	56,000	38,900	225
23,00-23,49	23,000	25,000	22,700	135,000	56,000	39,800	230
23,50-23,99	23,500	25,000	23,200	137,000	56,000	40,600	235
24,00-24,49	24,000	25,000	23,700	138,000	56,000	41,500	240
24,50-24,99	24,500	25,000	24,200	140,000	56,000	42,300	245
25,00-25,49	25,000	25,000	24,700	142,000	56,000	43,200	250
25,50-25,99	25,500	32,000	25,200	148,000	60,000	44,000	255
26,00-26,49	26,000	32,000	25,700	151,000	60,000	44,300	260
26,50-26,99	26,500	32,000	26,200	153,000	60,000	45,100	265
27,00-27,49	27,000	32,000	26,700	155,000	60,000	46,000	270
27,50-27,99	27,500	32,000	27,200	156,000	60,000	46,800	275
28,00-28,49	28,000	32,000	27,700	157,000	60,000	47,700	280
28,50-28,99	28,500	32,000	28,200	159,000	60,000	48,500	285
29,00-29,49	29,000	32,000	28,700	161,000	60,000	49,400	290
29,50-29,99	29,500	32,000	29,200	162,000	60,000	50,200	295
30,00-30,49	30,000	32,000	29,700	164,000	60,000	50,900	300
30,50-30,99	30,500	32,000	30,200	166,000	60,000	51,700	305
31,00-31,49	31,000	32,000	30,700	167,000	60,000	52,600	310
31,50-31,99	31,500	32,000	31,200	168,000	60,000	53,400	315
32,00-32,99	32,000	32,000	31,700	172,000	60,000	55,100	320
33,00-33,99	33,000	32,000	32,700	175,000	60,000	56,800	330
34,00-34,99	34,000	32,000	33,700	178,000	60,000	58,500	340
35,00-35,99	35,000	32,000	34,700	181,000	60,000	60,200	350
36,00-36,99	36,000	32,000	35,700	184,000	60,000	61,800	360
37,00-37,99	37,000	32,000	36,700	188,000	60,000	63,500	370
38,00-38,99	38,000	32,000	37,700	191,000	60,000	65,200	380
39,00-40,00	39,000	32,000	38,700	194,000	60,000	66,900	390

Sistema di foratura SuperV

Porta utensili SuperV-AP mini

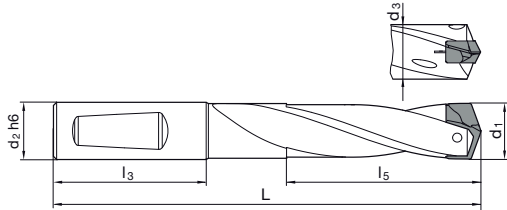


Catalogo n° 77000



Parametri di lav. ind. a pag. 38

- specialmente per resistenza all'usura
- taglio trasversale della scanalatura ottimizzato
- uscita del lubrificante ottimizzata
- vite di serraggio catalogo-Nr. 77020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



d1 mm	Codice	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	Grandezza
11,00-11,49	11,000	12,000	10,700	101,000	45,000	36,600	110
11,50-11,99	11,500	12,000	11,200	103,000	45,000	38,100	115
12,00-12,49	12,000	12,000	11,700	106,000	45,000	39,700	120
12,50-12,99	12,500	14,000	12,200	108,000	45,000	41,300	125
13,00-13,49	13,000	14,000	12,700	110,000	45,000	42,900	130
13,50-13,99	13,500	14,000	13,200	113,000	45,000	44,600	135
14,00-14,49	14,000	14,000	13,700	115,000	45,000	46,200	140
14,50-14,99	14,500	16,000	14,200	120,000	48,000	47,800	145
15,00-15,49	15,000	16,000	14,700	123,000	48,000	49,300	150
15,50-15,99	15,500	16,000	15,200	125,000	48,000	50,900	155
16,00-16,49	16,000	16,000	15,700	127,000	48,000	52,900	160
16,50-16,99	16,500	18,000	16,200	130,000	48,000	54,100	165
17,00-17,49	17,000	18,000	16,700	132,000	48,000	55,800	170
17,50-17,99	17,500	18,000	17,200	134,000	48,000	57,400	175
18,00-18,49	18,000	18,000	17,700	137,000	48,000	58,900	180
18,50-18,99	18,500	20,000	18,200	141,000	50,000	60,500	185
19,00-19,49	19,000	20,000	18,700	143,000	50,000	62,100	190
19,50-19,99	19,500	20,000	19,200	146,000	50,000	63,700	195
20,00-20,49	20,000	20,000	19,700	148,000	50,000	65,300	200
20,50-20,99	20,500	25,000	20,200	159,000	56,000	67,000	205
21,00-21,49	21,000	25,000	20,700	161,000	56,000	68,600	210
21,50-21,99	21,500	25,000	21,200	163,000	56,000	70,100	215
22,00-22,49	22,000	25,000	21,700	165,000	56,000	71,700	220
22,50-22,99	22,500	25,000	22,200	168,000	56,000	73,300	225
23,00-23,49	23,000	25,000	22,700	170,000	56,000	74,900	230
23,50-23,99	23,500	25,000	23,200	173,000	56,000	76,500	235
24,00-24,49	24,000	25,000	23,700	175,000	56,000	78,100	240
24,50-24,99	24,500	25,000	24,200	177,000	56,000	79,700	245
25,00-25,49	25,000	25,000	24,700	180,000	56,000	81,300	250
25,50-25,99	25,500	32,000	25,200	187,000	60,000	82,900	255
26,00-26,49	26,000	32,000	25,700	191,000	60,000	84,000	260
26,50-26,99	26,500	32,000	26,200	193,000	60,000	86,100	265
27,00-27,49	27,000	32,000	26,700	196,000	60,000	87,200	270
27,50-27,99	27,500	32,000	27,200	198,000	60,000	88,900	275
28,00-28,49	28,000	32,000	27,700	200,000	60,000	90,400	280
28,50-28,99	28,500	32,000	28,200	202,000	60,000	92,500	285
29,00-29,49	29,000	32,000	28,700	205,000	60,000	94,600	290
29,50-29,99	29,500	32,000	29,200	207,000	60,000	95,100	295
30,00-30,49	30,000	32,000	29,700	210,000	60,000	96,700	300
30,50-30,99	30,500	32,000	30,200	212,000	60,000	98,300	305
31,00-31,49	31,000	32,000	30,700	214,000	60,000	99,800	310
31,50-31,99	31,500	32,000	31,200	216,000	60,000	101,400	315
32,00-32,99	32,000	32,000	31,700	221,000	60,000	104,600	320
33,00-33,99	33,000	32,000	32,700	226,000	60,000	107,800	330
34,00-34,99	34,000	32,000	33,700	230,000	60,000	111,000	340
35,00-35,99	35,000	32,000	34,700	235,000	60,000	114,200	350
36,00-36,99	36,000	32,000	35,700	240,000	60,000	117,300	360
37,00-37,99	37,000	32,000	36,700	245,000	60,000	120,500	370
38,00-38,99	38,000	32,000	37,700	249,000	60,000	123,700	380
39,00-40,00	39,000	32,000	38,700	254,000	60,000	126,900	390

Sistema di foratura SuperV

Porta utensili SuperV-AP mini

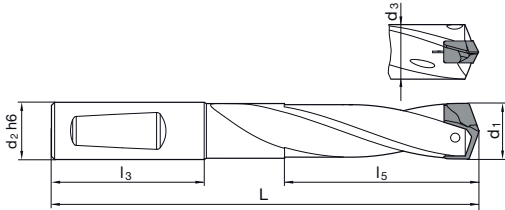


Catalogo n° 77001



Parametri di lav. ind. a pag. 40

- specialmente per resistenza all'usura
- taglio trasversale della scanalatura ottimizzato
- uscita del lubrificante ottimizzata
- vite di serraggio catalogo-Nr. 77020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



d1 mm	Codice	d2 h6 mm	d3 mm	L mm	I3 mm	I5 mm	Grandezza
11,00-11,49	11,000	12,000	10,700	124,000	45,000	59,600	110
11,50-11,99	11,500	12,000	11,200	127,000	45,000	62,100	115
12,00-12,49	12,000	12,000	11,700	131,000	45,000	64,700	120
12,50-12,99	12,500	14,000	12,200	134,000	45,000	67,300	125
13,00-13,49	13,000	14,000	12,700	137,000	45,000	69,900	130
13,50-13,99	13,500	14,000	13,200	141,000	45,000	72,600	135
14,00-14,49	14,000	14,000	13,700	144,000	45,000	75,200	140
14,50-14,99	14,500	16,000	14,200	150,000	48,000	77,800	145
15,00-15,49	15,000	16,000	14,700	154,000	48,000	80,300	150
15,50-15,99	15,500	16,000	15,200	157,000	48,000	82,900	155
16,00-16,49	16,000	16,000	15,700	160,000	48,000	85,900	160
16,50-16,99	16,500	18,000	16,200	164,000	48,000	88,100	165
17,00-17,49	17,000	18,000	16,700	167,000	48,000	90,800	170
17,50-17,99	17,500	18,000	17,200	170,000	48,000	93,400	175
18,00-18,49	18,000	18,000	17,700	174,000	48,000	95,900	180
18,50-18,99	18,500	20,000	18,200	179,000	50,000	98,500	185
19,00-19,49	19,000	20,000	18,700	182,000	50,000	101,100	190
19,50-19,99	19,500	20,000	19,200	186,000	50,000	103,700	195
20,00-20,49	20,000	20,000	19,700	189,000	50,000	106,300	200
20,50-20,99	20,500	25,000	20,200	201,000	56,000	109,000	205
21,00-21,49	21,000	25,000	20,700	204,000	56,000	111,600	210
21,50-21,99	21,500	25,000	21,200	207,000	56,000	114,100	215
22,00-22,49	22,000	25,000	21,700	210,000	56,000	116,700	220
22,50-22,99	22,500	25,000	22,200	214,000	56,000	119,300	225
23,00-23,49	23,000	25,000	22,700	217,000	56,000	121,900	230
23,50-23,99	23,500	25,000	23,200	221,000	56,000	124,500	235
24,00-24,49	24,000	25,000	23,700	224,000	56,000	127,100	240
24,50-24,99	24,500	25,000	24,200	227,000	56,000	129,700	245
25,00-25,49	25,000	25,000	24,700	231,000	56,000	132,300	250
25,50-25,99	25,500	32,000	25,200	239,000	60,000	134,900	255
26,00-26,49	26,000	32,000	25,700	244,000	60,000	137,000	260
26,50-26,99	26,500	32,000	26,200	247,000	60,000	140,000	265
27,00-27,49	27,000	32,000	26,700	251,000	60,000	142,200	270
27,50-27,99	27,500	32,000	27,200	254,000	60,000	144,800	275
28,00-28,49	28,000	32,000	27,700	257,000	60,000	147,400	280
28,50-28,99	28,500	32,000	28,200	260,000	60,000	150,400	285
29,00-29,49	29,000	32,000	28,700	264,000	60,000	153,500	290
30,00-30,49	30,000	32,000	29,700	271,000	60,000	157,600	300
30,50-30,99	30,500	32,000	30,200	274,000	60,000	160,200	305
31,00-31,49	31,000	32,000	30,700	277,000	60,000	162,800	310
31,50-31,99	31,500	32,000	31,200	280,000	60,000	165,400	315
32,00-32,99	32,000	32,000	31,700	287,000	60,000	170,600	320
33,00-33,99	33,000	32,000	32,700	294,000	60,000	175,800	330
34,00-34,99	34,000	32,000	33,700	300,000	60,000	181,000	340
35,00-35,99	35,000	32,000	34,700	307,000	60,000	186,200	350
36,00-36,99	36,000	32,000	35,700	314,000	60,000	191,300	360
37,00-37,99	37,000	32,000	36,700	321,000	60,000	196,500	370
38,00-38,99	38,000	32,000	37,700	327,000	60,000	201,700	380
39,00-40,00	39,000	32,000	38,700	334,000	60,000	206,900	390

Sistema di foratura SuperV

Porta utensili SuperV-AP mini

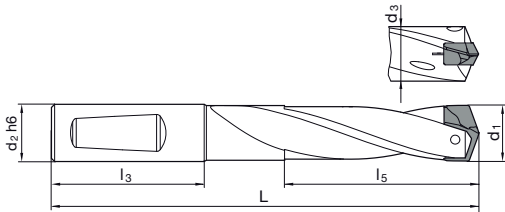


Catalogo n° 77003



Parametri di lav. ind. a pag. 42

- specialmente per resistenza all'usura
- taglio trasversale della scanalatura ottimizzato
- uscita del lubrificante ottimizzata
- vite di serraggio catalogo-Nr. 77020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



d1 mm	Codice	d2 h6 mm	d3 mm	L mm	l3 mm	l5 mm	Grandezza
11,00-11,49	11,000	12,000	10,700	147,000	45,000	82,600	110
11,50-11,99	11,500	12,000	11,200	151,000	45,000	86,100	115
12,00-12,49	12,000	12,000	11,700	156,000	45,000	89,700	120
12,50-12,99	12,500	14,000	12,200	160,000	45,000	93,300	125
13,00-13,49	13,000	14,000	12,700	164,000	45,000	96,900	130
13,50-13,99	13,500	14,000	13,200	169,000	45,000	100,600	135
14,00-14,49	14,000	14,000	13,700	173,000	45,000	104,200	140
14,50-14,99	14,500	16,000	14,200	180,000	48,000	107,800	145
15,00-15,49	15,000	16,000	14,700	185,000	48,000	111,300	150
15,50-15,99	15,500	16,000	15,200	189,000	48,000	114,900	155
16,00-16,49	16,000	16,000	15,700	193,000	48,000	118,900	160
16,50-16,99	16,500	18,000	16,200	198,000	48,000	122,100	165
17,00-17,49	17,000	18,000	16,700	202,000	48,000	125,800	170
17,50-17,99	17,500	18,000	17,200	206,000	48,000	129,400	175
18,00-18,49	18,000	18,000	17,700	211,000	48,000	132,900	180
18,50-18,99	18,500	20,000	18,200	217,000	50,000	136,500	185
19,00-19,49	19,000	20,000	18,700	221,000	50,000	140,100	190
19,50-19,99	19,500	20,000	19,200	226,000	50,000	143,700	195
20,00-20,49	20,000	20,000	19,700	230,000	50,000	147,300	200
20,50-20,99	20,500	25,000	20,200	243,000	56,000	151,000	205
21,00-21,49	21,000	25,000	20,700	247,000	56,000	154,600	210
21,50-21,99	21,500	25,000	21,200	251,000	56,000	158,100	215
22,00-22,49	22,000	25,000	21,700	255,000	56,000	161,700	220
22,50-22,99	22,500	25,000	22,200	260,000	56,000	165,300	225
23,00-23,49	23,000	25,000	22,700	264,000	56,000	168,900	230
23,50-23,99	23,500	25,000	23,200	269,000	56,000	172,500	235
24,00-24,49	24,000	25,000	23,700	273,000	56,000	176,100	240
24,50-24,99	24,500	25,000	24,200	277,000	56,000	179,700	245
25,00-25,49	25,000	25,000	24,700	282,000	56,000	183,300	250
25,50-25,99	25,500	32,000	25,200	291,000	60,000	186,900	255
26,00-26,49	26,000	32,000	25,700	297,000	60,000	190,000	260
26,50-26,99	26,500	32,000	26,200	301,000	60,000	194,000	265
27,00-27,49	27,000	32,000	26,700	306,000	60,000	197,200	270
27,50-27,99	27,500	32,000	27,200	310,000	60,000	200,800	275
28,00-28,49	28,000	32,000	27,700	314,000	60,000	204,400	280
28,50-28,99	28,500	32,000	28,200	318,000	60,000	208,400	285
29,00-29,49	29,000	32,000	28,700	323,000	60,000	212,500	290
29,50-29,99	29,500	32,000	29,200	327,000	60,000	215,100	295
30,00-30,49	30,000	32,000	29,700	332,000	60,000	218,600	300
30,50-30,99	30,500	32,000	30,200	336,000	60,000	222,200	305
31,00-31,49	31,000	32,000	30,700	340,000	60,000	225,800	310
31,50-31,99	31,500	32,000	31,200	344,000	60,000	229,400	315
33,00-33,99	33,000	32,000	32,700	362,000	60,000	244,600	330
36,00-36,99	36,000	32,000	35,700	387,000	60,000	265,800	360
39,00-40,00	39,000	32,000	38,700	413,000	60,000	287,400	390

Sistema di foratura SuperV

Porta utensili SuperV-AP mini

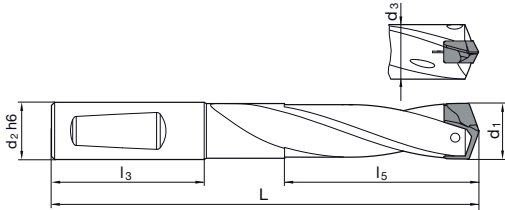


Catalogo n° 77004



Parametri di lav. ind. a pag. 44

- specialmente per resistenza all'usura
- taglio trasversale della scanalatura ottimizzato
- uscita del lubrificante ottimizzata
- vite di serraggio catalogo-Nr. 77020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



d1 mm	Codice	d2 h6 mm	d3 mm	L mm	I3 mm	I5 mm	Grandezza
11,00-11,49	11,000	12,000	10,700	182,000	45,000	117,100	110
11,50-11,99	11,500	12,000	11,200	187,000	45,000	122,100	115
12,00-12,49	12,000	12,000	11,700	194,000	45,000	127,200	120
12,50-12,99	12,500	14,000	12,200	199,000	45,000	132,300	125
13,00-13,49	13,000	14,000	12,700	205,000	45,000	137,500	130
13,50-13,99	13,500	14,000	13,200	211,000	45,000	142,500	135
14,00-14,49	14,000	14,000	13,700	217,000	45,000	147,700	140
14,50-14,99	14,500	16,000	14,200	225,000	48,000	152,800	145
15,00-15,49	15,000	16,000	14,700	232,000	48,000	157,800	150
15,50-15,99	15,500	16,000	15,200	237,000	48,000	162,900	155
16,00-16,49	16,000	16,000	15,700	243,000	48,000	168,000	160
16,50-16,99	16,500	18,000	16,200	249,000	48,000	170,000	165
17,00-17,49	17,000	18,000	16,700	255,000	48,000	178,300	170
17,50-17,99	17,500	18,000	17,200	260,000	48,000	183,500	175
18,00-18,49	18,000	18,000	17,700	267,000	48,000	188,400	180
18,50-18,99	18,500	20,000	18,200	274,000	50,000	193,500	185
19,00-19,49	19,000	20,000	18,700	280,000	50,000	198,700	190
19,50-19,99	19,500	20,000	19,200	286,000	50,000	203,700	195
20,00-20,49	20,000	20,000	19,700	292,000	50,000	208,900	200
20,50-20,99	20,500	25,000	20,200	306,000	56,000	214,000	205
21,00-21,49	21,000	25,000	20,700	312,000	56,000	219,100	210
21,50-21,99	21,500	25,000	21,200	317,000	56,000	224,200	215
22,00-22,49	22,000	25,000	21,700	323,000	56,000	229,300	220
22,50-22,99	22,500	25,000	22,200	329,000	56,000	234,400	225
23,00-23,49	23,000	25,000	22,700	335,000	56,000	239,500	230
23,50-23,99	23,500	25,000	23,200	341,000	56,000	244,600	235
24,00-24,49	24,000	25,000	23,700	347,000	56,000	249,700	240
24,50-24,99	24,500	25,000	24,200	352,000	56,000	254,800	245
25,00-25,49	25,000	25,000	24,700	359,000	56,000	259,900	250
25,50-25,99	25,500	32,000	25,200	369,000	60,000	265,000	255
26,00-26,49	26,000	32,000	25,700	377,000	60,000	270,000	260
26,50-26,99	26,500	32,000	26,200	382,000	60,000	275,000	265
27,00-27,49	27,000	32,000	26,700	388,000	60,000	280,100	270
27,50-27,99	27,500	32,000	27,200	394,000	60,000	285,200	275
28,00-28,49	28,000	32,000	27,700	400,000	60,000	290,300	280
28,50-28,99	28,500	32,000	28,200	405,000	60,000	295,400	285
29,00-29,49	29,000	32,000	28,700	412,000	60,000	300,500	290
29,50-29,99	29,500	32,000	29,200	418,000	60,000	305,600	295
30,00-30,49	30,000	32,000	29,700	424,000	60,000	310,600	300
30,50-30,99	30,500	32,000	30,200	429,000	60,000	315,700	305
31,00-31,49	31,000	32,000	30,700	435,000	60,000	320,800	310
31,50-31,99	31,500	32,000	31,200	441,000	60,000	325,900	315

Sistema di foratura SuperV

Inserti intercambiabili per SuperV-AP mini



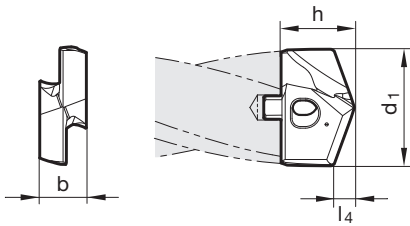
Catalogo n° 67011



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 36-44

- Assott. del noc. $\geq \varnothing 11,000$
- affilatura su piani
- tagliente principale forma diritta (dopo correzione)
- vite di serraggio catalogo-Nr. 77020 inclusa



d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
11,000		11,000	2,100	4,500	7,500	110
11,200		11,200	2,100	4,500	7,500	110
11,500		11,500	2,100	4,500	7,500	115
11,510	29/64	11,510	2,100	4,500	7,500	115
11,700		11,700	2,200	4,500	7,500	115
11,800		11,800	2,200	4,500	7,500	115
11,910	15/32	11,910	2,200	4,500	7,500	115
12,000		12,000	2,200	5,000	7,700	120
12,100		12,100	2,300	5,000	7,700	120
12,200		12,200	2,300	5,000	7,700	120
12,300	31/64	12,300	2,300	5,000	7,700	120
12,500		12,500	2,300	5,000	7,700	125
12,600		12,600	2,300	5,000	7,700	125
12,700	1/2	12,700	2,400	5,000	7,700	125
12,800		12,800	2,400	5,000	7,700	125
12,900		12,900	2,400	5,000	7,700	125
13,000		13,000	2,400	5,500	8,500	130
13,100	33/64	13,100	2,400	5,500	8,500	130
13,490	17/32	13,490	2,500	5,500	8,500	130
13,500		13,500	2,500	5,500	8,500	135
13,600		13,600	2,500	5,500	8,500	135
13,700		13,700	2,500	5,500	8,500	135
13,800		13,800	2,600	5,500	8,500	135
13,890	35/64	13,890	2,600	5,500	8,500	135
14,000		14,000	2,600	6,000	9,600	140
14,100		14,100	2,600	6,000	9,600	140
14,290	9/16	14,290	2,700	6,000	9,600	140
14,400		14,400	2,700	6,000	9,600	140
14,500		14,500	2,700	6,000	9,600	145
14,600		14,600	2,700	6,000	9,600	145
14,680	37/64	14,680	2,700	6,000	9,600	145
14,700		14,700	2,700	6,000	9,600	145
14,800		14,800	2,700	6,000	9,600	145
15,000		15,000	2,800	6,000	9,800	150
15,080	19/32	15,080	2,800	6,000	9,800	150
15,100		15,100	2,800	6,000	9,800	150
15,200		15,200	2,800	6,000	9,800	150
15,300		15,300	2,800	6,000	9,800	150
15,480	39/64	15,480	2,900	6,000	9,800	150
15,500		15,500	2,900	6,000	9,800	155
15,600		15,600	2,900	6,000	9,800	155
15,700		15,700	2,900	6,000	9,800	155
15,800		15,800	2,900	6,000	9,800	155
15,870	5/8	15,870	2,900	6,000	9,800	155
16,000		16,000	3,000	7,000	11,000	160
16,270	41/64	16,270	3,000	7,000	11,000	160
16,500		16,500	3,100	7,000	11,000	165
16,670	21/32	16,670	3,100	7,000	11,000	165

d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
17,000		17,000	3,100	7,000	11,000	170
17,070	43/64	17,070	3,200	7,000	11,000	170
17,250		17,250	3,200	7,000	11,000	170
17,460	11/16	17,460	3,200	7,000	11,000	170
17,500		17,500	3,200	7,000	11,000	175
17,600		17,600	3,300	7,000	11,000	175
17,860	45/64	17,860	3,300	7,000	11,000	175
18,000		18,000	3,300	8,000	12,600	180
18,260	23/32	18,260	3,400	8,000	12,600	180
18,500		18,500	3,400	8,000	12,600	185
18,650	47/64	18,650	3,400	8,000	12,600	185
19,000		19,000	3,500	8,000	12,600	190
19,050	3/4	19,050	3,500	8,000	12,600	190
19,250		19,250	3,600	8,000	12,600	190
19,450	49/64	19,450	3,600	8,000	12,600	190
19,500		19,500	3,600	8,000	12,600	195
19,600		19,600	3,600	8,000	12,600	195
19,840	25/32	19,840	3,700	8,000	12,600	195
20,000		20,000	3,700	9,000	13,900	200
20,240	51/64	20,240	3,700	9,000	13,900	200
20,500		20,500	3,800	9,000	13,900	205
20,640	13/16	20,640	3,800	9,000	13,900	205
21,000		21,000	3,900	9,000	13,900	210
21,030	53/64	21,030	3,900	9,000	13,900	210
21,100		21,100	3,900	9,000	13,900	210
21,430	27/32	21,430	3,900	9,000	13,900	210
21,500		21,500	4,000	9,000	13,900	215
21,830	55/64	21,830	4,000	9,000	13,900	215
22,000		22,000	4,100	10,000	15,300	220
22,220	7/8	22,220	4,100	10,000	15,300	220
22,500		22,500	4,100	10,000	15,300	225
22,620	57/64	22,620	4,200	10,000	15,300	225
23,000		23,000	4,200	10,000	15,300	230
23,020	29/32	23,020	4,200	10,000	15,300	230
23,420	59/64	23,420	4,300	10,000	15,300	230
23,500		23,500	4,300	10,000	15,300	235
23,810	15/16	23,810	4,400	10,000	15,300	235
24,000		24,000	4,400	11,000	15,800	240
24,100		24,100	4,400	11,000	15,800	240
24,210	61/64	24,210	4,500	11,000	15,800	240
24,500		24,500	4,500	11,000	15,800	245
24,610	31/32	24,610	4,500	11,000	15,800	245
25,000	63/64	25,000	4,600	11,000	15,800	250
25,250		25,250	4,600	11,000	15,800	250
25,400	1	25,400	4,700	11,000	15,800	250
25,500		25,500	4,700	11,000	15,800	255
25,650		25,650	4,700	11,000	15,800	255
25,670		25,670	4,700	11,000	15,800	255
25,700		25,700	4,700	11,000	15,800	255
25,810		25,810	4,700	11,000	15,800	255
26,000		26,000	4,800	12,000	20,000	260
26,190	1 1/32	26,190	4,800	12,000	20,000	260
26,500		26,500	4,900	12,000	20,000	265
26,590	1 3/64	26,590	4,900	12,000	20,000	265
27,000		27,000	5,000	12,000	20,000	270
27,500		27,500	5,100	12,000	20,000	275
27,700		27,700	5,100	12,000	20,000	275
27,780	1 3/32	27,780	5,100	12,000	20,000	275
28,000		28,000	5,100	13,000	20,700	280
28,180	1 7/64	28,180	5,200	13,000	20,700	280
28,500		28,500	5,200	13,000	20,700	285
28,580		28,580	5,300	13,000	20,700	285
29,000		29,000	5,300	13,000	20,700	290
29,370	1 5/32	29,370	5,400	13,000	20,700	290
29,500		29,500	5,400	13,000	20,700	295
29,600		29,600	5,400	13,000	20,700	295
29,770	1 11/64	29,770	5,500	13,000	20,700	295
30,000		30,000	5,500	14,000	22,300	300
30,160	1 3/16	30,160	5,500	14,000	22,300	300
30,500		30,500	5,600	14,000	22,300	305
30,960	1 7/32	30,960	5,700	14,000	22,300	305
31,000		31,000	5,700	14,000	22,300	310

d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
31,500		31,500	5,800	14,000	22,300	315
31,750	1 1/4	31,750	5,800	14,000	22,300	315
32,000		32,000	5,900	15,000	23,100	320
32,500		32,500	6,000	15,000	23,100	320
32,540	1 9/32	32,540	6,000	15,000	23,100	320
32,940	1 19/64	32,940	6,000	15,000	23,100	320
33,000		33,000	6,100	15,000	23,100	330
33,340	1 5/16	33,340	6,100	15,000	23,100	330
33,500		33,500	6,100	15,000	23,100	330
34,000		34,000	6,200	15,000	23,100	340
34,130	1 11/32	34,130	6,300	15,000	23,100	340
34,500		34,500	6,300	15,000	23,100	340
34,930		34,930	6,400	15,000	23,100	340
35,000		35,000	6,400	15,000	23,100	350
35,500		35,500	6,500	15,000	23,100	350
35,720	1 13/32	35,720	6,600	15,000	23,100	350
36,000		36,000	6,600	16,000	23,900	360
36,500		36,500	6,700	16,000	23,900	360
36,510	1 7/16	36,510	6,700	16,000	23,900	360
37,000		37,000	6,800	16,000	23,900	370
37,310	1 15/32	37,310	6,800	16,000	23,900	370
37,500		37,500	6,900	16,000	23,900	370
38,000		38,000	7,000	16,000	23,900	380
38,100	1 1/2	38,100	7,000	16,000	23,900	380
38,500	1 33/64	38,500	7,100	16,000	23,900	380
39,000		39,000	7,100	16,000	23,900	390
39,500		39,500	7,200	16,000	23,900	390
40,000		40,000	7,300	16,000	23,900	400

Sistema di foratura SuperV

Inserti intercambiabili per SuperV-AP mini



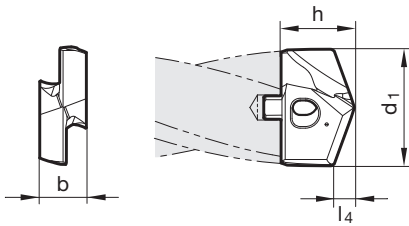
Catalogo n° 67012



P	M	K	N	S	H
	●	○		○	

Parametri di lav.
ind. a pag. 36-44

- Assott. del noc. $\geq \varnothing 11,000$
- spoglia sul cono tagliente
- tagliente principale forma diritta (dopo correzione)
- vite di serraggio catalogo-Nr. 77020 inclusa



d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
11,000		11,000	2,100	4,500	7,500	110
11,200		11,200	2,100	4,500	7,500	110
11,500		11,500	2,100	4,500	7,500	115
11,510	29/64	11,510	2,100	4,500	7,500	115
11,700		11,700	2,200	4,500	7,500	115
11,800		11,800	2,200	4,500	7,500	115
11,910	15/32	11,910	2,200	4,500	7,500	115
12,000		12,000	2,200	5,000	7,700	120
12,100		12,100	2,300	5,000	7,700	120
12,200		12,200	2,300	5,000	7,700	120
12,300	31/64	12,300	2,300	5,000	7,700	120
12,500		12,500	2,300	5,000	7,700	125
12,600		12,600	2,300	5,000	7,700	125
12,700	1/2	12,700	2,400	5,000	7,700	125
12,800		12,800	2,400	5,000	7,700	125
12,900		12,900	2,400	5,000	7,700	125
13,000		13,000	2,400	5,500	8,500	130
13,100	33/64	13,100	2,400	5,500	8,500	130
13,490	17/32	13,490	2,500	5,500	8,500	130
13,500		13,500	2,500	5,500	8,500	135
13,600		13,600	2,500	5,500	8,500	135
13,700		13,700	2,500	5,500	8,500	135
13,800		13,800	2,600	5,500	8,500	135
13,890	35/64	13,890	2,600	5,500	8,500	135
14,000		14,000	2,600	6,000	9,600	140
14,100		14,100	2,600	6,000	9,600	140
14,290	9/16	14,290	2,700	6,000	9,600	140
14,400		14,400	2,700	6,000	9,600	140
14,500		14,500	2,700	6,000	9,600	145
14,600		14,600	2,700	6,000	9,600	145
14,700		14,700	2,700	6,000	9,600	145
14,800		14,800	2,700	6,000	9,600	145
15,000		15,000	2,800	6,000	9,800	150
15,080	19/32	15,080	2,800	6,000	9,800	150
15,100		15,100	2,800	6,000	9,800	150
15,200		15,200	2,800	6,000	9,800	150
15,300		15,300	2,800	6,000	9,800	150
15,500		15,500	2,900	6,000	9,800	155
15,600		15,600	2,900	6,000	9,800	155
15,700		15,700	2,900	6,000	9,800	155
15,800		15,800	2,900	6,000	9,800	155
15,870	5/8	15,870	2,900	6,000	9,800	155
16,000		16,000	3,000	7,000	11,000	160
16,270	41/64	16,270	3,000	7,000	11,000	160
16,500		16,500	3,100	7,000	11,000	165
16,670	21/32	16,670	3,100	7,000	11,000	165
17,000		17,000	3,100	7,000	11,000	170
17,070	43/64	17,070	3,200	7,000	11,000	170

d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
17,250		17,250	3,200	7,000	11,000	170
17,460	11/16	17,460	3,200	7,000	11,000	170
17,500		17,500	3,200	7,000	11,000	175
17,600		17,600	3,300	7,000	11,000	175
17,860	45/64	17,860	3,300	7,000	11,000	175
18,000		18,000	3,300	8,000	12,600	180
18,260	23/32	18,260	3,400	8,000	12,600	180
18,500		18,500	3,400	8,000	12,600	185
18,650	47/64	18,650	3,400	8,000	12,600	185
19,000		19,000	3,500	8,000	12,600	190
19,050	3/4	19,050	3,500	8,000	12,600	190
19,250		19,250	3,600	8,000	12,600	190
19,450	49/64	19,450	3,600	8,000	12,600	190
19,500		19,500	3,600	8,000	12,600	195
19,600		19,600	3,600	8,000	12,600	195
19,840	25/32	19,840	3,700	8,000	12,600	195
20,000		20,000	3,700	9,000	13,900	200
20,240	51/64	20,240	3,700	9,000	13,900	200
20,500		20,500	3,800	9,000	13,900	205
20,640	13/16	20,640	3,800	9,000	13,900	205
21,000		21,000	3,900	9,000	13,900	210
21,030	53/64	21,030	3,900	9,000	13,900	210
21,100		21,100	3,900	9,000	13,900	210
21,430	27/32	21,430	3,900	9,000	13,900	210
21,500		21,500	4,000	9,000	13,900	215
21,830	55/64	21,830	4,000	9,000	13,900	215
22,000		22,000	4,100	10,000	15,300	220
22,220	7/8	22,220	4,100	10,000	15,300	220
22,500		22,500	4,100	10,000	15,300	225
22,620	57/64	22,620	4,200	10,000	15,300	225
23,000		23,000	4,200	10,000	15,300	230
23,020	29/32	23,020	4,200	10,000	15,300	230
23,420	59/64	23,420	4,300	10,000	15,300	230
23,500		23,500	4,300	10,000	15,300	235
23,810	15/16	23,810	4,400	10,000	15,300	235
24,000		24,000	4,400	11,000	15,800	240
24,100		24,100	4,400	11,000	15,800	240
24,210	61/64	24,210	4,500	11,000	15,800	240
24,500		24,500	4,500	11,000	15,800	245
24,610	31/32	24,610	4,500	11,000	15,800	245
25,000	63/64	25,000	4,600	11,000	15,800	250
25,250		25,250	4,600	11,000	15,800	250
25,400	1	25,400	4,700	11,000	15,800	250
25,500		25,500	4,700	11,000	15,800	255
25,650		25,650	4,700	11,000	15,800	255
25,670		25,670	4,700	11,000	15,800	255
25,700		25,700	4,700	11,000	15,800	255
26,000		26,000	4,800	12,000	20,000	260
26,190	1 1/32	26,190	4,800	12,000	20,000	260
26,500		26,500	4,900	12,000	20,000	265
27,000		27,000	5,000	12,000	20,000	270
27,500		27,500	5,100	12,000	20,000	275
27,700		27,700	5,100	12,000	20,000	275
27,780	1 3/32	27,780	5,100	12,000	20,000	275
28,000		28,000	5,100	13,000	20,700	280
28,180	1 7/64	28,180	5,200	13,000	20,700	280
28,500		28,500	5,200	13,000	20,700	285
28,580		28,580	5,300	13,000	20,700	285
29,000		29,000	5,300	13,000	20,700	290
29,370	1 5/32	29,370	5,400	13,000	20,700	290
29,500		29,500	5,400	13,000	20,700	295
29,600		29,600	5,400	13,000	20,700	295
30,000		30,000	5,500	14,000	22,300	300
30,160	1 3/16	30,160	5,500	14,000	22,300	300
30,500		30,500	5,600	14,000	22,300	305
30,960	1 7/32	30,960	5,700	14,000	22,300	305
31,000		31,000	5,700	14,000	22,300	310
31,500		31,500	5,800	14,000	22,300	315
31,750	1 1/4	31,750	5,800	14,000	22,300	315
32,000		32,000	5,900	15,000	23,100	320
32,500		32,500	6,000	15,000	23,100	320
32,540	1 9/32	32,540	6,000	15,000	23,100	320

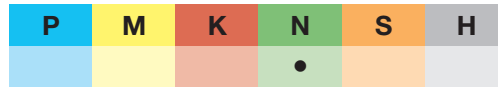
d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
33,000		33,000	6,100	15,000	23,100	330
33,340	1 5/16	33,340	6,100	15,000	23,100	330
33,500		33,500	6,100	15,000	23,100	330
34,000		34,000	6,200	15,000	23,100	340
34,130	1 11/32	34,130	6,300	15,000	23,100	340
34,500		34,500	6,300	15,000	23,100	340
34,930		34,930	6,400	15,000	23,100	340
35,000		35,000	6,400	15,000	23,100	350
35,500		35,500	6,500	15,000	23,100	350
35,720	1 13/32	35,720	6,600	15,000	23,100	350
36,000		36,000	6,600	16,000	23,900	360
36,500		36,500	6,700	16,000	23,900	360
36,510	1 7/16	36,510	6,700	16,000	23,900	360
37,000		37,000	6,800	16,000	23,900	370
37,310	1 15/32	37,310	6,800	16,000	23,900	370
37,500		37,500	6,900	16,000	23,900	370
38,000		38,000	7,000	16,000	23,900	380
38,100	1 1/2	38,100	7,000	16,000	23,900	380
38,500	1 33/64	38,500	7,100	16,000	23,900	380
39,000		39,000	7,100	16,000	23,900	390
39,500		39,500	7,200	16,000	23,900	390
40,000		40,000	7,300	16,000	23,900	400

Sistema di foratura SuperV

Inserti intercambiabili per SuperV-AP mini

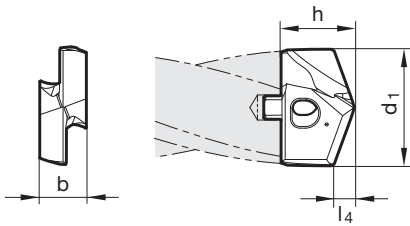


Catalogo n° 77012



Parametri di lav.
ind. a pag. 36-44

- Assott. del noc. $\geq \varnothing 11,000$
- spoglia sul cono tagliente
- tagliente principale forma concava
- vite di serraggio catalogo-Nr. 77020 inclusa



d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
11,000		11,000	2,100	4,500	7,500	110
11,200		11,200	2,100	4,500	7,500	110
11,510	29/64	11,510	2,100	4,500	7,500	115
11,800		11,800	2,200	4,500	7,500	115
12,000		12,000	2,200	5,000	7,700	120
12,200		12,200	2,300	5,000	7,700	120
12,500		12,500	2,300	5,000	7,700	125
12,700	1/2	12,700	2,400	5,000	7,700	125
12,900		12,900	2,400	5,000	7,700	125
13,100	33/64	13,100	2,400	5,500	8,500	130
13,500		13,500	2,500	5,500	8,500	135
13,700		13,700	2,500	5,500	8,500	135
13,800		13,800	2,600	5,500	8,500	135
14,000		14,000	2,600	6,000	9,600	140
14,100		14,100	2,600	6,000	9,600	140
14,400		14,400	2,700	6,000	9,600	140
14,500		14,500	2,700	6,000	9,600	145
14,680	37/64	14,680	2,700	6,000	9,600	145
14,700		14,700	2,700	6,000	9,600	145
15,000		15,000	2,800	6,000	9,800	150
15,080	19/32	15,080	2,800	6,000	9,800	150
15,200		15,200	2,800	6,000	9,800	150
15,300		15,300	2,800	6,000	9,800	150
15,500		15,500	2,900	6,000	9,800	155
15,600		15,600	2,900	6,000	9,800	155
15,800		15,800	2,900	6,000	9,800	155
15,870	5/8	15,870	2,900	6,000	9,800	155
16,270	41/64	16,270	3,000	7,000	11,000	160
16,500		16,500	3,100	7,000	11,000	165
17,000		17,000	3,100	7,000	11,000	170
17,070	43/64	17,070	3,200	7,000	11,000	170
17,460	11/16	17,460	3,200	7,000	11,000	170
17,500		17,500	3,200	7,000	11,000	175
17,600		17,600	3,300	7,000	11,000	175
17,860	45/64	17,860	3,300	7,000	11,000	175
18,000		18,000	3,300	8,000	12,600	180
18,260	23/32	18,260	3,400	8,000	12,600	180
18,500		18,500	3,400	8,000	12,600	185
18,650	47/64	18,650	3,400	8,000	12,600	185
19,000		19,000	3,500	8,000	12,600	190
19,050	3/4	19,050	3,500	8,000	12,600	190
19,250		19,250	3,600	8,000	12,600	190
19,450	49/64	19,450	3,600	8,000	12,600	190
19,500		19,500	3,600	8,000	12,600	195
19,600		19,600	3,600	8,000	12,600	195
19,840	25/32	19,840	3,700	8,000	12,600	195
20,000		20,000	3,700	9,000	13,900	200
20,240	51/64	20,240	3,700	9,000	13,900	200

d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
20,500		20,500	3,800	9,000	13,900	205
20,640	13/16	20,640	3,800	9,000	13,900	205
21,000		21,000	3,900	9,000	13,900	210
21,030	53/64	21,030	3,900	9,000	13,900	210
21,100		21,100	3,900	9,000	13,900	210
21,430	27/32	21,430	3,900	9,000	13,900	210
21,500		21,500	4,000	9,000	13,900	215
21,830	55/64	21,830	4,000	9,000	13,900	215
22,000		22,000	4,100	10,000	15,300	220
22,220	7/8	22,220	4,100	10,000	15,300	220
22,500		22,500	4,100	10,000	15,300	225
22,620	57/64	22,620	4,200	10,000	15,300	225
23,000		23,000	4,200	10,000	15,300	230
23,020	29/32	23,020	4,200	10,000	15,300	230
23,420	59/64	23,420	4,300	10,000	15,300	230
23,500		23,500	4,300	10,000	15,300	235
23,810	15/16	23,810	4,400	10,000	15,300	235
24,000		24,000	4,400	11,000	15,800	240
24,100		24,100	4,400	11,000	15,800	240
24,210	61/64	24,210	4,500	11,000	15,800	240
24,500		24,500	4,500	11,000	15,800	245
24,610	31/32	24,610	4,500	11,000	15,800	245
25,000	63/64	25,000	4,600	11,000	15,800	250
25,400	1	25,400	4,700	11,000	15,800	250
25,500		25,500	4,700	11,000	15,800	255
25,670		25,670	4,700	11,000	15,800	255
25,700		25,700	4,700	11,000	15,800	255
25,810		25,810	4,700	11,000	15,800	255
26,000		26,000	4,800	12,000	20,000	260
26,190	1 1/32	26,190	4,800	12,000	20,000	260
26,500		26,500	4,900	12,000	20,000	265
26,590	1 3/64	26,590	4,900	12,000	20,000	265
27,000		27,000	5,000	12,000	20,000	270
27,500		27,500	5,100	12,000	20,000	275
27,700		27,700	5,100	12,000	20,000	275
27,780	1 3/32	27,780	5,100	12,000	20,000	275
28,000		28,000	5,100	13,000	20,700	280
28,180	1 7/64	28,180	5,200	13,000	20,700	280
28,500		28,500	5,200	13,000	20,700	285
28,580		28,580	5,300	13,000	20,700	285
29,000		29,000	5,300	13,000	20,700	290
29,370	1 5/32	29,370	5,400	13,000	20,700	290
29,500		29,500	5,400	13,000	20,700	295
29,770	1 11/64	29,770	5,500	13,000	20,700	295
30,000		30,000	5,500	14,000	22,300	300
30,160	1 3/16	30,160	5,500	14,000	22,300	300
30,500		30,500	5,600	14,000	22,300	305
30,960	1 7/32	30,960	5,700	14,000	22,300	305
31,000		31,000	5,700	14,000	22,300	310
31,500		31,500	5,800	14,000	22,300	315
31,750	1 1/4	31,750	5,800	14,000	22,300	315
32,000		32,000	5,900	15,000	23,100	320
32,500		32,500	6,000	15,000	23,100	320
32,540	1 9/32	32,540	6,000	15,000	23,100	320
32,940	1 19/64	32,940	6,000	15,000	23,100	320
33,000		33,000	6,100	15,000	23,100	330
33,340	1 5/16	33,340	6,100	15,000	23,100	330
33,500		33,500	6,100	15,000	23,100	330
34,000		34,000	6,200	15,000	23,100	340
34,130	1 11/32	34,130	6,300	15,000	23,100	340
34,500		34,500	6,300	15,000	23,100	340
34,930		34,930	6,400	15,000	23,100	340
35,000		35,000	6,400	15,000	23,100	350
35,500		35,500	6,500	15,000	23,100	350
35,720	1 13/32	35,720	6,600	15,000	23,100	350
36,000		36,000	6,600	16,000	23,900	360
36,500		36,500	6,700	16,000	23,900	360
36,510	1 7/16	36,510	6,700	16,000	23,900	360
37,000		37,000	6,800	16,000	23,900	370
37,310	1 15/32	37,310	6,800	16,000	23,900	370
37,500		37,500	6,900	16,000	23,900	370
38,000		38,000	7,000	16,000	23,900	380

d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
38,100	1 1/2	38,100	7,000	16,000	23,900	380
38,500	1 33/64	38,500	7,100	16,000	23,900	380
39,000		39,000	7,100	16,000	23,900	390
39,500		39,500	7,200	16,000	23,900	390
40,000		40,000	7,300	16,000	23,900	400

Sistema di foratura SuperV

Inserti intercambiabili per SuperV-AP mini



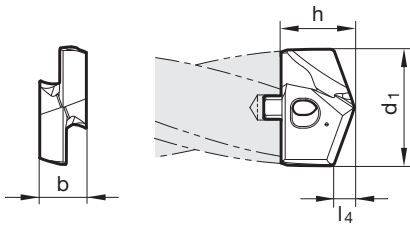
Catalogo n° 77011



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 36

- Assott. del noc. $\geq \varnothing 11,000$
- affilatura su piani
- 4 fasi di guida
- tagliente principale forma diritta (dopo correzione)
- vite di serraggio catalogo-Nr. 77020 inclusa
- specialmente per applicazioni con catalogo-Nr. 77007



d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
11,000		11,000	1,800	4,500	7,200	110
11,200		11,200	1,800	4,500	7,200	110
11,510	29/64	11,510	1,900	4,500	7,200	110
11,800		11,800	1,900	4,500	7,200	110
12,000		12,000	1,900	5,000	7,400	120
12,200		12,200	2,000	5,000	7,400	120
12,500		12,500	2,000	5,000	7,400	120
12,700	1/2	12,700	2,100	5,000	7,400	120
12,900		12,900	2,100	5,000	7,400	120
13,100	33/64	13,100	2,100	5,500	8,200	130
13,500		13,500	2,200	5,500	8,200	130
13,700		13,700	2,200	5,500	8,200	130
13,800		13,800	2,200	5,500	8,200	130
14,000		14,000	2,300	6,000	9,400	140
14,100		14,100	2,300	6,000	9,400	140
14,400		14,400	2,300	6,000	9,400	140
14,500		14,500	2,300	6,000	9,400	140
14,680	37/64	14,680	2,400	6,000	9,400	140
14,700		14,700	2,400	6,000	9,400	140
15,000		15,000	2,400	6,000	9,400	140
15,080	19/32	15,080	2,400	6,000	9,400	140
15,200		15,200	2,400	6,000	9,400	140
15,300		15,300	2,500	6,000	9,400	140
15,500		15,500	2,500	6,000	9,400	140
15,600		15,600	2,500	6,000	9,400	140
15,800		15,800	2,500	6,000	9,400	140
15,870	5/8	15,870	2,600	6,000	9,400	140
16,270	41/64	16,270	2,600	7,000	10,600	160
16,500		16,500	2,700	7,000	10,600	160
17,000		17,000	2,700	7,000	10,600	160
17,070	43/64	17,070	2,700	7,000	10,600	160
17,460	11/16	17,460	2,800	7,000	10,600	160
17,500		17,500	2,800	7,000	10,600	160
17,600		17,600	2,800	7,000	10,600	160
17,860	45/64	17,860	2,900	7,000	10,600	160
18,000		18,000	2,900	8,000	12,100	180
18,260	23/32	18,260	2,900	8,000	12,100	180
18,500		18,500	3,000	8,000	12,100	180
18,650	47/64	18,650	3,000	8,000	12,100	180
19,000		19,000	3,000	8,000	12,100	180
19,050	3/4	19,050	3,100	8,000	12,100	180
19,450	49/64	19,450	3,100	8,000	12,100	180
19,500		19,500	3,100	8,000	12,100	180
19,600		19,600	3,100	8,000	12,100	180
19,840	25/32	19,840	3,200	8,000	12,100	180
20,000		20,000	3,200	9,000	13,300	200
20,240	51/64	20,240	3,200	9,000	13,300	200
20,500		20,500	3,300	9,000	13,300	200

d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
20,640	13/16	20,640	3,300	9,000	13,300	200
21,000		21,000	3,400	9,000	13,300	200
21,030	53/64	21,030	3,400	9,000	13,300	200
21,100		21,100	3,400	9,000	13,300	200
21,500		21,500	3,400	9,000	13,300	200
22,000		22,000	3,500	10,000	14,800	220
22,500		22,500	3,600	10,000	14,800	220
23,000		23,000	3,700	10,000	14,800	220
23,420	59/64	23,420	3,700	10,000	14,800	220
23,810	15/16	23,810	3,800	10,000	14,800	220
24,100		24,100	3,800	11,000	15,300	240
24,500		24,500	3,900	11,000	15,300	240
25,000	63/64	25,000	4,000	11,000	15,300	240
25,500		25,500	4,100	11,000	15,300	240
25,700		25,700	4,100	11,000	15,300	240
26,190	1 1/32	26,190	4,200	12,000	19,400	260
26,500		26,500	4,200	12,000	19,400	260
27,500		27,500	4,400	12,000	19,400	260
27,700		27,700	4,400	12,000	19,400	260
28,000		28,000	4,500	13,000	20,100	280
28,180	1 7/64	28,180	4,500	13,000	20,100	280
28,580		28,580	4,600	13,000	20,100	280
29,000		29,000	4,600	13,000	20,100	280
29,500		29,500	4,700	13,000	20,100	280
30,000		30,000	4,800	14,000	21,700	300
30,500		30,500	4,900	14,000	21,700	300
30,960	1 7/32	30,960	4,900	14,000	21,700	300
31,500		31,500	5,000	14,000	21,700	300
31,750	1 1/4	31,750	5,100	14,000	21,700	300
32,500		32,500	5,200	15,000	22,400	320
32,540	1 9/32	32,540	5,200	15,000	22,400	320
33,340	1 5/16	33,340	5,300	15,000	22,400	320
33,500		33,500	5,300	15,000	22,400	320
34,000		34,000	5,400	15,000	22,400	320
34,130	1 11/32	34,130	5,400	15,000	22,400	320
34,500		34,500	5,500	15,000	22,400	320
34,930		34,930	5,600	15,000	22,400	320
35,000		35,000	5,600	15,000	22,400	320
35,500		35,500	5,600	15,000	22,400	320
36,000		36,000	5,700	16,000	23,200	360
36,500		36,500	5,800	16,000	23,200	360
36,510	1 7/16	36,510	5,800	16,000	23,200	360
37,000		37,000	5,900	16,000	23,200	360
37,310	1 15/32	37,310	5,900	16,000	23,200	360
37,500		37,500	6,000	16,000	23,200	360
38,000		38,000	6,000	16,000	23,200	360
38,100	1 1/2	38,100	6,100	16,000	23,200	360
38,500	1 33/64	38,500	6,100	16,000	23,200	360
39,000		39,000	6,200	16,000	23,200	360
39,500		39,500	6,300	16,000	23,200	360
40,000		40,000	6,400	16,000	23,200	360

Sistema di foratura SuperV

Porta utensili SuperV-AP maxi

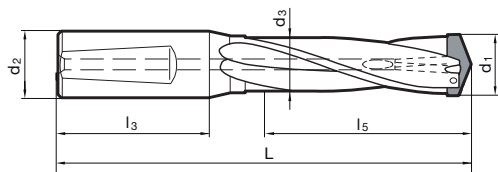


Catalogo n° 76000



Parametri di lav. ind. a pag. 46

- codolo rinforzato
- inserti intercambiabili, possono essere cambiati in macchina
- vite di serraggio catalogo n° 76020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



d1 mm	Codice	d2 mm	d3 mm	L mm	l3 mm	l5 mm	Grandezza
16,00-17,00	17,000	20,000	15,700	128,400	50,000	53,000	0.1
17,01-17,99	17,990	20,000	16,700	128,400	50,000	53,000	0.2
18,00-19,00	19,000	20,000	17,700	136,700	50,000	53,000	1.1
19,01-20,00	20,000	20,000	18,700	136,700	50,000	58,000	1.2
20,01-21,00	21,000	25,000	19,700	151,600	56,000	58,000	2.1
21,01-22,50	22,500	25,000	20,700	151,600	56,000	63,000	2.2
22,51-24,00	24,000	25,000	22,200	159,400	56,000	63,000	3.1
24,01-25,50	25,500	25,000	23,700	168,400	56,000	68,000	3.2
25,51-27,50	27,500	32,000	25,200	180,000	60,000	68,000	4.1
27,51-29,50	29,500	32,000	27,200	188,000	60,000	68,000	4.2
29,51-32,00	32,000	32,000	29,200	195,600	60,000	75,000	5.1
32,01-34,50	34,500	32,000	31,700	203,600	60,000	75,000	5.2
34,51-37,50	37,500	32,000	34,000	215,100	60,000	75,000	6.1
37,51-40,50	40,500	32,000	37,000	228,100	60,000	120,000	6.2

Sistema di foratura SuperV

Porta utensili SuperV-AP maxi

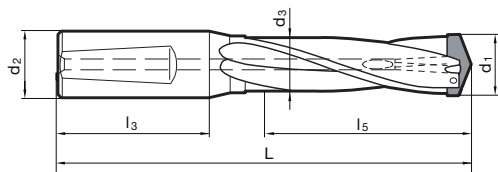


Catalogo n° 76001



Parametri di lav. ind. a pag. 48

- codolo rinforzato
- inserti intercambiabili, possono essere cambiati in macchina
- vite di serraggio catalogo n° 76020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



d1 mm	Codice	d2 mm	d3 mm	L mm	l3 mm	l5 mm	Grandezza
16,00-17,00	17,000	20,000	15,700	164,400	50,000	90,000	0.1
17,01-17,99	17,990	20,000	16,700	164,400	50,000	90,000	0.2
18,00-19,00	19,000	20,000	17,700	176,700	50,000	100,000	1.1
19,01-20,00	20,000	20,000	18,700	176,700	50,000	100,000	1.2
20,01-21,00	21,000	25,000	19,700	195,600	56,000	110,000	2.1
21,01-22,50	22,500	25,000	20,700	195,600	56,000	110,000	2.2
22,51-24,00	24,000	25,000	22,200	207,400	56,000	120,000	3.1
24,01-25,50	25,500	25,000	23,700	220,400	56,000	130,000	3.2
25,51-27,50	27,500	32,000	25,200	236,000	60,000	140,000	4.1
27,51-29,50	29,500	32,000	27,200	248,000	60,000	150,000	4.2
29,51-32,00	32,000	32,000	29,200	259,600	60,000	160,000	5.1
32,01-34,50	34,500	32,000	31,700	271,600	60,000	170,000	5.2
34,51-37,50	37,500	32,000	34,000	289,100	60,000	190,000	6.1
37,51-40,50	40,500	32,000	37,000	308,100	60,000	200,000	6.2

Sistema di foratura SuperV

Porta utensili SuperV-AP maxi

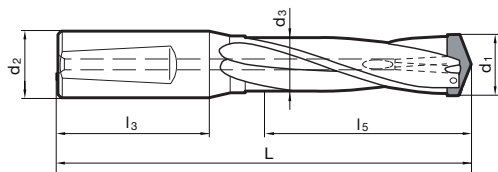


Catalogo n° 76003



Parametri di lav. ind. a pag. 50

- codolo rinforzato
- inserti intercambiabili, possono essere cambiati in macchina
- vite di serraggio catalogo n° 76020 inclusa
- cacciavite catalogo-Nr. 76021 incluso



d1 mm	Codice	d2 mm	d3 mm	L mm	l3 mm	l5 mm	Grandezza
16,00-17,00	17,000	20,000	15,700	194,000	50,000	126,000	0.1
17,01-17,99	17,990	20,000	16,700	194,000	50,000	126,000	0.2
18,00-19,00	19,000	20,000	17,700	210,000	50,000	140,000	1.1
19,01-20,00	20,000	20,000	18,700	210,000	50,000	140,000	1.2
20,01-21,00	21,000	25,000	19,700	232,200	56,000	154,000	2.1
21,01-22,50	22,500	25,000	20,700	232,200	56,000	154,000	2.2
22,51-24,00	24,000	25,000	22,200	247,000	56,000	168,000	3.1
24,01-25,50	25,500	25,000	23,700	264,000	56,000	182,000	3.2
25,51-27,50	27,500	32,000	25,200	282,400	60,000	196,000	4.1
27,51-29,50	29,500	32,000	27,200	298,400	60,000	210,000	4.2
29,51-32,00	32,000	32,000	29,200	312,400	60,000	224,000	5.1
32,01-34,50	34,500	32,000	31,700	328,400	60,000	238,000	5.2
34,51-37,50	37,500	32,000	34,000	350,000	60,000	266,000	6.1
37,51-40,50	40,500	32,000	37,000	375,000	60,000	280,000	6.2

Sistema di foratura SuperV

Inseri intercambiabili per SuperV-AP maxi



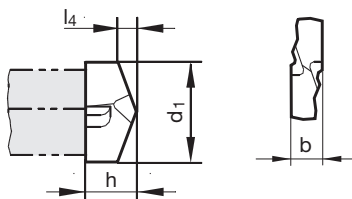
Catalogo n° 76011



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 46-50

- spoglia sul cono tagliente
- tagliente principale forma concava
- vite di serraggio catalogo n° 76020 inclusa



d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
16,000		16,000	3,000	4,500	8,000	0.1
16,500		16,500	3,100	4,500	8,000	0.1
17,000		17,000	3,100	4,500	8,000	0.1
17,500		17,500	3,200	4,500	8,000	0.2
18,000		18,000	3,300	5,000	8,000	1.1
18,500		18,500	3,400	5,000	8,000	1.1
19,000		19,000	3,500	5,000	8,000	1.1
19,500		19,500	3,600	5,000	8,000	1.2
20,000		20,000	3,700	5,000	8,000	1.2
20,500		20,500	3,800	5,500	8,800	2.1
21,000		21,000	3,900	5,500	8,800	2.1
21,500		21,500	4,000	5,500	8,800	2.2
22,000		22,000	4,100	5,500	8,800	2.2
22,500		22,500	4,100	5,500	8,800	2.2
23,000		23,000	4,200	6,300	10,000	3.1
23,500		23,500	4,300	6,300	10,000	3.1
24,000		24,000	4,400	6,300	10,000	3.1
24,500		24,500	4,500	6,300	10,000	3.2
25,000	63/64	25,000	4,600	6,300	10,000	3.2
25,500		25,500	4,700	6,300	10,000	3.2
26,000		26,000	4,800	7,300	11,600	4.1
26,500		26,500	4,900	7,300	11,600	4.1
27,000		27,000	5,000	7,300	11,600	4.1
27,500		27,500	5,100	7,300	11,600	4.1
28,000		28,000	5,100	7,300	11,600	4.2
28,500		28,500	5,200	7,300	11,600	4.2
29,000		29,000	5,300	7,300	11,600	4.2
29,500		29,500	5,400	7,300	11,600	4.2
30,000		30,000	5,500	8,500	13,600	5.1
30,500		30,500	5,600	8,500	13,600	5.1
31,000		31,000	5,700	8,500	13,600	5.1
31,500		31,500	5,800	8,500	13,600	5.1
32,000		32,000	5,900	8,500	13,600	5.1
32,500		32,500	6,000	8,500	13,600	5.2
33,000		33,000	6,100	8,500	13,600	5.2
33,500		33,500	6,100	8,500	13,600	5.2
34,000		34,000	6,200	8,500	13,600	5.2
34,500		34,500	6,300	8,500	13,600	5.2
35,000		35,000	6,400	10,000	16,000	6.1
36,000		36,000	6,600	10,000	16,000	6.1
37,000		37,000	6,800	10,000	16,000	6.1
37,500		37,500	6,900	10,000	16,000	6.1
38,000		38,000	7,000	10,000	16,000	6.2
39,000		39,000	7,100	10,000	16,000	6.2
40,000		40,000	7,300	10,000	16,000	6.2
40,500		40,500	7,400	10,000	16,000	6.2

Sistema di foratura SuperV

Inseri intercambiabili per SuperV-AP maxi



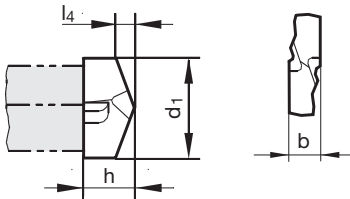
Catalogo n° 56011



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 46-50

- spoglia sul cono tagliente
- tagliente principale forma concava
- massima resistenza all'usura
- vite di serraggio catalogo n° 76020 inclusa



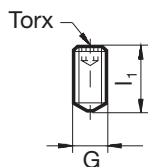
d1 mm	d1 inch	Codice	l4 mm	b mm	h mm	Grandezza
16,000		16,000	3,000	4,500	8,000	0.1
16,500		16,500	3,100	4,500	8,000	0.1
17,000		17,000	3,100	4,500	8,000	0.1
17,500		17,500	3,200	4,500	8,000	0.2
18,000		18,000	3,300	5,000	8,000	1.1
18,500		18,500	3,400	5,000	8,000	1.1
19,000		19,000	3,500	5,000	8,000	1.1
19,500		19,500	3,600	5,000	8,000	1.2
20,000		20,000	3,700	5,000	8,000	1.2
20,500		20,500	3,800	5,500	8,800	2.1
21,000		21,000	3,900	5,500	8,800	2.1
21,500		21,500	4,000	5,500	8,800	2.2
22,000		22,000	4,100	5,500	8,800	2.2
22,500		22,500	4,100	5,500	8,800	2.2
23,000		23,000	4,200	6,300	10,000	3.1
23,500		23,500	4,300	6,300	10,000	3.1
24,000		24,000	4,400	6,300	10,000	3.1
24,500		24,500	4,500	6,300	10,000	3.2
25,000	63/64	25,000	4,600	6,300	10,000	3.2
25,500		25,500	4,700	6,300	10,000	3.2
26,000		26,000	4,800	7,300	11,600	4.1
26,500		26,500	4,900	7,300	11,600	4.1
27,000		27,000	5,000	7,300	11,600	4.1
27,500		27,500	5,100	7,300	11,600	4.1
28,000		28,000	5,100	7,300	11,600	4.2
28,500		28,500	5,200	7,300	11,600	4.2
29,000		29,000	5,300	7,300	11,600	4.2
29,500		29,500	5,400	7,300	11,600	4.2
30,000		30,000	5,500	8,500	13,600	5.1
30,500		30,500	5,600	8,500	13,600	5.1
31,000		31,000	5,700	8,500	13,600	5.1
31,500		31,500	5,800	8,500	13,600	5.1
32,000		32,000	5,900	8,500	13,600	5.1
32,500		32,500	6,000	8,500	13,600	5.2
33,000		33,000	6,100	8,500	13,600	5.2
33,500		33,500	6,100	8,500	13,600	5.2
34,000		34,000	6,200	8,500	13,600	5.2
34,500		34,500	6,300	8,500	13,600	5.2
35,000		35,000	6,400	10,000	16,000	6.1
36,000		36,000	6,600	10,000	16,000	6.1
37,000		37,000	6,800	10,000	16,000	6.1
37,500		37,500	6,900	10,000	16,000	6.1
38,000		38,000	7,000	10,000	16,000	6.2
39,000		39,000	7,100	10,000	16,000	6.2
40,000		40,000	7,300	10,000	16,000	6.2
40,500		40,500	7,400	10,000	16,000	6.2

Sistema di foratura SuperV

Viti di serraggio



Catalogo n° 76020



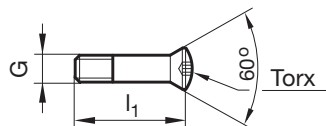
G	l1 mm	Torx	Codice
M 3X0,35	7,000	T6	3,000
M 3X0,35	6,000	T6	3,006
M 3,5X0,35	8,000	T7	3,500
M 4X0,5	9,000	T8	4,000
M 4,5X0,5	10,000	T8	4,500
M 5X0,5	11,000	T10	5,000

Sistema di foratura SuperV

Viti di serraggio



Catalogo n° 77020



G	l1 mm	Torx	Codice
M 2,2	9,500	T7	2,200
M 2,2	10,500	T7	2,201
M 2,5	11,400	T8	2,500
M 3	12,100	T9	3,000
M 3	13,100	T9	3,001
M 3,5	14,250	T10	3,500
M 4	16,000	T15	4,000
M 4,5	18,000	T15	4,500
M 5	19,750	T20	5,000
M 5	21,750	T20	5,001
M 5	23,400	T20	5,003
M 6	27,000	T25	6,000
M 6	28,500	T25	6,001
M 6	32,500	T25	6,002

Sistema di foratura SuperV

Chiavi dinamometriche



Catalogo n° 77022

Tipo	Codice	Torx	L mm	Mom. torcente Nm
A	2,000	1/4"	160,000	0,8...2
A	5,001	1/4"	160,000	1...5
A	8,000	1/4"	160,000	2...8

Sistema di foratura SuperV

Spine Torx



Catalogo n° 77021

Torx	L mm	kg	Codice
T6	25,000	0,040	6,000
T8	25,000	0,071	8,000
T10	25,000	0,112	10,000
T20	25,000	0,045	20,000

Sistema di foratura SuperV

Giravite Torx



Catalogo n° 76021

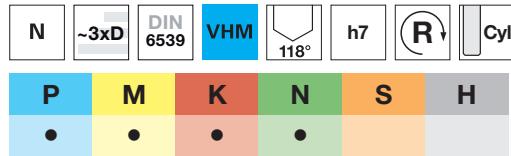
Torx	Codice	L mm
T6	6,000	42,000
T7	7,001	150,000
T8	8,000	48,000
T8	8,001	150,000
T9	9,001	150,000
T10	10,001	170,000
T15	15,000	54,000
T15	15,001	190,000
T20	20,000	57,000
T20	20,001	205,000
T25	25,000	60,000
T25	25,001	207,000

Punte in metallo duro

Punte elicoidali, extra corte

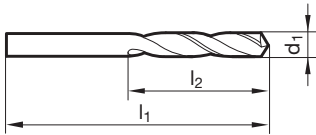


Catalogo n° 71184



Parametri di lav.
ind. a pag. 52

- Assott. del noc. $\geq \varnothing 2,100$
- affilatura su piani
- forma del tagliente principale dritta



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000	5,100		62,000	26,000
1,100		28,000	7,000	5,200		62,000	26,000
1,200		30,000	8,000	5,300		62,000	26,000
1,300		30,000	8,000	5,400		66,000	28,000
1,400		32,000	9,000	5,500		66,000	28,000
1,500		32,000	9,000	5,600		66,000	28,000
1,600		34,000	10,000	5,700		66,000	28,000
1,700		34,000	10,000	5,800		66,000	28,000
1,800		36,000	11,000	5,900		66,000	28,000
1,900		36,000	11,000	6,000		66,000	28,000
2,000		38,000	12,000	6,100		70,000	31,000
2,100		38,000	12,000	6,200		70,000	31,000
2,200		40,000	13,000	6,300		70,000	31,000
2,300		40,000	13,000	6,350	1/4	70,000	31,000
2,380	3/32	43,000	14,000	6,400		70,000	31,000
2,400		43,000	14,000	6,500		70,000	31,000
2,500		43,000	14,000	6,600		70,000	31,000
2,600		43,000	14,000	6,700		70,000	31,000
2,700		46,000	16,000	6,800		74,000	34,000
2,780	7/64	46,000	16,000	6,900		74,000	34,000
2,800		46,000	16,000	7,000		74,000	34,000
2,900		46,000	16,000	7,100		74,000	34,000
3,000		46,000	16,000	7,140	9/32	74,000	34,000
3,100		49,000	18,000	7,200		74,000	34,000
3,170	1/8	49,000	18,000	7,300		74,000	34,000
3,200		49,000	18,000	7,400		74,000	34,000
3,300		49,000	18,000	7,500		74,000	34,000
3,400		52,000	20,000	7,600		79,000	37,000
3,500		52,000	20,000	7,700		79,000	37,000
3,570	9/64	52,000	20,000	7,800		79,000	37,000
3,600		52,000	20,000	7,900		79,000	37,000
3,700		52,000	20,000	7,940	5/16	79,000	37,000
3,800		55,000	22,000	8,000		79,000	37,000
3,900		55,000	22,000	8,100		79,000	37,000
3,970	5/32	55,000	22,000	8,200		79,000	37,000
4,000		55,000	22,000	8,300		79,000	37,000
4,100		55,000	22,000	8,400		79,000	37,000
4,200		55,000	22,000	8,500		79,000	37,000
4,300		58,000	24,000	8,600		84,000	40,000
4,370	11/64	58,000	24,000	8,700		84,000	40,000
4,400		58,000	24,000	8,730	11/32	84,000	40,000
4,500		58,000	24,000	8,800		84,000	40,000
4,600		58,000	24,000	8,900		84,000	40,000
4,700		58,000	24,000	9,000		84,000	40,000
4,760	3/16	62,000	26,000	9,100		84,000	40,000
4,800		62,000	26,000	9,200		84,000	40,000
4,900		62,000	26,000	9,300		84,000	40,000
5,000		62,000	26,000	9,400		84,000	40,000

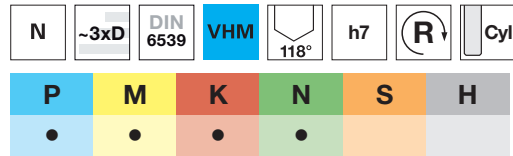
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
9,500		84,000	40,000	11,500		95,000	47,000
9,600		89,000	43,000	11,910	15/32	102,000	51,000
9,700		89,000	43,000	12,000		102,000	51,000
9,800		89,000	43,000	13,000		102,000	51,000
9,900		89,000	43,000	15,000		111,000	56,000
10,000		89,000	43,000				
10,100		89,000	43,000				
10,200		89,000	43,000				
10,300		89,000	43,000				
10,500		89,000	43,000				
11,000		95,000	47,000				
11,110	7/16	95,000	47,000				

Punte in metallo duro

Punte elicoidali, extra corte

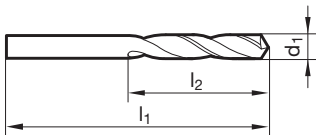


Catalogo n° 51184



Parametri di lav.
ind. a pag. 52

- Assott. del noc. $\geq \varnothing 2,100$
- affilatura su piani
- forma del tagliente principale diritta
- massima resistenza all'usura



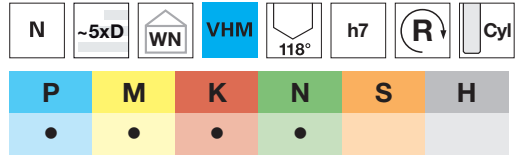
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000	5,800		66,000	28,000
1,100		28,000	7,000	5,900		66,000	28,000
1,200		30,000	8,000	6,000		66,000	28,000
1,300		30,000	8,000	6,100		70,000	31,000
1,400		32,000	9,000	6,200		70,000	31,000
1,500		32,000	9,000	6,300		70,000	31,000
1,600		34,000	10,000	6,400		70,000	31,000
1,700		34,000	10,000	6,500		70,000	31,000
1,800		36,000	11,000	6,600		70,000	31,000
1,900		36,000	11,000	6,700		70,000	31,000
2,000		38,000	12,000	6,800		74,000	34,000
2,100		38,000	12,000	6,900		74,000	34,000
2,200		40,000	13,000	7,000		74,000	34,000
2,300		40,000	13,000	7,100		74,000	34,000
2,400		43,000	14,000	7,200		74,000	34,000
2,500		43,000	14,000	7,300		74,000	34,000
2,600		43,000	14,000	7,400		74,000	34,000
2,700		46,000	16,000	7,500		74,000	34,000
2,800		46,000	16,000	7,600		79,000	37,000
2,900		46,000	16,000	7,700		79,000	37,000
3,000		46,000	16,000	7,800		79,000	37,000
3,100		49,000	18,000	7,900		79,000	37,000
3,200		49,000	18,000	8,000		79,000	37,000
3,300		49,000	18,000	8,100		79,000	37,000
3,400		52,000	20,000	8,200		79,000	37,000
3,500		52,000	20,000	8,300		79,000	37,000
3,600		52,000	20,000	8,400		79,000	37,000
3,700		52,000	20,000	8,500		79,000	37,000
3,800		55,000	22,000	8,600		84,000	40,000
3,900		55,000	22,000	8,700		84,000	40,000
4,000		55,000	22,000	8,800		84,000	40,000
4,100		55,000	22,000	8,900		84,000	40,000
4,200		55,000	22,000	9,000		84,000	40,000
4,300		58,000	24,000	9,100		84,000	40,000
4,400		58,000	24,000	9,200		84,000	40,000
4,500		58,000	24,000	9,300		84,000	40,000
4,600		58,000	24,000	9,400		84,000	40,000
4,700		58,000	24,000	9,500		84,000	40,000
4,800		62,000	26,000	9,600		89,000	43,000
4,900		62,000	26,000	9,700		89,000	43,000
5,000		62,000	26,000	9,800		89,000	43,000
5,100		62,000	26,000	9,900		89,000	43,000
5,200		62,000	26,000	10,000		89,000	43,000
5,300		62,000	26,000	10,200		89,000	43,000
5,400		66,000	28,000	10,500		89,000	43,000
5,500		66,000	28,000	11,000		95,000	47,000
5,600		66,000	28,000	11,500		95,000	47,000
5,700		66,000	28,000	12,000		102,000	51,000

Punte in metallo duro

Punte elicoidali, corte

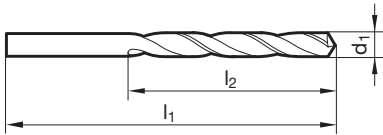


Catalogo n° 71290



Parametri di lav.
ind. a pag. 52

- Assott. del noc. $\geq \varnothing 2,100$
- affilatura su piani
- forma del tagliente principale dritta



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,100		86,000	52,000
1,100		36,000	14,000	5,160	13/64	86,000	52,000
1,200		38,000	16,000	5,200		86,000	52,000
1,300		38,000	16,000	5,300		86,000	52,000
1,400		40,000	18,000	5,400		93,000	57,000
1,500		40,000	18,000	5,500		93,000	57,000
1,600		43,000	20,000	5,560	7/32	93,000	57,000
1,700		43,000	20,000	5,600		93,000	57,000
1,800		46,000	22,000	5,700		93,000	57,000
1,900		46,000	22,000	5,800		93,000	57,000
2,000		49,000	24,000	5,900		93,000	57,000
2,100		49,000	24,000	5,950	15/64	93,000	57,000
2,200		53,000	27,000	6,000		93,000	57,000
2,300		53,000	27,000	6,100		101,000	63,000
2,380	3/32	57,000	30,000	6,200		101,000	63,000
2,400		57,000	30,000	6,300		101,000	63,000
2,500		57,000	30,000	6,350	1/4	101,000	63,000
2,600		57,000	30,000	6,400		101,000	63,000
2,700		61,000	33,000	6,500		101,000	63,000
2,780	7/64	61,000	33,000	6,600		101,000	63,000
2,800		61,000	33,000	6,700		101,000	63,000
2,900		61,000	33,000	6,800		109,000	69,000
3,000		61,000	33,000	6,900		109,000	69,000
3,100		65,000	36,000	7,000		109,000	69,000
3,170	1/8	65,000	36,000	7,100		109,000	69,000
3,200		65,000	36,000	7,140	9/32	109,000	69,000
3,300		65,000	36,000	7,200		109,000	69,000
3,400		70,000	39,000	7,300		109,000	69,000
3,500		70,000	39,000	7,400		109,000	69,000
3,570	9/64	70,000	39,000	7,500		109,000	69,000
3,600		70,000	39,000	7,600		117,000	75,000
3,700		70,000	39,000	7,700		117,000	75,000
3,800		75,000	43,000	7,800		117,000	75,000
3,900		75,000	43,000	7,900		117,000	75,000
3,970	5/32	75,000	43,000	7,940	5/16	117,000	75,000
4,000		75,000	43,000	8,000		117,000	75,000
4,100		75,000	43,000	8,100		117,000	75,000
4,200		75,000	43,000	8,200		117,000	75,000
4,300		80,000	47,000	8,300		117,000	75,000
4,370	11/64	80,000	47,000	8,400		117,000	75,000
4,400		80,000	47,000	8,500		117,000	75,000
4,500		80,000	47,000	8,600		125,000	81,000
4,600		80,000	47,000	8,700		125,000	81,000
4,700		80,000	47,000	8,730	11/32	125,000	81,000
4,760	3/16	86,000	52,000	8,800		125,000	81,000
4,800		86,000	52,000	8,900		125,000	81,000
4,900		86,000	52,000	9,000		125,000	81,000
5,000		86,000	52,000	9,100		125,000	81,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
9,200		125,000	81,000	11,000		142,000	94,000
9,300		125,000	81,000	11,110	7/16	142,000	94,000
9,400		125,000	81,000	11,500		142,000	94,000
9,500		125,000	81,000	11,910	15/32	151,000	101,000
9,600		133,000	87,000	12,000		151,000	101,000
9,700		133,000	87,000				
9,800		133,000	87,000				
9,900		133,000	87,000				
10,000		133,000	87,000				
10,200		133,000	87,000				
10,300		133,000	87,000				
10,500		133,000	87,000				

Punte in metallo duro

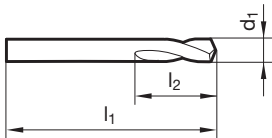
Punte cilindriche per centri CN



Catalogo n° 71190

N	WN	VHM	lucido	90°	h6	R	HA
P	M	K	N	S	H		
•	•	•	•	•			

- affilatura su piani
- adatte solo per centrare



d1 mm	l1 mm	l2 mm
5,000	62,000	14,000
6,000	66,000	16,000
8,000	79,000	21,000
10,000	89,000	25,000
12,000	102,000	30,000
16,000	115,000	37,500

d1 mm	l1 mm	l2 mm
20,000	131,000	45,000

Punte in metallo duro

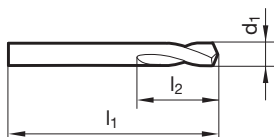
Punte cilindriche per centri CN



Catalogo n° 71191

N	WN	VHM	lucido	120°	h6	R	HA
P	M	K	N	S	H		
•	•	•	•	•			

- affilatura su piani
- adatte solo per centrare



d1 mm	l1 mm	l2 mm
5,000	62,000	14,000
6,000	66,000	16,000
8,000	79,000	21,000
10,000	89,000	25,000
12,000	102,000	30,000
16,000	115,000	37,500

d1 mm	l1 mm	l2 mm
20,000	131,000	45,000

Punte in metallo duro

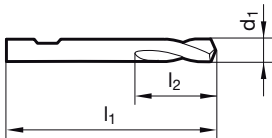
Punte cilindriche per centri CN



Catalogo n° 71189

N	WN	VHM	lucido	142°	h6	R	HB
P	M	K	N	S	H		
•	•	•	•	•			

- affilatura su piani
- adatte solo per centrare
- da gambo Ø 6 mm con dispositivo di bloccaggio



d1 mm	l1 mm	l2 mm
4,000	55,000	12,000
5,000	62,000	14,000
6,000	66,000	16,000
8,000	79,000	21,000
10,000	89,000	25,000
12,000	102,000	30,000

d1 mm	l1 mm	l2 mm
16,000	115,000	37,500
20,000	131,000	45,000

Punte in metallo duro

Punte speciali, con taglienti in MD



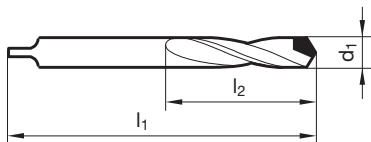
Catalogo n° 71180



P	M	K	N	S	H
○		○	○		

Parametri di lav.
ind. a pag. 52

- Assott. del nocch. $\geq \varnothing 3,000$
- affilatura su piani
- con riporti in MD



d1 mm	l1 mm	l2 mm
3,000	50,000	20,000
3,500	56,000	25,000
4,000	56,000	25,000
4,500	63,000	28,000
5,000	63,000	28,000
5,500	71,000	32,000
6,000	71,000	32,000
6,500	71,000	32,000
7,000	80,000	40,000
7,500	80,000	40,000
8,000	80,000	40,000
8,500	90,000	50,000
9,000	90,000	50,000
9,500	90,000	50,000
10,000	100,000	56,000
10,500	100,000	56,000
11,000	100,000	56,000
11,500	112,000	63,000

d1 mm	l1 mm	l2 mm
12,000	112,000	63,000
13,000	112,000	63,000
14,000	125,000	71,000
14,500	125,000	71,000
15,000	125,000	71,000
16,000	140,000	80,000
20,000	160,000	90,000

Punte in metallo duro

Punte speciali, con taglienti in MD

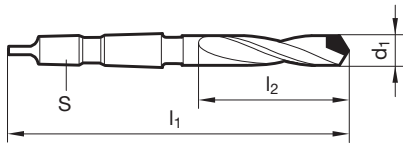


Catalogo n° 71380

N	DIN 8041	HM	lucido	118°	h8	R	MK
P	M	K	N	S	H		
○		●	○	○	○		

Parametri di lav. ind. a pag. 52

- Assott. del nocc. $\geq \varnothing 11,000$
- affilatura su piani
- con riporti in MD



d1 mm	S	l1 mm	l2 mm
11,000	MK-1	140,000	50,000
12,500	MK-1	146,000	56,000
13,000	MK-1	146,000	56,000
13,500	MK-2	168,000	63,000
14,000	MK-2	168,000	63,000
15,000	MK-2	168,000	63,000
15,500	MK-2	175,000	70,000
16,000	MK-2	175,000	70,000
17,000	MK-2	175,000	70,000
17,500	MK-2	185,000	80,000
18,000	MK-2	185,000	80,000
20,000	MK-3	215,000	90,000

d1 mm	S	l1 mm	l2 mm
21,000	MK-3	215,000	90,000
22,000	MK-3	215,000	90,000
28,000	MK-4	260,000	110,000
30,000	MK-4	275,000	125,000
33,000	MK-4	290,000	140,000

Punte a centrare VHM

Punte a centrare senza piano

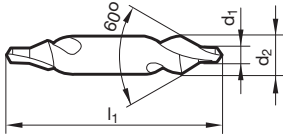


Catalogo n° 71616



P	M	K	N	S	H
●	○	●	●	○	

- Assott. del noc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per fori a centrare secondo DIN 332, foglio 1, forma A



d1 mm	d2 mm	l1 mm
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000

d1 mm	d2 mm	l1 mm
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-AL



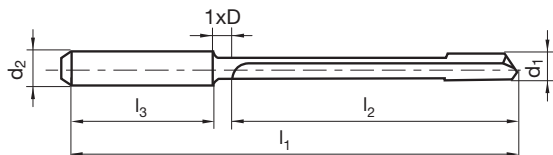
Catalogo n° 55027



P	M	K	N	S	H
•	•	•	•	•	

Parametri di lav.
ind. a pag. 56

- forma tagliente G
- punta in metallo duro con attacco in metallo duro integrale e parte terminale conica MMS da $d1 = 3$ mm e $d2 = 6$ mm
- uso universale



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
2,380	4,000	100,000	70,000	28,000	2,380
2,500	4,000	115,000	85,000	28,000	2,500
2,780	4,000	115,000	85,000	28,000	2,780
3,000	6,000	145,000	105,000	36,000	3,000
3,170	6,000	145,000	105,000	36,000	3,170
3,500	6,000	145,000	105,000	36,000	3,500
3,970	6,000	160,000	120,000	36,000	3,970
4,000	6,000	160,000	120,000	36,000	4,000
5,000	6,000	220,000	180,000	36,000	5,000
5,560	6,000	220,000	180,000	36,000	5,560
6,000	6,000	220,000	180,000	36,000	6,000
6,350	8,000	260,000	210,000	36,000	6,350
7,000	8,000	260,000	210,000	36,000	7,000
7,140	8,000	285,000	240,000	36,000	7,140
8,000	8,000	285,000	240,000	36,000	8,000
9,000	10,000	350,000	300,000	40,000	9,000
10,000	10,000	350,000	300,000	40,000	10,000
11,000	12,000	420,000	360,000	45,000	11,000
12,000	12,000	420,000	360,000	45,000	12,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-AL



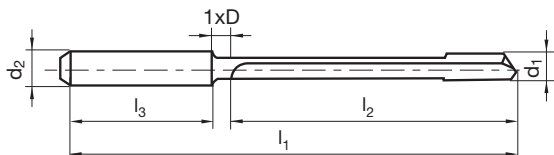
Catalogo n° 55028



P	M	K	N	S	H
•	•	•	•	•	•

Parametri di lav.
ind. a pag. 56

- forma tagliente G
- punta in metallo duro con attacco in metallo duro integrale e parte terminale conica MMS da $d1 = 3$ mm e $d2 = 6$ mm
- uso universale



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
2,380	4,000	160,000	130,000	28,000	2,380
2,500	4,000	185,000	155,000	28,000	2,500
2,780	4,000	185,000	155,000	28,000	2,780
3,000	6,000	230,000	190,000	36,000	3,000
3,170	6,000	230,000	190,000	36,000	3,170
3,500	6,000	230,000	190,000	36,000	3,500
3,970	6,000	260,000	220,000	36,000	3,970
4,000	6,000	260,000	220,000	36,000	4,000
5,000	6,000	370,000	330,000	36,000	5,000
5,560	6,000	370,000	330,000	36,000	5,560
6,000	6,000	370,000	330,000	36,000	6,000
6,350	8,000	430,000	385,000	36,000	6,350
7,000	8,000	430,000	385,000	36,000	7,000
7,140	8,000	485,000	440,000	36,000	7,140
8,000	8,000	485,000	440,000	36,000	8,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-AL



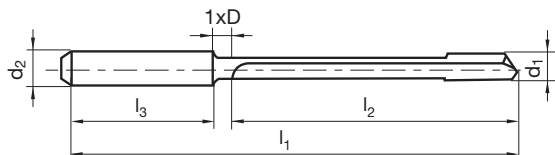
Catalogo n° 55029



P	M	K	N	S	H
•	•	•	•	•	

Parametri di lav.
ind. a pag. 56

- forma tagliente G
- punta in metallo duro con attacco in metallo duro integrale e parte terminale conica MMS da $d1 = 3$ mm e $d2 = 6$ mm
- uso universale



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
2,380	4,000	220,000	190,000	28,000	2,380
2,500	4,000	255,000	220,000	28,000	2,500
2,780	4,000	255,000	220,000	28,000	2,780
3,000	6,000	320,000	280,000	36,000	3,000
3,170	6,000	320,000	280,000	36,000	3,170
3,500	6,000	320,000	280,000	36,000	3,500
3,970	6,000	360,000	320,000	36,000	3,970
4,000	6,000	360,000	320,000	36,000	4,000
5,000	6,000	525,000	485,000	36,000	5,000
5,560	6,000	525,000	485,000	36,000	5,560
6,000	6,000	525,000	485,000	36,000	6,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-N

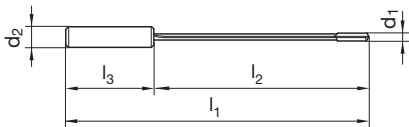


Catalogo n° 75018

SuperT-N	20xD	WN	HM	TiN	h5	R	HA
P	M	K	N	S	H		
•	•	•	•				

Parametri di lav.
ind. a pag. 56

- con rompitrucciolo
- forma tagliente G



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
4,000	12,000	150,000	100,000	45,000	4,000
4,200	12,000	160,000	110,000	45,000	4,200
4,500	12,000	170,000	120,000	45,000	4,500
5,000	16,000	180,000	130,000	48,000	5,000
5,500	16,000	190,000	140,000	48,000	5,500
6,000	16,000	210,000	160,000	48,000	6,000
6,500	16,000	220,000	170,000	48,000	6,500
7,000	16,000	235,000	185,000	48,000	7,000
8,000	16,000	260,000	210,000	48,000	8,000
9,000	16,000	280,000	230,000	48,000	9,000
10,000	20,000	320,000	260,000	50,000	10,000
12,000	20,000	370,000	310,000	50,000	12,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-N

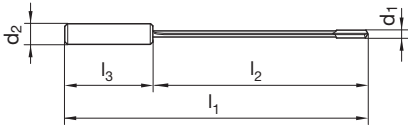


Catalogo n° 75017

SuperT-N	30xD	WN	HM	TiN	h5	R	HA
P	M	K	N	S	H		
•	•	•	•				

Parametri di lav.
ind. a pag. 56

- con rompitrucolo
- forma tagliente G



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
4,000	12,000	200,000	155,000	45,000	4,000
4,200	12,000	210,000	165,000	45,000	4,200
4,500	12,000	220,000	175,000	45,000	4,500
5,000	16,000	230,000	182,000	48,000	5,000
5,500	16,000	245,000	197,000	48,000	5,500
6,000	16,000	260,000	212,000	48,000	6,000
6,500	16,000	275,000	227,000	48,000	6,500
7,000	16,000	290,000	242,000	48,000	7,000
8,000	16,000	320,000	272,000	48,000	8,000
9,000	16,000	350,000	302,000	48,000	9,000
10,000	20,000	400,000	350,000	50,000	10,000
12,000	20,000	450,000	400,000	50,000	12,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-N

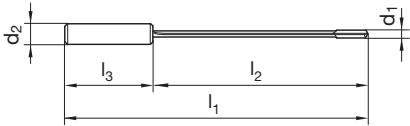


Catalogo n° 75022

SuperT-N	40xD	WN	HM	TiN	h5	R	HA
P	M	K	N	S	H		
•	•	•	•				

Parametri di lav.
ind. a pag. 56

- con rompitruciolo
- forma tagliente G



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
4,000	12,000	230,000	185,000	45,000	4,000
4,200	12,000	240,000	195,000	45,000	4,200
4,500	12,000	250,000	205,000	45,000	4,500
5,000	16,000	280,000	232,000	48,000	5,000
5,500	16,000	300,000	252,000	48,000	5,500
6,000	16,000	320,000	272,000	48,000	6,000
6,500	16,000	340,000	292,000	48,000	6,500
7,000	16,000	370,000	322,000	48,000	7,000
8,000	16,000	420,000	372,000	48,000	8,000
9,000	16,000	450,000	402,000	48,000	9,000
10,000	20,000	510,000	460,000	50,000	10,000
12,000	20,000	600,000	550,000	50,000	12,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-N

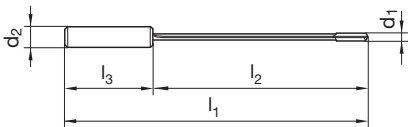


Catalogo n° 75023

SuperT-N	80xD	WN	HM	TiN	h5	R	HA
P	M	K	N	S	H		
•	•	•	•				

Parametri di lav.
ind. a pag. 56

- con rompitrucolo
- forma tagliente G
- profondità di foratura massima per ogni utensile 40xD, per profondità di foratura maggiori utilizzare prima le punte a catalogo-Nr. 75022
- per materiali a truciolo lungo



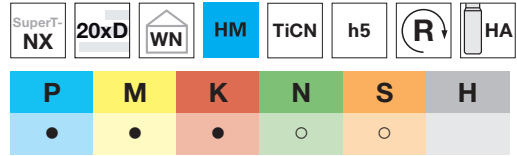
d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
4,950	16,000	480,000	432,000	48,000	4,950
5,950	16,000	560,000	512,000	48,000	5,950
7,950	16,000	740,000	692,000	48,000	7,950
9,950	20,000	910,000	860,000	50,000	9,950
11,950	20,000	1080,000	1030,000	50,000	11,950

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-NX



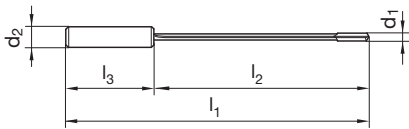
Catalogo n° 55018



P	M	K	N	S	H
●	●	●	○	○	○

Parametri di lav.
ind. a pag. 56

- forma tagliente G
- per acciai legati e altamente legati



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
3,970	10,000	150,000	100,000	40,000	3,970
4,000	12,000	150,000	100,000	45,000	4,000
5,000	16,000	180,000	130,000	48,000	5,000
5,156	16,000	180,000	130,000	48,000	5,156
6,000	16,000	210,000	160,000	48,000	6,000
6,350	16,000	220,000	170,000	48,000	6,350
7,000	16,000	235,000	185,000	48,000	7,000
7,938	16,000	260,000	210,000	48,000	7,938
8,000	16,000	260,000	210,000	48,000	8,000
9,000	16,000	280,000	230,000	48,000	9,000
9,525	16,000	290,000	240,000	48,000	9,525
10,000	20,000	320,000	260,000	50,000	10,000
11,000	20,000	340,000	290,000	50,000	11,000
11,113	20,000	340,000	290,000	50,000	11,113
12,000	20,000	370,000	310,000	50,000	12,000
12,700	20,000	385,000	330,000	50,000	12,700

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-NX



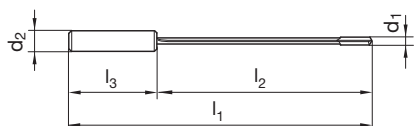
Catalogo n° 55017



P	M	K	N	S	H
●	●	●	○	○	○

Parametri di lav.
ind. a pag. 56

- forma tagliente G
- per acciai legati e altamente legati



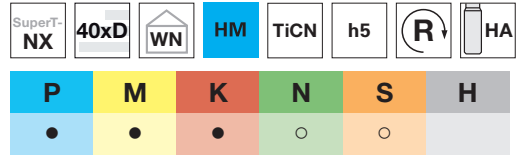
d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
3,970	10,000	200,000	155,000	40,000	3,970
4,000	12,000	200,000	155,000	45,000	4,000
5,000	16,000	230,000	182,000	48,000	5,000
5,156	16,000	230,000	182,000	48,000	5,156
6,000	16,000	260,000	212,000	48,000	6,000
6,350	16,000	275,000	227,000	48,000	6,350
7,000	16,000	290,000	242,000	48,000	7,000
7,938	16,000	320,000	272,000	48,000	7,938
8,000	16,000	320,000	272,000	48,000	8,000
9,000	16,000	350,000	302,000	48,000	9,000
9,525	16,000	380,000	330,000	48,000	9,525
10,000	20,000	400,000	350,000	50,000	10,000
11,000	20,000	430,000	380,000	50,000	11,000
11,113	20,000	430,000	380,000	50,000	11,113
12,000	20,000	450,000	400,000	50,000	12,000
12,700	20,000	500,000	450,000	50,000	12,700

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-NX

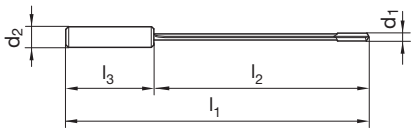


Catalogo n° 55022



Parametri di lav.
ind. a pag. 56

- forma tagliente G
- per acciai legati e altamente legati



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
3,970	10,000	230,000	185,000	40,000	3,970
4,000	12,000	230,000	185,000	45,000	4,000
5,000	16,000	280,000	232,000	48,000	5,000
5,156	16,000	280,000	232,000	48,000	5,156
6,000	16,000	320,000	272,000	48,000	6,000
6,350	16,000	340,000	292,000	48,000	6,350
7,000	16,000	370,000	322,000	48,000	7,000
7,938	16,000	420,000	372,000	48,000	7,938
8,000	16,000	420,000	372,000	48,000	8,000
9,000	16,000	450,000	402,000	48,000	9,000
9,525	16,000	480,000	432,000	48,000	9,525
10,000	20,000	510,000	460,000	50,000	10,000
11,000	20,000	550,000	500,000	50,000	11,000
11,113	20,000	550,000	500,000	50,000	11,113
12,000	20,000	600,000	550,000	50,000	12,000
12,700	20,000	635,000	585,000	50,000	12,700

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente SuperT-NX



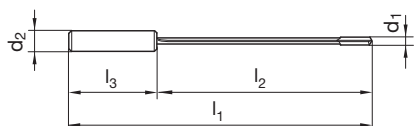
Catalogo n° 55023



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 56

- forma tagliente G
- profondità di foratura massima per ogni utensile 40xD, per profondità di foratura maggiori utilizzare prima le punte a catalogo-Nr. 75022
- per acciai legati e altamente legati



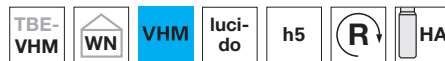
d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
4,950	16,000	480,000	432,000	48,000	4,950
5,106	16,000	480,000	432,000	48,000	5,106
5,950	16,000	560,000	512,000	48,000	5,950
6,300	16,000	590,000	542,000	48,000	6,300
6,950	16,000	650,000	602,000	48,000	6,950
7,888	16,000	740,000	692,000	48,000	7,888
7,950	16,000	740,000	692,000	48,000	7,950
8,950	16,000	820,000	772,000	48,000	8,950
9,475	16,000	870,000	822,000	48,000	9,475
9,950	20,000	910,000	860,000	50,000	9,950
10,950	20,000	995,000	945,000	50,000	10,950
11,063	20,000	995,000	945,000	50,000	11,063
11,950	20,000	1080,000	1030,000	50,000	11,950
12,650	20,000	1140,000	1090,000	50,000	12,650

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente TBE-VHM



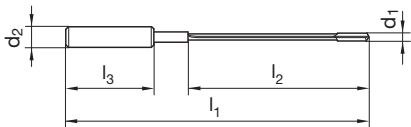
Catalogo n° 75024



P	M	K	N	S	H
•	•	•	•	○	

Parametri di lav.
ind. a pag. 56

- lunghezza elica 45 mm
- forma tagliente G
- uso universale



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
1,200	4,000	90,000	45,000	28,000	1,200
1,500	4,000	90,000	45,000	28,000	1,500
1,600	4,000	90,000	45,000	28,000	1,600
2,000	4,000	90,000	45,000	28,000	2,000
2,500	10,000	100,000	45,000	40,000	2,500
2,700	10,000	100,000	45,000	40,000	2,700
3,000	10,000	100,000	45,000	40,000	3,000
3,200	10,000	100,000	45,000	40,000	3,200

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente TBE-VHM



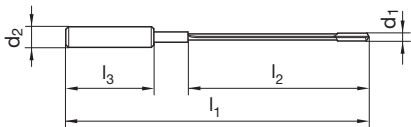
Catalogo n° 55024



P	M	K	N	S	H
●	●	●	●	○	○

Parametri di lav.
ind. a pag. 56

- lunghezza elica 45 mm
- forma tagliente G
- per acciai legati e altamente legati



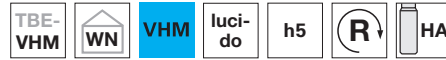
d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
2,000	4,000	90,000	45,000	28,000	2,000
2,500	10,000	100,000	45,000	40,000	2,500
2,700	10,000	100,000	45,000	40,000	2,700
3,000	10,000	100,000	45,000	40,000	3,000
3,200	10,000	100,000	45,000	40,000	3,200

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente TBE-VHM



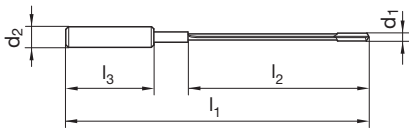
Catalogo n° 75020



P	M	K	N	S	H
●	●	○	○	○	

Parametri di lav.
ind. a pag. 56

- lunghezza elica 80 mm
- forma tagliente G
- uso universale



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
1,200	4,000	125,000	80,000	28,000	1,200
1,500	4,000	125,000	80,000	28,000	1,500
1,600	4,000	125,000	80,000	28,000	1,600
2,000	4,000	125,000	80,000	28,000	2,000
2,500	10,000	135,000	80,000	40,000	2,500
2,700	10,000	135,000	80,000	40,000	2,700
3,000	10,000	135,000	80,000	40,000	3,000
3,200	10,000	135,000	80,000	40,000	3,200
3,500	10,000	135,000	80,000	40,000	3,500
4,000	10,000	135,000	80,000	40,000	4,000
4,200	10,000	135,000	80,000	40,000	4,200
4,500	10,000	135,000	80,000	40,000	4,500
5,000	10,000	135,000	80,000	40,000	5,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente TBE-VHM



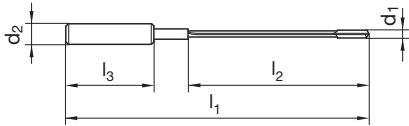
Catalogo n° 55020



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 56

- lunghezza elica 80 mm
- forma tagliente G
- per acciai legati e altamente legati



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
2,000	4,000	125,000	80,000	28,000	2,000
2,500	10,000	135,000	80,000	40,000	2,500
2,700	10,000	135,000	80,000	40,000	2,700
3,000	10,000	135,000	80,000	40,000	3,000
3,200	10,000	135,000	80,000	40,000	3,200
3,500	10,000	135,000	80,000	40,000	3,500
4,000	10,000	135,000	80,000	40,000	4,000
4,200	10,000	135,000	80,000	40,000	4,200
4,500	10,000	135,000	80,000	40,000	4,500
5,000	10,000	135,000	80,000	40,000	5,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente TBE-VHM



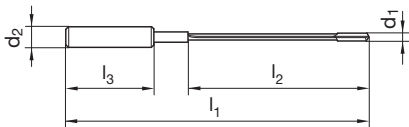
Catalogo n° 75026



P	M	K	N	S	H
●	●	○	●	○	

Parametri di lav.
ind. a pag. 56

- lunghezza elica 120 mm
- forma tagliente G
- uso universale



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
1,500	4,000	165,000	120,000	28,000	1,500
1,600	4,000	165,000	120,000	28,000	1,600
2,000	4,000	165,000	120,000	28,000	2,000
2,500	10,000	175,000	120,000	40,000	2,500
2,700	10,000	175,000	120,000	40,000	2,700
3,000	10,000	175,000	120,000	40,000	3,000
3,200	10,000	175,000	120,000	40,000	3,200
3,500	10,000	175,000	120,000	40,000	3,500
4,000	10,000	175,000	120,000	40,000	4,000
4,200	10,000	175,000	120,000	40,000	4,200
4,500	10,000	175,000	120,000	40,000	4,500
5,000	10,000	175,000	120,000	40,000	5,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente TBE-VHM



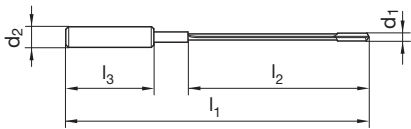
Catalogo n° 55026



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 56

- lunghezza elica 120 mm
- forma tagliente G
- per acciai legati e altamente legati



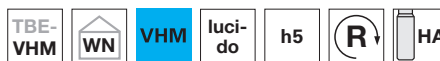
d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
2,000	4,000	165,000	120,000	28,000	2,000
2,500	10,000	175,000	120,000	40,000	2,500
2,700	10,000	175,000	120,000	40,000	2,700
3,000	10,000	175,000	120,000	40,000	3,000
3,200	10,000	175,000	120,000	40,000	3,200
3,500	10,000	175,000	120,000	40,000	3,500
4,000	10,000	175,000	120,000	40,000	4,000
4,200	10,000	175,000	120,000	40,000	4,200
4,500	10,000	175,000	120,000	40,000	4,500
5,000	10,000	175,000	120,000	40,000	5,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente TBE-VHM



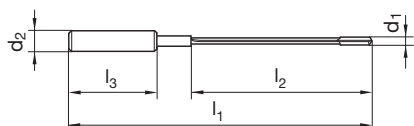
Catalogo n° 75021



P	M	K	N	S	H
●	●	○	●	○	

Parametri di lav.
ind. a pag. 56

- lunghezza elica 160 mm
- forma tagliente G
- uso universale



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
1,500	4,000	205,000	160,000	28,000	1,500
1,600	4,000	205,000	160,000	28,000	1,600
2,000	4,000	205,000	160,000	28,000	2,000
2,500	10,000	215,000	160,000	40,000	2,500
2,700	10,000	215,000	160,000	40,000	2,700
3,000	10,000	215,000	160,000	40,000	3,000
3,200	10,000	215,000	160,000	40,000	3,200
3,500	10,000	215,000	160,000	40,000	3,500
4,000	10,000	215,000	160,000	40,000	4,000
4,200	10,000	215,000	160,000	40,000	4,200
4,500	10,000	215,000	160,000	40,000	4,500
5,000	10,000	215,000	160,000	40,000	5,000
6,000	16,000	225,000	160,000	48,000	6,000
8,000	16,000	225,000	160,000	48,000	8,000

Punte a cannone ad 1 tagliente

Punte a cannone ad 1 tagliente TBE-VHM



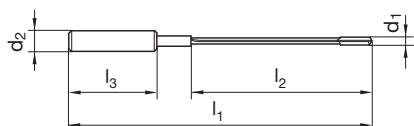
Catalogo n° 55021



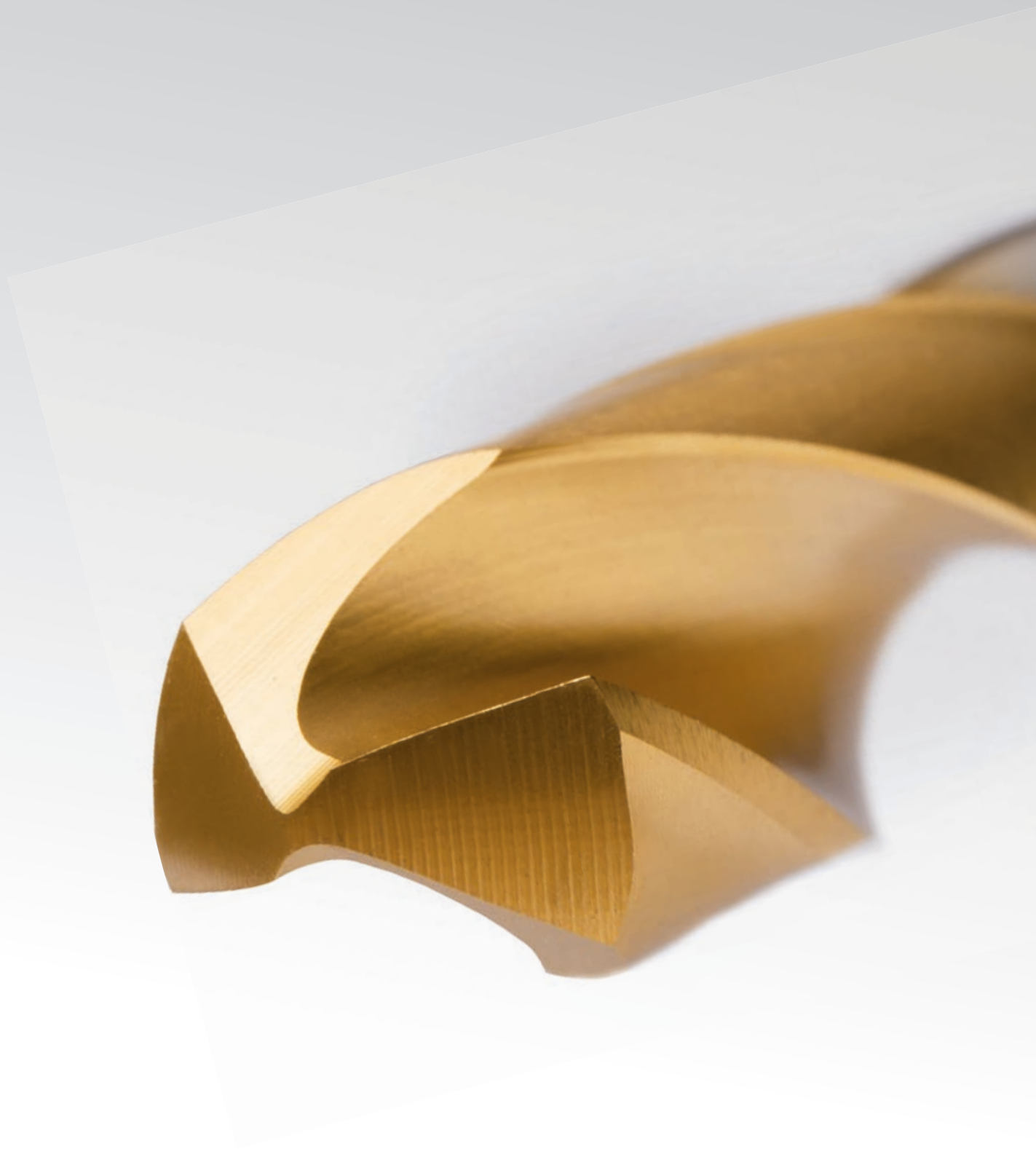
P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 56

- lunghezza elica 160 mm
- forma tagliente G
- per acciai legati e altamente legati



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	Codice
2,000	4,000	205,000	160,000	28,000	2,000
2,500	10,000	215,000	160,000	40,000	2,500
2,700	10,000	215,000	160,000	40,000	2,700
3,000	10,000	215,000	160,000	40,000	3,000
3,200	10,000	215,000	160,000	40,000	3,200
3,500	10,000	215,000	160,000	40,000	3,500
4,000	10,000	215,000	160,000	40,000	4,000
4,200	10,000	215,000	160,000	40,000	4,200
4,500	10,000	215,000	160,000	40,000	4,500
5,000	10,000	215,000	160,000	40,000	5,000
6,000	16,000	225,000	160,000	48,000	6,000
8,000	16,000	225,000	160,000	48,000	8,000





HSS

PUNTE ELICOIDALI



CODICI ISO

P	acciaio, acciaio legato in alta percentuale
M	acciaio inossidabile
K	ghisa grigia, ghisa sferoidale e ghisa malleabile
N	alluminio ed altri metalli non ferrosi
S	leghe speciali, superleghe e leghe di titanio
H	acciaio temprato e ghisa temprata

Nelle pagine successive, contenenti programma, trovate per ciascun utensile consigli sull' idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata



LEGENDA DEI PITTOGRAMMI

MATERIALE TAGLIANTE	HSS	M42	HSS-Co	HSS-E-PM	HSS-Co8						
TRATT. DI SUPERFICIE	lucido	trattati a vapore	TiN - testa	TiN	TiAlN nano	Facetas nitruradas					
TOLLERANZA SUL Ø	h6	h8	-0,004								
PROFONDITÀ DI FORO	~3xD	~5xD	~10xD	~15xD	~20xD	~25xD	<5xD	>25xD			
DIREZIONE DI TAGLIO											
	a destra	a sinistra									
FORMA DEL CODOLO											
			Conico Morse								
ANGOLI DI AFFILATURA											
NORMA	DIN 1897	DIN 338	DIN 339	DIN 1869	DIN 1899	DIN 345	DIN 346	DIN 341	DIN 344	DIN 1870	
	DIN 8374	DIN 8378	DIN 8376	DIN 8379	DIN 8377	DIN 333	DIN 343	DIN 340			
											Norma di fabbrica
TIPO	N	NX	V97	V-PM	VX	V72	H	V66			
	V66 Ti	V70	V73	V63	V73-IK	N-IK	V70-IK	V63-IK			

P	M	K	N	S	H	Tipo	Direzione di taglio	Angolo di affilatura °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte elicoidali, extra corte

						N	destra	118	HSS	lucido	DIN 1897	0,500 - 32,000	71110	190
						N	sinistra	118	HSS	lucido	DIN 1897	0,500 - 32,000	71111	192
						N	destra	118	HSS	trattati a vapore	DIN 1897	2,000 - 27,000	71108	194
						N	sinistra	118	HSS	trattati a vapore	DIN 1897	2,600 - 26,500	71109	196
						N	destra	118	HSS	TiN	DIN 1897	1,000 - 13,100	61118	197
						N	destra	135	M42	lucido	DIN 1897	1,000 - 10,000	71106	199
						NX	destra	118	HSS-Co	lucido	DIN 1897	1,000 - 14,000	71220	200
						NX	destra	118	HSS-Co	TiN	DIN 1897	1,000 - 14,000	61220	202
						V97	destra	130	HSS-Co	TiAlN nano	DIN 1897	2,000 - 16,000	51159	204
						V-PM	destra	130	HSS-E-PM	TiN	DIN 1897	1,000 - 14,000	61131	205
						VX	destra	118	HSS-Co	trattati a vapore	DIN 1897	1,000 - 10,000	71112	206
						VX	destra	118	HSS-Co	TiN	DIN 1897	1,000 - 12,500	61112	207
						V72	destra	118	HSS	lucido	Norma di fab.	1,000 - 16,000	71114	209
						V72	sinistra	118	HSS	lucido	Norma di fab.	1,000 - 16,000	71113	210

Punte elicoidali, corte

						N	destra	118	HSS	lucido	DIN 338	0,200 - 16,000	71116	212
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P	M	K	N	S	H	Tipo	Direzione di taglio	Angolo di affilatura °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte elicoidali, corte

		N	sinistra	118	HSS	lucido	DIN 338	2,800 - 13,500	71119	214
		N	destra	118	HSS	trattati a vapore	DIN 338	2,000 - 20,000	71115	215
		N	destra	118	HSS	TiN	DIN 338	1,000 - 16,000	61116	218
		N	destra	118	HSS	TiN - testa	DIN 338	1,000 - 16,000	61115	220
		N	destra	118	HSS-Co	trattati a vapore	DIN 338	1,000 - 15,000	71149	222
		N	destra	135	M42	lucido	DIN 338	1,000 - 16,000	71148	224
		H	destra	118	HSS	lucido	DIN 338	1,000 - 12,000	71117	226
		NX	destra	118	HSS-Co	lucido	DIN 338	1,000 - 14,000	71221	228
		NX	destra	118	HSS-Co	TiN	DIN 338	1,000 - 14,000	61221	230
		V66	destra	130	HSS-Co	fasi nitrurate	DIN 338	0,800 - 13,500	71123	232
		V66 Ti	destra	130	HSS-Co	lucido	DIN 338	1,000 - 16,000	71122	234
		V66 Ti	destra	130	HSS-Co	TiN	DIN 338	1,000 - 13,500	61223	236
		V66 Ti	destra	130	HSS-Co	TiAlN nano	DIN 338	2,000 - 13,000	51122	238
		V70	destra	130	HSS	lucido	DIN 338	1,500 - 15,500	71124	239
		V70	sinistra	130	HSS	lucido	DIN 338	1,500 - 16,000	71126	241
		V70	destra	130	HSS	TiN	DIN 338	1,500 - 16,000	61124	243

P	M	K	N	S	H	Tipo	Direzione di taglio	Angolo di affilatura °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte elicoidali, corte

	•	•	○	○	○	V70	destra	130	HSS-Co	fasi nitrate	DIN 338	1,500 - 13,000	71158	245
	•	•	○	○	○	V63	destra	130	HSS-Co	TiN	DIN 338	1,500 - 13,000	61158	247
	•	○	○	○	○	V72	destra	118	HSS	lucido	DIN 338	0,550 - 13,000	71128	248
	•	○	○	○	○	V72	sinistra	118	HSS	lucido	DIN 338	0,500 - 12,800	71129	250
	•	○	○	○	○	V97	destra	130	HSS-Co	TiAlN nano	DIN 338	1,000 - 13,000	51158	251
	○	○	○	○	○	V-PM	destra	130	HSS-E-PM	TiN	DIN 338	1,000 - 14,000	61232	253

Serie di punte



•	•	•	•	○	○	NX	destra	118	HSS-Co	lucido	DIN 338		79012	254
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•	•	•	•	○	○	N	destra	118	HSS	trattati a vapore	DIN 338		78879	254
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○	•	○	○	○	○	N	destra	118	HSS	TiN - testa	DIN 338		78880	255
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P	M	K	N	S	H	Tipo	Direzione di taglio	Angolo di affilatura °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Serie di punte



												Norma di fab.	78877	256
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												Norma di fab.	78878	256
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Punte con codolo rinforzato



•	•	•	•	•	•	NX	destra	118	HSS-Co	TiN	Norma di fab.	2,000 - 20,000	61120	257
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•	•	•	•	•	•	NX	destra	118	HSS-Co	TiN	Norma di fab.	2,000 - 20,000	61121	259
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•	•	•	•	•	•	V-PM	destra	130	HSS-E-PM	TiAlN nano	Norma di fab.	2,000 - 13,000	51132	261
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Punte corte, con codolo cil. Ø 16,0 mm



•	•	•	•	•	•	V72	destra	118	HSS-Co	lucido	Norma di fab.	16,000 - 30,000	71168	262
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Punte corte, con codolo cil. Ø 25,4 mm



•	•	•	•	•	•	V72	destra	118	HSS-Co	lucido	Norma di fab.	28,000 - 40,000	71169	263
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Punte per foratura con bussola di guida



•	•	•	•	•	•	N	destra	118	HSS	trattati a vapore	DIN 339	1,000 - 19,500	71130	264
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P	M	K	N	S	H	Tipo	Direzione di taglio	Angolo di affilatura °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte elicoidali, lunghe

		N	destra	118	HSS	lucido	DIN 340	0,500 - 16,500	71136	265
		N	destra	118	HSS	trattati a vapore	DIN 340	1,800 - 20,000	71135	266
		N	destra	118	HSS	TiN	DIN 340	1,000 - 16,000	61136	268
		NX	destra	118	HSS-Co	lucido	DIN 340	1,000 - 14,000	71222	270
		NX	destra	118	HSS-Co	TiN	DIN 340	1,000 - 14,000	61222	272
		V66	destra	130	HSS-Co	lucido	DIN 340	1,000 - 13,000	71225	274
		V70	destra	130	HSS	lucido	DIN 340	1,500 - 12,000	71150	275
		V70	sinistra	130	HSS	lucido	DIN 340	1,500 - 13,000	71152	276
		V70	destra	130	HSS	TiN	DIN 340	2,000 - 12,000	61150	277
		V73	destra	130	HSS	fasi nitrate	DIN 340	1,500 - 12,700	71154	278
		V73	destra	130	HSS-Co	fasi nitrate	DIN 340	1,500 - 13,000	71156	280

Punte elicoidali in lunghezze speciali, grandezza 1

		V63	destra	130	HSS	fasi nitrate	DIN 1869	2,000 - 13,000	71145	282
		V63	destra	130	HSS-Co	fasi nitrate	DIN 1869	3,000 - 12,700	71192	284

Punte elicoidali in lunghezze speciali, grandezza 2

		V63	destra	130	HSS	fasi nitrate	DIN 1869	3,000 - 13,000	71146	285
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P	M	K	N	S	H	Tipo	Direzione di taglio	Angolo di affilatura °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte elicoidali in lunghezze speciali, grandezza 2



•	○	•	•	•	•	V63	destra	130	HSS-Co	fasi nitrate	DIN 1869	3,000 - 12,000	71193	286
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Punte elicoidali in lunghezze speciali, grandezza 3



•	•	•	•	•	•	V63	destra	130	HSS	fasi nitrate	DIN 1869	3,500 - 13,000	71147	287
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Punte elicoidali, extra lunghe



•	•	•	•	•	•	V63	destra	130	HSS	fasi nitrate	Norma di fab.	6,000 - 12,000	71195	288
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•	•	•	•	•	•	V63	destra	130	HSS	lucido	Norma di fab.	8,000 - 12,000	71196	289
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Punte con fori di refrigerazione



•	•	•	•	•	•	V73-IK	destra	130	HSS	lucido	Norma di fab.	3,000 - 13,000	71584	290
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Micropunte



•	•	•	•	•	•	N	destra	118	HSS-E-PM	lucido	DIN 1899	0,050 - 1,450	71187	291
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Punte cilindriche per centri CN



•	•	•	•	•	•	N	destra	90	HSS	lucido	Norma di fab.	3,000 - 25,400	71175	293
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•	•	•	•	•	•	N	destra	90	HSS	TiN	Norma di fab.	3,000 - 25,000	61175	294
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•	•	•	•	•	•	N	destra	120	HSS	lucido	Norma di fab.	3,000 - 25,400	71176	295
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P	M	K	N	S	H	Tipo	Direzione di taglio	Angolo di affilatura °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte elicoidali, corte

	•	•	○	○	○	N	destra	130	HSS-Co8	lucido	Norma di fab.	10,000 - 25,500	71303	296
	•	•	○	○	○	N	destra	130	HSS-Co8	lucido	Norma di fab.	12,000 - 30,000	71304	297

Punte elicoidali

	•	•	•	•	○	N	destra	118	HSS	trattati a vapore	DIN 345	3,750 - 68,000	71300	298
	•	○	•	•	○	N	destra	118	HSS-Co	trattati a vapore	DIN 345	5,000 - 33,000	71416	301
	•	•	•	•	○	V70	destra	130	HSS	lucido	DIN 345	7,940 - 32,000	71305	302
	•	•	•	•	○	V66 Ti	destra	130	HSS-Co	lucido	DIN 345	8,500 - 32,000	71312	303
	•	•	•	•	○	V66 Ti	destra	130	HSS-Co	lucido	DIN 346	11,000 - 29,000	71313	304

Punte per foratura con bussola di guida

	•	•	•	•	○	N	destra	118	HSS	trattati a vapore	DIN 341	6,000 - 45,000	71320	305
	•	•	•	•	○	V70	destra	130	HSS	lucido	DIN 341	8,000 - 44,000	71322	306

Punte elicoidali in lunghezze speciali, grandezza 1

	•	•	•	•	○	V63	destra	130	HSS	fasi nitrate	DIN 1870	8,000 - 30,000	71325	307
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Punte elicoidali in lunghezze speciali, grandezza 2

	•	•	•	•	○	V63	destra	130	HSS	fasi nitrate	DIN 1870	8,000 - 43,000	71326	308
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P	M	K	N	S	H	Tipo	Direzione di taglio	Angolo di affilatura °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte con fori di refrigerazione



•	○	•	○			N-IK	destra	118	HSS	trattati a vapore	Norma di fab.	10,000 - 40,000	71554	309
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Punte elicoidali lunghe con refrigerazione interna



•		•	•			V70-IK	destra	130	HSS-Co	trattati a vapore	Norma di fab.	14,500 - 32,000	71550	310
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•		•	•			V70-IK	destra	130	HSS-Co	trattati a vapore	Norma di fab.	8,000 - 31,500	71553	311
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Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.



•	○	•	○	○		V63-IK	destra	130	HSS-Co	trattati a vapore	Norma di fab.	14,500 - 31,500	71565	312
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•	○	•	○	○		V63-IK	destra	130	HSS-Co	trattati a vapore	Norma di fab.	8,000 - 14,000	71567	313
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•	○	•	○	○		V63-IK	destra	130	HSS-Co	trattati a vapore	Norma di fab.	14,500 - 32,000	71566	314
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•	○	•	○	○		V63-IK	destra	130	HSS-Co	trattati a vapore	Norma di fab.	8,000 - 31,500	71568	315
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Alimentatori per punte con fori di refrigerazione



											Norma di fab.		71560	316
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P	M	K	N	S	H	Tipo	Direzione di taglio	Angolo di svasatura °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte a gradino ad eliche indipendenti, cil.



•		•				N	destra	90	HSS	trattati a vapore	DIN 8374	6,000 - 19,000	71501	317
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•		•				N	destra	90	HSS	trattati a vapore	DIN 8378	3,400 - 13,500	71503	318
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•		•				N	destra	180	HSS	trattati a vapore	DIN 8376	6,000 - 18,000	71500	319
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Punte a gradino ad eliche indipendenti, CM



•		•				N	destra	90	HSS	trattati a vapore	DIN 8379	9,000 - 22,000	71523	320
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•		•				N	destra	180	HSS	trattati a vapore	DIN 8377	11,000 - 26,000	71520	321
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P	M	K	N	S	H	Tipo	Direzione di taglio	Forma	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Punte a centrare senza piano

		N	destra	A	HSS	lucido	DIN 333	0,500 - 12,500	71600	322
		N	sinistra	A	HSS	lucido	DIN 333	0,500 - 8,000	71601	323
		N	destra	R	HSS	lucido	DIN 333	0,500 - 10,000	71602	324
		N	destra	R	HSS	TiN	DIN 333	0,800 - 6,300	61602	325
		N	destra	A	HSS	lucido	DIN 333	1,000 - 6,300	71605	326
		N	destra	B	HSS	lucido	DIN 333	1,000 - 6,300	71604	327

Punte a centrare con piano

		N	destra	A	HSS	lucido	DIN 333	1,600 - 6,300	71607	328
		N	destra	R	HSS	lucido	DIN 333	1,600 - 8,000	71609	329

P	M	K	N	S	H	Tipo	Direzione di taglio	Angolo di affilatura °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Allargatori cilindrici



•		•				N	destra	120	HSS	trattati a vapore	DIN 344	4,800 - 16,000	72200	330
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Allargatori con attacco cono morse



•		•				N	destra	120	HSS	trattati a vapore	DIN 343	9,000 - 48,600	72210	331
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Parametri di lavoro indicativi per punte

Serie d'avanzamento											
Lettera d'identi.	A	B	C	D	E	F	G	H	I		
Diametro utensile mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	Avanzamenti f (mm/giri)
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160	
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200	
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

R a destra
(tutti gli articoli con questo simbolo sono destri)

L a sinistra

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

≤3×D Prof. di foro

Catalogo n°	71108	71110	71114
	71109 <small>L</small>	71111 <small>L</small>	71113 <small>L</small>
Mat. da taglio	HSS	HSS	HSS
Superficie	luc./vap.	lucida	lucida
DIN/Forma	1897	1897	a norma
Tipo	N	N	V72
Pagina	194/196	190/192	209/210

61118
HSS
TiN
1897
N
197

71112	71168	71169	71303 71304	71106
HSS-Co	HSS-Co	HSS-Co	HSS-Co8	M42
luc./vap.	lucida	lucida	lucida	lucida
1897	a norma	a norma	a norma	1897
VX	V72	V72	N	N
206	262	263	296/297	199



v _c m/min	Codice d'avanzamento		
27	F	F	F
22	E	E	E
30	F	F	F
30	E	E	E
25	E	E	E
25	E	E	E
30	F	F	F
16	D	D	
30	F	F	F
30	F	F	F
25	F	F	F
20	F	F	F
70			G
70			G
50	G	G	G
50	F	F	F
70	F	F	F
60	E	E	E
40	E	E	E
30	D	D	D
25	D	D	D
15	D	D	D
18	D	D	D
28	E	E	E

v _c m/min	Codice d'avanz.
30	F
24	E
33	F
33	E
28	E
28	E
25	D
22	D
33	F
20	D
14	D
18	D
33	F
33	F
28	F
22	F
80	F
65	E
75	E
45	E
33	D
27	D
16	D
15	D
22	D
36	E

v _c m/min	Codice d'avanzamento				
35	E				E
30	E				E
40	E				E
40	E	E	E		E
40	E				E
40	E				E
35	D	D	D	D	D
20	D	D	D	D	D
16	C	C	C	C	C
36	F				F
20	D	D	D	D	C
15	C	C	C	C	C
16	D	D	D	D	C
12	C	C	C	C	C
15	D	D	D	D	C
12	C	C	C	C	C
15	C	C	C	C	C
8	B	B	B	B	B
4	A			A	A
18	D	D	D		C
14	C	C	C	C	C
16	C	C	C	C	C
35	F				E
30	F				E
30	F				E
25	F				E
10	C			C	C
8	A	A	A	A	A
10	B			B	B
6	B			B	B
90					G
90					G
80					G
70					F
70					F
40					E
60					E
40					E
35	D				D
30	D				D
20	D				D
15	D				D
20	D	D	D		D
30					D

≤3×D Prof. di foro

Catalogo n°	61112	51159	61120	71220	61220	61131	71187
Mat. da taglio	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-E-PM	HSS-E-PM
Superficie	TiN	TiAlN	TiN	lucida	TiN	TiN	lucida
DIN/Forma	1897	1897	a norma	1897	1897	1897	1899
Tipo	VX	V97	NX	NX	NX	V-PM	N
Pagina	207	204	257	200	202	205	291



v _c m/min	Codice d'avanz.	v _c m/min	Codice d'avanz.	v _c m/min	Codice d'avanz.	v _c m/min	Codice d'avanz.	v _c m/min	Codice d'avanz.	v _c m/min	Codice d'avanz.	v _c m/min	Codice d'avanz.
38	E	42	F	45	F	35	F	45	F	40	F	21	F
33	D	36	E	35	E	30	E	35	E	32	E	18	E
44	E	48	G	50	F	40	F	50	F	45	F	18	F
38	E	42	F	40	F	30	F	40	F	40	E	16	E
44	E	48	F	40	F	32	F	44	F	42	F	20	E
44	E	48	F	44	F	28	F	44	F	40	E	18	E
38	D	42	E	40	E	20	E	40	E	28	D	14	D
27	D	30	E	27	D	15	D	27	D	25	D	14	D
22	C	24	D	22	C	13	C	22	C	20	C	12	C
44	D	48	D	44	F	30	F	44	F	40	D	18	F
22	D	24	E	22	D	16	D	22	D	22	D	14	D
18	C	20	D	18	C	12	C	18	C	18	C	12	C
22	D	24	E	22	D	15	D	22	D	20	D	14	D
18	C	20	D	16	C	10	C	16	C	15	C	12	C
19	D	21	E	20	D	15	D	20	D	21	D	16	D
14	C	16	D	15	C	10	C	15	C	16	C	14	C
14	C	17	D	13	C	10	C	13	C	15	C	14	C
9	B	11	C							12	B	8	B
4	A												
20	D	17	D	20	D	14	D	20	D	15	D	18	D
15	C	12	C	16	D	10	D	16	D	10	C	14	C
18	C	14	C	18	D	12	D	18	D	12	C	16	C
40	F	50	G	45	F	36	F	45	F	50	F	26	F
35	F	45	G	40	F	30	F	40	F	40	F	22	F
33	F	36	G	40	F	30	F	40	F	44	F	18	F
27	F	29	G	30	F	22	F	30	F	32	F	22	F
12	C	10	D							8	C		
6	B												
11	B												
7	B												
				70	G	50	G	70	G				
				70	G	50	G	70	G				
				85	G	65	G	85	G			26	G
				70	F	60	F	70	F			18	F
				80	F	60	F	80	F			75	F
				96	F	80	E	80	E	80	E	42	E
				84	F	77	E	45	E	77	E		
				48	F	44	E	30	E	44	E	60	E
45	E	50	E	50	D	36	D	50	D	50	E	22	D
40	D	45	E	40	D	30	D	40	D	45	D	18	D
23	D	25	E	32	D	30	D	32	D	40	D	13	D
17	D	20	E	28	D	25	D	28	D	32	D		
		24	E	25	D	20	D	25	D	25	D	16	D
		30	E	25	D	15	D	25	D			18	D

Parametri di lavoro indicativi per punte

Serie d'avanzamento											
Lettera d'identi.	A	B	C	D	E	F	G	H	I		
Diametro utensile mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	Avanzamenti f (mm/giri)
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160	
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200	
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250		

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

R a destra
(tutti gli articoli con questo simbolo sono destri)

L a sinistra

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185 (St33), 1.0486 P275N (StE285), 1.0345 P235GH (H1), 1.0425 P265GH (H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100 (GG10), 0.6020 EN-GJL-200 (GG20) 0.6025 EN-GJL-250 (GG25), 0.6035 EN-GJL-350 (GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7 (GGG50), 0.8035 EN-GJMW-350-4 (GTW35) 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

≤5×D Prof. di foro

Catalogo n°	71116	71115	71300	71117	71124	71305	71128
Mat. da taglio	HSS	HSS	HSS	HSS	HSS	HSS	HSS
Superficie	lucida	luc./vap.	vap.	lucida	lucida	lucida	lucida
DIN/Forma	338	338	345	338	338	345	338
Tipo	N	N	N	H	V70	V70	V72
Pagina	212/214	215	298	226	239/241	302	248/250

61116	61124
HSS	HSS
TiN	TiN
338	338
N	V70
218	243

61115
HSS
testa TiN
338
N
220

61223
HSS-Co
TiN
338
V66 Ti
236



v _c m/min	Codice d'avanzamento					
27	F	F	F	F	F	F
22	E	E	E	E	E	E
30	F	F	F	F	F	F
30	E	E	E	E	E	E
25	E	E	E	E	E	E
25	E	E	E	E	E	E
30	F	F	F	F	F	F
16	D	D	D	D	D	D
30	F	F	F	G	G	F
30	F	F	F	F	F	F
25	F	F	F	F	F	F
25	F	F	F	F	F	F
80				G	G	G
80				G	G	G
70	G	G	G	G	G	G
70	F	F	F	F	F	F
50	F	F	F	F	F	F
50	E	E	E	F	F	E
70				F	F	E
40	E	E	E	F	F	E
30	D	D	D	D	D	D
25	D	D	D	D	D	D
15	D	D	D	D	D	D
18	D	D	D	D	D	D
28	E	E	E	E	E	E

v _c m/min	Codice d'avanzamento	
30	F	F
24	E	E
33	F	F
33	E	E
28	E	E
28	E	E
25	D	D
22	D	D
33	F	F
20	D	D
14	D	D
18	D	D
33	F	G
33	F	F
28	F	F
22	F	F
80	F	F
65	E	E
75	E	E
45	E	E
33	D	D
27	D	D
16	D	D
15	D	D
22	D	D
36	E	E

v _c m/min	Codice d'avanz.
30	F
24	E
33	F
33	E
28	E
28	E
25	D
22	D
33	F
20	D
14	D
18	D
33	F
33	F
28	F
22	F
80	F
65	E
75	E
45	E
33	D
27	D
16	D
15	D
22	D
36	E

v _c m/min	Codice d'avanz.
22	C
14	C
9	B
20	D
15	C
18	C
12	C
6	B
11	B
7	B
17	D

Parametri di lavoro indicativi per punte

Serie d'avanzamento											
Lettera d'identi.	A	B	C	D	E	F	G	H	I		
Diametro utensile mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	Avanzamenti f (mm/giri)
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160	
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200	
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		<input checked="" type="checkbox"/>
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		<input checked="" type="checkbox"/>
a truciolo lungo	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

≤5×D Prof. di foro

Catalogo n°	71416	71149	71158	71123	71122	71312	71313	71148	71221	61221
Mat. da taglio	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	M42	HSS-Co	HSS-Co
Superficie	vap.	luc./vap.	fase nitr.	luc./fase nitr.	lucida	lucida	lucida	lucida	lucida	TiN
DIN/Forma	345	338	338	338	338	345	346	338	338	338
Tipo	N	N	V70	V66	V66 Ti	V66 Ti	V66 Ti	N	NX	NX
Pagina	301	222	245	232	234	303	304	224	228	230



v _c m/min	Codice d'avanzamento								v _c m/min	Codice d'avanz.	v _c m/min	Codice d'avanz.	
35	E	E							E	35	F	45	F
30	E	E							E	30	E	35	E
40	E	E							E	40	F	50	F
40	E	E	E						E	30	F	40	F
40	E	E							E	32	F	44	F
40	E	E	E						E	28	F	44	F
35	D	D	D						E	20	E	40	E
20	D	D	D						D	15	D	27	D
16	C	C	C	C	C	C	C	C	C	13	C	22	C
36	F	F		F	F	F	F	F	F	30	F	44	F
20	D	D	D						C	16	D	22	D
15	C	C	C	C	C	C	C	C	C	12	C	18	C
16	D	D	D						C	15	D	22	D
12	C	C	C	C	C	C	C	C	C	10	C	16	C
15	D	D	D						C	15	D	20	D
12	C	C	C	C	C	C	C	C	C	10	C	15	C
15	C	C	C	C	C	C	C	C	C	10	C	13	C
8	B	B		B	B	B	B	B	B				
4									A				
18	D	D	D	D	D	D	D	D	C	14	D	20	D
14	C	C		C	C	C	C	C	C	10	D	16	D
16	C	C	C	C	C	C	C	C	C	12	D	18	D
35	F	F	F						E	36	F	45	F
30	F	F	F						E	30	F	40	F
30	F	F	F						E	30	F	40	F
28	F	F	F						E	22	F	30	F
10	C	C	C	C	C	C	C	C	C				
8				A	A	A	A	A	A				
10				B	B	B	B	B	B				
6				B	B	B	B	B	B				
90									G	50	G	70	G
90									G	50	G	70	G
80			G						G	65	G	85	G
70			F						F	60	F	70	F
70									F	60	F	70	F
40	E	E	E						E	25	E	80	E
60									E	70	E	77	E
40	E	E	E						E	30	E	44	E
35	D	D							D	36	D	50	D
33	D	D							D	30	D	40	D
20	D	D	D						D	30	D	32	D
15	D	D	D						D	25	D	28	D
20	D	D	D						D	20	D	25	D
										15	D	27	D

Parametri di lavoro indicativi per punte

Serie d'avanzamento											
Lettera d'identi.	A	B	C	D	E	F	G	H	I		
Diametro utensile mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	Avanzamenti f (mm/giri)
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160	
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200	
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMw-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		<input checked="" type="checkbox"/>
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Parametri di lavoro indicativi per punte

Lettera d'identi.		Serie d'avanzamento									
		A	B	C	D	E	F	G	H	I	
Diametro utensile mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019	Avanzamenti f (mm/giri)
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025	
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160	
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200	
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315	
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400	
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630	
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800	
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250	

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

R a destra
(tutti gli articoli con questo simbolo sono destri)

L a sinistra

Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Acciai inossidabili, solforati	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤850		<input checked="" type="checkbox"/>
austenitici	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤850		<input checked="" type="checkbox"/>
martensitisch	1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Ottone, a truciolo corto	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

≤10×D Prof. di foro

Catalogo n°	71136	71130	71135	71320	71150 71152	71322	71154
Mat. da taglio	HSS	HSS	HSS	HSS	HSS	HSS	HSS
Superficie	lucida	luc./vap.	vap.	lucida	lucida	fase nitr.	
DIN/Forma	340	339	340	341	340	341	340
Tipo	N	N	N	N	V70	V70	V73
Pagina	265	264	266	305	275/276	306	278

71584
HSS
lucida
a norma
V73-IK
290

61136	61150
HSS	HSS
TiN	TiN
340	340
N	V70
268	277

71225	71156
HSS-Co	
lucida	fase nitr.
340	340
V66	V73
274	280

71550	71553
HSS-Co	
vap.	
a norma	
V70-IK	
310/311	



v_c m/min	Codice d'avanzamento							v_c m/min	Codice d'avanz.	v_c m/min	Codice d'avanz.			v_c m/min	Codice d'avanz.	
24	F	F	F	F	F	F	F	26	F	28	F	F		26	F	
20	E	E	E	E	E	E	E	22	E	22	E	E		22	E	
27	F	F	F	F	F	F	F	30	F	30	F	F	24	E	30	F
27	E	E	E	E	E	E	E	30	E	30	E	E		30	E	
22	E	E	E	E	E	E	E	24	E	25	E	E		24	E	
22	E	E	E	E	E	E	E	24	E	25	E	E	24	E	24	E
								22	D	22	D	D	16	D	22	D
								20	D	18	D	D	16	D	20	D
								14	C				14	C	14	C
27	F	F	F	F	F	F	F	30	F	30	F	F		30	F	
								17	D	14	D	D	14	D	17	D
								12	C				10	C	12	C
								14	D	12	D	D	12	D	14	D
								10	C				8	C	10	C
14	D	D	D	D	D	D	D	15	D	16	D	D	16	D	15	D
								10	C	10	C	C	8	C	10	C
								10	C				8	C	10	C
								7	B				6	B	7	B
12					D								12	D	D	
													8	C	A	
													10	C	C	
27	F	F	F	F	G	G	F	30	F	30	F	F	30	F	30	F
27	F	F	F	F	F	F	F	30	F	30	F	F	24	F	30	F
22	F	F	F	F	F	F	F	24	F	24	F	F	24	F	24	F
18	F	F	F	F	F	F	F	20	F	20	F	F	20	F	20	F
								7	C				6	C	7	C
70					G	G										
70					G	G		80	F						80	F
45	G	G	G	G	G	G	G	50	G	50	G	G	60	G	50	G
45	F	F	F	F	F	F	F	50	F	50	F	F	50	F	50	F
63	F	F	F	F	F	F	F			70	F		60	E		
54	E	E	E	E	F	F	F	60	E	60	E	E	30	E	60	E
36	E	E	E	E	F	F	F	40	E	40	E	E	38	E	40	E
28	D	D	D	D						30	D					
22	D	D	D	D				24	D	25	D				24	D
22	D	D	D	D	D	D	D	24	D	14	D	D	24	D	24	D
								22	D	12	D	D	13	D	22	D
14	D	D	D	D	D	D	D			18	D	D	16	D	D	
22	E	E	E	E				24	E	32	E		26	D	24	E

Parametri di lavoro indicativi per punte

Serie d'avanzamento										
Lettera d'identi.	A	B	C	D	E	F	G	H	I	
Diametro utensile mm	0,50	0,004	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,019
	1,00	0,006	0,008	0,012	0,014	0,016	0,018	0,020	0,023	0,025
	2,00	0,020	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125
	2,50	0,025	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160
	3,15	0,032	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,160
	4,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,200
	5,00	0,040	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250
	6,30	0,050	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315
	8,00	0,063	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,315
	10,00	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,400
	12,50	0,080	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500
	16,00	0,100	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630
	20,00	0,125	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,630
	25,00	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	0,800
	31,50	0,160	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000
	40,00	0,200	0,250	0,315	0,400	0,500	0,630	0,800	1,000	1,250

Con le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

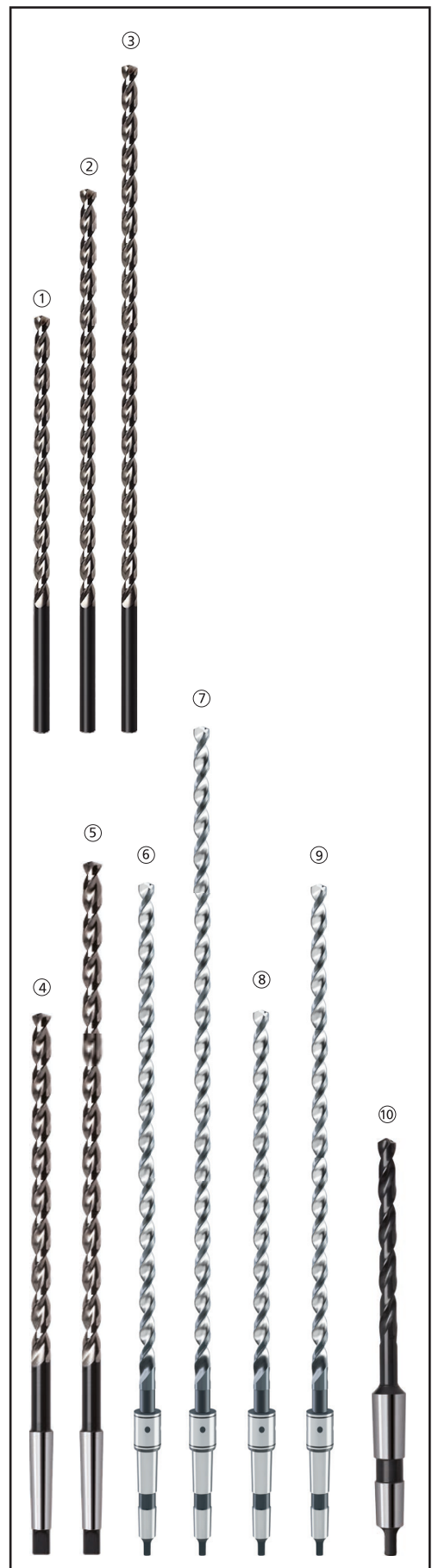
Impiego del refrigerante:

- Olio da taglio, attivo
- Emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
Mat. plast. a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

≥10×D Prof. di foro

Catalogo n°	71145 ^① 71146 ^② 71147 ^③	71195 ^① 71196 ^②	71325 ^④ 71326 ^⑤	71192 ^① 71193 ^②	71565 ^⑥ 71566 ^⑦ 71567 ^⑧ 71568 ^⑨	71554 ^⑩
Mat. da taglio	HSS	HSS	HSS	HSS-Co	HSS-Co	HSS
Superficie	luc./f. nitr.	fase nitr.	f. nitr./vap.	fase nitr.	vap.	vap.
DIN/Forma	1869	a norma	1870	1869	a norma	a norma
Tipo	V63	V63	V63	V63	V63-IK	N-IK
Pagina	282/285/287	288/289	307/308	284/286	312/314/313/315	309



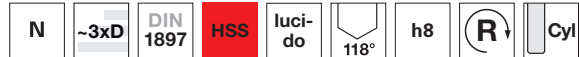
v _c m/min	Codice d'avanzamento			v _c m/min	Codice d'avanz.	v _c m/min	Codice d'avanz.	v _c m/min	Codice d'avanz.
22	E	E	E	30	D	30	E	26	F
18	D	D	D	25	D	25	D	22	E
22	E	E	E	33	D	30	E	30	F
18	D	D	D	30	D	25	D	30	E
22	D	D	D	33	D	30	D	24	E
18	D	D	D	33	D	25	D	24	E
				20	C	18	C	22	D
				14	C	16	C	20	D
				10	B	12	B	14	C
22	E	E	E	29	D	30	E	30	F
				14	C	14	C	17	D
				10	B	12	B	12	C
				10	C	12	C	14	D
				8	B	8	B	10	C
12	C	C	C	11	C	16	C	15	D
6	B	B	B	8	B	8	B	10	C
				8	B	8	B	10	C
				5	A	6	A	7	B
				3	A	3	A		
				10	C	12	C		
				8	B	8	B		
				10	B	12	B		
22	E	E	E	30	E	30	E	30	F
18	E	E	E	20	E	25	E	30	F
20	E	E	E	16	E	28	E	24	F
14	E	E	E	16	E	20	E	20	F
				5	B	6	B	7	C
				6	A	6	A		
				6	A	8	B		
				5	A	6	B		
45	F	F	F	50	F	63	F	50	G
36	E	E	E	40	E	50	E	50	F
55	E	E	E						
22	D	D	D	30	D	30	D	60	E
				45	D				
28	D	D	D	30	D	40	D	40	E
22	C	C	C	25	D				
20	C	C	C	20	D	28	D	24	D
18	C	C	C	16	C	25	D	24	D
				10	C	20	D	22	D
12	C	C	C	14	C				
18	D	D	D	20	C	25	D	24	E

Punte cilindriche

Punte elicoidali, extra corte



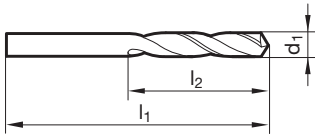
Catalogo n° 71110



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 176

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- per torni automatici/revolver
- anche per trapani a mano



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,500		20,000	3,000	3,300		49,000	18,000
0,600		21,000	3,500	3,400		52,000	20,000
0,700		23,000	4,500	3,500		52,000	20,000
0,750		23,000	4,500	3,600		52,000	20,000
0,800		24,000	5,000	3,700		52,000	20,000
0,900		25,000	5,500	3,750		52,000	20,000
1,000		26,000	6,000	3,800		55,000	22,000
1,050		26,000	6,000	3,900		55,000	22,000
1,100		28,000	7,000	4,000		55,000	22,000
1,150		28,000	7,000	4,100		55,000	22,000
1,200		30,000	8,000	4,200		55,000	22,000
1,250		30,000	8,000	4,250		55,000	22,000
1,300		30,000	8,000	4,300		58,000	24,000
1,350		32,000	9,000	4,400		58,000	24,000
1,400		32,000	9,000	4,500		58,000	24,000
1,450		32,000	9,000	4,600		58,000	24,000
1,500		32,000	9,000	4,700		58,000	24,000
1,550		34,000	10,000	4,800		62,000	26,000
1,600		34,000	10,000	4,900		62,000	26,000
1,650		34,000	10,000	5,000		62,000	26,000
1,700		34,000	10,000	5,100		62,000	26,000
1,750		36,000	11,000	5,150		62,000	26,000
1,800		36,000	11,000	5,200		62,000	26,000
1,900		36,000	11,000	5,250		62,000	26,000
1,950		38,000	12,000	5,300		62,000	26,000
2,000		38,000	12,000	5,400		66,000	28,000
2,050		38,000	12,000	5,500		66,000	28,000
2,100		38,000	12,000	5,600		66,000	28,000
2,150		40,000	13,000	5,700		66,000	28,000
2,200		40,000	13,000	5,750		66,000	28,000
2,250		40,000	13,000	5,800		66,000	28,000
2,300		40,000	13,000	5,900		66,000	28,000
2,400		43,000	14,000	6,000		66,000	28,000
2,450		43,000	14,000	6,100		70,000	31,000
2,500		43,000	14,000	6,200		70,000	31,000
2,550		43,000	14,000	6,250		70,000	31,000
2,600		43,000	14,000	6,300		70,000	31,000
2,650		43,000	14,000	6,400		70,000	31,000
2,700		46,000	16,000	6,500		70,000	31,000
2,750		46,000	16,000	6,600		70,000	31,000
2,800		46,000	16,000	6,700		70,000	31,000
2,850		46,000	16,000	6,750	17/64	74,000	34,000
2,900		46,000	16,000	6,800		74,000	34,000
2,950		46,000	16,000	6,900		74,000	34,000
3,000		46,000	16,000	7,000		74,000	34,000
3,100		49,000	18,000	7,100		74,000	34,000
3,200		49,000	18,000	7,200		74,000	34,000
3,250		49,000	18,000	7,250		74,000	34,000

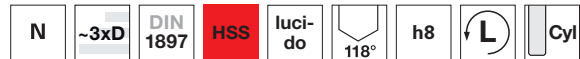
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
7,300		74,000	34,000	12,000		102,000	51,000
7,400		74,000	34,000	12,500		102,000	51,000
7,500		74,000	34,000	12,750		102,000	51,000
7,600		79,000	37,000	13,000		102,000	51,000
7,700		79,000	37,000	13,500		107,000	54,000
7,750		79,000	37,000	14,000		107,000	54,000
7,800		79,000	37,000	14,500		111,000	56,000
7,900		79,000	37,000	15,000		111,000	56,000
8,000		79,000	37,000	15,500		115,000	58,000
8,100		79,000	37,000	16,000		115,000	58,000
8,200		79,000	37,000	16,500		119,000	60,000
8,250		79,000	37,000	17,000		119,000	60,000
8,300		79,000	37,000	17,500		123,000	62,000
8,400		79,000	37,000	18,000		123,000	62,000
8,500		79,000	37,000	18,500		127,000	64,000
8,600		84,000	40,000	19,000		127,000	64,000
8,700		84,000	40,000	19,500		131,000	66,000
8,750		84,000	40,000	20,000		131,000	66,000
8,800		84,000	40,000	20,500		136,000	68,000
8,900		84,000	40,000	21,000		136,000	68,000
9,000		84,000	40,000	21,500		141,000	70,000
9,100		84,000	40,000	22,000		141,000	70,000
9,200		84,000	40,000	22,500		146,000	72,000
9,250		84,000	40,000	23,000		146,000	72,000
9,300		84,000	40,000	24,000		151,000	75,000
9,400		84,000	40,000	25,000	63/64	151,000	75,000
9,500		84,000	40,000	26,000		156,000	78,000
9,600		89,000	43,000	28,000		162,000	81,000
9,700		89,000	43,000	29,000		168,000	84,000
9,750		89,000	43,000	30,000		168,000	84,000
9,800		89,000	43,000	31,000		174,000	87,000
9,900		89,000	43,000	32,000		180,000	90,000
10,000		89,000	43,000				
10,100		89,000	43,000				
10,200		89,000	43,000				
10,250		89,000	43,000				
10,300		89,000	43,000				
10,400		89,000	43,000				
10,500		89,000	43,000				
10,750		95,000	47,000				
11,000		95,000	47,000				
11,500		95,000	47,000				

Punte cilindriche

Punte elicoidali, extra corte



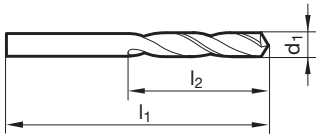
Catalogo n° 71111



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 176

- Assott. del noc. $\geq \varnothing 14,300$
- spoglia sul cono tagliente
- per torni automatici/revolver
- anche per trapani a mano



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,500		20,000	3,000	3,000		46,000	16,000
0,550		21,000	3,500	3,100		49,000	18,000
0,600		21,000	3,500	3,150		49,000	18,000
0,650		22,000	4,000	3,200		49,000	18,000
0,700		23,000	4,500	3,300		49,000	18,000
0,750		23,000	4,500	3,450		52,000	20,000
0,800		24,000	5,000	3,500		52,000	20,000
0,850		24,000	5,000	3,550		52,000	20,000
0,900		25,000	5,500	3,600		52,000	20,000
0,950		25,000	5,500	3,650		52,000	20,000
1,000		26,000	6,000	3,700		52,000	20,000
1,050		26,000	6,000	3,750		52,000	20,000
1,100		28,000	7,000	3,800		55,000	22,000
1,150		28,000	7,000	3,850		55,000	22,000
1,200		30,000	8,000	3,900		55,000	22,000
1,250		30,000	8,000	3,950		55,000	22,000
1,300		30,000	8,000	4,000		55,000	22,000
1,350		32,000	9,000	4,100		55,000	22,000
1,400		32,000	9,000	4,200		55,000	22,000
1,450		32,000	9,000	4,300		58,000	24,000
1,500		32,000	9,000	4,500		58,000	24,000
1,550		34,000	10,000	4,600		58,000	24,000
1,600		34,000	10,000	4,700		58,000	24,000
1,650		34,000	10,000	4,750		58,000	24,000
1,700		34,000	10,000	4,800		62,000	26,000
1,750		36,000	11,000	5,000		62,000	26,000
1,800		36,000	11,000	5,100		62,000	26,000
1,850		36,000	11,000	5,200		62,000	26,000
1,900		36,000	11,000	5,300		62,000	26,000
2,000		38,000	12,000	5,400		66,000	28,000
2,050		38,000	12,000	5,500		66,000	28,000
2,100		38,000	12,000	5,600		66,000	28,000
2,150		40,000	13,000	5,700		66,000	28,000
2,200		40,000	13,000	5,750		66,000	28,000
2,250		40,000	13,000	5,800		66,000	28,000
2,300		40,000	13,000	5,900		66,000	28,000
2,350		40,000	13,000	6,200		70,000	31,000
2,400		43,000	14,000	6,250		70,000	31,000
2,450		43,000	14,000	6,300		70,000	31,000
2,500		43,000	14,000	6,500		70,000	31,000
2,550		43,000	14,000	6,600		70,000	31,000
2,600		43,000	14,000	6,700		70,000	31,000
2,650		43,000	14,000	6,800		74,000	34,000
2,700		46,000	16,000	6,900		74,000	34,000
2,800		46,000	16,000	7,000		74,000	34,000
2,850		46,000	16,000	7,100		74,000	34,000
2,900		46,000	16,000	7,300		74,000	34,000
2,950		46,000	16,000	7,400		74,000	34,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
7,500		74,000	34,000	12,100		102,000	51,000
7,600		79,000	37,000	12,300	31/64	102,000	51,000
7,700		79,000	37,000	12,400		102,000	51,000
7,750		79,000	37,000	12,750		102,000	51,000
7,800		79,000	37,000	12,900		102,000	51,000
7,900		79,000	37,000	13,000		102,000	51,000
8,000		79,000	37,000	13,100	33/64	102,000	51,000
8,100		79,000	37,000	13,200		102,000	51,000
8,200		79,000	37,000	13,250		107,000	54,000
8,250		79,000	37,000	13,300		107,000	54,000
8,300		79,000	37,000	13,600		107,000	54,000
8,400		79,000	37,000	13,750		107,000	54,000
8,500		79,000	37,000	13,800		107,000	54,000
8,600		84,000	40,000	13,900		107,000	54,000
8,700		84,000	40,000	14,300		111,000	56,000
8,750		84,000	40,000	14,400		111,000	56,000
8,800		84,000	40,000	14,800		111,000	56,000
8,900		84,000	40,000	14,900		111,000	56,000
9,000		84,000	40,000	15,000		111,000	56,000
9,100		84,000	40,000	15,300		115,000	58,000
9,200		84,000	40,000	15,400		115,000	58,000
9,250		84,000	40,000	15,750		115,000	58,000
9,400		84,000	40,000	15,800		115,000	58,000
9,500		84,000	40,000	15,900		115,000	58,000
9,600		89,000	43,000	16,000		115,000	58,000
9,700		89,000	43,000	16,250		119,000	60,000
9,750		89,000	43,000	16,300		119,000	60,000
9,800		89,000	43,000	16,900		119,000	60,000
9,900		89,000	43,000	17,250		123,000	62,000
10,000		89,000	43,000	17,400		123,000	62,000
10,200		89,000	43,000	17,600		123,000	62,000
10,300		89,000	43,000	18,600		127,000	64,000
10,500		89,000	43,000	18,750		127,000	64,000
10,700		95,000	47,000	18,800		127,000	64,000
10,800		95,000	47,000	19,000		127,000	64,000
11,000		95,000	47,000	21,500		141,000	70,000
11,100		95,000	47,000	29,000		168,000	84,000
11,300		95,000	47,000	30,000		168,000	84,000
11,600		95,000	47,000	32,000		180,000	90,000
11,750		95,000	47,000				
11,900		102,000	51,000				
12,000		102,000	51,000				

Punte cilindriche

Punte elicoidali, extra corte



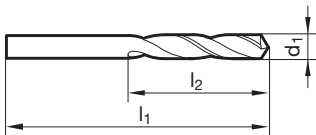
Catalogo n° 71108



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 176

- Assott. del noc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per torni automatici/revolver
- anche per trapani a mano
- lucida $< 2,36$ mm



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
2,000		38,000	12,000	6,400		70,000	31,000
2,100		38,000	12,000	6,500		70,000	31,000
2,200		40,000	13,000	6,600		70,000	31,000
2,300		40,000	13,000	6,700		70,000	31,000
2,400		43,000	14,000	6,800		74,000	34,000
2,500		43,000	14,000	6,900		74,000	34,000
2,550		43,000	14,000	7,000		74,000	34,000
2,600		43,000	14,000	7,100		74,000	34,000
2,700		46,000	16,000	7,200		74,000	34,000
2,800		46,000	16,000	7,300		74,000	34,000
2,900		46,000	16,000	7,400		74,000	34,000
2,950		46,000	16,000	7,500		74,000	34,000
3,000		46,000	16,000	7,600		79,000	37,000
3,100		49,000	18,000	7,700		79,000	37,000
3,200		49,000	18,000	7,800		79,000	37,000
3,250		49,000	18,000	7,900		79,000	37,000
3,300		49,000	18,000	8,000		79,000	37,000
3,400		52,000	20,000	8,100		79,000	37,000
3,500		52,000	20,000	8,200		79,000	37,000
3,600		52,000	20,000	8,300		79,000	37,000
3,700		52,000	20,000	8,400		79,000	37,000
3,800		55,000	22,000	8,500		79,000	37,000
3,900		55,000	22,000	8,600		84,000	40,000
4,000		55,000	22,000	8,700		84,000	40,000
4,100		55,000	22,000	8,750		84,000	40,000
4,200		55,000	22,000	8,800		84,000	40,000
4,300		58,000	24,000	8,900		84,000	40,000
4,400		58,000	24,000	9,000		84,000	40,000
4,500		58,000	24,000	9,100		84,000	40,000
4,600		58,000	24,000	9,200		84,000	40,000
4,700		58,000	24,000	9,300		84,000	40,000
4,800		62,000	26,000	9,400		84,000	40,000
4,900		62,000	26,000	9,500		84,000	40,000
5,000		62,000	26,000	9,600		89,000	43,000
5,100		62,000	26,000	9,700		89,000	43,000
5,200		62,000	26,000	9,800		89,000	43,000
5,250		62,000	26,000	9,900		89,000	43,000
5,300		62,000	26,000	10,000		89,000	43,000
5,400		66,000	28,000	10,100		89,000	43,000
5,500		66,000	28,000	10,200		89,000	43,000
5,600		66,000	28,000	10,500		89,000	43,000
5,700		66,000	28,000	11,000		95,000	47,000
5,800		66,000	28,000	11,500		95,000	47,000
5,900		66,000	28,000	12,000		102,000	51,000
6,000		66,000	28,000	12,500		102,000	51,000
6,100		70,000	31,000	13,000		102,000	51,000
6,200		70,000	31,000	13,500		107,000	54,000
6,300		70,000	31,000	14,000		107,000	54,000

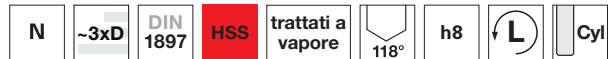
d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
14,500		111,000	56,000	20,000		131,000	66,000
15,000		111,000	56,000	20,500		136,000	68,000
16,000		115,000	58,000	25,000	63/64	151,000	75,000
17,000		119,000	60,000	27,000		162,000	81,000
18,000		123,000	62,000				
19,500		131,000	66,000				

Punte cilindriche

Punte elicoidali, extra corte



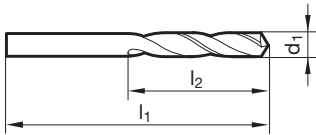
Catalogo n° 71109



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 176

- Assott. del noc. $\geq \varnothing 14,500$
- spoglia sul cono tagliente
- per torni automatici/revolver
- lucida < 6,00 mm



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
2,600		43,000	14,000	7,500		74,000	34,000
2,750		46,000	16,000	7,800		79,000	37,000
3,000		46,000	16,000	7,900		79,000	37,000
3,100		49,000	18,000	8,000		79,000	37,000
3,200		49,000	18,000	8,100		79,000	37,000
3,300		49,000	18,000	8,300		79,000	37,000
3,400		52,000	20,000	8,700		84,000	40,000
3,500		52,000	20,000	8,800		84,000	40,000
4,000		55,000	22,000	8,900		84,000	40,000
4,100		55,000	22,000	9,100		84,000	40,000
4,200		55,000	22,000	9,300		84,000	40,000
4,250		55,000	22,000	9,400		84,000	40,000
4,300		58,000	24,000	9,500		84,000	40,000
4,400		58,000	24,000	9,700		89,000	43,000
4,500		58,000	24,000	10,200		89,000	43,000
4,900		62,000	26,000	10,750		95,000	47,000
5,000		62,000	26,000	11,000		95,000	47,000
5,200		62,000	26,000	11,500		95,000	47,000
5,300		62,000	26,000	12,500		102,000	51,000
5,400		66,000	28,000	13,250		107,000	54,000
5,500		66,000	28,000	14,500		111,000	56,000
5,600		66,000	28,000	15,500		115,000	58,000
5,700		66,000	28,000	15,750		115,000	58,000
6,000		66,000	28,000	16,000		115,000	58,000
6,200		70,000	31,000	17,000		119,000	60,000
6,400		70,000	31,000	17,500		123,000	62,000
6,500		70,000	31,000	21,000		136,000	68,000
6,900		74,000	34,000	22,000		141,000	70,000
7,000		74,000	34,000	24,000		151,000	75,000
7,200		74,000	34,000	26,500		156,000	78,000

Punte cilindriche

Punte elicoidali, extra corte



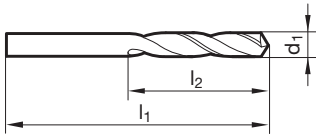
Catalogo n° 61118



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 176

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- per torni automatici/revolver
- anche per trapani a mano
- maggiore protezione contro l'usura



d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000

d1 mm	inch	l1 mm	l2 mm
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,800		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,300		89,000	43,000
10,400		89,000	43,000
10,500		89,000	43,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
10,600		89,000	43,000	13,000		102,000	51,000
10,800		95,000	47,000	13,100	33/64	102,000	51,000
11,000		95,000	47,000				
11,500		95,000	47,000				
12,000		102,000	51,000				
12,500		102,000	51,000				

Punte cilindriche

Punte elicoidali, extra corte



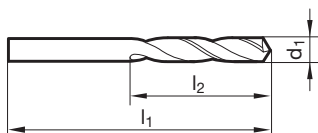
Catalogo n° 71106



P	M	K	N	S	H
•	•	•	•	•	○

Parametri di lav.
ind. a pag. 176

- Assott. del nocc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- con alta perc. di CoMo
- specialmente per resistenza all'usura



d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000
1,500		32,000	9,000
2,000		38,000	12,000
2,500		43,000	14,000
3,000		46,000	16,000
3,300		49,000	18,000
3,500		52,000	20,000
4,000		55,000	22,000
4,200		55,000	22,000
4,500		58,000	24,000
5,000		62,000	26,000
5,500		66,000	28,000

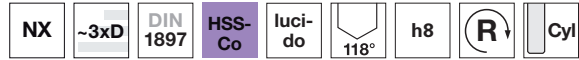
d1 mm	inch	l1 mm	l2 mm
6,000		66,000	28,000
6,500		70,000	31,000
6,800		74,000	34,000
7,000		74,000	34,000
7,500		74,000	34,000
8,000		79,000	37,000
8,500		79,000	37,000
9,000		84,000	40,000
9,500		84,000	40,000
10,000		89,000	43,000

Punte cilindriche

Punte elicoidali, extra corte



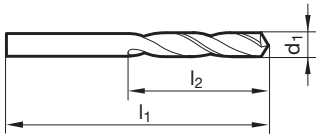
Catalogo n° 71220



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 178

- Assott. del noc. $\geq \varnothing 1,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- uso universale



d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000

d1 mm	inch	l1 mm	l2 mm
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,800		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,300		89,000	43,000
10,400		89,000	43,000
10,500		89,000	43,000

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
11,000		95,000	47,000	14,000		107,000	54,000
11,500		95,000	47,000				
12,000		102,000	51,000				
12,500		102,000	51,000				
13,000		102,000	51,000				
13,500		107,000	54,000				

Punte cilindriche

Punte elicoidali, extra corte



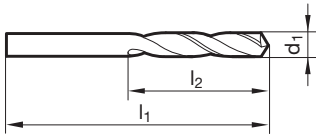
Catalogo n° 61220



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 178

- Assott. del noc. $\geq \varnothing 1,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- uso universale
- maggiore protezione contro l'usura



d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000

d1 mm	inch	l1 mm	l2 mm
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,600		84,000	40,000
8,700		84,000	40,000
8,800		84,000	40,000
8,900		84,000	40,000
9,000		84,000	40,000
9,100		84,000	40,000
9,200		84,000	40,000
9,300		84,000	40,000
9,400		84,000	40,000
9,500		84,000	40,000
9,600		89,000	43,000
9,700		89,000	43,000
9,800		89,000	43,000
9,900		89,000	43,000
10,000		89,000	43,000
10,100		89,000	43,000
10,200		89,000	43,000
10,300		89,000	43,000
10,400		89,000	43,000
10,500		89,000	43,000

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
11,000		95,000	47,000	14,000		107,000	54,000
11,500		95,000	47,000				
12,000		102,000	51,000				
12,500		102,000	51,000				
13,000		102,000	51,000				
13,500		107,000	54,000				

Punte cilindriche

Punte elicoidali, extra corte



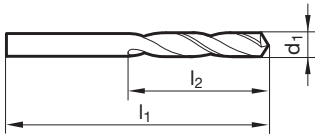
Catalogo n° 51159



P	M	K	N	S	H
●	●	○	○		

Parametri di lav.
ind. a pag. 178

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
2,000		38,000	12,000	6,900		74,000	34,000
2,100		38,000	12,000	7,000		74,000	34,000
2,200		40,000	13,000	7,100		74,000	34,000
2,300		40,000	13,000	7,300		74,000	34,000
2,400		43,000	14,000	7,400		74,000	34,000
2,500		43,000	14,000	7,500		74,000	34,000
2,600		43,000	14,000	7,600		79,000	37,000
2,700		46,000	16,000	7,700		79,000	37,000
2,800		46,000	16,000	7,800		79,000	37,000
2,900		46,000	16,000	7,900		79,000	37,000
3,000		46,000	16,000	8,000		79,000	37,000
3,100		49,000	18,000	8,100		79,000	37,000
3,200		49,000	18,000	8,200		79,000	37,000
3,300		49,000	18,000	8,300		79,000	37,000
3,400		52,000	20,000	8,400		79,000	37,000
3,500		52,000	20,000	8,500		79,000	37,000
3,600		52,000	20,000	8,600		84,000	40,000
3,700		52,000	20,000	8,700		84,000	40,000
3,800		55,000	22,000	8,800		84,000	40,000
3,900		55,000	22,000	8,900		84,000	40,000
4,000		55,000	22,000	9,000		84,000	40,000
4,100		55,000	22,000	9,100		84,000	40,000
4,200		55,000	22,000	9,200		84,000	40,000
4,300		58,000	24,000	9,300		84,000	40,000
4,400		58,000	24,000	9,500		84,000	40,000
4,500		58,000	24,000	9,600		89,000	43,000
4,600		58,000	24,000	9,700		89,000	43,000
4,700		58,000	24,000	9,800		89,000	43,000
4,800		62,000	26,000	9,900		89,000	43,000
4,900		62,000	26,000	10,000		89,000	43,000
5,000		62,000	26,000	10,200		89,000	43,000
5,100		62,000	26,000	10,500		89,000	43,000
5,200		62,000	26,000	10,800		95,000	47,000
5,300		62,000	26,000	11,000		95,000	47,000
5,400		66,000	28,000	11,500		95,000	47,000
5,500		66,000	28,000	11,800		95,000	47,000
5,600		66,000	28,000	12,000		102,000	51,000
5,700		66,000	28,000	12,300	31/64	102,000	51,000
5,800		66,000	28,000	12,500		102,000	51,000
5,900		66,000	28,000	13,000		102,000	51,000
6,000		66,000	28,000	13,500		107,000	54,000
6,100		70,000	31,000	14,000		107,000	54,000
6,200		70,000	31,000	14,500		111,000	56,000
6,300		70,000	31,000	15,000		111,000	56,000
6,400		70,000	31,000	15,500		115,000	58,000
6,500		70,000	31,000	16,000		115,000	58,000
6,700		70,000	31,000				
6,800		74,000	34,000				

Punte cilindriche

Punte elicoidali, extra corte



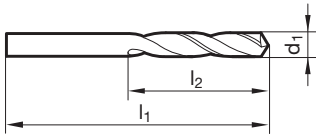
Catalogo n° 61131



P	M	K	N	S	H
●	●	●	○		

Parametri di lav.
ind. a pag. 178

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- scanalature larghe
- specialmente per resistenza all'usura
- stabilità elevata



d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000
1,100		28,000	7,000
1,200		30,000	8,000
1,300		30,000	8,000
1,400		32,000	9,000
1,500		32,000	9,000
1,600		34,000	10,000
1,700		34,000	10,000
1,800		36,000	11,000
1,900		36,000	11,000
2,000		38,000	12,000
2,100		38,000	12,000
2,200		40,000	13,000
2,300		40,000	13,000
2,400		43,000	14,000
2,500		43,000	14,000
2,600		43,000	14,000
2,700		46,000	16,000
2,800		46,000	16,000
2,900		46,000	16,000
3,000		46,000	16,000
3,100		49,000	18,000
3,200		49,000	18,000
3,300		49,000	18,000
3,400		52,000	20,000
3,500		52,000	20,000
3,600		52,000	20,000
3,700		52,000	20,000
3,800		55,000	22,000
3,900		55,000	22,000
4,000		55,000	22,000
4,100		55,000	22,000
4,200		55,000	22,000
4,300		58,000	24,000
4,400		58,000	24,000
4,500		58,000	24,000
4,600		58,000	24,000
4,700		58,000	24,000
4,800		62,000	26,000
4,900		62,000	26,000
5,000		62,000	26,000
5,100		62,000	26,000
5,200		62,000	26,000
5,300		62,000	26,000
5,400		66,000	28,000
5,500		66,000	28,000
5,600		66,000	28,000
5,700		66,000	28,000

d1 mm	inch	l1 mm	l2 mm
5,800		66,000	28,000
5,900		66,000	28,000
6,000		66,000	28,000
6,100		70,000	31,000
6,200		70,000	31,000
6,300		70,000	31,000
6,400		70,000	31,000
6,500		70,000	31,000
6,600		70,000	31,000
6,700		70,000	31,000
6,800		74,000	34,000
6,900		74,000	34,000
7,000		74,000	34,000
7,100		74,000	34,000
7,200		74,000	34,000
7,300		74,000	34,000
7,400		74,000	34,000
7,500		74,000	34,000
7,600		79,000	37,000
7,700		79,000	37,000
7,800		79,000	37,000
7,900		79,000	37,000
8,000		79,000	37,000
8,100		79,000	37,000
8,200		79,000	37,000
8,300		79,000	37,000
8,400		79,000	37,000
8,500		79,000	37,000
8,800		84,000	40,000
9,000		84,000	40,000
9,300		84,000	40,000
9,500		84,000	40,000
9,800		89,000	43,000
10,000		89,000	43,000
10,200		89,000	43,000
10,500		89,000	43,000
11,000		95,000	47,000
11,500		95,000	47,000
12,000		102,000	51,000
12,500		102,000	51,000
13,000		102,000	51,000
13,500		107,000	54,000
14,000		107,000	54,000

Punte cilindriche

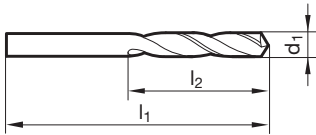
Punte elicoidali, extra corte



Catalogo n° 71112

vx	~3xD	DIN 1897	HSS-Co	trattati a vapore	118°	h8	R	Cyl
P	M	K	N	S	H	Parametri di lav. ind. a pag. 176		
●	●	●	○	○				

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- lucida $< 2,36$ mm



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000	4,400		58,000	24,000
1,100		28,000	7,000	4,500		58,000	24,000
1,150		28,000	7,000	4,600		58,000	24,000
1,200		30,000	8,000	4,700		58,000	24,000
1,250		30,000	8,000	4,750		58,000	24,000
1,300		30,000	8,000	4,800		62,000	26,000
1,400		32,000	9,000	4,900		62,000	26,000
1,500		32,000	9,000	5,000		62,000	26,000
1,550		34,000	10,000	5,100		62,000	26,000
1,600		34,000	10,000	5,200		62,000	26,000
1,650		34,000	10,000	5,300		62,000	26,000
1,700		34,000	10,000	5,400		66,000	28,000
1,750		36,000	11,000	5,500		66,000	28,000
1,800		36,000	11,000	5,600		66,000	28,000
1,900		36,000	11,000	5,700		66,000	28,000
2,000		38,000	12,000	5,800		66,000	28,000
2,050		38,000	12,000	5,900		66,000	28,000
2,100		38,000	12,000	6,000		66,000	28,000
2,200		40,000	13,000	6,100		70,000	31,000
2,250		40,000	13,000	6,200		70,000	31,000
2,300		40,000	13,000	6,300		70,000	31,000
2,350		40,000	13,000	6,400		70,000	31,000
2,400		43,000	14,000	6,500		70,000	31,000
2,450		43,000	14,000	6,600		70,000	31,000
2,500		43,000	14,000	6,750	17/64	74,000	34,000
2,600		43,000	14,000	6,800		74,000	34,000
2,650		43,000	14,000	6,900		74,000	34,000
2,700		46,000	16,000	7,000		74,000	34,000
2,750		46,000	16,000	7,100		74,000	34,000
2,800		46,000	16,000	7,200		74,000	34,000
2,900		46,000	16,000	7,250		74,000	34,000
2,950		46,000	16,000	7,300		74,000	34,000
3,000		46,000	16,000	7,500		74,000	34,000
3,100		49,000	18,000	7,600		79,000	37,000
3,200		49,000	18,000	7,800		79,000	37,000
3,300		49,000	18,000	8,000		79,000	37,000
3,400		52,000	20,000	8,100		79,000	37,000
3,500		52,000	20,000	8,200		79,000	37,000
3,600		52,000	20,000	8,400		79,000	37,000
3,700		52,000	20,000	8,500		79,000	37,000
3,750		52,000	20,000	8,700		84,000	40,000
3,800		55,000	22,000	8,900		84,000	40,000
3,900		55,000	22,000	9,000		84,000	40,000
4,000		55,000	22,000	9,250		84,000	40,000
4,100		55,000	22,000	9,300		84,000	40,000
4,200		55,000	22,000	9,700		89,000	43,000
4,250		55,000	22,000	9,800		89,000	43,000
4,300		58,000	24,000	10,000		89,000	43,000

Punte cilindriche

Punte elicoidali, extra corte



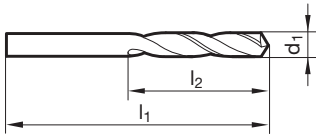
Catalogo n° 61112



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 178

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		26,000	6,000	5,800		66,000	28,000
1,100		28,000	7,000	5,900		66,000	28,000
1,200		30,000	8,000	6,000		66,000	28,000
1,300		30,000	8,000	6,100		70,000	31,000
1,400		32,000	9,000	6,200		70,000	31,000
1,500		32,000	9,000	6,300		70,000	31,000
1,600		34,000	10,000	6,400		70,000	31,000
1,700		34,000	10,000	6,500		70,000	31,000
1,800		36,000	11,000	6,600		70,000	31,000
1,900		36,000	11,000	6,700		70,000	31,000
2,000		38,000	12,000	6,800		74,000	34,000
2,100		38,000	12,000	6,900		74,000	34,000
2,200		40,000	13,000	7,000		74,000	34,000
2,300		40,000	13,000	7,100		74,000	34,000
2,400		43,000	14,000	7,200		74,000	34,000
2,500		43,000	14,000	7,300		74,000	34,000
2,600		43,000	14,000	7,400		74,000	34,000
2,700		46,000	16,000	7,500		74,000	34,000
2,800		46,000	16,000	7,600		79,000	37,000
2,900		46,000	16,000	7,700		79,000	37,000
3,000		46,000	16,000	7,800		79,000	37,000
3,100		49,000	18,000	7,900		79,000	37,000
3,200		49,000	18,000	8,000		79,000	37,000
3,300		49,000	18,000	8,100		79,000	37,000
3,400		52,000	20,000	8,200		79,000	37,000
3,500		52,000	20,000	8,300		79,000	37,000
3,600		52,000	20,000	8,400		79,000	37,000
3,700		52,000	20,000	8,500		79,000	37,000
3,800		55,000	22,000	8,600		84,000	40,000
3,900		55,000	22,000	8,700		84,000	40,000
4,000		55,000	22,000	8,800		84,000	40,000
4,100		55,000	22,000	9,000		84,000	40,000
4,200		55,000	22,000	9,100		84,000	40,000
4,300		58,000	24,000	9,200		84,000	40,000
4,400		58,000	24,000	9,300		84,000	40,000
4,500		58,000	24,000	9,400		84,000	40,000
4,600		58,000	24,000	9,500		84,000	40,000
4,700		58,000	24,000	9,600		89,000	43,000
4,800		62,000	26,000	9,700		89,000	43,000
4,900		62,000	26,000	9,800		89,000	43,000
5,000		62,000	26,000	9,900		89,000	43,000
5,100		62,000	26,000	10,000		89,000	43,000
5,200		62,000	26,000	10,100		89,000	43,000
5,300		62,000	26,000	10,200		89,000	43,000
5,400		66,000	28,000	10,500		89,000	43,000
5,500		66,000	28,000	11,000		95,000	47,000
5,600		66,000	28,000	11,500		95,000	47,000
5,700		66,000	28,000	12,000		102,000	51,000

d1 mm	inch	l1 mm	l2 mm
12,300	31/64	102,000	51,000
12,500		102,000	51,000

d1 mm	inch	l1 mm	l2 mm

Punte cilindriche

Punte elicoidali, extra corte



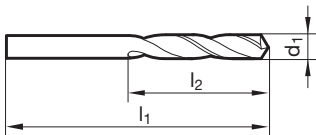
Catalogo n° 71114



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 176

- senza assottigliamento dell'apice della punta
- spoglia sul cono tagliente
- ideali per torni



d1 mm	inch	l1 mm	l2 mm
1,000		28,000	8,000
1,050		28,000	8,000
1,100		30,000	9,000
1,150		30,000	9,000
1,250		32,000	10,000
1,300		32,000	10,000
1,450		35,000	12,000
1,650		37,000	13,000
1,700		37,000	13,000
1,750		39,000	14,000
1,800		39,000	14,000
1,850		39,000	14,000
1,900		39,000	14,000
1,950		42,000	16,000
2,000		42,000	16,000
2,050		42,000	16,000
2,150		44,000	17,000
2,200		44,000	17,000
2,300		44,000	17,000
2,350		44,000	17,000
2,400		47,000	18,000
2,450		47,000	18,000
2,500		47,000	18,000
2,550		47,000	18,000
2,600		47,000	18,000
2,700		51,000	21,000
2,750		51,000	21,000
2,800		51,000	21,000
2,900		51,000	21,000
2,950		51,000	21,000
3,100		54,000	23,000
3,150		54,000	23,000
3,200		54,000	23,000
3,250		54,000	23,000
3,300		54,000	23,000
3,350		54,000	23,000
3,400		58,000	26,000
3,550		58,000	26,000
3,600		58,000	26,000
3,650		58,000	26,000
3,700		58,000	26,000
3,750		58,000	26,000
3,800		62,000	29,000
3,850		62,000	29,000
3,900		62,000	29,000
3,950		62,000	29,000
4,000		62,000	29,000
4,050		62,000	29,000

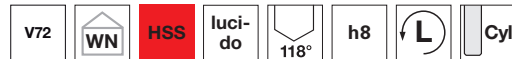
d1 mm	inch	l1 mm	l2 mm
4,100		62,000	29,000
4,150		62,000	29,000
4,350		65,000	31,000
4,400		65,000	31,000
4,450		65,000	31,000
4,500		65,000	31,000
4,600		65,000	31,000
4,650		65,000	31,000
4,700		65,000	31,000
4,800		70,000	34,000
4,850		70,000	34,000
4,900		70,000	34,000
4,950		70,000	34,000
5,400		74,000	36,000
5,500		74,000	36,000
5,600		74,000	36,000
5,700		74,000	36,000
5,800		74,000	36,000
5,900		74,000	36,000
6,000		74,000	36,000
6,200		79,000	40,000
6,300		79,000	40,000
6,600		79,000	40,000
6,700		79,000	40,000
6,900		84,000	44,000
7,000		84,000	44,000
7,100		84,000	44,000
8,000		90,000	48,000
8,500		90,000	48,000
9,000		96,000	52,000
9,100		96,000	52,000
9,500		96,000	52,000
10,000		102,000	56,000
11,500		109,000	61,000
13,000		117,000	66,000
14,000		122,000	70,000
14,500		128,000	73,000
15,000		128,000	73,000
15,500		132,000	75,000
16,000		132,000	75,000

Punte cilindriche

Punte elicoidali, extra corte



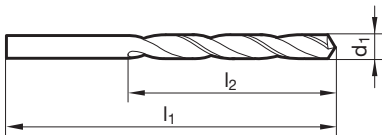
Catalogo n° 71113



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 176

- senza assottigliamento dell'apice della punta
- spoglia sul cono tagliente
- ideali per torni



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		28,000	8,000	5,300		70,000	34,000
1,100		30,000	9,000	5,500		74,000	36,000
1,250		32,000	10,000	5,600		74,000	36,000
1,300		32,000	10,000	5,700		74,000	36,000
1,350		35,000	12,000	5,800		74,000	36,000
1,400		35,000	12,000	5,900		74,000	36,000
1,600		37,000	13,000	6,200		79,000	40,000
1,650		37,000	13,000	6,300		79,000	40,000
1,700		37,000	13,000	6,500		79,000	40,000
1,750		39,000	14,000	6,700		79,000	40,000
1,800		39,000	14,000	6,900		84,000	44,000
1,900		39,000	14,000	7,100		84,000	44,000
1,950		42,000	16,000	7,200		84,000	44,000
2,000		42,000	16,000	7,300		84,000	44,000
2,050		42,000	16,000	7,400		84,000	44,000
2,100		42,000	16,000	7,500		84,000	44,000
2,150		44,000	17,000	7,600		90,000	48,000
2,200		44,000	17,000	7,700		90,000	48,000
2,300		44,000	17,000	7,800		90,000	48,000
2,350		44,000	17,000	7,900		90,000	48,000
2,400		47,000	18,000	8,000		90,000	48,000
2,550		47,000	18,000	8,300		90,000	48,000
2,600		47,000	18,000	8,500		90,000	48,000
2,650		47,000	18,000	8,600		96,000	52,000
2,700		51,000	21,000	8,700		96,000	52,000
2,800		51,000	21,000	8,800		96,000	52,000
2,850		51,000	21,000	8,900		96,000	52,000
2,900		51,000	21,000	9,100		96,000	52,000
3,100		54,000	23,000	9,200		96,000	52,000
3,200		54,000	23,000	9,300		96,000	52,000
3,300		54,000	23,000	9,500		96,000	52,000
3,400		58,000	26,000	9,600		102,000	56,000
3,500		58,000	26,000	9,700		102,000	56,000
3,550		58,000	26,000	9,800		102,000	56,000
3,600		58,000	26,000	9,900		102,000	56,000
3,700		58,000	26,000	10,400		102,000	56,000
3,900		62,000	29,000	10,500		102,000	56,000
3,950		62,000	29,000	10,800		109,000	61,000
4,100		62,000	29,000	10,900		109,000	61,000
4,200		62,000	29,000	11,200		109,000	61,000
4,250		62,000	29,000	11,300		109,000	61,000
4,300		65,000	31,000	11,400		109,000	61,000
4,400		65,000	31,000	11,500		109,000	61,000
4,600		65,000	31,000	11,800		109,000	61,000
4,700		65,000	31,000	12,200		117,000	66,000
4,900		70,000	34,000	12,250		117,000	66,000
4,950		70,000	34,000	12,300	31/64	117,000	66,000
5,200		70,000	34,000	12,600		117,000	66,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
13,500		122,000	70,000				
14,500		128,000	73,000				
14,750		128,000	73,000				
15,000		128,000	73,000				
15,500		132,000	75,000				
16,000		132,000	75,000				

Punte cilindriche

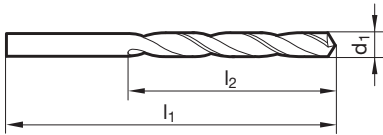
Punte elicoidali, corte



Catalogo n° 71116

N	~5xD	DIN 338	HSS	lucido	118°	h8	R	Cyl
P	M	K	N	S	H	Parametri di lav. ind. a pag. 180		
•		•	•					

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,200		19,000	2,500	1,320		38,000	16,000
0,250		19,000	3,000	1,340		40,000	18,000
0,290		19,000	3,000	1,360		40,000	18,000
0,300		19,000	3,000	1,380		40,000	18,000
0,330		19,000	4,000	1,400		40,000	18,000
0,340		19,000	4,000	1,430		40,000	18,000
0,350		19,000	4,000	1,450		40,000	18,000
0,390		20,000	5,000	1,500		40,000	18,000
0,400		20,000	5,000	1,560		43,000	20,000
0,450		20,000	5,000	1,570		43,000	20,000
0,500		22,000	6,000	1,600		43,000	20,000
0,540		24,000	7,000	1,610		43,000	20,000
0,550		24,000	7,000	1,620		43,000	20,000
0,580		24,000	7,000	1,650		43,000	20,000
0,600		24,000	7,000	1,660		43,000	20,000
0,630		26,000	8,000	1,670		43,000	20,000
0,660		26,000	8,000	1,680		43,000	20,000
0,680		28,000	9,000	1,700		43,000	20,000
0,700		28,000	9,000	1,710		46,000	22,000
0,740		28,000	9,000	1,730		46,000	22,000
0,760		30,000	10,000	1,750		46,000	22,000
0,770		30,000	10,000	1,800		46,000	22,000
0,780		30,000	10,000	1,810		46,000	22,000
0,800		30,000	10,000	1,850		46,000	22,000
0,850		30,000	10,000	1,870		46,000	22,000
0,860		32,000	11,000	1,900		46,000	22,000
0,870		32,000	11,000	1,950		49,000	24,000
0,880		32,000	11,000	1,990		49,000	24,000
0,900		32,000	11,000	2,000		49,000	24,000
0,940		32,000	11,000	2,050		49,000	24,000
0,950		32,000	11,000	2,100		49,000	24,000
0,960		34,000	12,000	2,200		53,000	27,000
1,000		34,000	12,000	2,300		53,000	27,000
1,050		34,000	12,000	2,400		57,000	30,000
1,060		34,000	12,000	2,500		57,000	30,000
1,080		36,000	14,000	2,600		57,000	30,000
1,100		36,000	14,000	2,700		61,000	33,000
1,110		36,000	14,000	2,800		61,000	33,000
1,120		36,000	14,000	2,900		61,000	33,000
1,130		36,000	14,000	3,000		61,000	33,000
1,150		36,000	14,000	3,100		65,000	36,000
1,160		36,000	14,000	3,200		65,000	36,000
1,170		36,000	14,000	3,300		65,000	36,000
1,190	3/64	38,000	16,000	3,400		70,000	39,000
1,200		38,000	16,000	3,500		70,000	39,000
1,230		38,000	16,000	3,600		70,000	39,000
1,250		38,000	16,000	3,700		70,000	39,000
1,300		38,000	16,000	3,800		75,000	43,000

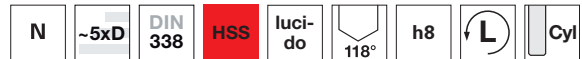
d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
3,900		75,000	43,000	8,000		117,000	75,000
4,000		75,000	43,000	8,100		117,000	75,000
4,100		75,000	43,000	8,200		117,000	75,000
4,200		75,000	43,000	8,300		117,000	75,000
4,300		80,000	47,000	8,400		117,000	75,000
4,400		80,000	47,000	8,500		117,000	75,000
4,500		80,000	47,000	8,600		125,000	81,000
4,600		80,000	47,000	8,800		125,000	81,000
4,700		80,000	47,000	9,000		125,000	81,000
4,800		86,000	52,000	9,100		125,000	81,000
4,900		86,000	52,000	9,200		125,000	81,000
5,000		86,000	52,000	9,300		125,000	81,000
5,100		86,000	52,000	9,400		125,000	81,000
5,200		86,000	52,000	9,500		125,000	81,000
5,300		86,000	52,000	9,600		133,000	87,000
5,400		93,000	57,000	9,700		133,000	87,000
5,500		93,000	57,000	9,900		133,000	87,000
5,600		93,000	57,000	10,000		133,000	87,000
5,700		93,000	57,000	10,200		133,000	87,000
5,800		93,000	57,000	10,300		133,000	87,000
5,900		93,000	57,000	10,500		133,000	87,000
6,000		93,000	57,000	10,700		142,000	94,000
6,100		101,000	63,000	10,900		142,000	94,000
6,200		101,000	63,000	11,000		142,000	94,000
6,250		101,000	63,000	11,500		142,000	94,000
6,300		101,000	63,000	11,900		151,000	101,000
6,500		101,000	63,000	12,000		151,000	101,000
6,600		101,000	63,000	12,200		151,000	101,000
6,700		101,000	63,000	12,500		151,000	101,000
6,800		109,000	69,000	13,000		151,000	101,000
6,900		109,000	69,000	14,000		160,000	108,000
7,000		109,000	69,000	14,500		169,000	114,000
7,100		109,000	69,000	15,000		169,000	114,000
7,500		109,000	69,000	15,500		178,000	120,000
7,700		117,000	75,000	16,000		178,000	120,000
7,800		117,000	75,000				

Punte cilindriche

Punte elicoidali, corte



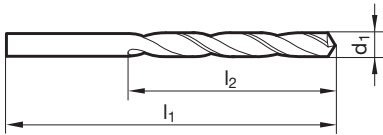
Catalogo n° 71119



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 180

- Assott. del noc. $\geq \varnothing 14,010$
- spoglia sul cono tagliente



d1 mm	inch	l1 mm	l2 mm
2,800		61,000	33,000
2,900		61,000	33,000
3,600		70,000	39,000
4,300		80,000	47,000
4,600		80,000	47,000
5,200		86,000	52,000
5,400		93,000	57,000
5,600		93,000	57,000
6,000		93,000	57,000
7,000		109,000	69,000
7,250		109,000	69,000
7,300		109,000	69,000

d1 mm	inch	l1 mm	l2 mm
7,800		117,000	75,000
8,000		117,000	75,000
8,800		125,000	81,000
9,000		125,000	81,000
9,500		125,000	81,000
13,500		160,000	108,000

Punte cilindriche

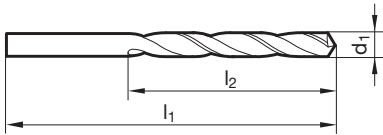
Punte elicoidali, corte



Catalogo n° 71115

N	~5xD	DIN 338	HSS	trattati a vapore	118°	h8	R	Cyl
P	M	K	N	S	H	Parametri di lav. ind. a pag. 180		
•		•	•					

- Assott. del noc. $\geq \varnothing 2,180$
- spoglia sul cono tagliente
- lucida $< 2,36$ mm



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
2,000		49,000	24,000	3,550		70,000	39,000
2,050		49,000	24,000	3,570	9/64	70,000	39,000
2,060		49,000	24,000	3,600		70,000	39,000
2,080		49,000	24,000	3,650		70,000	39,000
2,100		49,000	24,000	3,660		70,000	39,000
2,150		53,000	27,000	3,700		70,000	39,000
2,180		53,000	27,000	3,730		70,000	39,000
2,200		53,000	27,000	3,750		70,000	39,000
2,250		53,000	27,000	3,800		75,000	43,000
2,260		53,000	27,000	3,850		75,000	43,000
2,300		53,000	27,000	3,860		75,000	43,000
2,350		53,000	27,000	3,900		75,000	43,000
2,370		57,000	30,000	3,910		75,000	43,000
2,380	3/32	57,000	30,000	3,950		75,000	43,000
2,400		57,000	30,000	3,970	5/32	75,000	43,000
2,440		57,000	30,000	3,990		75,000	43,000
2,450		57,000	30,000	4,000		75,000	43,000
2,490		57,000	30,000	4,040		75,000	43,000
2,500		57,000	30,000	4,050		75,000	43,000
2,530		57,000	30,000	4,090		75,000	43,000
2,550		57,000	30,000	4,100		75,000	43,000
2,580		57,000	30,000	4,150		75,000	43,000
2,600		57,000	30,000	4,200		75,000	43,000
2,640		57,000	30,000	4,220		75,000	43,000
2,650		57,000	30,000	4,250		75,000	43,000
2,700		61,000	33,000	4,300		80,000	47,000
2,710		61,000	33,000	4,350		80,000	47,000
2,750		61,000	33,000	4,370	11/64	80,000	47,000
2,780	7/64	61,000	33,000	4,390		80,000	47,000
2,790		61,000	33,000	4,400		80,000	47,000
2,800		61,000	33,000	4,500		80,000	47,000
2,820		61,000	33,000	4,550		80,000	47,000
2,850		61,000	33,000	4,570		80,000	47,000
2,900		61,000	33,000	4,600		80,000	47,000
2,950		61,000	33,000	4,650		80,000	47,000
3,000		61,000	33,000	4,700		80,000	47,000
3,050		65,000	36,000	4,750		80,000	47,000
3,100		65,000	36,000	4,760	3/16	86,000	52,000
3,150		65,000	36,000	4,800		86,000	52,000
3,170	1/8	65,000	36,000	4,850		86,000	52,000
3,200		65,000	36,000	4,900		86,000	52,000
3,250		65,000	36,000	4,950		86,000	52,000
3,260		65,000	36,000	5,000		86,000	52,000
3,300		65,000	36,000	5,050		86,000	52,000
3,350		65,000	36,000	5,100		86,000	52,000
3,400		70,000	39,000	5,110		86,000	52,000
3,450		70,000	39,000	5,160	13/64	86,000	52,000
3,500		70,000	39,000	5,180		86,000	52,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
5,200		86,000	52,000	9,130	23/64	125,000	81,000
5,250		86,000	52,000	9,150		125,000	81,000
5,300		86,000	52,000	9,200		125,000	81,000
5,350		93,000	57,000	9,250		125,000	81,000
5,400		93,000	57,000	9,300		125,000	81,000
5,410		93,000	57,000	9,350		125,000	81,000
5,500		93,000	57,000	9,400		125,000	81,000
5,550		93,000	57,000	9,500		125,000	81,000
5,560	7/32	93,000	57,000	9,520	3/8	133,000	87,000
5,600		93,000	57,000	9,600		133,000	87,000
5,610		93,000	57,000	9,650		133,000	87,000
5,650		93,000	57,000	9,700		133,000	87,000
5,700		93,000	57,000	9,750		133,000	87,000
5,750		93,000	57,000	9,800		133,000	87,000
5,800		93,000	57,000	9,900		133,000	87,000
5,850		93,000	57,000	10,000		133,000	87,000
5,900		93,000	57,000	10,100		133,000	87,000
6,000		93,000	57,000	10,200		133,000	87,000
6,050		101,000	63,000	10,250		133,000	87,000
6,100		101,000	63,000	10,300		133,000	87,000
6,200		101,000	63,000	10,320	13/32	133,000	87,000
6,250		101,000	63,000	10,400		133,000	87,000
6,300		101,000	63,000	10,500		133,000	87,000
6,350	1/4	101,000	63,000	10,600		133,000	87,000
6,400		101,000	63,000	10,700		142,000	94,000
6,450		101,000	63,000	10,750		142,000	94,000
6,500		101,000	63,000	10,800		142,000	94,000
6,600		101,000	63,000	10,900		142,000	94,000
6,650		101,000	63,000	11,000		142,000	94,000
6,700		101,000	63,000	11,100		142,000	94,000
6,750	17/64	109,000	69,000	11,200		142,000	94,000
6,800		109,000	69,000	11,250		142,000	94,000
6,850		109,000	69,000	11,300		142,000	94,000
6,900		109,000	69,000	11,400		142,000	94,000
7,000		109,000	69,000	11,500		142,000	94,000
7,050		109,000	69,000	11,600		142,000	94,000
7,100		109,000	69,000	11,700		142,000	94,000
7,140	9/32	109,000	69,000	11,750		142,000	94,000
7,200		109,000	69,000	11,800		142,000	94,000
7,250		109,000	69,000	11,900		151,000	101,000
7,300		109,000	69,000	11,910	15/32	151,000	101,000
7,400		109,000	69,000	12,000		151,000	101,000
7,500		109,000	69,000	12,100		151,000	101,000
7,540	19/64	117,000	75,000	12,200		151,000	101,000
7,600		117,000	75,000	12,250		151,000	101,000
7,650		117,000	75,000	12,300	31/64	151,000	101,000
7,700		117,000	75,000	12,400		151,000	101,000
7,750		117,000	75,000	12,500		151,000	101,000
7,800		117,000	75,000	12,600		151,000	101,000
7,850		117,000	75,000	12,700	1/2	151,000	101,000
7,900		117,000	75,000	12,750		151,000	101,000
7,940	5/16	117,000	75,000	12,800		151,000	101,000
8,000		117,000	75,000	12,900		151,000	101,000
8,050		117,000	75,000	13,000		151,000	101,000
8,100		117,000	75,000	13,100	33/64	151,000	101,000
8,150		117,000	75,000	13,200		151,000	101,000
8,200		117,000	75,000	13,250		160,000	108,000
8,250		117,000	75,000	13,300		160,000	108,000
8,300		117,000	75,000	13,400		160,000	108,000
8,400		117,000	75,000	13,500		160,000	108,000
8,500		117,000	75,000	13,600		160,000	108,000
8,550		125,000	81,000	13,700		160,000	108,000
8,600		125,000	81,000	13,750		160,000	108,000
8,650		125,000	81,000	13,800		160,000	108,000
8,700		125,000	81,000	13,900		160,000	108,000
8,730	11/32	125,000	81,000	14,000		160,000	108,000
8,750		125,000	81,000	14,100		169,000	114,000
8,800		125,000	81,000	14,200		169,000	114,000
8,900		125,000	81,000	14,250		169,000	114,000
9,000		125,000	81,000	14,300		169,000	114,000
9,050		125,000	81,000	14,400		169,000	114,000
9,100		125,000	81,000	14,500		169,000	114,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
14,700		169,000	114,000	16,200		184,000	125,000
14,750		169,000	114,000	16,250		184,000	125,000
14,800		169,000	114,000	16,500		184,000	125,000
14,900		169,000	114,000	16,700		184,000	125,000
15,000		169,000	114,000	17,000		184,000	125,000
15,100		178,000	120,000	17,250		191,000	130,000
15,200		178,000	120,000	17,500		191,000	130,000
15,250		178,000	120,000	17,750		191,000	130,000
15,300		178,000	120,000	18,000		191,000	130,000
15,400		178,000	120,000	18,250		198,000	135,000
15,500		178,000	120,000	18,500		198,000	135,000
15,600		178,000	120,000	18,750		198,000	135,000
15,700		178,000	120,000	19,000		198,000	135,000
15,750		178,000	120,000	19,050	3/4	205,000	140,000
15,800		178,000	120,000	19,500		205,000	140,000
15,900		178,000	120,000	19,750		205,000	140,000
16,000		178,000	120,000	20,000		205,000	140,000
16,100		184,000	125,000				

Punte cilindriche

Punte elicoidali, corte



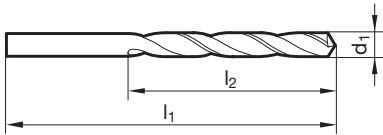
Catalogo n° 61116



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 180

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,700		93,000	57,000
1,100		36,000	14,000	5,800		93,000	57,000
1,200		38,000	16,000	5,900		93,000	57,000
1,300		38,000	16,000	6,000		93,000	57,000
1,400		40,000	18,000	6,100		101,000	63,000
1,500		40,000	18,000	6,200		101,000	63,000
1,600		43,000	20,000	6,300		101,000	63,000
1,700		43,000	20,000	6,400		101,000	63,000
1,800		46,000	22,000	6,500		101,000	63,000
1,900		46,000	22,000	6,600		101,000	63,000
2,000		49,000	24,000	6,700		101,000	63,000
2,100		49,000	24,000	6,800		109,000	69,000
2,200		53,000	27,000	6,900		109,000	69,000
2,300		53,000	27,000	7,000		109,000	69,000
2,400		57,000	30,000	7,100		109,000	69,000
2,500		57,000	30,000	7,200		109,000	69,000
2,600		57,000	30,000	7,300		109,000	69,000
2,700		61,000	33,000	7,400		109,000	69,000
2,800		61,000	33,000	7,500		109,000	69,000
2,900		61,000	33,000	7,600		117,000	75,000
3,000		61,000	33,000	7,700		117,000	75,000
3,100		65,000	36,000	7,800		117,000	75,000
3,200		65,000	36,000	7,900		117,000	75,000
3,300		65,000	36,000	8,000		117,000	75,000
3,400		70,000	39,000	8,100		117,000	75,000
3,500		70,000	39,000	8,200		117,000	75,000
3,600		70,000	39,000	8,300		117,000	75,000
3,700		70,000	39,000	8,400		117,000	75,000
3,800		75,000	43,000	8,500		117,000	75,000
3,900		75,000	43,000	8,600		125,000	81,000
4,000		75,000	43,000	8,700		125,000	81,000
4,100		75,000	43,000	8,800		125,000	81,000
4,200		75,000	43,000	8,900		125,000	81,000
4,250		75,000	43,000	9,000		125,000	81,000
4,300		80,000	47,000	9,100		125,000	81,000
4,400		80,000	47,000	9,200		125,000	81,000
4,500		80,000	47,000	9,300		125,000	81,000
4,600		80,000	47,000	9,400		125,000	81,000
4,700		80,000	47,000	9,500		125,000	81,000
4,800		86,000	52,000	9,600		133,000	87,000
4,900		86,000	52,000	9,700		133,000	87,000
5,000		86,000	52,000	9,800		133,000	87,000
5,100		86,000	52,000	9,900		133,000	87,000
5,200		86,000	52,000	10,000		133,000	87,000
5,300		86,000	52,000	10,200		133,000	87,000
5,400		93,000	57,000	10,500		133,000	87,000
5,500		93,000	57,000	10,800		142,000	94,000
5,600		93,000	57,000	11,000		142,000	94,000

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
11,500		142,000	94,000	13,500		160,000	108,000
11,800		142,000	94,000	14,000		160,000	108,000
12,000		151,000	101,000	14,500		169,000	114,000
12,500		151,000	101,000	15,000		169,000	114,000
12,700	1/2	151,000	101,000	15,500		178,000	120,000
13,000		151,000	101,000	16,000		178,000	120,000

Punte cilindriche

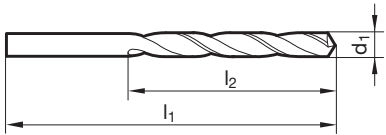
Punte elicoidali, corte



Catalogo n° 61115

N	~5xD	DIN 338	HSS	TiN - testa	118°	h8	R	Cyl
P	M	K	N	S	H	Parametri di lav. ind. a pag. 180		
●		●	○					

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,800		93,000	57,000
1,100		36,000	14,000	5,900		93,000	57,000
1,200		38,000	16,000	6,000		93,000	57,000
1,300		38,000	16,000	6,100		101,000	63,000
1,400		40,000	18,000	6,200		101,000	63,000
1,500		40,000	18,000	6,300		101,000	63,000
1,600		43,000	20,000	6,400		101,000	63,000
1,700		43,000	20,000	6,500		101,000	63,000
1,800		46,000	22,000	6,600		101,000	63,000
1,900		46,000	22,000	6,700		101,000	63,000
2,000		49,000	24,000	6,800		109,000	69,000
2,100		49,000	24,000	6,900		109,000	69,000
2,200		53,000	27,000	7,000		109,000	69,000
2,300		53,000	27,000	7,100		109,000	69,000
2,400		57,000	30,000	7,200		109,000	69,000
2,500		57,000	30,000	7,300		109,000	69,000
2,600		57,000	30,000	7,400		109,000	69,000
2,700		61,000	33,000	7,500		109,000	69,000
2,800		61,000	33,000	7,600		117,000	75,000
2,900		61,000	33,000	7,700		117,000	75,000
3,000		61,000	33,000	7,800		117,000	75,000
3,100		65,000	36,000	7,900		117,000	75,000
3,200		65,000	36,000	8,000		117,000	75,000
3,300		65,000	36,000	8,100		117,000	75,000
3,400		70,000	39,000	8,200		117,000	75,000
3,500		70,000	39,000	8,300		117,000	75,000
3,600		70,000	39,000	8,400		117,000	75,000
3,700		70,000	39,000	8,500		117,000	75,000
3,800		75,000	43,000	8,600		125,000	81,000
3,900		75,000	43,000	8,700		125,000	81,000
4,000		75,000	43,000	8,800		125,000	81,000
4,100		75,000	43,000	8,900		125,000	81,000
4,200		75,000	43,000	9,000		125,000	81,000
4,300		80,000	47,000	9,100		125,000	81,000
4,400		80,000	47,000	9,200		125,000	81,000
4,500		80,000	47,000	9,300		125,000	81,000
4,600		80,000	47,000	9,400		125,000	81,000
4,700		80,000	47,000	9,500		125,000	81,000
4,800		86,000	52,000	9,600		133,000	87,000
4,900		86,000	52,000	9,700		133,000	87,000
5,000		86,000	52,000	9,800		133,000	87,000
5,100		86,000	52,000	9,900		133,000	87,000
5,200		86,000	52,000	10,000		133,000	87,000
5,300		86,000	52,000	10,100		133,000	87,000
5,400		93,000	57,000	10,200		133,000	87,000
5,500		93,000	57,000	10,300		133,000	87,000
5,600		93,000	57,000	10,400		133,000	87,000
5,700		93,000	57,000	10,500		133,000	87,000

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
10,600		133,000	87,000	12,500		151,000	101,000
10,700		142,000	94,000	12,600		151,000	101,000
10,800		142,000	94,000	12,800		151,000	101,000
10,900		142,000	94,000	12,900		151,000	101,000
11,000		142,000	94,000	13,000		151,000	101,000
11,100		142,000	94,000	13,200		151,000	101,000
11,200		142,000	94,000	13,300		160,000	108,000
11,300		142,000	94,000	13,400		160,000	108,000
11,400		142,000	94,000	13,500		160,000	108,000
11,500		142,000	94,000	13,600		160,000	108,000
11,600		142,000	94,000	13,700		160,000	108,000
11,700		142,000	94,000	13,800		160,000	108,000
11,800		142,000	94,000	13,900		160,000	108,000
11,900		151,000	101,000	14,000		160,000	108,000
12,000		151,000	101,000	14,500		169,000	114,000
12,100		151,000	101,000	15,000		169,000	114,000
12,200		151,000	101,000	15,500		178,000	120,000
12,400		151,000	101,000	16,000		178,000	120,000

Punte cilindriche

Punte elicoidali, corte



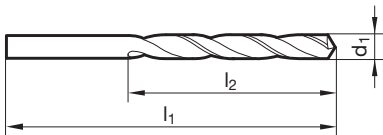
Catalogo n° 71149



P	M	K	N	S	H
●	●	●	○		

Parametri di lav.
ind. a pag. 182

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- lucida $< 2,36$ mm



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,800		93,000	57,000
1,100		36,000	14,000	5,900		93,000	57,000
1,200		38,000	16,000	6,000		93,000	57,000
1,300		38,000	16,000	6,100		101,000	63,000
1,400		40,000	18,000	6,200		101,000	63,000
1,500		40,000	18,000	6,300		101,000	63,000
1,600		43,000	20,000	6,400		101,000	63,000
1,700		43,000	20,000	6,500		101,000	63,000
1,800		46,000	22,000	6,600		101,000	63,000
1,900		46,000	22,000	6,700		101,000	63,000
2,000		49,000	24,000	6,800		109,000	69,000
2,100		49,000	24,000	6,900		109,000	69,000
2,200		53,000	27,000	7,000		109,000	69,000
2,300		53,000	27,000	7,100		109,000	69,000
2,400		57,000	30,000	7,200		109,000	69,000
2,500		57,000	30,000	7,300		109,000	69,000
2,600		57,000	30,000	7,400		109,000	69,000
2,700		61,000	33,000	7,500		109,000	69,000
2,800		61,000	33,000	7,600		117,000	75,000
2,900		61,000	33,000	7,700		117,000	75,000
3,000		61,000	33,000	7,800		117,000	75,000
3,100		65,000	36,000	8,000		117,000	75,000
3,200		65,000	36,000	8,100		117,000	75,000
3,300		65,000	36,000	8,200		117,000	75,000
3,400		70,000	39,000	8,300		117,000	75,000
3,500		70,000	39,000	8,400		117,000	75,000
3,600		70,000	39,000	8,500		117,000	75,000
3,700		70,000	39,000	8,600		125,000	81,000
3,800		75,000	43,000	8,700		125,000	81,000
3,900		75,000	43,000	8,800		125,000	81,000
4,000		75,000	43,000	8,900		125,000	81,000
4,100		75,000	43,000	9,000		125,000	81,000
4,200		75,000	43,000	9,100		125,000	81,000
4,300		80,000	47,000	9,200		125,000	81,000
4,400		80,000	47,000	9,300		125,000	81,000
4,500		80,000	47,000	9,400		125,000	81,000
4,600		80,000	47,000	9,500		125,000	81,000
4,700		80,000	47,000	9,600		133,000	87,000
4,800		86,000	52,000	9,700		133,000	87,000
4,900		86,000	52,000	9,800		133,000	87,000
5,000		86,000	52,000	9,900		133,000	87,000
5,100		86,000	52,000	10,000		133,000	87,000
5,200		86,000	52,000	10,200		133,000	87,000
5,300		86,000	52,000	10,500		133,000	87,000
5,400		93,000	57,000	11,000		142,000	94,000
5,500		93,000	57,000	11,500		142,000	94,000
5,600		93,000	57,000	12,000		151,000	101,000
5,700		93,000	57,000	12,500		151,000	101,000

d1 mm	inch	l1 mm	l2 mm
12,700	1/2	151,000	101,000
13,000		151,000	101,000
13,500		160,000	108,000
14,000		160,000	108,000
15,000		169,000	114,000

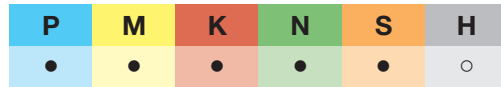
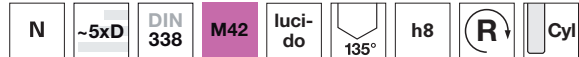
d1 mm	inch	l1 mm	l2 mm
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Punte cilindriche

Punte elicoidali, corte

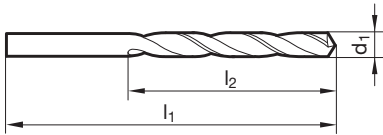


Catalogo n° 71148



Parametri di lav.
ind. a pag. 182

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- con alta perc. di CoMo
- specialmente per resistenza all'usura



d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000
1,100		36,000	14,000
1,200		38,000	16,000
1,300		38,000	16,000
1,400		40,000	18,000
1,500		40,000	18,000
1,600		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
2,000		49,000	24,000
2,100		49,000	24,000
2,200		53,000	27,000
2,300		53,000	27,000
2,400		57,000	30,000
2,500		57,000	30,000
2,600		57,000	30,000
2,700		61,000	33,000
2,800		61,000	33,000
2,900		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000

d1 mm	inch	l1 mm	l2 mm
5,800		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000
11,500		142,000	94,000
12,000		151,000	101,000
12,500		151,000	101,000

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
12,700	1/2	151,000	101,000	15,500		178,000	120,000
13,000		151,000	101,000	16,000		178,000	120,000
13,500		160,000	108,000				
14,000		160,000	108,000				
14,500		169,000	114,000				
15,000		169,000	114,000				

Punte cilindriche

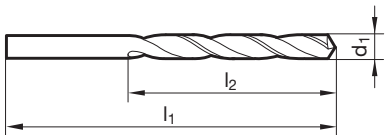
Punte elicoidali, corte



Catalogo n° 71117

H	~5xD	DIN 338	HSS	lucido	118°	h8	R	Cyl
P	M	K	N	S	H	Parametri di lav. ind. a pag. 180		
			○					

- spoglia sul cono tagliente
- per materiali duri e friabili



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,000		86,000	52,000
1,050		34,000	12,000	5,100		86,000	52,000
1,100		36,000	14,000	5,200		86,000	52,000
1,150		36,000	14,000	5,300		86,000	52,000
1,200		38,000	16,000	5,400		93,000	57,000
1,250		38,000	16,000	5,500		93,000	57,000
1,300		38,000	16,000	5,600		93,000	57,000
1,350		40,000	18,000	5,700		93,000	57,000
1,400		40,000	18,000	5,800		93,000	57,000
1,450		40,000	18,000	5,900		93,000	57,000
1,500		40,000	18,000	6,000		93,000	57,000
1,550		43,000	20,000	6,100		101,000	63,000
1,600		43,000	20,000	6,200		101,000	63,000
1,650		43,000	20,000	6,250		101,000	63,000
1,700		43,000	20,000	6,300		101,000	63,000
1,800		46,000	22,000	6,500		101,000	63,000
1,900		46,000	22,000	6,600		101,000	63,000
2,000		49,000	24,000	6,700		101,000	63,000
2,100		49,000	24,000	6,800		109,000	69,000
2,200		53,000	27,000	6,900		109,000	69,000
2,300		53,000	27,000	7,000		109,000	69,000
2,500		57,000	30,000	7,100		109,000	69,000
2,550		57,000	30,000	7,200		109,000	69,000
2,600		57,000	30,000	7,300		109,000	69,000
2,700		61,000	33,000	7,400		109,000	69,000
2,800		61,000	33,000	7,500		109,000	69,000
2,900		61,000	33,000	7,600		117,000	75,000
3,000		61,000	33,000	7,700		117,000	75,000
3,100		65,000	36,000	7,750		117,000	75,000
3,200		65,000	36,000	7,800		117,000	75,000
3,300		65,000	36,000	7,900		117,000	75,000
3,400		70,000	39,000	8,000		117,000	75,000
3,500		70,000	39,000	8,100		117,000	75,000
3,600		70,000	39,000	8,200		117,000	75,000
3,700		70,000	39,000	8,300		117,000	75,000
3,800		75,000	43,000	8,400		117,000	75,000
3,850		75,000	43,000	8,500		117,000	75,000
3,900		75,000	43,000	8,600		125,000	81,000
4,000		75,000	43,000	8,700		125,000	81,000
4,100		75,000	43,000	8,800		125,000	81,000
4,200		75,000	43,000	8,900		125,000	81,000
4,300		80,000	47,000	9,000		125,000	81,000
4,500		80,000	47,000	9,100		125,000	81,000
4,600		80,000	47,000	9,200		125,000	81,000
4,700		80,000	47,000	9,300		125,000	81,000
4,750		80,000	47,000	9,400		125,000	81,000
4,800		86,000	52,000	9,500		125,000	81,000
4,900		86,000	52,000	9,600		133,000	87,000

d1 mm	inch	l1 mm	l2 mm
9,700		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
11,500		142,000	94,000
12,000		151,000	101,000

d1 mm	inch	l1 mm	l2 mm

Punte cilindriche

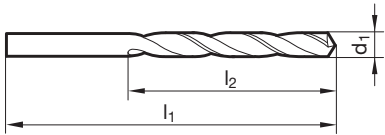
Punte elicoidali, corte



Catalogo n° 71221

NX	~5xD	DIN 338	HSS-Co	lucido	118°	h8	R	Cyl
P	M	K	N	S	H	Parametri di lav. ind. a pag. 182		
•	•	•	•					

- Assott. del noc. $\geq \varnothing 1,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- uso universale



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,800		93,000	57,000
1,100		36,000	14,000	5,900		93,000	57,000
1,200		38,000	16,000	6,000		93,000	57,000
1,300		38,000	16,000	6,100		101,000	63,000
1,400		40,000	18,000	6,200		101,000	63,000
1,500		40,000	18,000	6,300		101,000	63,000
1,600		43,000	20,000	6,400		101,000	63,000
1,700		43,000	20,000	6,500		101,000	63,000
1,800		46,000	22,000	6,600		101,000	63,000
1,900		46,000	22,000	6,700		101,000	63,000
2,000		49,000	24,000	6,800		109,000	69,000
2,100		49,000	24,000	6,900		109,000	69,000
2,200		53,000	27,000	7,000		109,000	69,000
2,300		53,000	27,000	7,100		109,000	69,000
2,400		57,000	30,000	7,200		109,000	69,000
2,500		57,000	30,000	7,300		109,000	69,000
2,600		57,000	30,000	7,400		109,000	69,000
2,700		61,000	33,000	7,500		109,000	69,000
2,800		61,000	33,000	7,600		117,000	75,000
2,900		61,000	33,000	7,700		117,000	75,000
3,000		61,000	33,000	7,800		117,000	75,000
3,100		65,000	36,000	7,900		117,000	75,000
3,200		65,000	36,000	8,000		117,000	75,000
3,300		65,000	36,000	8,100		117,000	75,000
3,400		70,000	39,000	8,200		117,000	75,000
3,500		70,000	39,000	8,300		117,000	75,000
3,600		70,000	39,000	8,400		117,000	75,000
3,700		70,000	39,000	8,500		117,000	75,000
3,800		75,000	43,000	8,600		125,000	81,000
3,900		75,000	43,000	8,700		125,000	81,000
4,000		75,000	43,000	8,800		125,000	81,000
4,100		75,000	43,000	8,900		125,000	81,000
4,200		75,000	43,000	9,000		125,000	81,000
4,300		80,000	47,000	9,100		125,000	81,000
4,400		80,000	47,000	9,200		125,000	81,000
4,500		80,000	47,000	9,300		125,000	81,000
4,600		80,000	47,000	9,400		125,000	81,000
4,700		80,000	47,000	9,500		125,000	81,000
4,800		86,000	52,000	9,600		133,000	87,000
4,900		86,000	52,000	9,700		133,000	87,000
5,000		86,000	52,000	9,800		133,000	87,000
5,100		86,000	52,000	9,900		133,000	87,000
5,200		86,000	52,000	10,000		133,000	87,000
5,300		86,000	52,000	10,100		133,000	87,000
5,400		93,000	57,000	10,200		133,000	87,000
5,500		93,000	57,000	10,300		133,000	87,000
5,600		93,000	57,000	10,400		133,000	87,000
5,700		93,000	57,000	10,500		133,000	87,000

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
11,000		142,000	94,000	14,000		160,000	108,000
11,500		142,000	94,000				
12,000		151,000	101,000				
12,500		151,000	101,000				
13,000		151,000	101,000				
13,500		160,000	108,000				

Punte cilindriche

Punte elicoidali, corte



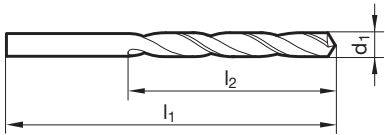
Catalogo n° 61221



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 182

- Assott. del noc. $\geq \varnothing 1,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- massima resistenza all'usura
- uso universale



d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000
1,100		36,000	14,000
1,200		38,000	16,000
1,300		38,000	16,000
1,400		40,000	18,000
1,500		40,000	18,000
1,600		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
2,000		49,000	24,000
2,100		49,000	24,000
2,200		53,000	27,000
2,300		53,000	27,000
2,400		57,000	30,000
2,500		57,000	30,000
2,600		57,000	30,000
2,700		61,000	33,000
2,800		61,000	33,000
2,900		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000

d1 mm	inch	l1 mm	l2 mm
5,800		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,200		109,000	69,000
7,300		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,400		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
11,000		142,000	94,000	14,000		160,000	108,000
11,500		142,000	94,000				
12,000		151,000	101,000				
12,500		151,000	101,000				
13,000		151,000	101,000				
13,500		160,000	108,000				

Punte cilindriche

Punte elicoidali, corte



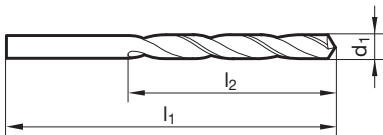
Catalogo n° 71123



P	M	K	N	S	H
●	○			○	

Parametri di lav.
ind. a pag. 182

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- lucida $< 2,0$ mm



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,800		30,000	10,000	4,400		80,000	47,000
0,850		30,000	10,000	4,500		80,000	47,000
0,900		32,000	11,000	4,600		80,000	47,000
1,000		34,000	12,000	4,700		80,000	47,000
1,050		34,000	12,000	4,800		86,000	52,000
1,100		36,000	14,000	4,900		86,000	52,000
1,200		38,000	16,000	5,000		86,000	52,000
1,300		38,000	16,000	5,100		86,000	52,000
1,350		40,000	18,000	5,200		86,000	52,000
1,400		40,000	18,000	5,300		86,000	52,000
1,450		40,000	18,000	5,400		93,000	57,000
1,500		40,000	18,000	5,500		93,000	57,000
1,550		43,000	20,000	5,600		93,000	57,000
1,600		43,000	20,000	5,700		93,000	57,000
1,700		43,000	20,000	5,800		93,000	57,000
1,800		46,000	22,000	5,900		93,000	57,000
1,900		46,000	22,000	6,000		93,000	57,000
1,950		49,000	24,000	6,100		101,000	63,000
2,000		49,000	24,000	6,200		101,000	63,000
2,050		49,000	24,000	6,300		101,000	63,000
2,100		49,000	24,000	6,400		101,000	63,000
2,200		53,000	27,000	6,500		101,000	63,000
2,300		53,000	27,000	6,600		101,000	63,000
2,400		57,000	30,000	6,700		101,000	63,000
2,450		57,000	30,000	6,800		109,000	69,000
2,500		57,000	30,000	6,900		109,000	69,000
2,550		57,000	30,000	7,000		109,000	69,000
2,600		57,000	30,000	7,100		109,000	69,000
2,700		61,000	33,000	7,200		109,000	69,000
2,750		61,000	33,000	7,300		109,000	69,000
2,800		61,000	33,000	7,400		109,000	69,000
2,850		61,000	33,000	7,500		109,000	69,000
2,900		61,000	33,000	7,600		117,000	75,000
2,950		61,000	33,000	7,700		117,000	75,000
3,000		61,000	33,000	7,800		117,000	75,000
3,100		65,000	36,000	7,900		117,000	75,000
3,200		65,000	36,000	8,000		117,000	75,000
3,300		65,000	36,000	8,100		117,000	75,000
3,400		70,000	39,000	8,200		117,000	75,000
3,500		70,000	39,000	8,300		117,000	75,000
3,600		70,000	39,000	8,400		117,000	75,000
3,700		70,000	39,000	8,500		117,000	75,000
3,800		75,000	43,000	8,600		125,000	81,000
3,900		75,000	43,000	8,700		125,000	81,000
4,000		75,000	43,000	8,800		125,000	81,000
4,100		75,000	43,000	8,900		125,000	81,000
4,200		75,000	43,000	9,000		125,000	81,000
4,300		80,000	47,000	9,100		125,000	81,000

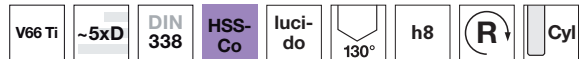
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
9,200		125,000	81,000	12,100		151,000	101,000
9,300		125,000	81,000	12,200		151,000	101,000
9,400		125,000	81,000	12,400		151,000	101,000
9,500		125,000	81,000	12,500		151,000	101,000
9,600		133,000	87,000	12,600		151,000	101,000
9,700		133,000	87,000	12,800		151,000	101,000
9,800		133,000	87,000	13,000		151,000	101,000
9,900		133,000	87,000	13,500		160,000	108,000
10,000		133,000	87,000				
10,200		133,000	87,000				
10,500		133,000	87,000				
10,800		142,000	94,000				
11,000		142,000	94,000				
11,500		142,000	94,000				
11,700		142,000	94,000				
11,800		142,000	94,000				
11,900		151,000	101,000				
12,000		151,000	101,000				

Punte cilindriche

Punte elicoidali, corte



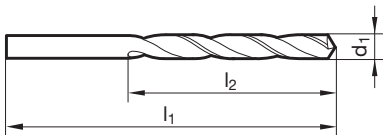
Catalogo n° 71122



P	M	K	N	S	H
○	●			●	

Parametri di lav.
ind. a pag. 182

- Assott. del noc. $\geq \varnothing 4,600$
- spoglia sul cono tagliente



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,800		93,000	57,000
1,100		36,000	14,000	5,900		93,000	57,000
1,200		38,000	16,000	6,000		93,000	57,000
1,300		38,000	16,000	6,100		101,000	63,000
1,400		40,000	18,000	6,200		101,000	63,000
1,500		40,000	18,000	6,300		101,000	63,000
1,600		43,000	20,000	6,400		101,000	63,000
1,700		43,000	20,000	6,500		101,000	63,000
1,800		46,000	22,000	6,600		101,000	63,000
1,900		46,000	22,000	6,700		101,000	63,000
2,000		49,000	24,000	6,750	17/64	109,000	69,000
2,100		49,000	24,000	6,800		109,000	69,000
2,200		53,000	27,000	6,900		109,000	69,000
2,300		53,000	27,000	7,000		109,000	69,000
2,400		57,000	30,000	7,100		109,000	69,000
2,500		57,000	30,000	7,200		109,000	69,000
2,600		57,000	30,000	7,400		109,000	69,000
2,700		61,000	33,000	7,500		109,000	69,000
2,800		61,000	33,000	7,600		117,000	75,000
2,900		61,000	33,000	7,800		117,000	75,000
3,000		61,000	33,000	7,900		117,000	75,000
3,100		65,000	36,000	8,000		117,000	75,000
3,200		65,000	36,000	8,100		117,000	75,000
3,300		65,000	36,000	8,200		117,000	75,000
3,400		70,000	39,000	8,300		117,000	75,000
3,500		70,000	39,000	8,400		117,000	75,000
3,600		70,000	39,000	8,500		117,000	75,000
3,700		70,000	39,000	8,600		125,000	81,000
3,800		75,000	43,000	8,700		125,000	81,000
3,900		75,000	43,000	8,800		125,000	81,000
4,000		75,000	43,000	8,900		125,000	81,000
4,100		75,000	43,000	9,000		125,000	81,000
4,200		75,000	43,000	9,100		125,000	81,000
4,300		80,000	47,000	9,300		125,000	81,000
4,400		80,000	47,000	9,400		125,000	81,000
4,500		80,000	47,000	9,500		125,000	81,000
4,600		80,000	47,000	9,600		133,000	87,000
4,700		80,000	47,000	9,700		133,000	87,000
4,800		86,000	52,000	9,800		133,000	87,000
4,900		86,000	52,000	10,000		133,000	87,000
5,000		86,000	52,000	10,200		133,000	87,000
5,100		86,000	52,000	10,500		133,000	87,000
5,200		86,000	52,000	11,000		142,000	94,000
5,300		86,000	52,000	11,500		142,000	94,000
5,400		93,000	57,000	12,000		151,000	101,000
5,500		93,000	57,000	12,500		151,000	101,000
5,600		93,000	57,000	13,000		151,000	101,000
5,700		93,000	57,000	13,500		160,000	108,000

d1 mm	inch	l1 mm	l2 mm
14,000		160,000	108,000
14,500		169,000	114,000
15,000		169,000	114,000
16,000		178,000	120,000

d1 mm	inch	l1 mm	l2 mm
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Punte cilindriche

Punte elicoidali, corte



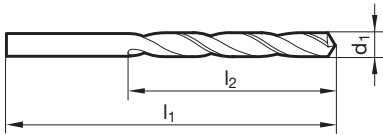
Catalogo n° 61223



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 180

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,000		86,000	52,000
1,050		34,000	12,000	5,100		86,000	52,000
1,100		36,000	14,000	5,200		86,000	52,000
1,150		36,000	14,000	5,300		86,000	52,000
1,200		38,000	16,000	5,400		93,000	57,000
1,250		38,000	16,000	5,500		93,000	57,000
1,300		38,000	16,000	5,600		93,000	57,000
1,350		40,000	18,000	5,700		93,000	57,000
1,400		40,000	18,000	5,800		93,000	57,000
1,500		40,000	18,000	5,900		93,000	57,000
1,550		43,000	20,000	6,000		93,000	57,000
1,600		43,000	20,000	6,100		101,000	63,000
1,650		43,000	20,000	6,200		101,000	63,000
1,700		43,000	20,000	6,300		101,000	63,000
1,750		46,000	22,000	6,400		101,000	63,000
1,800		46,000	22,000	6,500		101,000	63,000
1,900		46,000	22,000	6,600		101,000	63,000
1,950		49,000	24,000	6,700		101,000	63,000
2,000		49,000	24,000	6,800		109,000	69,000
2,100		49,000	24,000	6,900		109,000	69,000
2,200		53,000	27,000	7,000		109,000	69,000
2,300		53,000	27,000	7,100		109,000	69,000
2,400		57,000	30,000	7,200		109,000	69,000
2,500		57,000	30,000	7,300		109,000	69,000
2,600		57,000	30,000	7,400		109,000	69,000
2,700		61,000	33,000	7,500		109,000	69,000
2,800		61,000	33,000	7,600		117,000	75,000
2,900		61,000	33,000	7,700		117,000	75,000
3,000		61,000	33,000	7,800		117,000	75,000
3,100		65,000	36,000	7,900		117,000	75,000
3,200		65,000	36,000	8,000		117,000	75,000
3,300		65,000	36,000	8,100		117,000	75,000
3,400		70,000	39,000	8,200		117,000	75,000
3,500		70,000	39,000	8,300		117,000	75,000
3,600		70,000	39,000	8,400		117,000	75,000
3,700		70,000	39,000	8,500		117,000	75,000
3,800		75,000	43,000	8,600		125,000	81,000
3,900		75,000	43,000	8,700		125,000	81,000
4,000		75,000	43,000	8,800		125,000	81,000
4,100		75,000	43,000	8,900		125,000	81,000
4,200		75,000	43,000	9,000		125,000	81,000
4,300		80,000	47,000	9,100		125,000	81,000
4,400		80,000	47,000	9,200		125,000	81,000
4,500		80,000	47,000	9,300		125,000	81,000
4,600		80,000	47,000	9,400		125,000	81,000
4,700		80,000	47,000	9,500		125,000	81,000
4,800		86,000	52,000	9,600		133,000	87,000
4,900		86,000	52,000	9,700		133,000	87,000

d1		l1	l2
mm	inch	mm	mm
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000

d1		l1	l2
mm	inch	mm	mm
11,500		142,000	94,000
12,000		151,000	101,000
12,500		151,000	101,000
13,000		151,000	101,000
13,500		160,000	108,000

Punte cilindriche

Punte elicoidali, corte



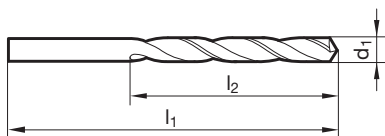
Catalogo n° 51122



P	M	K	N	S	H
○	●			○	

Parametri di lav.
ind. a pag. 184

- Assott. del nocch. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



d1 mm	inch	l1 mm	l2 mm
2,000		49,000	24,000
2,500		57,000	30,000
3,000		61,000	33,000
3,500		70,000	39,000
4,000		75,000	43,000
4,200		75,000	43,000
4,500		80,000	47,000
5,000		86,000	52,000
5,500		93,000	57,000
6,000		93,000	57,000
6,500		101,000	63,000
6,800		109,000	69,000
7,000		109,000	69,000
7,500		109,000	69,000
8,000		117,000	75,000
8,500		117,000	75,000
9,000		125,000	81,000
9,500		125,000	81,000

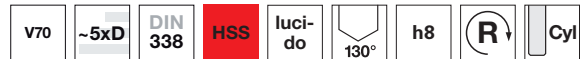
d1 mm	inch	l1 mm	l2 mm
10,000		133,000	87,000
10,200		133,000	87,000
10,500		133,000	87,000
11,000		142,000	94,000
11,500		142,000	94,000
12,000		151,000	101,000
12,500		151,000	101,000
13,000		151,000	101,000

Punte cilindriche

Punte elicoidali, corte



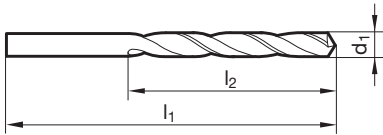
Catalogo n° 71124



P	M	K	N	S	H
●		○	●		

Parametri di lav.
ind. a pag. 180

- Assott. del noc. $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		40,000	18,000	3,910		75,000	43,000
1,570		43,000	20,000	3,970	5/32	75,000	43,000
1,600		43,000	20,000	3,990		75,000	43,000
1,700		43,000	20,000	4,000		75,000	43,000
1,750		46,000	22,000	4,090		75,000	43,000
1,780		46,000	22,000	4,100		75,000	43,000
1,800		46,000	22,000	4,200		75,000	43,000
1,850		46,000	22,000	4,220		75,000	43,000
1,900		46,000	22,000	4,300		80,000	47,000
1,930		49,000	24,000	4,390		80,000	47,000
1,980	5/64	49,000	24,000	4,400		80,000	47,000
1,990		49,000	24,000	4,500		80,000	47,000
2,000		49,000	24,000	4,570		80,000	47,000
2,050		49,000	24,000	4,600		80,000	47,000
2,080		49,000	24,000	4,700		80,000	47,000
2,100		49,000	24,000	4,800		86,000	52,000
2,180		53,000	27,000	4,850		86,000	52,000
2,200		53,000	27,000	4,900		86,000	52,000
2,260		53,000	27,000	4,980		86,000	52,000
2,300		53,000	27,000	5,000		86,000	52,000
2,370		57,000	30,000	5,100		86,000	52,000
2,400		57,000	30,000	5,110		86,000	52,000
2,490		57,000	30,000	5,180		86,000	52,000
2,500		57,000	30,000	5,200		86,000	52,000
2,580		57,000	30,000	5,220		86,000	52,000
2,600		57,000	30,000	5,300		86,000	52,000
2,700		61,000	33,000	5,310		93,000	57,000
2,710		61,000	33,000	5,400		93,000	57,000
2,780	7/64	61,000	33,000	5,410		93,000	57,000
2,790		61,000	33,000	5,500		93,000	57,000
2,800		61,000	33,000	5,560	7/32	93,000	57,000
2,870		61,000	33,000	5,600		93,000	57,000
2,900		61,000	33,000	5,610		93,000	57,000
2,950		61,000	33,000	5,700		93,000	57,000
3,000		61,000	33,000	5,790		93,000	57,000
3,100		65,000	36,000	5,800		93,000	57,000
3,200		65,000	36,000	5,900		93,000	57,000
3,260		65,000	36,000	5,940		93,000	57,000
3,300		65,000	36,000	5,950	15/64	93,000	57,000
3,400		70,000	39,000	6,000		93,000	57,000
3,450		70,000	39,000	6,050		101,000	63,000
3,500		70,000	39,000	6,100		101,000	63,000
3,600		70,000	39,000	6,200		101,000	63,000
3,700		70,000	39,000	6,300		101,000	63,000
3,730		70,000	39,000	6,350	1/4	101,000	63,000
3,800		75,000	43,000	6,400		101,000	63,000
3,860		75,000	43,000	6,500		101,000	63,000
3,900		75,000	43,000	6,530		101,000	63,000

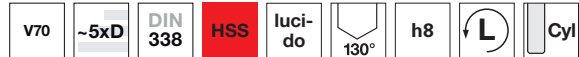
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
6,600		101,000	63,000	9,520	3/8	133,000	87,000
6,630		101,000	63,000	9,530		133,000	87,000
6,700		101,000	63,000	9,580		133,000	87,000
6,750	17/64	109,000	69,000	9,600		133,000	87,000
6,760		109,000	69,000	9,700		133,000	87,000
6,800		109,000	69,000	9,800		133,000	87,000
6,900		109,000	69,000	9,900		133,000	87,000
6,910		109,000	69,000	9,920	25/64	133,000	87,000
7,000		109,000	69,000	10,000		133,000	87,000
7,040		109,000	69,000	10,080		133,000	87,000
7,100		109,000	69,000	10,100		133,000	87,000
7,140	9/32	109,000	69,000	10,200		133,000	87,000
7,200		109,000	69,000	10,260		133,000	87,000
7,300		109,000	69,000	10,300		133,000	87,000
7,370		109,000	69,000	10,400		133,000	87,000
7,400		109,000	69,000	10,490		133,000	87,000
7,490		109,000	69,000	10,500		133,000	87,000
7,500		109,000	69,000	10,600		133,000	87,000
7,540	19/64	117,000	75,000	10,720	27/64	142,000	94,000
7,600		117,000	75,000	10,900		142,000	94,000
7,670		117,000	75,000	11,000		142,000	94,000
7,700		117,000	75,000	11,100		142,000	94,000
7,750		117,000	75,000	11,110	7/16	142,000	94,000
7,800		117,000	75,000	11,200		142,000	94,000
7,940	5/16	117,000	75,000	11,300		142,000	94,000
8,000		117,000	75,000	11,400		142,000	94,000
8,030		117,000	75,000	11,500		142,000	94,000
8,100		117,000	75,000	11,510	29/64	142,000	94,000
8,200		117,000	75,000	11,600		142,000	94,000
8,300		117,000	75,000	11,800		142,000	94,000
8,330	21/64	117,000	75,000	11,900		151,000	101,000
8,400		117,000	75,000	11,910	15/32	151,000	101,000
8,430		117,000	75,000	12,000		151,000	101,000
8,500		117,000	75,000	12,500		151,000	101,000
8,600		125,000	81,000	12,700	1/2	151,000	101,000
8,610		125,000	81,000	13,000		151,000	101,000
8,700		125,000	81,000	14,000		160,000	108,000
8,800		125,000	81,000	14,500		169,000	114,000
8,840		125,000	81,000	15,000		169,000	114,000
8,900		125,000	81,000	15,500		178,000	120,000
9,000		125,000	81,000				
9,090		125,000	81,000				
9,100		125,000	81,000				
9,130	23/64	125,000	81,000				
9,200		125,000	81,000				
9,300		125,000	81,000				
9,350		125,000	81,000				
9,500		125,000	81,000				

Punte cilindriche

Punte elicoidali, corte



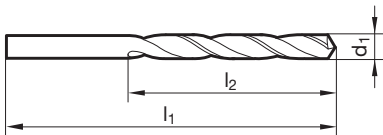
Catalogo n° 71126



P	M	K	N	S	H
●		○	●		

Parametri di lav.
ind. a pag. 180

- Assott. del noc. $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		40,000	18,000	6,800		109,000	69,000
1,600		43,000	20,000	6,900		109,000	69,000
1,700		43,000	20,000	7,000		109,000	69,000
1,750		46,000	22,000	7,100		109,000	69,000
1,800		46,000	22,000	7,200		109,000	69,000
1,900		46,000	22,000	7,300		109,000	69,000
2,000		49,000	24,000	7,400		109,000	69,000
2,100		49,000	24,000	7,500		109,000	69,000
2,200		53,000	27,000	7,600		117,000	75,000
2,300		53,000	27,000	7,700		117,000	75,000
2,400		57,000	30,000	7,800		117,000	75,000
2,500		57,000	30,000	8,000		117,000	75,000
2,600		57,000	30,000	8,100		117,000	75,000
2,900		61,000	33,000	8,200		117,000	75,000
3,000		61,000	33,000	8,300		117,000	75,000
3,100		65,000	36,000	8,400		117,000	75,000
3,200		65,000	36,000	8,500		117,000	75,000
3,300		65,000	36,000	8,600		125,000	81,000
3,500		70,000	39,000	8,700		125,000	81,000
3,600		70,000	39,000	8,800		125,000	81,000
3,700		70,000	39,000	8,900		125,000	81,000
3,800		75,000	43,000	9,000		125,000	81,000
3,900		75,000	43,000	9,100		125,000	81,000
4,000		75,000	43,000	9,200		125,000	81,000
4,100		75,000	43,000	9,300		125,000	81,000
4,200		75,000	43,000	9,400		125,000	81,000
4,400		80,000	47,000	9,500		125,000	81,000
4,500		80,000	47,000	9,600		133,000	87,000
4,600		80,000	47,000	9,700		133,000	87,000
4,700		80,000	47,000	9,800		133,000	87,000
4,800		86,000	52,000	9,900		133,000	87,000
4,900		86,000	52,000	10,000		133,000	87,000
5,000		86,000	52,000	10,100		133,000	87,000
5,200		86,000	52,000	10,200		133,000	87,000
5,300		86,000	52,000	10,300		133,000	87,000
5,400		93,000	57,000	10,400		133,000	87,000
5,500		93,000	57,000	10,500		133,000	87,000
5,600		93,000	57,000	10,600		133,000	87,000
5,700		93,000	57,000	10,700		142,000	94,000
5,800		93,000	57,000	10,800		142,000	94,000
5,900		93,000	57,000	10,900		142,000	94,000
6,000		93,000	57,000	11,000		142,000	94,000
6,100		101,000	63,000	11,100		142,000	94,000
6,200		101,000	63,000	11,300		142,000	94,000
6,300		101,000	63,000	11,400		142,000	94,000
6,500		101,000	63,000	11,500		142,000	94,000
6,600		101,000	63,000	11,600		142,000	94,000
6,700		101,000	63,000	11,700		142,000	94,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
11,800		142,000	94,000	14,000		160,000	108,000
11,900		151,000	101,000	14,500		169,000	114,000
12,000		151,000	101,000	15,000		169,000	114,000
12,300	31/64	151,000	101,000	16,000		178,000	120,000
12,500		151,000	101,000				
13,000		151,000	101,000				

Punte cilindriche

Punte elicoidali, corte



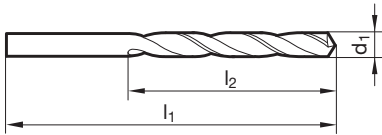
Catalogo n° 61124



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 180

- Assott. del noc. $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe
- maggiore protezione contro l'usura



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		40,000	18,000	5,700		93,000	57,000
1,600		43,000	20,000	5,800		93,000	57,000
1,700		43,000	20,000	6,000		93,000	57,000
1,800		46,000	22,000	6,100		101,000	63,000
1,850		46,000	22,000	6,200		101,000	63,000
1,900		46,000	22,000	6,250		101,000	63,000
1,980	5/64	49,000	24,000	6,300		101,000	63,000
2,000		49,000	24,000	6,400		101,000	63,000
2,100		49,000	24,000	6,500		101,000	63,000
2,180		53,000	27,000	6,600		101,000	63,000
2,200		53,000	27,000	6,700		101,000	63,000
2,300		53,000	27,000	6,750	17/64	109,000	69,000
2,400		57,000	30,000	6,800		109,000	69,000
2,500		57,000	30,000	6,900		109,000	69,000
2,600		57,000	30,000	7,000		109,000	69,000
2,700		61,000	33,000	7,100		109,000	69,000
2,800		61,000	33,000	7,200		109,000	69,000
2,900		61,000	33,000	7,300		109,000	69,000
3,000		61,000	33,000	7,400		109,000	69,000
3,100		65,000	36,000	7,500		109,000	69,000
3,200		65,000	36,000	7,600		117,000	75,000
3,300		65,000	36,000	7,700		117,000	75,000
3,400		70,000	39,000	7,800		117,000	75,000
3,500		70,000	39,000	7,900		117,000	75,000
3,570	9/64	70,000	39,000	8,000		117,000	75,000
3,600		70,000	39,000	8,030		117,000	75,000
3,700		70,000	39,000	8,100		117,000	75,000
3,800		75,000	43,000	8,200		117,000	75,000
3,860		75,000	43,000	8,300		117,000	75,000
3,900		75,000	43,000	8,400		117,000	75,000
3,990		75,000	43,000	8,500		117,000	75,000
4,000		75,000	43,000	8,600		125,000	81,000
4,100		75,000	43,000	8,700		125,000	81,000
4,200		75,000	43,000	8,800		125,000	81,000
4,300		80,000	47,000	8,840		125,000	81,000
4,400		80,000	47,000	8,900		125,000	81,000
4,500		80,000	47,000	9,000		125,000	81,000
4,600		80,000	47,000	9,100		125,000	81,000
4,700		80,000	47,000	9,200		125,000	81,000
4,800		86,000	52,000	9,300		125,000	81,000
4,900		86,000	52,000	9,400		125,000	81,000
5,000		86,000	52,000	9,500		125,000	81,000
5,100		86,000	52,000	9,600		133,000	87,000
5,200		86,000	52,000	9,700		133,000	87,000
5,300		86,000	52,000	9,800		133,000	87,000
5,400		93,000	57,000	9,900		133,000	87,000
5,500		93,000	57,000	9,920	25/64	133,000	87,000
5,600		93,000	57,000	10,000		133,000	87,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
10,100		133,000	87,000	12,300	31/64	151,000	101,000
10,200		133,000	87,000	12,500		151,000	101,000
10,500		133,000	87,000	12,700	1/2	151,000	101,000
10,600		133,000	87,000	13,000		151,000	101,000
10,720	27/64	142,000	94,000	13,500		160,000	108,000
10,800		142,000	94,000	14,000		160,000	108,000
10,900		142,000	94,000	14,500		169,000	114,000
11,000		142,000	94,000	15,000		169,000	114,000
11,100		142,000	94,000	15,500		178,000	120,000
11,200		142,000	94,000	16,000		178,000	120,000
11,300		142,000	94,000				
11,400		142,000	94,000				
11,500		142,000	94,000				
11,600		142,000	94,000				
11,800		142,000	94,000				
11,900		151,000	101,000				
11,910	15/32	151,000	101,000				
12,000		151,000	101,000				

Punte cilindriche

Punte elicoidali, corte



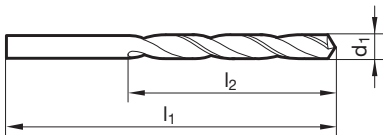
Catalogo n° 71158



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 182

- Assott. del noc. $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe
- lucida $< 2,36$ mm



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		40,000	18,000	6,100		101,000	63,000
1,590	1/16	43,000	20,000	6,200		101,000	63,000
1,600		43,000	20,000	6,300		101,000	63,000
1,700		43,000	20,000	6,350	1/4	101,000	63,000
1,800		46,000	22,000	6,400		101,000	63,000
1,900		46,000	22,000	6,500		101,000	63,000
2,000		49,000	24,000	6,600		101,000	63,000
2,100		49,000	24,000	6,700		101,000	63,000
2,200		53,000	27,000	6,800		109,000	69,000
2,300		53,000	27,000	6,900		109,000	69,000
2,400		57,000	30,000	7,000		109,000	69,000
2,500		57,000	30,000	7,100		109,000	69,000
2,600		57,000	30,000	7,140	9/32	109,000	69,000
2,700		61,000	33,000	7,200		109,000	69,000
2,800		61,000	33,000	7,300		109,000	69,000
2,900		61,000	33,000	7,400		109,000	69,000
3,000		61,000	33,000	7,500		109,000	69,000
3,100		65,000	36,000	7,600		117,000	75,000
3,170	1/8	65,000	36,000	7,700		117,000	75,000
3,200		65,000	36,000	7,800		117,000	75,000
3,300		65,000	36,000	7,900		117,000	75,000
3,400		70,000	39,000	7,940	5/16	117,000	75,000
3,500		70,000	39,000	8,000		117,000	75,000
3,600		70,000	39,000	8,100		117,000	75,000
3,700		70,000	39,000	8,200		117,000	75,000
3,800		75,000	43,000	8,300		117,000	75,000
3,900		75,000	43,000	8,400		117,000	75,000
4,000		75,000	43,000	8,500		117,000	75,000
4,100		75,000	43,000	8,600		125,000	81,000
4,200		75,000	43,000	8,700		125,000	81,000
4,300		80,000	47,000	8,800		125,000	81,000
4,400		80,000	47,000	8,900		125,000	81,000
4,500		80,000	47,000	9,000		125,000	81,000
4,600		80,000	47,000	9,100		125,000	81,000
4,700		80,000	47,000	9,200		125,000	81,000
4,800		86,000	52,000	9,300		125,000	81,000
4,900		86,000	52,000	9,400		125,000	81,000
5,000		86,000	52,000	9,500		125,000	81,000
5,100		86,000	52,000	9,520	3/8	133,000	87,000
5,200		86,000	52,000	9,600		133,000	87,000
5,300		86,000	52,000	9,700		133,000	87,000
5,400		93,000	57,000	9,800		133,000	87,000
5,500		93,000	57,000	9,900		133,000	87,000
5,600		93,000	57,000	10,000		133,000	87,000
5,700		93,000	57,000	10,200		133,000	87,000
5,800		93,000	57,000	10,500		133,000	87,000
5,900		93,000	57,000	10,800		142,000	94,000
6,000		93,000	57,000	11,000		142,000	94,000

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
11,110	7/16	142,000	94,000	12,700	1/2	151,000	101,000
11,200		142,000	94,000	13,000		151,000	101,000
11,500		142,000	94,000				
11,800		142,000	94,000				
12,000		151,000	101,000				
12,500		151,000	101,000				

Punte cilindriche

Punte elicoidali, corte



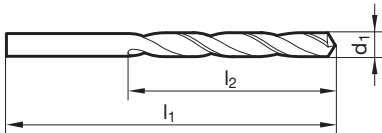
Catalogo n° 61158



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 184

- Assott. del noc. $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe
- massima resistenza all'usura
- specifiche per prof. di foro oltre 3xD



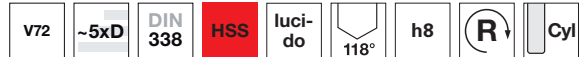
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		40,000	18,000	6,300		101,000	63,000
1,600		43,000	20,000	6,400		101,000	63,000
1,700		43,000	20,000	6,500		101,000	63,000
1,800		46,000	22,000	6,600		101,000	63,000
1,900		46,000	22,000	6,700		101,000	63,000
2,000		49,000	24,000	6,800		109,000	69,000
2,100		49,000	24,000	6,900		109,000	69,000
2,200		53,000	27,000	7,000		109,000	69,000
2,300		53,000	27,000	7,100		109,000	69,000
2,400		57,000	30,000	7,200		109,000	69,000
2,500		57,000	30,000	7,300		109,000	69,000
2,600		57,000	30,000	7,400		109,000	69,000
2,700		61,000	33,000	7,500		109,000	69,000
2,800		61,000	33,000	7,600		117,000	75,000
2,900		61,000	33,000	7,700		117,000	75,000
3,000		61,000	33,000	7,800		117,000	75,000
3,100		65,000	36,000	7,900		117,000	75,000
3,200		65,000	36,000	8,000		117,000	75,000
3,300		65,000	36,000	8,100		117,000	75,000
3,400		70,000	39,000	8,200		117,000	75,000
3,500		70,000	39,000	8,300		117,000	75,000
3,600		70,000	39,000	8,400		117,000	75,000
3,700		70,000	39,000	8,500		117,000	75,000
3,800		75,000	43,000	8,600		125,000	81,000
3,900		75,000	43,000	8,700		125,000	81,000
4,000		75,000	43,000	8,800		125,000	81,000
4,100		75,000	43,000	9,000		125,000	81,000
4,200		75,000	43,000	9,200		125,000	81,000
4,300		80,000	47,000	9,500		125,000	81,000
4,400		80,000	47,000	9,600		133,000	87,000
4,500		80,000	47,000	9,800		133,000	87,000
4,600		80,000	47,000	10,000		133,000	87,000
4,700		80,000	47,000	10,200		133,000	87,000
4,800		86,000	52,000	10,500		133,000	87,000
4,900		86,000	52,000	11,000		142,000	94,000
5,000		86,000	52,000	11,500		142,000	94,000
5,100		86,000	52,000	11,800		142,000	94,000
5,200		86,000	52,000	12,000		151,000	101,000
5,300		86,000	52,000	12,500		151,000	101,000
5,400		93,000	57,000	13,000		151,000	101,000
5,500		93,000	57,000				
5,600		93,000	57,000				
5,700		93,000	57,000				
5,800		93,000	57,000				
5,900		93,000	57,000				
6,000		93,000	57,000				
6,100		101,000	63,000				
6,200		101,000	63,000				

Punte cilindriche

Punte elicoidali, corte



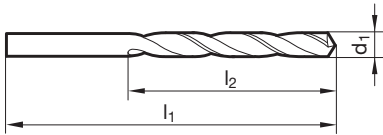
Catalogo n° 71128



P	M	K	N	S	H
●		○	●		

Parametri di lav.
ind. a pag. 180

- spoglia sul cono tagliente
- ideali per torni



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,550		24,000	7,000	3,450		70,000	39,000
0,600		24,000	7,000	3,500		70,000	39,000
0,650		26,000	8,000	3,550		70,000	39,000
0,750		28,000	9,000	3,600		70,000	39,000
0,800		30,000	10,000	3,700		70,000	39,000
0,850		30,000	10,000	3,750		70,000	39,000
0,900		32,000	11,000	3,800		75,000	43,000
0,950		32,000	11,000	3,850		75,000	43,000
1,000		34,000	12,000	3,900		75,000	43,000
1,050		34,000	12,000	4,000		75,000	43,000
1,100		36,000	14,000	4,100		75,000	43,000
1,200		38,000	16,000	4,150		75,000	43,000
1,250		38,000	16,000	4,200		75,000	43,000
1,300		38,000	16,000	4,300		80,000	47,000
1,400		40,000	18,000	4,350		80,000	47,000
1,450		40,000	18,000	4,400		80,000	47,000
1,500		40,000	18,000	4,450		80,000	47,000
1,550		43,000	20,000	4,500		80,000	47,000
1,600		43,000	20,000	4,550		80,000	47,000
1,700		43,000	20,000	4,600		80,000	47,000
1,750		46,000	22,000	4,700		80,000	47,000
1,800		46,000	22,000	4,800		86,000	52,000
1,850		46,000	22,000	4,850		86,000	52,000
1,900		46,000	22,000	4,900		86,000	52,000
1,950		49,000	24,000	4,950		86,000	52,000
2,000		49,000	24,000	5,000		86,000	52,000
2,100		49,000	24,000	5,100		86,000	52,000
2,150		53,000	27,000	5,200		86,000	52,000
2,200		53,000	27,000	5,300		86,000	52,000
2,250		53,000	27,000	5,400		93,000	57,000
2,300		53,000	27,000	5,500		93,000	57,000
2,400		57,000	30,000	5,600		93,000	57,000
2,450		57,000	30,000	5,700		93,000	57,000
2,500		57,000	30,000	5,800		93,000	57,000
2,550		57,000	30,000	5,900		93,000	57,000
2,600		57,000	30,000	6,000		93,000	57,000
2,700		61,000	33,000	6,100		101,000	63,000
2,800		61,000	33,000	6,200		101,000	63,000
2,850		61,000	33,000	6,300		101,000	63,000
2,900		61,000	33,000	6,400		101,000	63,000
2,950		61,000	33,000	6,500		101,000	63,000
3,000		61,000	33,000	6,600		101,000	63,000
3,100		65,000	36,000	6,700		101,000	63,000
3,150		65,000	36,000	6,800		109,000	69,000
3,250		65,000	36,000	6,900		109,000	69,000
3,300		65,000	36,000	7,000		109,000	69,000
3,350		65,000	36,000	7,100		109,000	69,000
3,400		70,000	39,000	7,200		109,000	69,000

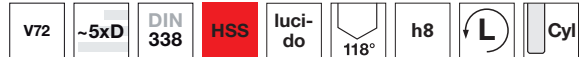
d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
7,300		109,000	69,000	9,800		133,000	87,000
7,400		109,000	69,000	10,000		133,000	87,000
7,500		109,000	69,000	10,200		133,000	87,000
7,600		117,000	75,000	10,500		133,000	87,000
7,700		117,000	75,000	11,000		142,000	94,000
7,800		117,000	75,000	11,500		142,000	94,000
7,900		117,000	75,000	12,000		151,000	101,000
8,000		117,000	75,000	12,500		151,000	101,000
8,500		117,000	75,000	13,000		151,000	101,000
8,600		125,000	81,000				
9,000		125,000	81,000				
9,500		125,000	81,000				

Punte cilindriche

Punte elicoidali, corte



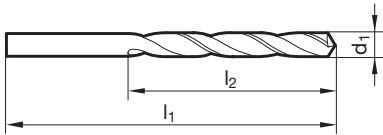
Catalogo n° 71129



P	M	K	N	S	H
●		○	●		

Parametri di lav.
ind. a pag. 180

- spoglia sul cono tagliente
- ideali per torni



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,500		22,000	6,000	6,600		101,000	63,000
0,550		24,000	7,000	6,700		101,000	63,000
0,600		24,000	7,000	6,800		109,000	69,000
0,650		26,000	8,000	7,000		109,000	69,000
0,700		28,000	9,000	7,100		109,000	69,000
0,750		28,000	9,000	7,400		109,000	69,000
0,900		32,000	11,000	7,500		109,000	69,000
1,000		34,000	12,000	8,000		117,000	75,000
1,250		38,000	16,000	8,100		117,000	75,000
1,550		43,000	20,000	8,200		117,000	75,000
1,650		43,000	20,000	8,300		117,000	75,000
2,150		53,000	27,000	8,700		125,000	81,000
2,200		53,000	27,000	8,800		125,000	81,000
2,300		53,000	27,000	8,900		125,000	81,000
2,500		57,000	30,000	9,000		125,000	81,000
2,650		57,000	30,000	9,500		125,000	81,000
2,700		61,000	33,000	9,600		133,000	87,000
2,850		61,000	33,000	9,800		133,000	87,000
2,950		61,000	33,000	9,900		133,000	87,000
3,000		61,000	33,000	10,000		133,000	87,000
3,100		65,000	36,000	10,600		133,000	87,000
3,300		65,000	36,000	10,700		142,000	94,000
3,550		70,000	39,000	10,800		142,000	94,000
3,600		70,000	39,000	10,900		142,000	94,000
3,950		75,000	43,000	11,000		142,000	94,000
4,000		75,000	43,000	11,100		142,000	94,000
4,250		75,000	43,000	11,200		142,000	94,000
4,500		80,000	47,000	11,500		142,000	94,000
4,550		80,000	47,000	11,700		142,000	94,000
4,600		80,000	47,000	11,800		142,000	94,000
4,650		80,000	47,000	12,000		151,000	101,000
4,700		80,000	47,000	12,100		151,000	101,000
4,800		86,000	52,000	12,200		151,000	101,000
5,000		86,000	52,000	12,300	31/64	151,000	101,000
5,700		93,000	57,000	12,400		151,000	101,000
5,800		93,000	57,000	12,500		151,000	101,000
5,900		93,000	57,000	12,600		151,000	101,000
6,100		101,000	63,000	12,700	1/2	151,000	101,000
6,200		101,000	63,000	12,800		151,000	101,000
6,300		101,000	63,000				
6,400		101,000	63,000				
6,500		101,000	63,000				

Punte cilindriche

Punte elicoidali, corte



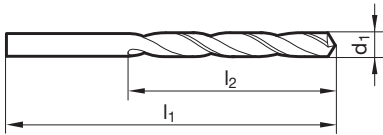
Catalogo n° 51158



P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 184

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- scanalature larghe
- massima resistenza all'usura
- specifiche per prof. di foro oltre 3xD



d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000
1,100		36,000	14,000
1,200		38,000	16,000
1,300		38,000	16,000
1,400		40,000	18,000
1,500		40,000	18,000
1,600		43,000	20,000
1,700		43,000	20,000
1,800		46,000	22,000
1,900		46,000	22,000
2,000		49,000	24,000
2,100		49,000	24,000
2,200		53,000	27,000
2,300		53,000	27,000
2,400		57,000	30,000
2,500		57,000	30,000
2,600		57,000	30,000
2,700		61,000	33,000
2,800		61,000	33,000
2,900		61,000	33,000
3,000		61,000	33,000
3,100		65,000	36,000
3,200		65,000	36,000
3,300		65,000	36,000
3,400		70,000	39,000
3,500		70,000	39,000
3,600		70,000	39,000
3,700		70,000	39,000
3,800		75,000	43,000
3,900		75,000	43,000
4,000		75,000	43,000
4,100		75,000	43,000
4,200		75,000	43,000
4,300		80,000	47,000
4,400		80,000	47,000
4,500		80,000	47,000
4,600		80,000	47,000
4,700		80,000	47,000
4,800		86,000	52,000
4,900		86,000	52,000
5,000		86,000	52,000
5,100		86,000	52,000
5,200		86,000	52,000
5,300		86,000	52,000
5,400		93,000	57,000
5,500		93,000	57,000
5,600		93,000	57,000
5,700		93,000	57,000

d1 mm	inch	l1 mm	l2 mm
5,800		93,000	57,000
5,900		93,000	57,000
6,000		93,000	57,000
6,100		101,000	63,000
6,200		101,000	63,000
6,300		101,000	63,000
6,400		101,000	63,000
6,500		101,000	63,000
6,600		101,000	63,000
6,700		101,000	63,000
6,800		109,000	69,000
6,900		109,000	69,000
7,000		109,000	69,000
7,100		109,000	69,000
7,400		109,000	69,000
7,500		109,000	69,000
7,600		117,000	75,000
7,700		117,000	75,000
7,800		117,000	75,000
7,900		117,000	75,000
8,000		117,000	75,000
8,100		117,000	75,000
8,200		117,000	75,000
8,300		117,000	75,000
8,500		117,000	75,000
8,600		125,000	81,000
8,700		125,000	81,000
8,800		125,000	81,000
8,900		125,000	81,000
9,000		125,000	81,000
9,100		125,000	81,000
9,200		125,000	81,000
9,300		125,000	81,000
9,400		125,000	81,000
9,500		125,000	81,000
9,600		133,000	87,000
9,700		133,000	87,000
9,800		133,000	87,000
9,900		133,000	87,000
10,000		133,000	87,000
10,100		133,000	87,000
10,200		133,000	87,000
10,300		133,000	87,000
10,400		133,000	87,000
10,500		133,000	87,000
10,700		142,000	94,000
10,800		142,000	94,000
11,000		142,000	94,000

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
11,200		142,000	94,000	13,000		151,000	101,000
11,500		142,000	94,000				
11,700		142,000	94,000				
11,800		142,000	94,000				
12,000		151,000	101,000				
12,500		151,000	101,000				

Punte cilindriche

Punte elicoidali, corte



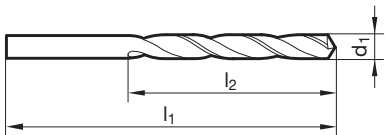
Catalogo n° 61232



P	M	K	N	S	H
○	○	●	○		

Parametri di lav.
ind. a pag. 184

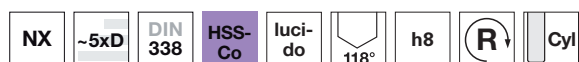
- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- scanalature larghe
- stabilità elevata
- specialmente per resistenza all'usura



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		34,000	12,000	5,800		93,000	57,000
1,100		36,000	14,000	5,900		93,000	57,000
1,200		38,000	16,000	6,000		93,000	57,000
1,300		38,000	16,000	6,100		101,000	63,000
1,400		40,000	18,000	6,200		101,000	63,000
1,500		40,000	18,000	6,300		101,000	63,000
1,600		43,000	20,000	6,400		101,000	63,000
1,700		43,000	20,000	6,500		101,000	63,000
1,800		46,000	22,000	6,600		101,000	63,000
1,900		46,000	22,000	6,700		101,000	63,000
2,000		49,000	24,000	6,800		109,000	69,000
2,100		49,000	24,000	6,900		109,000	69,000
2,200		53,000	27,000	7,000		109,000	69,000
2,300		53,000	27,000	7,100		109,000	69,000
2,400		57,000	30,000	7,200		109,000	69,000
2,500		57,000	30,000	7,300		109,000	69,000
2,600		57,000	30,000	7,400		109,000	69,000
2,700		61,000	33,000	7,500		109,000	69,000
2,800		61,000	33,000	7,600		117,000	75,000
2,900		61,000	33,000	7,700		117,000	75,000
3,000		61,000	33,000	7,800		117,000	75,000
3,100		65,000	36,000	7,900		117,000	75,000
3,200		65,000	36,000	8,000		117,000	75,000
3,300		65,000	36,000	8,100		117,000	75,000
3,400		70,000	39,000	8,200		117,000	75,000
3,500		70,000	39,000	8,300		117,000	75,000
3,600		70,000	39,000	8,400		117,000	75,000
3,700		70,000	39,000	8,500		117,000	75,000
3,800		75,000	43,000	8,800		125,000	81,000
3,900		75,000	43,000	9,000		125,000	81,000
4,000		75,000	43,000	9,300		125,000	81,000
4,100		75,000	43,000	9,500		125,000	81,000
4,200		75,000	43,000	9,800		133,000	87,000
4,300		80,000	47,000	10,000		133,000	87,000
4,400		80,000	47,000	10,200		133,000	87,000
4,500		80,000	47,000	10,500		133,000	87,000
4,600		80,000	47,000	11,000		142,000	94,000
4,700		80,000	47,000	11,500		142,000	94,000
4,800		86,000	52,000	12,000		151,000	101,000
4,900		86,000	52,000	12,500		151,000	101,000
5,000		86,000	52,000	13,000		151,000	101,000
5,100		86,000	52,000	13,500		160,000	108,000
5,200		86,000	52,000	14,000		160,000	108,000
5,300		86,000	52,000				
5,400		93,000	57,000				
5,500		93,000	57,000				
5,600		93,000	57,000				
5,700		93,000	57,000				

Punte cilindriche

Serie di punte



P	M	K	N	S	H
•	•	•	•		

- in scatole di plastica
- costituito da catalogo-Nr. 71221
- affilatura su piani

Catalogo n° 79012

Codice	d1 mm	in progr. mm	Pezzi per set
7,014	1,0-13,0	0,5	25
7,018	1,0-10,5	0,5	24

Punte cilindriche

Serie di punte



P	M	K	N	S	H
•		•	•		

- in scatole di plastica
- costituito da catalogo-Nr. 71115
- spoglia sul cono tagliente
- lucida < 2,36 mm

Catalogo n° 78879

Codice	d1 mm	in progr. mm	Pezzi per set
0,011	1,0-5,0	0,1	41
0,012	5,1-10,0	0,1	50
0,013	1,0-10,0	0,5	19
0,014	1,0-13,0	0,5	25
0,015	1,0-5,9	0,1	50
0,016	6,0-10,0	0,1	41
0,018	1,0-10,5	0,5	24

Punte cilindriche

Serie di punte



N	~5xD	DIN 338	HSS	TiN - testa	118°	h8	R	Cyl
P	M	K	N	S	H			
○		●	○					

- in scatole di plastica
- costituito da catalogo-Nr. 61115
- spoglia sul cono tagliente

Catalogo n° 78880

Codice	d1 mm	in progr. mm	Pezzi per set
6,013	1,0-10,0	0,5	19
6,014	1,0-13,0	0,5	25

Punte cilindriche

Serie di punte



- livello di bachelite

Catalogo n° 78877

Codice	d1 mm
0,111	1,0-5,0
0,112	5,1-10,0
0,113	1,0-10,0
0,114	1,0-13,0

Punte cilindriche

Serie di punte



- cassetta di plastica

Catalogo n° 78878

Codice	d1 mm	in progr. mm	Pezzi per set
0,213	1,0-10,0	0,5	19
0,214	1,0-13,0	0,5	25
0,215	1,0-5,9	0,1	50
0,216	6,0-10,0	0,1	41

Punte cilindriche

Punte con codolo rinforzato



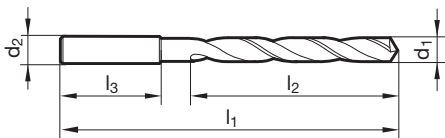
Catalogo n° 61120



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 178

- Assott. del noc. $\geq \varnothing 2,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- massima resistenza all'usura
- uso universale
- Con codolo ridotto



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
2,000	3,000	44,000	12,000	28,000
2,100	3,000	44,000	12,000	28,000
2,200	3,000	45,000	13,000	28,000
2,300	3,000	45,000	13,000	28,000
2,400	3,000	46,000	14,000	28,000
2,500	3,000	46,000	14,000	28,000
2,600	3,000	46,000	14,000	28,000
2,700	3,000	48,000	16,000	28,000
2,800	3,000	48,000	16,000	28,000
2,900	3,000	48,000	16,000	28,000
3,000	3,000	48,000	16,000	28,000
3,100	4,000	50,000	18,000	28,000
3,200	4,000	50,000	18,000	28,000
3,300	4,000	50,000	18,000	28,000
3,400	4,000	52,000	20,000	28,000
3,500	4,000	52,000	20,000	28,000
3,600	4,000	52,000	20,000	28,000
3,700	4,000	52,000	20,000	28,000
3,800	4,000	54,000	22,000	28,000
3,900	4,000	54,000	22,000	28,000
4,000	4,000	54,000	22,000	28,000
4,100	6,000	66,000	22,000	36,000
4,200	6,000	66,000	22,000	36,000
4,300	6,000	68,000	24,000	36,000
4,400	6,000	68,000	24,000	36,000
4,500	6,000	68,000	24,000	36,000
4,600	6,000	68,000	24,000	36,000
4,700	6,000	68,000	24,000	36,000
4,800	6,000	70,000	26,000	36,000
4,900	6,000	70,000	26,000	36,000
5,000	6,000	70,000	26,000	36,000
5,100	6,000	70,000	26,000	36,000
5,200	6,000	70,000	26,000	36,000
5,300	6,000	70,000	26,000	36,000
5,400	6,000	72,000	28,000	36,000
5,500	6,000	72,000	28,000	36,000
5,600	6,000	72,000	28,000	36,000
5,700	6,000	72,000	28,000	36,000
5,800	6,000	72,000	28,000	36,000
5,900	6,000	72,000	28,000	36,000
6,000	6,000	72,000	28,000	36,000
6,100	8,000	75,000	31,000	36,000
6,200	8,000	75,000	31,000	36,000
6,300	8,000	75,000	31,000	36,000
6,400	8,000	75,000	31,000	36,000
6,500	8,000	75,000	31,000	36,000
6,600	8,000	75,000	31,000	36,000
6,700	8,000	75,000	31,000	36,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,800	8,000	78,000	34,000	36,000
6,900	8,000	78,000	34,000	36,000
7,000	8,000	78,000	34,000	36,000
7,100	8,000	78,000	34,000	36,000
7,200	8,000	78,000	34,000	36,000
7,300	8,000	78,000	34,000	36,000
7,400	8,000	78,000	34,000	36,000
7,500	8,000	78,000	34,000	36,000
7,600	8,000	81,000	37,000	36,000
7,700	8,000	81,000	37,000	36,000
7,800	8,000	81,000	37,000	36,000
7,900	8,000	81,000	37,000	36,000
8,000	8,000	81,000	37,000	36,000
8,100	10,000	87,000	37,000	40,000
8,200	10,000	87,000	37,000	40,000
8,300	10,000	87,000	37,000	40,000
8,400	10,000	87,000	37,000	40,000
8,500	10,000	87,000	37,000	40,000
8,600	10,000	91,000	40,000	40,000
8,700	10,000	91,000	40,000	40,000
8,800	10,000	91,000	40,000	40,000
8,900	10,000	91,000	40,000	40,000
9,000	10,000	91,000	40,000	40,000
9,100	10,000	91,000	40,000	40,000
9,200	10,000	91,000	40,000	40,000
9,300	10,000	91,000	40,000	40,000
9,400	10,000	91,000	40,000	40,000
9,500	10,000	91,000	40,000	40,000
9,600	10,000	93,000	43,000	40,000
9,700	10,000	93,000	43,000	40,000
9,800	10,000	93,000	43,000	40,000
9,900	10,000	93,000	43,000	40,000
10,000	10,000	93,000	43,000	40,000
10,100	12,000	100,000	43,000	45,000
10,200	12,000	100,000	43,000	45,000
10,300	12,000	100,000	43,000	45,000
10,400	12,000	100,000	43,000	45,000
10,500	12,000	100,000	43,000	45,000
10,600	12,000	100,000	43,000	45,000
10,700	12,000	104,000	47,000	45,000
10,800	12,000	104,000	47,000	45,000
10,900	12,000	104,000	47,000	45,000
11,000	12,000	104,000	47,000	45,000
11,100	12,000	104,000	47,000	45,000
11,200	12,000	104,000	47,000	45,000
11,300	12,000	104,000	47,000	45,000
11,400	12,000	104,000	47,000	45,000
11,500	12,000	104,000	47,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
11,600	12,000	104,000	47,000	45,000	14,500	16,000	116,000	56,000	48,000
11,700	12,000	104,000	47,000	45,000	15,000	16,000	116,000	56,000	48,000
11,800	12,000	104,000	47,000	45,000	15,500	16,000	118,000	58,000	48,000
11,900	12,000	108,000	51,000	45,000	16,000	16,000	118,000	58,000	48,000
12,000	12,000	108,000	51,000	45,000	16,500	20,000	126,000	60,000	50,000
12,100	16,000	111,000	51,000	48,000	17,000	20,000	126,000	60,000	50,000
12,200	16,000	111,000	51,000	48,000	17,500	20,000	128,000	62,000	50,000
12,300	16,000	111,000	51,000	48,000	18,000	20,000	128,000	62,000	50,000
12,400	16,000	111,000	51,000	48,000	18,500	20,000	130,000	64,000	50,000
12,500	16,000	111,000	51,000	48,000	19,000	20,000	130,000	64,000	50,000
12,600	16,000	111,000	51,000	48,000	19,500	20,000	132,000	66,000	50,000
12,700	16,000	111,000	51,000	48,000	20,000	20,000	132,000	66,000	50,000
12,800	16,000	111,000	51,000	48,000					
12,900	16,000	111,000	51,000	48,000					
13,000	16,000	111,000	51,000	48,000					
13,100	16,000	111,000	51,000	48,000					
13,500	16,000	114,000	54,000	48,000					
14,000	16,000	114,000	54,000	48,000					

Punte cilindriche

Punte con codolo rinforzato



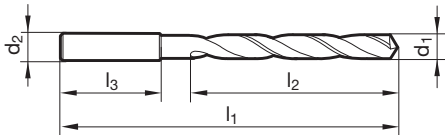
Catalogo n° 61121



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 184

- Assott. del noc. $\geq \varnothing 2,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- massima resistenza all'usura
- uso universale
- Con codolo ridotto



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
2,000	3,000	56,000	24,000	28,000	6,800	8,000	113,000	69,000	36,000
2,100	3,000	56,000	24,000	28,000	6,900	8,000	113,000	69,000	36,000
2,200	3,000	59,000	27,000	28,000	7,000	8,000	113,000	69,000	36,000
2,300	3,000	59,000	27,000	28,000	7,100	8,000	113,000	69,000	36,000
2,400	3,000	62,000	30,000	28,000	7,200	8,000	113,000	69,000	36,000
2,500	3,000	62,000	30,000	28,000	7,300	8,000	113,000	69,000	36,000
2,600	3,000	62,000	30,000	28,000	7,400	8,000	113,000	69,000	36,000
2,700	3,000	65,000	33,000	28,000	7,500	8,000	113,000	69,000	36,000
2,800	3,000	65,000	33,000	28,000	7,600	8,000	119,000	75,000	36,000
2,900	3,000	65,000	33,000	28,000	7,700	8,000	119,000	75,000	36,000
3,000	3,000	65,000	33,000	28,000	7,800	8,000	119,000	75,000	36,000
3,100	4,000	68,000	36,000	28,000	7,900	8,000	119,000	75,000	36,000
3,200	4,000	68,000	36,000	28,000	8,000	8,000	119,000	75,000	36,000
3,300	4,000	68,000	36,000	28,000	8,100	10,000	125,000	75,000	40,000
3,400	4,000	71,000	39,000	28,000	8,200	10,000	125,000	75,000	40,000
3,500	4,000	71,000	39,000	28,000	8,300	10,000	125,000	75,000	40,000
3,600	4,000	71,000	39,000	28,000	8,400	10,000	125,000	75,000	40,000
3,700	4,000	71,000	39,000	28,000	8,500	10,000	125,000	75,000	40,000
3,800	4,000	75,000	43,000	28,000	8,600	10,000	131,000	81,000	40,000
3,900	4,000	75,000	43,000	28,000	8,700	10,000	131,000	81,000	40,000
4,000	4,000	75,000	43,000	28,000	8,800	10,000	131,000	81,000	40,000
4,100	6,000	87,000	43,000	36,000	8,900	10,000	131,000	81,000	40,000
4,200	6,000	87,000	43,000	36,000	9,000	10,000	131,000	81,000	40,000
4,300	6,000	91,000	47,000	36,000	9,100	10,000	131,000	81,000	40,000
4,400	6,000	91,000	47,000	36,000	9,200	10,000	131,000	81,000	40,000
4,500	6,000	91,000	47,000	36,000	9,300	10,000	131,000	81,000	40,000
4,600	6,000	91,000	47,000	36,000	9,400	10,000	131,000	81,000	40,000
4,700	6,000	91,000	47,000	36,000	9,500	10,000	131,000	81,000	40,000
4,800	6,000	96,000	52,000	36,000	9,600	10,000	137,000	87,000	40,000
4,900	6,000	96,000	52,000	36,000	9,700	10,000	137,000	87,000	40,000
5,000	6,000	96,000	52,000	36,000	9,800	10,000	137,000	87,000	40,000
5,100	6,000	96,000	52,000	36,000	10,000	10,000	137,000	87,000	40,000
5,200	6,000	96,000	52,000	36,000	10,100	12,000	144,000	87,000	45,000
5,300	6,000	96,000	52,000	36,000	10,200	12,000	144,000	87,000	45,000
5,400	6,000	101,000	57,000	36,000	10,300	12,000	144,000	87,000	45,000
5,500	6,000	101,000	57,000	36,000	10,400	12,000	144,000	87,000	45,000
5,600	6,000	101,000	57,000	36,000	10,500	12,000	144,000	87,000	45,000
5,700	6,000	101,000	57,000	36,000	10,600	12,000	144,000	87,000	45,000
5,800	6,000	101,000	57,000	36,000	10,700	12,000	151,000	94,000	45,000
5,900	6,000	101,000	57,000	36,000	10,800	12,000	151,000	94,000	45,000
6,000	6,000	101,000	57,000	36,000	10,900	12,000	151,000	94,000	45,000
6,100	8,000	107,000	63,000	36,000	11,000	12,000	151,000	94,000	45,000
6,200	8,000	107,000	63,000	36,000	11,100	12,000	151,000	94,000	45,000
6,300	8,000	107,000	63,000	36,000	11,200	12,000	151,000	94,000	45,000
6,400	8,000	107,000	63,000	36,000	11,300	12,000	151,000	94,000	45,000
6,500	8,000	107,000	63,000	36,000	11,400	12,000	151,000	94,000	45,000
6,600	8,000	107,000	63,000	36,000	11,500	12,000	151,000	94,000	45,000
6,700	8,000	107,000	63,000	36,000	11,600	12,000	151,000	94,000	45,000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm	d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
11,700	12,000	151,000	94,000	45,000	15,000	16,000	169,000	109,000	48,000
11,800	12,000	151,000	94,000	45,000	15,500	16,000	172,000	112,000	48,000
11,900	12,000	158,000	101,000	45,000	16,000	16,000	172,000	112,000	48,000
12,000	12,000	158,000	101,000	45,000	16,500	20,000	181,000	115,000	50,000
12,100	16,000	161,000	101,000	48,000	17,000	20,000	181,000	115,000	50,000
12,200	16,000	161,000	101,000	48,000	17,500	20,000	184,000	118,000	50,000
12,300	16,000	161,000	101,000	48,000	18,000	20,000	184,000	118,000	50,000
12,400	16,000	161,000	101,000	48,000	18,500	20,000	188,000	122,000	50,000
12,500	16,000	161,000	101,000	48,000	19,000	20,000	188,000	122,000	50,000
12,600	16,000	161,000	101,000	48,000	19,500	20,000	191,000	125,000	50,000
12,700	16,000	161,000	101,000	48,000	20,000	20,000	191,000	125,000	50,000
12,800	16,000	161,000	101,000	48,000					
12,900	16,000	161,000	101,000	48,000					
13,000	16,000	161,000	101,000	48,000					
13,100	16,000	161,000	101,000	48,000					
13,500	16,000	166,000	106,000	48,000					
14,000	16,000	166,000	106,000	48,000					
14,500	16,000	169,000	109,000	48,000					

Punte cilindriche

Punte con codolo rinforzato



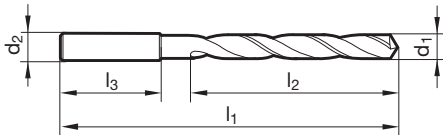
Catalogo n° 51132



P	M	K	N	S	H
●		●		○	

Parametri di lav.
ind. a pag. 184

- Assott. del nocco. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- stabilità elevata
- specialmente per resistenza all'usura
- Con codolo ridotto



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
2,000	3,000	56,000	24,000	28,000
2,200	3,000	59,000	27,000	28,000
2,500	3,000	62,000	30,000	28,000
3,000	3,000	65,000	33,000	28,000
3,200	4,000	68,000	36,000	28,000
3,300	4,000	68,000	36,000	28,000
3,400	4,000	71,000	39,000	28,000
3,500	4,000	71,000	39,000	28,000
3,700	4,000	71,000	39,000	28,000
3,800	4,000	75,000	43,000	28,000
4,000	4,000	75,000	43,000	28,000
4,200	6,000	87,000	43,000	36,000
4,300	6,000	91,000	47,000	36,000
4,500	6,000	91,000	47,000	36,000
4,600	6,000	91,000	47,000	36,000
4,800	6,000	96,000	52,000	36,000
5,000	6,000	96,000	52,000	36,000
5,100	6,000	96,000	52,000	36,000
5,500	6,000	101,000	57,000	36,000
5,700	6,000	101,000	57,000	36,000
5,800	6,000	101,000	57,000	36,000
6,000	6,000	101,000	57,000	36,000
6,500	8,000	107,000	63,000	36,000
6,800	8,000	113,000	69,000	36,000

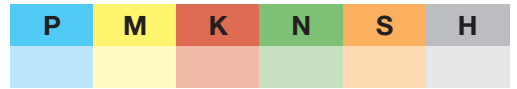
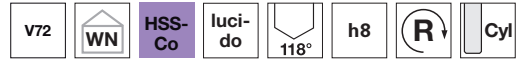
d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
6,900	8,000	113,000	69,000	36,000
7,000	8,000	113,000	69,000	36,000
7,400	8,000	113,000	69,000	36,000
7,500	8,000	113,000	69,000	36,000
7,800	8,000	119,000	75,000	36,000
8,000	8,000	119,000	75,000	36,000
8,500	10,000	125,000	75,000	40,000
8,600	10,000	131,000	81,000	40,000
8,800	10,000	131,000	81,000	40,000
9,000	10,000	131,000	81,000	40,000
9,300	10,000	131,000	81,000	40,000
9,500	10,000	131,000	81,000	40,000
10,000	10,000	137,000	87,000	40,000
10,200	12,000	144,000	87,000	45,000
10,300	12,000	144,000	87,000	45,000
10,500	12,000	144,000	87,000	45,000
11,000	12,000	151,000	94,000	45,000
11,200	12,000	151,000	94,000	45,000
11,500	12,000	151,000	94,000	45,000
12,000	12,000	158,000	101,000	45,000
12,100	14,000	161,000	101,000	45,000
12,500	14,000	161,000	101,000	45,000
13,000	14,000	161,000	101,000	45,000

Punte cilindriche

Punte corte, con codolo cil. Ø 16,0 mm

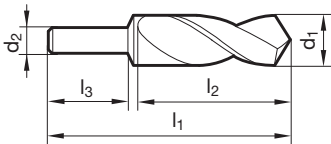


Catalogo n° 71168



Parametri di lav.
ind. a pag. 176

- per modifiche, come, p. es.: correzione del diametro, rettifica gradino, rettifica sagoma
- senza punto di divisione, senza tagli



d1 mm	l1 mm	l2 mm
16,000	130,000	88,000
16,500	130,000	88,000
17,000	130,000	88,000
17,500	130,000	88,000
18,000	130,000	88,000
19,000	130,000	88,000
20,000	130,000	88,000
20,500	130,000	88,000
21,000	130,000	88,000
21,500	130,000	88,000
22,000	130,000	88,000
23,000	130,000	88,000

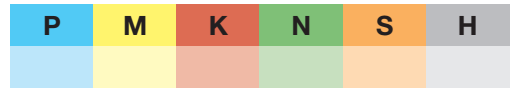
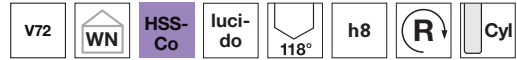
d1 mm	l1 mm	l2 mm
24,000	130,000	88,000
24,500	130,000	88,000
25,000	130,000	88,000
25,500	140,000	98,000
26,000	140,000	98,000
27,000	140,000	98,000
28,000	140,000	98,000
30,000	140,000	98,000

Punte cilindriche

Punte corte, con codolo cil. Ø 25,4 mm

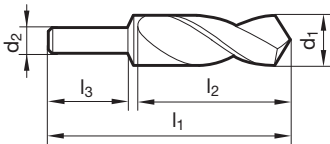


Catalogo n° 71169



Parametri di lav.
ind. a pag. 176

- con codolo unificato
- per modifiche, come, p. es.: correzione del diametro, rettifica gradino, rettifica sagoma
- senza punto di divisione, senza tagli



d1 mm	l1 mm	l2 mm
28,000	140,000	93,000
30,000	140,000	93,000
32,000	140,000	93,000
36,000	140,000	93,000
40,000	140,000	93,000

d1 mm	l1 mm	l2 mm

Punte cilindriche

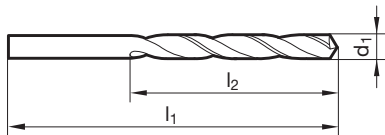
Punte per foratura con bussola di guida



Catalogo n° 71130

N	-10xD	DIN 339	HSS	trattati a vapore	118°	h8	R	Cyl
P	M	K	N	S	H	Parametri di lav. ind. a pag. 186		
•		•	•					

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- per forare con bussola di guida
- da $\varnothing 3$ mm con supporto secondo DIN 1809
- lucida $< 2,36$ mm



d1 mm	l1 mm	l2 mm
1,000	48,000	26,000
1,150	50,000	28,000
1,200	52,000	30,000
1,350	55,000	33,000
1,500	55,000	33,000
1,850	62,000	38,000
2,000	66,000	41,000
2,300	70,000	44,000
2,500	74,000	47,000
2,600	74,000	47,000
2,800	79,000	51,000
2,850	79,000	51,000
2,900	79,000	51,000
3,100	84,000	55,000
3,200	84,000	55,000
3,400	91,000	60,000
3,800	96,000	64,000
3,900	96,000	64,000
4,000	96,000	64,000
4,100	96,000	64,000
4,300	102,000	69,000
4,400	102,000	69,000
4,500	102,000	69,000
4,600	102,000	69,000
4,700	102,000	69,000
4,800	108,000	74,000
4,900	108,000	74,000
5,000	108,000	74,000
5,100	108,000	74,000
5,400	116,000	80,000
5,600	116,000	80,000
5,700	116,000	80,000
5,800	116,000	80,000
5,900	116,000	80,000
6,000	116,000	80,000
6,100	124,000	86,000
6,200	124,000	86,000
6,400	124,000	86,000
6,500	124,000	86,000
6,600	124,000	86,000
6,800	133,000	93,000
7,000	133,000	93,000
7,100	133,000	93,000
7,200	133,000	93,000
7,300	133,000	93,000
7,400	133,000	93,000
7,500	133,000	93,000
7,600	142,000	100,000

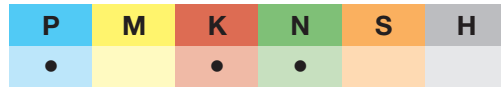
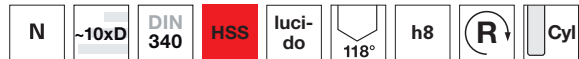
d1 mm	l1 mm	l2 mm
7,700	142,000	100,000
7,800	142,000	100,000
7,900	142,000	100,000
8,000	142,000	100,000
8,100	142,000	100,000
8,200	142,000	100,000
8,300	142,000	100,000
8,500	142,000	100,000
8,700	151,000	107,000
8,800	151,000	107,000
9,000	151,000	107,000
9,100	151,000	107,000
9,200	151,000	107,000
9,300	151,000	107,000
9,400	151,000	107,000
9,500	151,000	107,000
9,600	162,000	116,000
9,900	162,000	116,000
10,000	162,000	116,000
10,200	162,000	116,000
10,500	162,000	116,000
11,000	173,000	125,000
11,200	173,000	125,000
11,800	173,000	125,000
12,000	184,000	134,000
12,200	184,000	134,000
12,500	184,000	134,000
13,000	184,000	134,000
13,500	194,000	142,000
14,000	194,000	142,000
14,500	202,000	147,000
15,000	202,000	147,000
16,000	211,000	153,000
17,000	218,000	159,000
17,500	226,000	165,000
18,000	226,000	165,000
18,500	234,000	171,000
19,000	234,000	171,000
19,200	242,000	177,000
19,500	242,000	177,000

Punte cilindriche

Punte elicoidali, lunghe

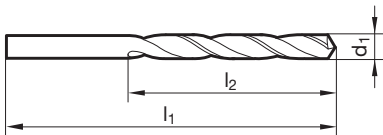


Catalogo n° 71136



Parametri di lav.
ind. a pag. 186

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- per fori profondi
- per forare con bussola di guida



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
0,500		32,000	12,000	5,400		139,000	91,000
0,600		35,000	15,000	5,500		139,000	91,000
0,700		42,000	21,000	5,600		139,000	91,000
0,800		46,000	25,000	5,700		139,000	91,000
0,900		51,000	29,000	5,800		139,000	91,000
1,000		56,000	33,000	5,900		139,000	91,000
1,050		56,000	33,000	6,000		139,000	91,000
1,100		60,000	37,000	6,200		148,000	97,000
1,200		65,000	41,000	6,300		148,000	97,000
1,250		65,000	41,000	6,400		148,000	97,000
1,300		65,000	41,000	6,500		148,000	97,000
1,500		70,000	45,000	6,600		148,000	97,000
1,550		76,000	50,000	6,700		148,000	97,000
1,600		76,000	50,000	6,800		156,000	102,000
1,650		76,000	50,000	6,900		156,000	102,000
1,800		80,000	53,000	7,000		156,000	102,000
1,850		80,000	53,000	7,100		156,000	102,000
1,900		80,000	53,000	7,500		156,000	102,000
1,950		85,000	56,000	7,600		165,000	109,000
2,000		85,000	56,000	8,000		165,000	109,000
2,400		95,000	62,000	8,100		165,000	109,000
2,500		95,000	62,000	8,200		165,000	109,000
2,600		95,000	62,000	8,500		165,000	109,000
2,700		100,000	66,000	8,700		175,000	115,000
2,900		100,000	66,000	8,800		175,000	115,000
3,000		100,000	66,000	8,900		175,000	115,000
3,200		106,000	69,000	9,000		175,000	115,000
3,300		106,000	69,000	9,100		175,000	115,000
3,400		112,000	73,000	9,200		175,000	115,000
3,500		112,000	73,000	9,300		175,000	115,000
3,600		112,000	73,000	9,500		175,000	115,000
3,700		112,000	73,000	9,600		184,000	121,000
3,800		119,000	78,000	9,700		184,000	121,000
3,900		119,000	78,000	9,900		184,000	121,000
4,000		119,000	78,000	10,000		184,000	121,000
4,100		119,000	78,000	10,200		184,000	121,000
4,200		119,000	78,000	10,500		184,000	121,000
4,300		126,000	82,000	11,000		195,000	128,000
4,400		126,000	82,000	11,500		195,000	128,000
4,500		126,000	82,000	12,000		205,000	134,000
4,600		126,000	82,000	12,500		205,000	134,000
4,700		126,000	82,000	13,000		205,000	134,000
4,800		132,000	87,000	13,500		214,000	140,000
4,900		132,000	87,000	14,500		220,000	144,000
5,000		132,000	87,000	15,000		220,000	144,000
5,100		132,000	87,000	15,500		227,000	149,000
5,200		132,000	87,000	16,000		227,000	149,000
5,300		132,000	87,000	16,500		235,000	154,000

Punte cilindriche

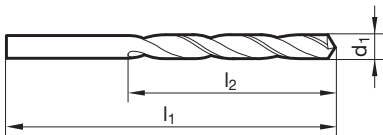
Punte elicoidali, lunghe



Catalogo n° 71135

N	-10xD	DIN 340	HSS	trattati a vapore	118°	h8	R	Cyl
P	M	K	N	S	H	Parametri di lav. ind. a pag. 186		
•		•	•					

- Assott. del noc. $\geq \varnothing 1,800$
- spoglia sul cono tagliente
- per fori profondi
- per forare con bussola di guida
- lucida $< 2,36$ mm



d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
1,800		80,000	53,000	6,250		148,000	97,000
2,000		85,000	56,000	6,300		148,000	97,000
2,050		85,000	56,000	6,400		148,000	97,000
2,100		85,000	56,000	6,500		148,000	97,000
2,300		90,000	59,000	6,600		148,000	97,000
2,400		95,000	62,000	6,700		148,000	97,000
2,500		95,000	62,000	6,800		156,000	102,000
2,600		95,000	62,000	6,900		156,000	102,000
2,800		100,000	66,000	7,000		156,000	102,000
3,000		100,000	66,000	7,100		156,000	102,000
3,050		106,000	69,000	7,200		156,000	102,000
3,100		106,000	69,000	7,250		156,000	102,000
3,200		106,000	69,000	7,300		156,000	102,000
3,250		106,000	69,000	7,400		156,000	102,000
3,300		106,000	69,000	7,500		156,000	102,000
3,400		112,000	73,000	7,600		165,000	109,000
3,500		112,000	73,000	7,700		165,000	109,000
3,550		112,000	73,000	7,800		165,000	109,000
3,600		112,000	73,000	7,900		165,000	109,000
3,700		112,000	73,000	8,000		165,000	109,000
3,800		119,000	78,000	8,100		165,000	109,000
3,850		119,000	78,000	8,200		165,000	109,000
3,900		119,000	78,000	8,300		165,000	109,000
4,000		119,000	78,000	8,400		165,000	109,000
4,100		119,000	78,000	8,500		165,000	109,000
4,200		119,000	78,000	8,600		175,000	115,000
4,250		119,000	78,000	8,700		175,000	115,000
4,300		126,000	82,000	8,750		175,000	115,000
4,500		126,000	82,000	8,800		175,000	115,000
4,600		126,000	82,000	8,900		175,000	115,000
4,650		126,000	82,000	9,000		175,000	115,000
4,750		126,000	82,000	9,100		175,000	115,000
4,800		132,000	87,000	9,200		175,000	115,000
4,850		132,000	87,000	9,300		175,000	115,000
4,900		132,000	87,000	9,400		175,000	115,000
5,000		132,000	87,000	9,500		175,000	115,000
5,100		132,000	87,000	9,600		184,000	121,000
5,200		132,000	87,000	9,700		184,000	121,000
5,300		132,000	87,000	9,800		184,000	121,000
5,400		139,000	91,000	9,900		184,000	121,000
5,500		139,000	91,000	10,000		184,000	121,000
5,600		139,000	91,000	10,100		184,000	121,000
5,700		139,000	91,000	10,200		184,000	121,000
5,800		139,000	91,000	10,250		184,000	121,000
5,900		139,000	91,000	10,300		184,000	121,000
6,000		139,000	91,000	10,400		184,000	121,000
6,100		148,000	97,000	10,500		184,000	121,000
6,200		148,000	97,000	10,600		184,000	121,000

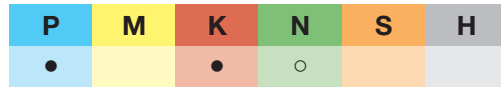
d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
10,700		195,000	128,000	15,000		220,000	144,000
10,800		195,000	128,000	15,500		227,000	149,000
10,900		195,000	128,000	16,000		227,000	149,000
11,000		195,000	128,000	17,000		235,000	154,000
11,500		195,000	128,000	18,000		241,000	158,000
11,750		195,000	128,000	20,000		254,000	166,000
12,000		205,000	134,000				
12,500		205,000	134,000				
13,000		205,000	134,000				
13,500		214,000	140,000				
14,000		214,000	140,000				
14,500		220,000	144,000				

Punte cilindriche

Punte elicoidali, lunghe

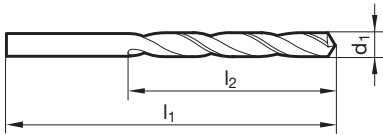


Catalogo n° 61136



Parametri di lav.
ind. a pag. 186

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- per fori profondi
- per forare con bussola di guida
- massima resistenza all'usura



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		56,000	33,000	5,800		139,000	91,000
1,100		60,000	37,000	5,900		139,000	91,000
1,200		65,000	41,000	6,000		139,000	91,000
1,300		65,000	41,000	6,100		148,000	97,000
1,400		70,000	45,000	6,200		148,000	97,000
1,500		70,000	45,000	6,300		148,000	97,000
1,600		76,000	50,000	6,400		148,000	97,000
1,700		76,000	50,000	6,500		148,000	97,000
1,800		80,000	53,000	6,600		148,000	97,000
1,900		80,000	53,000	6,700		148,000	97,000
2,000		85,000	56,000	6,800		156,000	102,000
2,100		85,000	56,000	6,900		156,000	102,000
2,200		90,000	59,000	7,000		156,000	102,000
2,300		90,000	59,000	7,100		156,000	102,000
2,400		95,000	62,000	7,200		156,000	102,000
2,500		95,000	62,000	7,300		156,000	102,000
2,600		95,000	62,000	7,400		156,000	102,000
2,700		100,000	66,000	7,500		156,000	102,000
2,800		100,000	66,000	7,600		165,000	109,000
2,900		100,000	66,000	7,700		165,000	109,000
3,000		100,000	66,000	7,800		165,000	109,000
3,100		106,000	69,000	7,900		165,000	109,000
3,200		106,000	69,000	8,000		165,000	109,000
3,300		106,000	69,000	8,100		165,000	109,000
3,400		112,000	73,000	8,200		165,000	109,000
3,500		112,000	73,000	8,300		165,000	109,000
3,600		112,000	73,000	8,400		165,000	109,000
3,700		112,000	73,000	8,500		165,000	109,000
3,800		119,000	78,000	8,600		175,000	115,000
3,900		119,000	78,000	8,700		175,000	115,000
4,000		119,000	78,000	8,800		175,000	115,000
4,100		119,000	78,000	8,900		175,000	115,000
4,200		119,000	78,000	9,000		175,000	115,000
4,300		126,000	82,000	9,100		175,000	115,000
4,400		126,000	82,000	9,200		175,000	115,000
4,500		126,000	82,000	9,300		175,000	115,000
4,600		126,000	82,000	9,400		175,000	115,000
4,700		126,000	82,000	9,500		175,000	115,000
4,800		132,000	87,000	9,600		184,000	121,000
4,900		132,000	87,000	9,700		184,000	121,000
5,000		132,000	87,000	9,800		184,000	121,000
5,100		132,000	87,000	9,900		184,000	121,000
5,200		132,000	87,000	10,000		184,000	121,000
5,300		132,000	87,000	10,200		184,000	121,000
5,400		139,000	91,000	10,500		184,000	121,000
5,500		139,000	91,000	10,800		195,000	128,000
5,600		139,000	91,000	11,000		195,000	128,000
5,700		139,000	91,000	11,500		195,000	128,000

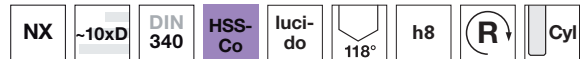
d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
12,000		205,000	134,000	15,000		220,000	144,000
12,500		205,000	134,000	15,500		227,000	149,000
13,000		205,000	134,000	16,000		227,000	149,000
13,500		214,000	140,000				
14,000		214,000	140,000				
14,500		220,000	144,000				

Punte cilindriche

Punte elicoidali, lunghe



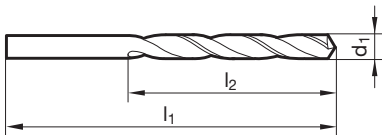
Catalogo n° 71222



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 184

- Assott. del noc. $\geq \varnothing 1,000$
- affilatura su piani
- è necess. una limitata forza di avanz.
- è necess. un limitato momento torcente
- uso universale



d1 mm	inch	l1 mm	l2 mm
1,000		56,000	33,000
1,100		60,000	37,000
1,200		65,000	41,000
1,300		65,000	41,000
1,400		70,000	45,000
1,500		70,000	45,000
1,600		76,000	50,000
1,700		76,000	50,000
1,800		80,000	53,000
1,900		80,000	53,000
2,000		85,000	56,000
2,100		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,400		95,000	62,000
2,500		95,000	62,000
2,600		95,000	62,000
2,700		100,000	66,000
2,800		100,000	66,000
2,900		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,600		112,000	73,000
3,700		112,000	73,000
3,800		119,000	78,000
3,900		119,000	78,000
4,000		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,600		126,000	82,000
4,700		126,000	82,000
4,800		132,000	87,000
4,900		132,000	87,000
5,000		132,000	87,000
5,100		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000

d1 mm	inch	l1 mm	l2 mm
5,800		139,000	91,000
5,900		139,000	91,000
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,700		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,400		165,000	109,000
8,500		165,000	109,000
8,600		175,000	115,000
8,700		175,000	115,000
8,800		175,000	115,000
8,900		175,000	115,000
9,000		175,000	115,000
9,100		175,000	115,000
9,200		175,000	115,000
9,300		175,000	115,000
9,400		175,000	115,000
9,500		175,000	115,000
9,600		184,000	121,000
9,700		184,000	121,000
9,800		184,000	121,000
9,900		184,000	121,000
10,000		184,000	121,000
10,100		184,000	121,000
10,200		184,000	121,000
10,300		184,000	121,000
10,400		184,000	121,000
10,500		184,000	121,000

d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
11,000		195,000	128,000	14,000		214,000	140,000
11,500		195,000	128,000				
12,000		205,000	134,000				
12,500		205,000	134,000				
13,000		205,000	134,000				
13,500		214,000	140,000				

Punte cilindriche

Punte elicoidali, lunghe



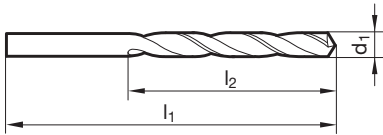
Catalogo n° 61222



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 184

- Assott. del noc. $\geq \varnothing 1,000$
- affilatura su piani
- è necess. un limitato momento torcente
- è necess. una limitata forza di avanz.
- massima resistenza all'usura
- uso universale



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,000		56,000	33,000	5,800		139,000	91,000
1,100		60,000	37,000	5,900		139,000	91,000
1,200		65,000	41,000	6,000		139,000	91,000
1,300		65,000	41,000	6,100		148,000	97,000
1,400		70,000	45,000	6,200		148,000	97,000
1,500		70,000	45,000	6,300		148,000	97,000
1,600		76,000	50,000	6,400		148,000	97,000
1,700		76,000	50,000	6,500		148,000	97,000
1,800		80,000	53,000	6,600		148,000	97,000
1,900		80,000	53,000	6,700		148,000	97,000
2,000		85,000	56,000	6,800		156,000	102,000
2,100		85,000	56,000	6,900		156,000	102,000
2,200		90,000	59,000	7,000		156,000	102,000
2,300		90,000	59,000	7,100		156,000	102,000
2,400		95,000	62,000	7,200		156,000	102,000
2,500		95,000	62,000	7,300		156,000	102,000
2,600		95,000	62,000	7,400		156,000	102,000
2,700		100,000	66,000	7,500		156,000	102,000
2,800		100,000	66,000	7,600		165,000	109,000
2,900		100,000	66,000	7,700		165,000	109,000
3,000		100,000	66,000	7,800		165,000	109,000
3,100		106,000	69,000	7,900		165,000	109,000
3,200		106,000	69,000	8,000		165,000	109,000
3,300		106,000	69,000	8,100		165,000	109,000
3,400		112,000	73,000	8,200		165,000	109,000
3,500		112,000	73,000	8,300		165,000	109,000
3,600		112,000	73,000	8,400		165,000	109,000
3,700		112,000	73,000	8,500		165,000	109,000
3,800		119,000	78,000	8,600		175,000	115,000
3,900		119,000	78,000	8,700		175,000	115,000
4,000		119,000	78,000	8,800		175,000	115,000
4,100		119,000	78,000	8,900		175,000	115,000
4,200		119,000	78,000	9,000		175,000	115,000
4,300		126,000	82,000	9,100		175,000	115,000
4,400		126,000	82,000	9,200		175,000	115,000
4,500		126,000	82,000	9,300		175,000	115,000
4,600		126,000	82,000	9,400		175,000	115,000
4,700		126,000	82,000	9,500		175,000	115,000
4,800		132,000	87,000	9,600		184,000	121,000
4,900		132,000	87,000	9,700		184,000	121,000
5,000		132,000	87,000	9,800		184,000	121,000
5,100		132,000	87,000	9,900		184,000	121,000
5,200		132,000	87,000	10,000		184,000	121,000
5,300		132,000	87,000	10,100		184,000	121,000
5,400		139,000	91,000	10,200		184,000	121,000
5,500		139,000	91,000	10,300		184,000	121,000
5,600		139,000	91,000	10,400		184,000	121,000
5,700		139,000	91,000	10,500		184,000	121,000

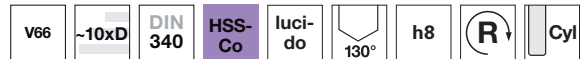
d1		l1	l2	d1		l1	l2
mm	inch	mm	mm	mm	inch	mm	mm
11,000		195,000	128,000	14,000		214,000	140,000
11,500		195,000	128,000				
12,000		205,000	134,000				
12,500		205,000	134,000				
13,000		205,000	134,000				
13,500		214,000	140,000				

Punte cilindriche

Punte elicoidali, lunghe



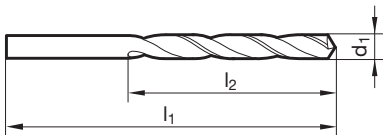
Catalogo n° 71225



P	M	K	N	S	H
•	•		•	•	

Parametri di lav.
ind. a pag. 186

- Assott. del noc. $\geq \varnothing 1,000$
- spoglia sul cono tagliente
- massima resistenza all'usura
- preferibile per Titanio e leghe di Titanio
- con riserva per Hastelloy, Inconel, Nimonic



d1 mm	inch	l1 mm	l2 mm
1,000		56,000	33,000
1,100		60,000	37,000
1,200		65,000	41,000
1,300		65,000	41,000
1,400		70,000	45,000
1,500		70,000	45,000
1,600		76,000	50,000
1,700		76,000	50,000
1,800		80,000	53,000
2,000		85,000	56,000
2,200		90,000	59,000
2,300		90,000	59,000
2,500		95,000	62,000
2,600		95,000	62,000
2,700		100,000	66,000
3,000		100,000	66,000
3,100		106,000	69,000
3,200		106,000	69,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
3,600		112,000	73,000
3,700		112,000	73,000
3,800		119,000	78,000
3,900		119,000	78,000
4,000		119,000	78,000
4,100		119,000	78,000
4,200		119,000	78,000
4,300		126,000	82,000
4,400		126,000	82,000
4,500		126,000	82,000
4,600		126,000	82,000
4,700		126,000	82,000
4,800		132,000	87,000
5,000		132,000	87,000
5,200		132,000	87,000
5,300		132,000	87,000
5,400		139,000	91,000
5,500		139,000	91,000
5,600		139,000	91,000
5,700		139,000	91,000
5,800		139,000	91,000

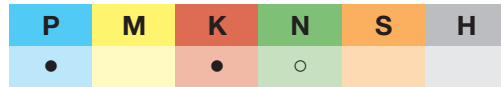
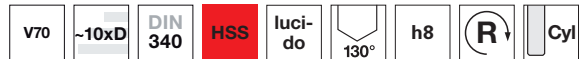
d1 mm	inch	l1 mm	l2 mm
6,000		139,000	91,000
6,100		148,000	97,000
6,200		148,000	97,000
6,300		148,000	97,000
6,400		148,000	97,000
6,500		148,000	97,000
6,600		148,000	97,000
6,700		148,000	97,000
6,800		156,000	102,000
6,900		156,000	102,000
7,000		156,000	102,000
7,100		156,000	102,000
7,200		156,000	102,000
7,300		156,000	102,000
7,400		156,000	102,000
7,500		156,000	102,000
7,600		165,000	109,000
7,800		165,000	109,000
7,900		165,000	109,000
8,000		165,000	109,000
8,100		165,000	109,000
8,200		165,000	109,000
8,300		165,000	109,000
8,500		165,000	109,000
9,000		175,000	115,000
9,500		175,000	115,000
10,000		184,000	121,000
10,200		184,000	121,000
10,500		184,000	121,000
11,000		195,000	128,000
12,000		205,000	134,000
13,000		205,000	134,000

Punte cilindriche

Punte elicoidali, lunghe

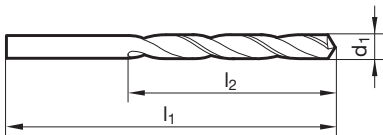


Catalogo n° 71150



Parametri di lav.
ind. a pag. 186

- Assott. del noc. $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		70,000	45,000	6,100		148,000	97,000
1,600		76,000	50,000	6,200		148,000	97,000
1,700		76,000	50,000	6,300		148,000	97,000
1,750		80,000	53,000	6,400		148,000	97,000
1,800		80,000	53,000	6,500		148,000	97,000
1,900		80,000	53,000	6,600		148,000	97,000
2,000		85,000	56,000	6,700		148,000	97,000
2,050		85,000	56,000	6,800		156,000	102,000
2,100		85,000	56,000	6,900		156,000	102,000
2,200		90,000	59,000	7,000		156,000	102,000
2,300		90,000	59,000	7,100		156,000	102,000
2,400		95,000	62,000	7,200		156,000	102,000
2,500		95,000	62,000	7,300		156,000	102,000
2,600		95,000	62,000	7,400		156,000	102,000
2,700		100,000	66,000	7,500		156,000	102,000
2,800		100,000	66,000	7,600		165,000	109,000
2,900		100,000	66,000	7,700		165,000	109,000
3,000		100,000	66,000	7,800		165,000	109,000
3,100		106,000	69,000	7,900		165,000	109,000
3,200		106,000	69,000	8,000		165,000	109,000
3,300		106,000	69,000	8,100		165,000	109,000
3,400		112,000	73,000	8,200		165,000	109,000
3,500		112,000	73,000	8,300		165,000	109,000
3,600		112,000	73,000	8,400		165,000	109,000
3,700		112,000	73,000	8,500		165,000	109,000
3,800		119,000	78,000	8,600		175,000	115,000
3,900		119,000	78,000	8,700		175,000	115,000
4,000		119,000	78,000	8,800		175,000	115,000
4,100		119,000	78,000	8,900		175,000	115,000
4,200		119,000	78,000	9,000		175,000	115,000
4,300		126,000	82,000	9,100		175,000	115,000
4,400		126,000	82,000	9,200		175,000	115,000
4,500		126,000	82,000	9,300		175,000	115,000
4,600		126,000	82,000	9,400		175,000	115,000
4,700		126,000	82,000	9,500		175,000	115,000
4,800		132,000	87,000	9,600		184,000	121,000
4,900		132,000	87,000	9,700		184,000	121,000
5,000		132,000	87,000	9,800		184,000	121,000
5,100		132,000	87,000	9,900		184,000	121,000
5,200		132,000	87,000	10,000		184,000	121,000
5,300		132,000	87,000	10,200		184,000	121,000
5,400		139,000	91,000	10,500		184,000	121,000
5,500		139,000	91,000	11,000		195,000	128,000
5,600		139,000	91,000	11,500		195,000	128,000
5,700		139,000	91,000	12,000		205,000	134,000
5,800		139,000	91,000				
5,900		139,000	91,000				
6,000		139,000	91,000				

Punte cilindriche

Punte elicoidali, lunghe



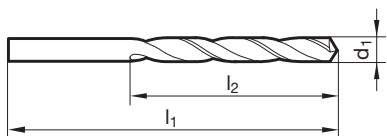
Catalogo n° 71152



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 186

- Assott. del noc. $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe



d1 mm	inch	l1 mm	l2 mm
1,500		70,000	45,000
1,600		76,000	50,000
1,900		80,000	53,000
2,400		95,000	62,000
2,500		95,000	62,000
2,700		100,000	66,000
2,900		100,000	66,000
3,000		100,000	66,000
3,300		106,000	69,000
3,400		112,000	73,000
3,500		112,000	73,000
4,000		119,000	78,000
4,200		119,000	78,000
4,500		126,000	82,000
5,000		132,000	87,000
6,000		139,000	91,000
6,600		148,000	97,000
6,800		156,000	102,000

d1 mm	inch	l1 mm	l2 mm
7,000		156,000	102,000
8,000		165,000	109,000
9,000		175,000	115,000
10,000		184,000	121,000
10,200		184,000	121,000
11,000		195,000	128,000
12,000		205,000	134,000
13,000		205,000	134,000

Punte cilindriche

Punte elicoidali, lunghe



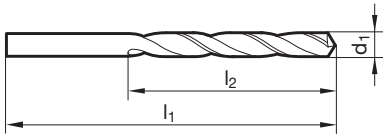
Catalogo n° 61150



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 186

- Assott. del nocc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- scanalature larghe
- maggiore protezione contro l'usura



d1 mm	inch	l1 mm	l2 mm
2,000		85,000	56,000
2,500		95,000	62,000
3,000		100,000	66,000
3,300		106,000	69,000
3,500		112,000	73,000
4,000		119,000	78,000
4,200		119,000	78,000
4,500		126,000	82,000
5,000		132,000	87,000
5,500		139,000	91,000
6,000		139,000	91,000
8,000		165,000	109,000

d1 mm	inch	l1 mm	l2 mm
8,500		165,000	109,000
10,000		184,000	121,000
10,200		184,000	121,000
12,000		205,000	134,000

Punte cilindriche

Punte elicoidali, lunghe



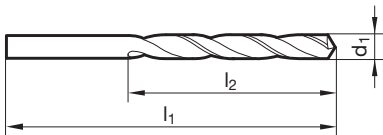
Catalogo n° 71154



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 186

- Assott. del noc. $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe
- stabilità elevata



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		70,000	45,000	3,600		112,000	73,000
1,590	1/16	76,000	50,000	3,660		112,000	73,000
1,600		76,000	50,000	3,700		112,000	73,000
1,610		76,000	50,000	3,730		112,000	73,000
1,700		76,000	50,000	3,800		119,000	78,000
1,750		80,000	53,000	3,860		119,000	78,000
1,780		80,000	53,000	3,900		119,000	78,000
1,800		80,000	53,000	3,910		119,000	78,000
1,850		80,000	53,000	3,970	5/32	119,000	78,000
1,900		80,000	53,000	3,990		119,000	78,000
1,930		85,000	56,000	4,000		119,000	78,000
1,980	5/64	85,000	56,000	4,040		119,000	78,000
1,990		85,000	56,000	4,090		119,000	78,000
2,000		85,000	56,000	4,100		119,000	78,000
2,050		85,000	56,000	4,200		119,000	78,000
2,060		85,000	56,000	4,300		126,000	82,000
2,080		85,000	56,000	4,310		126,000	82,000
2,100		85,000	56,000	4,370	11/64	126,000	82,000
2,180		90,000	59,000	4,390		126,000	82,000
2,200		90,000	59,000	4,400		126,000	82,000
2,260		90,000	59,000	4,500		126,000	82,000
2,300		90,000	59,000	4,570		126,000	82,000
2,370		95,000	62,000	4,600		126,000	82,000
2,380	3/32	95,000	62,000	4,700		126,000	82,000
2,400		95,000	62,000	4,760	3/16	132,000	87,000
2,440		95,000	62,000	4,800		132,000	87,000
2,490		95,000	62,000	4,850		132,000	87,000
2,500		95,000	62,000	4,900		132,000	87,000
2,580		95,000	62,000	4,920		132,000	87,000
2,600		95,000	62,000	4,980		132,000	87,000
2,700		100,000	66,000	5,000		132,000	87,000
2,710		100,000	66,000	5,060		132,000	87,000
2,780	7/64	100,000	66,000	5,100		132,000	87,000
2,800		100,000	66,000	5,110		132,000	87,000
2,870		100,000	66,000	5,180		132,000	87,000
2,900		100,000	66,000	5,200		132,000	87,000
2,950		100,000	66,000	5,220		132,000	87,000
3,000		100,000	66,000	5,300		132,000	87,000
3,100		106,000	69,000	5,310		139,000	91,000
3,170	1/8	106,000	69,000	5,400		139,000	91,000
3,180		106,000	69,000	5,410		139,000	91,000
3,200		106,000	69,000	5,500		139,000	91,000
3,260		106,000	69,000	5,560	7/32	139,000	91,000
3,300		106,000	69,000	5,600		139,000	91,000
3,400		112,000	73,000	5,610		139,000	91,000
3,450		112,000	73,000	5,700		139,000	91,000
3,500		112,000	73,000	5,790		139,000	91,000
3,570	9/64	112,000	73,000	5,800		139,000	91,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
5,900		139,000	91,000	8,610		175,000	115,000
5,940		139,000	91,000	8,700		175,000	115,000
5,950	15/64	139,000	91,000	8,730	11/32	175,000	115,000
6,000		139,000	91,000	8,800		175,000	115,000
6,040		148,000	97,000	8,840		175,000	115,000
6,100		148,000	97,000	8,900		175,000	115,000
6,150		148,000	97,000	9,000		175,000	115,000
6,200		148,000	97,000	9,090		175,000	115,000
6,250		148,000	97,000	9,100		175,000	115,000
6,300		148,000	97,000	9,130	23/64	175,000	115,000
6,350	1/4	148,000	97,000	9,200		175,000	115,000
6,400		148,000	97,000	9,300		175,000	115,000
6,500		148,000	97,000	9,400		175,000	115,000
6,530		148,000	97,000	9,500		175,000	115,000
6,600		148,000	97,000	9,520	3/8	184,000	121,000
6,700		148,000	97,000	9,530		184,000	121,000
6,750	17/64	156,000	102,000	9,580		184,000	121,000
6,760		156,000	102,000	9,600		184,000	121,000
6,800		156,000	102,000	9,700		184,000	121,000
6,900		156,000	102,000	9,800		184,000	121,000
6,910		156,000	102,000	9,900		184,000	121,000
7,000		156,000	102,000	9,920	25/64	184,000	121,000
7,040		156,000	102,000	10,000		184,000	121,000
7,100		156,000	102,000	10,080		184,000	121,000
7,140	9/32	156,000	102,000	10,200		184,000	121,000
7,200		156,000	102,000	10,260		184,000	121,000
7,300		156,000	102,000	10,320	13/32	184,000	121,000
7,370		156,000	102,000	10,490		184,000	121,000
7,400		156,000	102,000	10,500		184,000	121,000
7,490		156,000	102,000	10,720	27/64	195,000	128,000
7,500		156,000	102,000	11,000		195,000	128,000
7,540	19/64	165,000	109,000	11,110	7/16	195,000	128,000
7,600		165,000	109,000	11,500		195,000	128,000
7,670		165,000	109,000	11,510	29/64	195,000	128,000
7,700		165,000	109,000	11,910	15/32	205,000	134,000
7,800		165,000	109,000	12,000		205,000	134,000
7,900		165,000	109,000	12,300	31/64	205,000	134,000
7,940	5/16	165,000	109,000	12,700	1/2	205,000	134,000
8,000		165,000	109,000				
8,030		165,000	109,000				
8,100		165,000	109,000				
8,200		165,000	109,000				
8,300		165,000	109,000				
8,330	21/64	165,000	109,000				
8,400		165,000	109,000				
8,430		165,000	109,000				
8,500		165,000	109,000				
8,600		175,000	115,000				

Punte cilindriche

Punte elicoidali, lunghe



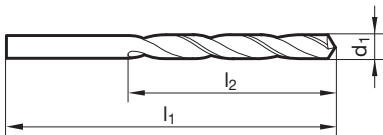
Catalogo n° 71156



P	M	K	N	S	H
●	○	●	○		

Parametri di lav.
ind. a pag. 186

- Assott. del noc. $\geq \varnothing 1,500$
- spoglia sul cono tagliente
- scanalature larghe
- stabilità elevata
- massima resistenza all'usura



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
1,500		70,000	45,000	5,800		139,000	91,000
1,590	1/16	76,000	50,000	5,900		139,000	91,000
1,600		76,000	50,000	6,000		139,000	91,000
1,700		76,000	50,000	6,100		148,000	97,000
1,800		80,000	53,000	6,200		148,000	97,000
1,900		80,000	53,000	6,300		148,000	97,000
2,000		85,000	56,000	6,350	1/4	148,000	97,000
2,100		85,000	56,000	6,400		148,000	97,000
2,200		90,000	59,000	6,500		148,000	97,000
2,300		90,000	59,000	6,600		148,000	97,000
2,380	3/32	95,000	62,000	6,700		148,000	97,000
2,500		95,000	62,000	6,800		156,000	102,000
2,600		95,000	62,000	6,900		156,000	102,000
2,700		100,000	66,000	7,000		156,000	102,000
2,800		100,000	66,000	7,100		156,000	102,000
2,900		100,000	66,000	7,140	9/32	156,000	102,000
3,000		100,000	66,000	7,200		156,000	102,000
3,100		106,000	69,000	7,300		156,000	102,000
3,170	1/8	106,000	69,000	7,400		156,000	102,000
3,180		106,000	69,000	7,500		156,000	102,000
3,200		106,000	69,000	7,600		165,000	109,000
3,300		106,000	69,000	7,700		165,000	109,000
3,400		112,000	73,000	7,800		165,000	109,000
3,500		112,000	73,000	7,900		165,000	109,000
3,600		112,000	73,000	7,940	5/16	165,000	109,000
3,700		112,000	73,000	8,000		165,000	109,000
3,800		119,000	78,000	8,100		165,000	109,000
3,900		119,000	78,000	8,200		165,000	109,000
3,970	5/32	119,000	78,000	8,300		165,000	109,000
4,000		119,000	78,000	8,400		165,000	109,000
4,100		119,000	78,000	8,500		165,000	109,000
4,200		119,000	78,000	8,600		175,000	115,000
4,300		126,000	82,000	8,700		175,000	115,000
4,400		126,000	82,000	8,730	11/32	175,000	115,000
4,500		126,000	82,000	8,800		175,000	115,000
4,600		126,000	82,000	8,900		175,000	115,000
4,700		126,000	82,000	9,000		175,000	115,000
4,760	3/16	132,000	87,000	9,100		175,000	115,000
4,800		132,000	87,000	9,200		175,000	115,000
4,900		132,000	87,000	9,300		175,000	115,000
5,000		132,000	87,000	9,400		175,000	115,000
5,100		132,000	87,000	9,500		175,000	115,000
5,200		132,000	87,000	9,520	3/8	184,000	121,000
5,300		132,000	87,000	9,530		184,000	121,000
5,400		139,000	91,000	9,600		184,000	121,000
5,500		139,000	91,000	9,700		184,000	121,000
5,600		139,000	91,000	9,800		184,000	121,000
5,700		139,000	91,000	9,900		184,000	121,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
10,000		184,000	121,000	13,000		205,000	134,000
10,200		184,000	121,000				
10,320	13/32	184,000	121,000				
10,500		184,000	121,000				
10,800		195,000	128,000				
11,000		195,000	128,000				
11,110	7/16	195,000	128,000				
11,500		195,000	128,000				
11,910	15/32	205,000	134,000				
12,000		205,000	134,000				
12,500		205,000	134,000				
12,700	1/2	205,000	134,000				

Punte cilindriche

Punte elicoidali in lunghezze speciali, grandezza 1

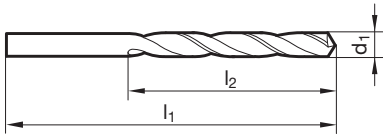


Catalogo n° 71145



P	M	K	N	S	H	Parametri di lav. ind. a pag. 188
•		•	•			

- Assott. del noc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo
- lucida $< 2,36$ mm



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
2,000		125,000	85,000	6,400		215,000	150,000
2,100		125,000	85,000	6,500		215,000	150,000
2,200		135,000	90,000	6,600		215,000	150,000
2,300		135,000	90,000	6,700		215,000	150,000
2,400		140,000	95,000	6,750	17/64	225,000	155,000
2,500		140,000	95,000	6,800		225,000	155,000
2,600		140,000	95,000	6,900		225,000	155,000
2,700		150,000	100,000	7,000		225,000	155,000
2,800		150,000	100,000	7,100		225,000	155,000
2,900		150,000	100,000	7,200		225,000	155,000
3,000		150,000	100,000	7,300		225,000	155,000
3,100		155,000	105,000	7,400		225,000	155,000
3,200		155,000	105,000	7,500		225,000	155,000
3,300		155,000	105,000	7,540	19/64	240,000	165,000
3,400		165,000	115,000	7,600		240,000	165,000
3,500		165,000	115,000	7,700		240,000	165,000
3,600		165,000	115,000	7,800		240,000	165,000
3,700		165,000	115,000	7,900		240,000	165,000
3,800		175,000	120,000	7,940	5/16	240,000	165,000
3,900		175,000	120,000	8,000		240,000	165,000
3,970	5/32	175,000	120,000	8,100		240,000	165,000
4,000		175,000	120,000	8,200		240,000	165,000
4,100		175,000	120,000	8,300		240,000	165,000
4,200		175,000	120,000	8,400		240,000	165,000
4,300		185,000	125,000	8,500		240,000	165,000
4,400		185,000	125,000	8,600		250,000	175,000
4,500		185,000	125,000	8,700		250,000	175,000
4,600		185,000	125,000	8,800		250,000	175,000
4,700		185,000	125,000	8,900		250,000	175,000
4,760	3/16	195,000	135,000	9,000		250,000	175,000
4,800		195,000	135,000	9,100		250,000	175,000
4,900		195,000	135,000	9,300		250,000	175,000
5,000		195,000	135,000	9,400		250,000	175,000
5,100		195,000	135,000	9,500		250,000	175,000
5,200		195,000	135,000	9,520	3/8	265,000	185,000
5,300		195,000	135,000	9,600		265,000	185,000
5,400		205,000	140,000	9,700		265,000	185,000
5,500		205,000	140,000	9,800		265,000	185,000
5,600		205,000	140,000	9,900		265,000	185,000
5,700		205,000	140,000	10,000		265,000	185,000
5,800		205,000	140,000	10,100		265,000	185,000
5,900		205,000	140,000	10,200		265,000	185,000
5,950	15/64	205,000	140,000	10,500		265,000	185,000
6,000		205,000	140,000	10,720	27/64	280,000	195,000
6,100		215,000	150,000	10,800		280,000	195,000
6,200		215,000	150,000	11,000		280,000	195,000
6,300		215,000	150,000	11,110	7/16	280,000	195,000
6,350	1/4	215,000	150,000	11,200		280,000	195,000

d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
11,500		280,000	195,000	12,700	1/2	295,000	205,000
11,510	29/64	280,000	195,000	13,000		295,000	205,000
11,800		280,000	195,000				
11,910	15/32	295,000	205,000				
12,000		295,000	205,000				
12,300	31/64	295,000	205,000				

Punte cilindriche

Punte elicoidali in lunghezze speciali, grandezza 1



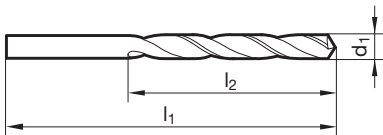
Catalogo n° 71192



P	M	K	N	S	H
●	○	●	●		

Parametri di lav.
ind. a pag. 188

- Assott. del noc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- scanalature larghe
- massima resistenza all'usura
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



d1 mm	inch	l1 mm	l2 mm	d1 mm	inch	l1 mm	l2 mm
3,000		150,000	100,000	7,300		225,000	155,000
3,100		155,000	105,000	7,400		225,000	155,000
3,170	1/8	155,000	105,000	7,500		225,000	155,000
3,200		155,000	105,000	7,600		240,000	165,000
3,300		155,000	105,000	7,700		240,000	165,000
3,400		165,000	115,000	7,800		240,000	165,000
3,500		165,000	115,000	7,900		240,000	165,000
3,600		165,000	115,000	7,940	5/16	240,000	165,000
3,700		165,000	115,000	8,000		240,000	165,000
3,800		175,000	120,000	8,100		240,000	165,000
3,900		175,000	120,000	8,200		240,000	165,000
3,970	5/32	175,000	120,000	8,300		240,000	165,000
4,000		175,000	120,000	8,400		240,000	165,000
4,100		175,000	120,000	8,500		240,000	165,000
4,200		175,000	120,000	8,600		250,000	175,000
4,300		185,000	125,000	8,700		250,000	175,000
4,400		185,000	125,000	8,730	11/32	250,000	175,000
4,500		185,000	125,000	8,800		250,000	175,000
4,600		185,000	125,000	8,900		250,000	175,000
4,700		185,000	125,000	9,000		250,000	175,000
4,760	3/16	195,000	135,000	9,100		250,000	175,000
4,800		195,000	135,000	9,200		250,000	175,000
4,900		195,000	135,000	9,300		250,000	175,000
5,000		195,000	135,000	9,400		250,000	175,000
5,100		195,000	135,000	9,500		250,000	175,000
5,200		195,000	135,000	9,530		265,000	185,000
5,300		195,000	135,000	9,600		265,000	185,000
5,400		205,000	140,000	9,700		265,000	185,000
5,500		205,000	140,000	9,900		265,000	185,000
5,560	7/32	205,000	140,000	10,000		265,000	185,000
5,600		205,000	140,000	10,100		265,000	185,000
5,700		205,000	140,000	10,200		265,000	185,000
5,800		205,000	140,000	10,320	13/32	265,000	185,000
5,900		205,000	140,000	10,500		265,000	185,000
6,000		205,000	140,000	10,800		280,000	195,000
6,100		215,000	150,000	11,000		280,000	195,000
6,200		215,000	150,000	11,200		280,000	195,000
6,300		215,000	150,000	11,500		280,000	195,000
6,350	1/4	215,000	150,000	11,800		280,000	195,000
6,400		215,000	150,000	11,910	15/32	295,000	205,000
6,500		215,000	150,000	12,700	1/2	295,000	205,000
6,600		215,000	150,000				
6,700		215,000	150,000				
6,800		225,000	155,000				
6,900		225,000	155,000				
7,000		225,000	155,000				
7,100		225,000	155,000				
7,200		225,000	155,000				

Punte cilindriche

Punte elicoidali in lunghezze speciali, grandezza 2



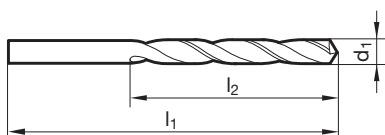
Catalogo n° 71146



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 188

- Assott. del noc. $\geq \varnothing 13,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



d1 mm	inch	l1 mm	l2 mm
3,000		190,000	130,000
3,170	1/8	200,000	135,000
3,500		210,000	145,000
3,570	9/64	210,000	145,000
3,970	5/32	220,000	150,000
4,000		220,000	150,000
4,500		235,000	160,000
4,760	3/16	245,000	170,000
5,000		245,000	170,000
5,500		260,000	180,000
5,950	15/64	260,000	180,000
6,000		260,000	180,000
6,500		275,000	190,000
6,750	17/64	290,000	200,000
6,800		290,000	200,000
7,000		290,000	200,000
7,500		290,000	200,000
7,940	5/16	305,000	210,000

d1 mm	inch	l1 mm	l2 mm
8,000		305,000	210,000
8,500		305,000	210,000
9,000		320,000	220,000
9,500		320,000	220,000
9,520	3/8	340,000	235,000
9,920	25/64	340,000	235,000
10,000		340,000	235,000
10,720	27/64	365,000	250,000
11,000		365,000	250,000
11,910	15/32	375,000	260,000
12,000		375,000	260,000
12,700	1/2	375,000	260,000
13,000		375,000	260,000

Punte cilindriche

Punte elicoidali in lunghezze speciali, grandezza 2



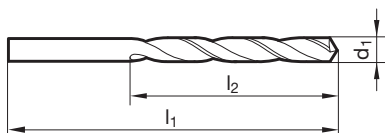
Catalogo n° 71193



P	M	K	N	S	H
●	○	●	●		

Parametri di lav.
ind. a pag. 188

- Assott. del nocc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- scanalature larghe
- massima resistenza all'usura
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



d1 mm	inch	l1 mm	l2 mm
3,000		190,000	130,000
3,500		210,000	145,000
4,000		220,000	150,000
4,500		235,000	160,000
5,000		245,000	170,000
5,500		260,000	180,000
6,000		260,000	180,000
6,500		275,000	190,000
7,000		290,000	200,000
7,500		290,000	200,000
8,000		305,000	210,000
8,500		305,000	210,000

d1 mm	inch	l1 mm	l2 mm
9,000		320,000	220,000
9,500		320,000	220,000
10,000		340,000	235,000
12,000		375,000	260,000

Punte cilindriche

Punte elicoidali in lunghezze speciali, grandezza 3



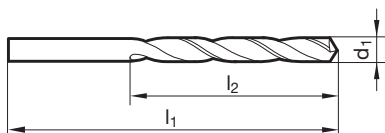
Catalogo n° 71147



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 188

- Assott. del noc. $\geq \varnothing 3,500$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



d1 mm	inch	l1 mm	l2 mm
3,500		265,000	180,000
4,000		280,000	190,000
4,500		295,000	200,000
5,000		315,000	210,000
5,500		330,000	225,000
6,000		330,000	225,000
6,350	1/4	350,000	235,000
6,500		350,000	235,000
7,000		370,000	250,000
7,500		370,000	250,000
7,940	5/16	390,000	265,000
8,000		390,000	265,000
8,500		390,000	265,000
9,000		410,000	280,000
9,130	23/64	410,000	280,000
9,500		410,000	280,000
9,530		430,000	295,000
9,920	25/64	430,000	295,000

d1 mm	inch	l1 mm	l2 mm
10,000		430,000	295,000
10,720	27/64	455,000	310,000
11,000		455,000	310,000
11,910	15/32	480,000	330,000
12,000		480,000	330,000
12,300	31/64	480,000	330,000
13,000		480,000	330,000

Punte cilindriche

Punte elicoidali, extra lunghe



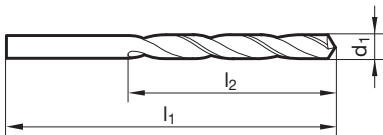
Catalogo n° 71195



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 188

- Assott. del noc. $\geq \varnothing 6,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



d1 mm	l1 mm	l2 mm
6,000	500,000	400,000
8,000	500,000	400,000
10,000	600,000	500,000
12,000	600,000	500,000

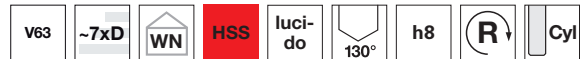
d1 mm	l1 mm	l2 mm

Punte cilindriche

Punte elicoidali, extra lunghe



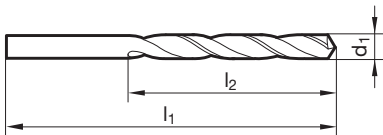
Catalogo n° 71196



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 188

- Assott. del noc. $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo



d1 mm	l1 mm	l2 mm
8,000	750,000	650,000
10,000	750,000	650,000
12,000	750,000	650,000

d1 mm	l1 mm	l2 mm
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Punte cilindriche

Punte con fori di refrigerazione



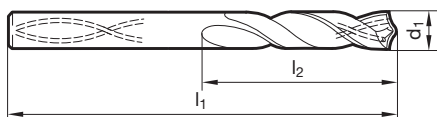
Catalogo n° 71584



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 186

- Assott. del noc. $\geq \varnothing 3,000$
- spoglia sul cono tagliente
- scanalature larghe



d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
3,000	3,000	100,000	66,000	34,000
3,300	3,300	106,000	69,000	37,000
3,500	3,500	112,000	73,000	39,000
4,000	4,000	119,000	78,000	41,000
4,200	4,200	119,000	78,000	41,000
4,500	4,500	126,000	82,000	44,000
5,000	5,000	132,000	87,000	45,000
5,500	5,500	139,000	91,000	48,000
6,000	6,000	139,000	91,000	48,000
6,500	6,500	148,000	97,000	51,000
6,800	6,800	156,000	102,000	54,000
7,000	7,000	156,000	102,000	54,000

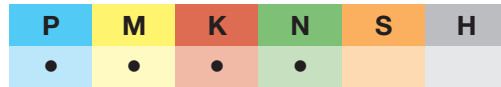
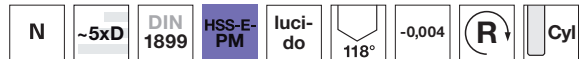
d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
7,500	7,500	156,000	102,000	54,000
8,000	8,000	165,000	109,000	56,000
8,500	8,500	165,000	109,000	56,000
9,000	9,000	175,000	115,000	60,000
9,500	9,500	175,000	115,000	60,000
10,000	10,000	184,000	121,000	63,000
10,200	10,200	184,000	121,000	63,000
10,500	10,500	184,000	121,000	63,000
11,000	11,000	195,000	128,000	67,000
12,000	12,000	205,000	134,000	71,000
13,000	13,000	205,000	134,000	71,000

Punte cilindriche

Micropunte

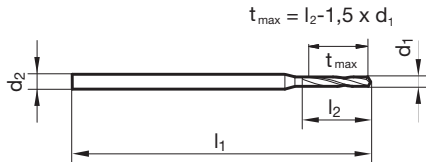


Catalogo n° 71187



Parametri di lav.
ind. a pag. 178

- affilatura su piani
- con codolo rinforzato



d1 mm	d2 mm	l1 mm	l2 mm
0,050	1,000	25,000	0,400
0,060	1,000	25,000	0,400
0,070	1,000	25,000	0,500
0,080	1,000	25,000	0,500
0,090	1,000	25,000	0,500
0,100	1,000	25,000	0,500
0,110	1,000	25,000	0,500
0,120	1,000	25,000	0,500
0,130	1,000	25,000	0,800
0,140	1,000	25,000	0,800
0,150	1,000	25,000	0,800
0,160	1,000	25,000	1,100
0,170	1,000	25,000	1,100
0,180	1,000	25,000	1,100
0,190	1,000	25,000	1,100
0,200	1,000	25,000	1,500
0,210	1,000	25,000	1,500
0,220	1,000	25,000	1,500
0,230	1,000	25,000	1,500
0,240	1,000	25,000	1,500
0,250	1,000	25,000	1,900
0,260	1,000	25,000	1,900
0,270	1,000	25,000	1,900
0,280	1,000	25,000	1,900
0,290	1,000	25,000	1,900
0,300	1,000	25,000	1,900
0,310	1,000	25,000	2,400
0,320	1,000	25,000	2,400
0,330	1,000	25,000	2,400
0,340	1,000	25,000	2,400
0,350	1,000	25,000	2,400
0,360	1,000	25,000	2,400
0,370	1,000	25,000	2,400
0,380	1,000	25,000	2,400
0,390	1,000	25,000	3,000
0,400	1,000	25,000	3,000
0,410	1,000	25,000	3,000
0,420	1,000	25,000	3,000
0,430	1,000	25,000	3,000
0,440	1,000	25,000	3,000
0,450	1,000	25,000	3,000
0,460	1,000	25,000	3,000
0,470	1,000	25,000	3,000
0,480	1,000	25,000	3,000
0,490	1,000	25,000	3,400
0,500	1,000	25,000	3,400
0,510	1,000	25,000	3,400
0,520	1,000	25,000	3,400

d1 mm	d2 mm	l1 mm	l2 mm
0,530	1,000	25,000	3,400
0,540	1,000	25,000	3,900
0,550	1,000	25,000	3,900
0,560	1,000	25,000	3,900
0,570	1,000	25,000	3,900
0,580	1,000	25,000	3,900
0,590	1,000	25,000	3,900
0,600	1,000	25,000	3,900
0,610	1,000	25,000	4,200
0,620	1,000	25,000	4,200
0,630	1,000	25,000	4,200
0,640	1,000	25,000	4,200
0,650	1,000	25,000	4,200
0,660	1,000	25,000	4,200
0,670	1,000	25,000	4,200
0,680	1,000	25,000	4,800
0,690	1,000	25,000	4,800
0,700	1,000	25,000	4,800
0,710	1,000	25,000	4,800
0,720	1,000	25,000	4,800
0,730	1,000	25,000	4,800
0,740	1,000	25,000	4,800
0,750	1,000	25,000	4,800
0,760	1,000	25,000	5,300
0,770	1,000	25,000	5,300
0,780	1,000	25,000	5,300
0,790	1,000	25,000	5,300
0,800	1,500	25,000	5,300
0,810	1,500	25,000	5,300
0,820	1,500	25,000	5,300
0,830	1,500	25,000	5,300
0,840	1,500	25,000	5,300
0,850	1,500	25,000	5,300
0,860	1,500	25,000	6,000
0,870	1,500	25,000	6,000
0,880	1,500	25,000	6,000
0,890	1,500	25,000	6,000
0,900	1,500	25,000	6,000
0,910	1,500	25,000	6,000
0,920	1,500	25,000	6,000
0,930	1,500	25,000	6,000
0,940	1,500	25,000	6,000
0,950	1,500	25,000	6,000
0,960	1,500	25,000	6,800
0,970	1,500	25,000	6,800
0,980	1,500	25,000	6,800
0,990	1,500	25,000	6,800
1,000	1,500	25,000	6,800

d1 mm	d2 mm	l1 mm	l2 mm	d1 mm	d2 mm	l1 mm	l2 mm
1,010	1,500	25,000	6,800	1,250	1,500	25,000	8,500
1,020	1,500	25,000	6,800	1,260	1,500	25,000	8,500
1,030	1,500	25,000	6,800	1,270	1,500	25,000	8,500
1,040	1,500	25,000	6,800	1,280	1,500	25,000	8,500
1,050	1,500	25,000	6,800	1,290	1,500	25,000	8,500
1,060	1,500	25,000	6,800	1,300	1,500	25,000	8,500
1,070	1,500	25,000	7,600	1,310	1,500	25,000	8,500
1,080	1,500	25,000	7,600	1,320	1,500	25,000	8,500
1,090	1,500	25,000	7,600	1,330	1,500	25,000	9,500
1,100	1,500	25,000	7,600	1,340	1,500	25,000	9,500
1,110	1,500	25,000	7,600	1,350	1,500	25,000	9,500
1,120	1,500	25,000	7,600	1,360	1,500	25,000	9,500
1,130	1,500	25,000	7,600	1,370	1,500	25,000	9,500
1,140	1,500	25,000	7,600	1,380	1,500	25,000	9,500
1,150	1,500	25,000	7,600	1,390	1,500	25,000	9,500
1,160	1,500	25,000	7,600	1,400	1,500	25,000	9,500
1,170	1,500	25,000	7,600	1,410	1,500	25,000	9,500
1,180	1,500	25,000	7,600	1,420	1,500	25,000	9,500
1,190	1,500	25,000	8,500	1,430	1,500	25,000	9,500
1,200	1,500	25,000	8,500	1,440	1,500	25,000	9,500
1,210	1,500	25,000	8,500	1,450	1,500	25,000	9,500
1,220	1,500	25,000	8,500				
1,230	1,500	25,000	8,500				
1,240	1,500	25,000	8,500				

Punte cilindriche

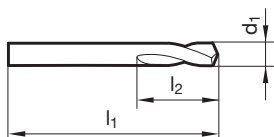
Punte cilindriche per centri CN



Catalogo n° 71175

N	WN	HSS	lucido	90°	h6	R	Cyl
P	M	K	N	S	H		
•	•	•	•	•			

- spoglia sul cono tagliente
- adatte solo per centrare



d1 mm	l1 mm	l2 mm
3,000	46,000	12,000
4,000	55,000	12,000
5,000	62,000	14,000
6,000	66,000	16,000
8,000	79,000	21,000
10,000	89,000	25,000

d1 mm	l1 mm	l2 mm
12,000	102,000	30,000
16,000	115,000	37,500
20,000	131,000	45,000
25,000	151,000	53,000
25,400	156,000	53,000

Punte cilindriche

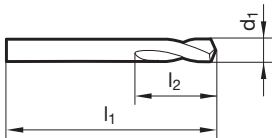
Punte cilindriche per centri CN



Catalogo n° 61175

N	WN	HSS	TiN	90°	h6	R	Cyl
P	M	K	N	S	H		
•	•	•	•	•			

- spoglia sul cono tagliente
- adatte solo per centrare
- maggiore protezione contro l'usura



d1 mm	l1 mm	l2 mm
3,000	46,000	12,000
4,000	55,000	12,000
6,000	66,000	16,000
8,000	79,000	21,000
10,000	89,000	25,000
12,000	102,000	30,000

d1 mm	l1 mm	l2 mm
16,000	115,000	37,500
20,000	131,000	45,000
25,000	151,000	53,000

Punte cilindriche

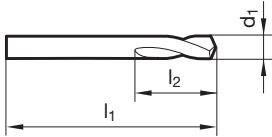
Punte cilindriche per centri CN



Catalogo n° 71176

N	WN	HSS	lucido	120°	h6	R	Cyl
P	M	K	N	S	H		
•	•	•	•	•			

- spoglia sul cono tagliente
- adatte solo per centrare



d1 mm	l1 mm	l2 mm
3,000	46,000	12,000
4,000	55,000	12,000
5,000	62,000	14,000
6,000	66,000	16,000
8,000	79,000	21,000
10,000	89,000	25,000

d1 mm	l1 mm	l2 mm
12,000	102,000	30,000
16,000	115,000	37,500
20,000	131,000	45,000
25,400	156,000	53,000

Punte con codolo conico Morse

Punte elicoidali, corte



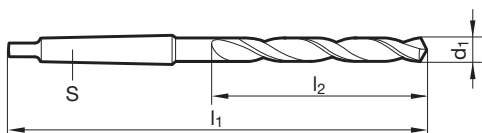
Catalogo n° 71303



P	M	K	N	S	H
●	●	○		○	○

Parametri di lav.
ind. a pag. 176

- Assott. del noc. $\geq \varnothing 10,000$
- spoglia sul cono tagliente
- particolarmente stabile e resistente



d1 mm	S	l1 mm	l2 mm
10,000	MK-1	138,000	57,000
10,200	MK-1	138,000	57,000
10,500	MK-1	138,000	57,000
10,800	MK-1	142,000	61,000
11,000	MK-1	142,000	61,000
11,500	MK-1	142,000	61,000
12,000	MK-1	147,000	66,000
12,500	MK-1	147,000	66,000
13,000	MK-1	147,000	66,000
14,500	MK-2	172,000	74,000
15,000	MK-2	172,000	74,000
16,000	MK-2	176,000	78,000

d1 mm	S	l1 mm	l2 mm
16,500	MK-2	179,000	81,000
17,000	MK-2	179,000	81,000
17,500	MK-2	183,000	85,000
18,000	MK-2	183,000	85,000
18,500	MK-2	186,000	88,000
23,500	MK-3	222,000	101,000
24,000	MK-3	225,000	104,000
24,500	MK-3	225,000	104,000
25,000	MK-3	225,000	104,000
25,500	MK-4	256,000	107,000

Punte con codolo conico Morse

Punte elicoidali, corte



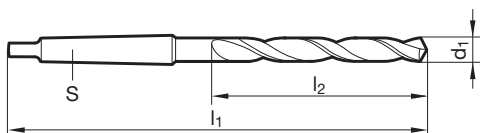
Catalogo n° 71304



P	M	K	N	S	H
●	●	○		○	○

Parametri di lav.
ind. a pag. 176

- Assott. del nocc. $\geq \varnothing 12,000$
- spoglia sul cono tagliente
- particolarmente stabile e resistente
- con cono Morse sovradimensionato



d1 mm	S	l1 mm	l2 mm
12,000	MK-2	164,000	66,000
12,500	MK-2	164,000	66,000
12,800	MK-2	164,000	66,000
13,000	MK-2	164,000	66,000
13,500	MK-2	169,000	70,000
14,000	MK-2	169,000	70,000
19,000	MK-3	211,000	88,000
19,500	MK-3	214,000	91,000
20,000	MK-3	214,000	91,000
20,500	MK-3	217,000	95,000
21,000	MK-3	217,000	95,000
21,500	MK-3	221,000	98,000

d1 mm	S	l1 mm	l2 mm
22,000	MK-3	221,000	98,000
22,500	MK-3	224,000	101,000
23,000	MK-3	224,000	101,000
26,000	MK-4	256,000	107,000
26,500	MK-4	261,000	107,000
27,000	MK-4	261,000	110,000
27,500	MK-4	261,000	110,000
28,000	MK-4	261,000	110,000
28,500	MK-4	265,000	114,000
29,000	MK-4	265,000	114,000
29,500	MK-4	265,000	114,000
30,000	MK-4	265,000	114,000

Punte con codolo conico Morse

Punte elicoidali

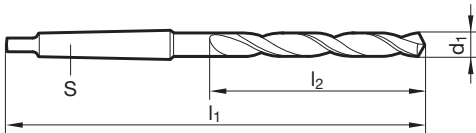


Catalogo n° 71300

N	~5xD	DIN 345	HSS	trattati a vapore	118°	h8	R	MK
P	M	K	N	S	H			
•		•	•					

Parametri di lav. ind. a pag. 180

- Assott. del noc. $\geq \varnothing 14,100$
- spoglia sul cono tagliente

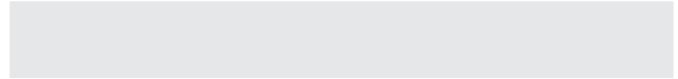
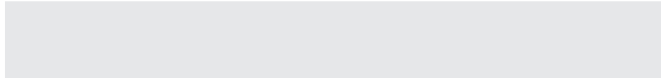
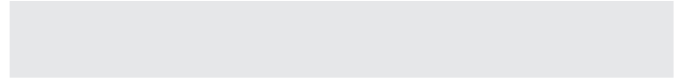
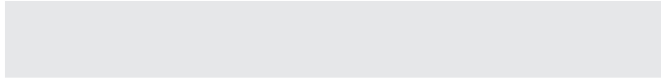


d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
3,750	MK-1	120,000	39,000	10,500	MK-1	168,000	87,000
4,000	MK-1	124,000	43,000	10,600	MK-1	168,000	87,000
4,100	MK-1	124,000	43,000	10,700	MK-1	175,000	94,000
4,200	MK-1	124,000	43,000	10,750	MK-1	175,000	94,000
4,250	MK-1	124,000	43,000	10,800	MK-1	175,000	94,000
4,500	MK-1	128,000	47,000	10,900	MK-1	175,000	94,000
4,600	MK-1	128,000	47,000	11,000	MK-1	175,000	94,000
4,900	MK-1	133,000	52,000	11,100	MK-1	175,000	94,000
5,000	MK-1	133,000	52,000	11,200	MK-1	175,000	94,000
5,100	MK-1	133,000	52,000	11,300	MK-1	175,000	94,000
5,500	MK-1	138,000	57,000	11,400	MK-1	175,000	94,000
5,750	MK-1	138,000	57,000	11,500	MK-1	175,000	94,000
5,800	MK-1	138,000	57,000	11,600	MK-1	175,000	94,000
6,000	MK-1	138,000	57,000	11,700	MK-1	175,000	94,000
6,500	MK-1	144,000	63,000	11,750	MK-1	175,000	94,000
6,750	MK-1	150,000	69,000	11,800	MK-1	175,000	94,000
6,800	MK-1	150,000	69,000	11,900	MK-1	182,000	101,000
7,000	MK-1	150,000	69,000	12,000	MK-1	182,000	101,000
7,200	MK-1	150,000	69,000	12,100	MK-1	182,000	101,000
7,250	MK-1	150,000	69,000	12,200	MK-1	182,000	101,000
7,400	MK-1	150,000	69,000	12,250	MK-1	182,000	101,000
7,500	MK-1	150,000	69,000	12,300	MK-1	182,000	101,000
7,800	MK-1	156,000	75,000	12,400	MK-1	182,000	101,000
7,900	MK-1	156,000	75,000	12,500	MK-1	182,000	101,000
8,000	MK-1	156,000	75,000	12,600	MK-1	182,000	101,000
8,100	MK-1	156,000	75,000	12,700	MK-1	182,000	101,000
8,200	MK-1	156,000	75,000	12,800	MK-1	182,000	101,000
8,250	MK-1	156,000	75,000	12,900	MK-1	182,000	101,000
8,300	MK-1	156,000	75,000	13,000	MK-1	182,000	101,000
8,500	MK-1	156,000	75,000	13,100	MK-1	182,000	101,000
8,600	MK-1	162,000	81,000	13,200	MK-1	182,000	101,000
8,700	MK-1	162,000	81,000	13,300	MK-1	189,000	108,000
8,750	MK-1	162,000	81,000	13,400	MK-1	189,000	108,000
8,900	MK-1	162,000	81,000	13,500	MK-1	189,000	108,000
9,000	MK-1	162,000	81,000	13,600	MK-1	189,000	108,000
9,200	MK-1	162,000	81,000	13,700	MK-1	189,000	108,000
9,300	MK-1	162,000	81,000	13,750	MK-1	189,000	108,000
9,400	MK-1	162,000	81,000	13,800	MK-1	189,000	108,000
9,500	MK-1	162,000	81,000	13,900	MK-1	189,000	108,000
9,750	MK-1	168,000	87,000	14,000	MK-1	189,000	108,000
9,800	MK-1	168,000	87,000	14,100	MK-2	212,000	114,000
9,900	MK-1	168,000	87,000	14,200	MK-2	212,000	114,000
10,000	MK-1	168,000	87,000	14,250	MK-2	212,000	114,000
10,100	MK-1	168,000	87,000	14,300	MK-2	212,000	114,000
10,200	MK-1	168,000	87,000	14,400	MK-2	212,000	114,000
10,250	MK-1	168,000	87,000	14,500	MK-2	212,000	114,000
10,300	MK-1	168,000	87,000	14,600	MK-2	212,000	114,000
10,400	MK-1	168,000	87,000	14,700	MK-2	212,000	114,000

d1 mm	S	l1 mm	l2 mm	d1 mm	S	l1 mm	l2 mm
14,750	MK-2	212,000	114,000	24,750	MK-3	281,000	160,000
14,800	MK-2	212,000	114,000	25,000	MK-3	281,000	160,000
14,900	MK-2	212,000	114,000	25,250	MK-3	286,000	165,000
15,000	MK-2	212,000	114,000	25,500	MK-3	286,000	165,000
15,100	MK-2	218,000	120,000	25,750	MK-3	286,000	165,000
15,200	MK-2	218,000	120,000	26,000	MK-3	286,000	165,000
15,250	MK-2	218,000	120,000	26,500	MK-3	286,000	165,000
15,300	MK-2	218,000	120,000	27,000	MK-3	291,000	170,000
15,400	MK-2	218,000	120,000	27,250	MK-3	291,000	170,000
15,500	MK-2	218,000	120,000	27,500	MK-3	291,000	170,000
15,600	MK-2	218,000	120,000	27,750	MK-3	291,000	170,000
15,700	MK-2	218,000	120,000	28,000	MK-3	291,000	170,000
15,750	MK-2	218,000	120,000	28,500	MK-3	296,000	175,000
15,800	MK-2	218,000	120,000	28,570	MK-3	296,000	175,000
15,900	MK-2	218,000	120,000	29,000	MK-3	296,000	175,000
16,000	MK-2	218,000	120,000	29,250	MK-3	296,000	175,000
16,100	MK-2	223,000	125,000	29,500	MK-3	296,000	175,000
16,200	MK-2	223,000	125,000	29,750	MK-3	296,000	175,000
16,250	MK-2	223,000	125,000	30,000	MK-3	296,000	175,000
16,300	MK-2	223,000	125,000	30,250	MK-3	301,000	180,000
16,400	MK-2	223,000	125,000	30,500	MK-3	301,000	180,000
16,500	MK-2	223,000	125,000	30,750	MK-3	301,000	180,000
16,600	MK-2	223,000	125,000	31,000	MK-3	301,000	180,000
16,700	MK-2	223,000	125,000	31,500	MK-3	301,000	180,000
16,750	MK-2	223,000	125,000	32,000	MK-4	334,000	185,000
16,800	MK-2	223,000	125,000	32,500	MK-4	334,000	185,000
16,900	MK-2	223,000	125,000	33,000	MK-4	334,000	185,000
17,000	MK-2	223,000	125,000	33,340	MK-4	334,000	185,000
17,100	MK-2	228,000	130,000	33,500	MK-4	334,000	185,000
17,200	MK-2	228,000	130,000	34,000	MK-4	339,000	190,000
17,300	MK-2	228,000	130,000	34,500	MK-4	339,000	190,000
17,400	MK-2	228,000	130,000	35,000	MK-4	339,000	190,000
17,500	MK-2	228,000	130,000	35,500	MK-4	339,000	190,000
17,600	MK-2	228,000	130,000	36,000	MK-4	344,000	195,000
17,700	MK-2	228,000	130,000	36,500	MK-4	344,000	195,000
17,750	MK-2	228,000	130,000	37,000	MK-4	344,000	195,000
17,800	MK-2	228,000	130,000	37,500	MK-4	344,000	195,000
17,900	MK-2	228,000	130,000	38,000	MK-4	349,000	200,000
18,000	MK-2	228,000	130,000	38,500	MK-4	349,000	200,000
18,100	MK-2	233,000	135,000	39,000	MK-4	349,000	200,000
18,200	MK-2	233,000	135,000	39,500	MK-4	349,000	200,000
18,250	MK-2	233,000	135,000	39,690	MK-4	349,000	200,000
18,300	MK-2	233,000	135,000	40,000	MK-4	349,000	200,000
18,500	MK-2	233,000	135,000	40,500	MK-4	354,000	205,000
18,600	MK-2	233,000	135,000	41,000	MK-4	354,000	205,000
18,750	MK-2	233,000	135,000	41,500	MK-4	354,000	205,000
19,000	MK-2	233,000	135,000	42,000	MK-4	354,000	205,000
19,250	MK-2	238,000	140,000	42,500	MK-4	354,000	205,000
19,500	MK-2	238,000	140,000	43,000	MK-4	359,000	210,000
19,750	MK-2	238,000	140,000	43,500	MK-4	359,000	210,000
20,000	MK-2	238,000	140,000	44,000	MK-4	359,000	210,000
20,100	MK-2	243,000	145,000	44,500	MK-4	359,000	210,000
20,250	MK-2	243,000	145,000	45,000	MK-4	359,000	210,000
20,300	MK-2	243,000	145,000	45,500	MK-4	364,000	215,000
20,400	MK-2	243,000	145,000	46,000	MK-4	364,000	215,000
20,500	MK-2	243,000	145,000	46,500	MK-4	364,000	215,000
20,640	MK-2	243,000	145,000	47,000	MK-4	364,000	215,000
20,750	MK-2	243,000	145,000	48,000	MK-4	369,000	220,000
21,000	MK-2	243,000	145,000	48,500	MK-4	369,000	220,000
21,250	MK-2	248,000	150,000	49,000	MK-4	369,000	220,000
21,430	MK-2	248,000	150,000	49,500	MK-4	369,000	220,000
21,500	MK-2	248,000	150,000	50,000	MK-4	369,000	220,000
22,000	MK-2	248,000	150,000	50,500	MK-4	374,000	225,000
22,250	MK-2	248,000	150,000	50,800	MK-4	374,000	225,000
22,500	MK-2	253,000	155,000	51,000	MK-5	412,000	225,000
22,900	MK-2	253,000	155,000	52,000	MK-5	412,000	225,000
23,000	MK-2	253,000	155,000	53,500	MK-5	417,000	230,000
23,500	MK-3	276,000	155,000	54,000	MK-5	417,000	230,000
23,750	MK-3	281,000	160,000	55,000	MK-5	417,000	230,000
24,000	MK-3	281,000	160,000	57,000	MK-5	422,000	235,000
24,250	MK-3	281,000	160,000	58,000	MK-5	422,000	235,000
24,500	MK-3	281,000	160,000	59,000	MK-5	422,000	235,000

d1 mm	S	l1 mm	l2 mm
60,000	MK-5	422,000	235,000
61,000	MK-5	427,000	240,000
68,000	MK-5	437,000	250,000

d1 mm	S	l1 mm	l2 mm
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Punte con codolo conico Morse

Punte elicoidali



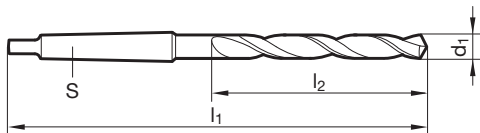
Catalogo n° 71416



P	M	K	N	S	H
●	○	●			

Parametri di lav.
ind. a pag. 182

- Assott. del nocco. $\geq \varnothing 5,000$
- spoglia sul cono tagliente
- massima resistenza all'usura



d1 mm	S	l1 mm	l2 mm
5,000	MK-1	133,000	52,000
8,000	MK-1	156,000	75,000
8,500	MK-1	156,000	75,000
9,000	MK-1	162,000	81,000
9,500	MK-1	162,000	81,000
10,200	MK-1	168,000	87,000
10,500	MK-1	168,000	87,000
10,600	MK-1	168,000	87,000
11,000	MK-1	175,000	94,000
11,500	MK-1	175,000	94,000
12,000	MK-1	182,000	101,000
12,500	MK-1	182,000	101,000
14,000	MK-1	189,000	108,000
14,500	MK-2	212,000	114,000
14,750	MK-2	212,000	114,000
15,000	MK-2	212,000	114,000
15,500	MK-2	218,000	120,000
16,000	MK-2	218,000	120,000

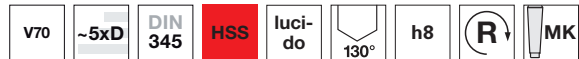
d1 mm	S	l1 mm	l2 mm
17,000	MK-2	223,000	125,000
17,500	MK-2	228,000	130,000
18,000	MK-2	228,000	130,000
18,500	MK-2	233,000	135,000
19,000	MK-2	233,000	135,000
20,000	MK-2	238,000	140,000
20,500	MK-2	243,000	145,000
21,000	MK-2	243,000	145,000
21,500	MK-2	248,000	150,000
22,000	MK-2	248,000	150,000
23,000	MK-2	253,000	155,000
23,500	MK-3	276,000	155,000
24,000	MK-3	281,000	160,000
25,000	MK-3	281,000	160,000
26,000	MK-3	286,000	165,000
26,500	MK-3	286,000	165,000
30,500	MK-3	301,000	180,000
33,000	MK-4	334,000	185,000

Punte con codolo conico Morse

Punte elicoidali



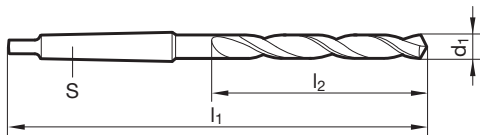
Catalogo n° 71305



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 180

- Assott. del noc. $\geq \varnothing 7,940$
- spoglia sul cono tagliente
- scanalature larghe



d1 mm	S	l1 mm	l2 mm
7,940	MK-1	156,000	75,000
8,000	MK-1	156,000	75,000
8,250	MK-1	156,000	75,000
8,500	MK-1	156,000	75,000
8,750	MK-1	162,000	81,000
9,000	MK-1	162,000	81,000
9,250	MK-1	162,000	81,000
9,500	MK-1	162,000	81,000
10,000	MK-1	168,000	87,000
10,200	MK-1	168,000	87,000
10,250	MK-1	168,000	87,000
10,500	MK-1	168,000	87,000
10,750	MK-1	175,000	94,000
11,000	MK-1	175,000	94,000
11,500	MK-1	175,000	94,000
11,750	MK-1	175,000	94,000
12,000	MK-1	182,000	101,000
12,250	MK-1	182,000	101,000
12,700	MK-1	182,000	101,000
13,000	MK-1	182,000	101,000
13,500	MK-1	189,000	108,000
14,000	MK-1	189,000	108,000
14,500	MK-2	212,000	114,000
15,000	MK-2	212,000	114,000
15,500	MK-2	218,000	120,000
16,000	MK-2	218,000	120,000
16,500	MK-2	223,000	125,000
17,000	MK-2	223,000	125,000
17,500	MK-2	228,000	130,000
18,000	MK-2	228,000	130,000

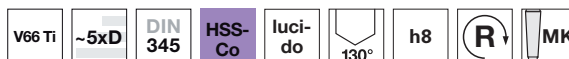
d1 mm	S	l1 mm	l2 mm
18,500	MK-2	233,000	135,000
19,000	MK-2	233,000	135,000
20,000	MK-2	238,000	140,000
20,500	MK-2	243,000	145,000
21,000	MK-2	243,000	145,000
22,000	MK-2	248,000	150,000
23,000	MK-2	253,000	155,000
24,000	MK-3	281,000	160,000
25,000	MK-3	281,000	160,000
25,500	MK-3	286,000	165,000
26,000	MK-3	286,000	165,000
26,500	MK-3	286,000	165,000
26,990	MK-3	291,000	170,000
27,000	MK-3	291,000	170,000
27,500	MK-3	291,000	170,000
28,000	MK-3	291,000	170,000
28,570	MK-3	296,000	175,000
29,000	MK-3	296,000	175,000
29,500	MK-3	296,000	175,000
31,000	MK-3	301,000	180,000
31,500	MK-3	301,000	180,000
32,000	MK-4	334,000	185,000

Punte con codolo conico Morse

Punte elicoidali



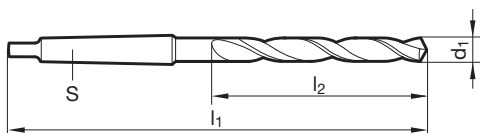
Catalogo n° 71312



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 182

- Assott. del noc. $\geq \varnothing 8,500$
- spoglia sul cono tagliente
- alta rigidità



d1 mm	S	l1 mm	l2 mm
8,500	MK-1	156,000	75,000
9,000	MK-1	162,000	81,000
9,500	MK-1	162,000	81,000
10,000	MK-1	168,000	87,000
10,200	MK-1	168,000	87,000
10,500	MK-1	168,000	87,000
11,000	MK-1	175,000	94,000
11,250	MK-1	175,000	94,000
11,500	MK-1	175,000	94,000
12,000	MK-1	182,000	101,000
12,500	MK-1	182,000	101,000
13,000	MK-1	182,000	101,000
13,500	MK-1	189,000	108,000
14,000	MK-1	189,000	108,000
14,500	MK-2	212,000	114,000
15,000	MK-2	212,000	114,000
15,500	MK-2	218,000	120,000
16,000	MK-2	218,000	120,000
16,250	MK-2	223,000	125,000
16,500	MK-2	223,000	125,000
17,000	MK-2	223,000	125,000
17,500	MK-2	228,000	130,000
18,000	MK-2	228,000	130,000
18,500	MK-2	233,000	135,000

d1 mm	S	l1 mm	l2 mm
19,000	MK-2	233,000	135,000
19,500	MK-2	238,000	140,000
20,000	MK-2	238,000	140,000
20,250	MK-2	243,000	145,000
21,000	MK-2	243,000	145,000
22,000	MK-2	248,000	150,000
23,000	MK-2	253,000	155,000
24,000	MK-3	281,000	160,000
25,000	MK-3	281,000	160,000
26,000	MK-3	286,000	165,000
27,000	MK-3	291,000	170,000
27,500	MK-3	291,000	170,000
28,000	MK-3	291,000	170,000
30,000	MK-3	296,000	175,000
32,000	MK-4	334,000	185,000

Punte con codolo conico Morse

Punte elicoidali



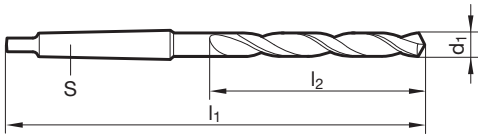
Catalogo n° 71313



P	M	K	N	S	H
•	•	•		•	

Parametri di lav.
ind. a pag. 182

- Assott. del nocc. $\geq \varnothing 11,000$
- spoglia sul cono tagliente
- alta rigidità
- con cono Morse rinforzato



d1 mm	S	l1 mm	l2 mm
11,000	MK-2	192,000	94,000
12,000	MK-2	199,000	101,000
12,500	MK-2	199,000	101,000
12,800	MK-2	199,000	101,000
13,000	MK-2	199,000	101,000
13,500	MK-2	206,000	108,000
14,000	MK-2	206,000	108,000
20,000	MK-3	261,000	140,000
20,500	MK-3	266,000	145,000
21,500	MK-3	271,000	150,000
23,000	MK-3	276,000	155,000
26,000	MK-4	314,000	165,000

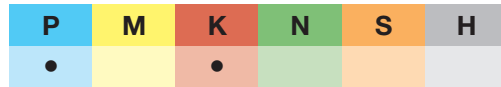
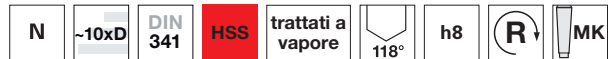
d1 mm	S	l1 mm	l2 mm
27,000	MK-4	319,000	170,000
29,000	MK-4	324,000	175,000

Punte con codolo conico Morse

Punte per foratura con bussola di guida

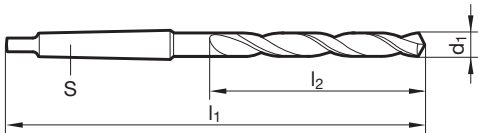


Catalogo n° 71320



Parametri di lav.
ind. a pag. 186

- Assott. del noc. $\geq \varnothing 14,500$
- spoglia sul cono tagliente
- per forare con bussola di guida



d1 mm	S	l1 mm	l2 mm
6,000	MK-1	161,000	80,000
6,500	MK-1	167,000	86,000
6,800	MK-1	174,000	93,000
7,000	MK-1	174,000	93,000
8,000	MK-1	181,000	100,000
8,200	MK-1	181,000	100,000
8,500	MK-1	181,000	100,000
8,750	MK-1	188,000	107,000
8,800	MK-1	188,000	107,000
9,000	MK-1	188,000	107,000
9,500	MK-1	188,000	107,000
10,000	MK-1	197,000	116,000
10,100	MK-1	197,000	116,000
10,200	MK-1	197,000	116,000
11,000	MK-1	206,000	125,000
11,500	MK-1	206,000	125,000
12,000	MK-1	215,000	134,000
12,500	MK-1	215,000	134,000
12,750	MK-1	215,000	134,000
13,000	MK-1	215,000	134,000
13,500	MK-1	223,000	142,000
13,750	MK-1	223,000	142,000
13,800	MK-1	223,000	142,000
13,900	MK-1	223,000	142,000
14,000	MK-1	223,000	142,000
14,500	MK-2	245,000	147,000
15,000	MK-2	245,000	147,000
16,000	MK-2	251,000	153,000
16,250	MK-2	257,000	159,000
16,500	MK-2	257,000	159,000
16,750	MK-2	257,000	159,000
17,000	MK-2	257,000	159,000
17,500	MK-2	263,000	165,000
18,000	MK-2	263,000	165,000
18,500	MK-2	269,000	171,000
18,750	MK-2	269,000	171,000

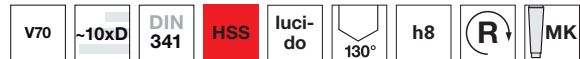
d1 mm	S	l1 mm	l2 mm
19,000	MK-2	269,000	171,000
19,250	MK-2	275,000	177,000
19,500	MK-2	275,000	177,000
20,000	MK-2	275,000	177,000
21,000	MK-2	282,000	184,000
22,000	MK-2	289,000	191,000
22,500	MK-2	296,000	198,000
23,000	MK-2	296,000	198,000
24,000	MK-3	327,000	206,000
25,000	MK-3	327,000	206,000
26,000	MK-3	335,000	214,000
26,500	MK-3	335,000	214,000
27,000	MK-3	343,000	222,000
28,000	MK-3	343,000	222,000
29,500	MK-3	351,000	230,000
30,000	MK-3	351,000	230,000
31,000	MK-3	360,000	239,000
32,000	MK-4	397,000	248,000
33,000	MK-4	397,000	248,000
34,000	MK-4	406,000	257,000
35,000	MK-4	406,000	257,000
36,000	MK-4	416,000	267,000
38,000	MK-4	426,000	277,000
40,000	MK-4	426,000	277,000
45,000	MK-4	447,000	298,000

Punte con codolo conico Morse

Punte per foratura con bussola di guida



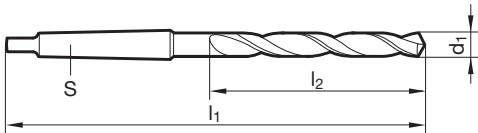
Catalogo n° 71322



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 186

- Assott. del noc. $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- scanalature larghe



d1 mm	S	l1 mm	l2 mm
8,000	MK-1	181,000	100,000
8,500	MK-1	181,000	100,000
8,730	MK-1	188,000	107,000
8,750	MK-1	188,000	107,000
9,000	MK-1	188,000	107,000
9,500	MK-1	188,000	107,000
9,920	MK-1	197,000	116,000
10,000	MK-1	197,000	116,000
10,250	MK-1	197,000	116,000
10,320	MK-1	197,000	116,000
10,500	MK-1	197,000	116,000
10,720	MK-1	206,000	125,000
10,750	MK-1	206,000	125,000
11,000	MK-1	206,000	125,000
11,750	MK-1	206,000	125,000
12,500	MK-1	215,000	134,000
12,700	MK-1	215,000	134,000
12,750	MK-1	215,000	134,000
13,000	MK-1	215,000	134,000
13,750	MK-1	223,000	142,000
14,000	MK-1	223,000	142,000
14,500	MK-2	245,000	147,000
15,000	MK-2	245,000	147,000
16,000	MK-2	251,000	153,000
16,500	MK-2	257,000	159,000
17,500	MK-2	263,000	165,000
17,750	MK-2	263,000	165,000
18,000	MK-2	263,000	165,000
18,260	MK-2	269,000	171,000
18,650	MK-2	269,000	171,000

d1 mm	S	l1 mm	l2 mm
19,000	MK-2	269,000	171,000
19,250	MK-2	275,000	177,000
20,000	MK-2	275,000	177,000
21,750	MK-2	289,000	191,000
22,000	MK-2	289,000	191,000
22,250	MK-2	289,000	191,000
23,020	MK-2	296,000	198,000
23,420	MK-3	319,000	198,000
23,500	MK-3	319,000	198,000
24,000	MK-3	327,000	206,000
25,000	MK-3	327,000	206,000
26,000	MK-3	335,000	214,000
28,000	MK-3	343,000	222,000
28,500	MK-3	351,000	230,000
29,500	MK-3	351,000	230,000
30,000	MK-3	351,000	230,000
31,500	MK-3	360,000	239,000
31,750	MK-3	369,000	248,000
32,000	MK-4	397,000	248,000
37,000	MK-4	416,000	267,000
37,500	MK-4	416,000	267,000
39,000	MK-4	426,000	277,000
40,000	MK-4	426,000	277,000
44,000	MK-4	447,000	298,000

Punte con codolo conico Morse

Punte elicoidali in lunghezze speciali, grandezza 1



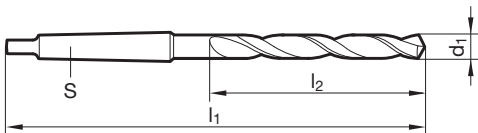
Catalogo n° 71325



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 188

- Assott. del noc. $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo
- vaporizzato $\leq \varnothing 16$ mm



d1 mm	S	l1 mm	l2 mm
8,000	MK-1	265,000	165,000
8,330	MK-1	265,000	165,000
8,500	MK-1	265,000	165,000
9,000	MK-1	275,000	175,000
10,000	MK-1	285,000	185,000
10,500	MK-1	285,000	185,000
11,000	MK-1	300,000	195,000
11,500	MK-1	300,000	195,000
12,000	MK-1	310,000	205,000
12,300	MK-1	310,000	205,000
12,500	MK-1	310,000	205,000
13,000	MK-1	310,000	205,000
13,500	MK-1	325,000	220,000
14,000	MK-1	325,000	220,000
14,500	MK-2	340,000	220,000
15,000	MK-2	340,000	220,000
15,500	MK-2	355,000	230,000
16,000	MK-2	355,000	230,000

d1 mm	S	l1 mm	l2 mm
17,000	MK-2	355,000	230,000
17,500	MK-2	370,000	245,000
18,000	MK-2	370,000	245,000
18,500	MK-2	370,000	245,000
19,000	MK-2	370,000	245,000
19,500	MK-2	385,000	260,000
20,000	MK-2	385,000	260,000
21,000	MK-2	385,000	260,000
21,500	MK-2	405,000	270,000
22,000	MK-2	405,000	270,000
23,000	MK-2	405,000	270,000
24,000	MK-3	440,000	290,000
25,000	MK-3	440,000	290,000
26,000	MK-3	440,000	290,000
26,990	MK-3	460,000	305,000
28,000	MK-3	460,000	305,000
30,000	MK-3	460,000	305,000

Punte con codolo conico Morse

Punte elicoidali in lunghezze speciali, grandezza 2



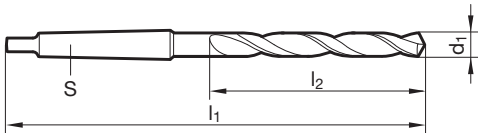
Catalogo n° 71326



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 188

- Assott. del nocco. $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- scanalature larghe
- per fori estremamente profondi
- per una migliore evacuazione del truciolo
- vaporizzato $\leq \varnothing 16$ mm



d1 mm	S	l1 mm	l2 mm
8,000	MK-1	330,000	210,000
8,730	MK-1	345,000	220,000
9,000	MK-1	345,000	220,000
10,000	MK-1	360,000	235,000
11,000	MK-1	375,000	250,000
11,500	MK-1	375,000	250,000
12,000	MK-1	395,000	260,000
12,700	MK-1	395,000	260,000
13,000	MK-1	395,000	260,000
13,500	MK-1	410,000	275,000
14,000	MK-1	410,000	275,000
14,500	MK-2	425,000	275,000
15,000	MK-2	425,000	275,000
15,500	MK-2	445,000	295,000
16,000	MK-2	445,000	295,000
16,500	MK-2	445,000	295,000
17,000	MK-2	445,000	295,000
17,500	MK-2	465,000	310,000

d1 mm	S	l1 mm	l2 mm
17,860	MK-2	465,000	310,000
18,000	MK-2	465,000	310,000
19,000	MK-2	465,000	310,000
20,000	MK-2	490,000	325,000
20,500	MK-2	490,000	325,000
21,000	MK-2	490,000	325,000
22,000	MK-2	515,000	345,000
23,000	MK-2	515,000	345,000
24,000	MK-3	555,000	365,000
25,000	MK-3	555,000	365,000
26,000	MK-3	555,000	365,000
26,500	MK-3	555,000	365,000
30,000	MK-3	580,000	385,000
31,750	MK-3	610,000	410,000
43,000	MK-4	735,000	490,000

Punte con codolo conico Morse

Punte con fori di refrigerazione



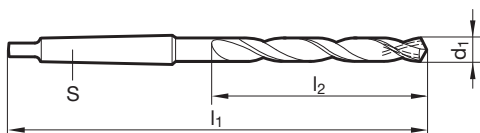
Catalogo n° 71554



P	M	K	N	S	H
●	○	●	○		

Parametri di lav.
ind. a pag. 188

- Assott. del nocco. $\geq \varnothing 10,000$
- spoglia sul cono tagliente
- per forare con bussola di guida



d1 mm	S	l1 mm	l2 mm
10,000	MK-2	233,000	116,000
11,000	MK-2	242,000	125,000
12,000	MK-2	251,000	134,000
13,000	MK-2	251,000	134,000
14,000	MK-2	259,000	142,000
15,000	MK-2	264,000	147,000
16,000	MK-2	270,000	153,000
17,000	MK-2	276,000	159,000
18,000	MK-2	282,000	165,000
19,000	MK-3	307,000	171,000
20,000	MK-3	313,000	177,000
21,000	MK-3	320,000	184,000
22,000	MK-3	327,000	191,000
23,000	MK-3	334,000	198,000
24,000	MK-3	342,000	206,000
25,000	MK-3	342,000	206,000
26,000	MK-3	350,000	214,000
27,000	MK-4	385,000	222,000

d1 mm	S	l1 mm	l2 mm
28,000	MK-4	385,000	222,000
29,000	MK-4	393,000	230,000
30,000	MK-4	393,000	230,000
32,000	MK-4	421,000	248,000
33,000	MK-4	421,000	248,000
34,000	MK-4	430,000	257,000
35,000	MK-4	430,000	257,000
40,000	MK-4	450,000	277,000

Punte con codolo conico Morse

Punte elicoidali lunghe con refrigerazione interna



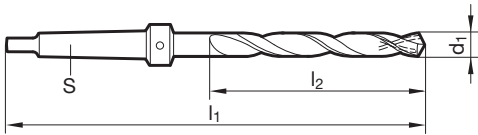
Catalogo n° 71550



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 186

- Assott. del nocco. $\geq \varnothing 14,500$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



d1 mm	S	l1 mm	l2 mm
14,500	MK-2	297,000	147,000
15,000	MK-2	297,000	147,000
15,500	MK-2	303,000	153,000
16,000	MK-2	303,000	153,000
17,000	MK-2	309,000	159,000
18,000	MK-2	315,000	165,000

d1 mm	S	l1 mm	l2 mm
24,000	MK-3	374,000	206,000
24,500	MK-3	374,000	206,000
25,000	MK-3	374,000	206,000
26,000	MK-3	382,000	214,000
32,000	MK-4	461,000	248,000

Punte con codolo conico Morse

Punte elicoidali lunghe con refrigerazione interna



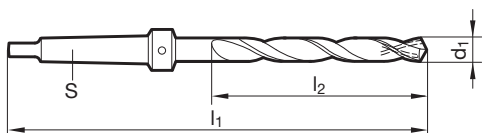
Catalogo n° 71553



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 186

- Assott. del nocco. $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



d1 mm	S	l1 mm	l2 mm
8,000	MK-2	250,000	100,000
8,500	MK-2	250,000	100,000
9,000	MK-2	257,000	107,000
9,500	MK-2	257,000	107,000
10,000	MK-2	266,000	116,000
10,500	MK-2	266,000	116,000
11,500	MK-2	275,000	125,000
12,000	MK-2	284,000	134,000
12,500	MK-2	284,000	134,000
13,000	MK-2	284,000	134,000
14,000	MK-2	292,000	142,000
19,500	MK-3	345,000	177,000

d1 mm	S	l1 mm	l2 mm
20,000	MK-3	345,000	177,000
20,500	MK-3	352,000	184,000
21,000	MK-3	352,000	184,000
21,500	MK-3	359,000	191,000
22,000	MK-3	359,000	191,000
23,000	MK-3	366,000	198,000
27,000	MK-4	435,000	222,000
27,500	MK-4	435,000	222,000
28,500	MK-4	443,000	230,000
29,000	MK-4	443,000	230,000
29,500	MK-4	443,000	230,000
31,500	MK-4	452,000	239,000

Punte con codolo conico Morse

Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.



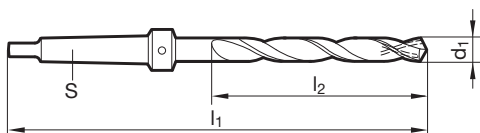
Catalogo n° 71565



P	M	K	N	S	H
●	○	●	○	○	

Parametri di lav.
ind. a pag. 188

- Assott. del noc. $\geq \varnothing 14,500$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



d1 mm	S	l1 mm	l2 mm
14,500	MK-2	370,000	220,000
15,000	MK-2	370,000	220,000
15,480	MK-2	380,000	230,000
15,500	MK-2	380,000	230,000
16,000	MK-2	380,000	230,000
17,860	MK-2	395,000	245,000
18,000	MK-2	395,000	245,000
19,000	MK-2	395,000	245,000
19,840	MK-2	410,000	260,000
20,000	MK-2	410,000	260,000
21,430	MK-2	420,000	270,000
21,500	MK-2	420,000	270,000
22,000	MK-2	420,000	270,000
22,220	MK-2	420,000	270,000
22,500	MK-2	420,000	270,000
23,500	MK-3	438,000	270,000
23,810	MK-3	458,000	290,000
25,000	MK-3	458,000	290,000

d1 mm	S	l1 mm	l2 mm
25,500	MK-3	458,000	290,000
26,000	MK-3	458,000	290,000
27,780	MK-3	473,000	305,000
28,500	MK-3	473,000	305,000
28,570	MK-3	473,000	305,000
29,000	MK-3	473,000	305,000
29,370	MK-3	473,000	305,000
29,500	MK-3	473,000	305,000
30,000	MK-3	473,000	305,000
31,000	MK-3	488,000	320,000
31,500	MK-3	488,000	320,000

Punte con codolo conico Morse

Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.



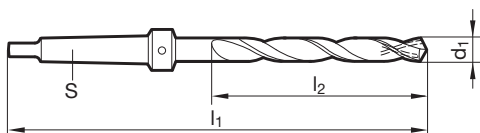
Catalogo n° 71567



P	M	K	N	S	H
●	○	●	○	○	

Parametri di lav.
ind. a pag. 188

- Assott. del nocc. $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



d1 mm	S	l1 mm	l2 mm
8,000	MK-2	315,000	165,000
9,000	MK-2	325,000	175,000
9,500	MK-2	325,000	175,000
10,000	MK-2	335,000	185,000
10,320	MK-2	335,000	185,000
10,500	MK-2	335,000	185,000
10,720	MK-2	345,000	195,000
11,000	MK-2	345,000	195,000
11,110	MK-2	345,000	195,000
11,500	MK-2	345,000	195,000
11,510	MK-2	345,000	195,000
12,000	MK-2	355,000	205,000

d1 mm	S	l1 mm	l2 mm
12,500	MK-2	355,000	205,000
13,000	MK-2	355,000	205,000
13,100	MK-2	355,000	205,000
13,490	MK-2	370,000	220,000
14,000	MK-2	370,000	220,000

Punte con codolo conico Morse

Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.



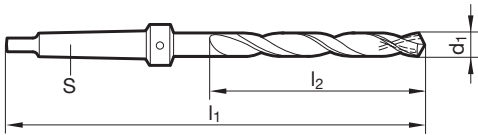
Catalogo n° 71566



P	M	K	N	S	H
●	○	●	○	○	

Parametri di lav.
ind. a pag. 188

- Assott. del noc. $\geq \varnothing 14,500$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



d1 mm	S	l1 mm	l2 mm
14,500	MK-2	425,000	275,000
15,000	MK-2	425,000	275,000
15,500	MK-2	445,000	295,000
16,000	MK-2	445,000	295,000
17,500	MK-2	460,000	310,000
18,000	MK-2	460,000	310,000

d1 mm	S	l1 mm	l2 mm
23,500	MK-3	513,000	345,000
24,000	MK-3	533,000	365,000
25,000	MK-3	533,000	365,000
25,500	MK-3	533,000	365,000
27,000	MK-4	598,000	385,000
32,000	MK-4	623,000	410,000

Punte con codolo conico Morse

Punta per fori prof. con tagl. a spirale extra lungo con raffr. int.



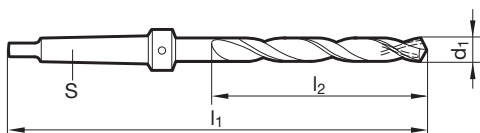
Catalogo n° 71568



P	M	K	N	S	H
●	○	●	○	○	

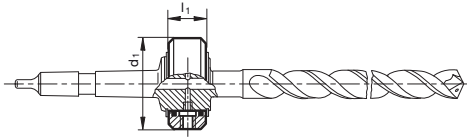
Parametri di lav.
ind. a pag. 188

- Assott. del nocc. $\geq \varnothing 8,000$
- spoglia sul cono tagliente
- raffreddamento mediante anello di adduzione, catalogo-Nr. 71560 (disponibile separatamente)



d1 mm	S	l1 mm	l2 mm
8,000	MK-2	360,000	210,000
8,500	MK-2	360,000	210,000
9,000	MK-2	370,000	220,000
10,000	MK-2	385,000	235,000
10,500	MK-2	385,000	235,000
11,000	MK-2	400,000	250,000
11,500	MK-2	400,000	250,000
13,000	MK-2	410,000	260,000
14,000	MK-2	425,000	275,000
19,000	MK-3	478,000	310,000
19,500	MK-3	493,000	325,000
21,000	MK-3	493,000	325,000

d1 mm	S	l1 mm	l2 mm
21,500	MK-3	513,000	345,000
28,000	MK-4	598,000	385,000
29,000	MK-4	598,000	385,000
29,500	MK-4	598,000	385,000
30,000	MK-4	598,000	385,000
31,000	MK-4	623,000	410,000
31,500	MK-4	623,000	410,000

Alimentatori per punte con fori di refrigerazione**Alimentatori per punte con fori di refrigerazione****Catalogo n° 71560**

Grandezza	Codice	d1 mm	l1 mm
MK-2	1,000	58,000	24,000
MK-3	2,000	58,000	24,000
MK-4	3,000	80,000	28,000

Punte a gradino

Punte a gradino ad eliche indipendenti, cil.

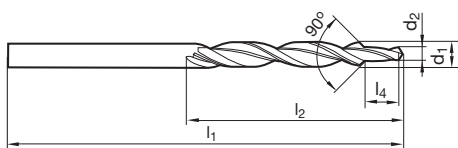


Catalogo n° 71501



P	M	K	N	S	H
•		•			

- Assott. del nocch. $\geq \varnothing 6,000$
- spoglia sul cono tagliente
- per fori passanti a DIN EN 20273, serie fine
- per svasature per teste di viti 90°
- l'avanz. si basa sul diametro inferiore
- Vc si basa sul diametro maggiore



d1 mm	d2 mm	l1 mm	l2 mm	l4 mm	Grandezza
6,000	3,200	93,000	57,000	9,000	M 3
8,000	4,300	117,000	75,000	11,000	M 4
10,000	5,300	133,000	87,000	13,000	M 5
11,500	6,400	142,000	94,000	15,000	M 6
15,000	8,400	169,000	114,000	19,000	M 8
19,000	10,500	198,000	135,000	23,000	M 10

Punte a gradino

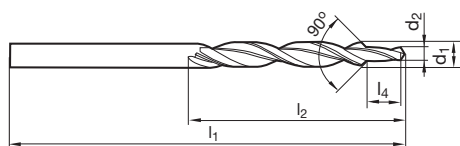
Punte a gradino ad eliche indipendenti, cil.



Catalogo n° 71503



P	M	K	N	S	H
•		•			



- Assott. del nocc. $\geq \varnothing 3,400$
- spoglia sul cono tagliente
- per fori filettati secondo DIN 336
- per svasature a 90° corrispondenti a fori passanti secondo DIN EN 20273, serie media
- l'avanz. si basa sul diametro inferiore
- Vc si basa sul diametro maggiore

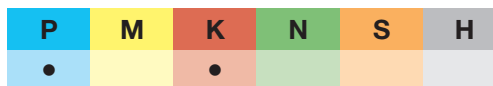
d1 mm	d2 mm	l1 mm	l2 mm	l4 mm	Grandezza
3,400	2,500	70,000	39,000	8,800	M 3
4,500	3,300	80,000	47,000	11,400	M 4
5,500	4,200	93,000	57,000	13,600	M 5
6,600	5,000	101,000	63,000	16,500	M 6
9,000	6,800	125,000	81,000	21,000	M 8
11,000	8,500	142,000	94,000	25,500	M 10
13,500	10,200	160,000	108,000	30,000	M 12

Punte a gradino

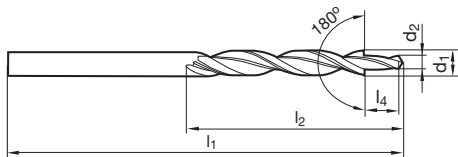
Punte a gradino ad eliche indipendenti, cil.



Catalogo n° 71500



- Assott. del nocch. $\geq \varnothing 6,000$
- spoglia sul cono tagliente
- per fori passanti a DIN EN 20273, serie media
- per svasature per teste di viti 180° secondo DIN 974-1, serie 1
- per viti secondo DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 e DIN 7513, 7516, 7500-1
- l'avanz. si basa sul diametro inferiore
- Vc si basa sul diametro maggiore



d1 mm	d2 mm	l1 mm	l2 mm	l4 mm	Grandezza
6,000	3,400	93,000	57,000	9,000	M 3
8,000	4,500	117,000	75,000	11,000	M 4
10,000	5,500	133,000	87,000	13,000	M 5
11,000	6,600	142,000	94,000	15,000	M 6
15,000	9,000	169,000	114,000	19,000	M 8
18,000	11,000	191,000	130,000	23,000	M 10

Punte a gradino

Punte a gradino ad eliche indipendenti, CM

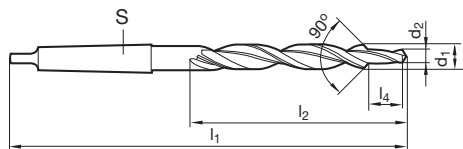


Catalogo n° 71523



P	M	K	N	S	H
•		•			

- Assott. del nocc. $\geq \varnothing 9,000$
- spoglia sul cono tagliente
- per fori filettati secondo DIN 336
- per svasature a 90° corrispondenti a fori passanti secondo DIN EN 20273, serie media
- l'avanz. si basa sul diametro inferiore
- Vc si basa sul diametro maggiore



d1 mm	d2 mm	S	l1 mm	l2 mm	l4 mm	Grandezza
9,000	6,800	MK-1	162,000	81,000	21,000	M 8
11,000	8,500	MK-1	175,000	94,000	25,500	M 10
13,500	10,200	MK-1	189,000	108,000	30,000	M 12
15,500	12,000	MK-2	218,000	120,000	34,500	M 14
17,500	14,000	MK-2	228,000	130,000	38,500	M 16
20,000	15,500	MK-2	238,000	140,000	43,500	M 18
22,000	17,500	MK-2	248,000	150,000	47,500	M 20

Punte a gradino

Punte a gradino ad eliche indipendenti, CM

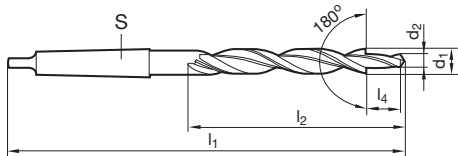


Catalogo n° 71520



P	M	K	N	S	H
•		•			

- Assott. del nocc. $\geq \varnothing 11,000$
- spoglia sul cono tagliente
- per fori passanti a DIN EN 20273, serie media
- per svasature per teste di viti 180° secondo DIN 974-1, serie 1
- per viti secondo DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580 e DIN 7513, 7516, 7500-1
- l'avanz. si basa sul diametro inferiore
- Vc si basa sul diametro maggiore



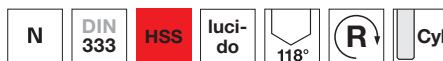
d1 mm	d2 mm	S	l1 mm	l2 mm	l4 mm	Grandezza
11,000	6,600	MK-1	175,000	94,000	15,000	M 6
15,000	9,000	MK-2	212,000	114,000	19,000	M 8
18,000	11,000	MK-2	228,000	130,000	23,000	M 10
20,000	13,500	MK-2	238,000	140,000	27,000	M 12
24,000	15,500	MK-3	281,000	160,000	31,000	M 14
26,000	17,500	MK-3	286,000	165,000	35,000	M 16

Punte a centrare

Punte a centrare senza piano

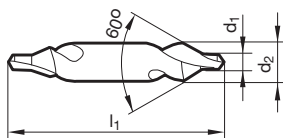


Catalogo n° 71600



P	M	K	N	S	H
•	•	•	•	○	

- Assott. del noc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per fori a centrare secondo DIN 332, foglio 1, forma A
- $d1 \leq 0,8$ mm: 1 solo lato tagliente



d1 mm	d2 mm	l1 mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

d1 mm	d2 mm	l1 mm
10,000	25,000	100,000
12,500	31,500	125,000

Punte a centrare

Punte a centrare senza piano

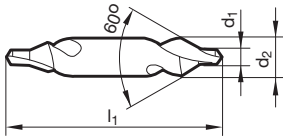


Catalogo n° 71601



P	M	K	N	S	H
●	●	●	●	○	

- Assott. del noc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per fori a centrare secondo DIN 332, foglio 1, forma A
- $d1 \leq 0,8$ mm: 1 solo lato tagliente



d1 mm	d2 mm	l1 mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000

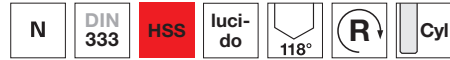
d1 mm	d2 mm	l1 mm
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

Punte a centrare

Punte a centrare senza piano

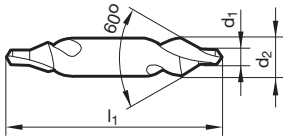


Catalogo n° 71602



P	M	K	N	S	H
●	●	●	●	○	

- Assott. del nocc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- corretto posizionamento fra le contropunte
- per fori a centrare a DIN 332 parte 1, forma R
- $d1 \leq 0,8$ mm: 1 solo lato tagliente



d1 mm	d2 mm	l1 mm
0,500	3,150	25,000
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000
8,000	20,000	80,000

d1 mm	d2 mm	l1 mm
10,000	25,000	100,000

Punte a centrare

Punte a centrare senza piano

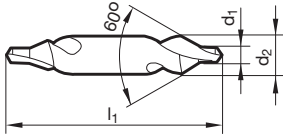


Catalogo n° 61602



P	M	K	N	S	H
•	•	•	•	•	

- Assott. del noc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- corretto posizionamento fra le contropunte
- per fori a centrare a DIN 332 parte 1, forma R
- maggiore protezione contro l'usura
- $d1 \leq 0,8$ mm: 1 solo lato tagliente



d1 mm	d2 mm	l1 mm
0,800	3,150	25,000
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000

d1 mm	d2 mm	l1 mm
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000

Punte a centrare

Punte a centrare senza piano

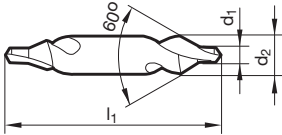


Catalogo n° 71605



P	M	K	N	S	H
•	•	•	•	○	

- Assott. del noc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- maggiore resistenza alla rottura grazie al rigonfiamento
- la cavità tra la svasatura e il foro serve da contenitore aggiuntivo di lubrificante
- per fori a centrare secondo DIN 332, foglio 1, forma A



d1 mm	d2 mm	l1 mm
1,000	3,150	31,500
1,250	3,150	31,500
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000

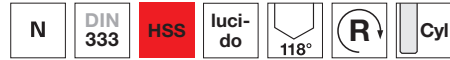
d1 mm	d2 mm	l1 mm
4,000	10,000	56,000
5,000	12,500	63,000
6,300	16,000	71,000

Punte a centrare

Punte a centrare senza piano

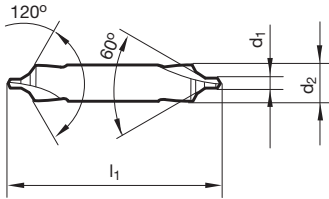


Catalogo n° 71604



P	M	K	N	S	H
•	•	•	•	○	

- Assott. del noc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per fori a centrare secondo DIN 332, foglio 1, forma B
- con smusso di protezione 120°



d1 mm	d2 mm	l1 mm
1,000	4,000	35,500
1,250	5,000	40,000
1,600	6,300	45,000
2,000	8,000	50,000
2,500	10,000	56,000
3,150	11,200	60,000

d1 mm	d2 mm	l1 mm
4,000	14,000	67,000
5,000	18,000	75,000
6,300	20,000	80,000

Punte a centrare

Punte a centrare con piano

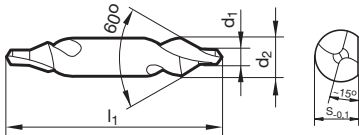


Catalogo n° 71607



P	M	K	N	S	H
•	•	•	•	○	

- Assott. del noc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- per fori a centrare secondo DIN 332, foglio 1, forma A



d1 mm	d2 mm	l1 mm
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000

d1 mm	d2 mm	l1 mm
6,300	16,000	71,000

Punte a centrare

Punte a centrare con piano

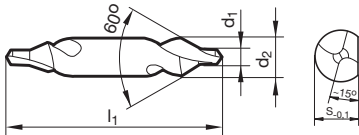


Catalogo n° 71609



P	M	K	N	S	H
•	•	•	•	○	

- Assott. del noc. $\geq \varnothing 2,000$
- spoglia sul cono tagliente
- corretto posizionamento fra le contropunte
- per fori a centrare a DIN 332 parte 1, forma R



d1 mm	d2 mm	l1 mm
1,600	4,000	35,500
2,000	5,000	40,000
2,500	6,300	45,000
3,150	8,000	50,000
4,000	10,000	56,000
5,000	12,500	63,000

d1 mm	d2 mm	l1 mm
6,300	16,000	71,000
8,000	20,000	80,000

Allargatori

Allargatori cilindrici

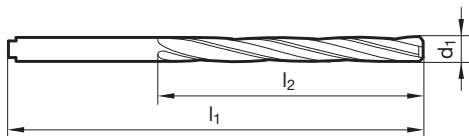


Catalogo n° 72200



P	M	K	N	S	H
•		•			

- spoglia sul cono tagliente
- stabilità elevata
- con dente di trascinamento secondo DIN 1809
- per fori prefusi, precolati, preforati
- corregge la precisione di allineamento
- corregge la mancanza di rotondità
- finitura di superf. del foro migliorata
- \varnothing imbocco < al foro da praticare
- considerare la quota "d0" come misura più piccola del foro pilota



d1 mm	d0 mm	l1 mm	l2 mm
4,800	3,5	108,000	74,000
5,000	3,5	108,000	74,000
5,800	4,2	116,000	80,000
6,000	4,2	116,000	80,000
6,800	4,9	133,000	93,000
7,000	4,9	133,000	93,000
7,800	5,6	142,000	100,000
8,000	5,6	142,000	100,000
8,800	6,3	151,000	107,000
9,000	6,3	151,000	107,000
9,800	7,0	162,000	116,000
10,000	7,0	162,000	116,000

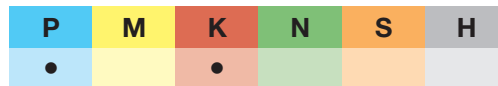
d1 mm	d0 mm	l1 mm	l2 mm
10,750	7,7	173,000	125,000
11,000	7,7	173,000	125,000
11,750	8,4	184,000	134,000
12,000	8,4	184,000	134,000
12,750	9,1	184,000	134,000
13,000	9,1	184,000	134,000
13,750	9,8	194,000	142,000
14,750	10,5	202,000	147,000
16,000	11,2	211,000	153,000

Allargatori

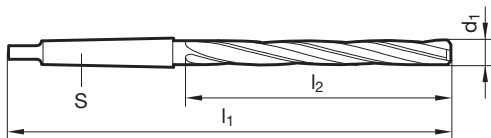
Allargatori con attacco cono morse



Catalogo n° 72210



- spoglia sul cono tagliente
- stabilità elevata
- per fori prefusi, precolati, preforati
- corregge la precisione di allineamento
- corregge la mancanza di rotondità
- finitura di superf. del foro migliorata
- \varnothing imbocco < al foro da praticare
- considerare la quota "d0" come misura più piccola del foro pilota



d1 mm	d0 mm	S	l1 mm	l2 mm
9,000	6,3	MK-1	162,000	81,000
9,800	7,0	MK-1	168,000	87,000
10,000	7,0	MK-1	168,000	87,000
11,750	8,4	MK-1	182,000	101,000
12,750	9,1	MK-1	182,000	101,000
13,750	9,8	MK-1	189,000	108,000
14,000	9,8	MK-1	189,000	108,000
14,750	10,5	MK-2	212,000	114,000
15,000	10,5	MK-2	212,000	114,000
15,750	11,2	MK-2	218,000	120,000
16,000	11,2	MK-2	218,000	120,000
16,750	11,9	MK-2	223,000	125,000
17,000	11,9	MK-2	223,000	125,000
17,750	12,6	MK-2	228,000	130,000
18,000	12,6	MK-2	228,000	130,000
18,700	13,3	MK-2	233,000	135,000
19,000	13,3	MK-2	233,000	135,000
19,700	14,0	MK-2	238,000	140,000
20,000	14,0	MK-2	238,000	140,000
21,000	14,6	MK-2	243,000	145,000
21,700	15,3	MK-2	248,000	150,000
22,000	15,3	MK-2	248,000	150,000
22,500	16,0	MK-2	253,000	155,000
22,700	16,0	MK-2	253,000	155,000

d1 mm	d0 mm	S	l1 mm	l2 mm
23,000	16,0	MK-2	253,000	155,000
23,700	16,6	MK-3	281,000	160,000
24,000	16,6	MK-3	281,000	160,000
24,700	17,3	MK-3	281,000	160,000
25,700	18,0	MK-3	286,000	165,000
26,000	18,0	MK-3	286,000	165,000
26,700	18,6	MK-3	291,000	170,000
27,700	19,3	MK-3	291,000	170,000
29,700	20,5	MK-3	296,000	175,000
31,600	22,0	MK-4	334,000	185,000
34,600	25,0	MK-4	339,000	190,000
38,000	26,5	MK-4	349,000	200,000
48,600	34,0	MK-4	369,000	220,000





UTENSILI PER FILETTARE



CODICI ISO

P	acciaio, acciaio legato in alta percentuale
M	acciaio inossidabile
K	ghisa grigia, ghisa sferoidale e ghisa malleabile
N	alluminio ed altri metalli non ferrosi
S	leghe speciali, superleghe e leghe di titanio
H	acciaio temprato e ghisa temprata

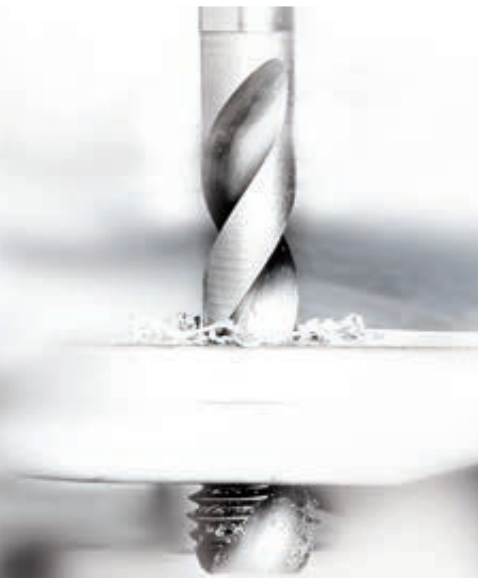
Nelle pagine successive, contenenti programma, trovate per ciascun utensile consigli sull' idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata



LEGENDA DEI PITTOGRAMMI

MATERIALE TAGLIANTE	VHM	HSS	HSS-E	HSS-E-PM										
	Int. in metallo duro													
TRATT. DI SUPERFICIE	lucido	nitrurato	tratt. a vapore		TiCN	Al-TiZrN	TiAlN	TiN	Al-TiN	Al-CrN				
CLASSE DI TOLLERANZA	ISO2/6H	6HX	ISO3/6G	2B	6GX	6g								
FORMA	B	C	D	E										
DIREZIONE DI TAGLIO														
	a destra		a sinistra											
FORMA DEL CODOLO														
PROFONDITÀ	1xD	2xD												
NORMA	DIN 371	DIN 376	DIN 374	DIN 371/376	~DIN 371	~DIN 376	~DIN 371/376	~DIN 374	DIN 5156					
	DIN 40432	DIN 2180	DIN 352	~DIN 352	DIN 357	DIN 5157	DIN EN 22568							
	Norma di fabbrica													
TIPO	Produttiv Synchrono	Produttiv N-X	Produttiv N	Intensiv Synchrono	Intensiv N-X	Intensiv N	Produttiv HX	Produttiv HDX	N	Massiv N	Intensiv HX	Intensiv HDX		
	HGX	H	Produttiv H	HR15	Produttiv HD	Intensiv HD	GG	Produttiv W	Intensiv W	Durativ	VA	TMC SP	TM SP	



La gamma dei nostri utensili per filettare

Gli utensili per filettare sono, insieme a punte, alesatori e frese, gli utensili di precisione più importanti della gamma STOCK. La varietà di design, insieme alle diverse tipologie di di filettatura, alle tolleranze ed agli standard DIN od in caso, utensili

speciali, offrono una vasta scelta per risolvere i problemi di filettatura. La qualità del foro, la dimensione del pre foro, la rotondità, la lineareità e la rugosità della superficie hanno una rilevante influenza sui filetti prodotti.

Per andare sul sicuro e ottenere risultati migliori si consiglia di utilizzare le punte STOCK. Richiedi il nostro catalogo oppure contattaci per la scelta dell' utensile più adatto.



STOCK-

Utensili per filettare

maschi
 maschi a rullare
 maschi a mano
 filiere
 frese a filettare

STOCK-

Frese

HSS
 HSS-E
 HSS-E-PM
 Metallo Duro

STOCK-

Filettature standard

Metrico,
 Metrico fine,
 UNC, UNF, BSW
 G, PG, NPT

STOCK-

Codici Colore

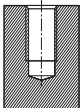
-  Acciai in genere fino a 800 N/mm²
-  Materiali con resistenza alla trazione da 800 a 1200 N/mm²
-  Acciai inossidabili e resistenti agli acidi
-  Applicazioni universali > 1100 N/mm²
-  Alluminio e sue leghe
-  Ghisa

Spiegazione dei Simboli per la tipologia dei fori

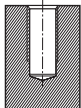
 = foro passante, corto

 = foro cieco 1 x D

 = foro passante 1 x D

 = foro cieco 2 x D

 = foro passante 2 x D

 = foro cieco

STOCK-

Tipi Standard

PRODUKTIV

N, W, H, HD, HDX, HX, N-X e maschi Synchro con taglienti dritti con angolo d'elica per fori passanti.

INTENSIV

Tipo N, W, H, HD, HDX, HX e Synchro
 Maschi a macchina Synchro con taglienti elicoidali da 10°, 15°, 25°, 40°, 45° e 50° per fori ciechi.

MASSIV

Tipo N
 Maschi per fori passanti per la applicazioni di foratura o punzonatura di lamiera.

DURATIV

Tipo N
 Maschi a rullare con o senza canali di lubrificazione.

STOCK-

Soluzioni

Produciamo utensili speciali per filettare come maschi, maschi a rullare, frese a filettare con o senza lubrificazione, per lavorazioni a secco o con lubrificazione minimale e per la lavorazione di materiali temprati. Per un migliore risultato gli utensili possono essere lucidi, vaporizzati, nitrurati o rivestiti con TiN, TiCN, TiAlN o MoS₂ per una migliore lubrificazione.

P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Maschi a macchina per filettatura metrica ISO

	•	•	•	•	○	Produktiv Synchro	B	ISO2/6H	HSS-E-PM	TiCN	DIN 371	M 2 - M10	53053	362
	•	•	•	•	○	Produktiv Synchro	B	ISO2/6H	HSS-E-PM	TiCN	DIN 376	M12 - M20	53054	363
	•	•	•	○	•	Produktiv N-X	B	6HX	HSS-E	AlTiZrN	~DIN 371/-DIN 376	M 2 - M30	53733	364
	•	○	○	○	○	Produktiv N	B	ISO2/6H	HSS-E	TiN	DIN 371	M 3 - M10	63033	365
	•	○	○	○	○	Produktiv N	B	ISO2/6H	HSS-E	trattati a vapore	DIN 371	M 3 - M10	73033	366
	•	○	○	○	○	Produktiv N	B	ISO2/6H	HSS-E	trattati a vapore	DIN 376	M12 - M24	73038	367
	•	•	•	•	○	Intensiv Synchro	C	6HX	HSS-E-PM	TiCN	DIN 371	M 5 - M10	53050	368
	•	•	•	•	○	Intensiv Synchro	C	6HX	HSS-E-PM	TiCN	DIN 376	M12 - M20	53051	369
	•	•	•	○	○	Intensiv N-X	C	6HX	HSS-E	TiAlN	~DIN 371/-DIN 376	M 2 - M30	53746	370
	•	○	○	○	○	Intensiv N	C	ISO2/6H	HSS-E	TiN	DIN 371	M 3 - M10	63046	371
	•	○	○	○	○	Intensiv N	C	ISO2/6H	HSS-E	trattati a vapore	DIN 371	M 3 - M10	73046	372
	•	○	○	○	○	Intensiv N	C	6HX	HSS-E	TiN	DIN 376	M12 - M20	63048	373
	•	○	○	○	○	Intensiv N	C	ISO2/6H	HSS-E	trattati a vapore	DIN 376	M12 - M24	73048	374
	•	○	○	○	○	Intensiv N	E	ISO2/6H	HSS-E	lucido	DIN 371	M 4 - M10	73047	375
	•	○	○	○	•	Produktiv HX	B	6HX	HSS-E-PM	AlTiN	DIN 371/ DIN 376	M 3 - M16	53669	376
	•	○	○	○	•	Intensiv HDX	B	6HX	HSS-E-PM	TiCN	DIN 371/ DIN 376	M 3 - M16	53667	377

P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Maschi a macchina per filettatura metrica ISO

	•			○			N	C	ISO2/6H	HSS-E	lucido	DIN 371	M 1 - M10	73185	378
	•			○			N	C	ISO2/6H	HSS-E	lucido	DIN 376	M 6 - M22	73191	379
	•			○			Massiv N	B	ISO2/6H	HSS-E	lucido	DIN 371	M 2,3 - M10	73126	380
			○		•	•	Intensiv HX	C	6HX	HSS-E-PM	AlTiN	DIN 371/ DIN 376	M 3 - M16	53668	381
		•			•		Intensiv HDX	C	6HX	HSS-E-PM	TiCN	DIN 371/ DIN 376	M 3 - M16	53666	382
	•		•	○	•	○	HCX	C	6HX	HSS-E-PM	TiCN	DIN 371	M 5 - M10	53670	383
				•			H	C	6HX	Metallo duro	lucido	DIN 371	M 3 - M10	73011	384
	•			○			Produktiv N	B	ISO2/6H	HSS-E	TiN	DIN 371	M 3 - M10	63133	385
	•			○			Produktiv N	B	ISO3/6G	HSS-E	lucido	DIN 371	M 2,5 - M10	73132	386
	•			○			Produktiv N	B	ISO2/6H	HSS-E	lucido	DIN 371	M 2 - M10	73133	387
	•			○			Produktiv N	B	ISO2/6H	HSS-E	TiN	DIN 376	M12 - M20	63138	388
	•			○			Produktiv N	B	ISO2/6H	HSS-E	lucido	DIN 376	M 2 - M24	73138	389
	•			○			Intensiv N	C	ISO2/6H	HSS-E	TiN	DIN 371	M 3 - M10	63146	390
	•			○			Intensiv N	C	ISO3/6G	HSS-E	lucido	DIN 371	M 3 - M10	73145	391
	•			○			Intensiv N	C	ISO2/6H	HSS-E	lucido	DIN 371	M 2 - M10	73146	392
	•			○			Intensiv N	C	ISO2/6H	HSS-E	lucido	DIN 371	M 2 - M10	73221	393

P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Maschi a macchina per filettatura metrica ISO

	•			○		Intensiv N	C	ISO2/6H	HSS-E	TiN	DIN 376	M12 - M20	63148	394
	•			○		Intensiv N	C	ISO2/6H	HSS-E	lucido	DIN 376	M 3 - M30	73148	395
	•			○		Intensiv N	C	ISO2/6H	HSS-E	lucido	DIN 376	M 3 - M20	73227	396
	•		○			Produktiv H	B	ISO2/6H	HSS-E-PM	TiCN	DIN 371/ DIN 376	M 3 - M10	53640	397
	•		○			Produktiv H	B	ISO2/6H	HSS-E	TiCN	DIN 371	M 2 - M10	53642	398
	•		○			Produktiv H	B	ISO2/6H	HSS-E-PM	TiN	DIN 371	M 3 - M10	63641	399
	•		○			Produktiv H	B	ISO2/6H	HSS-E-PM	lucido	DIN 371	M 3 - M10	73640	400
	•		○			Produktiv H	B	ISO2/6H	HSS-E	nitruato	DIN 371	M 2 - M10	73642	401
	•		○			Produktiv H	B	ISO2/6H	HSS-E-PM	TiN	DIN 376	M12 - M20	63643	402
	•		○			Produktiv H	B	ISO2/6H	HSS-E	nitruato	DIN 376	M12 - M20	73645	403
	•		○			Intensiv H	C	ISO2/6H	HSS-E	TiCN	DIN 371/ DIN 376	M 2 - M10	53661	404
	•			○		Intensiv H	C	ISO2/6H	HSS-E	TiN	DIN 371	M 3 - M10	63674	405
	•		○			H R15	C	ISO2/6H	HSS-E-PM	lucido	DIN 371	M 3 - M10	73619	406
	•		○			Intensiv H	C	ISO2/6H	HSS-E	lucido	DIN 371	M 3 - M10	73661	407
	•		○			Intensiv H	C	ISO2/6H	HSS-E	TiN	DIN 376	M12 - M20	63675	408
	•		○			Intensiv H	C	ISO2/6H	HSS-E	lucido	DIN 376	M12 - M20	73664	409

P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Maschi a macchina per filettatura metrica ISO

						H R15	C	ISO2/6H	HSS-E-PM	lucido	DIN 376	M12 - M20	73666	410
						H	D	ISO2/6H	Metallo duro	TiCN	~DIN 371	M 3 - M12	63010	411
						Produktiv HD	B	ISO2/6H	HSS-E-PM	TiCN	DIN 371	M 3 - M10	53641	412
						Produktiv HD	B	ISO2/6H	HSS-E	TiN	DIN 371	M 3 - M10	63176	413
						Produktiv HD	B	ISO2/6H	HSS-E	trattati a vapore	DIN 371	M 3 - M10	73176	414
						Produktiv HD	B	ISO2/6H	HSS-E-PM	lucido	DIN 371	M 3 - M10	73641	415
						Produktiv HD	B	ISO2/6H	HSS-E-PM	TiCN	DIN 376	M12 - M16	53643	416
						Produktiv HD	B	6HX	HSS-E	TiN	DIN 376	M12 - M16	63177	417
						Produktiv HD	B	ISO2/6H	HSS-E	trattati a vapore	DIN 376	M12 - M20	73177	418
						Produktiv HD	B	ISO2/6H	HSS-E-PM	lucido	DIN 376	M12 - M22	73643	419
						Intensiv HD	C	ISO2/6H	HSS-E-PM	TiCN	DIN 371	M 3 - M10	53662	420
						Intensiv HD	C	ISO2/6H	HSS-E-PM	TiN	DIN 371	M 3 - M10	63662	421
						Intensiv HD	C	ISO2/6H	HSS-E	trattati a vapore	DIN 371	M 3 - M10	73660	422
						Intensiv HD	C	ISO2/6H	HSS-E-PM	lucido	DIN 371	M 3 - M10	73662	423
						Intensiv HD	C	ISO2/6H	HSS-E-PM	TiCN	DIN 376	M12 - M16	53665	424
						Intensiv HD	C	ISO2/6H	HSS-E-PM	TiN	DIN 376	M12 - M16	63665	425

P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Maschi a macchina per filettatura metrica ISO

		Intensiv HD	C	ISO2/6H	HSS-E	trattati a vapore	DIN 376	M12 - M20	73659	426
		Intensiv HD	C	ISO2/6H	HSS-E-PM	lucido	DIN 376	M12 - M24	73665	427
		GG	C	6HX	HSS-E	AlTiN	DIN 371	M 3 - M10	63201	428
		GG	C	6HX	HSS-E	nitruato	DIN 371	M 3 - M10	73201	429
		GG	C	6HX	HSS-E	nitruato	DIN 376	M12 - M20	73211	430
		Produktiv W	B	ISO2/6H	HSS-E	lucido	DIN 371	M 2 - M10	73131	431
		Produktiv W	B	ISO2/6H	HSS-E	lucido	DIN 376	M12 - M20	73189	432
		Intensiv W	C	ISO2/6H	HSS-E	lucido	DIN 371	M 2 - M10	73156	433
		Intensiv W	C	ISO2/6H	HSS-E	lucido	DIN 376	M12 - M20	73136	434

Maschi a macchina per fil. metr. ISO passo fine

		Intensiv N-X	C	6HX	HSS-E	TiAlN	DIN 374	M 6 X0,75 - M24 X1,5	53780	435
		Produktiv N-X	B	6HX	HSS-E	AlTiZrN	DIN 374	M 6 X0,75 - M24 X1,5	53778	436
		Produktiv Synchro	B	ISO2/6H	HSS-E-PM	TiCN	DIN 374	M 8 X1 - M16 X1,5	53055	437
		Intensiv Synchro	C	6HX	HSS-E-PM	TiCN	DIN 374	M 8 X1 - M20 X1,5	53052	438
		Produktiv N	B	ISO2/6H	HSS-E	trattati a vapore	DIN 374	M 6 X0,75 - M20 X1,5	73183	439
		Intensiv N	C	ISO2/6H	HSS-E	trattati a vapore	DIN 374	M 6 X0,75 - M20 X1,5	73187	440

P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Maschi a macchina per fil. metr. ISO passo fine

		N	C	ISO2/6H	HSS-E	lucido	DIN 374	M 8 X0,75 - M24 X1,5	73237	441
		Produttiv N	B	ISO2/6H	HSS-E	lucido	DIN 374	M 4 X0,5 - M36 X1,5	73250	442
		Intensiv N	C	ISO2/6H	HSS-E	lucido	DIN 374	M 3 X0,35 - M30 X2	73173	443
		Intensiv N	C	ISO2/6H	HSS-E	TiN	DIN 374	M 8 X1 - M20 X1,5	63173	444
		Produttiv H	B	ISO2/6H	HSS-E	nitruato	DIN 374	M 3 X0,35 - M22 X1,5	73646	445
		Produttiv HD	B	ISO2/6H	HSS-E	trattati a vapore	DIN 374	M 5 X0,5 - M20 X1,5	73178	446
		Intensiv HD	C	ISO2/6H	HSS-E	trattati a vapore	DIN 374	M 8 X1 - M20 X1,5	73180	447
		GG	C	6HX	HSS-E	nitruato	DIN 374	M 8 X1 - M20 X1,5	73194	448

Maschi a macchina per filettatura UNC

		Produttiv N	B	2B	HSS-E	trattati a vapore	~DIN 371	4 -40 - 3/8 -16	73308	449
		Produttiv N	B	2B	HSS-E	trattati a vapore	~DIN 376	1/2 -13 - 3/4 -10	73309	450
		Intensiv N	C	2B	HSS-E	trattati a vapore	~DIN 371	4 -40 - 3/8 -16	73322	451
		Intensiv N	C	2B	HSS-E	trattati a vapore	~DIN 376	1/2 -13 - 3/4 -10	73323	452
		Produttiv HD	B	2B	HSS-E	trattati a vapore	~DIN 371	4 -40 - 3/8 -16	73297	453
		Produttiv HD	B	2B	HSS-E	trattati a vapore	~DIN 376	1/2 -13 - 1 - 8	73298	454
		Intensiv HD	C	2B	HSS-E	trattati a vapore	~DIN 371	4 -40 - 3/8 -16	73304	455

P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Maschi a macchina per filettatura UNC

	●			○		Intensiv HD	C	2B	HSS-E	trattati a vapore	~DIN 376	1/2 -13 - 3/4 -10	73305	456
		●				GG	C	2B	HSS-E	nitruato	~DIN 371	8 -32 - 3/8 -16	73326	457
	●					GG	C	2B	HSS-E	nitruato	~DIN 376	1/2 -13 - 1 - 8	73327	458

Maschi a macchina per filettatura UNF

	●	○	○	○		Produktiv N	B	2B	HSS-E	trattati a vapore	~DIN 374	10 -32 - 5/8 -18	73310	459
	●	○	○	○		Intensiv N	C	2B	HSS-E	trattati a vapore	~DIN 374	10 -32 - 5/8 -18	73324	460
		●				Produktiv HD	B	2B	HSS-E	trattati a vapore	~DIN 374	10 -32 - 5/8 -18	73299	461
	●					Intensiv HD	C	2B	HSS-E	trattati a vapore	~DIN 374	10 -32 - 3/4 -16	73306	462

Maschi a macchina per filettatura NPT

	○	●	○			VA	C		HSS-E	trattati a vapore	Norma di fab.	1/8 - 3/4	73293	463
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Maschi a macchina per filettatura Whitworth BSP

	●	○	○	○		Produktiv N	B		HSS-E	trattati a vapore	DIN 5156	G 1/8 - G1	73321	464
	●	○	○	○		Intensiv N	C		HSS-E	trattati a vapore	DIN 5156	G 1/8 - G1	73325	465
	●	●	●	○	○	Intensiv N-X	C	X	HSS-E	TiAlN	DIN 5156	G 1/16 - G1	53788	466
	●			○		Intensiv N	C		HSS-E	lucido	DIN 5156	G 1/8 - G1 1/2	73286	467
	●			○		Produktiv HD	B		HSS-E	trattati a vapore	DIN 5156	G 1/8 - G1	73300	468

P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Maschi a macchina per filettatura Whitworth BSP

	•			○		Intensiv HD	C		HSS-E	trattati a vapore	DIN 5156	G 1/8 - G1	73288	469
		•				GG	C		HSS-E	nitruato	DIN 5156	G 1/8 - G1	73345	470
	•	•	•	○	○	Produttiv N-X	B	X	HSS-E	AlTiZrN	DIN 5156	G 1/16 - G1	53787	471

Maschi a macchina per filettatura Pg

	•		○	○		N	B		HSS-E	lucido	DIN 40432	PG 7 - PG 16	73296	472
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Maschi corti per filettatura NPT

	•		○	○		N	C		HSS-E	lucido	Norma di fab.	1/16 - 1	73295	473
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Maschi a macchina a rullare con canali di lubr. per fil. metrica ISO

	•	•		•		Durativ	C	6HX	HSS-E	lucido	~DIN 371	M 3 - M10	73120	474
	•	•		•		Durativ	C	6HX	HSS-E	TiN	~DIN 371	M 3 - M10	63120	475
	•	•		•		Durativ	C	6GX	HSS-E	TiN	~DIN 371	M 3 - M10	63119	476
	•	•		•		Durativ	C	6HX	HSS-E	TiN	~DIN 376	M12 - M16	63122	477
	•	•		•		Durativ	C	6HX	HSS-E-PM	AlCrN	~DIN 371	M 3 - M10	53620	478
	•	•		•		Durativ	C	6GX	HSS-E-PM	AlCrN	~DIN 371	M 3 - M10	53621	479
	•	•		•		Durativ	C	6HX	HSS-E-PM	AlCrN	~DIN 376	M12 - M20	53622	480

P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Maschi a rullare forati e c.canalini di lubr. per fil. metrica ISO



•	•	•	•	•	•	Durativ	C	6HX	Metallo duro	TiCN	~DIN 371	M 3 - M10	63013	481
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Maschi a macchina a rullare senza canalini di lubr. per fil. metrica ISO



•	•	•	•	•	•	Durativ	C	6HX	HSS-E	lucido	DIN 371	M 2 - M10	73121	482
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•	•	•	•	•	•	Durativ	C	6HX	HSS-E	TiN	DIN 371	M 2 - M10	63121	483
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•	•	•	•	•	•	Durativ	C	6HX	HSS-E	TiN	~DIN 376	M12 - M20	63123	484
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Frese a filettare con fase di svasatura per filettatura metrica ISO



•	•	•	•	•	•	TMC SP			Metallo duro	lucido	Norma di fab.	M 3 - M20	73810	485
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•	•	•	•	•	•	TMC SP	○		Metallo duro	TiCN	Norma di fab.	M 3 - M20	53810	486
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Frese a filettare con fase di svasatura per fil. metr. ISO passo fine



•	•	•	•	•	•	TMC SP	○		Metallo duro	TiCN	Norma di fab.	M 4 X0,5 - M16 X1,5	53820	487
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•	•	•	•	•	•	TMC SP			Metallo duro	lucido	Norma di fab.	M 4 X0,5 - M16 X1,5	73820	488
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Frese a filettare senza fase di svasatura per filettatura metrica ISO



•	•	•	•	•	•	TM SP			Metallo duro	lucido	Norma di fab.	M 6 - M20 X1,5	73830	489
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•	•	•	•	•	•	TM SP	○		Metallo duro	TiCN	Norma di fab.	M 6 - M20 X1,5	53830	490
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P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Serie du maschi a mano per filettature metriche ISO destri



●	○	●	●	●	●	N	A/D/C	ISO2/6H	HSS	lucido	DIN 352	M 1 - M24	73531	491
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Serie di maschi a mano per filettature metriche ISO sinistri



●	○	●	●	●	●	N	A/D/C	ISO2/6H	HSS	lucido	DIN 352	M 4 - M16	73532	492
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Maschio a mano per filettatura metrica fine ISO, kit



●	○	●	●	●	●	N	D/C	ISO2/6H	HSS	lucido	DIN 2181	M 5 X0,5 - M18 X1,5	73521	493
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Maschio a macchina per filettatura UNC, kit



●	○	●	●	●	●	N	A/D/C	2B	HSS	lucido	~DIN 352	4 -40 - 3/4 -10	73535	494
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Maschio a macchina per filettatura BSW, kit



●	○	●	●	●	●	N	A/D/C		HSS	lucido	~DIN 352	W 1/8 - W 3/4	73534	495
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P	M	K	N	S	H	Tipo	Forma	classe di tolleranza	Materiale tagliente	Superficie	Norma	d1	Catalogo n°	Pagina
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Maschio a mano per filettatura gas, kit



●	○	●	●	○	○	N	D/C		HSS	lucido	DIN 5157	G 1/8 - G 1/2	73522	496
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Utensili combinati per fil. metrica ISO



●	○	●	●	○	○	N	D	ISO2/6H	HSS-E	lucido	Norma di fab.	M 3 - M12	73248	497
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Maschi a macchina per dadi per fil. metrica ISO



●	○	●	●	○	○	N		ISO2/6H	HSS-E	lucido	DIN 357	M 3 - M18	73243	498
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Filiere per filettatura metrica ISO



●	○	○	●	○	○		B	6h	HSS	lucido	DIN EN 22568	M 1 - M30	73400	499
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●	○	○	●	○	○		B	6g	HSS	lucido	DIN EN 22568	M 3 - M18	73410	500
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●	●	○	●	○	○		B	6g	HSS-E	nitruato	DIN EN 22568	M 2,5 - M20	73413	501
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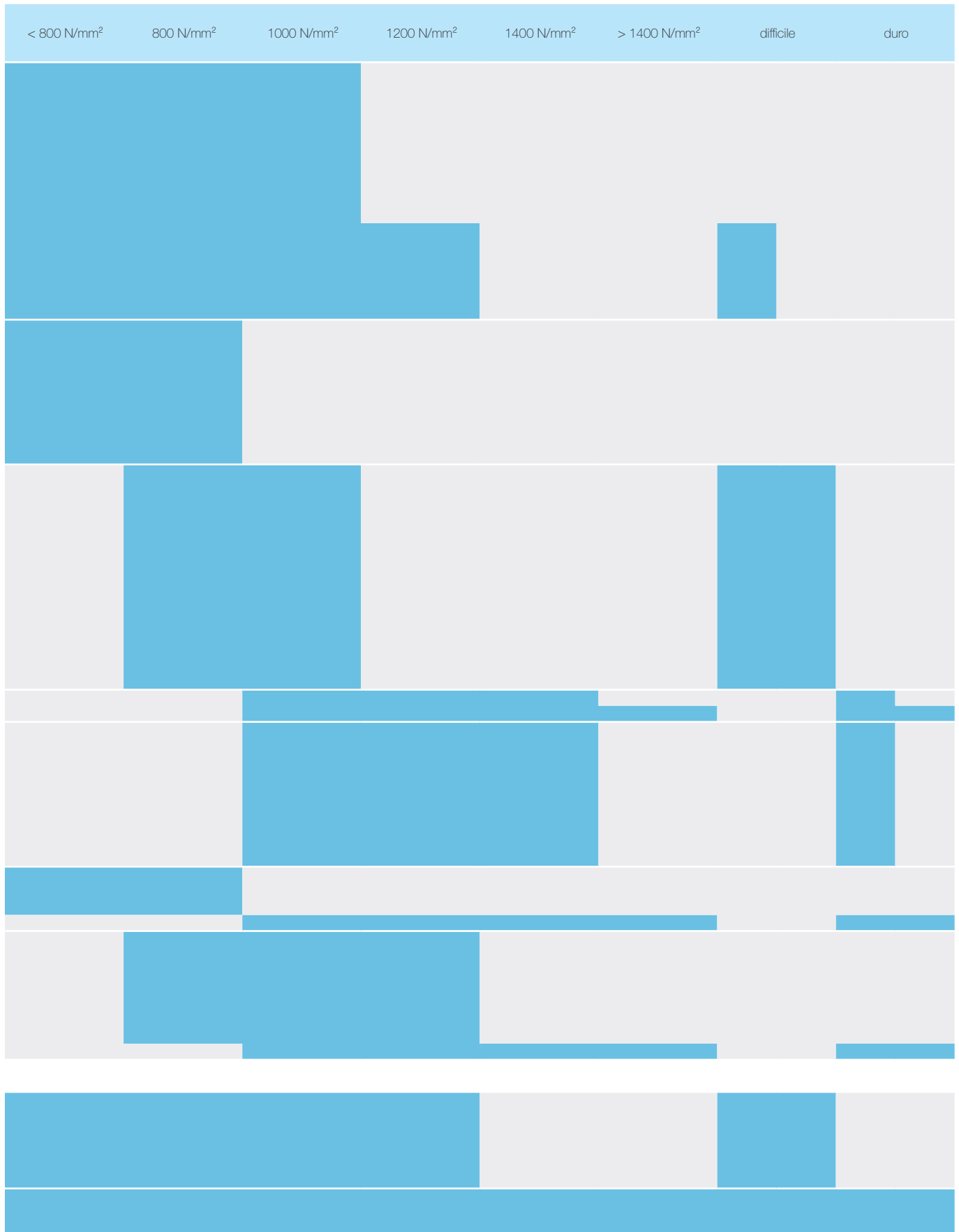
Applicazione

Per materiale

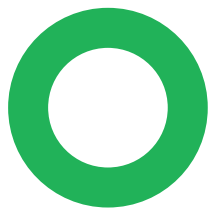
Colore anello	Catalogo n°		materiali non ferrosi, alluminio	acciai	ghise	acciai inossidabili e resistenti agli acidi	nichel e leghe di titanio	acciai temprati
	Produktiv	Intensiv						
verde	73033	73046						
	73038	73048						
	73183	73187						
	73308	73322						
	73309	73323						
	73310	73324						
	73321	73325						
	63033	63046						
		63048						
		73047						
		53733	53746					
		53778	53780					
		53787	53788					
	verde Synchro	53053	53050					
	53054	53051						
	53055	53052						
giallo	73133	73146						
	73132	73145						
	73138	73148						
	73250	73173						
		73227						
		73286						
	63133	63146						
	63138	63148						
		63173						
		73660						
blu	73176	73660						
	73177	73659						
	73178	73180						
	73297	73304						
	73298	73305						
	73299	73306						
	73300	73288						
	63176	73662						
	63177	73665						
	73641	63662						
	73643	63665						
	53641	53662						
	53643	53665						
	53667	53666						
ohne Ring	53669	53668						
rosso	73642	53661						
	73645	73619						
	73646	73661						
	53642	73664						
	73640	73666						
	63641	63010						
	63643	63674						
	53640	63675						
	53670	53670						
nero	73131	73156						
	73189	73136						
	73011	73011						
	53670	53670						
bianco	73201	73201						
	73211	73211						
	73194	73194						
	73326	73326						
	73327	73327						
	73345	73345						
	63201	63201						
	53670	53670						
per fori passanti e ciechi								
Filettature Rullate	73121	63122						
	63121	53620						
	63123	53621						
	73120	53622						
	63120	63013						
	63119							
Filettatura con frese a filettare	73810	53820						
	73820	73830						
	53810	53830						

■ ottimale ■ adatto bene

Per resistenza alla trazione



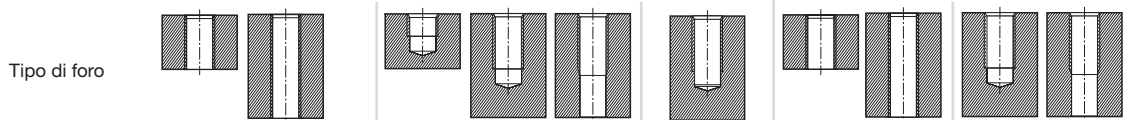
Campi d'applicazione per maschi



Esempi di materiale

per l'applicazione universale in materiale <math>< 1100 \text{ N/mm}^2</math>, p. e. : acciaio da costruzione, acciai automatici acciai temprati, acciai da bonifica acciai niturati ghisa sferoidale

per lavorazione Synchro per l'applicazione universale in materiale fino a 1200 N/mm^2

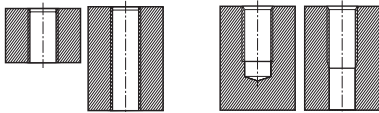


Mat. tagliente	HSS-E			HSS-E-PM	HSS-E-PM
Tipo	Produttiv N		Intensiv N	Intensiv N	Intensiv-Synchro
Forma	B		C	E	B
Tratt. di superficie	vap.	TiN	vap.	TiN	lucido
v_c m/min	≤ 15	≤ 20	≤ 15	≤ 20	≤ 15

Tipo di filettatura	Dimensioni a DIN 2184-1	Tolleranza	Catalogo n°/Diametro/Pagina					
M	DIN 371	ISO 2 6H	73033 M3 - M10 366	63033 M3 - M10 365	73046 M3 - M10 372	63046 M3 - M10 371	73047 M4 - M10 375	53053 M2 - M10 362
		6HX						53050 M5 - M10 368
	DIN 376	ISO 2 6H	73038 M12 - M24 367		73048 M12 - M24 374	63048 M12 - M20 373		53054 M12 - M20 363
		6HX						53051 M12 - M20 369
MF	DIN 374	ISO 2 6H	73183 M6x0,75 - M20x1,5 439		73187 M6x0,75 - M20x1,5 440		53055 M8x1 - M16x1,5 437	
		6HX					53052 M8x1 - M20x1,5 438	
UNC	DIN ~ 371	2B	73308 Nr.4-40 - 3/8-16 449		73322 Nr.4-40 - 3/8-16 451			
	DIN ~ 376	2B	73309 1/2-13 - 3/4-10 450		73323 1/2-13 - 3/4-10 452			
UNF	DIN ~ 374	2B	73310 Nr.10-32 - 5/8-18 459		73324 Nr.10-32 - 5/8-18 460			
G	DIN 5156	-	73321 G1/8 - G1 464		73325 G1/8 - G1 465			



applicazioni universali
per acciai fino a 1300 N/mm²
incl. inossidabile e resistente agli acidi, ghisa,
metalli non ferrosi



HSS-E	HSS-E
ProduktivN-X	IntensivN-X
B	C
AlTiZrN	TiAlN
≤ 20	≤ 20
Catalogo n°/Diametro/Pagina	
53733 M2 - M10 364	53746 M2 - M10 370
53733 M12 - M30 364	53746 M12 - M30 370
53778 MF 6x0,75 - MF 24x1,5 436	53780 MF 6x0,75 - MF 24x1,5 435
53787 G1/16 - G1 471	53788 G1/16 - G1 466

STOCK ProduktivN-X

Maschi per foro passante, imbocco B
HSS-E, TiAlN.

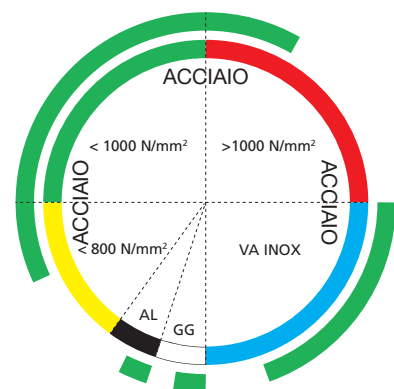
STOCK IntensivN-X

Maschi per foro cieco, imbocco C
elica a 45°, HSS-E, TiAlN.



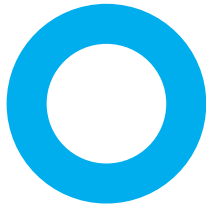
Un maschio universale per la produzione di filettature interne in quasi tutte le applicazioni. Per la lavorazione di acciaio al carbonio, temprato, bonificato, inossidabile e resistente agli acidi ma anche di ghisa e vari metalli non ferrosi in un range di resistenza alla trazione tra < 600 N/mm² e 1300 N/mm². Efficiente evacuazione del truciolo, miglior vita utensile e precisione nelle filettature prodotte.

L'innovativa geometria del tagliente, il rivestimento TiAlN anti-usura e le corrette tolleranze producono filettature di alta qualità. La produzione di filettature con tolleranza 6HX, viene ottenuta in modo più economico ed efficiente grazie all'incremento delle performance, per una più vasta, affidabile ed universale applicazione.



Campi d'applicazione

Campi d'applicazione per maschi

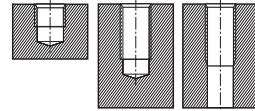
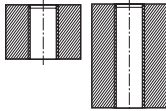


Esempi di materiale

per
acciaio inossidabile e resistente e acido p. e. :
acciai solforati
acciai austenitici
acciai martensitici
acciai ferritici

per
acciaio inossidabile e resistente e acido p. e. :
acciai solforati
acciai austenitici
acciai martensitici
acciai ferritici

Tipo di foro



Mat. tagliente	HSS-E		HSS-E-PM		HSS-E		HSS-E-PM	
Tipo	Produttiv HD				Intensiv HD			
Forma	B				C			
Tratt. di superficie	vap.	TiN	lucido	TiCN	vap.	lucido	TiCN	TiN
v_c m/min	≤ 15	≤ 20	≤ 15	≤ 20	≤ 15	≤ 15	≤ 20	≤ 20

Tipo di filettatura	Dimensioni a DIN 2184-1	Tolleranza	Catalogo n°/Diametro/Pagina							
M	DIN 371	ISO 2 6H	73176 M3 - M10 414	63176 M3 - M10 413	73641 M3 - M10 415	53641 M3 - M10 412	73660 M3 - M10 422	73662 M3 - M10 423	53662 M3 - M10 420	63662 M3 - M10 421
		6HX								
	DIN 376	ISO 2 6H	73177 M12 - M20 418	63177 M12 - M16 417	73643 M12 - M22 419	53643 M12 - M16 416	73659 M12 - M20 426	73665 M12 - M24 427	53665 M12 - M16 424	63665 M12 - M16 425
		6HX								
MF	DIN 374	ISO 2 6H	73178 M5x0,5 - M20x1,5 446					73180 M8x1 - M20x1,5 447		
UNC	DIN ~ 371	2B	73297 Nr.4-40 - 3/8-16 453					73304 Nr.4-40 - 3/8-16 455		
	DIN ~ 376	2B	73298 1/2-13 - 1-8 454					73305 1/2-13 - 3/4-10 456		
UNF	DIN ~ 374	2B	73299 Nr.10-32- 5/8-18 461					73306 Nr.10-32- 3/4-16 462		
G	DIN 5156	-	73300 G1/8 - G1 468					73288 G1/8 - G1 469		
NPT	a norma	-	73293 1/8 - 3/4 463							

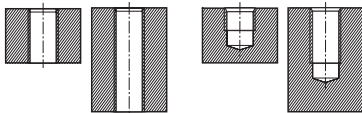


per titanio e leghe di titanio



Stabili su materiali difficili da lavorare.

Specialmente affidabile per lavorazioni di titanio e leghe di titanio. I maschi HDX completano la nostra gamma di maschi HD.



HSS-E-PM	
Produktiv HDX	Intensiv HDX
B	C
TiCN	TiCN
≤ 20	≤ 20
Catalogo n°/Diametro/Pagina	
53667 M3 - M10 377	53666 M3 - M10 382
53667 M12 - M16 377	53666 M12 - M16 382

Vantaggi:

- alta qualità di filetto
- ottimizzata evacuazione del truciolo
- non incolla
- bassa usura
- lunga vita dell'utensile
- massima affidabilità di processo



Campi d'applicazione per maschi

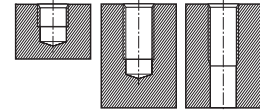
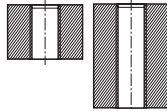


Esempi di materiale

per acciai ad alta resistenza
 $\geq 1100 \dots 1400 \text{ N/mm}^2$, p. e. :
 acciai da bonifica
 acciai per utensili legati a freddo
 acciaio rapido

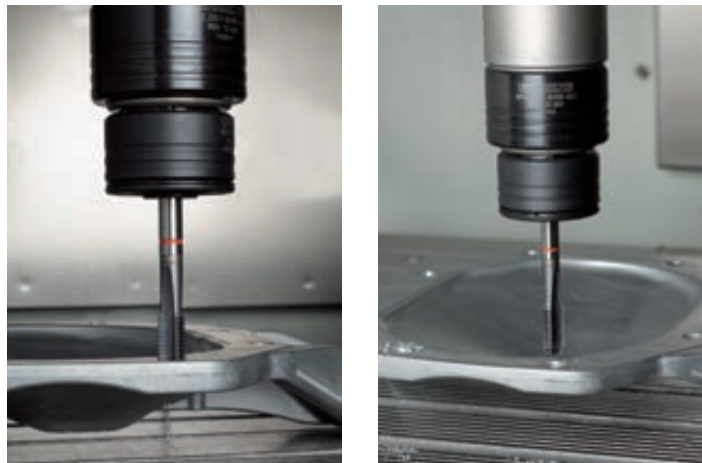
per acciai ad alta resistenza
 $\geq 1100 \dots 1400 \text{ N/mm}^2$, p. e. :
 acciai da bonifica
 acciai per utensili legati a freddo
 acciaio rapido

Tipo di foro



Mat. tagliente	HSS-E		HSS-E-PM			HSS-E			HSS-E-PM
Tipo	Produttiv H				Intensiv H			HR 15	
Forma	B				C			C	
Tratt. di superficie	nitruato	TiCN	lucido	TiN	TiCN	lucido	TiCN	TiN	lucido
v_c m/min	≤ 15	≤ 20	≤ 15	≤ 20	≤ 20	≤ 15	≤ 20	≤ 20	≤ 15

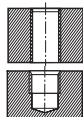
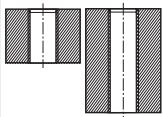
Tipo di filettatura	Dimensioni a DIN 2184-1	Tolleranza	Catalogo n°/Diametro/Pagina									
M	DIN 371	ISO 2 6H	73642 M2 - M10 401	53642 M2 - M10 398	73640 M3 - M10 400	63641 M3 - M10 399	53640 M3 - M10 397	73661 M3 - M10 407	53661 M2 - M10 404	63674 M3 - M10 405	73619 M3 - M10 406	
		6HX										
	DIN 376	ISO 2 6H	73645 M12 - M20 403			63643 M12 - M20 402	73664 M12 - M20 409		63675 M12 - M20 408		73666 M12 - M20 410	
		6HX			53640 M12 - M16 397	53661 M12 - M16 404						
	a norma	ISO 2 6H										
MF	DIN 374	ISO 2 6H	73646 M3x0,35 - M22x1,5 445									
UNC	DIN ~ 371	2B										
	DIN ~ 376	2B										
UNF	DIN ~ 374	2B										
G	DIN 5156	-										



per materiale ad alta resistenza $\geq 1400 \text{ N/mm}^2$

per leghe speciale ad alta resistenza $\geq 1400 \text{ N/mm}^2$, p. e. : Inconel

per acciai ad alta resistenza 54-62HRC



HSS-E-PM		HSS-E-PM		M.D.I.
HCX	Produktiv HX	Intensiv HX		H
C	B	B		D
TiCN	AlTiN	AlTiN		TiCN
≤ 20	≤ 20	≤ 20		≤ 2

Catalogo n°/Diametro/Pagina

53670 M5 - M10 383	53669 M3 - M10 376	53668 M3 - M10 381	
	53669 M12 - M16 376	53668 M12 - M16 381	
			63010 M3 - M12 411

In casi difficili.

Con i maschi di tipo HX e HCX STOCK vengono offerte soluzioni speciali per la lavorazione di materiali con alta resistenza alla trazione. Il rivestimento speciale permette una miglior resistenza all'usura nel caso di lavorazioni in condizioni difficili.

Applicazioni **HX**:

- Inconel
- Hastelloy
- Waspalloy
- Leghe di nickel

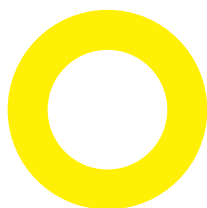
Applicazioni **HCX**:

- acciai per utensili
- tutti gli acciai trattabili a caldo
- acciai ad alta velocità
- ghisa lamellare
- ghisa sferoidale
- bronzi duri
- materiali duri speciali
- Ampco >21

Vantaggi:

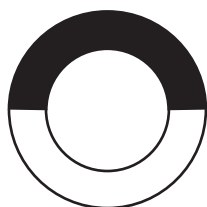
- maschiatura affidabile
- lunga vita dell'utensile
- elevata precisione

Campi d'applicazione per maschi



Esempi di materiale	per acciai generici $\leq 800 \text{ N/mm}^2$ e metalli non ferrosi	per acciai generici $\leq 800 \text{ N/mm}^2$, p. e.: acciaio da costruzione acciai automatici acciai temprati acciai da bonifica	per acciai generici $\leq 800 \text{ N/mm}^2$, p. e.: acciaio da costruzione acciai automatici acciai temprati acciai da bonifica	per acciai generici $\leq 800 \text{ N/mm}^2$ e metalli non ferrosi	per acciai generici $\leq 800 \text{ N/mm}^2$, p. e.: acciaio da costruzione acciai automatici acciai temprati acciai da bonifica		
Tipo di foro							
Mat. tagliente	HSS-E						
Tipo	Massiv N	N	Produktiv N		Intensiv N		
Forma	B	C	B		C		
Tratt. di superficie	lucido	lucido	lucido	TiN	lucido	lucido	TiN
v_c m/min	≤ 15	≤ 15	≤ 15	≤ 20	≤ 15	≤ 15	≤ 20

Tipo di filettatura	Dimensioni a DIN 2184-1	Tolleranza	Catalogo n°/Diametro/Pagina						
M	DIN 371	ISO 2 6H	73126 M2,3 - M10 380	73185 M1 - M10 378	73133 M2 - M10 387	63133 M3 - M10 385	73221 M2 - M10 393	73146 M2 - M10 392	63146 M3 - M10 390
		ISO 3 6G			73132 M2,5 - M10 386			73145 M3 - M10 391	
	DIN 376	ISO 2 6H		73191 M6 - M22 379	73138 M2 - M24 389	63138 M12 - M20 388	73227 M3 - M20 396	73148 M3 - M30 395	63148 M12 - M20 394
MF	DIN 374	ISO 2 6H	73237 M8x0,75 - M24x1,5 441	73250 M4x0,50 - M36x1,5 442				73173 M3x0,35 - M30x2 443	63173 M8x1 - M20x1,5 444
G	DIN 5156	-						73286 G1/8 - G1 1/2 467	



Esempi di materiale

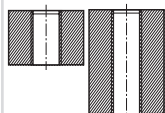
per materiali non ferrosi a truciolo corto. es: Alsi > 10% Si

es: alluminio puro e leghe con Si < 10%

per Al e sue leghe a truciolo corto metalli non ferrosi plastica

per ghise, p. e.:
ghisa grigia
ghisa malleabile
ghisa sferoidale
ghisa

Tipo di foro



Mat. tagliente

HSS-E-PM

HSS-E

M.D.I.

HSS-E-PM

HSS-E

Tipo

HCX

Produktiv W

Intensiv W

H

HCX

GG

Forma

C

B

C

C

C

Tratt. di superficie

TICN

lucido

lucido

lucido

TICN

nitruato

AlTiN

v_c m/min

≤ 20

≤ 15

≤ 15

≤ 15

≤ 20

≤ 20

≤ 30

Tipo di filettatura	Dimensioni a DIN 2184-1	Tolleranza	Catalogo n°/Diametro/Pagina					
M	DIN 371	ISO 2 6H	73131	73156				
			M2 - M10 431	M2 - M10 433				
	DIN 376	6HX	53670		73011	53670	73201	63201
			M5 - M10 383		M3 - M10 384	M5 - M10 383	M3 - M10 429	M3 - M10 428
DIN 376	ISO 2 6H	73189	73136					
		M12 - M20 432	M12 - M20 434					
MF	DIN 374	6HX					73194 M8x1 - M20x1,5 448	
UNC	DIN ~ 371	2B					73326 Nr.8-32 - 3/8-16 457	
	DIN ~ 376	2B					73327 1/2-13 - 1-8 458	
G	DIN 5156	-					73345 G1/8 - G1 470	

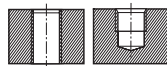
Campi d'applicazione per maschi a mano, maschi a macchina corto e maschi speciali



Esempi di materiale per acciai generici $\leq 800 \text{ N/mm}^2$, p. e.: acciaio da costruzione, acciai automatici, acciai temprati, acciai da bonifica
i maschi 73531 e 73532 sono utilizzabili anche per acciaio ad alta resistenza e resistente agli acidi

per acciai generici $\leq 800 \text{ N/mm}^2$, p. e.: acciaio da costruzione acciai automatici acciai temprati acciai da bonifica

Tipo di foro



Mat. tagliente

HSS

HSS-E

Tipo

N

N

Forma

-

B

Kombi

-

Tratt. di superficie

lucido

lucido

lucido

lucido

v_c m/min

-

≤ 15

≤ 15

≤ 15

Tipo di filettatura	Dimensioni a DIN 2184-1	Tolleranza	Catalogo n°/Diametro/Pagina		
M	DIN 352	ISO 2 6H	73531 (set) RH: V 73101 M 73102 F 73103 M1 - M24 491	73532 (set) LH: V 73105 M 73106 F 73107 M4 - M16 492	73243 M3 - M18 498
	a norma	ISO 2 6H			73248 M3 - M12 497
MF	DIN 2181	ISO 2 6H	73521 (set): V 73110 / F 73111 M5x0,5 - M18x1,5 493		
UNC	~DIN 352	2B	73535 (set): V 73301 / M 73302 / F 73303 Nr.4-40 - 3/4-10 494		
BSW	~DIN 352	-	73534 (set): V 73311 / M 73312 / F 73313 W1/8 - W3/4 495		
G	DIN 5157	-	73522 (set): V 73315 / F 73316 G1/8 - G1/2 496		
Pg	DIN 40432	-			73296 Pg7 - PG16 472
NPT	a norma	-			73295 1 1/16 - 1 473

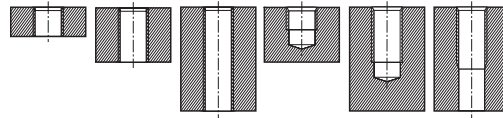


Disponibili anche con:
MASCHIATORI STOCK

Campi d'applicazione per maschi a rullare



Tipo di foro



Esempi di materiale

per acciai generici $\geq 800 \dots 1000 \text{ N/mm}^2$,
acciaio inossidabile e resistente e acido,
per l'applicazione universale in materiale $< 1000 \text{ N/mm}^2$
Al e leghe di Al

		Mat. tagliente		HSS-E		HSS-E-PM		M.D.I.	
		Tipo		Durativ					
		Forma		C senza canalini di lub.		C con canalini di lub.			
		Tratt. di superficie		lucido	TiN	lucido	TiN	AlCrN	TiCN
		v_c m/min		4-50	4-50	4-50	4-50	4-50	4-50
Tipo di filettatura	Dimensioni a DIN 2174	Tolleranza							
		Catalogo n°/Diametro/Pagina							
M	~ DIN 371	6HX	73121	63121	73120	63120	53620	63013	
			M2 - M10 482	M2 - M10 483	M3 - M10 474	M3 - M10 475	M3 - M10 478	M3 - M10 481	
	6GX			63119	53621				
				M3 - M10 476	M3 - M10 479				
	~ DIN 376	6HX		63123	63122	53622			
			M12 - M20 484	M12 - M16 477	M12 - M20 480				

Campi d'applicazione per frese a filettare



Tipo di foro

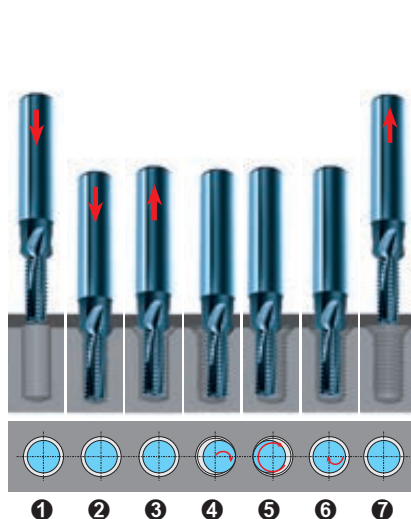


Esempi di materiale

per l'applicazione universale:
acciaio da costruzione, acciai automatici, acciai temprati,
acciai da bonifica, acciai per utensili, acciaio rapido,
acciai austenitici e martensitici e solforati, leghe speciale,
Al e leghe di Al, ghise,
metalli non ferrosi, plastica, leghe di magnesio, Titanio

Mat. tagliente	M.D.I.		M.D.I.	
Tipo	TMC SP		TM SP	
Forma	-	-	-	-
Tratt. di superficie	lucido	TiCN	lucido	TiCN
v_c m/min	100 - 300 (Ti: 40-60)	50 - 200	100 - 300 (Ti: 40-60)	50 - 200

Tipo di filettatura	Dimensioni a	Prof. di filettatura	Catalogo n°/Diametro/Pagina			
M	a norma	2,0 x D	73810	53810	73830	53830
			M3 - M20 485	M3 - M20 486	M6 - M20 489	M6 - M20 490
MF	a norma	2,0 x D	73820	53820	73830	53830
			M4x0,5 - M16x1,5 488	M4x0,5 - M16x1,5 487	M8x1 - M20x1,5 489	M8x1 - M20x1,5 490



Maschi a macchina

Maschi a macchina per filettatura metrica ISO



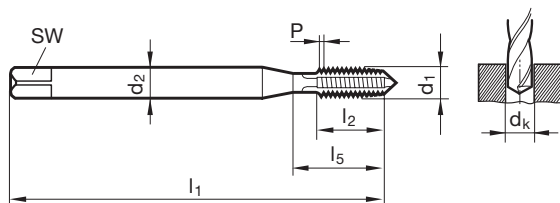
Catalogo n° 53053



P	M	K	N	S	H
●	●	●	●	○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- materiali in acciaio fino a 1200 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M 2,2	0,450	2,800	2,100	1,75	45,000	9,000	14,500
M 2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M 10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



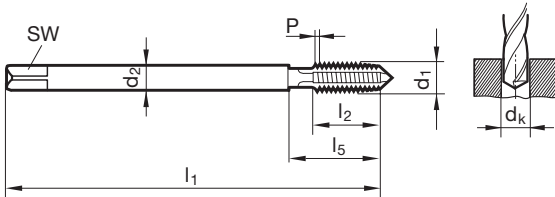
Catalogo n° 53054



P	M	K	N	S	H
•	•	•	•	○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- materiali in acciaio fino a 1200 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

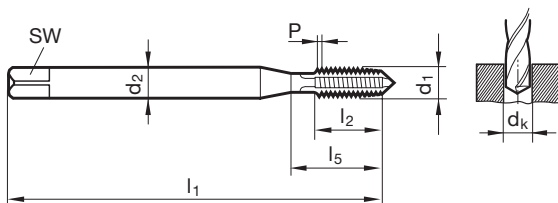


Catalogo n° 53733

Produktiv N-X	~DIN 371/376	B	HSS-E	Al-TiZrN	R	6HX
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P	M	K	N	S	H
●	●	●	○	●	

Parametri di lav.
ind. a pag. 348



- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciaio 600-1300 N / mm²
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M 2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	40,000	85,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



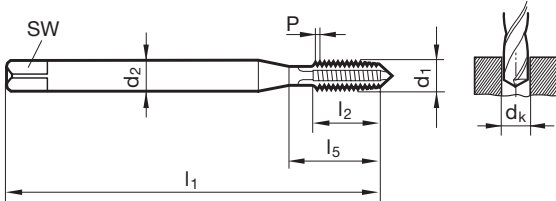
Catalogo n° 63033

Produttiv N	DIN 371	B	HSS-E	TiN	R	ISO2/6H
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P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



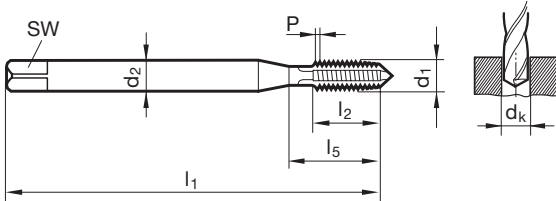
Catalogo n° 73033

Produttiv N	DIN 371	B	HSS-E	trattati a vapore	(R)	ISO2/6H
-----------------------	--------------------------	----------	--------------	----------------------	------------	---------

P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



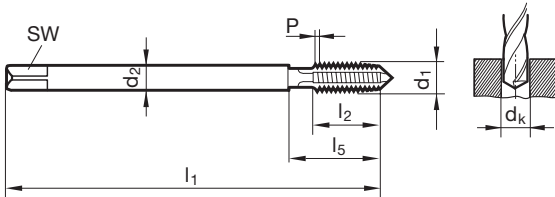
Catalogo n° 73038

Produttiv N	DIN 376	B	HSS-E	trattati a vapore	(R)	ISO2/6H
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P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



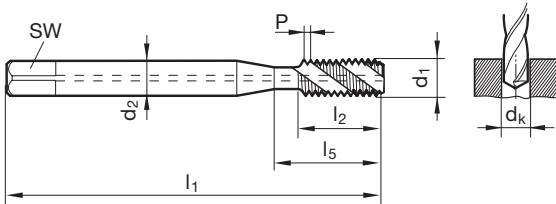
Catalogo n° 53050



P	M	K	N	S	H
●	●	●	●	○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- Scanalature con torsione destra 50°
- lunghezza del filetto più corto, adatto solo con mandrini a maschiatura sincro
- evacuazione truciolo nella direzione del codolo
- uso universale
- materiali in acciaio fino a 1200 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 5	0,800	6,000	4,900	4,20	70,000	4,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	5,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	6,300	35,000
M10	1,500	10,000	8,000	8,50	100,000	7,500	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



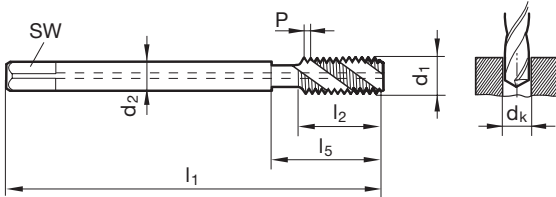
Catalogo n° 53051



P	M	K	N	S	H
●	●	●	●	○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- Scanalature con torsione destra 50°
- lunghezza del filetto più corto, adatto solo con mandrini a maschiatura sincro
- evacuazione truciolo nella direzione del codolo
- uso universale
- materiali in acciaio fino a 1200 N/mm²



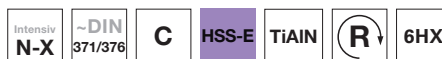
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	8,800	63,000
M14	2,000	11,000	9,000	12,00	110,000	10,000	58,000
M16	2,000	12,000	9,000	14,00	110,000	10,000	58,000
M20	2,500	16,000	12,000	17,50	140,000	12,500	85,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

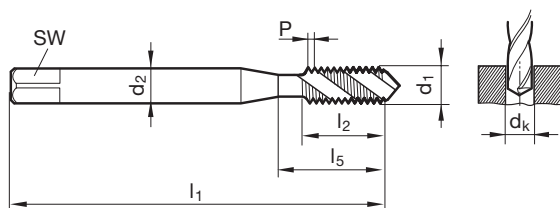


Catalogo n° 53746



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 348



- per fori ciechi
- scanalature con torsione destra 45°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciaio 600-1300 N / mm²
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise

d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M 2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



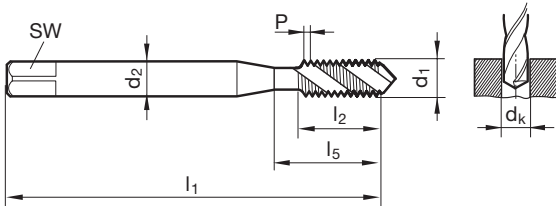
Catalogo n° 63046



P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



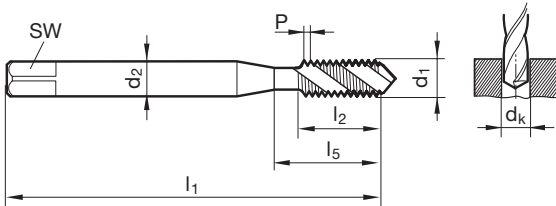
Catalogo n° 73046



P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



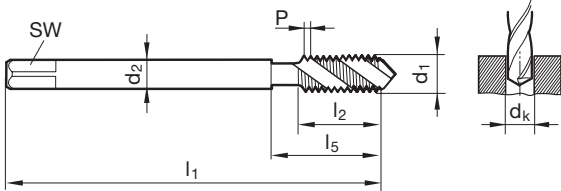
Catalogo n° 63048



P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



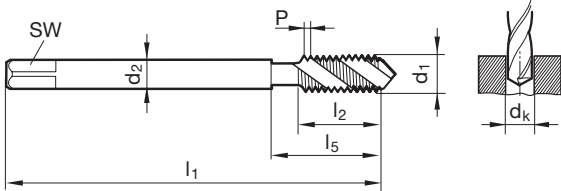
Catalogo n° 73048



P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



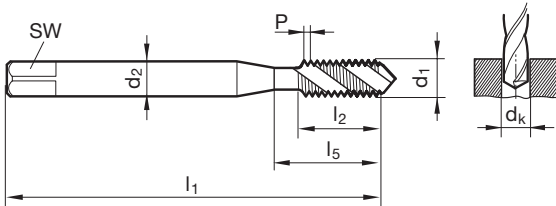
Catalogo n° 73047



P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- imbocco corto per profondità di filetto vicine alla base del foro
- acciai fino a 1100 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



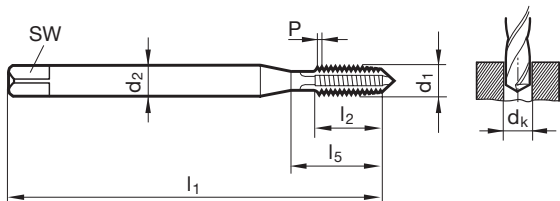
Catalogo n° 53669



P	M	K	N	S	H
		○		●	●

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- leghe speciali, acciai temprati
- nickel e leghe di nickel
- ampco > 21, ghisa refrigerate, Inconel



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



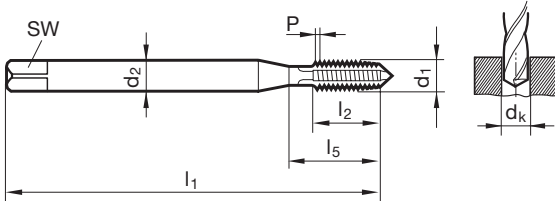
Catalogo n° 53667



P	M	K	N	S	H
	•			•	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- leghe speciali
- titanio e leghe di titanio
- materiali duri fino a 1400 N / mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

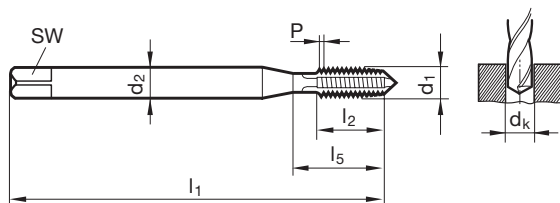


Catalogo n° 73185



Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per profondità di filetto fino a 1xD
- acciai fino a 800 N/mm²



d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M 1	0,250	2,500	2,100	0,75	40,000	5,500	
M 1,2	0,250	2,500	2,100	0,95	40,000	5,500	
M 1,4	0,300	2,500	2,100	1,10	40,000	7,000	
M 1,6	0,350	2,500	2,100	1,25	40,000	4,500	
M 2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M 2,3	0,400	2,800	2,100	1,90	45,000	4,500	14,500
M 2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M 2,6	0,450	2,800	2,100	2,15	50,000	5,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

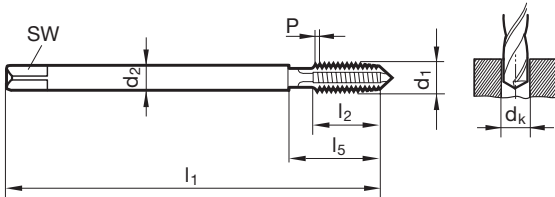


Catalogo n° 73191

N	1xD	DIN 376	C	HSS-E	lucido	R	ISO2/6H
P	M	K	N	S	H		
●			○				

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per profondità di filetto fino a 1xD
- acciai fino a 800 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M 8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

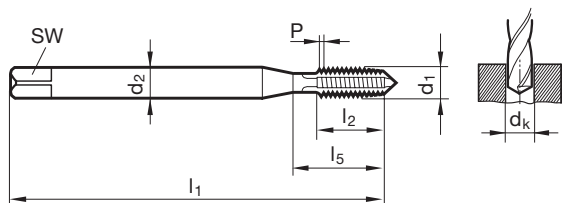


Catalogo n° 73126



Parametri di lav.
ind. a pag. 348

- per fori passanti
- per profondità di filetto fino a 1xD
- soprattutto per lamiera e occhielli in lamiera



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2,3	0,400	2,800	2,100	1,90	45,000	9,000	14,500
M 2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M 2,6	0,450	2,800	2,100	2,15	50,000	9,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



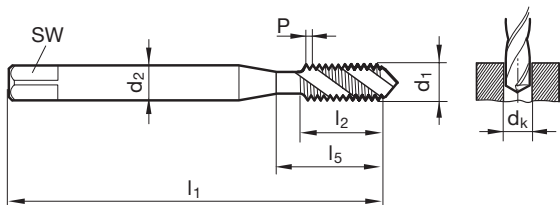
Catalogo n° 53668



P	M	K	N	S	H
		○		●	●

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 10°
- evacuazione truciolo nella direzione del codolo
- leghe speciali, acciai temprati
- nickel e leghe di nickel
- ampco > 21, ghisa refrigerate, Inconel



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



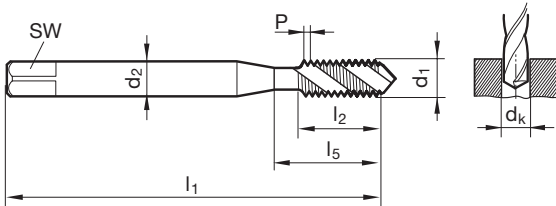
Catalogo n° 53666



P	M	K	N	S	H
	•			•	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 15°
- evacuazione truciolo nella direzione del codolo
- leghe speciali
- titanio e leghe di titanio
- materiali duri fino a 1400 N / mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



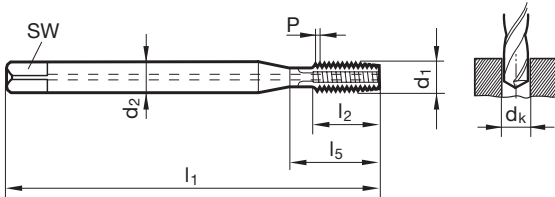
Catalogo n° 53670



P	M	K	N	S	H
●		●	○	●	○

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- con condotto interno del refrigerante $\geq M5$
- uscita centrale del lubrificante
- acciaio ad alta resistenza fino a 1600 N / mm²
- materiali duri come ferro, bronzo, leghe Al-Si ad elevato contenuto di Si



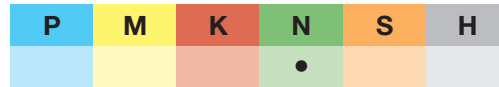
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

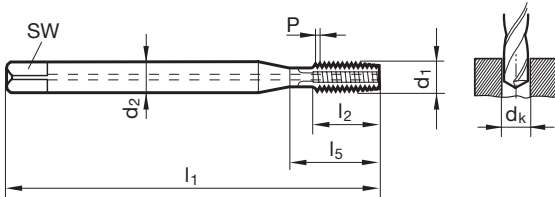


Catalogo n° 73011



Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- con condotto interno del refrigerante \geq M5
- uscita centrale del lubrificante
- leghe di alluminio e leghe di alluminio a truciolo corto, Metalli NE, a truciolo corto e fragili



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	8,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	10,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	10,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	12,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	16,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	18,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



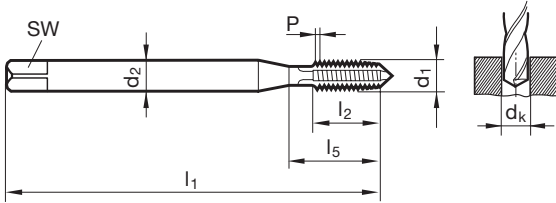
Catalogo n° 63133

Produttiv N	DIN 371	B	HSS-E	TiN	R	ISO2/6H
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P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



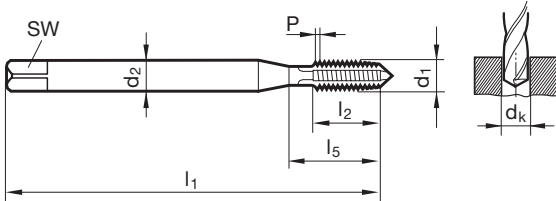
Catalogo n° 73132



P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm²



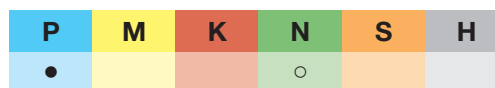
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M 10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

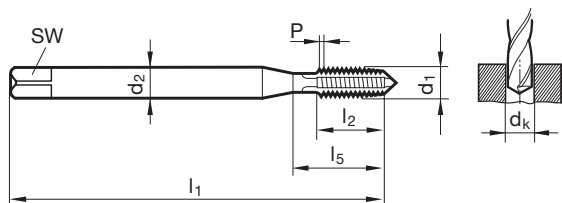


Catalogo n° 73133



Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M 2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 7	1,000	7,000	5,500	6,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



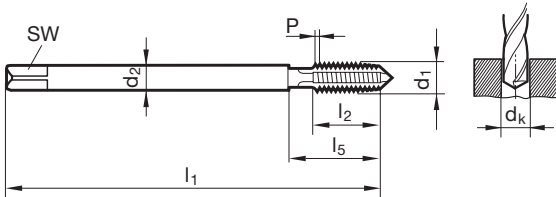
Catalogo n° 63138



P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm²



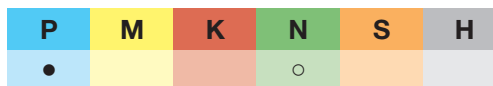
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

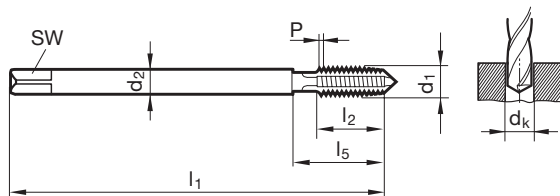


Catalogo n° 73138



Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm²



d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M 2	0,400	1,400		1,60	45,000	8,000	13,500
M 2,5	0,450	1,800		2,05	50,000	9,000	14,500
M 3	0,500	2,200		2,50	56,000	10,000	18,000
M 3,5	0,600	2,500	2,100	2,90	56,000	12,000	20,000
M 4	0,700	2,800	2,100	3,30	63,000	12,000	21,000
M 5	0,800	3,500	2,700	4,20	70,000	14,000	25,000
M 6	1,000	4,500	3,400	5,00	80,000	16,000	30,000
M 8	1,250	6,000	4,900	6,80	90,000	17,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	20,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	32,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	36,000	73,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



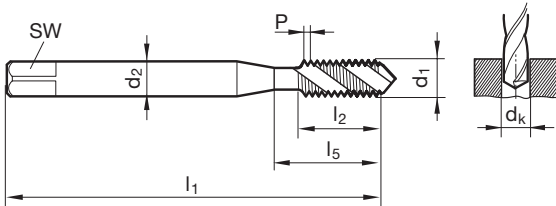
Catalogo n° 63146



P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



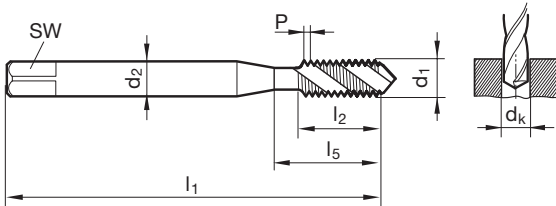
Catalogo n° 73145



P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



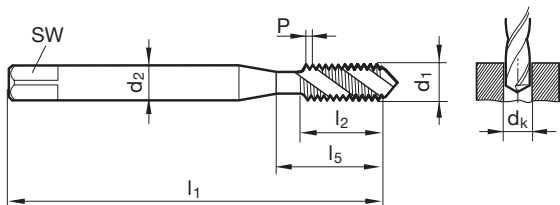
Catalogo n° 73146



P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm²



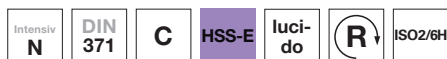
d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M 2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M 2,2	0,450	2,800	2,100	1,75	45,000	5,000	14,500
M 2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



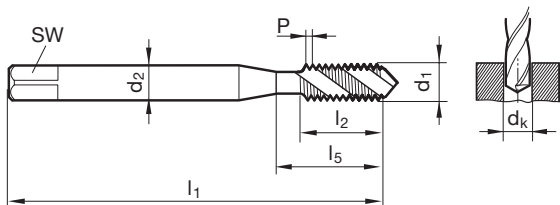
Catalogo n° 73221



P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 15°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M 2,2	0,450	2,800	2,100	1,75	45,000	5,000	14,500
M 2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



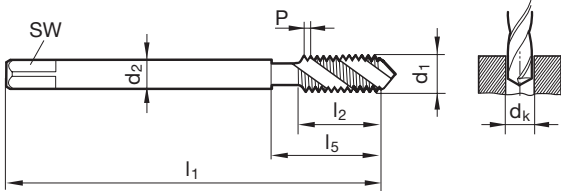
Catalogo n° 63148



P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm²



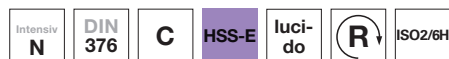
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



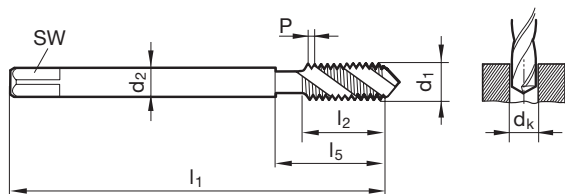
Catalogo n° 73148



P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	2,200		2,50	56,000	6,000	18,000
M 4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M 5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M 6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M 8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000
M27	3,000	20,000	16,000	24,00	160,000	30,000	73,000
M30	3,500	22,000	18,000	26,50	180,000	35,000	85,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



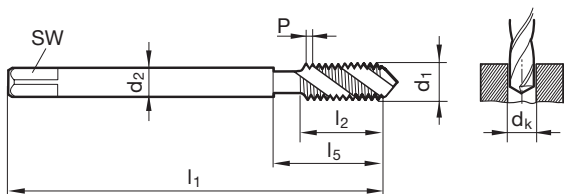
Catalogo n° 73227



P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 15°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	2,200		2,50	56,000	6,000	18,000
M 4	0,700	2,800	2,100	3,30	63,000	7,500	21,000
M 5	0,800	3,500	2,700	4,20	70,000	8,500	25,000
M 6	1,000	4,500	3,400	5,00	80,000	11,000	30,000
M 8	1,250	6,000	4,900	6,80	90,000	14,000	35,000
M10	1,500	7,000	5,500	8,50	100,000	16,000	39,000
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



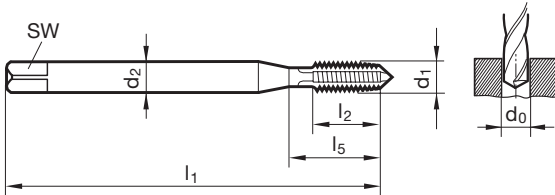
Catalogo n° 53640



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



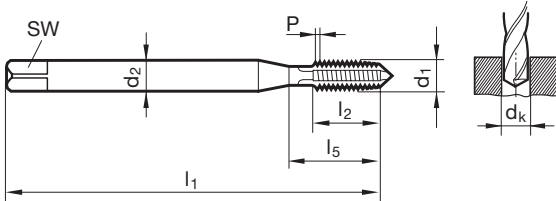
Catalogo n° 53642



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- leghe speciali, leghe di nickel
- materiali duri fino a 1400 N / mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



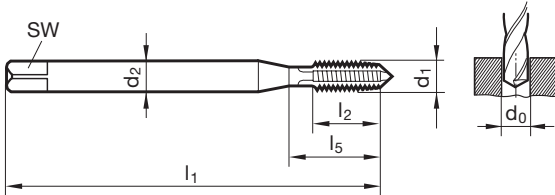
Catalogo n° 63641



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- leghe speciali, leghe di nickel
- materiali duri fino a 1400 N / mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



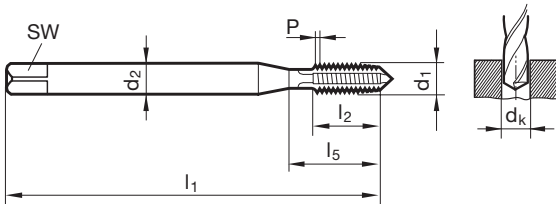
Catalogo n° 73640

Produttiv H	DIN 371	B	HSS-E-PM	luci- do	R	ISO2/6H
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P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



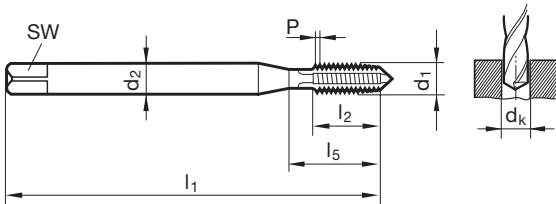
Catalogo n° 73642



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



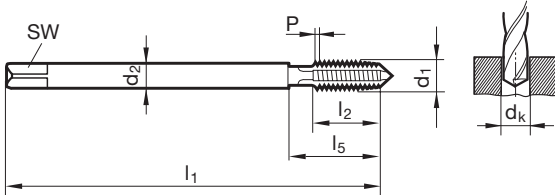
Catalogo n° 63643



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



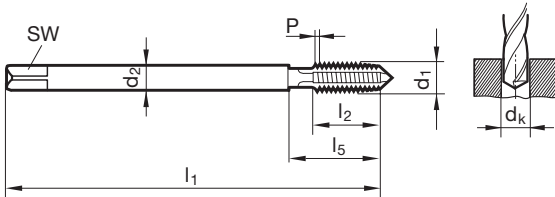
Catalogo n° 73645

Produttiv H	DIN 376	B	HSS-E	nitru- rato	R	ISO2/6H
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P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



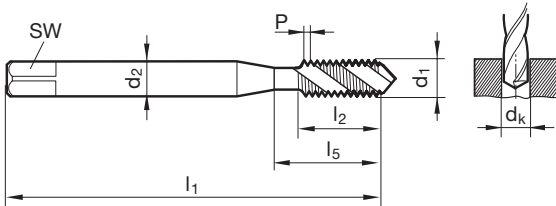
Catalogo n° 53661



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



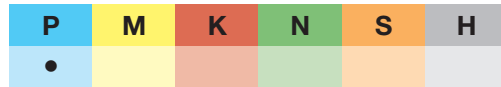
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M 10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

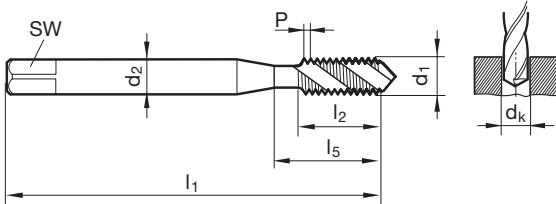


Catalogo n° 63674



Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



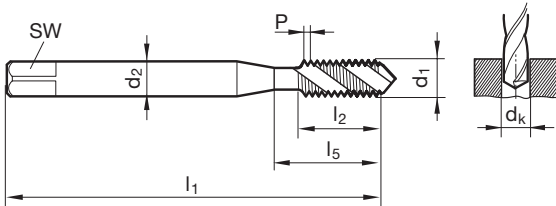
Catalogo n° 73619



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 15°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



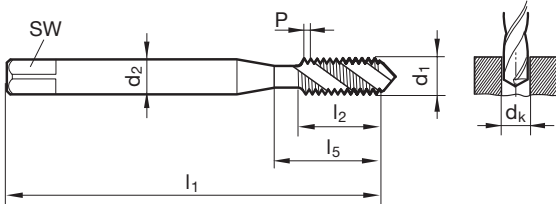
Catalogo n° 73661



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



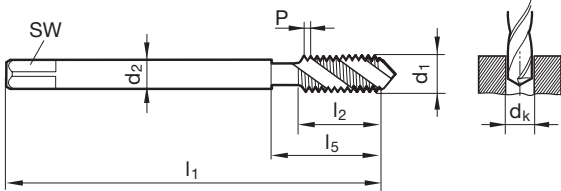
Catalogo n° 63675



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



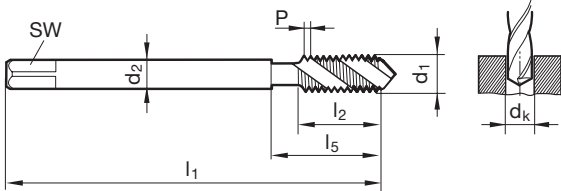
Catalogo n° 73664



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



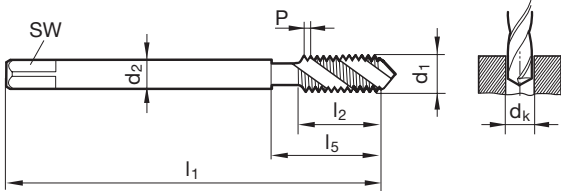
Catalogo n° 73666



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 15°
- evacuazione truciolo nella direzione del codolo
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



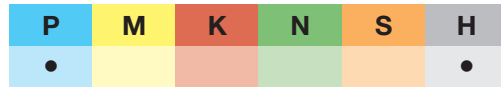
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

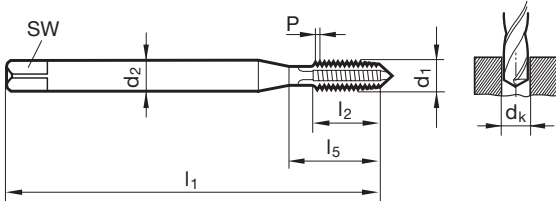


Catalogo n° 63010



Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per profondità di filetto fino a 1xD
- acciai temprati da 54 a 62 HRC



d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,60	56,000	12,000
M 4	0,700	4,500	3,400	3,40	63,000	14,000
M 5	0,800	6,000	4,900	4,30	70,000	17,000
M 6	1,000	6,000	4,900	5,10	80,000	20,000
M 8	1,250	8,000	6,200	6,90	90,000	20,000
M10	1,500	10,000	8,000	8,60	100,000	24,000
M12	1,750	12,000	9,000	10,40	110,000	28,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



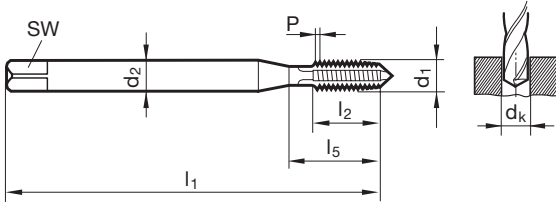
Catalogo n° 53641



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



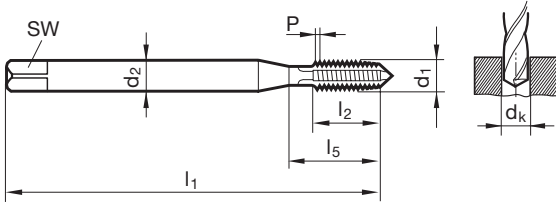
Catalogo n° 63176



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



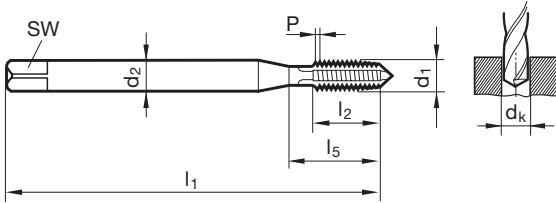
Catalogo n° 73176



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



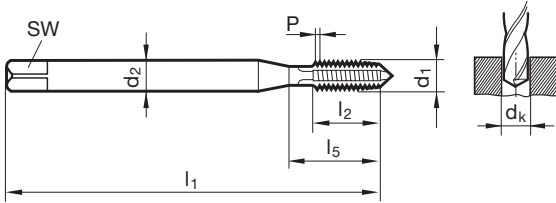
Catalogo n° 73641



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



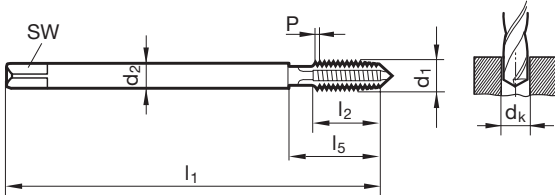
Catalogo n° 53643

Produttiv HD	DIN 376	B	HSS-E- PM	TiCN	R	ISO2/6H
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P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



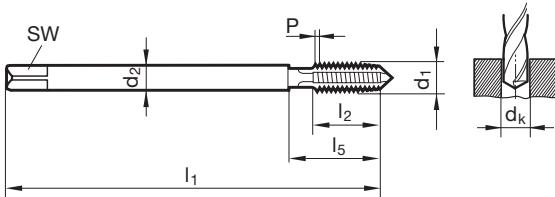
Catalogo n° 63177



P	M	K	N	S	H
	•		○	○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

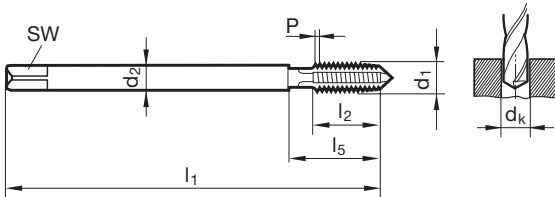


Catalogo n° 73177

Produttività HD	DIN 376	B	HSS-E	trattati a vapore	R	ISO2/6H
P	M	K	N	S	H	
	•			○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



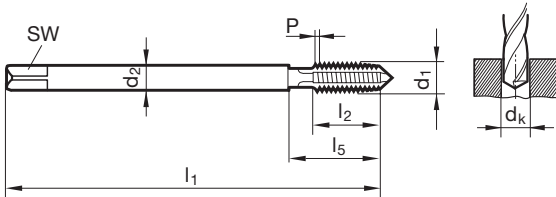
Catalogo n° 73643

Produttiv HD	DIN 376	B	HSS-E- PM	luci- do	(R)	ISO2/6H
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P	M	K	N	S	H
	•		○	○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	32,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



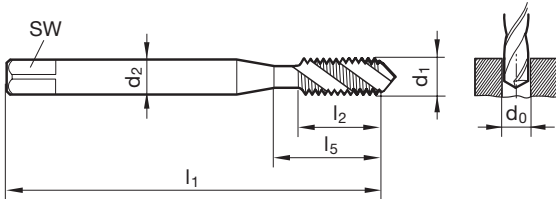
Catalogo n° 53662



P	M	K	N	S	H
	•		○	○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



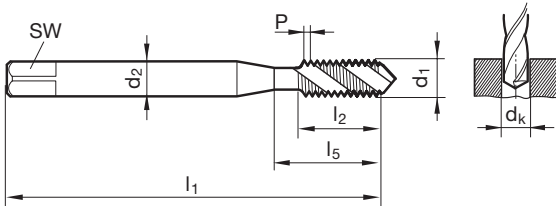
Catalogo n° 63662



P	M	K	N	S	H
	•		○	○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

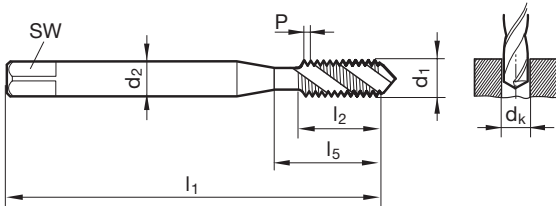


Catalogo n° 73660

Intensiv HD	DIN 371	C	HSS-E	trattati a vapore	(R)	ISO2/6H
P	M	K	N	S	H	
	•			○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



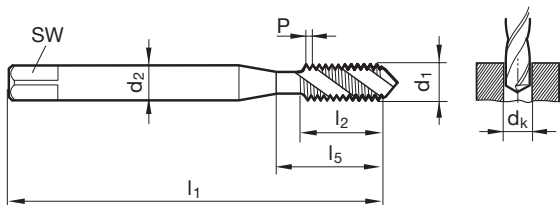
Catalogo n° 73662



P	M	K	N	S	H
	•		○	○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 3,5	0,600	4,000	3,000	2,90	56,000	7,000	20,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



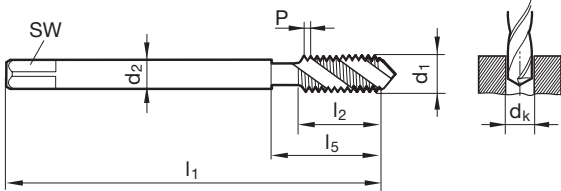
Catalogo n° 53665



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



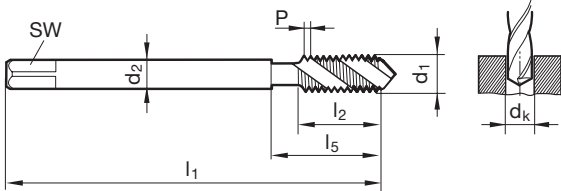
Catalogo n° 63665



P	M	K	N	S	H
	•			•	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



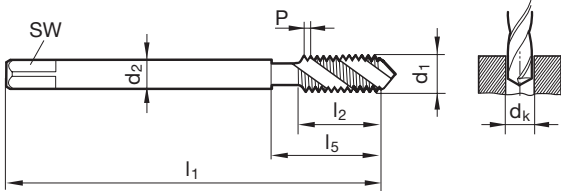
Catalogo n° 73659



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



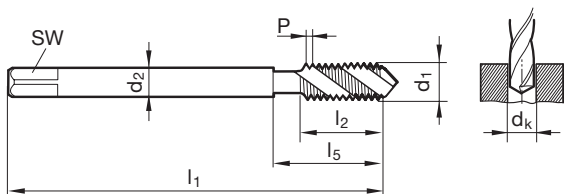
Catalogo n° 73665



P	M	K	N	S	H
	•		○	○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



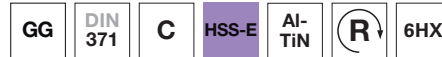
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M14	2,000	11,000	9,000	12,00	110,000	20,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	25,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000
M22	2,500	18,000	14,500	19,50	140,000	27,000	62,000
M24	3,000	18,000	14,500	21,00	160,000	30,000	73,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO



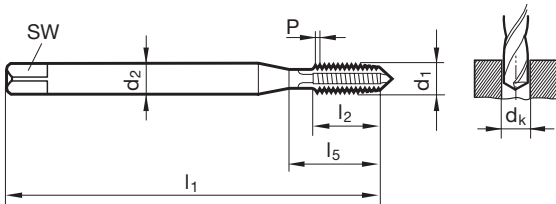
Catalogo n° 63201



P	M	K	N	S	H
		•	○		

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



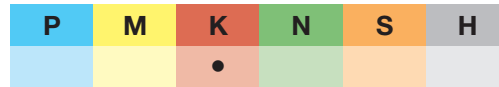
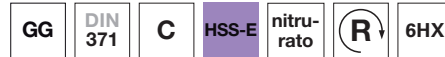
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

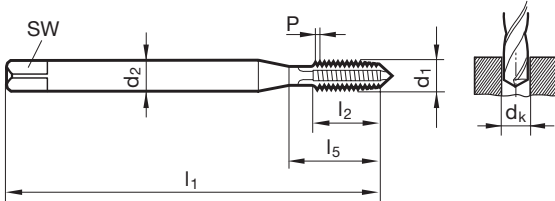


Catalogo n° 73201



Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



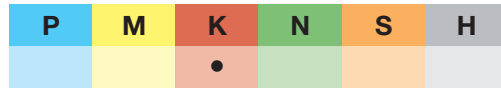
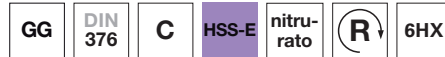
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

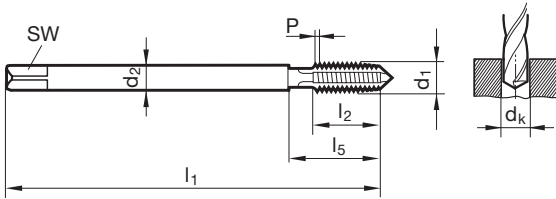


Catalogo n° 73211



Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



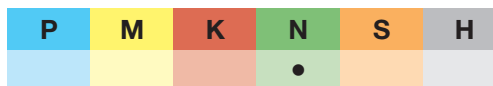
d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	12,00	110,000	26,000	53,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M18	2,500	14,000	11,000	15,50	125,000	30,000	62,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

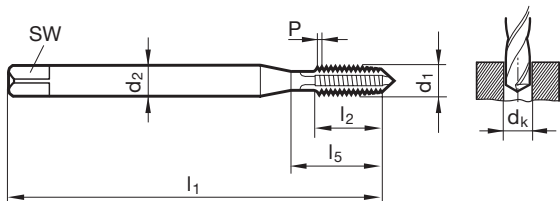


Catalogo n° 73131



Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- materiali morbidi e a truciolo lungo quali alluminio, leghe di alluminio, metalli non ferrosi



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,60	45,000	8,000	13,500
M 2,3	0,400	2,800	2,100	1,90	45,000	9,000	14,500
M 2,5	0,450	2,800	2,100	2,05	50,000	9,000	14,500
M 2,6	0,450	2,800	2,100	2,15	50,000	9,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	10,000	18,000
M 3,5	0,600	4,000	3,000	2,90	56,000	12,000	20,000
M 4	0,700	4,500	3,400	3,30	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,20	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,00	80,000	16,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	17,000	35,000
M 10	1,500	10,000	8,000	8,50	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

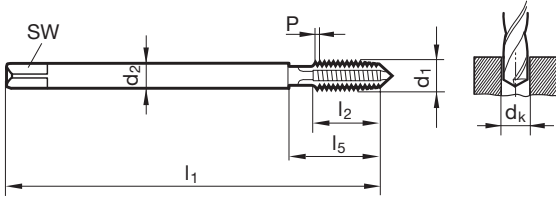


Catalogo n° 73189



Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- materiali morbidi e a truciolo lungo quali alluminio, leghe di alluminio, metalli non ferrosi



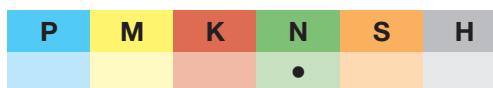
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	14,00	110,000	26,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	32,000	62,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

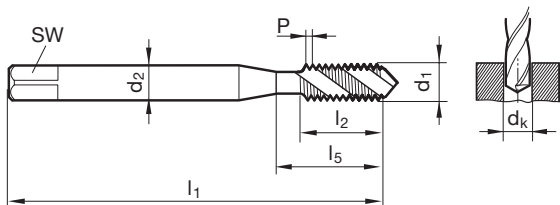


Catalogo n° 73156



Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 45°
- evacuazione truciolo nella direzione del codolo
- materiali morbidi e a truciolo lungo quali alluminio, leghe di alluminio, metalli non ferrosi



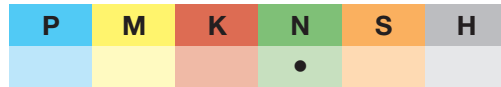
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,60	45,000	4,500	13,500
M 2,3	0,400	2,800	2,100	1,90	45,000	4,500	14,500
M 2,5	0,450	2,800	2,100	2,05	50,000	5,000	14,500
M 3	0,500	3,500	2,700	2,50	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,30	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,20	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,00	80,000	11,000	30,000
M 8	1,250	8,000	6,200	6,80	90,000	14,000	35,000
M 10	1,500	10,000	8,000	8,50	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura metrica ISO

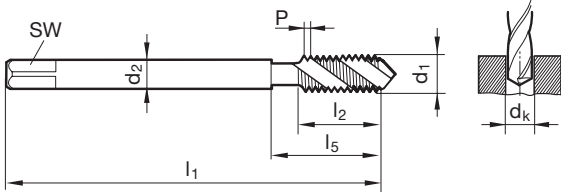


Catalogo n° 73136



Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 45°
- evacuazione truciolo nella direzione del codolo
- materiali morbidi e a truciolo lungo quali alluminio, leghe di alluminio, metalli non ferrosi



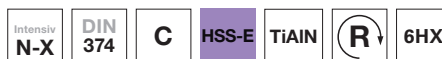
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	10,20	110,000	18,500	49,000
M16	2,000	12,000	9,000	14,00	110,000	20,000	54,000
M20	2,500	16,000	12,000	17,50	140,000	25,000	62,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine



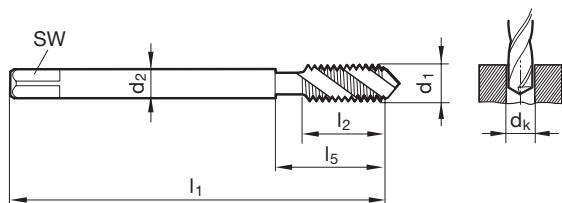
Catalogo n° 53780



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 45°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciaio 600-1300 N / mm²
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise



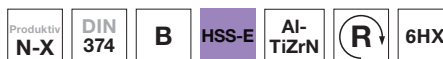
Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
6,004	M 6 X0,75	4,500	3,400	5,20	80,000	8,000	30,000
8,004	M 8 X0,75	6,000	4,900	7,20	80,000	8,000	30,000
8,005	M 8 X1	6,000	4,900	7,00	90,000	11,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	11,000	35,000
10,006	M10 X1,25	7,000	5,500	8,80	100,000	14,000	39,000
12,005	M12 X1	9,000	7,000	11,00	100,000	11,000	40,000
12,006	M12 X1,25	9,000	7,000	10,80	100,000	16,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	16,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	15,000	44,000
18,007	M18 X1,5	14,000	11,000	16,50	110,000	16,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	16,000	44,000
24,007	M24 X1,5	18,000	14,500	22,50	140,000	16,000	48,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine



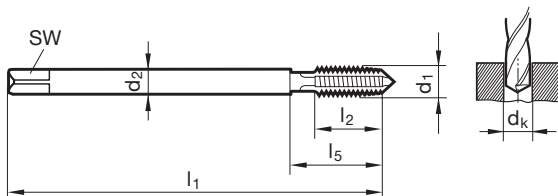
Catalogo n° 53778



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciaio 600-1300 N / mm²
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise



Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
6,004	M 6 X0,75	4,500	3,400	5,20	80,000	13,000	30,000
8,004	M 8 X0,75	6,000	4,900	7,20	80,000	14,000	30,000
8,005	M 8 X1	6,000	4,900	7,00	90,000	16,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	16,000	35,000
10,006	M10 X1,25	7,000	5,500	8,80	100,000	20,000	39,000
12,005	M12 X1	9,000	7,000	11,00	100,000	20,000	40,000
12,006	M12 X1,25	9,000	7,000	10,80	100,000	20,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	22,000	44,000
18,007	M18 X1,5	14,000	11,000	16,50	110,000	25,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	25,000	44,000
24,007	M24 X1,5	18,000	14,500	22,50	140,000	28,000	48,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine



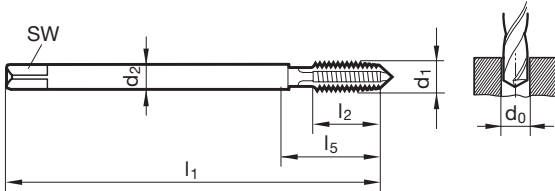
Catalogo n° 53055



P	M	K	N	S	H
•	•	•	•	○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- materiali in acciaio fino a 1200 N/mm²



Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
8,005	M 8 X1	6,000	4,900	7,00	90,000	16,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	16,000	35,000
12,005	M12 X1	9,000	7,000	11,00	100,000	20,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	22,000	44,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine



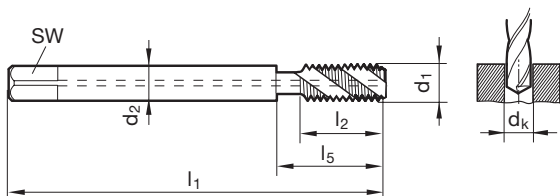
Catalogo n° 53052



P	M	K	N	S	H
●	●	●	●	○	

Parametri di lav. ind. a pag. 348

- per fori ciechi
- Scanalature con torsione destra 50°
- lunghezza del filetto più corto, adatto solo con mandrini a maschiatura sincro
- evacuazione truciolo nella direzione del codolo
- uso universale
- materiali in acciaio fino a 1200 N/mm²



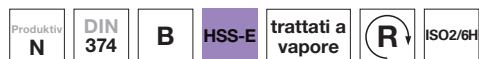
Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
8,005	M 8 X1	6,000	4,900	7,00	90,000	5,000	44,000
10,005	M10 X1	7,000	5,500	9,00	90,000	5,000	44,000
12,005	M12 X1	9,000	7,000	11,00	100,000	5,000	53,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	7,500	53,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	7,500	48,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	7,500	48,000
18,007	M18 X1,5	14,000	11,000	16,50	110,000	7,500	58,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	7,500	70,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine



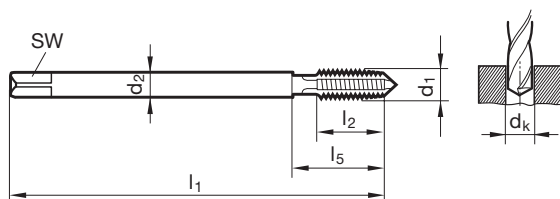
Catalogo n° 73183



P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm²



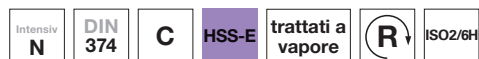
Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
6,004	M 6 X0,75	4,500	3,400	5,20	80,000	13,000	30,000
8,004	M 8 X0,75	6,000	4,900	7,20	80,000	14,000	30,000
8,005	M 8 X1	6,000	4,900	7,00	90,000	16,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	16,000	35,000
12,005	M12 X1	9,000	7,000	11,00	100,000	20,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	22,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	25,000	44,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine



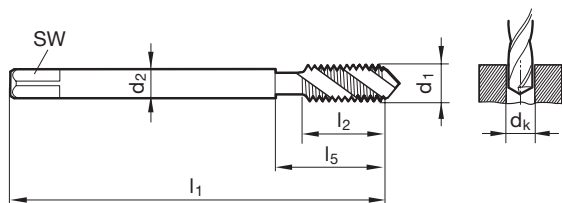
Catalogo n° 73187



P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm²



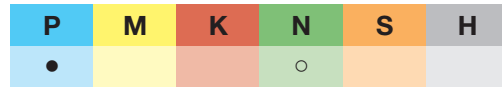
Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
6,004	M 6 X0,75	4,500	3,400	5,20	80,000	8,000	30,000
8,005	M 8 X1	6,000	4,900	7,00	90,000	11,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	11,000	35,000
10,006	M10 X1,25	7,000	5,500	8,80	100,000	14,000	39,000
12,005	M12 X1	9,000	7,000	11,00	100,000	11,000	40,000
12,006	M12 X1,25	9,000	7,000	10,80	100,000	16,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	16,000	40,000
14,005	M14 X1	11,000	9,000	13,00	100,000	11,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	15,000	44,000
18,007	M18 X1,5	14,000	11,000	16,50	110,000	16,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	16,000	44,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine

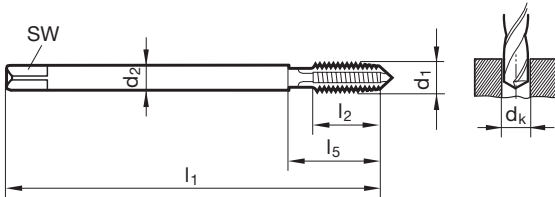


Catalogo n° 73237



Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- acciai fino a 800 N/mm²



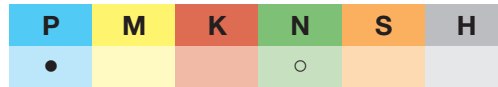
Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
8,004	M 8 X0,75	6,000	4,900	7,20	80,000	14,000	30,000
10,005	M10 X1	7,000	5,500	9,00	90,000	16,000	35,000
10,006	M10 X1,25	7,000	5,500	8,80	100,000	20,000	39,000
12,006	M12 X1,25	9,000	7,000	10,80	100,000	16,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	16,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	15,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	16,000	44,000
22,007	M22 X1,5	18,000	14,500	20,50	125,000	16,000	44,000
24,007	M24 X1,5	18,000	14,500	22,50	140,000	16,000	48,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine

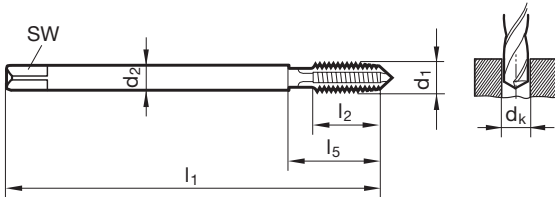


Catalogo n° 73250



Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- applicazioni generali
- acciai fino a 800 N/mm²



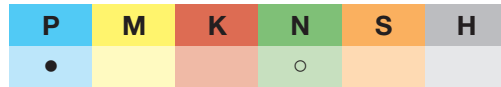
Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
4,003	M 4 X0,5	2,800	2,100	3,50	63,000	8,000	21,000
5,003	M 5 X0,5	3,500	2,700	4,50	70,000	10,000	25,000
6,003	M 6 X0,5	4,500	3,400	5,50	80,000	13,000	30,000
6,004	M 6 X0,75	4,500	3,400	5,20	80,000	13,000	30,000
8,004	M 8 X0,75	6,000	4,900	7,20	80,000	14,000	30,000
8,005	M 8 X1	6,000	4,900	7,00	90,000	16,000	35,000
9,005	M 9 X1	7,000	5,500	8,00	90,000	16,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	16,000	35,000
10,006	M10 X1,25	7,000	5,500	8,80	100,000	20,000	39,000
12,005	M12 X1	9,000	7,000	11,00	100,000	20,000	40,000
12,006	M12 X1,25	9,000	7,000	10,80	100,000	20,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,005	M14 X1	11,000	9,000	13,00	100,000	20,000	40,000
14,006	M14 X1,25	11,000	9,000	12,80	100,000	20,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,005	M16 X1	12,000	9,000	15,00	100,000	22,000	44,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	22,000	44,000
18,005	M18 X1	14,000	11,000	17,00	110,000	25,000	44,000
18,007	M18 X1,5	14,000	11,000	16,50	110,000	25,000	44,000
20,005	M20 X1	16,000	12,000	19,00	125,000	25,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	25,000	44,000
20,008	M20 X2	16,000	12,000	18,00	140,000	32,000	60,000
22,005	M22 X1	18,000	14,500	21,00	125,000	25,000	44,000
22,007	M22 X1,5	18,000	14,500	20,50	125,000	25,000	44,000
24,007	M24 X1,5	18,000	14,500	22,50	140,000	28,000	48,000
24,008	M24 X2	18,000	14,500	22,00	140,000	28,000	48,000
27,007	M27 X1,5	20,000	16,000	25,50	140,000	28,000	53,000
30,007	M30 X1,5	22,000	18,000	28,50	150,000	28,000	53,000
30,008	M30 X2	22,000	18,000	28,00	150,000	28,000	53,000
36,007	M36 X1,5	28,000	22,000	34,50	170,000	30,000	56,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine

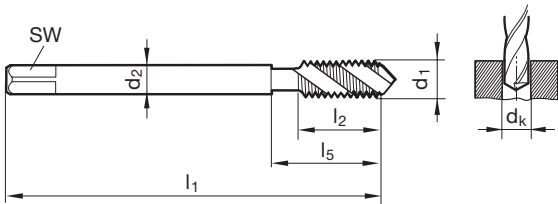


Catalogo n° 73173



Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm²



Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
3,002	M 3 X0,35	2,200		2,65	56,000	4,000	18,000
4,003	M 4 X0,5	2,800	2,100	3,50	63,000	5,000	21,000
5,003	M 5 X0,5	3,500	2,700	4,50	70,000	5,000	25,000
6,003	M 6 X0,5	4,500	3,400	5,50	80,000	5,000	30,000
6,004	M 6 X0,75	4,500	3,400	5,20	80,000	8,000	30,000
8,004	M 8 X0,75	6,000	4,900	7,20	80,000	8,000	30,000
8,005	M 8 X1	6,000	4,900	7,00	90,000	11,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	11,000	35,000
10,006	M10 X1,25	7,000	5,500	8,80	100,000	14,000	39,000
11,005	M11 X1	8,000	6,200	10,00	90,000	11,000	33,000
12,005	M12 X1	9,000	7,000	11,00	100,000	11,000	40,000
12,006	M12 X1,25	9,000	7,000	10,80	100,000	16,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	16,000	40,000
14,005	M14 X1	11,000	9,000	13,00	100,000	11,000	40,000
14,006	M14 X1,25	11,000	9,000	12,80	100,000	15,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,005	M16 X1	12,000	9,000	15,00	100,000	11,000	44,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	15,000	44,000
18,005	M18 X1	14,000	11,000	17,00	110,000	12,000	44,000
18,007	M18 X1,5	14,000	11,000	16,50	110,000	16,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	16,000	44,000
22,007	M22 X1,5	18,000	14,500	20,50	125,000	16,000	44,000
24,007	M24 X1,5	18,000	14,500	22,50	140,000	16,000	48,000
24,008	M24 X2	18,000	14,500	22,00	140,000	22,000	48,000
26,007	M26 X1,5	18,000	14,500	24,50	140,000	20,000	50,000
30,007	M30 X1,5	22,000	18,000	28,50	150,000	20,000	53,000
30,008	M30 X2	22,000	18,000	28,00	150,000	20,000	53,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine



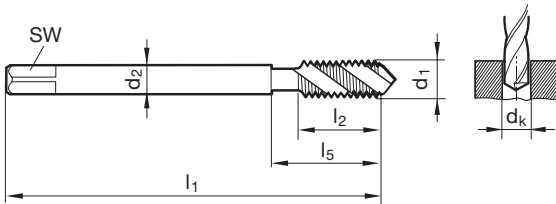
Catalogo n° 63173



P	M	K	N	S	H
●			○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm²



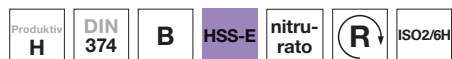
Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
8,005	M 8 X1	6,000	4,900	7,00	90,000	11,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	11,000	35,000
10,006	M10 X1,25	7,000	5,500	8,80	100,000	14,000	39,000
12,005	M12 X1	9,000	7,000	11,00	100,000	11,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	16,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	15,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	16,000	44,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine



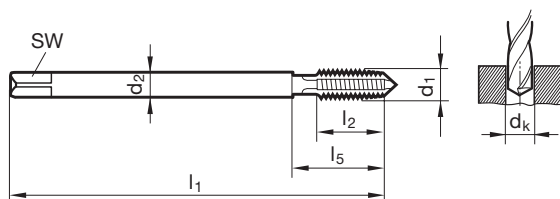
Catalogo n° 73646



P	M	K	N	S	H
●		○			

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai ad alta resistenza
- acciaio da 1100 a 1600 N/mm²



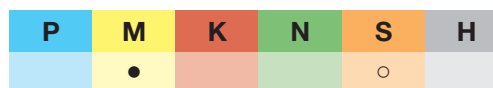
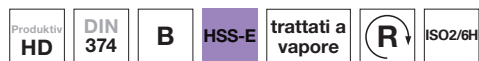
Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
3,002	M 3 X0,35	2,200		2,65	56,000	7,000	18,000
4,003	M 4 X0,5	2,800	2,100	3,50	63,000	8,000	21,000
5,003	M 5 X0,5	3,500	2,700	4,50	70,000	10,000	25,000
6,004	M 6 X0,75	4,500	3,400	5,20	80,000	13,000	30,000
8,004	M 8 X0,75	6,000	4,900	7,20	80,000	14,000	30,000
8,005	M 8 X1	6,000	4,900	7,00	90,000	16,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	16,000	35,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	22,000	44,000
18,007	M18 X1,5	14,000	11,000	16,50	110,000	25,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	25,000	44,000
22,007	M22 X1,5	18,000	14,500	20,50	125,000	25,000	44,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine

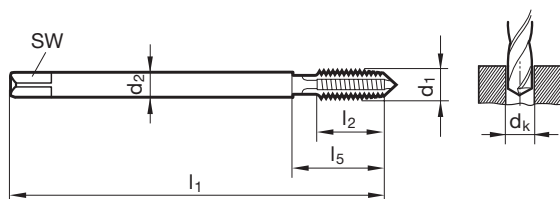


Catalogo n° 73178



Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



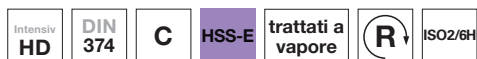
Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
5,003	M 5 X0,5	3,500	2,700	4,50	70,000	10,000	25,000
6,004	M 6 X0,75	4,500	3,400	5,20	80,000	13,000	30,000
8,005	M 8 X1	6,000	4,900	7,00	90,000	16,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	16,000	35,000
12,005	M12 X1	9,000	7,000	11,00	100,000	20,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	22,000	44,000
18,007	M18 X1,5	14,000	11,000	16,50	110,000	25,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	25,000	44,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine



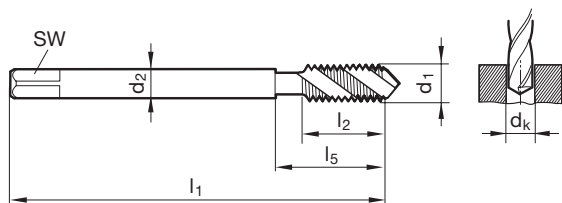
Catalogo n° 73180



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



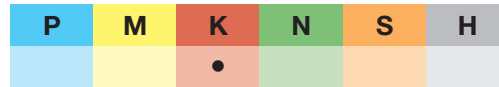
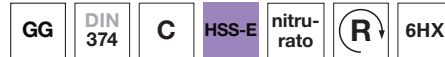
Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
8,005	M 8 X1	6,000	4,900	7,00	90,000	11,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	11,000	35,000
12,005	M12 X1	9,000	7,000	11,00	100,000	11,000	40,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	16,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	15,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	15,000	44,000
18,007	M18 X1,5	14,000	11,000	16,50	110,000	16,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	16,000	44,000

Maschi a macchina

Maschi a macchina per fil. metr. ISO passo fine

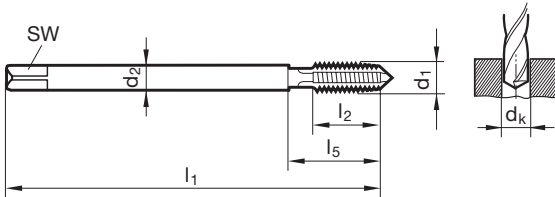


Catalogo n° 73194



Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
8,005	M 8 X1	6,000	4,900	7,00	90,000	16,000	35,000
10,005	M10 X1	7,000	5,500	9,00	90,000	16,000	35,000
12,007	M12 X1,5	9,000	7,000	10,50	100,000	20,000	40,000
14,007	M14 X1,5	11,000	9,000	12,50	100,000	20,000	40,000
16,007	M16 X1,5	12,000	9,000	14,50	100,000	22,000	44,000
18,007	M18 X1,5	14,000	11,000	16,50	110,000	25,000	44,000
20,007	M20 X1,5	16,000	12,000	18,50	125,000	25,000	44,000

Maschi a macchina

Maschi a macchina per filettatura UNC



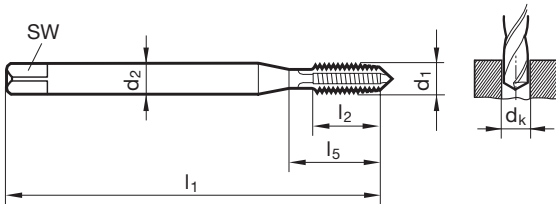
Catalogo n° 73308

Produttiv N	~DIN 371	B	HSS-E	trattati a vapore	R	2B
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P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm²



Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
2,845	4 -40	3,500	2,700	2,35	56,000	11,000	18,000
3,505	6 -32	4,000	3,000	2,85	56,000	12,000	20,000
4,166	8 -32	4,500	3,400	3,50	63,000	12,000	21,000
4,826	10 -24	6,000	4,900	3,90	70,000	14,000	25,000
6,350	1/4 -20	7,000	5,500	5,10	80,000	16,000	30,000
7,938	5/16 -18	8,000	6,200	6,60	90,000	18,000	35,000
9,525	3/8 -16	10,000	8,000	8,00	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura UNC



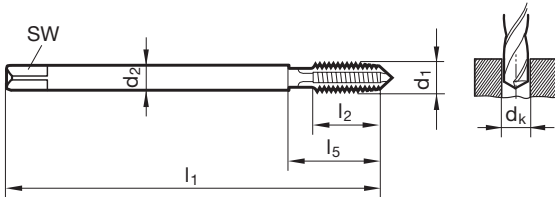
Catalogo n° 73309

Produttività N	~DIN 376	B	HSS-E	trattati a vapore	R	2B
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P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm²



Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
12,700	1/2 -13	9,000	7,000	10,80	110,000	25,000	49,000
15,875	5/8 -11	12,000	9,000	13,50	110,000	30,000	53,000
19,050	3/4 -10	14,000	11,000	16,50	125,000	33,000	62,000

Maschi a macchina

Maschi a macchina per filettatura UNC



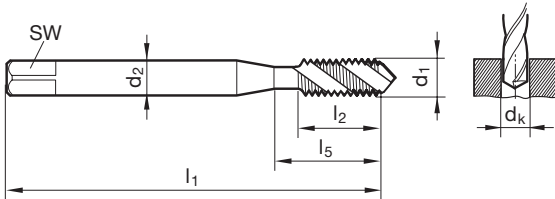
Catalogo n° 73322

Intensiv N	~DIN 371	C	HSS-E	trattati a vapore	R	2B
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P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm²



Codice	d1	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
2,845	4 -40	3,500	2,700	2,35	56,000	7,000	18,000
3,505	6 -32	4,000	3,000	2,85	56,000	8,000	20,000
4,166	8 -32	4,500	3,400	3,50	63,000	8,000	21,000
4,826	10 -24	6,000	4,900	3,90	70,000	11,000	25,000
6,350	1/4 -20	7,000	5,500	5,10	80,000	13,000	30,000
7,938	5/16 -18	8,000	6,200	6,60	90,000	14,000	35,000
9,525	3/8 -16	10,000	8,000	8,00	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura UNC



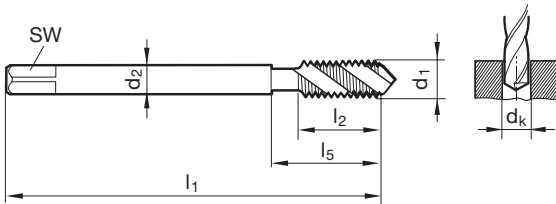
Catalogo n° 73323

Intensiv N	~DIN 376	C	HSS-E	trattati a vapore	R	2B
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P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm²



Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
12,700	1/2 -13	9,000	7,000	10,80	110,000	20,000	49,000
15,875	5/8 -11	12,000	9,000	13,50	110,000	24,000	53,000
19,050	3/4 -10	14,000	11,000	16,50	125,000	25,000	62,000

Maschi a macchina

Maschi a macchina per filettatura UNC



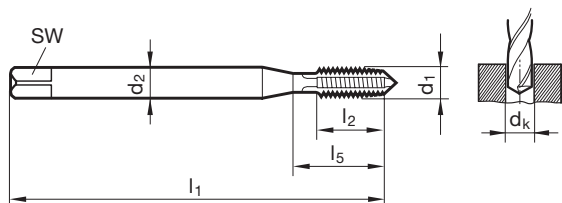
Catalogo n° 73297

Produttività HD	~DIN 371	B	HSS-E	trattati a vapore	R	2B
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P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
2,845	4 -40	3,500	2,700	2,35	56,000	11,000	18,000
3,505	6 -32	4,000	3,000	2,85	56,000	12,000	20,000
4,166	8 -32	4,500	3,400	3,50	63,000	12,000	21,000
4,826	10 -24	6,000	4,900	3,90	70,000	14,000	25,000
6,350	1/4 -20	7,000	5,500	5,10	80,000	16,000	30,000
7,938	5/16 -18	8,000	6,200	6,60	90,000	18,000	35,000
9,525	3/8 -16	10,000	8,000	8,00	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura UNC



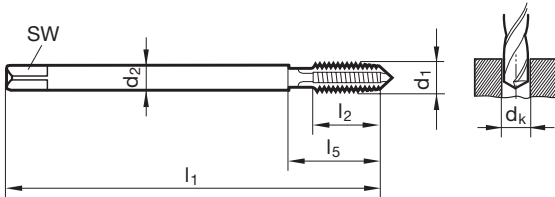
Catalogo n° 73298

Produttività HD	~DIN 376	B	HSS-E	trattati a vapore	R	2B
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P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



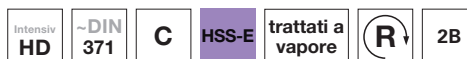
Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
12,700	1/2 -13	9,000	7,000	10,80	110,000	25,000	49,000
15,875	5/8 -11	12,000	9,000	13,50	110,000	30,000	53,000
19,050	3/4 -10	14,000	11,000	16,50	125,000	33,000	62,000
25,400	1 - 8	18,000	14,500	22,25	160,000	38,000	73,000

Maschi a macchina

Maschi a macchina per filettatura UNC



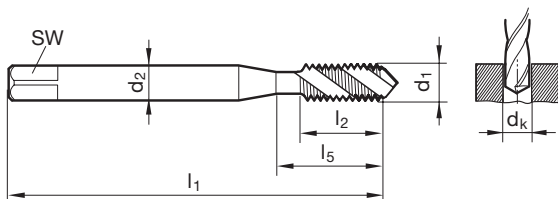
Catalogo n° 73304



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
2,845	4 -40	3,500	2,700	2,35	56,000	7,000	18,000
3,505	6 -32	4,000	3,000	2,85	56,000	8,000	20,000
4,166	8 -32	4,500	3,400	3,50	63,000	8,000	21,000
4,826	10 -24	6,000	4,900	3,90	70,000	11,000	25,000
6,350	1/4 -20	7,000	5,500	5,10	80,000	13,000	30,000
7,938	5/16 -18	8,000	6,200	6,60	90,000	14,000	35,000
9,525	3/8 -16	10,000	8,000	8,00	100,000	16,000	39,000

Maschi a macchina

Maschi a macchina per filettatura UNC



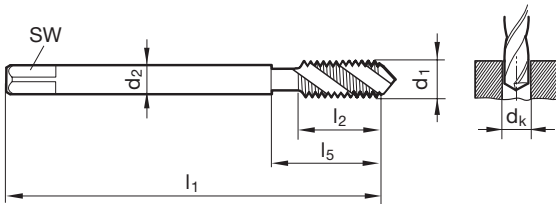
Catalogo n° 73305



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
12,700	1/2 -13	9,000	7,000	10,80	110,000	20,000	49,000
15,875	5/8 -11	12,000	9,000	13,50	110,000	24,000	53,000
19,050	3/4 -10	14,000	11,000	16,50	125,000	25,000	62,000

Maschi a macchina

Maschi a macchina per filettatura UNC



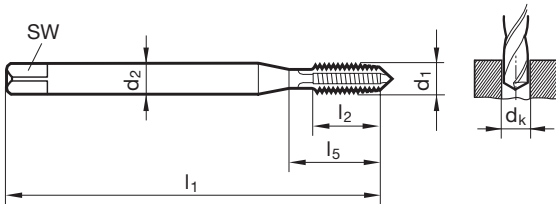
Catalogo n° 73326

GG	~DIN 371	C	HSS-E	nitru- rato	R	2B
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P	M	K	N	S	H
		•			

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
4,166	8 -32	4,500	3,400	3,50	63,000	12,000	21,000
4,826	10 -24	6,000	4,900	3,90	70,000	14,000	25,000
6,350	1/4 -20	7,000	5,500	5,10	80,000	16,000	30,000
7,938	5/16-18	8,000	6,200	6,60	90,000	18,000	35,000
9,525	3/8 -16	10,000	8,000	8,00	100,000	20,000	39,000

Maschi a macchina

Maschi a macchina per filettatura UNC



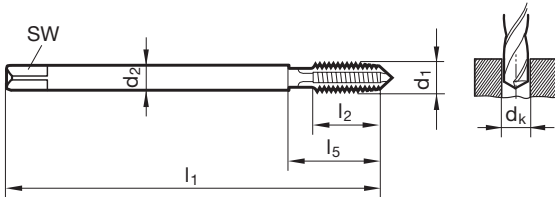
Catalogo n° 73327

GG	~DIN 376	C	HSS-E	nitru- rato	R	2B
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P	M	K	N	S	H
		•			

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
12,700	1/2 -13	9,000	7,000	10,80	110,000	25,000	49,000
15,875	5/8 -11	12,000	9,000	13,50	110,000	30,000	53,000
19,050	3/4 -10	14,000	11,000	16,50	125,000	33,000	62,000
25,400	1 - 8	18,000	14,500	22,25	160,000	38,000	73,000

Maschi a macchina

Maschi a macchina per filettatura UNF



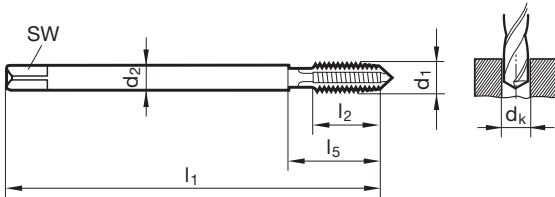
Catalogo n° 73310

Produttiv N	~DIN 374	B	HSS-E	trattati a vapore	R	2B
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P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm²



Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
4,826	10 -32	3,500	2,700	4,10	70,000	14,000	25,000
6,350	1/4 -28	4,500	3,400	5,50	80,000	16,000	30,000
9,525	3/8 -24	7,000	5,500	8,50	90,000	18,000	35,000
15,875	5/8 -18	12,000	9,000	14,50	100,000	22,000	44,000

Maschi a macchina

Maschi a macchina per filettatura UNF



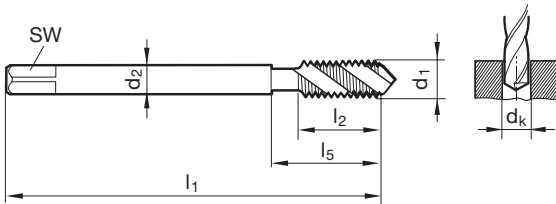
Catalogo n° 73324

Intensiv N	~DIN 374	C	HSS-E	trattati a vapore	R	2B
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P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm²



Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
4,826	10 -32	3,500	2,700	4,10	70,000	8,500	25,000
6,350	1/4 -28	4,500	3,400	5,50	80,000	9,000	30,000
7,938	5/16-24	6,000	4,900	6,90	90,000	11,000	35,000
9,525	3/8 -24	7,000	5,500	8,50	90,000	11,000	35,000
11,113	7/16-20	8,000	6,200	9,90	100,000	13,000	42,000
12,700	1/2 -20	9,000	7,000	11,50	100,000	13,000	40,000
15,875	5/8 -18	12,000	9,000	14,50	100,000	15,000	44,000

Maschi a macchina

Maschi a macchina per filettatura UNF



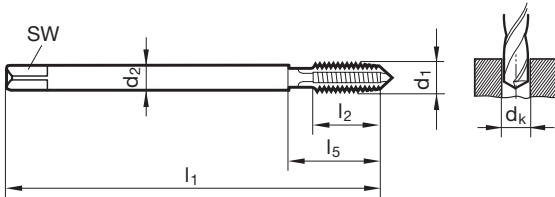
Catalogo n° 73299

Produttività HD	~DIN 374	B	HSS-E	trattati a vapore	R	2B
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P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
4,826	10 -32	3,500	2,700	4,10	70,000	14,000	25,000
6,350	1/4 -28	4,500	3,400	5,50	80,000	16,000	30,000
9,525	3/8 -24	7,000	5,500	8,50	90,000	18,000	35,000
15,875	5/8 -18	12,000	9,000	14,50	100,000	22,000	44,000

Maschi a macchina

Maschi a macchina per filettatura UNF



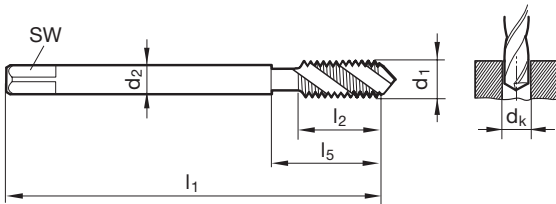
Catalogo n° 73306



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



Codice	d1	d2	SW	dk	l1	l2	l5
		mm	mm	mm	mm	mm	mm
4,826	10 -32	3,500	2,700	4,10	70,000	8,500	25,000
6,350	1/4 -28	4,500	3,400	5,50	80,000	9,000	30,000
7,938	5/16-24	6,000	4,900	6,90	90,000	11,000	35,000
9,525	3/8 -24	7,000	5,500	8,50	90,000	11,000	35,000
11,113	7/16-20	8,000	6,200	9,90	100,000	13,000	42,000
12,700	1/2 -20	9,000	7,000	11,50	100,000	13,000	40,000
15,875	5/8 -18	12,000	9,000	14,50	100,000	15,000	44,000
19,050	3/4 -16	14,000	11,000	17,50	110,000	16,000	44,000

Maschi a macchina

Maschi a macchina per filettatura NPT



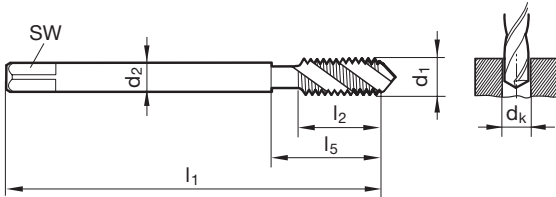
Catalogo n° 73293



P	M	K	N	S	H
○	●	○	○	○	○

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra di circa 25°
- per profondità di filetto fino a 2xD
- evacuazione truciolo nella direzione del codolo



Codice	d1	P	d2	SW	dk	l1	l2	l5
		G/inch	mm	mm	mm	mm	mm	mm
10,620	1/8	27,000	11,000	9,000	8,50	90,000	15,000	29,000
14,140	1/4	18,000	14,000	11,000	11,20	100,000	21,000	40,000
17,570	3/8	18,000	16,000	12,000	14,40	110,000	21,000	35,000
21,900	1/2	14,000	18,000	14,500	18,00	125,000	27,000	44,000
27,230	3/4	14,000	22,000	18,000	23,40	140,000	27,000	52,000

Maschi a macchina

Maschi a macchina per filettatura Whitworth BSP



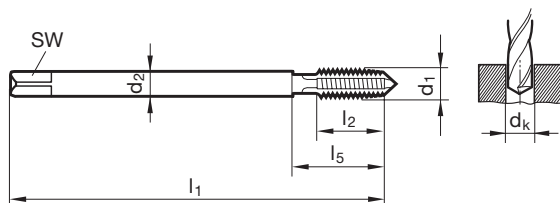
Catalogo n° 73321



P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm²



Codice	d1	P	d2	SW	dk	l1	l2	l5
		G/inch	mm	mm	mm	mm	mm	mm
9,728	G 1/8	28,000	7,000	5,500	8,80	90,000	18,000	35,000
13,157	G 1/4	19,000	11,000	9,000	11,80	100,000	20,000	40,000
16,662	G 3/8	19,000	12,000	9,000	15,25	100,000	22,000	44,000
20,955	G 1/2	14,000	16,000	12,000	19,00	125,000	25,000	44,000
26,441	G 3/4	14,000	20,000	16,000	24,50	140,000	28,000	53,000
33,249	G1	11,000	25,000	20,000	30,75	160,000	30,000	56,000

Maschi a macchina

Maschi a macchina per filettatura Whitworth BSP



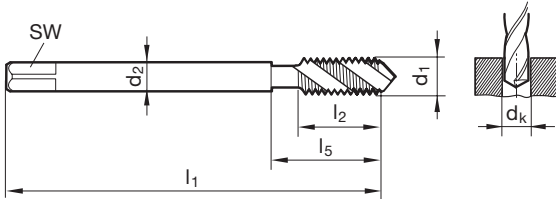
Catalogo n° 73325



P	M	K	N	S	H
●	○	○	○		

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciai fino a 1100 N/mm²



Codice	d1	P	d2	SW	dk	l1	l2	l5
		G/inch	mm	mm	mm	mm	mm	mm
9,728	G 1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000
13,157	G 1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000
16,662	G 3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000
20,955	G 1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000
26,441	G 3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000
33,249	G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000

Maschi a macchina

Maschi a macchina per filettatura Whitworth BSP



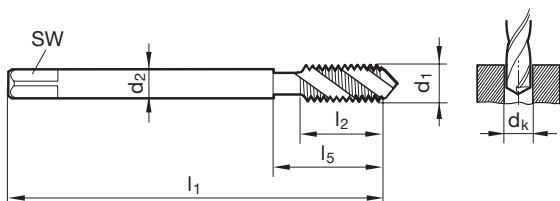
Catalogo n° 53788



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 45°
- evacuazione truciolo nella direzione del codolo
- uso universale
- acciaio 600-1300 N / mm²
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise



Codice	d1	P	d2	SW	dk	l1	l2	l5
		G/inch	mm	mm	mm	mm	mm	mm
7,723	G 1/16	28,000	6,000	4,900	6,80	90,000	11,000	30,000
9,728	G 1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000
13,157	G 1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000
16,662	G 3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000
20,955	G 1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000
22,911	G 5/8	14,000	18,000	14,500	21,00	125,000	18,000	48,000
26,441	G 3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000
30,201	G 7/8	14,000	22,000	18,000	28,25	150,000	22,000	53,000
33,249	G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000

Maschi a macchina

Maschi a macchina per filettatura Whitworth BSP



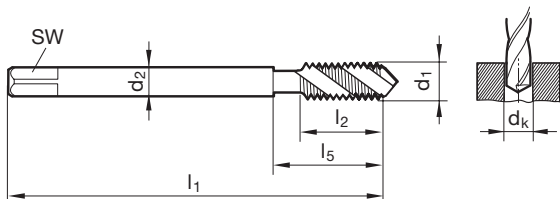
Catalogo n° 73286



P	M	K	N	S	H
●			○		

Parametri di lav. ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- applicazioni generali
- acciai fino a 800 N/mm²



Codice	d1	P	d2	SW	dk	l1	l2	l5
		G/inch	mm	mm	mm	mm	mm	mm
9,728	G 1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000
13,157	G 1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000
16,662	G 3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000
20,955	G 1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000
26,441	G 3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000
33,249	G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000
41,910	G1 1/4	11,000	32,000	24,000	39,50	170,000	25,000	57,000
47,803	G1 1/2	11,000	36,000	29,000	45,25	190,000	27,000	60,000

Maschi a macchina

Maschi a macchina per filettatura Whitworth BSP



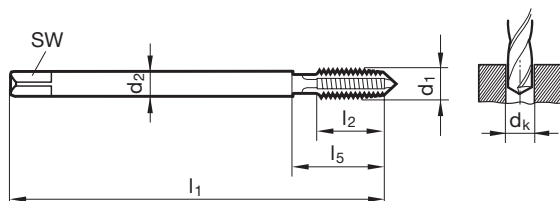
Catalogo n° 73300



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



Codice	d1	P	d2	SW	dk	l1	l2	l5
		G/inch	mm	mm	mm	mm	mm	mm
9,728	G 1/8	28,000	7,000	5,500	8,80	90,000	18,000	35,000
13,157	G 1/4	19,000	11,000	9,000	11,80	100,000	20,000	40,000
16,662	G 3/8	19,000	12,000	9,000	15,25	100,000	22,000	44,000
20,955	G 1/2	14,000	16,000	12,000	19,00	125,000	25,000	44,000
26,441	G 3/4	14,000	20,000	16,000	24,50	140,000	28,000	53,000
33,249	G1	11,000	25,000	20,000	30,75	160,000	30,000	56,000

Maschi a macchina

Maschi a macchina per filettatura Whitworth BSP



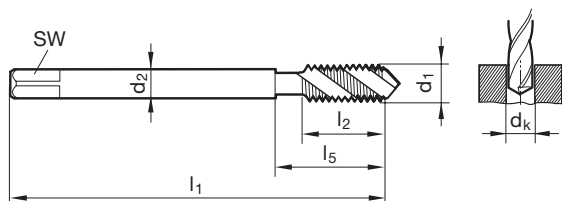
Catalogo n° 73288



P	M	K	N	S	H
	•			○	

Parametri di lav.
ind. a pag. 348

- per fori ciechi
- scanalature con torsione destra 40°
- evacuazione truciolo nella direzione del codolo
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



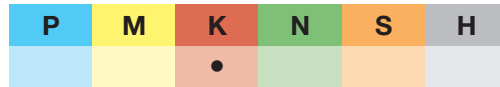
Codice	d1	P	d2	SW	dk	l1	l2	l5
		G/inch	mm	mm	mm	mm	mm	mm
9,728	G 1/8	28,000	7,000	5,500	8,80	90,000	11,000	35,000
13,157	G 1/4	19,000	11,000	9,000	11,80	100,000	14,000	40,000
16,662	G 3/8	19,000	12,000	9,000	15,25	100,000	14,000	44,000
20,955	G 1/2	14,000	16,000	12,000	19,00	125,000	18,000	44,000
26,441	G 3/4	14,000	20,000	16,000	24,50	140,000	20,000	53,000
33,249	G1	11,000	25,000	20,000	30,75	160,000	24,000	56,000

Maschi a macchina

Maschi a macchina per filettatura Whitworth BSP

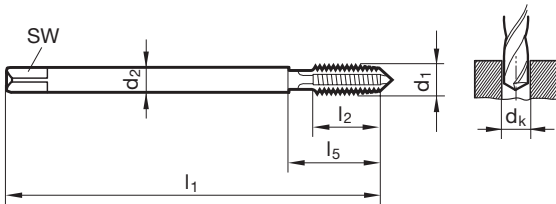


Catalogo n° 73345



Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- ghise come ghisa grigia, ghisa temprata e ghisa sferoidale



Codice	d1	P	d2	SW	dk	l1	l2	l5
		G/inch	mm	mm	mm	mm	mm	mm
9,728	G 1/8	28,000	7,000	5,500	8,80	90,000	18,000	35,000
13,157	G 1/4	19,000	11,000	9,000	11,80	100,000	20,000	40,000
16,662	G 3/8	19,000	12,000	9,000	15,25	100,000	22,000	44,000
20,955	G 1/2	14,000	16,000	12,000	19,00	125,000	25,000	44,000
26,441	G 3/4	14,000	20,000	16,000	24,50	140,000	28,000	53,000
33,249	G1	11,000	25,000	20,000	30,75	160,000	30,000	56,000

Maschi a macchina

Maschi a macchina per filettatura Whitworth BSP



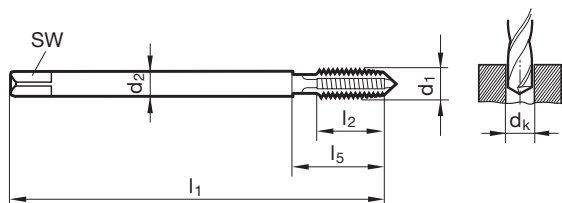
Catalogo n° 53787



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciaio 600-1300 N / mm²
- acciai inossidabili e resist. al calore
- metalli non ferrosi
- ghise



Codice	d1	P	d2	SW	dk	l1	l2	l5
		G/inch	mm	mm	mm	mm	mm	mm
7,723	G 1/16	28,000	6,000	4,900	6,80	90,000	18,000	30,000
9,728	G 1/8	28,000	7,000	5,500	8,80	90,000	18,000	35,000
13,157	G 1/4	19,000	11,000	9,000	11,80	100,000	20,000	40,000
16,662	G 3/8	19,000	12,000	9,000	15,25	100,000	22,000	44,000
20,955	G 1/2	14,000	16,000	12,000	19,00	125,000	25,000	44,000
22,911	G 5/8	14,000	18,000	14,500	21,00	125,000	25,000	48,000
26,441	G 3/4	14,000	20,000	16,000	24,50	140,000	28,000	53,000
30,201	G 7/8	14,000	22,000	18,000	28,25	150,000	28,000	53,000
33,249	G1	11,000	25,000	20,000	30,75	160,000	30,000	56,000

Maschi a macchina

Maschi a macchina per filettatura Pg



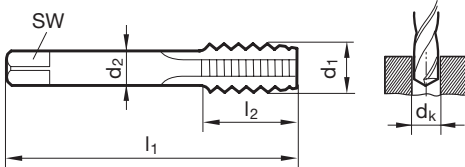
Catalogo n° 73296



P	M	K	N	S	H
●		○	○		

Parametri di lav.
ind. a pag. 348

- per fori passanti
- con smusso
- evacuazione truciolo nel senso di avanzamento
- uso universale
- acciai fino a 1100 N/mm²



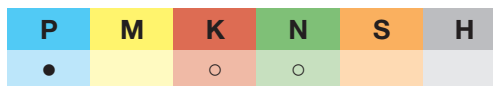
Codice	d1	P G/inch	d2 mm	SW mm	dk mm	l1 mm	l2 mm
12,500	PG 7	20,000	9,000	7,000	11,40	70,000	22,000
15,200	PG 9	18,000	12,000	9,000	14,00	70,000	22,000
18,600	PG 11	18,000	14,000	11,000	17,30	80,000	22,000
20,400	PG 13,5	18,000	16,000	12,000	19,00	80,000	22,000
22,500	PG 16	18,000	18,000	14,500	21,30	80,000	22,000

Maschi a macchina

Maschi corti per filettatura NPT

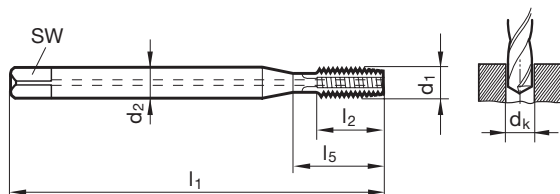


Catalogo n° 73295



Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per profondità di filetto fino a 1xD
- uso universale
- acciai fino a 1100 N/mm²



Codice	d1	P G/inch	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
8,190	1/16	27,000	6,000	4,900	6,15	56,000	14,000	27,000
10,620	1/8	27,000	7,000	5,500	8,40	63,000	15,000	29,000
14,140	1/4	18,000	11,000	9,000	11,10	63,000	21,000	33,000
17,570	3/8	18,000	12,000	9,000	14,30	70,000	21,000	35,000
21,900	1/2	14,000	16,000	12,000	17,90	80,000	27,000	41,000
27,230	3/4	14,000	20,000	16,000	23,30	100,000	27,000	42,000
34,180	1	11,500	25,000	20,000	29,00	110,000	32,000	53,000

Maschi a macchina a rullare

Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO



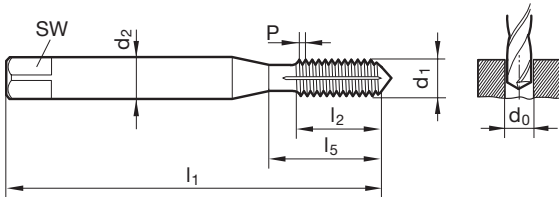
Catalogo n° 73120

Durativ	~DIN 371	C	HSS-E	lucido	R	6HX
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P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M 3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M 4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M 8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M 10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

Maschi a macchina a rullare

Maschi a macchina a rullare con canali di lubr. per fil. metrica ISO



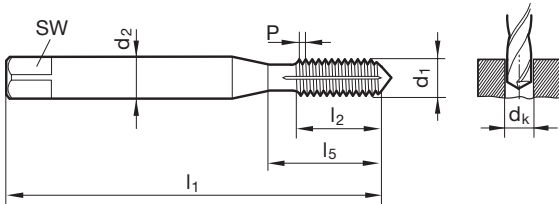
Catalogo n° 63120

Durativ	~DIN 371	C	HSS-E	TiN	R	6HX
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P	M	K	N	S	H
•	•		•		

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M 8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

Maschi a macchina a rullare

Maschi a macchina a rullare con canali di lubr. per fil. metrica ISO



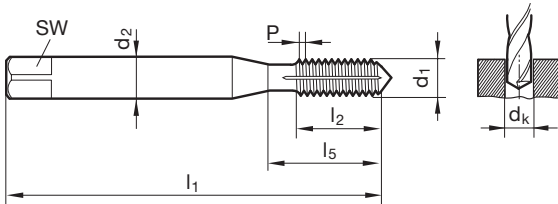
Catalogo n° 63119

Durativ	~DIN 371	C	HSS-E	TiN	R	6GX
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P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M 8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

Maschi a macchina a rullare

Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO



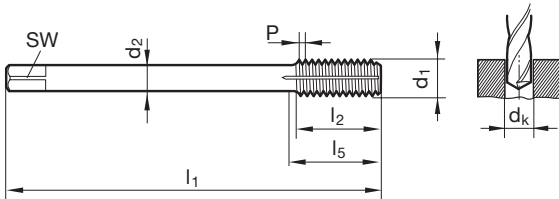
Catalogo n° 63122

Durativ	~DIN 376	C	HSS-E	TiN		6HX
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P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000

Maschi a macchina a rullare

Maschi a macchina a rullare con canali di lubr. per fil. metrica ISO



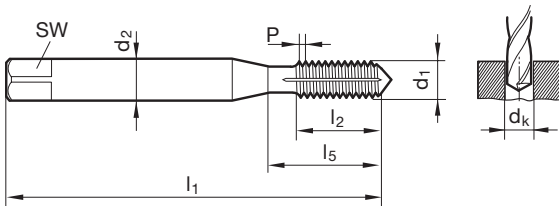
Catalogo n° 53620

Durativ	~DIN 371	C	HSS-E- PM	Al- CrN	R	6HX
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P	M	K	N	S	H
•	•		•		

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M 8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

Maschi a macchina a rullare

Maschi a macchina a rullare con canalini di lubr. per fil. metrica ISO



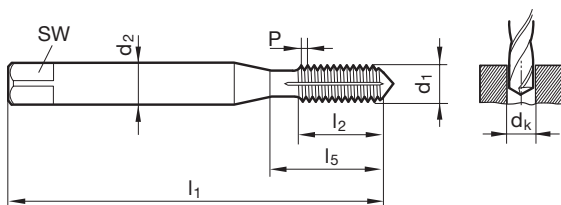
Catalogo n° 53621

Durativ	~DIN 371	C	HSS-E- PM	Al- CrN	R	6GX
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P	M	K	N	S	H
•	•		•		

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M 8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

Maschi a macchina a rullare

Maschi a macchina a rullare con canali di lubr. per fil. metrica ISO



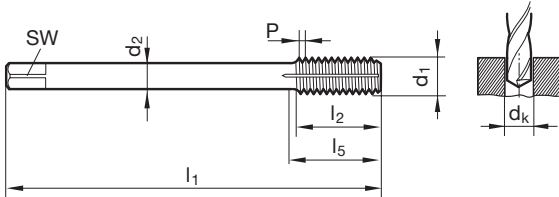
Catalogo n° 53622

Durativ	~DIN 376	C	HSS-E- PM	Al- CrN	R	6HX
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P	M	K	N	S	H
•	•		•		

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M14	2,000	11,000	9,000	13,10	110,000	26,000	53,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Maschi a macchina a rullare

Maschi a rullare forati per fil. metrica ISO



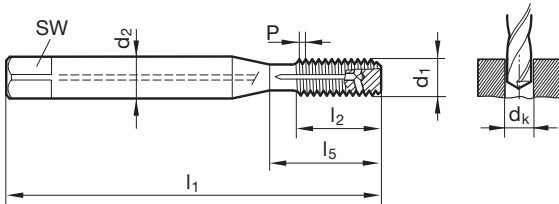
Catalogo n° 63013

Durativ	~DIN 371	C	VHM	TiCN	R	6HX
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P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 3	0,500	3,500	2,700	2,80	56,000	6,000	18,000
M 4	0,700	4,500	3,400	3,70	63,000	7,500	21,000
M 5	0,800	6,000	4,900	4,65	70,000	8,500	25,000
M 6	1,000	6,000	4,900	5,55	80,000	11,000	30,000
M 8	1,250	8,000	6,200	7,40	90,000	14,000	35,000
M10	1,500	10,000	8,000	9,30	100,000	16,000	39,000

Maschi a macchina a rullare

Maschi a macchina a rullare senza canalini di lub. per fil. metrica ISO



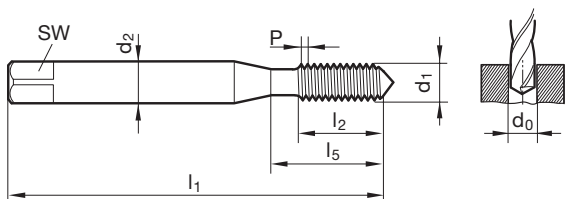
Catalogo n° 73121



P	M	K	N	S	H
•	•		•		

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



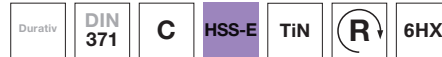
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M 2,2	0,450	2,800	2,100	2,03	45,000	9,000	14,500
M 2,3	0,400	2,800	2,100	2,10	45,000	9,000	14,500
M 2,5	0,450	2,800	2,100	2,30	50,000	9,000	14,500
M 3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M 3,5	0,600	4,000	3,000	3,25	56,000	12,000	20,000
M 4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M 8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M 10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

Maschi a macchina a rullare

Maschi a macchina a rullare senza canalini di lub. per fil. metrica ISO



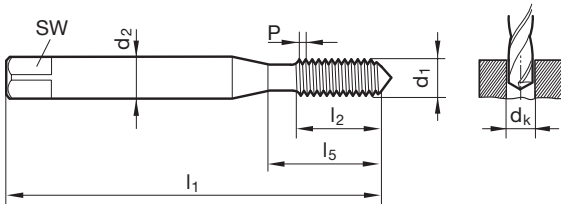
Catalogo n° 63121



P	M	K	N	S	H
•	•		•		

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



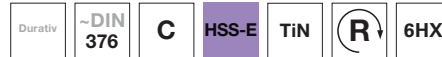
d1	P	d2	SW	dk	l1	l2	l5
	mm	mm	mm	mm	mm	mm	mm
M 2	0,400	2,800	2,100	1,85	45,000	8,000	13,500
M 3	0,500	3,500	2,700	2,80	56,000	10,000	18,000
M 4	0,700	4,500	3,400	3,70	63,000	12,000	21,000
M 5	0,800	6,000	4,900	4,65	70,000	14,000	25,000
M 6	1,000	6,000	4,900	5,55	80,000	16,000	30,000
M 8	1,250	8,000	6,200	7,40	90,000	17,000	35,000
M 10	1,500	10,000	8,000	9,30	100,000	20,000	39,000

Maschi a macchina a rullare

Maschi a macchina a rullare senza canalini di lub. per fil. metrica ISO



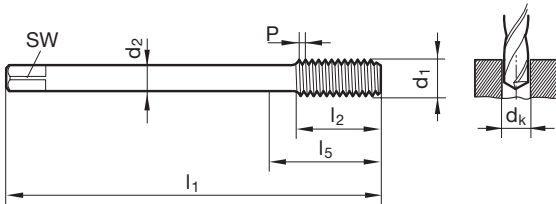
Catalogo n° 63123



P	M	K	N	S	H
•	•		•		

Parametri di lav.
ind. a pag. 348

- per fori passanti e ciechi
- per grandi profondità del filetto
- uso universale
- materiali in acciaio fino a 1000 N/mm²
- acciai inossidabili e resist. al calore
- materiali a truciolo lungo duri



d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M12	1,750	9,000	7,000	11,20	110,000	24,000	49,000
M16	2,000	12,000	9,000	15,10	110,000	26,000	54,000
M20	2,500	16,000	12,000	18,90	140,000	32,000	62,000

Frese a filettare

Frese a filettare con fase di svasatura per filettatura metrica ISO



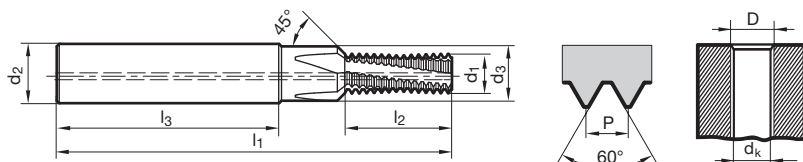
Catalogo n° 73810



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 348

- frese a filettare con smusso 45°, con taglienti e refrigerazione interna assiale
- uso universale



Codice	D	P mm	d1 mm	d2 mm	d3 mm	dk mm	l1 mm	l2 mm	l3 mm	Z
3,000	M 3	0,500	2,300	6,000	3,400	2,50	48,000	6,800	36,000	3
4,000	M 4	0,700	3,000	6,000	4,500	3,30	48,000	8,800	36,000	3
5,000	M 5	0,800	4,000	6,000	5,500	4,20	54,000	10,800	36,000	3
6,000	M 6	1,000	4,800	8,000	6,600	5,00	62,000	13,500	36,000	3
8,000	M 8	1,250	6,400	10,000	9,000	6,80	74,000	18,100	40,000	3
10,000	M10	1,500	7,950	12,000	11,000	8,50	80,000	21,800	45,000	4
12,000	M12	1,750	9,950	14,000	13,500	10,20	90,000	25,400	45,000	4
14,000	M14	2,000	11,200	16,000	15,500	12,00	102,000	31,000	48,000	4
16,000	M16	2,000	12,800	18,000	17,500	14,00	102,000	35,000	48,000	4
20,000	M20	2,500	14,500	20,000	21,500	17,50	125,000	41,300	50,000	4

Frese a filettare

Frese a filettare con fase di svasatura per filettatura metrica ISO



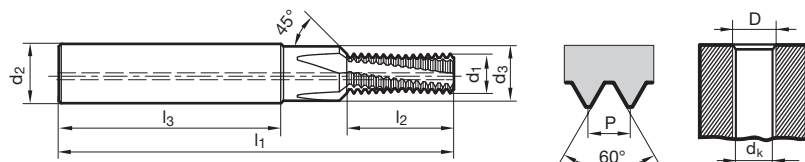
Catalogo n° 53810



P	M	K	N	S	H
●	●	●	●	●	○

Parametri di lav.
ind. a pag. 348

- frese a filettare con smusso 45°, con taglienti e refrigerazione interna assiale
- applicazione universale nella maggior parte dei materiali



Codice	D	P mm	d1 mm	d2 mm	d3 mm	dk mm	l1 mm	l2 mm	l3 mm	Z
3,000	M 3	0,500	2,300	6,000	3,400	2,50	48,000	6,800	36,000	3
4,000	M 4	0,700	3,000	6,000	4,500	3,30	48,000	8,800	36,000	3
5,000	M 5	0,800	4,000	6,000	5,500	4,20	54,000	10,800	36,000	3
6,000	M 6	1,000	4,800	8,000	6,600	5,00	62,000	13,500	36,000	3
8,000	M 8	1,250	6,400	10,000	9,000	6,80	74,000	18,100	40,000	3
10,000	M10	1,500	7,950	12,000	11,000	8,50	80,000	21,800	45,000	4
12,000	M12	1,750	9,950	14,000	13,500	10,20	90,000	25,400	45,000	4
14,000	M14	2,000	11,200	16,000	15,500	12,00	102,000	31,000	48,000	4
16,000	M16	2,000	12,800	18,000	17,500	14,00	102,000	35,000	48,000	4
20,000	M20	2,500	14,500	20,000	21,500	17,50	125,000	41,300	50,000	4

Frese a filettare

Frese a filettare con fase di svasatura per fil. metr. ISO passo fine



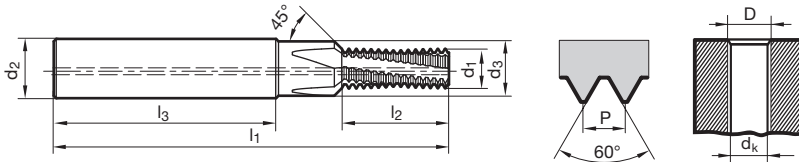
Catalogo n° 53820



P	M	K	N	S	H
●	●	●	●	●	○

Parametri di lav.
ind. a pag. 348

- frese a filettare con smusso 45°, con taglienti e refrigerazione interna assiale
- applicazione universale nella maggior parte dei materiali



Codice	D	d1 mm	d2 mm	d3 mm	dk mm	l1 mm	l2 mm	l3 mm	Z
4,003	M 4 X0,5	3,000	6,000	4,500	3,50	48,000	8,800	36,000	3
5,003	M 5 X0,5	4,000	6,000	5,500	4,50	54,000	10,800	36,000	3
6,003	M 6 X0,5	4,800	8,000	6,600	5,50	62,000	12,800	36,000	3
6,004	M 6 X0,75	4,800	8,000	6,600	5,20	62,000	13,100	36,000	3
8,004	M 8 X0,75	6,400	10,000	9,000	7,20	74,000	16,900	40,000	3
8,005	M 8 X1	6,400	10,000	9,000	7,00	74,000	17,500	40,000	3
10,005	M10 X1	7,950	12,000	11,000	9,00	80,000	21,500	45,000	4
10,006	M10 X1,25	7,950	12,000	11,000	8,80	80,000	21,900	45,000	4
12,005	M12 X1	9,950	14,000	13,500	11,00	90,000	25,500	45,000	4
12,007	M12 X1,5	9,950	14,000	13,500	10,50	90,000	26,300	45,000	4
14,007	M14 X1,5	11,200	16,000	15,500	12,50	102,000	30,800	48,000	4
16,007	M16 X1,5	12,800	18,000	17,500	14,50	102,000	33,800	48,000	4

Frese a filettare

Frese a filettare con fase di svasatura per fil. metr. ISO passo fine



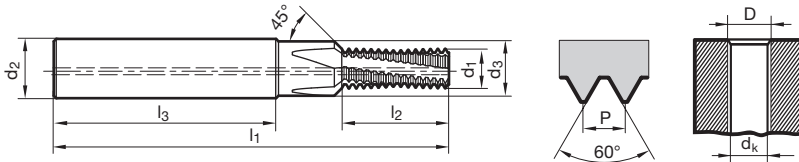
Catalogo n° 73820



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 348

- frese a filettare con smusso 45°, con taglienti e refrigerazione interna assiale
- applicazione universale nella maggior parte dei materiali



Codice	D	d1 mm	d2 mm	d3 mm	dk mm	l1 mm	l2 mm	l3 mm	Z
4,003	M 4 X0,5	3,000	6,000	4,500	3,50	48,000	8,800	36,000	3
5,003	M 5 X0,5	4,000	6,000	5,500	4,50	54,000	10,800	36,000	3
6,003	M 6 X0,5	4,800	8,000	6,600	5,50	62,000	12,800	36,000	3
6,004	M 6 X0,75	4,800	8,000	6,600	5,20	62,000	13,100	36,000	3
8,004	M 8 X0,75	6,400	10,000	9,000	7,20	74,000	16,900	40,000	3
8,005	M 8 X1	6,400	10,000	9,000	7,00	74,000	17,500	40,000	3
10,005	M10 X1	7,950	12,000	11,000	9,00	80,000	21,500	45,000	4
10,006	M10 X1,25	7,950	12,000	11,000	8,80	80,000	21,900	45,000	4
12,005	M12 X1	9,950	14,000	13,500	11,00	90,000	25,500	45,000	4
12,007	M12 X1,5	9,950	14,000	13,500	10,50	90,000	26,300	45,000	4
14,007	M14 X1,5	11,200	16,000	15,500	12,50	102,000	30,800	48,000	4
16,007	M16 X1,5	12,800	18,000	17,500	14,50	102,000	33,800	48,000	4

Frese a filettare

Frese a filettare senza fase di svasatura per filettatura metrica ISO



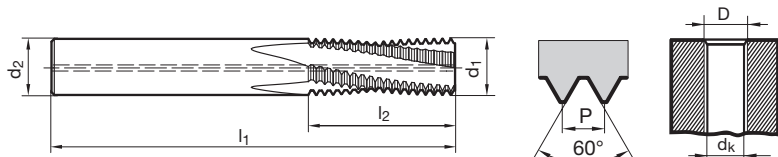
Catalogo n° 73830



P	M	K	N	S	H
•	•	•	•	•	

Parametri di lav.
ind. a pag. 348

- frese a filettare senza smusso, con taglienti e refrigerazione interna assiale
- applicazione universale nella maggior parte dei materiali



Codice	d1	P	d1	d2	dk	l1	l2	Z
		mm	mm	mm	mm	mm	mm	
6,000	M 6	1,000	4,800	6,000	5,00	54,000	13,500	3
8,000	M 8	1,250	6,400	8,000	6,80	62,000	18,100	3
8,005	M 8 X1	1,000	6,400	8,000	7,00	62,000	14,500	3
10,000	M10	1,500	7,950	10,000	8,50	74,000	21,800	3
10,005	M10 X1	1,000	7,950	10,000	9,00	74,000	14,500	3
10,006	M10 X1,25	1,250	7,950	10,000	8,80	74,000	18,100	3
12,000	M12	1,750	9,950	10,000	10,20	74,000	25,400	4
14,000	M14	2,000	11,200	12,000	12,00	90,000	31,000	4
14,007	M14 X1,5	1,500	11,200	12,000	12,50	90,000	23,300	4
16,000	M16	2,000	12,800	14,000	14,00	90,000	35,000	4
16,007	M16 X1,5	1,500	12,800	14,000	14,50	90,000	26,300	4
20,000	M20	2,500	14,950	16,000	17,50	102,000	41,300	4
20,007	M20 X1,5	1,500	14,950	16,000	18,50	102,000	24,800	4

Frese a filettare

Frese a filettare senza fase di svasatura per filettatura metrica ISO



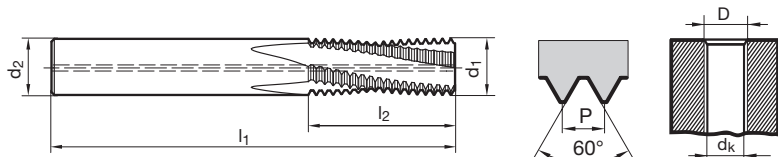
Catalogo n° 53830



P	M	K	N	S	H
●	●	●	●	●	○

Parametri di lav.
ind. a pag. 348

- frese a filettare senza smusso, con taglienti e refrigerazione interna assiale
- applicazione universale nella maggior parte dei materiali



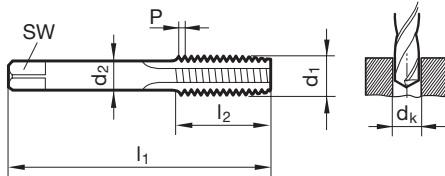
Codice	d1	P	d1	d2	dk	l1	l2	Z
		mm	mm	mm	mm	mm	mm	
6,000	M 6	1,000	4,800	6,000	5,00	54,000	13,500	3
8,000	M 8	1,250	6,400	8,000	6,80	62,000	18,100	3
8,005	M 8 X1	1,000	6,400	8,000	7,00	62,000	14,500	3
10,000	M10	1,500	7,950	10,000	8,50	74,000	21,800	3
10,005	M10 X1	1,000	7,950	10,000	9,00	74,000	14,500	3
10,006	M10 X1,25	1,250	7,950	10,000	8,80	74,000	18,100	3
12,000	M12	1,750	9,950	10,000	10,20	74,000	25,400	4
14,000	M14	2,000	11,200	12,000	12,00	90,000	31,000	4
14,007	M14 X1,5	1,500	11,200	12,000	12,50	90,000	23,300	4
16,000	M16	2,000	12,800	14,000	14,00	90,000	35,000	4
16,007	M16 X1,5	1,500	12,800	14,000	14,50	90,000	26,300	4
20,000	M20	2,500	14,950	16,000	17,50	102,000	41,300	4
20,007	M20 X1,5	1,500	14,950	16,000	18,50	102,000	24,800	4

Maschi a mano

Serie di maschi a mano per filettature metriche ISO destri



Catalogo n° 73531



P	M	K	N	S	H
●	○	●	●		

Parametri di lav.
ind. a pag. 358

- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- sbozzatore e medio sono graduati con diametri esterni e medi
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73101
- medio 73102
- finitore 73103

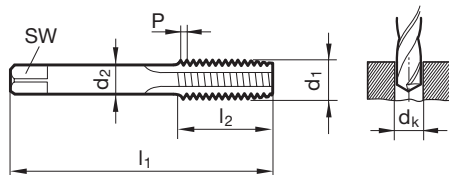
d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M 1	0,250	2,500	2,100	0,75	32,000	5,500
M 1,2	0,250	2,500	2,100	0,95	32,000	5,500
M 1,4	0,300	2,500	2,100	1,10	32,000	7,000
M 1,6	0,350	2,500	2,100	1,25	32,000	8,000
M 1,7	0,350	2,500	2,100	1,35	32,000	8,000
M 2	0,400	2,800	2,100	1,60	36,000	8,000
M 2,3	0,400	2,800	2,100	1,90	36,000	9,000
M 2,5	0,450	2,800	2,100	2,05	40,000	9,000
M 2,6	0,450	2,800	2,100	2,15	40,000	9,000
M 3	0,500	3,500	2,700	2,50	40,000	10,000
M 3,5	0,600	4,000	3,000	2,90	45,000	12,000
M 4	0,700	4,500	3,400	3,30	45,000	12,000
M 4,5	0,750	6,000	4,900	3,70	50,000	14,000
M 5	0,800	6,000	4,900	4,20	50,000	14,000
M 6	1,000	6,000	4,900	5,00	56,000	16,000
M 7	1,000	6,000	4,900	6,00	56,000	16,000
M 8	1,250	6,000	4,900	6,80	63,000	17,000
M10	1,500	7,000	5,500	8,50	70,000	20,000
M12	1,750	9,000	7,000	10,20	75,000	24,000
M14	2,000	11,000	9,000	12,00	80,000	26,000
M16	2,000	12,000	9,000	14,00	80,000	26,000
M18	2,500	14,000	11,000	15,50	95,000	30,000
M20	2,500	16,000	12,000	17,50	95,000	32,000
M24	3,000	18,000	14,500	21,00	110,000	36,000

Maschi a mano

Serie di maschi a mano per filettature metriche ISO sinistri



Catalogo n° 73532



P	M	K	N	S	H
●	○	●	●		

Parametri di lav.
ind. a pag. 358

- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- sbozzatore e medio sono graduati con diametri esterni e medi
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73105
- medio 73106
- finitore 73107

d1	P	d2	SW	dk	l1	l2
	mm	mm	mm	mm	mm	mm
M 4	0,700	4,500	3,400	3,30	45,000	12,000
M 5	0,800	6,000	4,900	4,20	50,000	14,000
M 6	1,000	6,000	4,900	5,00	56,000	16,000
M 8	1,250	6,000	4,900	6,80	63,000	17,000
M10	1,500	7,000	5,500	8,50	70,000	20,000
M12	1,750	9,000	7,000	10,20	75,000	24,000
M14	2,000	11,000	9,000	12,00	80,000	26,000
M16	2,000	12,000	9,000	14,00	80,000	26,000

Maschi a mano

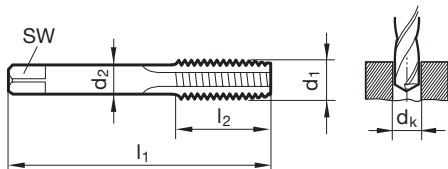
Maschio a mano per filettatura metrica fine ISO, kit



P	M	K	N	S	H
●	○	●	●		

Parametri di lav.
ind. a pag. 358

Catalogo n° 73521



- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73110
- Finitore 73111

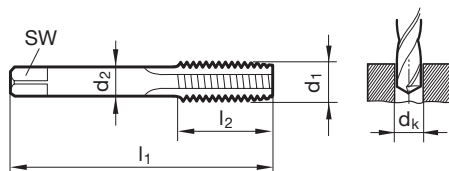
Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm
5,003	M 5 X0,5	6,000	4,900	4,50	50,000	11,000
6,003	M 6 X0,5	6,000	4,900	5,50	56,000	12,000
6,004	M 6 X0,75	6,000	4,900	5,20	56,000	12,000
8,004	M 8 X0,75	6,000	4,900	7,20	56,000	14,000
8,005	M 8 X1	6,000	4,900	7,00	63,000	17,000
10,005	M10 X1	7,000	5,500	9,00	63,000	16,000
10,006	M10 X1,25	7,000	5,500	8,80	63,000	20,000
11,005	M11 X1	8,000	6,200	10,00	63,000	18,000
12,005	M12 X1	9,000	7,000	11,00	70,000	20,000
16,007	M16 X1,5	12,000	9,000	14,50	70,000	20,000
18,007	M18 X1,5	14,000	11,000	16,50	80,000	22,000

Maschi a mano

Maschio a macchina per filettatura UNC, kit



Catalogo n° 73535



P	M	K	N	S	H
●	○	●	●		

Parametri di lav. ind. a pag. 358

- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- sbozzatore e medio sono graduati con diametri esterni e medi
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73301
- medio 73302
- finitore 73303

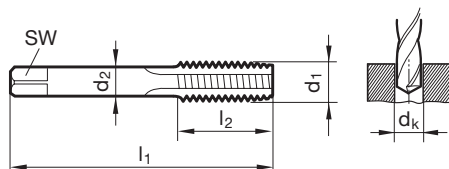
Codice	d1	d2	SW	dk	l1	l2
		mm	mm	mm	mm	mm
2,845	4 -40	3,500	2,700	2,35	40,000	11,000
3,175	5 -40	4,000	2,700	2,65	40,000	11,000
3,505	6 -32	4,000	3,000	2,85	45,000	12,000
4,166	8 -32	4,500	3,400	3,50	45,000	12,000
4,826	10 -24	6,000	4,900	3,90	50,000	14,000
6,350	1/4 -20	6,000	4,900	5,10	56,000	16,000
7,938	5/16 -18	6,000	4,900	6,60	63,000	18,000
9,525	3/8 -16	7,000	5,500	8,00	70,000	20,000
11,113	7/16 -14	8,000	6,200	9,40	70,000	22,000
12,700	1/2 -13	9,000	7,000	10,80	75,000	25,000
15,875	5/8 -11	12,000	9,000	13,50	80,000	30,000
19,050	3/4 -10	16,000	11,000	16,50	95,000	33,000

Maschi a mano

Maschio a macchina per filettatura BSW, kit



Catalogo n° 73534



P	M	K	N	S	H
●	○	●	●		

Parametri di lav.
ind. a pag. 358

- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- sbozzatore e medio sono graduati con diametri esterni e medi
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73311
- medio 73312
- finitore 73313

Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm
3,175	W 1/8	4,000	2,700	2,50	40,000	11,000
3,969	W 5/32	4,500	3,400	3,20	45,000	12,000
4,762	W 3/16	6,000	4,900	3,60	50,000	14,000
6,350	W 1/4	6,000	4,900	5,10	56,000	16,000
7,938	W 5/16	6,000	4,900	6,50	63,000	18,000
9,525	W 3/8	7,000	5,500	7,90	70,000	20,000
11,113	W 7/16	8,000	6,200	9,20	70,000	22,000
12,700	W 1/2	9,000	7,000	10,50	75,000	25,000
14,287	W 9/16	11,000	9,000	12,00	80,000	28,000
15,876	W 5/8	12,000	9,000	13,50	80,000	30,000
19,051	W 3/4	16,000	11,000	16,25	95,000	33,000

Maschi a mano

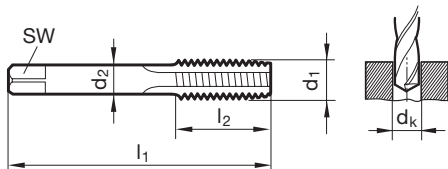
Maschio a mano per filettatura gas, kit



P	M	K	N	S	H
●	○	●	●		

Parametri di lav.
ind. a pag. 358

Catalogo n° 73522



- per fori passanti e ciechi
- Kit maschi, dritti, specializzati per l'utilizzo manuale, ma anche per l'inserimento in macchina
- il finitore può essere utilizzato da solo come maschio a macchina corto
- sbozzatore 73315
- Finitore 73316

Codice	d1	d2 mm	SW mm	dk mm	l1 mm	l2 mm
9,728	G 1/8	7,000	5,500	8,80	63,000	18,000
13,157	G 1/4	11,000	9,000	11,80	70,000	20,000
16,662	G 3/8	12,000	9,000	15,25	70,000	20,000
20,955	G 1/2	16,000	12,000	19,00	80,000	22,000

Utensili combinati

Utensili combinati per fil. metrica ISO

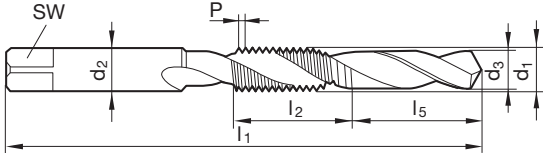


Catalogo n° 73248



P	M	K	N	S	H
●	○	●	●		

- per fori passanti
- acciai fino a 800 N/mm²



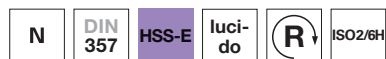
d1	P	Codice	d2	d3	SW	l1	l5	l2
	mm		mm	mm	mm	mm	mm	mm
M 3	0,500	3,000	3,500	2,500	2,700	62,000	11,000	12,000
M 4	0,700	4,000	4,500	3,300	3,400	66,000	10,000	16,000
M 5	0,800	5,000	6,000	4,200	4,900	75,000	12,000	18,000
M 6	1,000	6,000	6,000	5,000	4,900	81,000	14,000	20,000
M 8	1,250	8,000	6,000	6,800	4,900	93,000	20,000	12,000
M10	1,500	10,000	7,000	8,500	5,500	99,000	22,000	14,000
M12	1,750	12,000	9,000	10,200	7,000	106,000	25,000	16,000

Maschi a macchina per per dadi

Maschi a macchina per dadi per fil. metrica ISO

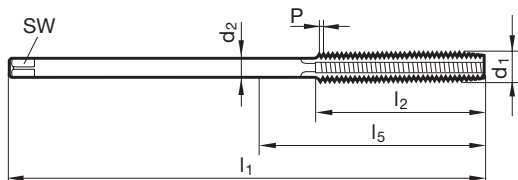


Catalogo n° 73243



P	M	K	N	S	H
●	○	●	●		

- per fori passanti
- per dadi con profondità di filetto fino a 1xD
- Imbocco circa 20 filetti



d1	P mm	d2 mm	SW mm	dk mm	l1 mm	l2 mm	l5 mm
M 3	0,500	2,200		2,50	70,000	22,000	30,000
M 3,5	0,600	2,500	2,100	2,90	80,000	25,000	31,000
M 4	0,700	2,800	2,100	3,30	90,000	25,000	33,000
M 5	0,800	3,500	2,700	4,20	100,000	28,000	38,000
M 6	1,000	4,500	3,400	5,00	110,000	32,000	44,000
M 8	1,250	6,000	4,900	6,80	125,000	40,000	61,000
M10	1,500	7,000	5,500	8,50	140,000	45,000	85,000
M12	1,750	9,000	7,000	10,20	180,000	50,000	120,000
M14	2,000	11,000	9,000	12,00	200,000	56,000	130,000
M16	2,000	12,000	9,000	14,00	200,000	63,000	145,000
M18	2,500	14,000	11,000	15,50	220,000	63,000	155,000

Filiere

Filiere per filettatura metrica ISO



Catalogo n° 73400

DIN EN
22568

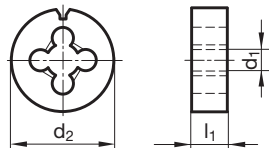
HSS

luci-
do



P	M	K	N	S	H
●	○		●		

• lavorazione generale



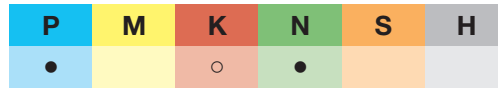
d1	P	d2	l1	Workpiece Ø	Codice
	mm	mm	mm	mm	
M 1	0,250	16,000	5,000	0,970	1,000
M 1,2	0,250	16,000	5,000	1,170	1,200
M 2,2	0,450	16,000	5,000	2,130	2,200
M 2,3	0,400	16,000	5,000	2,250	2,300
M 3	0,500	20,000	5,000	2,920	3,000
M 3,5	0,600	20,000	5,000	3,410	3,500
M 4	0,700	20,000	5,000	3,910	4,000
M 5	0,800	20,000	7,000	4,900	5,000
M 6	1,000	20,000	7,000	5,880	6,000
M 7	1,000	25,000	9,000	6,880	7,000
M 8	1,250	25,000	9,000	7,870	8,000
M10	1,500	30,000	11,000	9,850	10,000
M12	1,750	38,000	14,000	11,830	12,000
M14	2,000	38,000	14,000	13,820	14,000
M16	2,000	45,000	18,000	15,820	16,000
M18	2,500	45,000	18,000	17,790	18,000
M20	2,500	45,000	18,000	19,790	20,000
M24	3,000	55,000	22,000	23,770	24,000
M30	3,500	65,000	25,000	29,730	30,000

Filiere

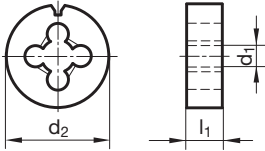
Filiere per filettatura metrica ISO



Catalogo n° 73410



- esecuzione lappata per metalli NE
- lavorazione generale



d1	P	d2	l1	Workpiece Ø	Codice
	mm	mm	mm	mm	
M 3	0,500	20,000	5,000	2,920	3,000
M 4	0,700	20,000	5,000	3,910	4,000
M 6	1,000	20,000	7,000	5,880	6,000
M 8	1,250	25,000	9,000	7,870	8,000
M10	1,500	30,000	11,000	9,850	10,000
M12	1,750	38,000	14,000	11,830	12,000
M14	2,000	38,000	14,000	13,820	14,000
M18	2,500	45,000	18,000	17,790	18,000

Filiere

Filiere per filettatura metrica ISO

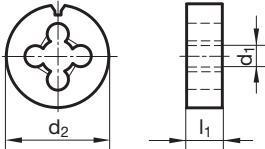


Catalogo n° 73413



P	M	K	N	S	H
•	•		•		

- esecuzione lappata per metalli NE
- lavorazione generale



d1	P	d2	l1	Workpiece Ø	Codice
	mm	mm	mm	mm	
M 2,5	0,450	16,000	5,000	2,430	2,500
M 3	0,500	20,000	5,000	2,920	3,020
M 4	0,700	20,000	5,000	3,910	4,020
M 5	0,800	20,000	7,000	4,900	5,000
M 6	1,000	20,000	7,000	5,880	6,000
M 8	1,250	25,000	9,000	7,870	8,000
M10	1,500	30,000	11,000	9,850	10,000
M12	1,750	38,000	14,000	11,830	12,000
M14	2,000	38,000	14,000	13,820	14,000
M16	2,000	45,000	18,000	15,820	16,000
M20	2,500	45,000	18,000	19,790	20,000





UTENSILI A FRESARE

SUPER F-UT

CODICI ISO



P	acciaio, acciaio legato in alta percentuale
M	acciaio inossidabile
K	ghisa grigia, ghisa sferoidale e ghisa malleabile
N	alluminio ed altri metalli non ferrosi
S	leghe speciali, superleghe e leghe di titanio
H	acciaio temprato e ghisa temprata

Nelle pagine successive, contenenti programma, trovate per ciascun utensile consigli sull' idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata

LEGENDA DEI PITTOGRAMMI



MATERIALE TAGLIANTE	VHM
	Int. in metallo duro
TRATT. DI SUPERFICIE	luci-do AlTiN nano TiAl-SiN TiAlN Al-TiN+
TOLLERANZA SUL Ø	h10 e8
CONDIZIONI DI FRESATURA	HPC
DIREZIONE DI TAGLIO	R
	a destra
FORMA DEL CODOLO	HB HA
ANGOLI DELL'ELICA	
NORMA	DIN 6527L DIN 6527K WN
	Norma di fabbrica
TIPO	N NX N-F N-3 N-5 Ti H
	VA VA-X VA-X IK VA-XF VA-IK AI AL-F AL-3 FS

P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elicico °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Frese SuperF-UT NX

	•	•	•	•	•	SuperF-UT NX	HA	36/38/37	Metallo duro	TiAlSiN	DIN 6527L	4,000 - 20,000	54590	518
	•	•	•	•	•	SuperF-UT NX	HB	36/38/37	Metallo duro	TiAlSiN	DIN 6527L	4,000 - 20,000	54591	519

Frese SuperF-UT N

	•	•	•	•	•	SuperF-UT N	HB	35/38	Metallo duro	TiAlN	DIN 6527K	6,000 - 20,000	64550	520
	•	•	•	•	•	SuperF-UT N	HA	35/38	Metallo duro	TiAlN	DIN 6527L	4,000 - 20,000	54551	521
	•	•	•	•	•	SuperF-UT N	HB	35/38	Metallo duro	TiAlN	DIN 6527L	4,000 - 25,000	64551	522
	•	•	•	•	•	SuperF-UT N	HA	35/38	Metallo duro	TiAlN	Norma di fab.	6,000 - 20,000	54562	523
	•	•	•	•	•	SuperF-UT N	HB	35/38	Metallo duro	TiAlN	Norma di fab.	6,000 - 20,000	54563	524
	•	•	•	•	•	SuperF-UT N	HA	35/38	Metallo duro	TiAlN	Norma di fab.	10,000 - 25,000	54552	525
	•	•	○	•	○	SuperF-UT N-F	HA	30/32	Metallo duro	TiAlN	DIN 6527L	6,000 - 25,000	54566	526
	•	•	○	•	○	SuperF-UT N-F	HB	30/32	Metallo duro	TiAlN	DIN 6527L	6,000 - 25,000	54567	527
	•	○	•	○	•	SuperF-UT N-3	HA	41/43/45	Metallo duro	TiAlN	Norma di fab.	3,000 - 20,000	54564	528
	•	○	•	○	•	SuperF-UT N-3	HB	41/43/45	Metallo duro	TiAlN	Norma di fab.	3,000 - 20,000	54565	529
	•	•	•	•	•	SuperF-UT N-5	HA	45	Metallo duro	TiAlN	Norma di fab.	4,000 - 20,000	54579	530
	•	•	•	•	•	SuperF-UT N-5	HB	45	Metallo duro	TiAlN	Norma di fab.	4,000 - 20,000	54580	531

P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elicico °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Frese SuperF-UT FS

	•	•	•	•	•	SuperF-UT FS	HA	44/45/46	Metallo duro	TiAlN	Norma di fab.	8,000 - 25,000	64558	552
	•	•	•	•	•	SuperF-UT FS	HB	44/45/46	Metallo duro	TiAlN	Norma di fab.	8,000 - 25,000	64559	553

Frese SuperF-UT Ti

	•	•	○	•	•	SuperF-UT Ti	HA	35/38	Metallo duro	AlTiN+	DIN 6527L	6,000 - 20,000	54560	532
	•	•	○	•	•	SuperF-UT Ti	HB	35/38	Metallo duro	AlTiN+	DIN 6527L	6,000 - 20,000	54561	533

Frese SuperF-UT H

	•	•	•	•	•	SuperF-UT H	HA	40/42	Metallo duro	TiAlSiN	DIN 6527L	6,000 - 20,000	54572	550
	•	•	•	•	•	SuperF-UT H	HB	40/42	Metallo duro	TiAlSiN	DIN 6527L	6,000 - 20,000	54573	551

Frese VA-X Super-UT

	•	•	•	•	•	SuperF-UT VA-X	HB	36/38	Metallo duro	AlTiN nano	DIN 6527K	4,000 - 20,000	54576	534
	•	•	•	•	•	SuperF-UT VA-X	HA	36/38	Metallo duro	AlTiN nano	DIN 6527L	3,000 - 25,000	54558	535
	•	•	•	•	•	SuperF-UT VA-X	HB	36/38	Metallo duro	AlTiN nano	DIN 6527L	3,000 - 25,000	54559	536
	•	•	•	•	•	SuperF-UT VA-X IK	HA	36/38	Metallo duro	AlTiN nano	DIN 6527L	6,000 - 25,000	54574	537
	•	•	•	•	•	SuperF-UT VA-X IK	HB	36/38	Metallo duro	AlTiN nano	DIN 6527L	6,000 - 25,000	54575	538
	•	•	•	•	•	SuperF-UT VA-XF	HA	36/38	Metallo duro	AlTiN nano	DIN 6527L	6,000 - 25,000	54568	539

P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elicico °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Frese VA-X Super-UT

						SuperF-UT VA-XF	HB	36/38	Metallo duro	AlTiN nano	DIN 6527L	6,000 - 25,000	54569	540
						SuperF-UT S	HA	40/42	Metallo duro	AlTiN nano	DIN 6527L	4,000 - 20,000	54556	541
						SuperF-UT VA	HB	40/42	Metallo duro	TiAlN	DIN 6527L	4,000 - 20,000	64557	542
						SuperF-UT VA-IK	HB	40/42	Metallo duro	TiAlN	DIN 6527L	6,000 - 20,000	64567	543

Frese SuperF-UT Alluminio

						SuperF-UT Al	HA	40/42	Metallo duro	lucido	DIN 6527L	4,000 - 20,000	74554	544
						SuperF-UT Al	HB	40/42	Metallo duro	lucido	DIN 6527L	4,000 - 20,000	74555	545
						SuperF-UT Al-F	HA	29/30/31	Metallo duro	lucido	Norma di fab.	6,000 - 25,000	54570	546
						SuperF-UT Al-F	HB	29/30/31	Metallo duro	lucido	Norma di fab.	6,000 - 25,000	54571	547
						SuperF-UT Al-3	HA	39/40/41	Metallo duro	lucido	Norma di fab.	3,000 - 20,000	74552	548
						SuperF-UT Al-3	HB	39/40/41	Metallo duro	lucido	Norma di fab.	3,000 - 20,000	74553	549

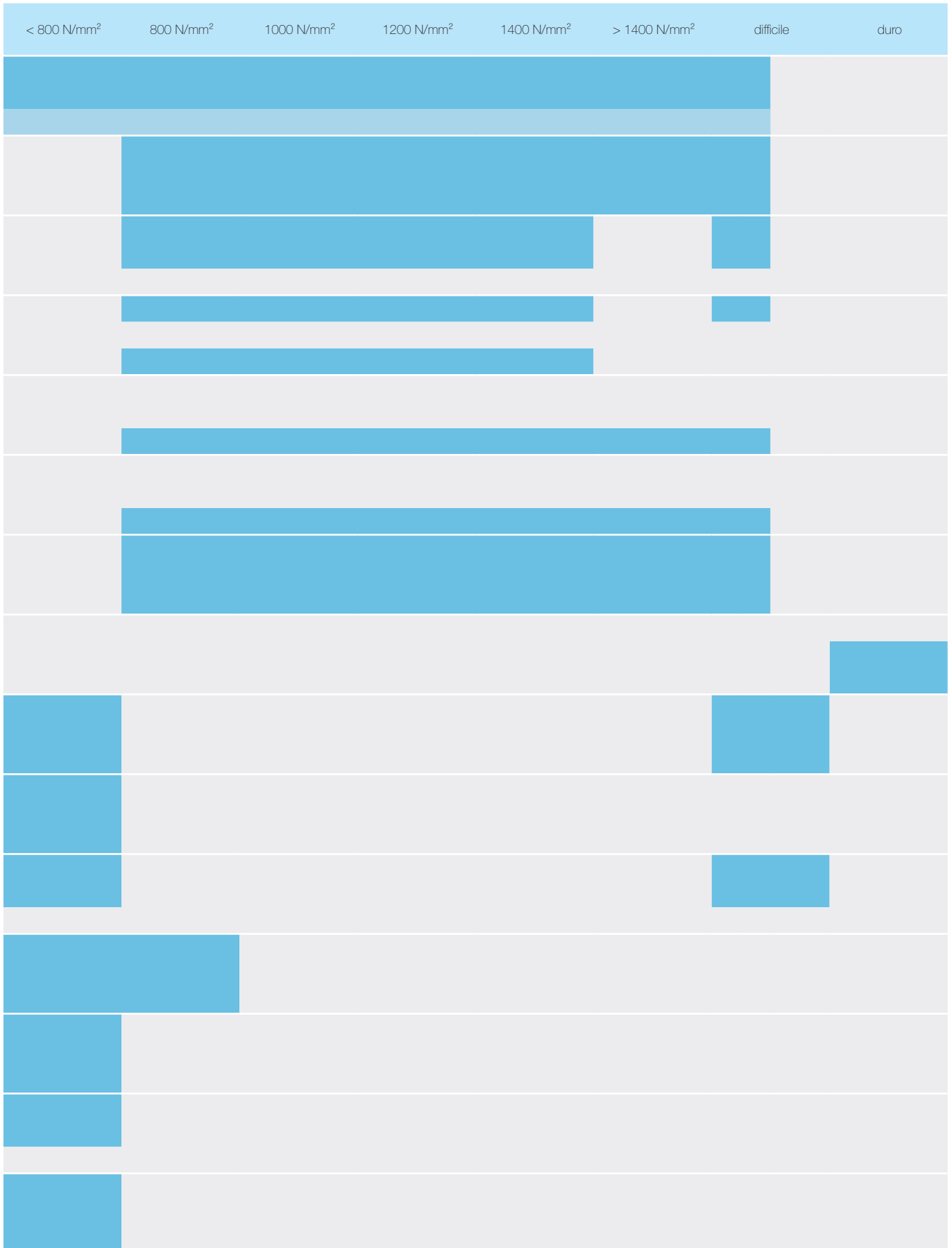
Applicazione

Per materiale

Tipo	Catalogo n°	Applicazione	metalli non ferrosi, alluminio	acciaio	ghise	acciaio inossidabile resistente e acido	nicel, leghe di titanio	acciai temprati	
SuperF-UT NX	54590 54591	per cave		ottimale					
		per sgrossatura		ottimale					
		per finitura		adatto bene					
SuperF-UT N	64550 54551 64551 54562 54563 54552	per cave		adatto bene			ottimale		
		per sgrossatura		ottimale			adatto bene		
		per finitura	adatto bene	ottimale			adatto bene		
		per cave		ottimale			adatto bene		
SuperF-UT N-F	54566 54567	per sgrossatura		ottimale				adatto bene	
		per finitura		adatto bene				adatto bene	
		per cave		ottimale					
SuperF-UT N-3	54564 54565	per sgrossatura		ottimale					
		per finitura	adatto bene	adatto bene					
		per cave		adatto bene					
SuperF-UT N-5	54579 54580	per sgrossatura		ottimale					
		per finitura	adatto bene	ottimale					
		per cave		adatto bene					
SuperF-UT FS	64558 64559	per sgrossatura		adatto bene					
		per finitura		ottimale					
		per cave		adatto bene					
SuperF-UT Ti	54560 54561	per sgrossatura		adatto bene			ottimale		
		per finitura	adatto bene	adatto bene			ottimale		
		per cave		adatto bene					
SuperF-UT H	54572 54573	per sgrossatura		adatto bene					ottimale
		per finitura		adatto bene					ottimale
		per cave		adatto bene					
SuperF-UT VA-X	54576 54558 54559	per sgrossatura		adatto bene		adatto bene			
		per finitura		adatto bene		adatto bene			
		per cave		adatto bene		adatto bene			
SuperF-UT VA-X IK	54574 54575	per sgrossatura		adatto bene		adatto bene			
		per finitura		adatto bene		adatto bene			
		per cave		adatto bene		adatto bene			
SuperF-UT VA-XF	54568 54569	per sgrossatura		adatto bene		adatto bene			
		per finitura		adatto bene		adatto bene			
		per cave		adatto bene		adatto bene			
SuperF-UT VA	54556 64557 64567	per sgrossatura		adatto bene			adatto bene		
		per finitura		adatto bene			adatto bene		
		per cave		adatto bene			adatto bene		
SuperF-UT AI-3	74552 74553	per sgrossatura	ottimale						
		per finitura	ottimale						
		per cave	ottimale						
SuperF-UT AI-F	54570 54571	per sgrossatura	ottimale						
		per finitura	ottimale						
		per cave	ottimale						
SuperF-UT AI	74554 74555	per sgrossatura	adatto bene						
		per finitura	adatto bene						
		per cave	adatto bene						

ottimale adatto bene

Per resistenza alla trazione



Raccomandazioni generali

Le frese F-UT STOCK sono state progettate per applicazioni sotto condizioni ottimali di lavorazione, esempi:

- alte prestazioni
- sufficiente refrigerazione
- pezzo e serraggio rigido

Nel caso in cui non ci sono sufficienti condizioni di lavorazione, noi raccomandiamo l'utilizzo della Super F-UT con il nuovo profilo di sgrossatura e finitura, esempio N-F e VA-XF.

Per lavorare gli acciai (di solito si usa la Super F-UT tipo N) con una fresa raggiata noi raccomandiamo la Super F-UT Ti, n° catalogo 54560 o 54561.

Noi raccomandiamo anche la fresatura sincronizzata.

Foratura:

- ridurre l'avanzamento v_f (mm/min.)
- con profondità di foro $> 0.5 \times D$ o per passare a lavorazione radiale bisogna anche scaricare

Attenzione: pericolo di rottura con repentino aumento di carico!

Lavorazione a tuffo inclinata fino a 15° (da preferire):

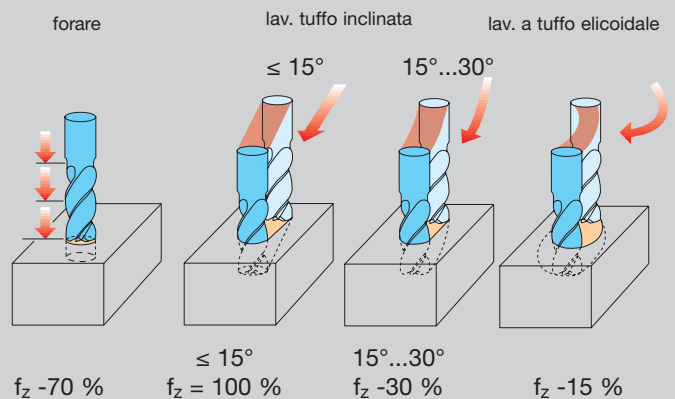
- l'avanzamento v_f (mm/min.) può anche non essere ridotto

Lavorazione a tuffo inclinata da 15° a 30°:

- ridurre l'avanzamento v_f (mm/min.) in base al grafico qui a lato

Lavorazione a tuffo per interpolazione:

- per lavorare ad interpolazione/a tuffo elicoidale consigliamo un incremento radiale da 0.1 to 0.2 per giro
- ridurre l'avanzamento v_f (mm/min.) in base al grafico qui a lato
- scegliere preferibilmente un diametro del foro di $1.8 \times D$



Formule:

Rivoluzione per min . n [min⁻¹]

$$n = \frac{v_c \cdot 1000}{\pi \cdot D}$$

Avanzamento per min . v_f [mm/min]

$$v_f = f_z \cdot n \cdot Z_c$$

f_z = avanzamento per dente [mm/Z]

Z_c = no efficace . di denti

D = diametro utensile [mm]

Volume Chip Q [mm³/min]

$$Q = \frac{a_p \cdot a_e \cdot v_f}{1000}$$

Coppia M_c [Nm]

$$M_c = \frac{P_c \cdot 30 \cdot 10^3}{\pi \cdot n}$$

P_c = forza di taglio [kW]

v_c = velocità di taglio [m/min]

a_p = profondità di taglio [mm]

a_e = larghezza di taglio [mm]

π = Pi



FRESA SUPER F-UT NX



RAMPA

Angolo di rampa fino a 45°
Ottima asportazione truciolo!

FORATURA

Ottime caratteristiche di foratura da 2xD
Non c'è più bisogno di utensili pilota!
Ideale per i pre-fori di alesatura.

CAVA

Alto avanzamento per lavorazioni a tuffo e case
Elevata asportazione del truciolo e del diam.
sottodimensionamento per cave di precisione
Ottima ripetibilità garantita dallo smusso di rinforzato del tagliente.

SGROSSATURA

Adatta anche per lavorazione su macchine meno rigide dato il basso assorbimento di potenza.
Incremento della velocità di taglio fino al 100% per lavorazione di acciaio.
Elevata asportazione del truciolo

FINITURA

Profili con elevata qualità delle superfici
Incremento vita utensili fino al 100%
Elevati parametri di lavorazione anche per la lavorazione di acciai legati e bonificati

Fresatura HPC

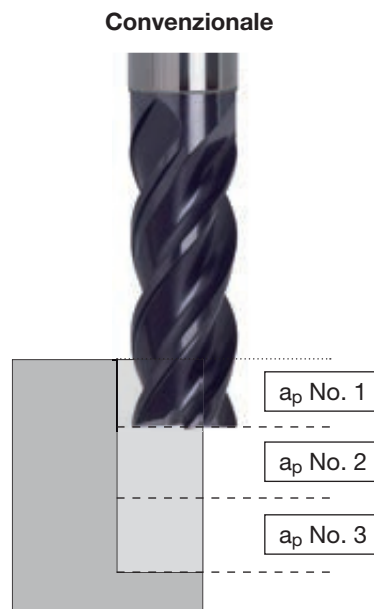
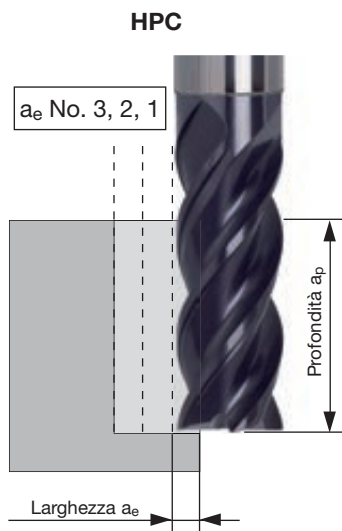
High Performance Cutting (HPC) è un processo di fresatura che aumenta avanzamento e velocità e generalmente opera su profondità di fresatura più vaste, rispetto ai soliti processi di fresatura.

Pro:

- Meno stress sull'utensile e sulla macchina, grazie alla minore larghezza di taglio
- Temperatura più bassa durante la fresatura
- Possibile utilizzo dell'intera lunghezza di taglio
- Vita utensile più duratura

Contro:

- Controllo dinamico della macchina utensile necessario per la fresatura di profili complessi



ae	fattore fz	fattore v _c	Q in %
100%	1,00	1,00	100
50%	1,00	1,20	59
40%	1,08	1,25	54
30%	1,20	1,30	45
20%	1,48	1,35	39
10%	2,00	1,50	27

Osservazione:

Le basi di tutti i parametri di taglio convertiti nella fresatura HPC sono quelli per la fresatura di cave con la SuperF-UT

Esempio:

Fresa: SuperF-UT N Ø12, Kat.-Nr. 54551
 Materiale: 42CrMo4
 Parametri di taglio „HPC Base“:
 $v_c = 135 \text{ m/min}$
 $fz = 0,065 \text{ mm/Z}$

Formola per utilizzo in HPC:

Parametri di taglio HPC calcolati con ae al 10 % del diam:
 $v_c = 135 \text{ m/min} \times 1,5 = 203 \text{ m/min}$
 $fz = 0,065 \text{ mm/Z} \times 2 = 0,13 \text{ mm/Z}$



Fresa F-UT tipo HPC per fresatura universale



Condizioni stabili:
 - buona refrigerazione
 - potenza sufficiente
 - scarico truciolo breve

Condizioni instabili:
 - refrigerazione standard
 - potenza media
 - scarico trucioli da medio a lungo

ae	fattore fz	fattore Vc	Q in %
100%	1,00	1,00	100
50%	1,00	1,20	59
40%	1,08	1,25	54
30%	1,20	1,30	45
20%	1,48	1,35	39
10%	2,00	1,50	27

Materiali	Durezza / Res. alla trazione	RF 100 consiglia	Impiego	Vc [m/min]	fz [mm/z] con Ø nominale							
					3	6	8	10	12	16	20	25
P Acc. da costruzione, automatici, da bonifica e da cementaz. non legati 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E, 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E, 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	fino a 850 N/mm ²	N	condizioni stabili	180	0,018	0,035	0,045	0,060	0,070	0,090	0,100	0,150
			condizioni instabili	180	0,013	0,025	0,032	0,042	0,049	0,063	0,070	0,105
P Acciai automatici, acc. da cementazione legati, acc. nitrurati 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E, 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1.200 N/mm ²	N	condizioni stabili	160	0,018	0,035	0,045	0,060	0,070	0,090	0,100	0,150
			condizioni instabili	160	0,013	0,025	0,032	0,042	0,049	0,063	0,070	0,105
P Acciai da bonifica legati, acc. utensili ed acc. super rapidi 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1, 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 acciaio per molle = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1.400 N/mm ²	N	condizioni stabili	135	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	135	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098
H Acciai temprati Acciai per utensili, acciaio bonificato, acciaio per molle, acciaio ad alta velocità, acciai temprati, etc. Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2	fino a 54 HRC	N	condizioni stabili	70	0,012	0,025	0,030	0,040	0,045	0,060	0,070	0,100
			condizioni instabili	70	0,008	0,018	0,021	0,028	0,032	0,042	0,049	0,070
M Acciai inossidabili 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	fino a 750 N/mm ²	VA-X	condizioni stabili	120	0,015	0,030	0,040	0,050	0,060	0,070	0,090	0,130
			condizioni instabili	120	0,011	0,021	0,028	0,035	0,042	0,049	0,063	0,091
M Acciai inossidabili 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm ²	VA-X	condizioni stabili	80	0,015	0,025	0,035	0,045	0,050	0,065	0,080	0,120
			condizioni instabili	80	0,011	0,018	0,025	0,032	0,035	0,046	0,056	0,084
M Acciai inossidabili 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	oltre 850 N/mm ²	VA-X	condizioni stabili	70	0,012	0,025	0,030	0,040	0,045	0,060	0,070	0,100
			condizioni instabili	70	0,008	0,018	0,021	0,028	0,032	0,042	0,049	0,070
S Leghe speciali (a base Nikel "Ni") Nimonic, Inconel, Monel, Hastelloy	fino a 1.300 N/mm ²	Ti	condizioni stabili	30	0,010	0,015	0,020	0,025	0,030	0,040	0,050	0,060
			condizioni instabili	30	0,007	0,011	0,014	0,018	0,021	0,028	0,035	0,042
Ti Leghe di titanio ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	fino a 1.300 N/mm ²	Ti	condizioni stabili	60	0,015	0,025	0,035	0,045	0,050	0,065	0,080	0,120
			condizioni instabili	60	0,011	0,018	0,025	0,032	0,035	0,046	0,056	0,084
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	fino a 240 HB 30	N	condizioni stabili	160	0,020	0,040	0,050	0,065	0,080	0,095	0,110	0,160
			condizioni instabili	160	0,014	0,028	0,035	0,046	0,056	0,067	0,077	0,112
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	oltre 240 HB 30	N	condizioni stabili	140	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	140	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098
N Alluminio, leghe alu per lav. plastiche, leghe di alu 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	fino a 3% Si	Al	condizioni stabili	500	0,020	0,040	0,050	0,065	0,080	0,095	0,110	0,160
			condizioni instabili	500	0,014	0,028	0,035	0,046	0,056	0,067	0,077	0,112
N Leghe alu-ghisa 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	oltre 3% Si	Al	stabile Verhältnisse	230	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	230	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098
N Leghe di magnesio MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	Al	condizioni stabili	180	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	180	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098
N Mettuttei non ferrosi (rame, ottone o bronzo, a truciolo coto e lungo) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPB, 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2, 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPB, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn, 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	fino a 850 N/mm ²	Al	condizioni stabili	250	0,015	0,025	0,035	0,045	0,050	0,065	0,080	0,120
			condizioni instabili	250	0,011	0,018	0,025	0,032	0,035	0,046	0,056	0,084



$$a_p = 1 \times D - 3 \times D$$

$$a_e = 0,1 \times D - 0,5 \times D$$

Fresa F-UT tipo NX per fresatura universale



Raffreddamento periferico raccomandato per un'ottimale evacuazione del truciolo e durata utensile maggiore.

TUFFO E CAVA

Materiali	Durezza / Res. alla trazione	Prof.cava (ap max.)	Cava max. angolo in °	Vel. taglio v _c [m/min]	fz [mm/z] con Ø nominale							
					4	6	8	10	12	14	16	20
P Acc. da costruzione, automatici bonifica e cementaz no legati 1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6	fino a 850 N/mm ²	1xD	45°	270	0,015	0,020	0,030	0,040	0,045	0,050	0,055	0,060
P Acciai automatici, acc. da cementazione legati, acc. nitrurati 1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7	850-1.200 N/mm ²	1xD	45°	240	0,010	0,015	0,020	0,030	0,035	0,040	0,045	0,050
P Acciai da bonifica legati, acc. utensili ed acc. super rapidi 1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6	850-1.400 N/mm ²	1xD	30°	200	0,007	0,010	0,015	0,020	0,025	0,030	0,035	0,040
M Acciai inossidabili 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9	fino a 750 N/mm ²	1xD	10°	60	0,007	0,010	0,015	0,020	0,025	0,030	0,035	0,040
M Acciai inossidabili 1.4301 X5CrNi18-10, 1.4571 X6CrNi18-10, 1.4404 X2CrNiMo17-12-2	750-950 N/mm ²	0,5xD	5°	50	0,005	0,008	0,012	0,018	0,023	0,026	0,030	0,035
Ti Leghe di titanio ("Ti") 3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4	fino a 1.300 N/mm ²	0,5xD	10°	45	0,005	0,008	0,012	0,018	0,023	0,026	0,030	0,035
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6025 EN-GL250 (GG25), 0.7070 EN-GJS-700-2 (GGG70)	oltre 240 HB	1xD	45°	150	0,015	0,020	0,030	0,040	0,045	0,050	0,055	0,060
N Alluminio, leghe Alu per lav.plastiche, leghe Alu 3.0255 Al99,5, 3.2315 AlMgSi1, 3.1325 AlCuMg1, 3.3245 AlMg3Si	fino a 3% Si	1xD	30°	180	0,010	0,015	0,020	0,030	0,035	0,040	0,045	0,050
N Leghe alu-ghisa 3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISi9	oltre 3% Si	1xD	45°	140	0,015	0,020	0,030	0,040	0,045	0,050	0,055	0,060

CAVE

Materiali	Durezza / Res. alla trazione	Prof. taglio (ap max.)	Larg. taglio (ae max.)	Vel. taglio v _c [m/min]	fz [mm/z] con Ø nominale							
					4	6	8	10	12	14	16	20
P Acc. da costruzione, automatici bonifica e cementaz no legati 1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6	fino a 850 N/mm ²	1xD	1xD	270	0,015	0,025	0,035	0,050	0,055	0,060	0,080	0,100
P Acciai automatici, acc. da cementazione legati, acc. nitrurati 1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7	850-1.200 N/mm ²	1xD	1xD	240	0,015	0,025	0,035	0,050	0,055	0,060	0,080	0,100
P Acciai da bonifica legati, acc. utensili ed acc. super rapidi 1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6	850-1.400 N/mm ²	1xD	1xD	200	0,015	0,025	0,030	0,045	0,050	0,055	0,070	0,085
M Acciai inossidabili 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9	fino a 750 N/mm ²	1xD	1xD	120	0,015	0,020	0,030	0,045	0,055	0,060	0,065	0,075
M Acciai inossidabili 1.4301 X5CrNi18-10, 1.4571 X6CrNi18-10, 1.4404 X2CrNiMo17-12-2	750-950 N/mm ²	1xD	1xD	80	0,015	0,020	0,025	0,030	0,040	0,050	0,060	0,070
Ti Leghe di titanio ("Ti") 3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4	fino a 1.300 N/mm ²	1xD	1xD	60	0,015	0,020	0,025	0,030	0,040	0,050	0,060	0,070
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6025 EN-GL250 (GG25), 0.7070 EN-GJS-700-2 (GGG70)	oltre 240 HB	1xD	1xD	160	0,015	0,025	0,035	0,050	0,055	0,060	0,080	0,100
N Alluminio, leghe Alu per lav.plastiche, leghe Alu 3.0255 Al99,5, 3.2315 AlMgSi1, 3.1325 AlCuMg1, 3.3245 AlMg3Si	fino a 3% Si	1xD	1xD	500	0,025	0,030	0,040	0,065	0,080	0,085	0,095	0,110
N Leghe alu-ghisa 3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISi9	oltre 3% Si	1xD	1xD	340	0,015	0,020	0,030	0,055	0,065	0,07w0	0,080	0,100

* per lavorazioni HSC la vel. di taglio può essere aumentata del 50%, l'avanzamento può essere ridotto in base tutte richieste della superficie.
** per fresatura trocoidale e imachining con ae = 0.1-0.2xd la Vel. taglio e l'avanzamento possono essere aumentati del 50 %.

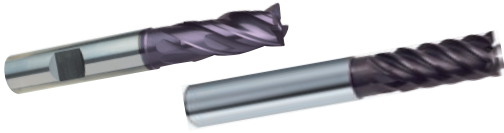
HPC-SGROSSATURA E HSC-FINITURA

Materiali	Durezza / Res. alla trazione	Prof. taglio (ap max.)	Larg. taglio (ae max.)	Vel. taglio v _c [m/min]	fz [mm/z] con Ø nominale							
					4	6	8	10	12	14	16	20
P Acc. da costruzione, automatici bonifica e cementaz no legati 1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6	fino a 850 N/mm ²	2xD	0.4xD	350	0,020	0,030	0,045	0,060	0,075	0,080	0,090	0,110
P Acciai automatici, acc. da cementazione legati, acc. nitrurati 1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7	850-1.200 N/mm ²	2xD	0.4xD	290	0,020	0,030	0,045	0,060	0,075	0,080	0,090	0,110
P Acciai da bonifica legati, acc. utensili ed acc. super rapidi 1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6	850-1.400 N/mm ²	2xD	0.3xD	240	0,015	0,025	0,030	0,050	0,065	0,075	0,085	0,100
M Acciai inossidabili 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9	fino a 750 N/mm ²	2xD	0.3xD	140	0,020	0,025	0,035	0,055	0,065	0,070	0,080	0,090
M Acciai inossidabili 1.4301 X5CrNi18-10, 1.4571 X6CrNi18-10, 1.4404 X2CrNiMo17-12-2	750-950 N/mm ²	2xD	0.25xD	120	0,015	0,020	0,030	0,040	0,050	0,060	0,065	0,075
Ti Leghe di titanio ("Ti") 3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4	fino a 1.300 N/mm ²	2xD	0.4xD	120	0,015	0,020	0,030	0,040	0,050	0,060	0,065	0,075
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6025 EN-GL250 (GG25), 0.7070 EN-GJS-700-2 (GGG70)	oltre 240 HB	2xD	0.4xD	180	0,020	0,030	0,045	0,060	0,075	0,080	0,090	0,110
N Alluminio, leghe Alu per lav.plastiche, leghe Alu 3.0255 Al99,5, 3.2315 AlMgSi1, 3.1325 AlCuMg1, 3.3245 AlMg3Si	fino a 3% Si	2xD	0.5xD	600	0,025	0,040	0,060	0,080	0,100	0,110	0,120	0,150
N Leghe alu-ghisa 3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISi9	oltre 3% Si	2xD	0.4xD	420	0,020	0,030	0,045	0,060	0,075	0,080	0,090	0,110

FORATURA

Materiali	Durezza / Res. alla trazione	Prof. foratura (ap max.)	entstpanen ab 1xD	Vel. taglio v _c [m/min]	fz [mm/z] con Ø nominale							
					4	6	8	10	12	14	16	20
P Acc. da costruzione, automatici bonifica e cementaz no legati 1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6	fino a 850 N/mm ²	2xD	Ja	270	0,015	0,020	0,030	0,040	0,045	0,045	0,050	0,060
P Acciai automatici, acc. da cementazione legati, acc. nitrurati 1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7	850-1.200 N/mm ²	2xD	Ja	240	0,010	0,015	0,020	0,035	0,040	0,040	0,045	0,050
P Acciai da bonifica legati, acc. utensili ed acc. super rapidi 1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6	850-1.400 N/mm ²	1xD	-	200	0,005	0,010	0,015	0,025	0,030	0,030	0,035	0,040
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6025 EN-GL250 (GG25), 0.7070 EN-GJS-700-2 (GGG70)	oltre 240 HB	2xD	Ja	150	0,015	0,020	0,030	0,040	0,045	0,045	0,050	0,060
N Alluminio, leghe Alu per lav.plastiche, leghe Alu 3.0255 Al99,5, 3.2315 AlMgSi1, 3.1325 AlCuMg1, 3.3245 AlMg3Si	fino a 3% Si	1xD	-	180	0,010	0,015	0,020	0,035	0,040	0,040	0,045	0,050
N Leghe alu-ghisa 3.2131 G-AISI5Cu1, 3.2153 G-AISI7Cu3, 3.2573 G-AISi9	oltre 3% Si	1xD	-	140	0,015	0,020	0,030	0,040	0,045	0,045	0,050	0,060

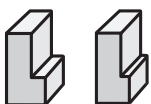
F-UT Frese di finitura / Frese di superfinitura



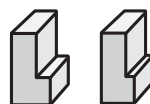
Condizioni stabili:
 - buona refrigerazione
 - potenza sufficiente
 - scarico truciolo breve

* Frese #54207, #54227 per super finitura in acciai temprati > 54 HRC

Materiali	Durezza / Res. alla trazione	RF 100 consiglia-ta	Impiego	v _c [m/min]	fz [mm/z] con Ø nominale							
					3	6	8	10	12	16	20	25
P Acc. da costruzione, automatici, da bonifica e da cementaz. non legati 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E, 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E, 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	fino a 850 N/mm ²	N / FS	condizioni stabili	280	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	-								
P Acciai automatici, acc. da cementazione legati, acc. nitrurati 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E, 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1.200 N/mm ²	N / FS	condizioni stabili	220	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	-								
P Acciai da bonifica legati, acc. utensili ed acc. super rapidi 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1, 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 acciaio per molle = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1.400 N/mm ²	N / FS	condizioni stabili	200	0,015	0,030	0,040	0,050	0,060	0,070	0,090	0,130
			condizioni instabili	-								
H Acciai temprati Acciai per utensili, acciaio bonificato, acciaio per molle, acciaio ad alta velocità, acciai temprati, etc. Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2	fino a 54 HRC	N / FS	condizioni stabili	150	0,015	0,030	0,040	0,050	0,060	0,070	0,090	0,130
			- / H*	condizioni instabili	110	0,007	0,017	0,024	0,030	0,036	0,045	0,057
M Acciai inossidabili 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	fino a 750 N/mm ²	VA-X / FS	condizioni stabili	180	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	-								
M Acciai inossidabili 1.4301 X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm ²	VA-X / FS	condizioni stabili	140	0,015	0,030	0,040	0,050	0,060	0,070	0,090	0,130
			condizioni instabili	-								
M Acciai inossidabili 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	oltre 850 N/mm ²	VA-X / FS	condizioni stabili	120	0,015	0,025	0,035	0,045	0,050	0,065	0,080	0,120
			condizioni instabili	-								
S Leghe speciali (a base Nikel "Ni") Nimonic, Inconel, Monel, Hastelloy	fino a 1.300 N/mm ²	N / FS	condizioni stabili	45	0,015	0,025	0,035	0,045	0,050	0,065	0,080	0,120
			condizioni instabili	-								
Ti Leghe di titanio ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	fino a 1.300 N/mm ²	N / FS	condizioni stabili	130	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	-								
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	fino a 240 HB 30	N / FS	condizioni stabili	220	0,018	0,035	0,045	0,060	0,070	0,090	0,100	0,150
			condizioni instabili	-								
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	oltre 240 HB 30	N / FS	condizioni stabili	200	0,018	0,035	0,045	0,060	0,070	0,090	0,100	0,150
			condizioni instabili	-								
N Alluminio, leghe alu per lav. plastiche, leghe di alu 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	fino a 3% Si	Al / FS	condizioni stabili	1000	0,018	0,035	0,045	0,060	0,070	0,090	0,100	0,150
			condizioni instabili	-								
N Leghe alu-ghisa 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	oltre 3% Si	Al / FS	condizioni stabili	350	0,018	0,035	0,045	0,060	0,070	0,090	0,100	0,150
			condizioni instabili	-								
N Leghe di magnesio MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	Al / FS	condizioni stabili	280	0,018	0,035	0,045	0,060	0,070	0,090	0,100	0,150
			condizioni instabili	-								
N Mettuttei non ferrosi (rame, ottone o bronzo, a truciolo coto e lungo) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb, 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2, 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn, 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	fino a 850 N/mm ²	N / FS	condizioni stabili	400	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	-								

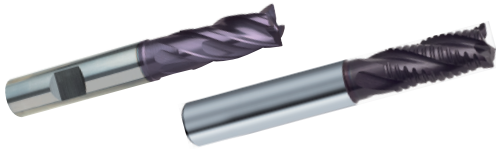


Frese di finitura:
 $a_p = 1 \times D - 2 \times D$
 $a_e = 0,1 \times D - 0,3 \times D$



Frese di superfinitura:
 $a_p = 1 \times D - 3 \times D$
 $a_e = 0,05 \times D - 0,1 \times D$

F-UT Frese di sgrossatura



Condizioni stabili:
 - buona refrigerazione
 - potenza sufficiente
 - scarico truciolo breve

Condizioni instabili:
 - refrigerazione standard
 - potenza media
 - scarico trucioli da medio a lungo

Materiali	Durezza / Res. alla trazione	RF 100 consiglia	Impiego	v _c [m/min]	fz [mm/z] con Ø nominale							
					3	6	8	10	12	16	20	25
P Acc. da costruzione, automatici, da bonifica e da cementaz. non legati 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E, 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E, 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	fino a 850 N/mm ²	N	condizioni stabili	200	0,020	0,040	0,055	0,070	0,085	0,100	0,120	0,170
		N-F	condizioni instabili	200	0,014	0,028	0,039	0,049	0,060	0,070	0,084	0,119
P Acciai automatici, acc. da cementazione legati, acc. nitrurati 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E, 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1.200 N/mm ²	N	condizioni stabili	180	0,020	0,040	0,055	0,070	0,085	0,100	0,120	0,170
		N-F	condizioni instabili	180	0,014	0,028	0,039	0,049	0,060	0,070	0,084	0,119
P Acciai da bonifica legati, acc. utensili ed acc. super rapidi 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1, 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 acciaio per molle = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1.400 N/mm ²	N	condizioni stabili	160	0,020	0,040	0,050	0,065	0,080	0,095	0,110	0,160
		N-F	condizioni instabili	160	0,014	0,028	0,035	0,046	0,056	0,067	0,077	0,112
H Acciai temprati Acciai per utensili, acciaio bonificato, acciaio per molle, acciaio ad alta velocità, acciai temprati, etc. Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2	fino a 54 HRC	N	condizioni stabili	110	0,015	0,025	0,035	0,045	0,050	0,065	0,080	0,120
		N-F	condizioni instabili	110	0,011	0,018	0,025	0,032	0,035	0,046	0,056	0,084
M Acciai inossidabili 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	fino a 750 N/mm ²	VA-X	condizioni stabili	140	0,018	0,035	0,045	0,060	0,070	0,090	0,100	0,150
		VA-XF	condizioni instabili	140	0,013	0,025	0,032	0,042	0,049	0,063	0,070	0,105
M Acciai inossidabili 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm ²	VA-X	condizioni stabili	120	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
		VA-XF	condizioni instabili	120	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098
M Acciai inossidabili 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	oltre 850 N/mm ²	VA-X	condizioni stabili	100	0,015	0,025	0,035	0,045	0,050	0,065	0,080	0,120
		VA-XF	condizioni instabili	100	0,011	0,018	0,025	0,032	0,035	0,046	0,056	0,084
S Leghe speciali (a base Nikel "Ni") Nimonic, Inconel, Monel, Hastelloy	fino a 1.300 N/mm ²	Ti	condizioni stabili	35	0,010	0,020	0,030	0,035	0,040	0,055	0,065	0,080
		N-F	condizioni instabili	35	0,007	0,014	0,021	0,025	0,028	0,039	0,046	0,056
Ti Leghe di titanio ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	fino a 1.300 N/mm ²	Ti	condizioni stabili	90	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
		N-F	condizioni instabili	90	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	fino a 240 HB 30	N	condizioni stabili	180	0,020	0,040	0,055	0,070	0,085	0,100	0,120	0,170
		N-F	condizioni instabili	180	0,014	0,028	0,039	0,049	0,060	0,070	0,084	0,119
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	oltre 240 HB 30	N	condizioni stabili	160	0,020	0,040	0,050	0,065	0,080	0,095	0,110	0,160
		N-F	condizioni instabili	160	0,014	0,028	0,035	0,046	0,056	0,067	0,077	0,112
N Alluminio, leghe alu per lav. plastiche, leghe di alu 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	fino a 3% Si	Al	condizioni stabili	600	0,020	0,040	0,055	0,070	0,085	0,100	0,120	0,170
		Al-F	condizioni instabili	600	0,014	0,028	0,039	0,049	0,060	0,070	0,084	0,119
N Leghe alu-ghisa 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	oltre 3% Si	Al	condizioni stabili	280	0,020	0,040	0,050	0,065	0,080	0,095	0,110	0,160
		Al-F	condizioni instabili	280	0,014	0,028	0,035	0,046	0,056	0,067	0,077	0,112
N Leghe di magnesio MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	Al	condizioni stabili	220	0,020	0,040	0,050	0,065	0,080	0,095	0,110	0,160
		Al-F	condizioni instabili	220	0,014	0,028	0,035	0,046	0,056	0,067	0,077	0,112
N Mettuttei non ferrosi (rame, ottone o bronzo, a truciolo coto e lungo) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb, 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2, 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn, 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	fino a 850 N/mm ²	Al	condizioni stabili	300	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
		Al-F	condizioni instabili	300	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098



$$a_p \leq 1 \times D \quad a_p = 1 \times D - 2 \times D$$

$$a_e = 0,5 - 0,9 \times D \quad f_z = 70\%$$

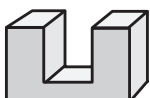
F-UT Frese per cave



Condizioni stabili:
 - buona refrigerazione
 - potenza sufficiente
 - scarico truciolo breve

Condizioni instabili:
 - refrigerazione standard
 - potenza media
 - scarico trucioli da medio a lungo

Materiali	Durezza / Res. alla trazione	RF 100 consiglia	Impiego	v _c [m/min]	z [mm/z] con Ø nominale							
					3	6	8	10	12	16	20	25
P Acc. da costruzione, automatici, da bonifica e da cementaz. non legati 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E, 1.0503 C45, 1.1191 C30E 1.2379 X155CrVMo12-1, 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 acciaio per molle = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	fino a 850 N/mm ²	N-3	condizioni stabili	180	0,018	0,035	0,045	0,060	0,070	0,090	0,100	0,150
			condizioni instabili	180	0,013	0,025	0,032	0,042	0,049	0,063	0,070	0,105
P Acciai automatici, acc. da cementazione legati, acc. nitrurati 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E, 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1.200 N/mm ²	N-3	condizioni stabili	160	0,018	0,035	0,045	0,060	0,070	0,090	0,100	0,150
			condizioni instabili	160	0,013	0,025	0,032	0,042	0,049	0,063	0,070	0,105
P Acciai da bonifica legati, acc. utensili ed acc. super rapidi 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1, 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 acciaio per molle = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1.400 N/mm ²	N-3	condizioni stabili	135	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	135	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098
H Acciai temprati Acciai per utensili, acciaio bonificato, acciaio per molle, acciaio ad alta velocità, acciai temprati, etc. Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2	fino a 54 HRC	N-3	condizioni stabili	70	0,012	0,025	0,030	0,040	0,045	0,060	0,070	0,100
			condizioni instabili	70	0,008	0,018	0,021	0,028	0,032	0,042	0,049	0,070
M Acciai inossidabili 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	fino a 750 N/mm ²	VA-X	condizioni stabili	120	0,015	0,030	0,040	0,050	0,060	0,070	0,090	0,130
			condizioni instabili	120	0,011	0,021	0,028	0,035	0,042	0,049	0,063	0,091
M Acciai inossidabili 1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm ²	VA-X	condizioni stabili	80	0,015	0,025	0,035	0,045	0,050	0,065	0,080	0,120
			condizioni instabili	80	0,011	0,018	0,025	0,032	0,035	0,046	0,056	0,084
M Acciai inossidabili 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	oltre 850 N/mm ²	VA-X	condizioni stabili	70	0,012	0,025	0,030	0,040	0,045	0,060	0,070	0,100
			condizioni instabili	70	0,008	0,018	0,021	0,028	0,032	0,042	0,049	0,070
S Leghe speciali (a base Nikel "Ni") Nimonic, Inconel, Monel, Hastelloy	fino a 1.300 N/mm ²	Ti	condizioni stabili	30	0,010	0,015	0,020	0,025	0,030	0,040	0,050	0,060
			condizioni instabili	30	0,007	0,011	0,014	0,018	0,021	0,028	0,035	0,042
Ti Leghe di titanio ("Ti") 3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5	fino a 1.300 N/mm ²	Ti	condizioni stabili	60	0,015	0,025	0,035	0,045	0,050	0,065	0,080	0,120
			condizioni instabili	60	0,011	0,018	0,025	0,032	0,035	0,046	0,056	0,084
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	fino a 240 HB 30	N	condizioni stabili	160	0,020	0,040	0,050	0,065	0,080	0,095	0,110	0,160
			condizioni instabili	160	0,014	0,028	0,035	0,046	0,056	0,067	0,077	0,112
K Ghise, ghisa grigia, ghisa temprata e ghisa sferoidale 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	oltre 240 HB 30	N	condizioni stabili	140	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	140	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098
N Alluminio, leghe alu per lav. plastiche, leghe di alu 3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	fino a 3% Si	Al-3	condizioni stabili	500	0,020	0,040	0,050	0,065	0,080	0,095	0,110	0,160
			condizioni instabili	500	0,014	0,028	0,035	0,046	0,056	0,067	0,077	0,112
N Leghe alu-ghisa 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	oltre 3% Si	Al-3	condizioni stabili	230	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	230	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098
N Leghe di magnesio MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	Al-3	condizioni stabili	180	0,016	0,030	0,040	0,055	0,065	0,080	0,095	0,140
			condizioni instabili	180	0,011	0,021	0,028	0,039	0,046	0,056	0,067	0,098
N Mettuttei non ferrosi (rame, ottone o bronzo, a truciolo coto e lungo) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb, 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2, 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn, 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	fino a 850 N/mm ²	Al-3	condizioni stabili	250	0,015	0,025	0,035	0,045	0,050	0,065	0,080	0,120
			condizioni instabili	250	0,011	0,018	0,025	0,032	0,035	0,046	0,056	0,084



$$a_p = 0,5 \times D - 1 \times D \quad a_p = 1 \times D - 2 \times D$$

$$a_e = 1 \times D \quad f_z = 70\%$$

Frese SuperF-UT

Frese SuperF-UT NX



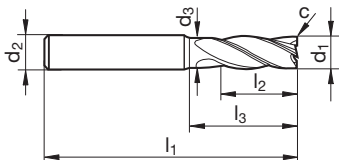
Catalogo n° 54590



P	M	K	N	S	H
•	•	•	•	•	

Parametri di lav. ind. a pag. 513-517

- geometria frontale e delle scanalature adattata per valori di taglio alti e asportazione del truciolo molto buona
- è possibile angolo di immersione estremamente inclinato fino a 45°
- lunga vita utensile grazie al rivestimento molto forte
- grande sicurezza del processo con riduzione simultanea dei tempi di lavoro fino a 1400 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
4,000	6,000	3,700	57,000	11,000	18,000	0,040	4	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,050	4	5,000
5,700	6,000	5,400	57,000	13,000	20,000	0,060	4	5,700
6,000	6,000	5,500	57,000	13,000	20,000	0,060	4	6,000
7,700	8,000	7,200	63,000	19,000	26,000	0,080	4	7,700
8,000	8,000	7,500	63,000	19,000	26,000	0,080	4	8,000
9,700	10,000	9,200	72,000	22,000	31,000	0,100	4	9,700
10,000	10,000	9,200	72,000	22,000	30,000	0,100	4	10,000
11,700	12,000	10,900	83,000	26,000	35,500	0,120	4	11,700
12,000	12,000	11,200	83,000	26,000	36,000	0,120	4	12,000
13,700	14,000	12,900	83,000	26,000	35,500	0,140	4	13,700
14,000	14,000	13,200	83,000	26,000	36,000	0,140	4	14,000
15,600	16,000	14,800	92,000	32,000	41,400	0,160	4	15,600
16,000	16,000	15,000	92,000	32,000	42,000	0,160	4	16,000
19,500	20,000	18,500	104,000	38,000	51,300	0,200	4	19,500
20,000	20,000	19,000	104,000	38,000	52,000	0,200	4	20,000

Frese SuperF-UT

Frese SuperF-UT NX



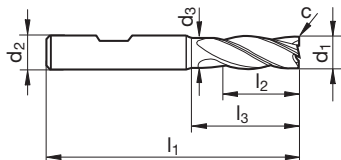
Catalogo n° 54591



P	M	K	N	S	H
•	•	•	•	•	

Parametri di lav.
ind. a pag. 513-
517

- geometria frontale e delle scanalature adattata per valori di taglio alti e asportazione del truciolo molto buona
- è possibile angolo di immersione estremamente inclinato fino a 45°
- lunga vita utensile grazie al rivestimento molto forte
- grande sicurezza del processo con riduzione simultanea dei tempi di lavoro fino a 1400 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
4,000	6,000	3,700	57,000	11,000	18,000	0,040	4	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,050	4	5,000
5,700	6,000	5,400	57,000	13,000	20,000	0,060	4	5,700
6,000	6,000	5,500	57,000	13,000	20,000	0,060	4	6,000
7,700	8,000	7,200	63,000	19,000	26,000	0,080	4	7,700
8,000	8,000	7,500	63,000	19,000	26,000	0,080	4	8,000
9,700	10,000	9,200	72,000	22,000	31,000	0,100	4	9,700
10,000	10,000	9,200	72,000	22,000	30,000	0,100	4	10,000
11,700	12,000	10,900	83,000	26,000	35,500	0,120	4	11,700
12,000	12,000	11,200	83,000	26,000	36,000	0,120	4	12,000
13,700	14,000	12,900	83,000	26,000	35,500	0,140	4	13,700
14,000	14,000	13,200	83,000	26,000	36,000	0,140	4	14,000
15,600	16,000	14,800	92,000	32,000	41,400	0,160	4	15,600
16,000	16,000	15,000	92,000	32,000	42,000	0,160	4	16,000
19,500	20,000	18,500	104,000	38,000	51,300	0,200	4	19,500
20,000	20,000	19,000	104,000	38,000	52,000	0,200	4	20,000

Frese SuperF-UT

Frese SuperF-UT N



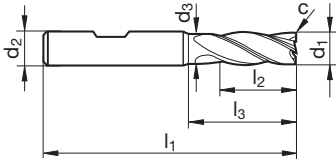
Catalogo n° 64550



P	M	K	N	S	H
●		●			

Parametri di lav.
ind. a pag. 513-
517

- uso universale
- esecuzione corta stabile
- fino a 1600 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	5,500	54,000	10,000	17,000	0,150	4	6,000
8,000	8,000	7,500	58,000	12,000	21,000	0,150	4	8,000
10,000	10,000	9,200	66,000	14,000	24,000	0,200	4	10,000
12,000	12,000	11,200	73,000	16,000	26,000	0,200	4	12,000
14,000	14,000	13,200	75,000	18,000	28,000	0,250	4	14,000
16,000	16,000	15,000	82,000	22,000	32,000	0,350	4	16,000
18,000	18,000	17,000	84,000	24,000	34,000	0,400	4	18,000
20,000	20,000	19,000	92,000	26,000	40,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT N



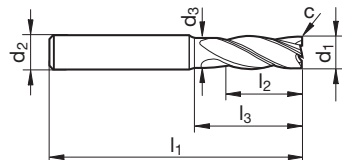
Catalogo n° 54551



P	M	K	N	S	H
●		●			

Parametri di lav.
ind. a pag. 513-
517

- uso universale
- fino a 1600 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
4,000	6,000	3,700	57,000	11,000	18,000	0,100	4	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,100	4	5,000
6,000	6,000	5,500	57,000	13,000	20,000	0,150	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,150	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,200	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,200	4	12,000
14,000	14,000	13,200	83,000	26,000	36,000	0,250	4	14,000
16,000	16,000	15,000	92,000	32,000	42,000	0,350	4	16,000
18,000	18,000	17,000	92,000	32,000	42,000	0,400	4	18,000
20,000	20,000	19,000	104,000	38,000	52,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT N



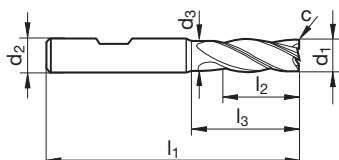
Catalogo n° 64551



P	M	K	N	S	H
●		●			

Parametri di lav. ind. a pag. 513-517

- uso universale
- fino a 1600 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
4,000	6,000	3,700	57,000	11,000	18,000	0,100	4	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,100	4	5,000
6,000	6,000	5,500	57,000	13,000	20,000	0,150	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,150	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,200	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,200	4	12,000
14,000	14,000	13,200	83,000	26,000	36,000	0,250	4	14,000
16,000	16,000	15,000	92,000	32,000	42,000	0,350	4	16,000
18,000	18,000	17,000	92,000	32,000	42,000	0,400	4	18,000
20,000	20,000	19,000	104,000	38,000	52,000	0,450	4	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,600	4	25,000

Frese SuperF-UT

Frese SuperF-UT N



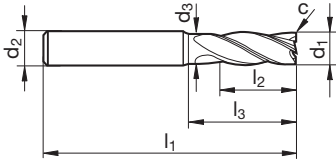
Catalogo n° 54562



P	M	K	N	S	H
•		•			

Parametri di lav.
ind. a pag. 513-
517

- uso universale
- fino a 1600 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	5,500	65,000	18,000	28,000	0,150	4	6,000
8,000	8,000	7,500	75,000	24,000	38,000	0,150	4	8,000
10,000	10,000	9,200	80,000	30,000	38,000	0,200	4	10,000
12,000	12,000	11,200	93,000	36,000	46,000	0,200	4	12,000
16,000	16,000	15,000	108,000	48,000	58,000	0,350	4	16,000
20,000	20,000	19,000	126,000	60,000	74,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT N



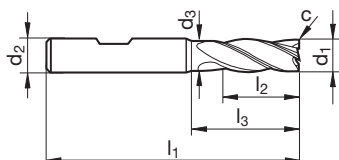
Catalogo n° 54563



P	M	K	N	S	H
•		•			

Parametri di lav.
ind. a pag. 513-
517

- uso universale
- fino a 1600 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	5,500	65,000	18,000	28,000	0,150	4	6,000
8,000	8,000	7,500	75,000	24,000	38,000	0,150	4	8,000
10,000	10,000	9,200	80,000	30,000	38,000	0,200	4	10,000
12,000	12,000	11,200	93,000	36,000	46,000	0,200	4	12,000
16,000	16,000	15,000	108,000	48,000	58,000	0,350	4	16,000
20,000	20,000	19,000	126,000	60,000	74,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT N



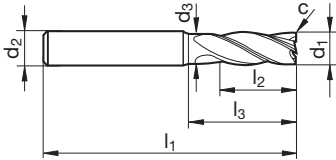
Catalogo n° 54552



P	M	K	N	S	H
•		•			

Parametri di lav.
ind. a pag. 513-
517

- uso universale
- fino a 1600 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
10,000	10,000	9,200	100,000	40,000	48,000	0,200	4	10,000
12,000	12,000	11,200	150,000	45,000	58,000	0,200	4	12,000
14,000	14,000	13,200	150,000	45,000	58,000	0,250	4	14,000
16,000	16,000	15,000	150,000	65,000	78,000	0,350	4	16,000
18,000	18,000	17,000	150,000	65,000	78,000	0,400	4	18,000
20,000	20,000	19,000	150,000	65,000	78,000	0,450	4	20,000
25,000	25,000	23,500	150,000	75,000	92,000	0,600	4	25,000

Frese SuperF-UT

Frese SuperF-UT N-F



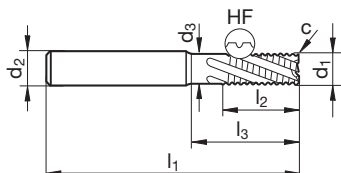
Catalogo n° 54566



P	M	K	N	S	H
●		○		○	

Parametri di lav.
ind. a pag. 513-
517

- fino a 48 HRC così come leghe al titanio e al nickel
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3 µm
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,300	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,300	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,500	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,500	4	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,600	4	25,000

Frese SuperF-UT

Frese SuperF-UT N-F



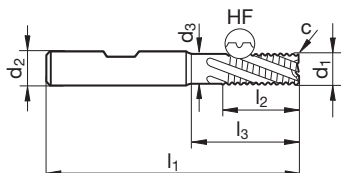
Catalogo n° 54567



P	M	K	N	S	H
●		○		○	

Parametri di lav.
ind. a pag. 513-
517

- fino a 48 HRC così come leghe al titanio e al nickel
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3 μm
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,300	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,300	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,500	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,500	4	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,600	4	25,000

Frese SuperF-UT

Frese SuperF-UT N-3



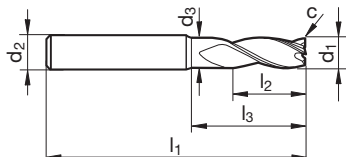
Catalogo n° 54564



P	M	K	N	S	H
●	○	●	○		

Parametri di lav.
ind. a pag. 513-
517

- 3 taglienti con ingombro dei trucioli ingrandito
- per la produzione di linguette
- fino a 1400 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
3,000	6,000	2,700	57,000	8,000	15,000	0,050	3	3,000
3,500	6,000	3,200	57,000	10,000	15,000	0,050	3	3,500
3,700	6,000	3,400	57,000	11,000	15,000	0,050	3	3,700
4,000	6,000	3,700	57,000	11,000	18,000	0,050	3	4,000
4,500	6,000	4,200	57,000	11,000	18,000	0,050	3	4,500
4,700	6,000	4,400	57,000	13,000	18,000	0,050	3	4,700
5,000	6,000	4,700	57,000	13,000	18,000	0,050	3	5,000
5,500	6,000	5,200	57,000	13,000	19,300	0,050	3	5,500
5,700	6,000	5,400	57,000	13,000	19,500	0,050	3	5,700
6,000	6,000	5,500	57,000	13,000	20,000	0,050	3	6,000
6,500	8,000	6,000	63,000	16,000	24,300	0,100	3	6,500
7,000	8,000	6,500	63,000	16,000	24,700	0,100	3	7,000
7,500	8,000	7,000	63,000	19,000	25,100	0,100	3	7,500
8,000	8,000	7,500	63,000	19,000	26,000	0,100	3	8,000
8,500	10,000	8,000	72,000	19,000	29,300	0,100	3	8,500
9,000	10,000	8,500	72,000	19,000	29,700	0,100	3	9,000
9,500	10,000	9,000	72,000	22,000	30,100	0,100	3	9,500
10,000	10,000	9,200	72,000	22,000	30,000	0,100	3	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,100	3	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,150	3	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,150	3	20,000

Frese SuperF-UT

Frese SuperF-UT N-3



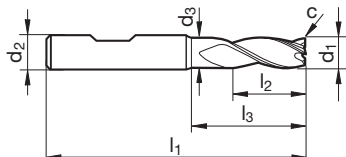
Catalogo n° 54565



P	M	K	N	S	H
●	○	●	○		

Parametri di lav.
ind. a pag. 513-
517

- 3 taglianti con ingombro dei trucioli ingrandito
- per la produzione di linguette
- fino a 1400 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliante al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
3,000	6,000	2,700	57,000	8,000	15,000	0,050	3	3,000
3,500	6,000	3,200	57,000	10,000	15,000	0,050	3	3,500
3,700	6,000	3,400	57,000	11,000	15,000	0,060	3	3,700
4,000	6,000	3,700	57,000	11,000	18,000	0,060	3	4,000
4,500	6,000	4,200	57,000	11,000	18,000	0,070	3	4,500
4,700	6,000	4,400	57,000	13,000	18,000	0,070	3	4,700
5,000	6,000	4,700	57,000	13,000	18,000	0,080	3	5,000
5,500	6,000	5,200	57,000	13,000	20,000	0,080	3	5,500
5,700	6,000	5,400	57,000	13,000	20,000	0,090	3	5,700
6,000	6,000	5,500	57,000	13,000	20,000	0,090	3	6,000
6,500	8,000	6,000	63,000	16,000	26,000	0,100	3	6,500
7,000	8,000	6,500	63,000	16,000	26,000	0,110	3	7,000
7,500	8,000	7,000	63,000	19,000	26,000	0,110	3	7,500
8,000	8,000	7,500	63,000	19,000	26,000	0,120	3	8,000
8,500	10,000	8,000	72,000	19,000	31,000	0,130	3	8,500
9,000	10,000	8,500	72,000	19,000	31,000	0,140	3	9,000
9,500	10,000	9,000	72,000	22,000	31,000	0,140	3	9,500
10,000	10,000	9,200	72,000	22,000	30,000	0,150	3	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,180	3	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,190	3	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,240	3	20,000

Frese SuperF-UT

Frese SuperF-UT N-5



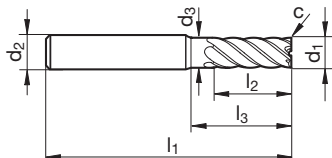
Catalogo n° 54579



P	M	K	N	S	H
•	•	•	•	•	

Parametri di lav.
ind. a pag. 513-
517

- vantaggi maggiormente possibili con operazioni di lappatura e semi-sgrossatura specialmente a condizioni HPC
- divisione diseguale
- misura corta, vedi F-UT FS con 6 denti
- fino a 1600 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
4,000	6,000	3,700	65,000	12,000	26,000	0,050	5	4,000
5,000	6,000	4,700	65,000	15,000	26,000	0,050	5	5,000
6,000	6,000	5,500	65,000	18,000	28,000	0,050	5	6,000
8,000	8,000	7,500	75,000	24,000	38,000	0,100	5	8,000
10,000	10,000	9,200	80,000	30,000	38,000	0,100	5	10,000
12,000	12,000	11,200	93,000	36,000	46,000	0,100	5	12,000
16,000	16,000	15,000	108,000	48,000	58,000	0,150	5	16,000
20,000	20,000	19,000	126,000	60,000	74,000	0,150	5	20,000

Frese SuperF-UT

Frese SuperF-UT N-5



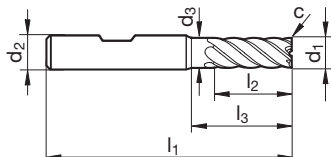
Catalogo n° 54580



P	M	K	N	S	H
•	•	•	•	•	

Parametri di lav.
ind. a pag. 513-
517

- vantaggi maggiormente possibili con operazioni di lappatura e semi-sgrossatura specialmente a condizioni HPC
- divisione diseguale
- misura corta, vedi F-UT FS con 6 denti
- fino a 1600 N/mm²
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
4,000	6,000	3,700	65,000	12,000	26,000	0,050	5	4,000
5,000	6,000	4,700	65,000	15,000	26,000	0,050	5	5,000
6,000	6,000	5,500	65,000	18,000	28,000	0,050	5	6,000
8,000	8,000	7,500	75,000	24,000	38,000	0,100	5	8,000
10,000	10,000	9,200	80,000	30,000	38,000	0,100	5	10,000
12,000	12,000	11,200	93,000	36,000	46,000	0,100	5	12,000
16,000	16,000	15,000	108,000	48,000	58,000	0,150	5	16,000
20,000	20,000	19,000	126,000	60,000	74,000	0,150	5	20,000

Frese SuperF-UT

Frese SuperF-UT Ti



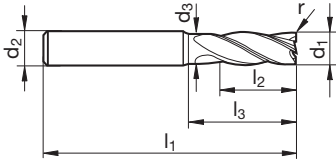
Catalogo n° 54560



P	M	K	N	S	H
●		○		●	

Parametri di lav.
ind. a pag. 513-
517

- esecuzione spigolo tagliente ottimizzata per leghe al titanio ad alta resistenza e materiali speciali
- può anche essere applicato come SuperF-UT Tipo N con raggio
- con raggi definiti
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,500	4	6,005
6,000	6,000	5,500	57,000	13,000	20,000	0,800	4	6,008
6,000	6,000	5,500	57,000	13,000	20,000	1,000	4	6,010
6,000	6,000	5,500	57,000	13,000	20,000	1,500	4	6,015
6,000	6,000	5,500	57,000	13,000	20,000	2,000	4	6,020
8,000	8,000	7,500	63,000	19,000	26,000	0,500	4	8,005
8,000	8,000	7,500	63,000	19,000	26,000	0,800	4	8,008
8,000	8,000	7,500	63,000	19,000	26,000	1,000	4	8,010
8,000	8,000	7,500	63,000	19,000	26,000	1,500	4	8,015
8,000	8,000	7,500	63,000	19,000	26,000	2,000	4	8,020
10,000	10,000	9,200	72,000	22,000	30,000	0,500	4	10,005
10,000	10,000	9,200	72,000	22,000	30,000	0,800	4	10,008
10,000	10,000	9,200	72,000	22,000	30,000	1,000	4	10,010
10,000	10,000	9,200	72,000	22,000	30,000	1,500	4	10,015
10,000	10,000	9,200	72,000	22,000	30,000	2,000	4	10,020
12,000	12,000	11,200	83,000	26,000	36,000	0,500	4	12,005
12,000	12,000	11,200	83,000	26,000	36,000	0,800	4	12,008
12,000	12,000	11,200	83,000	26,000	36,000	1,000	4	12,010
12,000	12,000	11,200	83,000	26,000	36,000	1,500	4	12,015
12,000	12,000	11,200	83,000	26,000	36,000	2,000	4	12,020
12,000	12,000	11,200	83,000	26,000	36,000	2,500	4	12,025
12,000	12,000	11,200	83,000	26,000	36,000	3,000	4	12,030
12,000	12,000	11,200	83,000	26,000	36,000	4,000	4	12,040
16,000	16,000	15,000	92,000	32,000	42,000	0,500	4	16,005
16,000	16,000	15,000	92,000	32,000	42,000	0,800	4	16,008
16,000	16,000	15,000	92,000	32,000	42,000	1,000	4	16,010
16,000	16,000	15,000	92,000	32,000	42,000	1,500	4	16,015
16,000	16,000	15,000	92,000	32,000	42,000	2,000	4	16,020
16,000	16,000	15,000	92,000	32,000	42,000	2,500	4	16,025
16,000	16,000	15,000	92,000	32,000	42,000	3,000	4	16,030
16,000	16,000	15,000	92,000	32,000	42,000	4,000	4	16,040
20,000	20,000	19,000	104,000	38,000	52,000	1,000	4	20,010
20,000	20,000	19,000	104,000	38,000	52,000	2,000	4	20,020
20,000	20,000	19,000	104,000	38,000	52,000	4,000	4	20,040

Frese SuperF-UT

Frese SuperF-UT Ti



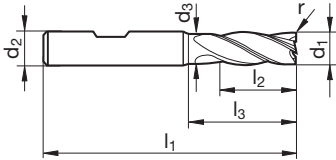
Catalogo n° 54561



P	M	K	N	S	H
●		○		●	

Parametri di lav.
ind. a pag. 513-
517

- esecuzione spigolo tagliente ottimizzata per leghe al titanio ad alta resistenza e materiali speciali
- può anche essere applicato come SuperF-UT Tipo N con raggio
- con raggi definiti
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,500	4	6,005
6,000	6,000	5,500	57,000	13,000	20,000	0,800	4	6,008
6,000	6,000	5,500	57,000	13,000	20,000	1,000	4	6,010
6,000	6,000	5,500	57,000	13,000	20,000	1,500	4	6,015
6,000	6,000	5,500	57,000	13,000	20,000	2,000	4	6,020
8,000	8,000	7,500	63,000	19,000	26,000	0,500	4	8,005
8,000	8,000	7,500	63,000	19,000	26,000	0,800	4	8,008
8,000	8,000	7,500	63,000	19,000	26,000	1,000	4	8,010
8,000	8,000	7,500	63,000	19,000	26,000	1,500	4	8,015
8,000	8,000	7,500	63,000	19,000	26,000	2,000	4	8,020
10,000	10,000	9,200	72,000	22,000	30,000	0,500	4	10,005
10,000	10,000	9,200	72,000	22,000	30,000	0,800	4	10,008
10,000	10,000	9,200	72,000	22,000	30,000	1,000	4	10,010
10,000	10,000	9,200	72,000	22,000	30,000	1,500	4	10,015
10,000	10,000	9,200	72,000	22,000	30,000	2,000	4	10,020
12,000	12,000	11,200	83,000	26,000	36,000	0,500	4	12,005
12,000	12,000	11,200	83,000	26,000	36,000	0,800	4	12,008
12,000	12,000	11,200	83,000	26,000	36,000	1,000	4	12,010
12,000	12,000	11,200	83,000	26,000	36,000	1,500	4	12,015
12,000	12,000	11,200	83,000	26,000	36,000	2,000	4	12,020
12,000	12,000	11,200	83,000	26,000	36,000	2,500	4	12,025
12,000	12,000	11,200	83,000	26,000	36,000	3,000	4	12,030
12,000	12,000	11,200	83,000	26,000	36,000	4,000	4	12,040
16,000	16,000	15,000	92,000	32,000	42,000	0,500	4	16,005
16,000	16,000	15,000	92,000	32,000	42,000	0,800	4	16,008
16,000	16,000	15,000	92,000	32,000	42,000	1,000	4	16,010
16,000	16,000	15,000	92,000	32,000	42,000	1,500	4	16,015
16,000	16,000	15,000	92,000	32,000	42,000	2,000	4	16,020
16,000	16,000	15,000	92,000	32,000	42,000	2,500	4	16,025
16,000	16,000	15,000	92,000	32,000	42,000	3,000	4	16,030
16,000	16,000	15,000	92,000	32,000	42,000	4,000	4	16,040
20,000	20,000	19,000	104,000	38,000	52,000	1,000	4	20,010
20,000	20,000	19,000	104,000	38,000	52,000	2,000	4	20,020
20,000	20,000	19,000	104,000	38,000	52,000	4,000	4	20,040

Frese SuperF-UT

Frese VA-X Super-UT



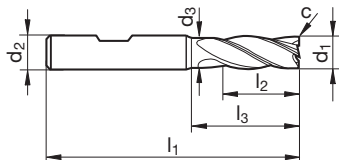
Catalogo n° 54576



P	M	K	N	S	H
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Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- esecuzione corta stabile
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
4,000	6,000	3,700	54,000	8,000	15,000	0,150	4	4,000
5,000	6,000	4,700	54,000	9,000	15,000	0,150	4	5,000
6,000	6,000	5,500	54,000	10,000	17,000	0,200	4	6,000
8,000	8,000	7,500	58,000	12,000	21,000	0,250	4	8,000
10,000	10,000	9,200	66,000	14,000	24,000	0,300	4	10,000
12,000	12,000	11,200	73,000	16,000	26,000	0,350	4	12,000
16,000	16,000	15,000	82,000	22,000	32,000	0,500	4	16,000
20,000	20,000	19,000	92,000	26,000	40,000	0,600	4	20,000

Frese SuperF-UT

Frese VA-X Super-UT



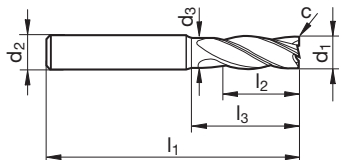
Catalogo n° 54558



P	M	K	N	S	H
	•			•	

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	6,000	2,700	57,000	8,000	15,000	0,100	4	3,000
4,000	6,000	3,700	57,000	11,000	18,000	0,150	4	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,150	4	5,000
6,000	6,000	5,500	57,000	13,000	20,000	0,200	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,250	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,350	4	12,000
14,000	14,000	13,200	83,000	26,000	36,000	0,400	4	14,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	4	16,000
18,000	18,000	17,000	92,000	32,000	42,000	0,600	4	18,000
20,000	20,000	19,000	104,000	38,000	52,000	0,600	4	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,750	4	25,000

Frese SuperF-UT

Frese VA-X Super-UT



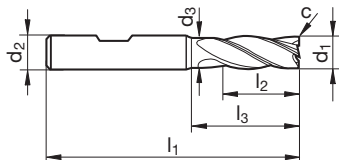
Catalogo n° 54559



P	M	K	N	S	H
	•			•	

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	6,000	2,700	57,000	8,000	15,000	0,100	4	3,000
4,000	6,000	3,700	57,000	11,000	18,000	0,150	4	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,150	4	5,000
6,000	6,000	5,500	57,000	13,000	20,000	0,200	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,250	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,350	4	12,000
14,000	14,000	13,200	83,000	26,000	36,000	0,400	4	14,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	4	16,000
18,000	18,000	17,000	92,000	32,000	42,000	0,600	4	18,000
20,000	20,000	19,000	104,000	38,000	52,000	0,600	4	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,750	4	25,000

Frese SuperF-UT

Frese SuperF-UT VA-X IK



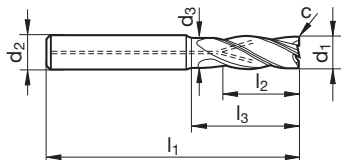
Catalogo n° 54574



P	M	K	N	S	H
	•			•	

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- con refrigerazione interna per vita utensile maggiore e asportazione truciolo ottimale
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,200	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,250	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,350	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,600	4	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,750	4	25,000

Frese SuperF-UT

Frese SuperF-UT VA-X IK



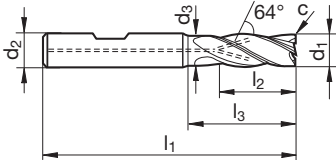
Catalogo n° 54575



P	M	K	N	S	H
	•			•	

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- con refrigerazione interna per vita utensile maggiore e asportazione truciolo ottimale
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,200	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,250	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,350	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,600	4	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,750	4	25,000

Frese SuperF-UT

Frese SuperF-UT VA-XF



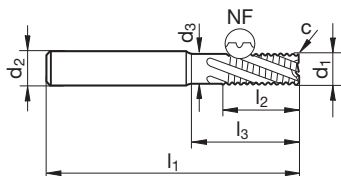
Catalogo n° 54568



P	M	K	N	S	H
	•			•	

Parametri di lav.
ind. a pag. 513-
517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3 μm
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,300	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,300	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,500	4	12,000
14,000	14,000	13,200	83,000	26,000	36,000	0,500	4	14,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	4	16,000
18,000	18,000	17,000	92,000	32,000	42,000	0,500	4	18,000
20,000	20,000	19,000	104,000	38,000	52,000	0,500	4	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,600	4	25,000

Frese SuperF-UT

Frese SuperF-UT VA-XF



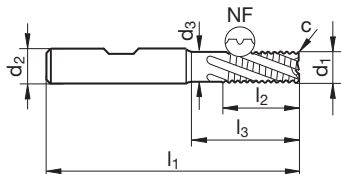
Catalogo n° 54569



P	M	K	N	S	H
	•			•	

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- per la lavorazione di acciai resistenti alla ruggine e all'acido così come di leghe a base di nickel
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3 μm
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



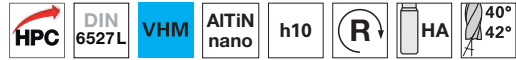
d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,300	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,300	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,500	4	12,000
14,000	14,000	13,200	83,000	26,000	36,000	0,500	4	14,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	4	16,000
18,000	20,000	17,000	92,000	32,000	42,000	0,500	4	18,000
20,000	20,000	19,000	104,000	38,000	52,000	0,500	4	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,600	4	25,000

Frese SuperF-UT

Frese SuperF-UT VA



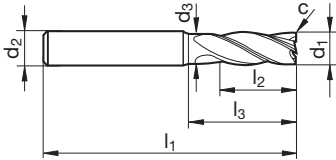
Catalogo n° 54556



P	M	K	N	S	H
●	○		○		

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- materiali dolci, a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
4,000	6,000	3,700	57,000	11,000	18,000	0,100	4	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,100	4	5,000
6,000	6,000	5,500	57,000	13,000	20,000	0,150	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,150	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,200	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,200	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,350	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT VA



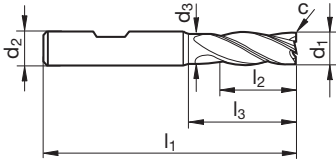
Catalogo n° 64557



P	M	K	N	S	H
●	○		○		

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- materiali dolci, a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
4,000	6,000	3,700	57,000	11,000	18,000	0,100	4	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,100	4	5,000
6,000	6,000	5,500	57,000	13,000	20,000	0,150	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,150	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,200	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,200	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,350	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT VA-IK



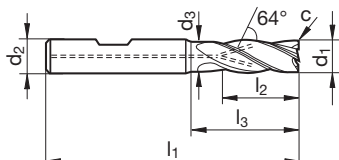
Catalogo n° 64567



P	M	K	N	S	H
●	○		○		

Parametri di lav. ind. a pag. 513-517

- geometria di taglio e rivestimento adattati
- materiali dolci, a truciolo lungo
- con refrigerazione interna per vita utensile maggiore e asportazione truciolo ottimale
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



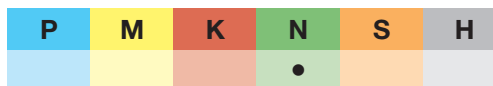
d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,150	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,150	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,200	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,200	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,350	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT Alluminio

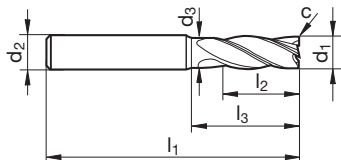


Catalogo n° 74554



Parametri di lav. ind. a pag. 513-517

- alluminio e leghe di alluminio così come metalli NE
- qualità di superficie notevole con operazioni di lappatura
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



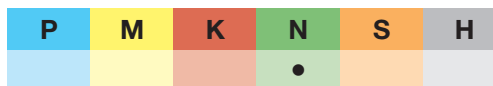
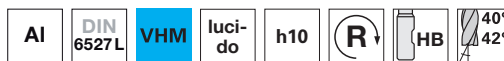
d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
4,000	6,000	3,700	57,000	11,000	18,000	0,100	4	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,100	4	5,000
6,000	6,000	5,500	57,000	13,000	20,000	0,150	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,150	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,200	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,200	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,350	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT Alluminio

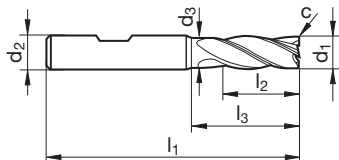


Catalogo n° 74555



Parametri di lav. ind. a pag. 513-517

- alluminio e leghe di alluminio così come metalli NE
- qualità di superficie notevole con operazioni di lappatura
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



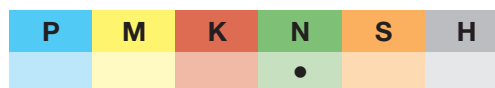
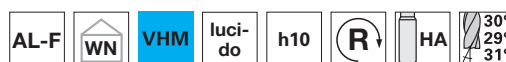
d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
4,000	6,000	3,700	57,000	11,000	18,000	0,100	4	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,100	4	5,000
6,000	6,000	5,500	57,000	13,000	20,000	0,150	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,150	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,200	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,200	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,350	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT Al-F

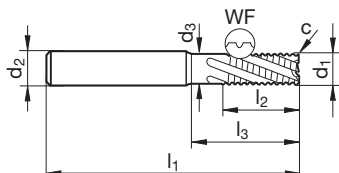


Catalogo n° 54570



Parametri di lav. ind. a pag. 513-517

- 3 taglienti con ingombro dei trucioli ingrandito
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3 μm
- alluminio e leghe in alluminio così come altri metalli NE a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



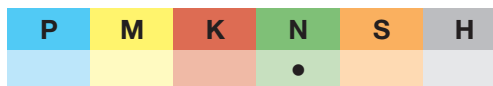
d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,300	3	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,300	3	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	3	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,500	3	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	3	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,500	3	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,600	3	25,000

Frese SuperF-UT

Frese SuperF-UT Al-F

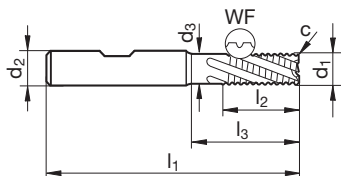


Catalogo n° 54571



Parametri di lav. ind. a pag. 513-517

- 3 taglienti con ingombro dei trucioli ingrandito
- molto adatto anche per condizioni di macchina instabili e difficili
- qualità di superficie raggiungibile rugosità = 2 fino a 3 μm
- alluminio e leghe in alluminio così come altri metalli NE a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



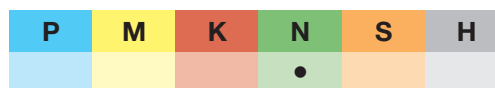
d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,300	3	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,300	3	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	3	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,500	3	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	3	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,500	3	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,600	3	25,000

Frese SuperF-UT

Frese SuperF-UT Al-3

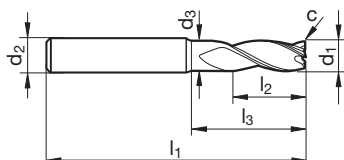


Catalogo n° 74552



Parametri di lav.
ind. a pag. 513-
517

- 3 taglienti con ingombro dei trucioli ingrandito
- finitura speculare per asportazione del truciolo ottimale
- alluminio e leghe in alluminio così come altri metalli NE a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



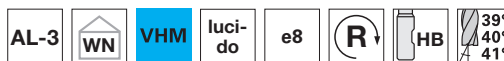
d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
3,000	6,000	2,700	57,000	8,000	15,000	0,030	3	3,000
4,000	6,000	3,700	57,000	11,000	18,000	0,040	3	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,050	3	5,000
6,000	6,000	5,500	57,000	13,000	20,000	0,060	3	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,080	3	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,100	3	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,120	3	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,160	3	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,200	3	20,000

Frese SuperF-UT

Frese SuperF-UT Al-3



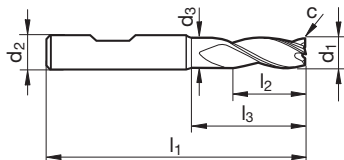
Catalogo n° 74553



P	M	K	N	S	H
			•		

Parametri di lav.
ind. a pag. 513-
517

- 3 taglienti con ingombro dei trucioli ingrandito
- finitura speculare per asportazione del truciolo ottimale
- alluminio e leghe in alluminio così come altri metalli NE a truciolo lungo
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
3,000	6,000	2,700	57,000	8,000	15,000	0,030	3	3,000
4,000	6,000	3,700	57,000	11,000	18,000	0,040	3	4,000
5,000	6,000	4,700	57,000	13,000	18,000	0,050	3	5,000
6,000	6,000	5,500	57,000	13,000	20,000	0,060	3	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,080	3	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,100	3	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,120	3	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,160	3	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,200	3	20,000

Frese SuperF-UT

Frese SuperF-UT H



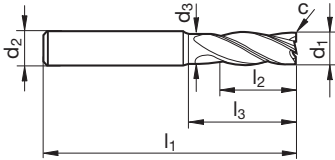
Catalogo n° 54572



P	M	K	N	S	H
•		•			•

Parametri di lav.
ind. a pag. 513-
517

- sgrossatura fino a 1xD di materiali fino a 54 HRC
- lappatura fino a 2,5xD di materiali fino a 63 HRC
- lunga vita utensile grazie al rivestimento molto forte
- particolarmente stabile grazie a punta rinforzata
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,150	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,150	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,200	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,200	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,350	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT H



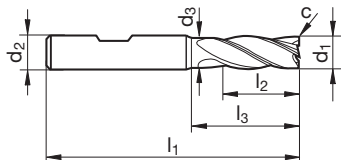
Catalogo n° 54573



P	M	K	N	S	H
•		•			•

Parametri di lav.
ind. a pag. 513-
517

- sgrossatura fino a 1xD di materiali fino a 54 HRC
- lappatura fino a 2,5xD di materiali fino a 63 HRC
- lunga vita utensile grazie al rivestimento molto forte
- particolarmente stabile grazie a punta rinforzata
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm x 45°	c mm	Z	Codice
6,000	6,000	5,500	57,000	13,000	20,000	0,150	4	6,000
8,000	8,000	7,500	63,000	19,000	26,000	0,150	4	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,200	4	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,200	4	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,350	4	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,450	4	20,000

Frese SuperF-UT

Frese SuperF-UT FS



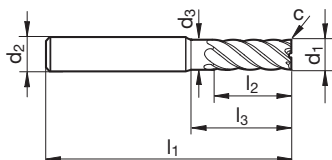
Catalogo n° 64558



P	M	K	N	S	H
•	•	•	•	•	•

Parametri di lav.
ind. a pag. 513-
517

- vantaggi maggiormente possibili con operazioni di lappatura e semi-sgrossatura specialmente a condizioni HPC
- per superfinitura fino a 50 HRC con qualità di superficie notevole
- misura lunga, vedi F-UT N-5 con 5 denti
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
8,000	8,000	7,500	63,000	19,000	26,000	0,100	6	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,100	6	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,100	6	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,150	6	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,150	6	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,200	6	25,000

Frese SuperF-UT

Frese SuperF-UT FS



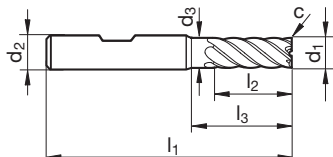
Catalogo n° 64559



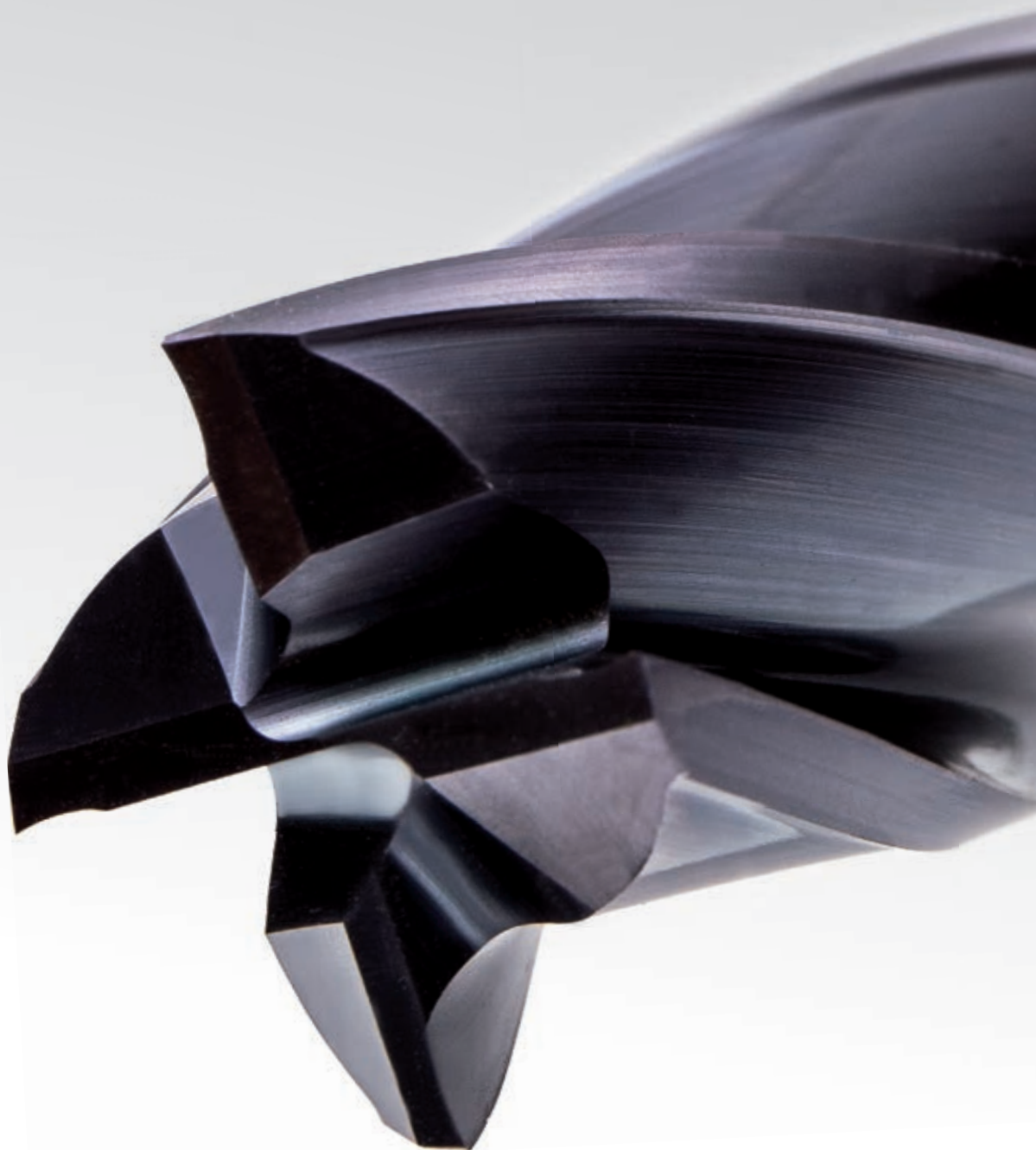
P	M	K	N	S	H
•	•	•	•	•	•

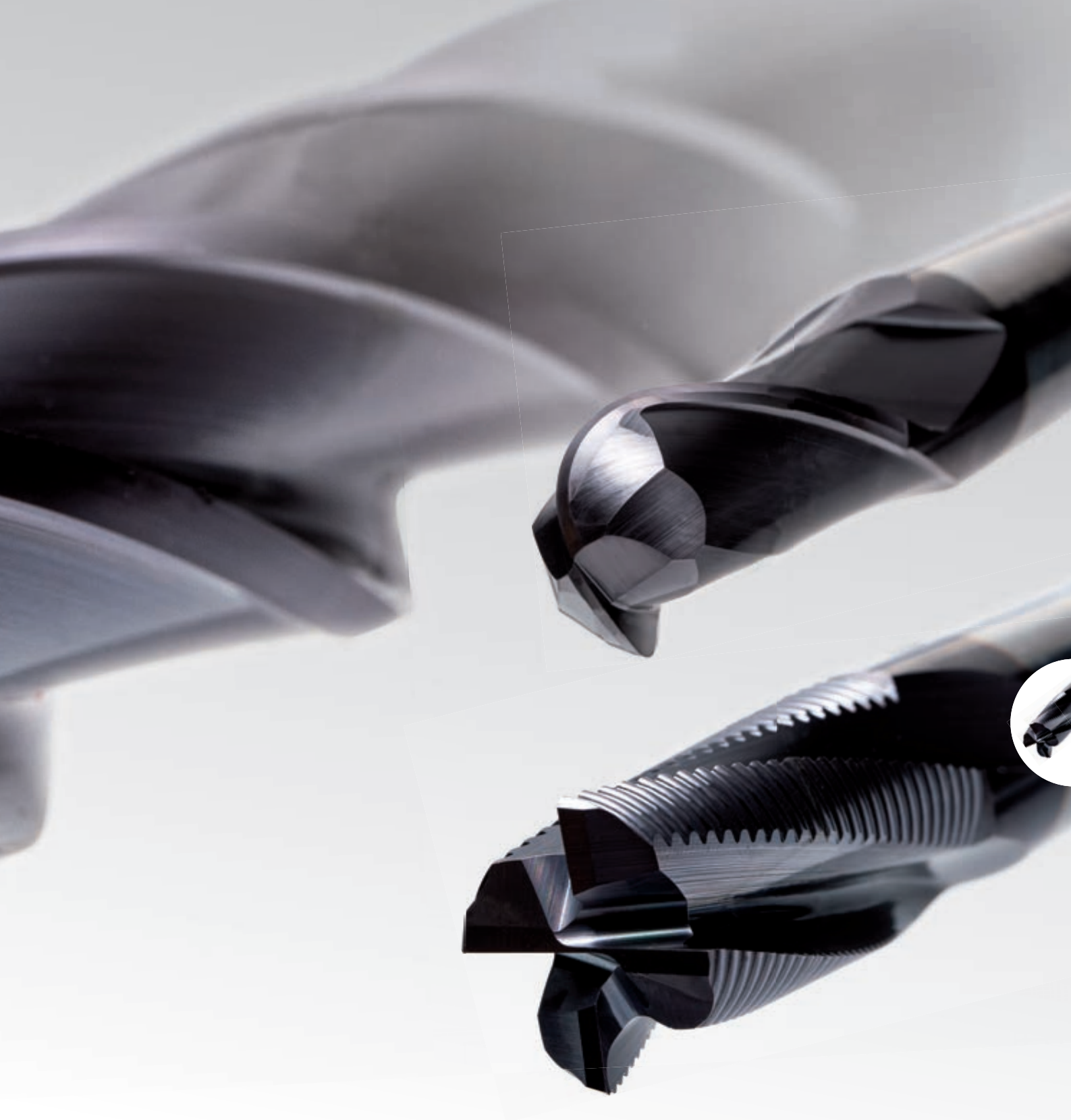
Parametri di lav.
ind. a pag. 513-
517

- vantaggi maggiormente possibili con operazioni di lappatura e semi-sgrossatura specialmente a condizioni HPC
- per superfinitura fino a 50 HRC con qualità di superficie notevole
- misura lunga, vedi F-UT N-5 con 5 denti
- protezione micro angolo
- rettifica della spoglia
- tagliente al centro
- movimento tranquillo, senza vibrazioni attraverso passo dell'elica irregolare



d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
8,000	8,000	7,500	63,000	19,000	26,000	0,300	6	8,000
10,000	10,000	9,200	72,000	22,000	30,000	0,300	6	10,000
12,000	12,000	11,200	83,000	26,000	36,000	0,500	6	12,000
16,000	16,000	15,000	92,000	32,000	42,000	0,500	6	16,000
20,000	20,000	19,000	104,000	38,000	52,000	0,500	6	20,000
25,000	25,000	23,500	121,000	45,000	63,000	0,600	6	25,000





UTENSILI A FRESARE



CODICI ISO

P	acciaio, acciaio legato in alta percentuale
M	acciaio inossidabile
K	ghisa grigia, ghisa sferoidale e ghisa malleabile
N	alluminio ed altri metalli non ferrosi
S	leghe speciali, superleghe e leghe di titanio
H	acciaio temprato e ghisa temprata

Nelle pagine successive, contenenti programma, trovate per ciascun utensile consigli sull' idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata



LEGENDA DEI PITTOGRAMMI

MATERIALE TAGLIANTE	VHM	M42	HSS-E-PM						
	Int. in metallo duro								
TRATT. DI SUPERFICIE	lucido	TiAlN	TiAl-SiN	Al-TiN	AlTiN nano	Al-TiN+			
TOLLERANZA SUL Ø	e8	e8/h10	h8	h10	m8	js9	k10	js12	k12
DIREZIONE DI TAGLIO	 a destra								
FORMA DEL CODOLO									
ANGOLI DELL'ELICA									
NORMA	DIN 6527K	DIN 6527L	DIN 6528	DIN 327	DIN 844K	DIN 844L			
	Norma di fabbrica								
TIPO	W	N	NH	H	NF	WR	NRf	HR	NR
	Super AF-60	Super AF-90	Super AF-120	Super AD-90					

P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elica °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Frese frontali alluminio

						W	HB	45	Metallo duro	lucido	DIN 6527K	3,000 - 20,000	74204	584
						W	HB	45	Metallo duro	lucido	DIN 6527L	3,000 - 20,000	74202	585
						W	HA	45	Metallo duro	lucido	Norma di fab.	5,000 - 16,000	74206	586
						W	HA	45	Metallo duro	lucido	Norma di fab.	6,000 - 20,000	74479	587

Frese frontali (a 2 taglienti)

						N	HB	30	Metallo duro	lucido	DIN 6527K	2,000 - 20,000	74520	588
						N	HB	30	Metallo duro	TiAIN	DIN 6527K	2,000 - 20,000	54520	589
						N	HA	30	Metallo duro	TiAIN	DIN 6527L	2,000 - 20,000	54519	590
						N	HB	30	Metallo duro	lucido	DIN 6527L	2,000 - 20,000	74521	591
						N	HB	30	Metallo duro	TiAIN	DIN 6527L	2,000 - 20,000	54521	592
						N	HA	30	Metallo duro	lucido	Norma di fab.	3,000 - 20,000	74404	593
						N	HA	30	Metallo duro	TiAIN	Norma di fab.	5,000 - 20,000	54404	594

Mini frese frontali (a 3 taglienti)

						N	HA/HB	30	Metallo duro	TiAIN	Norma di fab.	0,300 - 20,000	64080	595
						NH	HA/HB	45	Metallo duro	TiAIN	Norma di fab.	1,000 - 10,000	64180	596

P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elicico °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Frese frontali (a 3 taglienti)

	•	•	•	•	•	N	HB	30	Metallo duro	lucido	DIN 6527K	2,000 - 20,000	74522	597
	•	•	•	○	•	N	HB	30	Metallo duro	TiAlN	DIN 6527K	2,000 - 20,000	64522	598
	•	•	•	○	•	N	HA	30	Metallo duro	TiAlN	DIN 6527L	2,000 - 20,000	54523	599
	•	•	•	•	•	N	HB	30	Metallo duro	lucido	DIN 6527L	2,000 - 20,000	74523	600
	•	•	•	○	•	N	HB	30	Metallo duro	TiAlN	DIN 6527L	2,000 - 20,000	64523	601
	•	•	○	○	•	N	HA	30	Metallo duro	lucido	Norma di fab.	3,000 - 20,000	74424	602
	•	•	•	○	•	N	HA	30	Metallo duro	TiAlN	Norma di fab.	3,000 - 20,000	54424	603

Frese frontali (a 3 taglienti) NH

	•	•	•	○	•	NH	HB	45	Metallo duro	TiAlN	DIN 6527K	3,000 - 20,000	64570	604
	•	•	•	•	•	NH	HA	45	Metallo duro	lucido	DIN 6527L	3,000 - 20,000	74478	605
	•	•	•	○	•	NH	HA	45	Metallo duro	TiAlN	DIN 6527L	1,000 - 20,000	64478	606
	•	•	•	○	•	NH	HB	45	Metallo duro	TiAlN	DIN 6527L	3,000 - 20,000	64571	607

Frese frontali (a 4 taglienti)

	•	•	•	○	•	N	HA	30	Metallo duro	TiAlN	DIN 6527L	2,000 - 20,000	54524	608
	•	•	•	•	•	N	HB	30	Metallo duro	lucido	DIN 6527L	3,000 - 20,000	74525	609

P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elica °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Frese frontali (a 4 taglienti)

	•	○	•	○	○	N	HB	30	Metallo duro	TiAIN	DIN 6527L	2,000 - 20,000	64525	610
	•	○	•	○	○	N	HA	30	Metallo duro	TiAIN	Norma di fab.	3,000 - 20,000	54444	611

Frese frontali con spigolo raggiato

	•	•	•	○	•	N	HA	30	Metallo duro	TiAIN	DIN 6527L	6,000 - 16,000	54522	612
	•	•	•	○	•	N	HA	30	Metallo duro	TiAIN	DIN 6527L	6,000 - 20,000	54526	613
	•	•	•	○	•	NH	HA	45	Metallo duro	TiAIN	DIN 6527L	6,000 - 20,000	54206	614

Frese frontali per finitura, taglienti multipli

	•	•	•	○	•	NH	HA	45	Metallo duro	TiAIN	Norma di fab.	3,000 - 20,000	54205	615
	•	•	•	○	•	NH	HB	45	Metallo duro	TiAIN	Norma di fab.	6,000 - 20,000	54201	616
	•	•	•	○	•	NH	HA	45	Metallo duro	TiAIN	Norma di fab.	6,000 - 20,000	54225	617
	•	•	•	○	•	NH	HB	45	Metallo duro	TiAIN	Norma di fab.	6,000 - 20,000	54221	618

Frese per materiali duri, taglienti multipli

	•	•	•	○	•	H	HA	55	Metallo duro	TiAISIN	Norma di fab.	3,000 - 20,000	54207	619
	•	•	•	○	•	H	HA	55	Metallo duro	TiAISIN	Norma di fab.	6,000 - 20,000	54227	620

P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elicico °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Frese a sgrossare

						NF	HB	30	Metallo duro	TiAIN	DIN 6527L	6,000 - 25,000	54496	621
						NF	HB	45	Metallo duro	TiAIN	DIN 6527L	6,000 - 25,000	54497	622
						WR	HB	30	Metallo duro	lucido	DIN 6527L	6,000 - 20,000	74203	623
						WR	HB	30	Metallo duro	lucido	DIN 6527L	6,000 - 20,000	74303	624
						NRf	HB	30	Metallo duro	TiAIN	DIN 6527L	6,000 - 20,000	64495	625
						HR	HB	20	Metallo duro	TiAISiN	DIN 6527L	6,000 - 20,000	64497	626

Frese a raggio

						N	HA	30	Metallo duro	lucido	DIN 6527L	3,000 - 20,000	74543	627
						N	HA	30	Metallo duro	TiAIN	DIN 6527L	0,500 - 20,000	54541	628
						N	HB	30	Metallo duro	TiAIN	DIN 6527L	1,000 - 20,000	64542	629
						N	HA	30	Metallo duro	lucido	Norma di fab.	3,000 - 12,000	74545	630
						N	HA	30	Metallo duro	TiAIN	Norma di fab.	3,000 - 12,000	64545	631
						N	HA	30	Metallo duro	lucido	DIN 6528	4,000 - 16,000	74531	632
						N	HA	30	Metallo duro	TiAIN	DIN 6528	4,000 - 20,000	54531	633
						N	HB	30	Metallo duro	TiAIN	DIN 6527L	3,000 - 20,000	64532	634

P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elicico °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Frese a raggio



•	•	•	○	○		N	HA	30	Metallo duro	TiAlN	Norma di fab.	3,000 - 12,000	64535	635
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Frese per copiatori con affilatura torica



•	•	•	○	•		H	HA	30	Metallo duro	TiAlSiN	Norma di fab.	3,000 - 16,000	54304	636
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•	•	•	○	•	•	H	HA	30	Metallo duro	TiAlSiN	Norma di fab.	6,000 - 16,000	54305	637
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•	•	•	○	•		N	HA	30	Metallo duro	TiAlSiN	Norma di fab.	2,000 - 12,000	54302	638
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•	•	•	○	•		N	HA	30	Metallo duro	TiAlSiN	Norma di fab.	2,000 - 12,000	54303	639
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Frese a raggio per copiatori



•	•	•	○	•	•	H	HA	30	Metallo duro	TiAlSiN	Norma di fab.	0,500 - 16,000	54306	640
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•	•	•	○	•	•	H	HA	30	Metallo duro	TiAlSiN	Norma di fab.	3,000 - 16,000	54307	641
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•	•	•	○	•		N	HA	30	Metallo duro	TiAlSiN	Norma di fab.	2,000 - 12,000	54300	642
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•	•	•	○	•		N	HA	30	Metallo duro	TiAlSiN	Norma di fab.	2,000 - 12,000	54301	643
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Fresa pilota



•	•	•	○	•	•	N	HA	30	Metallo duro	AlTiN+	DIN 6527L	1,400 - 12,000	54700	644
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Fresa frontali a 60° per sbavatura



•	•	•	○	•		SuperAF-60	HA	0	Metallo duro	AlTiN	Norma di fab.	4,000 - 12,000	53393	645
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P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elicico °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Fresa frontali a 60° per sbavatura



•	•	•	•	•	•	SuperAF-60	HB	0	Metallo duro	AlTiN	Norma di fab.	6,000 - 12,000	53394	646
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Fresa frontali a 90° per sbavatura



•	•	•	•	•	•	SuperAF-90	HA	0	Metallo duro	AlTiN	Norma di fab.	4,000 - 12,000	53395	647
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•	•	•	•	•	•	SuperAF-90	HB	0	Metallo duro	AlTiN	Norma di fab.	4,000 - 12,000	53396	648
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Fresa frontali a 120° per sbavatura



•	•	•	•	•	•	SuperAF-120	HA	0	Metallo duro	AlTiN	Norma di fab.	4,000 - 12,000	53397	649
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•	•	•	•	•	•	SuperAF-120	HB	0	Metallo duro	AlTiN	Norma di fab.	6,000 - 12,000	53398	650
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Sbavatori a 90° ad avanzamento ed estrazione



•	•	•	•	•	•	SuperAD-90	HA	0	Metallo duro	AlTiN nano	Norma di fab.	3,000 - 12,000	52365	651
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P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elica °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Frese frontali (a 2 taglienti)

		N	B	30	M42	lucido	DIN 327	1,000 - 25,000	74231	652
		N	B	30	M42	TiAIN	DIN 327	1,000 - 20,000	64640	653
		N	B	30	M42	lucido	DIN 844K	3,000 - 20,000	74243	654
		N	B	30	M42	TiAIN	DIN 844K	3,000 - 20,000	64670	655
		N	B	30	M42	lucido	DIN 844L	3,000 - 20,000	74244	656
		N	B	30	M42	TiAIN	DIN 844L	4,000 - 20,000	64671	657

Frese frontali (a 3 taglienti)

		N	B	30	M42	lucido	DIN 327	2,800 - 25,000	74280	658
		N	B	30	M42	TiAIN	DIN 327	2,800 - 25,000	64604	659
		N	B	30	M42	lucido	DIN 844K	3,000 - 20,000	74282	660
		N	B	30	M42	TiAIN	DIN 844K	3,000 - 20,000	64641	661
		N	B	30	M42	lucido	DIN 844L	3,000 - 20,000	74294	663
		N	B	30	M42	TiAIN	DIN 844L	4,000 - 18,000	54294	662

Mini frese frontali (a 3 taglienti)

		N		30	M42	TiAIN	Norma di fab.	3,000 - 10,000	54080	664
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P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elicico °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Mini frese frontali (a 3 taglienti)



○	●	●	●	○		N		30	M42	TiAIN	Norma di fab.	3,000 - 10,000	54180	665
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Frese universali, taglienti multipli



●	●	○	○			N	B	30	M42	lucido	DIN 844K	2,000 - 25,000	74617	666
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●	●	●	○			N	B	30	M42	TiAIN	DIN 844K	3,000 - 25,000	64667	667
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●	○	●	○			N	B	30	M42	lucido	DIN 844L	3,000 - 25,000	74847	668
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●	●	●	○			N	B	30	M42	TiAIN	DIN 844L	3,000 - 32,000	54847	669
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●	○					N	B	30	M42	lucido	Norma di fab.	6,000 - 20,000	74800	670
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Frese di semifinitura



●	●	●				NF	B	30	M42	TiAIN	DIN 844K	6,000 - 25,000	54815	671
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Frese a sgrossare (3 taglienti)



●	●	●				NRf	B	30	HSS-E-PM	lucido	DIN 844K	6,000 - 20,000	74825	672
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●	●	●				NRf	B	30	HSS-E-PM	TiAIN	DIN 844K	6,000 - 20,000	54825	673
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Frese a sgrossare (4 taglienti)



●	●	●				NR	B	30	M42	lucido	DIN 844K	6,000 - 30,000	74816	674
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●	●	●				NR	B	30	M42	TiAIN	DIN 844K	6,000 - 32,000	54816	675
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P	M	K	N	S	H	Tipo	Forma dell'attacco	Angolo elic. °	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Frese a sgrossare (4 taglienti)



•	•	•	•	•	•	NRf	B	30	HSS-E-PM	lucido	DIN 844K	6,000 - 25,000	74845	676
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•	•	•	•	•	•	NRf	B	30	HSS-E-PM	TiAIN	DIN 844K	6,000 - 25,000	54845	677
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•	•	•	•	•	•	NR	B	30	M42	lucido	DIN 844L	6,000 - 25,000	74836	678
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•	•	•	•	•	•	NR	B	30	M42	TiAIN	DIN 844L	6,000 - 25,000	54836	679
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Frese a raggio



•	•	•	•	•	•	N	B	30	M42	TiAIN	DIN 327	2,000 - 20,000	54275	680
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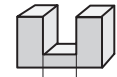


•	•	•	•	•	•	N	B	30	M42	TiAIN	Norma di fab.	3,000 - 20,000	54276	681
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Parametri di lavoro indicativi per frese frontali in M.D.I.

Serie d'avanzamento																	
Codice lettera	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	
Ø utensile mm	2,00	0,001	0,001	0,001	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,020
	3,00	0,002	0,002	0,003	0,003	0,004	0,007	0,010	0,010	0,010	0,015	0,016	0,013	0,019	0,022	0,024	0,030
	5,00	0,005	0,006	0,007	0,009	0,010	0,014	0,020	0,020	0,022	0,025	0,026	0,026	0,028	0,030	0,032	0,038
	6,00	0,006	0,008	0,009	0,011	0,013	0,017	0,024	0,025	0,027	0,031	0,029	0,033	0,039	0,036	0,041	0,047
	8,00	0,010	0,012	0,014	0,016	0,019	0,024	0,032	0,032	0,035	0,042	0,042	0,047	0,053	0,052	0,058	0,064
	10,00	0,013	0,015	0,018	0,021	0,025	0,030	0,038	0,039	0,044	0,050	0,053	0,059	0,065	0,066	0,073	0,080
	12,00	0,010	0,018	0,022	0,026	0,030	0,036	0,046	0,048	0,052	0,059	0,063	0,072	0,079	0,085	0,090	0,100
	16,00	0,020	0,023	0,027	0,032	0,038	0,045	0,054	0,058	0,063	0,071	0,079	0,088	0,095	0,100	0,110	0,120
	20,00	0,023	0,028	0,033	0,038	0,045	0,057	0,066	0,073	0,080	0,090	0,097	0,100	0,110	0,120	0,130	0,140
	25,00	0,030	0,035	0,040	0,045	0,055	0,065	0,075	0,100	0,120	0,130	0,140	0,150	0,165	0,170	0,180	0,190

a_e = larghezza di taglio
 a_p = profondità di taglio



$$a_e = 1,0 \times D$$

I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a $1 \times D$. Questo viene applicato anche per la transizione in lavorazione radiale.

Scanalatura

a_p = profondità di taglio $0,5 \times D = f_z$ 100%

a_p = profondità di taglio $1,0 \times D = f_z$ 75%

Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a $0,5 \times D$.



olio da taglio, attivo ■
 emulsione ■
 solo refrigerazione ad aria □

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■
Acciai temprati	-		≤40-48 HRC >48-60 HRC	■
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Ghisa dura	-		≤350 HB	■
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		■
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		■
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	□
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	■ □
Mat. plast. a fibre aramidiche	Kevlar		-	□
a fibre di vetro/C rinforzate	GFK/CFK		-	□

Frese per cave

Catalogo n°

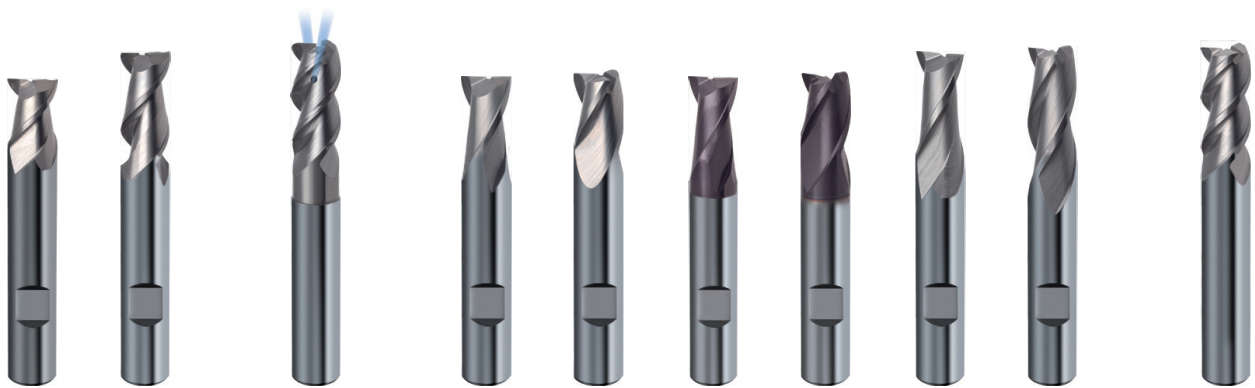
Mat. de tagl.

Norma

Tipo

Pagina

74204	74202	74479	74520	74522	54520 54522	64522	74521	74523	74478
M.D.I.		M.D.I.	M.D.I.		M.D.I.		M.D.I.		M.D.I.
6527 K	6527 L	Stock std.	6527 K		6527 K		6527 L		6527 L
W		W	N		N		N		NH
584	585	587	588	597	589/612	598	591	600	605

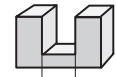


V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.
		73	O	120	O	63	N	63	N		
		69	M	115	N	60	L	60	L		
		73	M	120	N	63	L	63	L		
		53	N	90	O	47	M	47	M		
		73	M	120	N	63	L	63	L		
		65	M	108	N	57	L	57	L		
		53	N	90	O	47	M	47	M		
		65	N	108	O	57	M	57	M		
		53	N	90	O	47	M	47	M		
		76	M	127	N	66	L	66	L		
		65	M	108	N	57	L	57	L		
		46	N	76	O	40	M	40	M		
		73	M	120	N	63	L	63	L		
		65	L	108	M	57	L	57	L		
		65	M	108	N	57	L	57	L		
		53	L	90	M	47	L	47	L		
		39	N	64	O	33	M	33	M		
				64	M						
				64	M						
		39	N	64	O	33	M	33	M		
		35	L	58	M	30	L	30	L		
		31	M	51	N	27	L	27	L		
		92	M	152	N	80	L	80	L		
		84	L	140	M	73	L	73	L		
		76	M	127	N	66	L	66	L		
		69	L	115	M	60	L	60	L		
		46	L	76	M	40	L	40	L		
				39	M						
		39	L	64	M	33	L	33	L		
		31	L	51	M	27	L	27	L		
363	R	436	T	343	O	570	P	297	N	297	N
440	R	528	T	418	O	697	P	363	N	363	N
176	Q	212	S	168	N	279	O	146	M	146	M
143	R	172	T	137	O	228	P	119	N	119	N
209	S	251	T	191	P	317	Q	165	O	165	O
99	R	119	T	92	O	152	P	80	N	80	N
88	R	106	T	76	O	127	P	66	N	66	N
83	Q	99	S	69	N	115	O	60	M	60	M
88	Q	106	S	76	N	127	O	66	M	66	M
77	P	93	S	61	M	102	N	53	L	53	L
77	Q	93	S	61	N	102	O	53	M	53	M
66	O	80	R	53	L	90	M	47	L	47	L
99	O	119	R	92	L	152	M	80	L	80	L
88	O	106	R	84	L	140	M	73	L	73	L

Parametri di lavoro indicativi per frese frontali in M.D.I.

Serie d'avanzamento																	
Codice lettera	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	
Ø utensile mm	2,00	0,001	0,001	0,001	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,020
	3,00	0,002	0,002	0,003	0,003	0,004	0,007	0,010	0,010	0,010	0,015	0,016	0,013	0,019	0,022	0,024	0,030
	5,00	0,005	0,006	0,007	0,009	0,010	0,014	0,020	0,020	0,022	0,025	0,026	0,026	0,028	0,030	0,032	0,038
	6,00	0,006	0,008	0,009	0,011	0,013	0,017	0,024	0,025	0,027	0,031	0,029	0,033	0,039	0,036	0,041	0,047
	8,00	0,010	0,012	0,014	0,016	0,019	0,024	0,032	0,032	0,035	0,042	0,042	0,047	0,053	0,052	0,058	0,064
	10,00	0,013	0,015	0,018	0,021	0,025	0,030	0,038	0,039	0,044	0,050	0,053	0,059	0,065	0,066	0,073	0,080
	12,00	0,010	0,018	0,022	0,026	0,030	0,036	0,046	0,048	0,052	0,059	0,063	0,072	0,079	0,085	0,090	0,100
	16,00	0,020	0,023	0,027	0,032	0,038	0,045	0,054	0,058	0,063	0,071	0,079	0,088	0,095	0,100	0,110	0,120
	20,00	0,023	0,028	0,033	0,038	0,045	0,057	0,066	0,073	0,080	0,090	0,097	0,100	0,110	0,120	0,130	0,140
	25,00	0,030	0,035	0,040	0,045	0,055	0,065	0,075	0,100	0,120	0,130	0,140	0,150	0,165	0,170	0,180	0,190

a_e = larghezza di taglio
 a_p = profondità di taglio



$$a_e = 1,0 \times D$$

I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

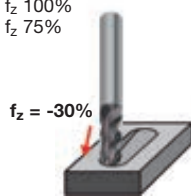
Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a $1 \times D$. Questo viene applicato anche per la transizione in lavorazione radiale.

Scanalatura

a_p = profondità di taglio $0,5 \times D = f_z$ 100%

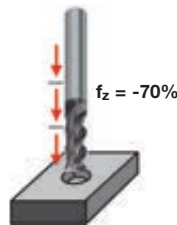
a_p = profondità di taglio $1,0 \times D = f_z$ 75%



Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a $0,5 \times D$.



olio da taglio, attivo ■
 emulsione ■
 solo refrigerazione ad aria □

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■
Acciai temprati	-		≤40-48 HRC >48-60 HRC	■
Acciai inossidabili, solforati	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤850		■
austenitici	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitisch	1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850		■
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Ghisa dura	-		≤350 HB	■
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Leghe ghisa alluminio ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		■
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■
Ottone, a truciolo corto	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		■
a truciolo lungo	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		■
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600 >600-850		■
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	□
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	■ □
Mat. plast. a fibre aramidiche	Kevlar		-	□
a fibre di vetro/C rinforzate	GFK/CFK		-	□

Frese per cave

Catalogo n°

Mat. de tagl.

Norma

Tipo

Pagina

54521 54519	54523 64523	64478	64570 64571	74404	74424	54404	54424	64080	64180
M.D.I.		M.D.I.		M.D.I.		M.D.I.		M.D.I.	
6527 L		6527 L	6527 K/L	Stock std.		Stock std.		Stock std.	
N		NH		N		N		N	
592/590	599/601	606	604/607	593	602	594	603	595	596

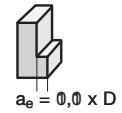


V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.
105	N	105	N	50	J	80	J	95	M	105	N
99	M	99	M	45	H	75	I	90	L	100	M
105	M	105	M	50	H	80	I	95	L	105	M
77	N	77	N	35	I	60	J	70	M	75	N
105	M	105	M	50	H	80	I	95	L	105	M
94	M	94	M	40	H	70	I	85	L	95	M
77	N	77	N	35	I	60	J	70	M	75	N
94	N	94	N	40	I	70	J	85	M	95	N
77	N	77	N	35	I	60	J				
110	M	110	M	45	H	75	I	100	L	110	M
94	M	94	M	40	H	70	I	85	L	95	M
66	N	66	N	30	I	50	J				
105	M	105	M	50	H	80	I	95	L	105	M
94	L	94	L	40	H	70	H				
94	M	94	M	40	H	70	I	85	L	95	M
77	L	77	L	35	H	60	H	70	K	75	L
55	N	55	N	38	I	45	J	50	M	55	N
55	L	55	L								
55	L	55	L								
55	N	55	N					50	M	55	N
50	L	50	L					45	K	50	L
44	M	44	M					40	L	45	M
132	M	132	M	60	H	105	I	120	L	130	M
121	L	121	L	55	H	95	H	110	K	120	L
110	M	110	M	55	H	90	I	100	L	110	M
99	L	99	L	45	H	75	H	90	K	100	L
66	L	66	L					60	K	65	L
33	L	33	L								
55	L	55	L	40	H	65	H	50	K	55	L
44	L	44	L	20	H	35	H	40	K	45	L
495	O	495	O					330	Q	330	Q
605	O	605	O					400	Q	400	Q
242	N	242	N					160	P	245	N
198	O	198	O					130	Q	200	O
275	P	275	P					185	R	185	R
132	O	132	O					90	Q	130	O
110	O	110	O					80	Q	110	O
99	N	99	N					70	P	75	P
110	N	110	N					80	P	110	N
88	M	88	M					70	O	90	M
88	N	88	N					70	P	70	P
77	L	77	L					60	N	60	N
132	L	132	L					90	N	90	N
121	L	121	L					80	N	80	N

Parametri di lavoro indicativi per frese frontali in M.D.I.

Serie d'avanzamento														Avanzamento f (mm/dente)			
Codice lettera	H	I	J	K	L	M	N	O	P	Q	R	S	T		U	V	W
Ø utensile mm	2,00	0,001	0,001	0,001	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,020
	3,00	0,002	0,002	0,003	0,003	0,004	0,007	0,010	0,010	0,010	0,015	0,016	0,013	0,019	0,022	0,024	0,030
	5,00	0,005	0,006	0,007	0,009	0,010	0,014	0,020	0,020	0,022	0,025	0,026	0,026	0,028	0,030	0,032	0,038
	6,00	0,006	0,008	0,009	0,011	0,013	0,017	0,024	0,025	0,027	0,031	0,029	0,033	0,039	0,036	0,041	0,047
	8,00	0,010	0,012	0,014	0,016	0,019	0,024	0,032	0,032	0,035	0,042	0,042	0,047	0,053	0,052	0,058	0,064
	10,00	0,013	0,015	0,018	0,021	0,025	0,030	0,038	0,039	0,044	0,050	0,053	0,059	0,065	0,066	0,073	0,080
	12,00	0,010	0,018	0,022	0,026	0,030	0,036	0,046	0,048	0,052	0,059	0,063	0,072	0,079	0,085	0,090	0,100
	16,00	0,020	0,023	0,027	0,032	0,038	0,045	0,054	0,058	0,063	0,071	0,079	0,088	0,095	0,100	0,110	0,120
	20,00	0,023	0,028	0,033	0,038	0,045	0,057	0,066	0,073	0,080	0,090	0,097	0,100	0,110	0,120	0,130	0,140
	25,00	0,030	0,035	0,040	0,045	0,055	0,065	0,075	0,100	0,120	0,130	0,140	0,150	0,165	0,170	0,180	0,190

a_e = larghezza di taglio
a_p = profondità di taglio



I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a 1 x D. Questo viene applicato anche per la transizione in lavorazione radiale.

Scanalatura

a_p = profondità di taglio 0,5 x D = f_z 100%
a_p = profondità di taglio 1,0 x D = f_z 75%

Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a 0.5 x D.



olio da taglio, attivo ■
emulsione ■
solo refrigerazione ad aria □

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■
Acciai temprati	-		≤40-48 HRC >48-60 HRC	■
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Ghisa dura	-		≤350 HB	■
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		■
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		■
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	□
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	■ □
Mat. plast. a fibre aramidiche	Kevlar		-	□
a fibre di vetro/C rinforzate	GFK/CFK		-	□

Frese di finitura

Catalogo n°

Mat. de tagl.

Norma

Tipo

Pagina

74525	54526	64525 54524	74424	54444	74204	74202	74206	74479
M.D.I.	M.D.I.	M.D.I.	M.D.I.	M.D.I.	M.D.I.		M.D.I.	M.D.I.
6527 L	6527 L	6527 L	Stock std.	Stock std.	6527 K	6527 L	Stock std.	Stock std.
N	N	N	N	N	W		W	W
609	613	610/608	602	611	584	585	586	587



V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.
116	S	193	S	76	N	127	O						
106	R	176	S	70	M	116	N						
116	R	193	S	76	M	127	N						
86	Q	143	R	60	L	99	M						
116	R	193	S	76	M	127	N						
106	R	176	S	66	M	110	N						
86	Q	143	R	57	L	94	M						
103	Q	171	R	66	L	110	M						
86	P	143	Q	57	L	94	L						
129	R	215	S	73	M	121	N						
103	R	171	S	66	M	110	N						
76	Q	127	R	50	L	83	M						
116	R	193	S	76	M	127	N						
106	P	176	Q	66	L	110	L						
103	R	171	S	66	M	110	N						
86	P	143	Q	57	L	94	L						
66	Q	110	R	43	L	72	M						
66	P	110	Q										
39	N	55	O										
66	Q	110	R										
57	P	94	Q										
53	Q	88	R										
139	R	231	S	99	M	165	N						
139	Q	231	R	90	L	149	M						
126	R	209	S	83	M	138	N						
106	Q	176	R	70	L	116	M						
73	O	121	P										
40	P	66	Q										
66	P	110	Q	43	L	72	L						
53	O	88	P	33	K	55	L						
561	T	935	T	330	P	550	Q	418	U	330	P	523	U
528	S	880	T	396	O	660	P	506	T	396	O	633	T
274	S	457	S	165	N	275	O	203	T	165	N	253	T
225	S	374	T	132	O	220	P	165	T	132	P	207	T
317	T	528	T	198	P	330	Q	241	U	198	U	302	U
146	S	242	T	99	O	165	P	115	T	99	P	143	T
132	S	220	S	80	N	132	O	102	T	80	N	127	T
106	S	176	S	66	N	110	O	95	T	66	N	119	T
132	S	220	S	80	N	132	O	102	T	80	N	127	T
99	R	165	S					90	S			112	S
99	R	165	S					90	S			112	S
86	Q	143	R					76	S			95	S
146	Q	242	R					115	S			143	S
132	Q	220	R					102	S			127	S

Parametri di lavoro indicativi per frese frontali per Metallo Duro

Serie d'avanzamento														Avanzamento f (mm/dente)			
Codice lettera	H	I	J	K	L	M	N	O	P	Q	R	S	T		U	V	W
Ø utensile mm	2,00	0,001	0,001	0,001	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,020
	3,00	0,002	0,002	0,003	0,003	0,004	0,007	0,010	0,010	0,010	0,015	0,016	0,013	0,019	0,022	0,024	0,030
	5,00	0,005	0,006	0,007	0,009	0,010	0,014	0,020	0,020	0,022	0,025	0,026	0,026	0,028	0,030	0,032	0,038
	6,00	0,006	0,008	0,009	0,011	0,013	0,017	0,024	0,025	0,027	0,031	0,029	0,033	0,039	0,036	0,041	0,047
	8,00	0,010	0,012	0,014	0,016	0,019	0,024	0,032	0,032	0,035	0,042	0,042	0,047	0,053	0,052	0,058	0,064
	10,00	0,013	0,015	0,018	0,021	0,025	0,030	0,038	0,039	0,044	0,050	0,053	0,059	0,065	0,066	0,073	0,080
	12,00	0,010	0,018	0,022	0,026	0,030	0,036	0,046	0,048	0,052	0,059	0,063	0,072	0,079	0,085	0,090	0,100
	16,00	0,020	0,023	0,027	0,032	0,038	0,045	0,054	0,058	0,063	0,071	0,079	0,088	0,095	0,100	0,110	0,120
	20,00	0,023	0,028	0,033	0,038	0,045	0,057	0,066	0,073	0,080	0,090	0,097	0,100	0,110	0,120	0,130	0,140
	25,00	0,030	0,035	0,040	0,045	0,055	0,065	0,075	0,100	0,120	0,130	0,140	0,150	0,165	0,170	0,180	0,190

a_e = larghezza di taglio
a_p = profondità di taglio



$$a_e = 0,6 \times D$$

I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a 1 x D. Questo viene applicato anche per la transizione in lavorazione radiale.

Scanalatura

a_p = profondità di taglio 0,5 x D = f_z 100%

a_p = profondità di taglio 1,0 x D = f_z 75%

Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a 0.5 x D.



olio da taglio, attivo ■
emulsione ■
solo refrigerazione ad aria □

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■
Acciai temprati	-		≤40-48 HRC >48-60 HRC	■
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Ghisa dura	-		≤350 HB	■
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		■
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		■
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	□
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	■ □
Mat. plast. a fibre aramidiche	Kevlar		-	□
a fibre di vetro/C rinforzate	GFK/CFK		-	□

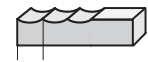
Parametri di lavoro indicativi per frese frontali/a raggio per Metallo Duro

Serie d'avanzamento														Avanzamento f (mm/dente)			
Codice lettera	H	I	J	K	L	M	N	O	P	Q	R	S	T		U	V	W
Ø utensile mm	2,00	0,001	0,001	0,001	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,020
	3,00	0,002	0,002	0,003	0,003	0,004	0,007	0,010	0,010	0,010	0,015	0,016	0,013	0,019	0,022	0,024	0,030
	5,00	0,005	0,006	0,007	0,009	0,010	0,014	0,020	0,020	0,022	0,025	0,026	0,026	0,028	0,030	0,032	0,038
	6,00	0,006	0,008	0,009	0,011	0,013	0,017	0,024	0,025	0,027	0,031	0,029	0,033	0,039	0,036	0,041	0,047
	8,00	0,010	0,012	0,014	0,016	0,019	0,024	0,032	0,032	0,035	0,042	0,042	0,047	0,053	0,052	0,058	0,064
	10,00	0,013	0,015	0,018	0,021	0,025	0,030	0,038	0,039	0,044	0,050	0,053	0,059	0,065	0,066	0,073	0,080
	12,00	0,010	0,018	0,022	0,026	0,030	0,036	0,046	0,048	0,052	0,059	0,063	0,072	0,079	0,085	0,090	0,100
	16,00	0,020	0,023	0,027	0,032	0,038	0,045	0,054	0,058	0,063	0,071	0,079	0,088	0,095	0,100	0,110	0,120
	20,00	0,023	0,028	0,033	0,038	0,045	0,057	0,066	0,073	0,080	0,090	0,097	0,100	0,110	0,120	0,130	0,140
	25,00	0,030	0,035	0,040	0,045	0,055	0,065	0,075	0,100	0,120	0,130	0,140	0,150	0,165	0,170	0,180	0,190

a_e = larghezza di taglio
a_p = profondità di taglio



$$a_e = 0,02 \times D, 05 \times D$$



$$a_p = 0,02 - 0,05 \times D$$

I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a 1 x D. Questo viene applicato anche per la transizione in lavorazione radiale.

Scanalatura

a_p = profondità di taglio 0,5 x D = f_z 100%

a_p = profondità di taglio 1,0 x D = f_z 75%



Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a 0,5 x D.

olio da taglio, attivo ■

emulsione ■

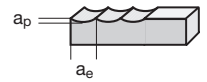
solo refrigerazione ad aria □

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■
Acciai temprati	-		≤40-48 HRC >48-60 HRC	■
Acciai inossidabili, solforati	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤850		■
austenitici	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi17-12-2 (V4A)	≤850		■
martensitisch	1.4057 X20CrNi17.2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850		■
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Ghisa dura	-		≤350 HB	■
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Leghe ghisa alluminio ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		■
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■
Ottone, a truciolo corto	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		■
a truciolo lungo	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		■
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600 >600-850		■
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	□
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	■ □
Mat. plast. a fibre aramidiche	Kevlar		-	□
a fibre di vetro/C rinforzate	GFK/CFK		-	□

Parametri di lavoro indicativi per frese a raggio per Metallo Duro

Serie d'avanzamento																	
Codice lettera	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	
Ø utensile mm	2,00	0,001	0,001	0,001	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,020
	3,00	0,002	0,002	0,003	0,003	0,004	0,007	0,010	0,010	0,010	0,015	0,016	0,013	0,019	0,022	0,024	0,030
	5,00	0,005	0,006	0,007	0,009	0,010	0,014	0,020	0,020	0,022	0,025	0,026	0,026	0,028	0,030	0,032	0,038
	6,00	0,006	0,008	0,009	0,011	0,013	0,017	0,024	0,025	0,027	0,031	0,029	0,033	0,039	0,036	0,041	0,047
	8,00	0,010	0,012	0,014	0,016	0,019	0,024	0,032	0,032	0,035	0,042	0,042	0,047	0,053	0,052	0,058	0,064
	10,00	0,013	0,015	0,018	0,021	0,025	0,030	0,038	0,039	0,044	0,050	0,053	0,059	0,065	0,066	0,073	0,080
	12,00	0,010	0,018	0,022	0,026	0,030	0,036	0,046	0,048	0,052	0,059	0,063	0,072	0,079	0,085	0,090	0,100
	16,00	0,020	0,023	0,027	0,032	0,038	0,045	0,054	0,058	0,063	0,071	0,079	0,088	0,095	0,100	0,110	0,120
	20,00	0,023	0,028	0,033	0,038	0,045	0,057	0,066	0,073	0,080	0,090	0,097	0,100	0,110	0,120	0,130	0,140
	25,00	0,030	0,035	0,040	0,045	0,055	0,065	0,075	0,100	0,120	0,130	0,140	0,150	0,165	0,170	0,180	0,190

a_e = larghezza di taglio
 a_p = profondità di taglio



$$a_e = 1,0 \times D$$

Le nuove condizioni europee in accordo con le norme DIN EN per acciaio e ghisa sono applicate per tutti i nostri esempi di materiale.

olio da taglio, attivo ■
 emulsione ■
 solo refrigerazione ad aria □

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■ ■
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■ ■
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■ ■
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■ ■
Acciai temprati	-		≤40-48 HRC >48-60 HRC	■ ■
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■ ■
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■ ■
Ghisa dura	-		≤350 HB	■
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■ ■
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■ ■
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■ ■
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		■ ■
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		■ ■
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■ ■
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	□
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	■ □
Mat. plast. a fibre aramidiche	Kevlar		-	□
a fibre di vetro/C rinforzate	GFK/CFK		-	□

Lavorazione HSC

Catalogo n°

**54300
54301**

Mat. de tagl.

M.D.I.

Norma

Stock std.

Tipo

N

Pagina

642/643



**54302
54303**

M.D.I.

Stock std.

N

638/639

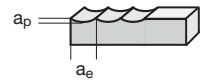


54300 / 54301								54302 / 54303							
Ø		2/3	4	6	8	10	12	Ø		4	6	8	10	12	
sgrossatura								sgrossatura							
eff. Ø *		-	1,74	2,99	4,21	5,27	6,63	eff. Ø *		-	-	-	-	-	
a _p mm		0,10	0,20	0,40	0,60	0,75	1,00	a _p mm		0,20	0,40	0,60	0,75	1,00	
a _e mm		0,15	0,30	0,50	0,75	1,00	1,50	a _e mm		0,30	0,50	0,75	1,00	1,50	
finitura								finitura							
eff. Ø *		-	1,25	1,81	2,24	2,66	3,07	eff. Ø *		-	-	-	-	-	
a _p mm		0,07	0,10	0,14	0,16	0,18	0,20	a _p mm		0,10	0,14	0,16	0,18	0,20	
a _e mm		0,05	0,07	0,10	0,15	0,20	0,25	a _e mm		0,07	0,10	0,15	0,20	0,25	
V _c m/min	V _c m/min	fz (mm)	fz (mm)	fz (mm)	fz (mm)	fz (mm)	fz (mm)	V _c m/min	V _c m/min	fz (mm)	fz (mm)	fz (mm)	fz (mm)	fz (mm)	
225	310	0,03	0,03	0,05	0,06	0,08	0,1	225	310	0,03	0,05	0,06	0,08	0,1	
170	240	0,02	0,02	0,04	0,05	0,08	0,1	170	240	0,02	0,04	0,05	0,08	0,1	
170	240	0,02	0,02	0,04	0,05	0,08	0,1	170	240	0,02	0,04	0,05	0,08	0,1	
150	190	0,02	0,02	0,04	0,05	0,08	0,1	150	190	0,02	0,04	0,05	0,08	0,1	
190	240	0,02	0,02	0,04	0,05	0,08	0,1	190	240	0,02	0,04	0,05	0,08	0,1	
190	240	0,02	0,02	0,04	0,05	0,08	0,1	190	240	0,02	0,04	0,05	0,08	0,1	
150	190	0,02	0,02	0,04	0,05	0,08	0,1	150	190	0,02	0,04	0,05	0,08	0,1	
150	190	0,02	0,02	0,04	0,05	0,08	0,1	150	190	0,02	0,04	0,05	0,08	0,1	
105	140	0,02	0,02	0,04	0,05	0,08	0,1	105	140	0,02	0,04	0,05	0,08	0,1	
225	310	0,03	0,03	0,05	0,06	0,08	0,1	225	310	0,03	0,05	0,06	0,08	0,1	
150	190	0,02	0,02	0,04	0,05	0,08	0,1	150	190	0,02	0,04	0,05	0,08	0,1	
105	140	0,02	0,02	0,04	0,05	0,08	0,1	105	140	0,02	0,04	0,05	0,08	0,1	
150	190	0,02	0,02	0,04	0,05	0,08	0,1	150	190	0,02	0,04	0,05	0,08	0,1	
105	140	0,02	0,02	0,04	0,05	0,08	0,1	105	140	0,02	0,04	0,05	0,08	0,1	
150	190	0,02	0,02	0,04	0,05	0,08	0,1	150	190	0,02	0,04	0,05	0,08	0,1	
105	140	0,02	0,02	0,04	0,05	0,08	0,1	105	140	0,02	0,04	0,05	0,08	0,1	
80	125	0,02	0,02	0,04	0,05	0,06	0,08	80	125						
80	125	0,02	0,02	0,04	0,05	0,06	0,08	80	125						
300	450	0,04	0,04	0,06	0,08	0,1	0,13	300	450	0,04	0,06	0,08	0,1	0,13	
225	310	0,03	0,03	0,05	0,06	0,08	0,1	225	310	0,03	0,05	0,06	0,08	0,1	
105	140	0,02	0,02	0,04	0,05	0,08	0,1	105	140	0,02	0,04	0,05	0,08	0,1	
80	125	0,02	0,02	0,04	0,05	0,06	0,08	80	125	0,02	0,04	0,05	0,06	0,08	
300	400	0,06	0,06	0,1	0,15	0,2	0,25	300	400	0,06	0,1	0,15	0,2	0,25	
300	400	0,05	0,05	0,08	0,1	0,15	0,2	300	400	0,05	0,08	0,1	0,15	0,2	
225	325	0,05	0,05	0,08	0,1	0,12	0,15	225	325	0,05	0,08	0,1	0,12	0,15	
225	275	0,04	0,04	0,06	0,08	0,1	0,12	225	275	0,04	0,06	0,08	0,1	0,12	
65	80	0,02	0,02	0,04	0,05	0,06	0,08	65	80	0,02	0,04	0,05	0,06	0,08	
80	125	0,02	0,02	0,04	0,05	0,08	0,1	80	125	0,02	0,04	0,05	0,08	0,1	
75	100	0,02	0,02	0,04	0,05	0,06	0,08	75	100	0,02	0,04	0,05	0,06	0,08	
375	500	0,04	0,04	0,06	0,08	0,1	0,15	375	500	0,04	0,06	0,08	0,1	0,15	
500	900	0,04	0,04	0,06	0,08	0,1	0,15	500	900	0,04	0,06	0,08	0,1	0,15	
300	450	0,04	0,04	0,06	0,08	0,1	0,13	300	450	0,04	0,06	0,08	0,1	0,13	
225	310	0,03	0,03	0,05	0,06	0,08	0,1	225	310	0,03	0,05	0,06	0,08	0,1	
225	310	0,03	0,03	0,05	0,06	0,08	0,1	225	310	0,03	0,05	0,06	0,08	0,1	
300	350	0,05	0,05	0,08	0,12	0,15	0,2	300	350	0,05	0,08	0,12	0,15	0,2	
225	300	0,04	0,04	0,06	0,1	0,12	0,15	225	300	0,04	0,06	0,1	0,12	0,15	
225	325	0,05	0,05	0,08	0,1	0,12	0,15	225	325	0,05	0,08	0,1	0,12	0,15	
225	275	0,04	0,04	0,06	0,08	0,1	0,12	225	275	0,04	0,06	0,08	0,1	0,12	
225	275	0,04	0,04	0,06	0,08	0,1	0,12	225	275	0,04	0,06	0,08	0,1	0,12	
150	225	0,03	0,03	0,05	0,08	0,1	0,12	150	225	0,03	0,05	0,08	0,1	0,12	

Parametri di lavoro indicativi per frese a raggio per Metallo Duro

Serie d'avanzamento																	
Codice lettera	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	
Ø utensile mm	2,00	0,001	0,001	0,001	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,020
	3,00	0,002	0,002	0,003	0,003	0,004	0,007	0,010	0,010	0,010	0,015	0,016	0,013	0,019	0,022	0,024	0,030
	5,00	0,005	0,006	0,007	0,009	0,010	0,014	0,020	0,020	0,022	0,025	0,026	0,026	0,028	0,030	0,032	0,038
	6,00	0,006	0,008	0,009	0,011	0,013	0,017	0,024	0,025	0,027	0,031	0,029	0,033	0,039	0,036	0,041	0,047
	8,00	0,010	0,012	0,014	0,016	0,019	0,024	0,032	0,032	0,035	0,042	0,042	0,047	0,053	0,052	0,058	0,064
	10,00	0,013	0,015	0,018	0,021	0,025	0,030	0,038	0,039	0,044	0,050	0,053	0,059	0,065	0,066	0,073	0,080
	12,00	0,010	0,018	0,022	0,026	0,030	0,036	0,046	0,048	0,052	0,059	0,063	0,072	0,079	0,085	0,090	0,100
	16,00	0,020	0,023	0,027	0,032	0,038	0,045	0,054	0,058	0,063	0,071	0,079	0,088	0,095	0,100	0,110	0,120
	20,00	0,023	0,028	0,033	0,038	0,045	0,057	0,066	0,073	0,080	0,090	0,097	0,100	0,110	0,120	0,130	0,140
	25,00	0,030	0,035	0,040	0,045	0,055	0,065	0,075	0,100	0,120	0,130	0,140	0,150	0,165	0,170	0,180	0,190

a_e = larghezza di taglio
 a_p = profondità di taglio



$$a_e = 1,0 \times D$$

Le nuove condizioni europee in accordo con le norme DIN EN per acciaio e ghisa sono applicate per tutti i nostri esempi di materiale.

olio da taglio, attivo ■
 emulsione ■
 solo refrigerazione ad aria □

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■ ■
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■ ■
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■ ■
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■ ■
Acciai temprati	-		≤40-48 HRC >48-60 HRC	■ ■
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■ ■
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■ ■
Ghisa dura	-		≤350 HB	■
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■ ■
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■ ■
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■ ■
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		■ ■
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		■ ■
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■ ■
Mat. plastiche termoidurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	□
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	■ □
Mat. plast. a fibre aramidiche	Kevlar		-	□
a fibre di vetro/C rinforzate	GFK/CFK		-	□

Lavorazione HSC

Catalogo n°
Mat. de tagl.
Norma
Tipo
Pagina

54306 54307
M.D.I.
Stock std.
N
640/641



54304 54305
M.D.I.
Stock std.
N
636/637

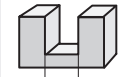


Ø 4 6 8 10 12 16								Ø 6 8 10 12 16						
sgrossatura								sgrossatura						
eff. Ø *	1,74	2,99	4,21	5,27	6,63	9,33		eff. Ø *	-	-	-	-	-	
a _p mm	0,20	0,40	0,60	0,75	1,00	1,50		a _p mm	0,40	0,60	0,75	1,00	1,50	
a _e mm	0,30	0,50	0,75	1,00	1,50	2,50		a _e mm	3,50	5,50	6,50	8,50	11,50	
finitura								finitura						
eff. Ø *	1,25	1,81	2,24	2,66	3,07	3,97		eff. Ø *	-	-	-	-	-	
a _p mm	0,10	0,14	0,16	0,18	0,20	0,25		a _p mm	0,15	0,20	0,30	0,40	0,50	
a _e mm	0,07	0,10	0,15	0,20	0,25	0,30		a _e mm	0,20	0,30	0,40	0,60	1,00	
V _c m/min	V _c m/min	fz (mm)	fz (mm)	fz (mm)	fz (mm)	fz (mm)	fz (mm)	V _c m/min	V _c m/min	fz (mm)	fz (mm)	fz (mm)	fz (mm)	fz (mm)
								200	230	0,05	0,06	0,07	0,08	0,1
								200	230	0,05	0,06	0,07	0,08	0,1
								200	230	0,05	0,06	0,07	0,08	0,1
300	350	0,04	0,06	0,08	0,1	0,15	0,2	200	230	0,05	0,06	0,07	0,08	0,1
200	300	0,04	0,06	0,08	0,1	0,13	0,15	160	190	0,04	0,05	0,06	0,07	0,08
150	250	0,03	0,05	0,06	0,08	0,1	0,12	105	125	0,02	0,03	0,04	0,05	0,06
200	300	0,04	0,06	0,08	0,1	0,13	0,15	150	175	0,05	0,06	0,07	0,08	0,1
150	180	0,02	0,04	0,05	0,08	0,1	0,12	75	95	0,02	0,03	0,04	0,05	0,06
300	400	0,06	0,1	0,15	0,2	0,25	0,3	300	400	0,06	0,08	0,1	0,12	0,15
300	400	0,05	0,08	0,1	0,15	0,2	0,25	300	400	0,06	0,08	0,1	0,12	0,15
250	325	0,05	0,08	0,1	0,12	0,15	0,2	250	325	0,05	0,06	0,07	0,08	0,1
250	275	0,04	0,06	0,08	0,1	0,12	0,15	225	275	0,04	0,05	0,06	0,07	0,08
150	225	0,03	0,05	0,08	0,1	0,12	0,15	150	225	0,02	0,03	0,04	0,05	0,06
400	475	0,06	0,1	0,15	0,2	0,25	0,3	400	475	0,06	0,08	0,1	0,12	0,15
300	350	0,05	0,08	0,12	0,15	0,2	0,3	300	350	0,06	0,08	0,1	0,12	0,15
275	300	0,04	0,06	0,1	0,12	0,15	0,2	275	300	0,05	0,06	0,07	0,08	0,1

Parametri di lavoro indicativi per frese per acciaio ad alto velocità

Serie d'avanzamento																	
Codice lettera	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	
Q utensile mm	2,00	0,001	0,001	0,001	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,020
	3,00	0,002	0,002	0,003	0,003	0,004	0,007	0,010	0,010	0,010	0,015	0,016	0,013	0,019	0,022	0,024	0,030
	5,00	0,005	0,006	0,007	0,009	0,010	0,014	0,020	0,020	0,022	0,025	0,026	0,026	0,028	0,030	0,032	0,038
	6,00	0,006	0,008	0,009	0,011	0,013	0,017	0,024	0,025	0,027	0,031	0,029	0,033	0,039	0,036	0,041	0,047
	8,00	0,010	0,012	0,014	0,016	0,019	0,024	0,032	0,032	0,035	0,042	0,042	0,047	0,053	0,052	0,058	0,064
	10,00	0,013	0,015	0,018	0,021	0,025	0,030	0,038	0,039	0,044	0,050	0,053	0,059	0,065	0,066	0,073	0,080
	12,00	0,010	0,018	0,022	0,026	0,030	0,036	0,046	0,048	0,052	0,059	0,063	0,072	0,079	0,085	0,090	0,100
	16,00	0,020	0,023	0,027	0,032	0,038	0,045	0,054	0,058	0,063	0,071	0,079	0,088	0,095	0,100	0,110	0,120
	20,00	0,023	0,028	0,033	0,038	0,045	0,057	0,066	0,073	0,080	0,090	0,097	0,100	0,110	0,120	0,130	0,140
	25,00	0,030	0,035	0,040	0,045	0,055	0,065	0,075	0,100	0,120	0,130	0,140	0,150	0,165	0,170	0,180	0,190

a_e = larghezza di taglio
 a_p = profondità di taglio



$a_e = 1,0 \times D$

I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

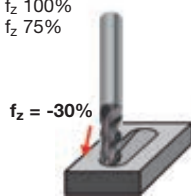
Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a $1 \times D$. Questo viene applicato anche per la transizione in lavorazione radiale.

Scanalatura

a_p = profondità di taglio $0,5 \times D = f_z$ 100%

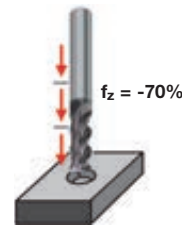
a_p = profondità di taglio $1,0 \times D = f_z$ 75%



Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a $0,5 \times D$.



olio da taglio, attivo ■
 emulsione ■
 solo refrigerazione ad aria □

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■ ■
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■ ■
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■ ■
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■ ■
Acciai temprati	-		≤40-48 HRC >48-60 HRC	■ ■
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		■ ■ ■
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■ ■
Ghisa dura	-		≤350 HB	■
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■ ■
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Leghe ghisa alluminio ≤ 10 % Si > 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		■ ■
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■ ■
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		■ ■
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		■ ■
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		■ ■
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	□
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	■ □
Mat. plast. a fibre aramidiche	Kevlar		-	□
a fibre di vetro/C rinforzate	GFK/CFK		-	□

Frese per cave

Catalogo n°	74231 74280	74243 74282	54275 64640 64604	64670 64641	54080 54180	74244	74294	64671	54294	54276	54825	54845	74816	54816	
Mat. de tagl.	M42		M42			M42		M42			HSS-E-PM		M42		M42
Norma	327 D	844 K	327 D	844 K	Stock	844 L		844 L			844 K		844 K		844 K
Tipo	N		N			N		N			NRf		NR		NR
Pagina	652/658	654/660	680/653/659	655/661	664/665	656	663	657	662	681	673	677	674	675	

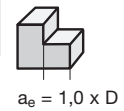
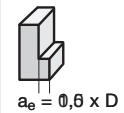


V _c m/min	Codice d'avanz.	Codice d'avanz.	V _c m/min	Codice d'avanz.	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	Codice d'avanz.	V _c m/min	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.
28	M	61	M	22	K	49	K	90	O	34	M	61	N		
25	L	55	L	20	K	44	K	80	N	30	K	55	L		
25	L	55	L	20	K	44	K	80	N	30	K	55	L		
22	M	50	M	18	K	40	K	75	M	28	J	50	K		
28	L	61	L	22	K	49	K	90	N	34	K	61	L		
26	L	55	L	21	K	44	K	80	N	30	K	55	L		
22	M	50	M	18	K	40	K	75	M	28	J	50	K		
22	M	50	M	18	K	40	K	75	M	28	J	50	K		
17	M	39	M	14	K	31	K	60	L	22	I	39	J		
28	L	61	L	22	K	49	K	90	N	34	K	61	L		
22	L	50	L	18	K	40	K	75	N	28	K	50	L		
17	M	39	M	14	K	31	K	60	M	22	J	39	K		
22	L	50	L	18	K	40	K	75	N	28	K	50	L		
17	L	39	L	14	K	31	K	60	L	22	I	39	J		
28	L	61	L	22	K	49	K	90	N	34	K	61	L		
11	L	28	L	9	K	22	K	40	L	15	I	28	J		
11	M	28	M	9	K	22	K	40	M	15	J	28	K		
11	L	22	L					33	L			22	J		
18	M	42	M					65	M	23	J	42	K		
14	L	39	L					60	L	21	I	39	J		
14	L	39	L					60	M	21	J	39	K		
20	L	50	L	16	K	40	K	75	N	28	K	50	L		
14	L	42	L	11	K	34	K	65	M			42	K		
20	L	50	L	16	K	40	K	75	N	28	K	50	L		
14	L	42	L	11	K	34	K	65	M			42	K		
11	L	31	L					45	K			31	I		
5	L	9	L					14	L			9	J		
11	L	25	L					36	L	13	I	25	J		
7	L	11	L					17	K			11	I		
154	N	220	N												
110	N	198	N												
88	M	132	M												
44	N	121	N												
66	O	143	O												
61	N	99	N												
61	N	99	N												
39	M	94	M												
39	M	94	M												
33	L	72	L												
33	M	72	M												
17	L	44	L												

Parametri di lavoro indicativi per frese per acciaio ad alto velocità

Serie d'avanzamento																	
Codice lettera	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	
Ø utensile mm	2,00	0,001	0,001	0,001	0,002	0,002	0,004	0,005	0,006	0,007	0,008	0,010	0,012	0,014	0,016	0,018	0,020
	3,00	0,002	0,002	0,003	0,003	0,004	0,007	0,010	0,010	0,010	0,015	0,016	0,013	0,019	0,022	0,024	0,030
	5,00	0,005	0,006	0,007	0,009	0,010	0,014	0,020	0,020	0,022	0,025	0,026	0,026	0,028	0,030	0,032	0,038
	6,00	0,006	0,008	0,009	0,011	0,013	0,017	0,024	0,025	0,027	0,031	0,029	0,033	0,039	0,036	0,041	0,047
	8,00	0,010	0,012	0,014	0,016	0,019	0,024	0,032	0,032	0,035	0,042	0,042	0,047	0,053	0,052	0,058	0,064
	10,00	0,013	0,015	0,018	0,021	0,025	0,030	0,038	0,039	0,044	0,050	0,053	0,059	0,065	0,066	0,073	0,080
	12,00	0,010	0,018	0,022	0,026	0,030	0,036	0,046	0,048	0,052	0,059	0,063	0,072	0,079	0,085	0,090	0,100
	16,00	0,020	0,023	0,027	0,032	0,038	0,045	0,054	0,058	0,063	0,071	0,079	0,088	0,095	0,100	0,110	0,120
	20,00	0,023	0,028	0,033	0,038	0,045	0,057	0,066	0,073	0,080	0,090	0,097	0,100	0,110	0,120	0,130	0,140
	25,00	0,030	0,035	0,040	0,045	0,055	0,065	0,075	0,100	0,120	0,130	0,140	0,150	0,165	0,170	0,180	0,190

a_e = larghezza di taglio
a_p = profondità di taglio



I valori in grassetto dell'avanzamento sono le scelte rispettive preferite per il gruppo di materiali.

Lavorazione inclinata a tuffo e scanalatura

Per lavorazione inclinata a tuffo, l'avanzamento dovrebbe essere ridotto come illustrato. In aggiunta, l'evacuazione del truciolo è richiesta se si fora ad una profondità superiore a 1 x D. Questo viene applicato anche per la transizione in lavorazione radiale.

Scanalatura

a_p = profondità di taglio 0,5 x D = f_z 100%
a_p = profondità di taglio 1,0 x D = f_z 75%

Foratura

Per la foratura, l'avanzamento dovrebbe essere ridotto come illustrato.

In aggiunta, l'evacuazione del truciolo è richiesta per grandi profondità di foratura, superiori a 0.5 x D.



olio da taglio, attivo ■
emulsione ■
solo refrigerazione ad aria □

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		■
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		■
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		■
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		■
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		■
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		■
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		■
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		■
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		■
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	■
Acciai temprati	-		≤40-48 HRC >48-60 HRC	■
Acciai inossidabili, solforati	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9	≤850		■
austenitici	1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitisch	1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850		■
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		■ □
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	■
Ghisa dura	-		≤350 HB	■
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			■ □
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		■ □
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		■
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		■
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		■
Leghe ghisa alluminio ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9	≤600		■
> 10 % Si	3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		□
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		■
Ottone, a truciolo corto	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2	≤600		■
a truciolo lungo	2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600		■
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn	≤600		■
a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	>600-850 ≤850 >850-1000		■
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	□
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	■ □
Mat. plast. a fibre aramidiche	Kevlar		-	□
a fibre di vetro/C rinforzate	GFK/CFK		-	□

Frese di finitura

Frese di sgrossatura

Catalogo n°

Mat. de tagl.

Norma

Tipo

Pagina

	74617	74847	64667	54847	74800	74825	74845	54825	54845	74816	74836	54816	54836	54815
	M42	M42	M42		M42	HSS-E-PM		HSS-E-PM		M42	M42	M42		
	844K	844 L	844 K	844 L	Stock std.	844 K		844 K		844 K/L	844 K/L	844 K/L		
	N	N	N		N	NRf		NRf		NR	NR	NF		
	666	668	667	669	670	672	676	673	677	674/678	674/678	675/679	671	



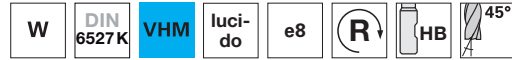
V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.	V _c m/min	Codice d'avanz.
28	M	31	N	68	O	19	L	57	O	102	P	38	N	68	O
24	L	27	M	61	N	16	K	51	N	92	O	33	L	61	M
24	L	27	M	61	N	16	K	51	N	92	O	33	L	61	M
22	K	25	L	55	M	15	K	46	M	83	N	31	L	55	L
28	L	31	M	68	N	19	K	57	N	102	O	38	L	68	M
25	L	28	M	61	N	17	K	51	N	92	O	33	L	61	M
22	K	25	L	55	M	15	K	46	M	83	N	31	L	55	L
22	K	25	L	55	M	15	K	46	M	83	N	31	L	55	L
17	J	19	L	43	L	11	K	36	L	65	M	24	K	43	L
28	L	31	M	68	N	19	K	57	N	102	O	38	L	68	M
22	L	25	M	55	N	15	K	46	N	83	O	31	L	55	M
17	K	19	L	43	M	11	K	36	M	65	N	24	L	43	L
22	L	25	M	55	N	15	K	46	N	83	O	31	L	55	M
17	J	19	L	43	L	11	K	36	L	65	M	24	K	43	L
28	L	31	M	68	N	19	K	57	N	102	O	38	L	68	M
11	J	13	L	31	L	8	K	26	L	47	M	17	K	31	L
11	K	13	L	31	M	8	K	26	M	47	N	17	L	31	L
		13	L	25	L			20	L	37	M	14	K	25	L
18	K	20	L	47	M	13	K	39	M	70	N	26	L	47	L
13	J	15	L	43	L	9	K	36	L	65	M	24	K	43	L
13	K	15	L	43	M	9	K	36	M	65	N	24	L	43	L
20	L	22	M	55	N			46	N	83	O	31	L	55	M
		15	L	47	M			39	M	70	N	26	L	47	L
20	L	22	M	55	N			46	N	83	O	31	L	55	M
		15	L	47	M			39	M	70	N	26	L	47	L
11	I	13	K	35	L			29	L	52	L	19	K	35	K
		5	L	10	L			9	L	16	M	6	K	10	L
11	J	13	L	27	L			22	L	40	M	15	K	27	L
		8	K	13	L			10	L	19	L	7	K	13	K
155	O	170	P	242	Q										
110	N	121	O	218	P										
90	M	97	N	146	O										
40	N	49	O	134	P										
65	O	73	P	158	Q										
62	N	68	O	109	P										
62	M	68	N	109	O										
40	M	43	N	104	O										
40	M	43	N	104	O										
33	L	37	M	80	N										
33	L	37	M	80	N										
17	K	19	L	49	M										

Frese in MD

Frese frontali alluminio

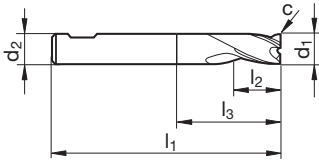


Catalogo n° 74204



Parametri di lav.
ind. a pag. 570

- extra corto
- tagliente al centro



d1 e8 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	6,000	50,000	4,000	8,400	0,030	2	3,000
4,000	6,000	54,000	5,000	10,400	0,030	2	4,000
5,000	6,000	54,000	6,000	12,400	0,030	2	5,000
6,000	6,000	54,000	7,000	18,000	0,030	2	6,000
8,000	8,000	58,000	9,000	22,000	0,050	2	8,000
10,000	10,000	66,000	11,000	26,000	0,050	2	10,000
12,000	12,000	73,000	12,000	28,000	0,100	2	12,000
14,000	14,000	75,000	14,000	30,000	0,100	2	14,000
16,000	16,000	82,000	16,000	34,000	0,100	2	16,000
18,000	18,000	84,000	18,000	36,000	0,100	2	18,000
20,000	20,000	92,000	20,000	42,000	0,100	2	20,000

Frese in MD

Frese frontali alluminio

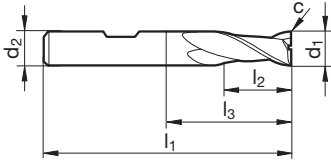


Catalogo n° 74202

W	DIN 6527L	VHM	lucido	e8	R	HB	45°
P	M	K	N	S	H		

Parametri di lav.
ind. a pag. 570

• tagliente al centro



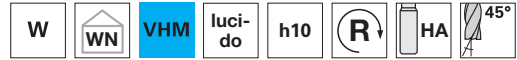
d1 e8 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	6,000	57,000	7,000	11,400	0,030	2	3,000
4,000	6,000	57,000	8,000	13,900	0,030	2	4,000
5,000	6,000	57,000	10,000	16,900	0,030	2	5,000
6,000	6,000	57,000	10,000	21,000	0,030	2	6,000
8,000	8,000	63,000	16,000	27,000	0,050	2	8,000
10,000	10,000	72,000	19,000	32,000	0,050	2	10,000
12,000	12,000	83,000	22,000	38,000	0,100	2	12,000
14,000	14,000	83,000	22,000	38,000	0,100	2	14,000
16,000	16,000	92,000	26,000	44,000	0,100	2	16,000
18,000	18,000	92,000	26,000	44,000	0,100	2	18,000
20,000	20,000	104,000	32,000	54,000	0,100	2	20,000

Frese in MD

Frese frontali alluminio

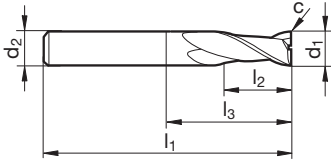


Catalogo n° 74206



Parametri di lav.
ind. a pag. 570

- extra lungo
- tagliente al centro



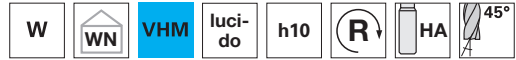
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
5,000	5,000	75,000	30,000	47,000	0,030	2	5,000
6,000	6,000	75,000	30,000	39,000	0,030	2	6,000
8,000	8,000	100,000	40,000	64,000	0,050	2	8,000
10,000	10,000	100,000	40,000	60,000	0,050	2	10,000
12,000	12,000	150,000	45,000	105,000	0,100	2	12,000
16,000	16,000	150,000	65,000	102,000	0,100	2	16,000

Frese in MD

Frese frontali alluminio

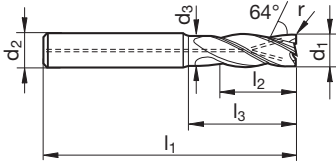


Catalogo n° 74479



Parametri di lav.
ind. a pag. 570

- con refrigerazione interna per vita utensile maggiore e asportazione truciolo ottimale
- tagliente al centro



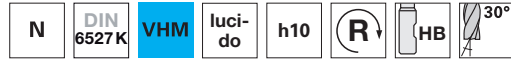
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	r mm x 45°	Z	Codice
6,000	6,000	57,000	10,000	21,000	1,000	3	6,000
8,000	8,000	63,000	16,000	27,000	1,000	3	8,000
10,000	10,000	72,000	19,000	32,000	1,500	3	10,000
12,000	12,000	83,000	22,000	38,000	1,500	3	12,000
16,000	16,000	92,000	26,000	44,000	2,000	3	16,000
20,000	20,000	104,000	32,000	54,000	2,500	3	20,000

Frese in MD

Frese frontali (a 2 taglienti)



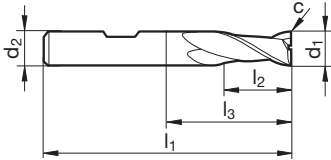
Catalogo n° 74520



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 566

- extra corto
- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	50,000	3,000	6,400	0,025	2	2,000
2,500	6,000	50,000	3,000	6,400	0,050	2	2,500
3,000	6,000	50,000	4,000	8,900	0,050	2	3,000
3,500	6,000	50,000	4,000	9,000	0,050	2	3,500
4,000	6,000	54,000	5,000	10,400	0,050	2	4,000
4,500	6,000	54,000	5,000	11,500	0,050	2	4,500
5,000	6,000	54,000	6,000	12,900	0,050	2	5,000
5,500	6,000	54,000	7,000	14,400	0,050	2	5,500
6,000	6,000	54,000	7,000	18,000	0,050	2	6,000
6,500	8,000	58,000	8,000	17,400	0,100	2	6,500
7,000	8,000	58,000	8,000	17,400	0,100	2	7,000
7,500	8,000	58,000	9,000	18,400	0,100	2	7,500
8,000	8,000	58,000	9,000	22,000	0,100	2	8,000
8,500	10,000	66,000	10,000	21,400	0,100	2	8,500
9,000	10,000	66,000	10,000	21,400	0,100	2	9,000
9,500	10,000	66,000	11,000	22,400	0,100	2	9,500
10,000	10,000	66,000	11,000	26,000	0,100	2	10,000
11,000	12,000	73,000	12,000	25,400	0,100	2	11,000
12,000	12,000	73,000	12,000	28,000	0,100	2	12,000
13,000	14,000	75,000	14,000	29,400	0,150	2	13,000
14,000	14,000	75,000	14,000	30,000	0,150	2	14,000
15,000	16,000	82,000	16,000	33,400	0,150	2	15,000
16,000	16,000	82,000	16,000	34,000	0,150	2	16,000
18,000	18,000	84,000	18,000	36,000	0,150	2	18,000
20,000	20,000	92,000	20,000	42,000	0,150	2	20,000

Frese in MD

Frese frontali (a 2 taglienti)



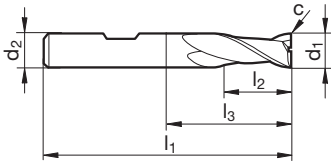
Catalogo n° 54520



P	M	K	N	S	H
•	•	•	○	•	

Parametri di lav.
ind. a pag. 566

- extra corto
- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	50,000	3,000	7,400	0,025	2	2,000
3,000	6,000	50,000	4,000	8,400	0,050	2	3,000
4,000	6,000	54,000	5,000	10,400	0,050	2	4,000
5,000	6,000	54,000	6,000	12,400	0,050	2	5,000
6,000	6,000	54,000	7,000	18,000	0,050	2	6,000
8,000	8,000	58,000	9,000	22,000	0,100	2	8,000
10,000	10,000	66,000	11,000	26,000	0,100	2	10,000
12,000	12,000	73,000	12,000	28,000	0,100	2	12,000
14,000	14,000	75,000	14,000	30,000	0,150	2	14,000
16,000	16,000	82,000	16,000	34,000	0,150	2	16,000
18,000	18,000	84,000	18,000	36,000	0,150	2	18,000
20,000	20,000	92,000	20,000	42,000	0,150	2	20,000

Frese in MD

Frese frontali (a 2 taglienti)



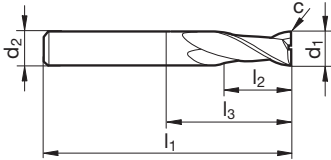
Catalogo n° 54519



P	M	K	N	S	H
•	•	•	○	•	

Parametri di lav.
ind. a pag. 568

- tagliente al centro
- uso universale



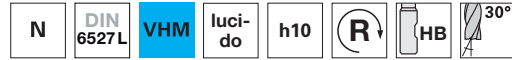
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	57,000	6,000	9,400	0,025	2	2,000
2,800	6,000	57,000	7,000	11,900	0,050	2	2,800
3,000	6,000	57,000	7,000	11,900	0,050	2	3,000
3,800	6,000	57,000	8,000	13,400	0,050	2	3,800
4,000	6,000	57,000	8,000	13,400	0,050	2	4,000
4,800	6,000	57,000	10,000	16,900	0,050	2	4,800
5,000	6,000	57,000	10,000	16,900	0,050	2	5,000
5,750	6,000	57,000	10,000	18,400	0,050	2	5,750
6,000	6,000	57,000	10,000	21,000	0,050	2	6,000
6,750	8,000	63,000	13,000	22,400	0,100	2	6,750
7,000	8,000	63,000	13,000	22,400	0,100	2	7,000
7,750	8,000	63,000	16,000	25,400	0,100	2	7,750
8,000	8,000	63,000	16,000	27,000	0,100	2	8,000
8,700	10,000	72,000	16,000	27,400	0,100	2	8,700
9,000	10,000	72,000	16,000	27,400	0,100	2	9,000
9,700	10,000	72,000	19,000	30,400	0,100	2	9,700
10,000	10,000	72,000	19,000	32,000	0,100	2	10,000
11,700	12,000	83,000	22,000	35,400	0,100	2	11,700
12,000	12,000	83,000	22,000	38,000	0,100	2	12,000
14,000	14,000	83,000	22,000	38,000	0,150	2	14,000
15,700	16,000	92,000	26,000	44,000	0,150	2	15,700
18,000	18,000	92,000	26,000	44,000	0,150	2	18,000
20,000	20,000	104,000	32,000	54,000	0,150	2	20,000

Frese in MD

Frese frontali (a 2 taglienti)



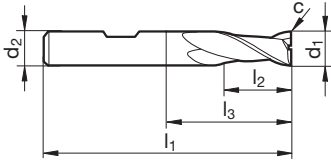
Catalogo n° 74521



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 566

- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	57,000	6,000	9,400	0,025	2	2,000
2,500	6,000	57,000	7,000	10,400	0,050	2	2,500
3,000	6,000	57,000	7,000	11,900	0,050	2	3,000
3,500	6,000	57,000	7,000	12,400	0,050	2	3,500
3,800	6,000	57,000	8,000	13,400	0,050	2	3,800
4,000	6,000	57,000	8,000	13,400	0,050	2	4,000
4,500	6,000	57,000	8,000	14,900	0,050	2	4,500
4,800	6,000	57,000	10,000	16,900	0,050	2	4,800
5,000	6,000	57,000	10,000	16,900	0,050	2	5,000
5,750	6,000	57,000	10,000	18,400	0,050	2	5,750
6,000	6,000	57,000	10,000	21,000	0,050	2	6,000
6,750	8,000	63,000	13,000	22,400	0,100	2	6,750
7,000	8,000	63,000	13,000	22,400	0,100	2	7,000
7,750	8,000	63,000	16,000	25,400	0,100	2	7,750
8,000	8,000	63,000	16,000	27,000	0,100	2	8,000
8,700	10,000	72,000	16,000	27,400	0,100	2	8,700
9,000	10,000	72,000	16,000	27,400	0,100	2	9,000
9,700	10,000	72,000	19,000	30,400	0,100	2	9,700
10,000	10,000	72,000	19,000	32,000	0,100	2	10,000
11,700	12,000	83,000	22,000	35,400	0,100	2	11,700
12,000	12,000	83,000	22,000	38,000	0,100	2	12,000
14,000	14,000	83,000	22,000	38,000	0,150	2	14,000
15,700	16,000	92,000	26,000	44,000	0,150	2	15,700
16,000	16,000	92,000	26,000	44,000	0,150	2	16,000
18,000	18,000	92,000	26,000	44,000	0,150	2	18,000
20,000	20,000	104,000	32,000	54,000	0,150	2	20,000

Frese in MD

Frese frontali (a 2 taglienti)



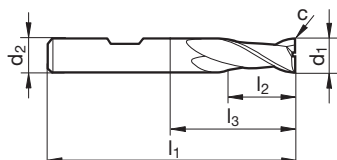
Catalogo n° 54521



P	M	K	N	S	H
•	•	•	○	•	

Parametri di lav.
ind. a pag. 568

- tagliente al centro
- uso universale



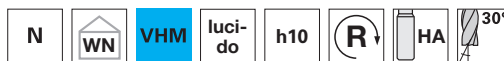
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	57,000	6,000	10,400	0,025	2	2,000
2,800	6,000	57,000	7,000	11,400	0,050	2	2,800
3,000	6,000	57,000	7,000	11,400	0,050	2	3,000
3,800	6,000	57,000	8,000	13,900	0,050	2	3,800
4,000	6,000	57,000	8,000	13,900	0,050	2	4,000
4,800	6,000	57,000	10,000	16,900	0,050	2	4,800
5,000	6,000	57,000	10,000	16,900	0,050	2	5,000
5,750	6,000	57,000	10,000	17,900	0,050	2	5,750
6,000	6,000	57,000	10,000	21,000	0,050	2	6,000
6,750	8,000	63,000	13,000	21,900	0,100	2	6,750
7,000	8,000	63,000	13,000	21,900	0,100	2	7,000
7,750	8,000	63,000	16,000	25,900	0,100	2	7,750
8,000	8,000	63,000	16,000	27,000	0,100	2	8,000
8,700	10,000	72,000	16,000	27,400	0,100	2	8,700
9,000	10,000	72,000	16,000	27,400	0,100	2	9,000
9,700	10,000	72,000	19,000	31,400	0,100	2	9,700
10,000	10,000	72,000	19,000	32,000	0,100	2	10,000
11,700	12,000	83,000	22,000	36,400	0,100	2	11,700
12,000	12,000	83,000	22,000	38,000	0,100	2	12,000
14,000	14,000	83,000	22,000	38,000	0,150	2	14,000
15,700	16,000	92,000	26,000	44,000	0,150	2	15,700
16,000	16,000	92,000	26,000	44,000	0,150	2	16,000
18,000	18,000	92,000	26,000	44,000	0,150	2	18,000
20,000	20,000	104,000	32,000	54,000	0,150	2	20,000

Frese in MD

Frese frontali (a 2 taglienti)



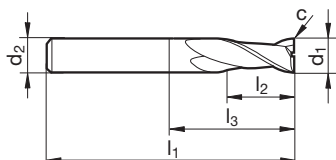
Catalogo n° 74404



P	M	K	N	S	H
●		○	○		

Parametri di lav.
ind. a pag. 568

- extra lungo
- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	3,000	75,000	20,000	28,000	0,050	2	3,000
4,000	4,000	75,000	25,000	33,000	0,050	2	4,000
5,000	5,000	75,000	30,000	37,000	0,050	2	5,000
6,000	6,000	75,000	30,000	41,000	0,050	2	6,000
8,000	8,000	100,000	40,000	53,000	0,100	2	8,000
10,000	10,000	100,000	40,000	50,000	0,100	2	10,000
12,000	12,000	150,000	45,000	58,000	0,100	2	12,000
14,000	14,000	150,000	45,000	63,000	0,150	2	14,000
16,000	16,000	150,000	65,000	85,000	0,150	2	16,000
18,000	18,000	150,000	65,000	85,000	0,150	2	18,000
20,000	20,000	150,000	65,000	100,000	0,150	2	20,000

Frese in MD

Frese frontali (a 2 taglienti)



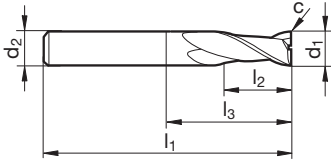
Catalogo n° 54404



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 568

- extra lungo
- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
5,000	5,000	75,000	30,000	41,000	0,050	2	5,000
6,000	6,000	75,000	30,000	42,000	0,050	2	6,000
8,000	8,000	100,000	40,000	53,000	0,100	2	8,000
10,000	10,000	100,000	40,000	50,000	0,100	2	10,000
12,000	12,000	150,000	45,000	58,000	0,100	2	12,000
14,000	14,000	150,000	45,000	64,000	0,150	2	14,000
16,000	16,000	150,000	65,000	86,000	0,150	2	16,000
20,000	20,000	150,000	65,000	89,000	0,150	2	20,000

Frese in MD

Mini frese frontali (a 3 taglienti)



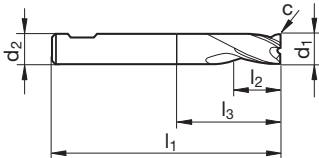
Catalogo n° 64080



P	M	K	N	S	H
•		•			

Parametri di lav.
ind. a pag. 568

- extra corto
- tagliente al centro
- Fresa One-Way ottimale



d1 e8 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
0,300	3,000	38,000	1,000	3,400		3	0,300
0,400	3,000	38,000	1,000	3,400		3	0,400
0,500	3,000	38,000	1,500	3,400	0,025	3	0,500
0,600	3,000	38,000	1,500	3,400	0,025	3	0,600
0,800	3,000	38,000	2,000	3,900	0,025	3	0,800
1,000	3,000	38,000	2,000	3,900	0,025	3	1,000
1,200	3,000	38,000	2,000	3,900	0,025	3	1,200
1,500	3,000	38,000	2,000	3,900	0,025	3	1,500
1,800	3,000	38,000	2,000	3,900	0,025	3	1,800
2,000	6,000	38,000	4,000	7,400	0,025	3	2,000
2,500	6,000	38,000	5,000	8,400	0,050	3	2,500
3,000	6,000	38,000	5,000	8,400	0,050	3	3,000
3,500	6,000	38,000	6,000	9,400	0,050	3	3,500
4,000	6,000	38,000	7,000	10,400	0,050	3	4,000
4,500	6,000	38,000	8,000	12,400	0,050	3	4,500
5,000	6,000	38,000	8,000	12,400	0,050	3	5,000
5,500	6,000	38,000	8,000	12,400	0,050	3	5,500
5,750	6,000	38,000	8,000	12,400	0,050	3	5,750
6,000	6,000	38,000	8,000	14,000	0,050	3	6,000
6,750	8,000	42,000	10,000	15,400	0,100	3	6,750
7,000	8,000	42,000	10,000	16,400	0,100	3	7,000
7,750	8,000	42,000	10,000	16,400	0,100	3	7,750
8,000	8,000	43,000	11,000	19,000	0,100	3	8,000
8,700	10,000	48,000	11,000	17,400	0,100	3	8,700
9,000	10,000	48,000	11,000	17,400	0,100	3	9,000
9,700	10,000	48,000	11,000	17,400	0,100	3	9,700
10,000	10,000	50,000	13,000	23,000	0,100	3	10,000
12,000	12,000	55,000	15,000	24,500	0,100	3	12,000
14,000	14,000	58,000	15,000	28,000	0,150	3	14,000
16,000	16,000	62,000	18,000	29,000	0,150	3	16,000
18,000	18,000	70,000	20,000	37,000	0,150	3	18,000
20,000	20,000	75,000	22,000	41,000	0,150	3	20,000

Frese in MD

Mini frese frontali (a 3 taglienti)



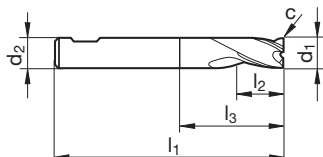
Catalogo n° 64180



P	M	K	N	S	H
	•			•	

Parametri di lav.
ind. a pag. 568

- esecuzione stabile
- tagliente al centro
- Fresa One-Way ottimale



d1 e8 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
1,000	3,000	38,000	2,000	3,900	0,025	3	1,000
1,200	3,000	38,000	2,000	3,900	0,025	3	1,200
1,500	3,000	38,000	3,000	4,900	0,025	3	1,500
1,800	3,000	38,000	3,000	4,900	0,025	3	1,800
2,000	6,000	45,000	4,000	7,400	0,025	3	2,000
2,500	6,000	45,000	5,000	8,400	0,050	3	2,500
3,000	6,000	45,000	6,000	9,400	0,050	3	3,000
3,500	6,000	45,000	6,000	9,400	0,050	3	3,500
4,000	6,000	45,000	7,000	10,400	0,050	3	4,000
4,500	6,000	45,000	8,000	12,400	0,050	3	4,500
5,000	6,000	45,000	8,000	12,400	0,050	3	5,000
5,500	6,000	45,000	8,000	12,400	0,050	3	5,500
5,750	6,000	45,000	10,000	15,000	0,050	3	5,750
6,000	6,000	45,000	10,000	15,000	0,050	3	6,000
6,750	8,000	55,000	10,000	15,400	0,100	3	6,750
7,000	8,000	55,000	12,000	18,400	0,100	3	7,000
7,750	8,000	55,000	12,000	18,400	0,100	3	7,750
8,000	8,000	55,000	13,000	19,000	0,100	3	8,000
8,700	10,000	55,000	14,000	20,400	0,100	3	8,700
9,000	10,000	55,000	14,000	20,400	0,100	3	9,000
9,700	10,000	55,000	16,000	23,400	0,100	3	9,700
10,000	10,000	55,000	16,000	25,000	0,100	3	10,000

Frese in MD

Frese frontali (a 3 taglienti)



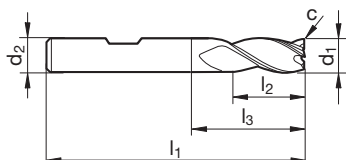
Catalogo n° 74522



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 566

- extra corto
- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	50,000	3,000	7,400	0,025	3	2,000
3,000	6,000	50,000	4,000	8,400	0,050	3	3,000
4,000	6,000	54,000	5,000	10,400	0,050	3	4,000
5,000	6,000	54,000	6,000	12,400	0,050	3	5,000
5,500	6,000	54,000	7,000	14,900	0,050	3	5,500
6,000	6,000	54,000	7,000	18,000	0,050	3	6,000
7,000	8,000	58,000	8,000	16,900	0,100	3	7,000
8,000	8,000	58,000	9,000	22,000	0,100	3	8,000
10,000	10,000	66,000	11,000	26,000	0,100	3	10,000
12,000	12,000	73,000	12,000	28,000	0,100	3	12,000
14,000	14,000	75,000	14,000	30,000	0,150	3	14,000
16,000	16,000	82,000	16,000	34,000	0,150	3	16,000
18,000	18,000	84,000	18,000	36,000	0,150	3	18,000
20,000	20,000	92,000	20,000	42,000	0,150	3	20,000

Frese in MD

Frese frontali (a 3 taglienti)



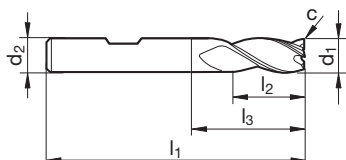
Catalogo n° 64522



P	M	K	N	S	H
•	•	•	○	•	

Parametri di lav.
ind. a pag. 566

- extra corto
- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	50,000	3,000	7,400	0,025	3	2,000
3,000	6,000	50,000	4,000	8,400	0,050	3	3,000
4,000	6,000	54,000	5,000	10,400	0,050	3	4,000
5,000	6,000	54,000	6,000	12,400	0,050	3	5,000
6,000	6,000	54,000	7,000	18,000	0,050	3	6,000
7,000	8,000	58,000	8,000	16,900	0,100	3	7,000
8,000	8,000	58,000	9,000	22,000	0,100	3	8,000
10,000	10,000	66,000	11,000	26,000	0,100	3	10,000
12,000	12,000	73,000	12,000	28,000	0,100	3	12,000
14,000	14,000	75,000	14,000	30,000	0,150	3	14,000
16,000	16,000	82,000	16,000	34,000	0,150	3	16,000
20,000	20,000	92,000	20,000	42,000	0,150	3	20,000

Frese in MD

Frese frontali (a 3 taglienti)



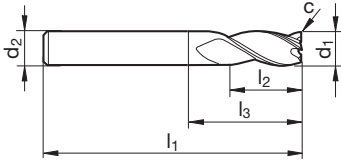
Catalogo n° 54523



P	M	K	N	S	H
•	•	•	○	•	

Parametri di lav.
ind. a pag. 568

- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	57,000	6,000	10,400	0,025	3	2,000
2,500	6,000	57,000	7,000	11,400	0,050	3	2,500
3,000	6,000	57,000	7,000	11,400	0,050	3	3,000
3,500	6,000	57,000	7,000	11,400	0,050	3	3,500
4,000	6,000	57,000	8,000	13,900	0,050	3	4,000
4,500	6,000	57,000	8,000	13,900	0,050	3	4,500
5,000	6,000	57,000	10,000	16,900	0,050	3	5,000
6,000	6,000	57,000	10,000	21,000	0,050	3	6,000
8,000	8,000	63,000	16,000	27,000	0,100	3	8,000
10,000	10,000	72,000	19,000	32,000	0,100	3	10,000
12,000	12,000	83,000	22,000	38,000	0,100	3	12,000
14,000	14,000	83,000	22,000	38,000	0,150	3	14,000
16,000	16,000	92,000	26,000	44,000	0,150	3	16,000
18,000	18,000	92,000	26,000	44,000	0,150	3	18,000
20,000	20,000	104,000	32,000	54,000	0,150	3	20,000

Frese in MD

Frese frontali (a 3 taglienti)



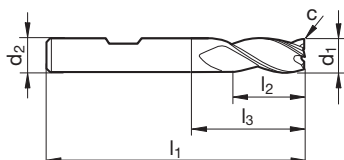
Catalogo n° 74523



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 566

- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	57,000	6,000	10,400	0,025	3	2,000
2,500	6,000	57,000	7,000	11,400	0,050	3	2,500
3,000	6,000	57,000	7,000	11,400	0,050	3	3,000
3,500	6,000	57,000	7,000	11,400	0,050	3	3,500
4,000	6,000	57,000	8,000	13,900	0,050	3	4,000
4,500	6,000	57,000	8,000	13,900	0,050	3	4,500
5,000	6,000	57,000	10,000	16,900	0,050	3	5,000
6,000	6,000	57,000	10,000	21,000	0,050	3	6,000
8,000	8,000	63,000	16,000	27,000	0,100	3	8,000
10,000	10,000	72,000	19,000	32,000	0,100	3	10,000
12,000	12,000	83,000	22,000	38,000	0,100	3	12,000
14,000	14,000	83,000	22,000	38,000	0,150	3	14,000
16,000	16,000	92,000	26,000	44,000	0,150	3	16,000
18,000	18,000	92,000	26,000	44,000	0,150	3	18,000
20,000	20,000	104,000	32,000	54,000	0,150	3	20,000

Frese in MD

Frese frontali (a 3 taglienti)



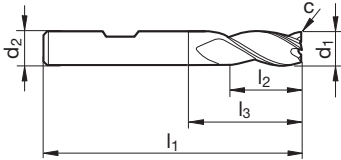
Catalogo n° 64523



P	M	K	N	S	H
•	•	•	○	•	

Parametri di lav.
ind. a pag. 568

- tagliente al centro
- uso universale



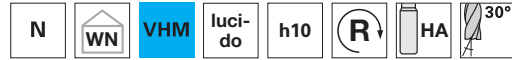
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	57,000	6,000	9,400	0,025	3	2,000
2,500	6,000	57,000	7,000	10,400	0,050	3	2,500
3,000	6,000	57,000	7,000	11,900	0,050	3	3,000
3,500	6,000	57,000	7,000	12,400	0,050	3	3,500
4,000	6,000	57,000	8,000	13,400	0,050	3	4,000
4,500	6,000	57,000	8,000	14,900	0,050	3	4,500
5,000	6,000	57,000	10,000	16,900	0,050	3	5,000
6,000	6,000	57,000	10,000	21,000	0,050	3	6,000
8,000	8,000	63,000	16,000	27,000	0,100	3	8,000
10,000	10,000	72,000	19,000	32,000	0,100	3	10,000
12,000	12,000	83,000	22,000	38,000	0,100	3	12,000
14,000	14,000	83,000	22,000	38,000	0,150	3	14,000
16,000	16,000	92,000	26,000	44,000	0,150	3	16,000
18,000	18,000	92,000	26,000	44,000	0,150	3	18,000
20,000	20,000	104,000	32,000	54,000	0,150	3	20,000

Frese in MD

Frese frontali (a 3 taglienti)



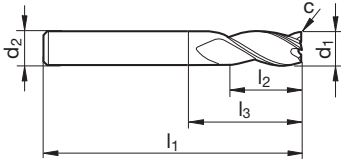
Catalogo n° 74424



P	M	K	N	S	H
●		○	○		

Parametri di lav.
ind. a pag. 568

- extra lungo
- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	3,000	75,000	20,000	47,000	0,050	3	3,000
4,000	4,000	75,000	25,000	47,000	0,050	3	4,000
5,000	5,000	75,000	30,000	47,000	0,050	3	5,000
6,000	6,000	75,000	30,000	39,000	0,050	3	6,000
8,000	8,000	100,000	40,000	64,000	0,100	3	8,000
10,000	10,000	100,000	40,000	60,000	0,100	3	10,000
12,000	12,000	150,000	45,000	105,000	0,100	3	12,000
16,000	16,000	150,000	65,000	102,000	0,150	3	16,000
20,000	20,000	150,000	65,000	100,000	0,150	3	20,000

Frese in MD

Frese frontali (a 3 taglienti)



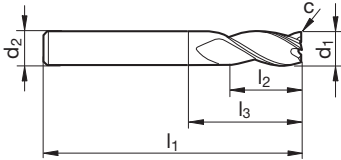
Catalogo n° 54424



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 568

- extra lungo
- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	3,000	75,000	20,000	47,000	0,050	3	3,000
4,000	4,000	75,000	25,000	47,000	0,050	3	4,000
5,000	5,000	75,000	30,000	47,000	0,050	3	5,000
6,000	6,000	75,000	30,000	39,000	0,050	3	6,000
8,000	8,000	100,000	40,000	64,000	0,100	3	8,000
10,000	10,000	100,000	40,000	60,000	0,100	3	10,000
12,000	12,000	150,000	45,000	105,000	0,100	3	12,000
16,000	16,000	150,000	65,000	102,000	0,150	3	16,000
20,000	20,000	150,000	65,000	100,000	0,150	3	20,000

Frese in MD

Frese frontali (a 3 taglienti) NH



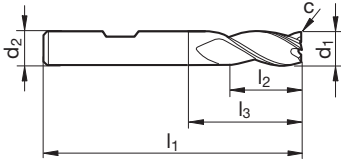
Catalogo n° 64570



P	M	K	N	S	H
●	●	●		○	

Parametri di lav.
ind. a pag. 568

- Fresa ad alto rendimento universale
- extra corto
- tagliente al centro



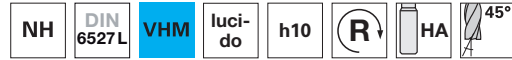
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	6,000	50,000	4,000	7,900	0,050	3	3,000
4,000	6,000	54,000	5,000	8,900	0,050	3	4,000
5,000	6,000	54,000	6,000	11,400	0,050	3	5,000
6,000	6,000	54,000	7,000	18,000	0,050	3	6,000
8,000	8,000	58,000	9,000	22,000	0,100	3	8,000
10,000	10,000	66,000	11,000	26,000	0,100	3	10,000
12,000	12,000	73,000	12,000	28,000	0,100	3	12,000
16,000	16,000	82,000	16,000	34,000	0,150	3	16,000
18,000	18,000	84,000	18,000	36,000	0,150	3	18,000
20,000	20,000	92,000	20,000	42,000	0,150	3	20,000

Frese in MD

Frese frontali (a 3 taglienti) NH



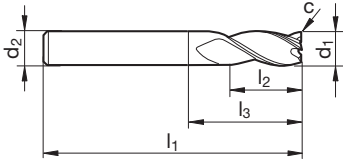
Catalogo n° 74478



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 566

- high cutting performance, very smooth operation
- Fresa ad alto rendimento universale
- tagliente al centro



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	6,000	57,000	7,000	11,400	0,050	3	3,000
3,500	6,000	57,000	7,000	11,400	0,050	3	3,500
4,000	6,000	57,000	8,000	13,900	0,050	3	4,000
4,500	6,000	57,000	8,000	13,900	0,050	3	4,500
5,000	6,000	57,000	10,000	16,900	0,050	3	5,000
6,000	6,000	57,000	10,000	21,000	0,050	3	6,000
8,000	8,000	63,000	16,000	27,000	0,100	3	8,000
10,000	10,000	72,000	19,000	32,000	0,100	3	10,000
12,000	12,000	83,000	22,000	38,000	0,100	3	12,000
14,000	14,000	83,000	22,000	38,000	0,150	3	14,000
16,000	16,000	92,000	26,000	44,000	0,150	3	16,000
18,000	18,000	92,000	26,000	44,000	0,150	3	18,000
20,000	20,000	104,000	32,000	54,000	0,150	3	20,000

Frese in MD

Frese frontali (a 3 taglienti) NH



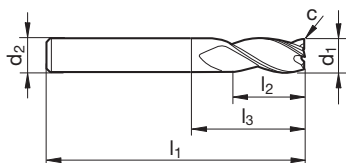
Catalogo n° 64478



P	M	K	N	S	H
●	●	●		○	

Parametri di lav.
ind. a pag. 568

- high cutting performance, very smooth operation
- Fresa ad alto rendimento universale
- tagliente al centro



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
1,000	3,000	38,000	2,000	3,400	0,020	3	1,000
1,500	3,000	38,000	3,000	5,900	0,020	3	1,500
2,000	6,000	57,000	6,000	8,900	0,030	3	2,000
2,500	6,000	57,000	7,000	9,900	0,040	3	2,500
3,000	6,000	57,000	7,000	10,900	0,050	3	3,000
3,500	6,000	57,000	7,000	10,900	0,050	3	3,500
4,000	6,000	57,000	8,000	11,900	0,060	3	4,000
4,500	6,000	57,000	8,000	13,400	0,070	3	4,500
5,000	6,000	57,000	10,000	15,400	0,080	3	5,000
6,000	6,000	57,000	10,000	21,000	0,090	3	6,000
8,000	8,000	63,000	16,000	27,000	0,120	3	8,000
10,000	10,000	72,000	19,000	32,000	0,150	3	10,000
12,000	12,000	83,000	22,000	38,000	0,180	3	12,000
14,000	14,000	83,000	22,000	38,000	0,210	3	14,000
16,000	16,000	92,000	26,000	44,000	0,190	3	16,000
18,000	18,000	92,000	26,000	44,000	0,220	3	18,000
20,000	20,000	104,000	32,000	54,000	0,240	3	20,000

Frese in MD

Frese frontali (a 3 taglienti) NH



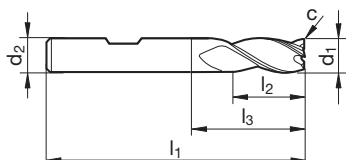
Catalogo n° 64571



P	M	K	N	S	H
●	●	●		○	

Parametri di lav.
ind. a pag. 568

- high cutting performance, very smooth operation
- Fresa ad alto rendimento universale
- tagliente al centro



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	6,000	57,000	7,000	10,900	0,050	3	3,000
3,500	6,000	57,000	7,000	10,900	0,050	3	3,500
4,000	6,000	57,000	8,000	11,900	0,050	3	4,000
4,500	6,000	57,000	8,000	13,400	0,050	3	4,500
5,000	6,000	57,000	10,000	15,400	0,050	3	5,000
6,000	6,000	57,000	10,000	21,000	0,050	3	6,000
8,000	8,000	63,000	16,000	27,000	0,100	3	8,000
9,000	10,000	72,000	16,000	25,400	0,100	3	9,000
10,000	10,000	72,000	19,000	32,000	0,100	3	10,000
12,000	12,000	83,000	22,000	38,000	0,100	3	12,000
14,000	14,000	83,000	22,000	38,000	0,150	3	14,000
16,000	16,000	92,000	26,000	44,000	0,150	3	16,000
18,000	18,000	92,000	26,000	44,000	0,150	3	18,000
20,000	20,000	104,000	32,000	54,000	0,150	3	20,000

Frese in MD

Frese frontali (a 4 taglienti)



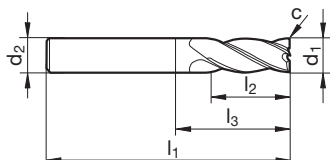
Catalogo n° 54524



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 570

- tagliente al centro
- uso universale



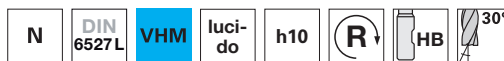
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	57,000	7,000	11,400	0,025	4	2,000
3,000	6,000	57,000	8,000	12,900	0,050	4	3,000
4,000	6,000	57,000	11,000	16,900	0,050	4	4,000
5,000	6,000	57,000	13,000	19,900	0,050	4	5,000
6,000	6,000	57,000	13,000	21,000	0,050	4	6,000
8,000	8,000	63,000	19,000	27,000	0,100	4	8,000
10,000	10,000	72,000	22,000	32,000	0,100	4	10,000
12,000	12,000	83,000	26,000	38,000	0,100	4	12,000
14,000	14,000	83,000	26,000	38,000	0,150	4	14,000
16,000	16,000	92,000	32,000	44,000	0,150	4	16,000
18,000	18,000	92,000	32,000	44,000	0,150	4	18,000
20,000	20,000	104,000	38,000	54,000	0,150	4	20,000

Frese in MD

Frese frontali (a 4 taglienti)



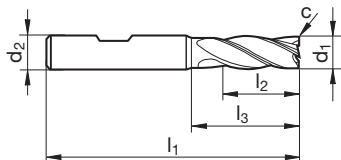
Catalogo n° 74525



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 570

- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	6,000	57,000	8,000	12,900	0,050	4	3,000
4,000	6,000	57,000	11,000	16,900	0,050	4	4,000
5,000	6,000	57,000	13,000	19,900	0,050	4	5,000
6,000	6,000	57,000	13,000	21,000	0,050	4	6,000
8,000	8,000	63,000	19,000	27,000	0,100	4	8,000
10,000	10,000	72,000	22,000	32,000	0,100	4	10,000
12,000	12,000	83,000	26,000	38,000	0,100	4	12,000
14,000	14,000	83,000	26,000	38,000	0,150	4	14,000
16,000	16,000	92,000	32,000	44,000	0,150	4	16,000
18,000	18,000	92,000	32,000	44,000	0,150	4	18,000
20,000	20,000	104,000	38,000	54,000	0,150	4	20,000

Frese in MD

Frese frontali (a 4 taglienti)



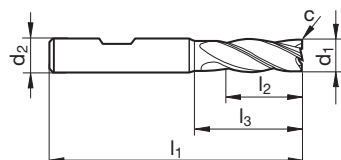
Catalogo n° 64525



P	M	K	N	S	H
●	○	●			

Parametri di lav.
ind. a pag. 570

- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
2,000	6,000	57,000	7,000	9,900	0,025	4	2,000
3,000	6,000	57,000	8,000	12,400	0,050	4	3,000
4,000	6,000	57,000	11,000	15,900	0,050	4	4,000
5,000	6,000	57,000	13,000	19,400	0,050	4	5,000
6,000	6,000	57,000	13,000	21,000	0,050	4	6,000
7,000	8,000	63,000	16,000	23,900	0,100	4	7,000
8,000	8,000	63,000	19,000	27,000	0,100	4	8,000
10,000	10,000	72,000	22,000	32,000	0,100	4	10,000
12,000	12,000	83,000	26,000	38,000	0,100	4	12,000
14,000	14,000	83,000	26,000	38,000	0,150	4	14,000
16,000	16,000	92,000	32,000	44,000	0,150	4	16,000
18,000	18,000	92,000	32,000	44,000	0,150	4	18,000
20,000	20,000	104,000	38,000	54,000	0,150	4	20,000

Frese in MD

Frese frontali (a 4 taglienti)



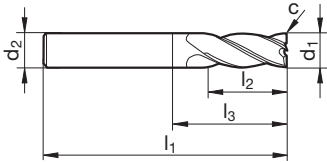
Catalogo n° 54444



P	M	K	N	S	H
●		●	○		

Parametri di lav.
ind. a pag. 570

- extra lungo
- tagliente al centro
- uso universale



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	3,000	75,000	20,000	47,000	0,050	4	3,000
4,000	4,000	75,000	25,000	47,000	0,050	4	4,000
5,000	5,000	75,000	30,000	47,000	0,050	4	5,000
6,000	6,000	75,000	30,000	39,000	0,050	4	6,000
8,000	8,000	100,000	40,000	64,000	0,100	4	8,000
10,000	10,000	100,000	40,000	60,000	0,100	4	10,000
12,000	12,000	150,000	45,000	105,000	0,100	4	12,000
14,000	14,000	150,000	45,000	105,000	0,150	4	14,000
16,000	16,000	150,000	65,000	102,000	0,150	4	16,000
18,000	18,000	150,000	65,000	102,000	0,150	4	18,000
20,000	20,000	150,000	65,000	100,000	0,150	4	20,000

Frese in MD

Frese frontali con spigolo raggiato



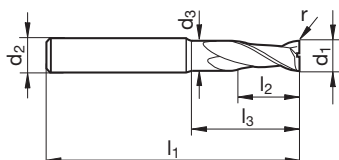
Catalogo n° 54522



P	M	K	N	S	H
•	•	•	○	•	

Parametri di lav.
ind. a pag. 566

- rettifica della spoglia
- tagliente al centro



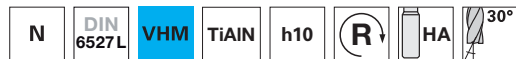
d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Codice
6,000	6,000	5,700	57,000	10,000	21,000	0,500	2	6,005
6,000	6,000	5,700	57,000	10,000	21,000	1,000	2	6,010
8,000	8,000	7,700	63,000	16,000	27,000	0,500	2	8,005
8,000	8,000	7,700	63,000	16,000	27,000	1,000	2	8,010
8,000	8,000	7,700	63,000	16,000	27,000	1,500	2	8,015
10,000	10,000	9,500	72,000	19,000	32,000	0,500	2	10,005
10,000	10,000	9,500	72,000	19,000	32,000	1,000	2	10,010
10,000	10,000	9,500	72,000	19,000	32,000	1,500	2	10,015
10,000	10,000	9,500	72,000	19,000	32,000	2,000	2	10,020
12,000	12,000	11,500	83,000	22,000	38,000	0,500	2	12,005
12,000	12,000	11,500	83,000	22,000	38,000	1,000	2	12,010
12,000	12,000	11,500	83,000	22,000	38,000	2,000	2	12,020
16,000	16,000	15,500	92,000	26,000	44,000	1,000	2	16,010
16,000	16,000	15,500	92,000	26,000	44,000	2,000	2	16,020

Frese in MD

Frese frontali con spigolo raggiato



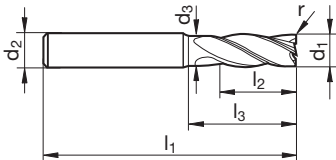
Catalogo n° 54526



P	M	K	N	S	H
•	•	•	○	•	

Parametri di lav.
ind. a pag. 570

- rettifica della spoglia
- tagliente al centro



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Codice
6,000	6,000	5,700	57,000	13,000	21,000	0,500	4	6,005
6,000	6,000	5,700	57,000	13,000	21,000	1,000	4	6,010
8,000	8,000	7,700	63,000	19,000	27,000	0,500	4	8,005
8,000	8,000	7,700	63,000	19,000	27,000	1,000	4	8,010
8,000	8,000	7,700	63,000	19,000	27,000	1,500	4	8,015
8,000	8,000	7,700	63,000	19,000	27,000	2,000	4	8,020
10,000	10,000	9,500	72,000	22,000	32,000	0,500	4	10,005
10,000	10,000	9,500	72,000	22,000	32,000	0,800	4	10,008
10,000	10,000	9,500	72,000	22,000	32,000	1,000	4	10,010
10,000	10,000	9,500	72,000	22,000	32,000	1,500	4	10,015
10,000	10,000	9,500	72,000	22,000	32,000	2,000	4	10,020
12,000	12,000	11,500	83,000	26,000	38,000	0,500	4	12,005
12,000	12,000	11,500	83,000	26,000	38,000	0,800	4	12,008
12,000	12,000	11,500	83,000	26,000	38,000	1,000	4	12,010
12,000	12,000	11,500	83,000	26,000	38,000	1,500	4	12,015
12,000	12,000	11,500	83,000	26,000	38,000	2,000	4	12,020
16,000	16,000	15,500	92,000	32,000	44,000	1,000	4	16,010
16,000	16,000	15,500	92,000	32,000	44,000	2,000	4	16,020
20,000	20,000	19,500	104,000	38,000	54,000	1,000	4	20,010
20,000	20,000	19,500	104,000	38,000	54,000	2,000	4	20,020

Frese in MD

Frese frontali con spigolo raggiato



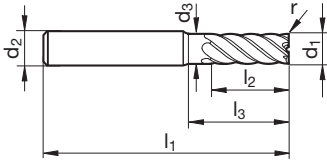
Catalogo n° 54206



P	M	K	N	S	H
●	●	●	○	●	○

Parametri di lav.
ind. a pag. 574

- qualità di superficie notevole con operazioni di lappatura
- rettifica della spoglia
- tagliente al centro



d1 h10 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	r	Z	Codice
6,000	6,000	5,700	57,000	13,000	20,000	0,500	6	6,005
6,000	6,000	5,700	57,000	13,000	20,000	1,000	6	6,010
8,000	8,000	7,700	63,000	19,000	26,000	0,500	6	8,005
8,000	8,000	7,700	63,000	19,000	26,000	1,000	6	8,010
8,000	8,000	7,700	63,000	19,000	26,000	1,500	6	8,015
8,000	8,000	7,700	63,000	19,000	26,000	2,000	6	8,020
10,000	10,000	9,500	72,000	22,000	30,000	0,500	6	10,005
10,000	10,000	9,500	72,000	22,000	30,000	0,800	6	10,008
10,000	10,000	9,500	72,000	22,000	30,000	1,000	6	10,010
10,000	10,000	9,500	72,000	22,000	30,000	1,500	6	10,015
10,000	10,000	9,500	72,000	22,000	30,000	2,000	6	10,020
12,000	12,000	11,500	83,000	26,000	36,000	0,500	6	12,005
12,000	12,000	11,500	83,000	26,000	36,000	0,800	6	12,008
12,000	12,000	11,500	83,000	26,000	36,000	1,000	6	12,010
12,000	12,000	11,500	83,000	26,000	36,000	1,500	6	12,015
12,000	12,000	11,500	83,000	26,000	36,000	2,000	6	12,020
16,000	16,000	15,500	92,000	32,000	42,000	1,000	6	16,010
16,000	16,000	15,500	92,000	32,000	42,000	2,000	6	16,020
20,000	20,000	19,500	104,000	38,000	52,000	1,000	8	20,010
20,000	20,000	19,500	104,000	38,000	52,000	2,000	8	20,020

Frese in MD

Frese frontali per finitura, taglienti multipli



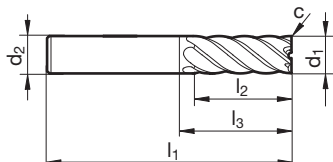
Catalogo n° 54205



P	M	K	N	S	H
●	●	●	○	●	○

Parametri di lav.
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- tagliente al centro
- adatto a superfinitura su materiale fino a 50 HRC



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	6,000	57,000	8,000	11,400	0,050	6	3,000
4,000	6,000	57,000	11,000	15,900	0,050	6	4,000
5,000	6,000	57,000	13,000	17,900	0,050	6	5,000
6,000	6,000	57,000	13,000	21,000	0,050	6	6,000
8,000	8,000	63,000	19,000	27,000	0,100	6	8,000
10,000	10,000	72,000	22,000	32,000	0,100	6	10,000
12,000	12,000	83,000	26,000	38,000	0,100	6	12,000
14,000	14,000	83,000	26,000	38,000	0,150	6	14,000
16,000	16,000	92,000	32,000	44,000	0,150	6	16,000
18,000	18,000	92,000	32,000	44,000	0,150	8	18,000
20,000	20,000	104,000	38,000	54,000	0,150	8	20,000

Frese in MD

Frese frontali per finitura, taglienti multipli



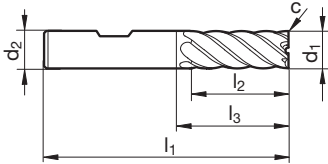
Catalogo n° 54201



P	M	K	N	S	H
●	●	●	○	●	○

Parametri di lav.
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- tagliente al centro
- adatto a superfinitura su materiale fino a 50 HRC



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	57,000	13,000	21,000	0,050	6	6,000
8,000	8,000	63,000	19,000	27,000	0,100	6	8,000
10,000	10,000	72,000	22,000	32,000	0,100	6	10,000
12,000	12,000	83,000	26,000	38,000	0,100	6	12,000
14,000	14,000	83,000	26,000	38,000	0,150	6	14,000
16,000	16,000	92,000	32,000	44,000	0,150	6	16,000
18,000	18,000	92,000	32,000	44,000	0,150	8	18,000
20,000	20,000	104,000	38,000	54,000	0,150	8	20,000

Frese in MD

Frese frontali per finitura, taglienti multipli



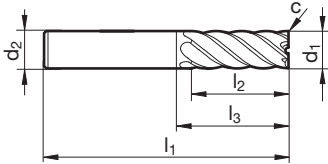
Catalogo n° 54225



P	M	K	N	S	H
●	●	●	○	●	○

Parametri di lav.
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- extra lungo
- tagliente al centro
- adatto a superfinitura su materiale fino a 50 HRC



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	75,000	30,000	39,000	0,050	6	6,000
8,000	8,000	100,000	40,000	64,000	0,100	6	8,000
10,000	10,000	100,000	40,000	60,000	0,100	6	10,000
12,000	12,000	150,000	45,000	105,000	0,100	6	12,000
16,000	16,000	150,000	65,000	102,000	0,150	6	16,000
20,000	20,000	150,000	65,000	100,000	0,150	8	20,000

Frese in MD

Frese frontali per finitura, taglienti multipli



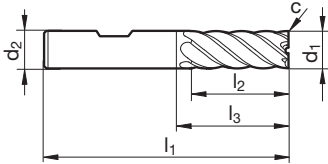
Catalogo n° 54221



P	M	K	N	S	H
●	●	●	○	●	○

Parametri di lav.
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- extra lungo
- tagliente al centro
- adatto a superfinitura su materiale fino a 50 HRC



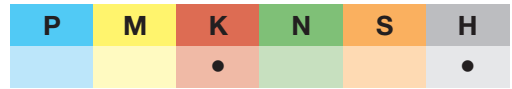
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	75,000	30,000	39,000	0,050	6	6,000
8,000	8,000	100,000	40,000	64,000	0,100	6	8,000
10,000	10,000	100,000	40,000	60,000	0,100	6	10,000
12,000	12,000	150,000	45,000	105,000	0,100	6	12,000
16,000	16,000	150,000	65,000	102,000	0,150	6	16,000
20,000	20,000	150,000	65,000	100,000	0,150	8	20,000

Frese in MD

Frese per materiali duri, taglienti multipli

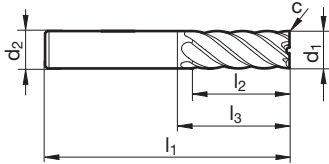


Catalogo n° 54207



Parametri di lav.
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- tagliente al centro
- adatto per superfinitura su materiali fino a 62 HRC e superiore



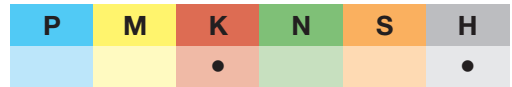
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
3,000	6,000	57,000	8,000	11,400	0,050	6	3,000
4,000	6,000	57,000	11,000	15,900	0,050	6	4,000
5,000	6,000	57,000	13,000	17,900	0,050	6	5,000
6,000	6,000	57,000	13,000	21,000	0,050	6	6,000
8,000	8,000	63,000	19,000	27,000	0,100	6	8,000
10,000	10,000	72,000	22,000	32,000	0,100	6	10,000
12,000	12,000	83,000	26,000	38,000	0,100	6	12,000
14,000	14,000	83,000	26,000	38,000	0,150	6	14,000
16,000	16,000	92,000	32,000	44,000	0,150	6	16,000
18,000	18,000	92,000	32,000	44,000	0,150	8	18,000
20,000	20,000	104,000	38,000	54,000	0,150	8	20,000

Frese in MD

Frese per materiali duri, taglienti multipli

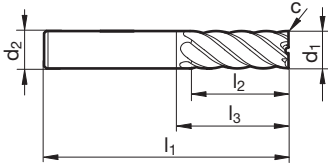


Catalogo n° 54227



Parametri di lav.
ind. a pag. 574

- eccezionale qualità' della finitura superficiale
- extra lungo
- tagliente al centro
- adatto per superfinitura su materiali fino a 62 HRC e superiore



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	75,000	30,000	39,000	0,050	6	6,000
8,000	8,000	100,000	40,000	64,000	0,100	6	8,000
10,000	10,000	100,000	40,000	60,000	0,100	6	10,000
12,000	12,000	150,000	45,000	105,000	0,100	6	12,000
16,000	16,000	150,000	65,000	102,000	0,150	6	16,000
20,000	20,000	150,000	65,000	100,000	0,150	8	20,000

Frese in MD

Frese a sgrossare



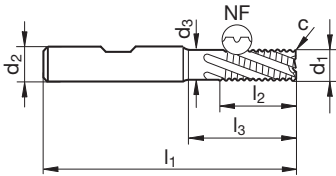
Catalogo n° 54496



P	M	K	N	S	H
●	○	●	○		

Parametri di lav.
ind. a pag. 572

- per scanalatura e sgrossatura
- tagliente al centro



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	57,000	13,000	20,000	0,300	4	6,000
8,000	8,000	63,000	19,000	26,000	0,300	4	8,000
10,000	10,000	72,000	22,000	30,000	0,300	4	10,000
12,000	12,000	83,000	26,000	36,000	0,500	4	12,000
14,000	14,000	83,000	26,000	36,000	0,500	4	14,000
16,000	16,000	92,000	32,000	42,000	0,500	4	16,000
18,000	18,000	92,000	32,000	42,000	0,500	4	18,000
20,000	20,000	104,000	38,000	52,000	0,500	4	20,000
25,000	25,000	121,000	45,000	63,000	0,600	5	25,000

Frese in MD

Frese a sgrossare



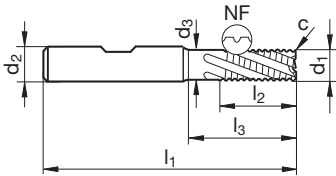
Catalogo n° 54497



P	M	K	N	S	H
●	○	●	○		

Parametri di lav.
ind. a pag. 572

- per fratura a sgrossare e a finire
- tagliente al centro



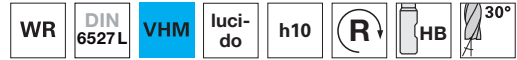
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	57,000	13,000	20,000	0,300	5	6,000
8,000	8,000	63,000	19,000	26,000	0,300	5	8,000
10,000	10,000	72,000	22,000	30,000	0,300	5	10,000
12,000	12,000	83,000	26,000	36,000	0,500	5	12,000
14,000	14,000	83,000	26,000	36,000	0,500	5	14,000
16,000	16,000	92,000	32,000	42,000	0,500	6	16,000
18,000	18,000	92,000	32,000	42,000	0,500	6	18,000
20,000	20,000	104,000	38,000	52,000	0,500	6	20,000
25,000	25,000	121,000	45,000	63,000	0,600	6	25,000

Frese in MD

Frese a sgrossare

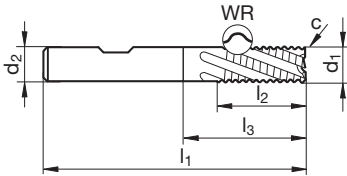


Catalogo n° 74203



Parametri di lav.
ind. a pag. 572

- alta capacità di truciatura con alluminio e metalli NE attraverso dentatura zigrinata di sgrossatura grossolana
- tagliente al centro



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	57,000	10,000	21,000	0,300	3	6,000
8,000	8,000	63,000	16,000	27,000	0,300	3	8,000
10,000	10,000	72,000	19,000	32,000	0,300	3	10,000
12,000	12,000	83,000	22,000	38,000	0,500	3	12,000
14,000	14,000	83,000	22,000	38,000	0,500	3	14,000
16,000	16,000	92,000	26,000	44,000	0,500	3	16,000
18,000	18,000	92,000	26,000	44,000	0,500	3	18,000
20,000	20,000	104,000	32,000	54,000	0,500	3	20,000

Frese in MD

Frese a sgrossare

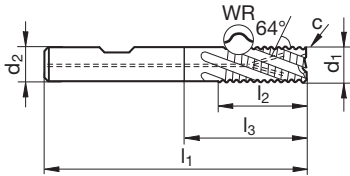


Catalogo n° 74303



Parametri di lav.
ind. a pag. 572

- con refrigerazione interna per vita utensile maggiore e asportazione truciolo ottimale
- alta capacità di truciolatura con alluminio e metallo NE attraverso dentatura zigrinata di sgrossatura grossolana
- tagliente al centro



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	57,000	10,000	21,000	0,300	3	6,000
8,000	8,000	63,000	16,000	27,000	0,300	3	8,000
10,000	10,000	72,000	19,000	32,000	0,300	3	10,000
12,000	12,000	83,000	22,000	38,000	0,500	3	12,000
16,000	16,000	92,000	26,000	44,000	0,500	3	16,000
20,000	20,000	104,000	32,000	54,000	0,500	3	20,000

Frese in MD

Frese a sgrossare



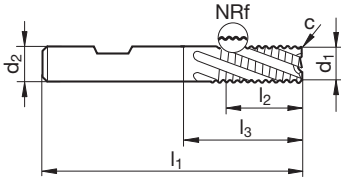
Catalogo n° 64495



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 572

- dentatura zigrinata di sgrossatura fine
- tagliente al centro



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	57,000	13,000	20,000	0,300	4	6,000
8,000	8,000	63,000	19,000	26,000	0,300	4	8,000
10,000	10,000	72,000	22,000	30,000	0,300	4	10,000
12,000	12,000	83,000	26,000	36,000	0,500	4	12,000
14,000	14,000	83,000	26,000	36,000	0,500	4	14,000
16,000	16,000	92,000	32,000	42,000	0,500	4	16,000
18,000	18,000	92,000	32,000	42,000	0,500	4	18,000
20,000	20,000	104,000	38,000	52,000	0,500	4	20,000

Frese in MD

Frese a sgrossare



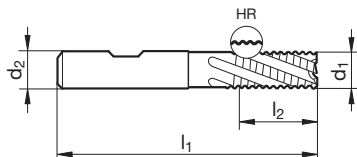
Catalogo n° 64497



P	M	K	N	S	H
•		•			•

Parametri di lav.
ind. a pag. 572

- dentatura zigrinata di sgrossatura fine
- profilo divisione truciolo
- tagliente al centro
- per materiali difficili da lavorare con 3 ° di angolo di spoglia
- specifica per fresatura su acciaio con resistenza alla trazione, ghisa, ghisa grigia, temprati fino a 56 HRC



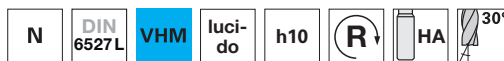
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
6,000	6,000	57,000	13,000	21,000	0,300	4	6,000
8,000	8,000	63,000	19,000	27,000	0,300	4	8,000
10,000	10,000	72,000	22,000	32,000	0,300	4	10,000
12,000	12,000	83,000	26,000	38,000	0,500	4	12,000
16,000	16,000	92,000	32,000	44,000	0,500	4	16,000
20,000	20,000	104,000	38,000	54,000	0,500	4	20,000

Frese in MD

Frese a raggio



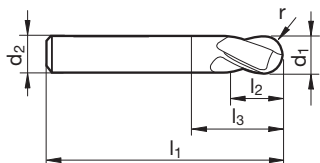
Catalogo n° 74543



P	M	K	N	S	H
•	•	•	○		

Parametri di lav.
ind. a pag. 574

- tagliente al centro
- raggio



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Codice
3,000	6,000	57,000	7,000	11,400	1,500	2	3,000
4,000	6,000	57,000	8,000	13,900	2,000	2	4,000
5,000	6,000	57,000	10,000	16,900	2,500	2	5,000
6,000	6,000	57,000	10,000	21,000	3,000	2	6,000
8,000	8,000	63,000	16,000	27,000	4,000	2	8,000
10,000	10,000	72,000	19,000	32,000	5,000	2	10,000
12,000	12,000	83,000	22,000	38,000	6,000	2	12,000
14,000	14,000	83,000	22,000	38,000	7,000	2	14,000
16,000	16,000	92,000	26,000	44,000	8,000	2	16,000
18,000	18,000	92,000	26,000	44,000	9,000	2	18,000
20,000	20,000	104,000	32,000	54,000	10,000	2	20,000

Frese in MD

Frese a raggio



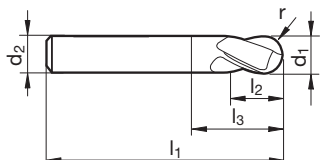
Catalogo n° 54541



P	M	K	N	S	H
•	•	•	○	○	

Parametri di lav.
ind. a pag. 574

- tagliente al centro
- raggio



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Codice
0,500	3,000	38,000	1,000	2,100	0,250	2	0,500
0,800	3,000	38,000	1,000	2,100	0,400	2	0,800
1,000	3,000	38,000	2,000	3,900	0,500	2	1,000
1,500	3,000	38,000	3,000	6,400	0,750	2	1,500
2,000	6,000	57,000	6,000	9,400	1,000	2	2,000
3,000	6,000	57,000	7,000	11,900	1,500	2	3,000
4,000	6,000	57,000	8,000	13,400	2,000	2	4,000
5,000	6,000	57,000	10,000	16,900	2,500	2	5,000
6,000	6,000	57,000	10,000	21,000	3,000	2	6,000
8,000	8,000	63,000	16,000	27,000	4,000	2	8,000
10,000	10,000	72,000	19,000	32,000	5,000	2	10,000
12,000	12,000	83,000	22,000	38,000	6,000	2	12,000
14,000	14,000	83,000	22,000	38,000	7,000	2	14,000
16,000	16,000	92,000	26,000	44,000	8,000	2	16,000
18,000	18,000	92,000	26,000	44,000	9,000	2	18,000
20,000	20,000	104,000	32,000	54,000	10,000	2	20,000

Frese in MD

Frese a raggio



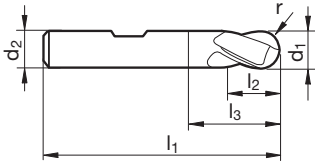
Catalogo n° 64542



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 574

- tagliente al centro
- raggio



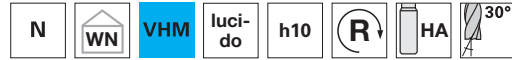
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Codice
1,000	3,000	38,000	2,000	3,900	0,500	2	1,000
1,500	3,000	38,000	3,000	6,400	0,750	2	1,500
2,000	6,000	57,000	6,000	9,400	1,000	2	2,000
3,000	6,000	57,000	7,000	11,900	1,500	2	3,000
4,000	6,000	57,000	8,000	13,400	2,000	2	4,000
5,000	6,000	57,000	10,000	16,900	2,500	2	5,000
6,000	6,000	57,000	10,000	21,000	3,000	2	6,000
8,000	8,000	63,000	16,000	27,000	4,000	2	8,000
10,000	10,000	72,000	19,000	32,000	5,000	2	10,000
12,000	12,000	83,000	22,000	38,000	6,000	2	12,000
14,000	14,000	83,000	22,000	38,000	7,000	2	14,000
16,000	16,000	92,000	26,000	44,000	8,000	2	16,000
18,000	18,000	92,000	26,000	44,000	9,000	2	18,000
20,000	20,000	104,000	32,000	54,000	10,000	2	20,000

Frese in MD

Frese a raggio



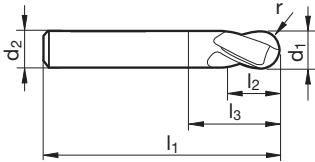
Catalogo n° 74545



P	M	K	N	S	H
●	○	●	○		

Parametri di lav.
ind. a pag. 574

- extra lungo
- tagliente al centro
- raggio



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Codice
3,000	3,000	75,000	20,000	47,000	1,500	2	3,000
4,000	4,000	75,000	25,000	47,000	2,000	2	4,000
5,000	5,000	75,000	30,000	47,000	2,500	2	5,000
6,000	6,000	75,000	30,000	39,000	3,000	2	6,000
8,000	8,000	100,000	40,000	64,000	4,000	2	8,000
10,000	10,000	100,000	40,000	60,000	5,000	2	10,000
12,000	12,000	150,000	45,000	105,000	6,000	2	12,000

Frese in MD

Frese a raggio



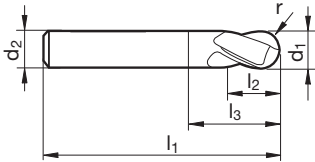
Catalogo n° 64545



P	M	K	N	S	H
•	•	•	○	○	

Parametri di lav.
ind. a pag. 574

- extra lungo
- tagliente al centro
- raggio



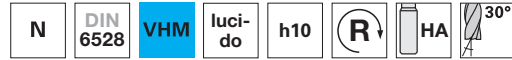
d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Codice
3,000	3,000	75,000	20,000	47,000	1,500	2	3,000
4,000	4,000	75,000	25,000	47,000	2,000	2	4,000
5,000	5,000	75,000	30,000	47,000	2,500	2	5,000
6,000	6,000	75,000	30,000	39,000	3,000	2	6,000
8,000	8,000	100,000	40,000	64,000	4,000	2	8,000
10,000	10,000	100,000	40,000	60,000	5,000	2	10,000
12,000	12,000	150,000	45,000	105,000	6,000	2	12,000

Frese in MD

Frese a raggio



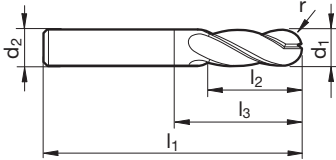
Catalogo n° 74531



P	M	K	N	S	H
•	•	•	○		

Parametri di lav.
ind. a pag. 574

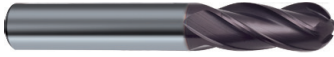
- tagliente al centro
- raggio



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Codice
4,000	4,000	50,000	11,000	22,000	2,000	4	4,000
5,000	5,000	50,000	13,000	22,000	2,500	4	5,000
6,000	6,000	57,000	13,000	21,000	3,000	4	6,000
8,000	8,000	63,000	19,000	27,000	4,000	4	8,000
10,000	10,000	72,000	22,000	32,000	5,000	4	10,000
12,000	12,000	83,000	26,000	38,000	6,000	4	12,000
16,000	16,000	92,000	32,000	44,000	8,000	4	16,000

Frese in MD

Frese a raggio



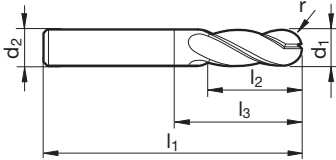
Catalogo n° 54531



P	M	K	N	S	H
•	•	•	○	○	

Parametri di lav.
ind. a pag. 574

- tagliente al centro
- raggio



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Codice
4,000	4,000	50,000	11,000	22,000	2,000	4	4,000
5,000	5,000	50,000	13,000	22,000	2,500	4	5,000
6,000	6,000	57,000	13,000	21,000	3,000	4	6,000
8,000	8,000	63,000	19,000	27,000	4,000	4	8,000
10,000	10,000	72,000	22,000	32,000	5,000	4	10,000
12,000	12,000	83,000	26,000	38,000	6,000	4	12,000
14,000	14,000	83,000	26,000	38,000	7,000	4	14,000
16,000	16,000	92,000	32,000	44,000	8,000	4	16,000
18,000	18,000	92,000	32,000	44,000	9,000	4	18,000
20,000	20,000	104,000	38,000	54,000	10,000	4	20,000

Frese in MD

Frese a raggio



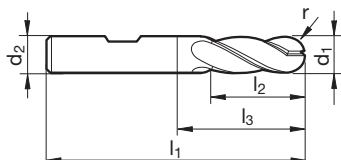
Catalogo n° 64532



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 574

- tagliente al centro
- raggio



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Codice
3,000	6,000	57,000	8,000	11,400	1,500	4	3,000
4,000	6,000	57,000	11,000	14,400	2,000	4	4,000
5,000	6,000	57,000	13,000	17,400	2,500	4	5,000
6,000	6,000	57,000	13,000	21,000	3,000	4	6,000
8,000	8,000	63,000	19,000	27,000	4,000	4	8,000
10,000	10,000	72,000	22,000	32,000	5,000	4	10,000
12,000	12,000	83,000	26,000	38,000	6,000	4	12,000
14,000	14,000	83,000	26,000	38,000	7,000	4	14,000
16,000	16,000	92,000	32,000	44,000	8,000	4	16,000
18,000	18,000	92,000	32,000	44,000	9,000	4	18,000
20,000	20,000	104,000	38,000	54,000	10,000	4	20,000

Frese in MD

Frese a raggio



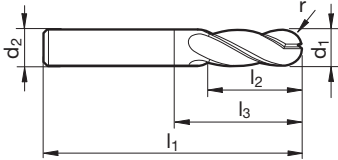
Catalogo n° 64535



P	M	K	N	S	H
●	●	●	○	○	

Parametri di lav.
ind. a pag. 574

- extra lungo
- tagliente al centro
- raggio



d1 h10 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	r mm	Z	Codice
3,000	3,000	75,000	20,000	47,000	1,500	4	3,000
4,000	4,000	75,000	25,000	47,000	2,000	4	4,000
5,000	5,000	75,000	30,000	47,000	2,500	4	5,000
6,000	6,000	75,000	30,000	39,000	3,000	4	6,000
8,000	8,000	100,000	40,000	64,000	4,000	4	8,000
10,000	10,000	100,000	40,000	60,000	5,000	4	10,000
12,000	12,000	150,000	45,000	105,000	6,000	4	12,000

Frese in MD

Frese per copiatori con affilatura torica



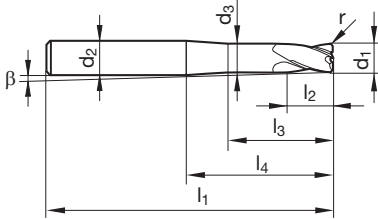
Catalogo n° 54304



P	M	K	N	S	H
•	•	•		○	•

Parametri di lav.
ind. a pag. 578

- corto
- tagliente al centro
- per l'industria della formatura
- lunga vita utensile grazie al rivestimento molto forte



d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Codice
3,000	6,000	2,800	57,000	5,000	9,400	21,000	0,500	4,200	4	3,000
4,000	6,000	3,800	57,000	6,000	13,400	21,000	0,500	2,800	4	4,000
5,000	6,000	4,800	57,000	8,000	15,900	21,000	0,500	1,400	4	5,000
6,000	6,000	5,700	57,000	9,000	21,000	21,000	1,000		4	6,000
8,000	8,000	7,700	63,000	12,000	27,000	27,000	1,000		4	8,000
10,000	10,000	9,500	72,000	15,000	32,000	32,000	1,500		4	10,000
12,000	12,000	11,500	83,000	18,000	38,000	38,000	1,500		4	12,000
16,000	16,000	15,500	92,000	24,000	44,000	44,000	2,000		4	16,000

Frese in MD

Frese per copiatori con affilatura torica



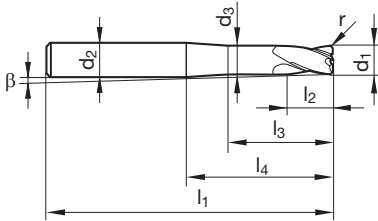
Catalogo n° 54305



P	M	K	N	S	H
•	•	•		•	•

Parametri di lav.
ind. a pag. 578

- lungo
- tagliente al centro
- con raggio di azione extra lungo per l'industria della formatura
- lunga vita utensile grazie al rivestimento molto forte



d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Codice
6,000	6,000	5,700	75,000	9,000	38,000	39,000	1,000		4	6,000
8,000	8,000	7,700	100,000	12,000	63,000	64,000	1,000		4	8,000
10,000	10,000	9,500	100,000	15,000	58,000	60,000	1,500		4	10,000
12,000	12,000	11,500	150,000	18,000	103,000	105,000	1,500		4	12,000
16,000	16,000	15,500	150,000	24,000	100,000	102,000	2,000		4	16,000

Frese in MD

Frese per copiatori con affilatura torica



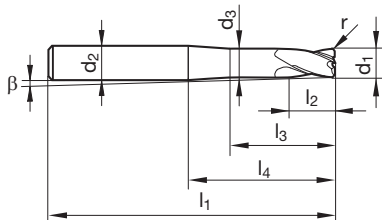
Catalogo n° 54302



P	M	K	N	S	H
•	•	•	•	○	

Parametri di lav.
ind. a pag. 576

- per sgrossatura, finitura e superfinitura in condizioni HSC in pressofusione e stampi
- tagliente al centro
- adatto per materiale da 40 a 54 HRC
- lunga vita utensile grazie al rivestimento molto forte



d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Codice
2,000	6,000	1,800	57,000	3,000	6,200	20,000	0,500	5,900	2	2,000
3,000	6,000	2,800	57,000	3,500	8,400	20,000	0,500	4,400	2	3,000
4,000	6,000	3,800	57,000	4,000	9,400	20,000	1,000	3,100	2	4,000
6,000	6,000	5,600	57,000	6,000	19,000	21,000	2,000		2	6,000
8,000	8,000	7,600	63,000	7,000	25,000	27,000	2,000		2	8,000
10,000	10,000	9,600	72,000	8,000	28,000	32,000	3,000		2	10,000
12,000	12,000	11,500	83,000	10,000	33,000	38,000	4,000		2	12,000

Frese in MD

Frese per copiatori con affilatura torica



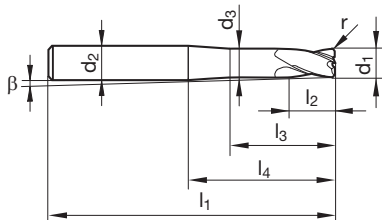
Catalogo n° 54303



P	M	K	N	S	H
•	•	•	•	○	

Parametri di lav.
ind. a pag. 576

- con raggio di azione extra lungo per sgrossatura, lappatura e superfinitura a condizioni HSC nell'industria dello stampo e formatura
- tagliente al centro
- adatto per materiale da 40 a 54 HRC
- lunga vita utensile grazie al rivestimento molto forte



d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Codice
2,000	6,000	1,800	80,000	3,000	8,000	40,000	0,500	2,900	2	2,000
3,000	6,000	2,800	80,000	3,500	12,000	40,000	0,500	2,200	2	3,000
4,000	6,000	3,800	80,000	4,000	20,000	40,000	1,000	1,500	2	4,000
6,000	8,000	5,600	100,000	6,000	59,000	60,000	2,000	1,000	2	6,000
8,000	10,000	7,600	120,000	7,000	74,000	75,000	2,000	0,800	2	8,000
10,000	12,000	9,600	120,000	8,000	68,000	70,000	3,000	0,900	2	10,000
12,000	16,000	11,500	150,000	10,000	95,800	100,000	4,000	1,200	2	12,000

Frese in MD

Frese a raggio per copiatori



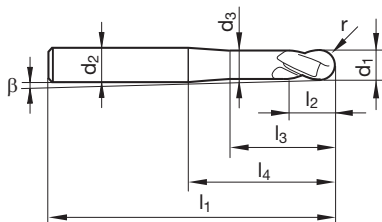
Catalogo n° 54306



P	M	K	N	S	H
•	•	•		•	•

Parametri di lav.
ind. a pag. 578

- corto
- tagliente al centro
- lunga vita utensile grazie al rivestimento molto forte



d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Codice
0,500	3,000	0,400	38,000	0,750	2,600	10,000	0,250	7,400	2	0,500
0,800	3,000	0,700	38,000	1,200	3,500	10,000	0,400	6,600	2	0,800
1,000	3,000	0,900	38,000	1,500	4,000	10,000	0,500	6,100	2	1,000
1,500	3,000	1,400	38,000	2,250	5,500	10,000	0,750	4,700	2	1,500
2,000	6,000	1,900	57,000	3,000	9,400	21,000	1,000	5,800	2	2,000
3,000	6,000	2,700	57,000	5,000	11,600	21,000	1,500	4,400	2	3,000
4,000	6,000	3,700	57,000	6,000	14,500	21,000	2,000	3,100	2	4,000
5,000	6,000	4,700	57,000	8,000	17,300	21,000	2,500	1,600	2	5,000
6,000	6,000	5,700	57,000	9,000	20,000	21,000	3,000		2	6,000
8,000	8,000	7,700	63,000	12,000	26,000	27,000	4,000		2	8,000
10,000	10,000	9,500	72,000	15,000	30,000	32,000	5,000		2	10,000
12,000	12,000	11,500	83,000	18,000	36,000	38,000	6,000		2	12,000
16,000	16,000	15,500	92,000	24,000	42,000	44,000	8,000		2	16,000

Frese in MD

Frese a raggio per copiatori



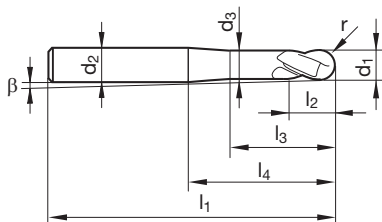
Catalogo n° 54307



P	M	K	N	S	H
•	•	•		•	•

Parametri di lav.
ind. a pag. 578

- lungo
- tagliente al centro
- con raggio di azione extra lungo per l'industria della formatura
- lunga vita utensile grazie al rivestimento molto forte



d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Codice
3,000	6,000	2,700	75,000	5,000	20,000	39,000	1,500	2,300	2	3,000
4,000	6,000	3,700	75,000	6,000	20,000	39,000	2,000	1,600	2	4,000
5,000	6,000	4,700	75,000	8,000	20,000	39,000	2,500	0,800	2	5,000
6,000	6,000	5,700	75,000	9,000	38,000	39,000	3,000		2	6,000
8,000	8,000	7,700	100,000	12,000	63,000	64,000	4,000		2	8,000
10,000	10,000	9,500	100,000	15,000	58,000	60,000	5,000		2	10,000
12,000	12,000	11,500	150,000	18,000	103,000	105,000	6,000		2	12,000
16,000	16,000	15,500	150,000	24,000	100,000	102,000	8,000		2	16,000

Frese in MD

Frese a raggio per copiatori



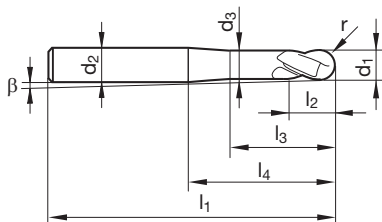
Catalogo n° 54300



P	M	K	N	S	H
•	•	•	•	○	

Parametri di lav.
ind. a pag. 576

- corto
- tagliente al centro
- per la lavorazione di acciai duri fino a 54 HRC
- lunga vita utensile grazie al rivestimento molto forte



d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Codice
2,000	6,000	1,800	57,000	3,000	6,200	20,000	1,000	6,100	2	2,000
3,000	6,000	2,800	57,000	3,500	8,400	20,000	1,500	4,700	2	3,000
4,000	6,000	3,800	57,000	4,000	9,400	20,000	2,000	3,200	2	4,000
6,000	6,000	5,600	57,000	6,000	19,000	21,000	3,000		2	6,000
8,000	8,000	7,600	63,000	7,000	25,000	27,000	4,000		2	8,000
10,000	10,000	9,600	72,000	8,000	28,000	32,000	5,000		2	10,000
12,000	12,000	11,500	83,000	10,000	33,000	38,000	6,000		2	12,000

Frese in MD

Frese a raggio per copiatori



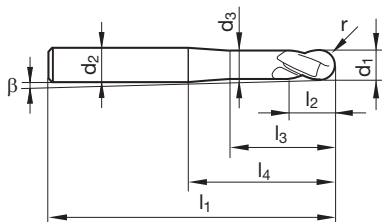
Catalogo n° 54301



P	M	K	N	S	H
•	•	•	•	○	

Parametri di lav.
ind. a pag. 576

- lungo
- tagliente al centro
- con raggio di azione extra lungo per sgrossatura, lappatura e superfinitura a condizioni HSC nell'industria dello stampo e formatura
- lunga vita utensile grazie al rivestimento molto forte



d1 h8 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	r mm	β °	Z	Codice
2,000	6,000	1,800	80,000	3,000	8,000	40,000	1,000	3,000	2	2,000
3,000	6,000	2,800	80,000	3,500	12,000	40,000	1,500	2,300	2	3,000
4,000	6,000	3,800	80,000	4,000	20,000	40,000	2,000	1,600	2	4,000
6,000	8,000	5,600	100,000	6,000	59,000	60,000	3,000	1,100	2	6,000
8,000	10,000	7,600	120,000	7,000	74,000	75,000	4,000	0,900	2	8,000
10,000	12,000	9,600	120,000	8,000	68,000	70,000	5,000	0,900	2	10,000
12,000	16,000	11,500	150,000	10,000	95,800	100,000	6,000	1,300	2	12,000

Frese in MD

Fresa pilota

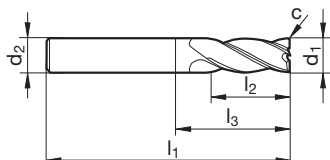


Catalogo n° 54700



P	M	K	N	S	H
•	•	•	•	•	•

- per fresare e foratura pilota
- adatto anche in combinazione con punte a cannone o punte per fori profondi, tipo SUPERV-T o SUPERV-NX
- tagliente al centro



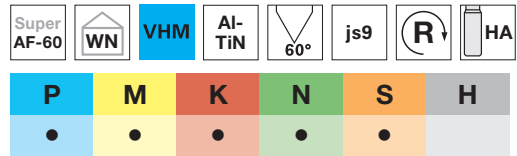
d1 m8 mm	d2 h6 mm	l1 mm	l2 mm	l3 mm	c mm x 45°	Z	Codice
1,400	3,000	38,000	3,000	5,900	0,010	4	1,400
1,500	3,000	38,000	4,000	6,900	0,020	4	1,500
1,800	3,000	38,000	6,000	8,900	0,020	4	1,800
2,000	3,000	38,000	6,500	9,400	0,020	4	2,000
2,100	3,000	38,000	6,500	9,900	0,020	4	2,100
2,300	3,000	38,000	6,500	9,900	0,020	4	2,300
2,500	3,000	38,000	6,500	9,900	0,030	4	2,500
2,800	3,000	38,000	6,500	10,000	0,030	4	2,800
3,000	6,000	57,000	8,000	12,400	0,030	4	3,000
3,500	6,000	57,000	10,000	14,900	0,040	4	3,500
4,000	6,000	57,000	11,000	15,900	0,040	4	4,000
4,500	6,000	57,000	11,000	17,400	0,050	4	4,500
5,000	6,000	57,000	13,000	19,400	0,050	4	5,000
5,500	6,000	57,000	13,000	20,400	0,060	4	5,500
6,000	8,000	63,000	13,000	20,400	0,060	4	6,000
6,500	8,000	63,000	13,000	20,900	0,070	4	6,500
7,000	8,000	63,000	16,000	23,900	0,070	4	7,000
7,500	8,000	63,000	16,000	23,900	0,080	4	7,500
8,000	10,000	72,000	19,000	26,900	0,080	4	8,000
8,500	10,000	72,000	19,000	28,400	0,090	4	8,500
9,000	10,000	72,000	19,000	28,400	0,090	4	9,000
10,000	12,000	83,000	22,000	31,400	0,100	4	10,000
11,000	12,000	83,000	26,000	36,400	0,110	4	11,000
12,000	14,000	83,000	26,000	37,400	0,120	4	12,000

Utensili di sbavatura e smussatura

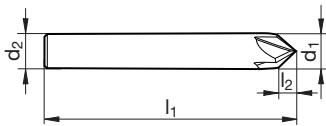
Fresa frontali a 60° per sbavatura



Catalogo n° 53393



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 60°



d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
4,000	4,000	50,000	3,500	4	4,000
6,000	6,000	57,000	5,200	4	6,000
8,000	8,000	63,000	7,000	4	8,000
10,000	10,000	72,000	8,700	4	10,000
12,000	12,000	83,000	10,400	4	12,000

Utensili di sbavatura e smussatura

Fresa frontali a 60° per sbavatura

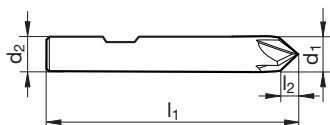


Catalogo n° 53394



P	M	K	N	S	H
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• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 60°



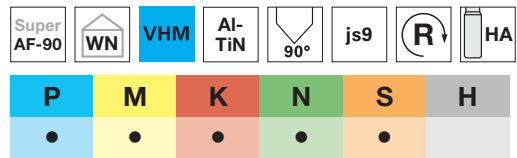
d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	5,200	4	6,000
8,000	8,000	63,000	7,000	4	8,000
10,000	10,000	72,000	8,700	4	10,000
12,000	12,000	83,000	10,400	4	12,000

Utensili di sbavatura e smussatura

Fresa frontali a 90° per sbavatura



Catalogo n° 53395



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 90°



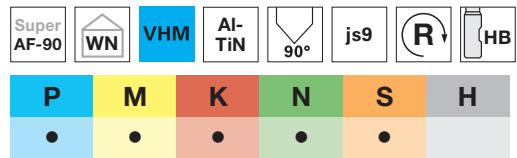
d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
4,000	4,000	50,000	2,000	4	4,000
6,000	6,000	57,000	3,000	4	6,000
8,000	8,000	63,000	4,000	4	8,000
10,000	10,000	72,000	5,000	4	10,000
12,000	12,000	83,000	6,000	4	12,000

Utensili di sbavatura e smussatura

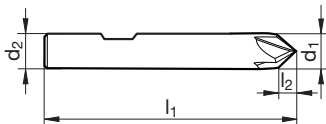
Fresa frontali a 90° per sbavatura



Catalogo n° 53396



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 90°



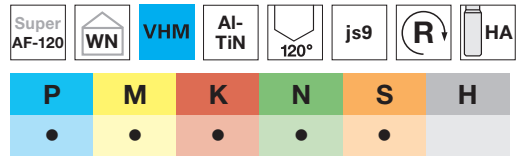
d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
4,000	4,000	50,000	2,000	4	4,000
6,000	6,000	57,000	3,000	4	6,000
8,000	8,000	63,000	4,000	4	8,000
10,000	10,000	72,000	5,000	4	10,000
12,000	12,000	83,000	6,000	4	12,000

Utensili di sbavatura e smussatura

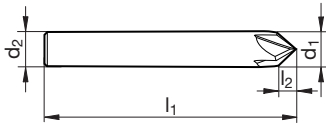
Fresa frontali a 120° per sbavatura



Catalogo n° 53397



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 120°



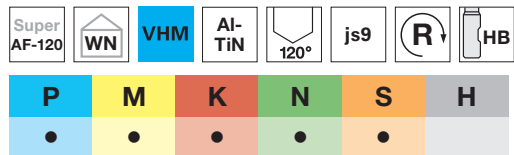
d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
4,000	4,000	50,000	1,200	4	4,000
6,000	6,000	57,000	1,800	4	6,000
8,000	8,000	63,000	2,400	4	8,000
10,000	10,000	72,000	2,900	4	10,000
12,000	12,000	83,000	3,500	4	12,000

Utensili di sbavatura e smussatura

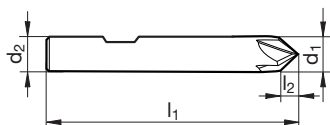
Fresa frontali a 120° per sbavatura



Catalogo n° 53398



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 120°



d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	1,800	4	6,000
8,000	8,000	63,000	2,400	4	8,000
10,000	10,000	72,000	2,900	4	10,000
12,000	12,000	83,000	3,500	4	12,000

Utensili di sbavatura e smussatura

Sbavatori a 90° ad avanzamento ed estrazione

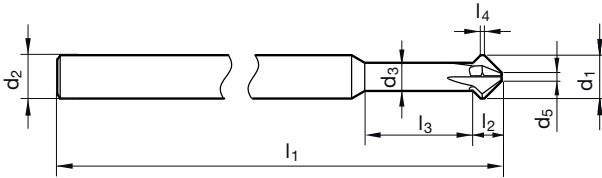


Catalogo n° 52365



P	M	K	N	S	H
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- Utensile per sbavatura e smussatura per la lavorazione in entrata e uscita dal foro con un angolo di smusso 90°
- per impiego in mandrini ad espansione idraulica e per calettamento
- con codolo a DIN 6535



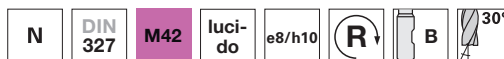
d1 mm	d2 h6 mm	d3 mm	d5 mm	l1 mm	l2 mm	l3 mm	l4 mm	Z	Codice
3,000	4,000	2,200	0,600	75,000	2,10	9,300	0,500	4	3,000
4,000	4,000	2,900	0,800	75,000	2,70	12,300	0,500	4	4,000
5,000	5,000	3,900	1,000	75,000	3,00	15,000	0,500	4	5,000
6,000	6,000	3,900	1,200	100,000	3,90	14,300	0,500	4	6,000
8,000	6,000	6,000	1,600	100,000	4,70		0,500	4	8,000
10,000	6,000	6,000	2,000	100,000	6,50		0,500	4	10,000
12,000	6,000	6,000	2,400	100,000	8,30		0,500	4	12,000

Frese per acciaio ad alta velocità

Frese frontali (a 2 taglienti)



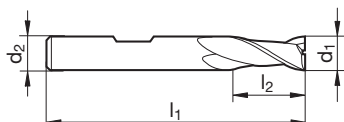
Catalogo n° 74231



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 580

- extra corto
- tagliente al centro
- materiale fino a circa 1200 N/mm²



d1 mm	Tolleranza d1	d2 mm	l1 mm	l2 mm	Z	Codice
1,000	h10	6,000	47,000	2,000	2	1,000
1,500	h10	6,000	47,000	3,000	2	1,500
2,000	e8	6,000	48,000	4,000	2	2,000
2,500	e8	6,000	49,000	5,000	2	2,500
3,000	e8	6,000	49,000	5,000	2	3,000
3,500	h10	6,000	50,000	6,000	2	3,500
4,000	e8	6,000	51,000	7,000	2	4,000
4,500	h10	6,000	51,000	7,000	2	4,500
5,000	e8	6,000	52,000	8,000	2	5,000
5,500	h10	6,000	52,000	8,000	2	5,500
6,000	e8	6,000	52,000	8,000	2	6,000
7,000	e8	10,000	60,000	10,000	2	7,000
8,000	e8	10,000	61,000	11,000	2	8,000
9,000	h10	10,000	61,000	11,000	2	9,000
10,000	e8	10,000	63,000	13,000	2	10,000
12,000	e8	12,000	73,000	16,000	2	12,000
14,000	e8	12,000	73,000	16,000	2	14,000
16,000	e8	16,000	79,000	19,000	2	16,000
18,000	e8	16,000	79,000	19,000	2	18,000
20,000	e8	20,000	88,000	22,000	2	20,000
25,000	e8	25,000	102,000	26,000	2	25,000

Frese per acciaio ad alta velocità

Frese frontali (a 2 taglienti)



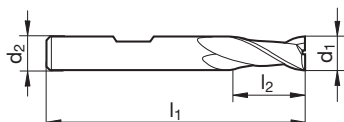
Catalogo n° 64640



P	M	K	N	S	H
●	●	●	○		

Parametri di lav.
ind. a pag. 580

- extra corto
- tagliente al centro
- materiale fino a circa 1200 N/mm²



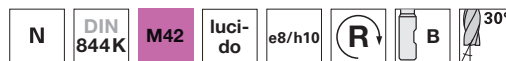
d1 mm	Tolleranza d1	d2 mm	l1 mm	l2 mm	Z	Codice
1,000	h10	6,000	47,000	2,000	2	1,000
1,500	h10	6,000	47,000	3,000	2	1,500
2,000	e8	6,000	48,000	4,000	2	2,000
2,500	e8	6,000	49,000	5,000	2	2,500
3,000	e8	6,000	49,000	5,000	2	3,000
3,500	h10	6,000	50,000	6,000	2	3,500
4,000	e8	6,000	51,000	7,000	2	4,000
4,500	h10	6,000	51,000	7,000	2	4,500
5,000	e8	6,000	52,000	8,000	2	5,000
5,500	h10	6,000	52,000	8,000	2	5,500
6,000	e8	6,000	52,000	8,000	2	6,000
7,000	e8	10,000	60,000	10,000	2	7,000
8,000	e8	10,000	61,000	11,000	2	8,000
9,000	h10	10,000	61,000	11,000	2	9,000
10,000	e8	10,000	63,000	13,000	2	10,000
12,000	e8	12,000	73,000	16,000	2	12,000
14,000	e8	12,000	73,000	16,000	2	14,000
16,000	e8	16,000	79,000	19,000	2	16,000
18,000	e8	16,000	79,000	19,000	2	18,000
20,000	e8	20,000	88,000	22,000	2	20,000

Frese per acciaio ad alta velocità

Frese frontali (a 2 taglienti)



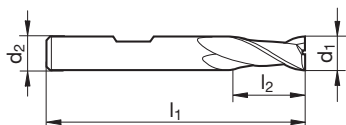
Catalogo n° 74243



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 580

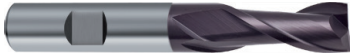
- tagliente al centro
- materiale fino a circa 1200 N/mm²



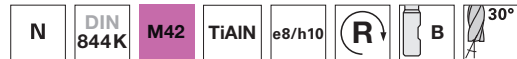
d1 mm	Tolleranza d1	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	e8	6,000	52,000	8,000	2	3,000
3,500	h10	6,000	54,000	10,000	2	3,500
4,000	e8	6,000	55,000	11,000	2	4,000
4,500	h10	6,000	55,000	11,000	2	4,500
5,000	e8	6,000	57,000	13,000	2	5,000
5,500	h10	6,000	57,000	13,000	2	5,500
6,000	e8	6,000	57,000	13,000	2	6,000
7,000	e8	10,000	66,000	16,000	2	7,000
8,000	e8	10,000	69,000	19,000	2	8,000
10,000	e8	10,000	72,000	22,000	2	10,000
12,000	e8	12,000	83,000	26,000	2	12,000
14,000	e8	12,000	83,000	26,000	2	14,000
16,000	e8	16,000	92,000	32,000	2	16,000
18,000	e8	16,000	92,000	32,000	2	18,000
20,000	e8	20,000	104,000	38,000	2	20,000

Frese per acciaio ad alta velocità

Frese frontali (a 2 taglienti)



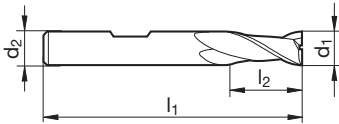
Catalogo n° 64670



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 580

- tagliente al centro
- materiale fino a circa 1200 N/mm²



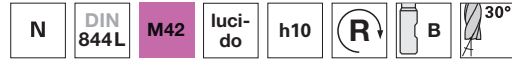
d1 mm	Tolleranza d1	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	e8	6,000	52,000	8,000	2	3,000
4,000	e8	6,000	55,000	11,000	2	4,000
5,000	e8	6,000	57,000	13,000	2	5,000
6,000	e8	6,000	57,000	13,000	2	6,000
8,000	e8	10,000	69,000	19,000	2	8,000
10,000	e8	10,000	72,000	22,000	2	10,000
12,000	e8	12,000	83,000	26,000	2	12,000
16,000	e8	16,000	92,000	32,000	2	16,000
18,000	e8	16,000	92,000	32,000	2	18,000
20,000	e8	20,000	104,000	38,000	2	20,000

Frese per acciaio ad alta velocità

Frese frontali (a 2 taglienti)



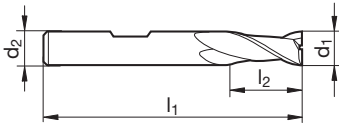
Catalogo n° 74244



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 580

- extra lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm²



d1 mm	Tolleranza d1	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	h10	6,000	56,000	12,000	2	3,000
4,000	h10	6,000	63,000	19,000	2	4,000
5,000	h10	6,000	68,000	24,000	2	5,000
6,000	h10	6,000	68,000	24,000	2	6,000
8,000	h10	10,000	88,000	38,000	2	8,000
10,000	h10	10,000	95,000	45,000	2	10,000
12,000	h10	12,000	110,000	53,000	2	12,000
14,000	h10	12,000	110,000	53,000	2	14,000
16,000	h10	16,000	123,000	63,000	2	16,000
18,000	h10	16,000	123,000	63,000	2	18,000
20,000	h10	20,000	141,000	75,000	2	20,000

Frese per acciaio ad alta velocità

Frese frontali (a 2 taglienti)



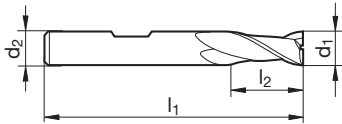
Catalogo n° 64671



P	M	K	N	S	H
•		•			

Parametri di lav.
ind. a pag. 580

- extra lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm²



d1 mm	Tolleranza d1	d2 mm	l1 mm	l2 mm	Z	Codice
4,000	h10	6,000	63,000	19,000	2	4,000
5,000	h10	6,000	68,000	24,000	2	5,000
6,000	h10	6,000	68,000	24,000	2	6,000
8,000	h10	10,000	88,000	38,000	2	8,000
10,000	h10	10,000	95,000	45,000	2	10,000
12,000	h10	12,000	110,000	53,000	2	12,000
14,000	h10	12,000	110,000	53,000	2	14,000
16,000	h10	16,000	123,000	63,000	2	16,000
18,000	h10	16,000	123,000	63,000	2	18,000
20,000	h10	20,000	141,000	75,000	2	20,000

Frese per acciaio ad alta velocità

Frese frontali (a 3 taglienti)



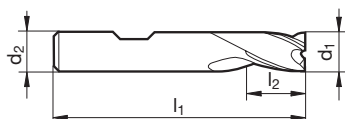
Catalogo n° 74280



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 580

- extra corto
- tagliente al centro
- materiale fino a circa 1200 N/mm²



d1 mm	d1	d2 mm	l1 mm	l2 mm	Z	Codice
2,800	h10	6,000	49,000	5,000	3	2,800
3,000	e8	6,000	49,000	5,000	3	3,000
3,800	h10	6,000	51,000	7,000	3	3,800
4,000	e8	6,000	51,000	7,000	3	4,000
4,800	h10	6,000	52,000	8,000	3	4,800
5,000	e8	6,000	52,000	8,000	3	5,000
5,750	h10	6,000	52,000	8,000	3	5,750
6,000	e8	6,000	52,000	8,000	3	6,000
6,750	h10	10,000	60,000	10,000	3	6,750
7,000	e8	10,000	60,000	10,000	3	7,000
7,750	h10	10,000	61,000	11,000	3	7,750
8,000	e8	10,000	61,000	11,000	3	8,000
9,700	h10	10,000	63,000	13,000	3	9,700
10,000	e8	10,000	63,000	13,000	3	10,000
11,700	h10	12,000	70,000	13,000	3	11,700
12,000	e8	12,000	73,000	16,000	3	12,000
13,700	h10	12,000	73,000	16,000	3	13,700
14,000	e8	12,000	73,000	16,000	3	14,000
15,700	h10	16,000	79,000	19,000	3	15,700
16,000	e8	16,000	79,000	19,000	3	16,000
18,000	e8	16,000	79,000	19,000	3	18,000
20,000	e8	20,000	88,000	22,000	3	20,000
25,000	e8	25,000	102,000	26,000	3	25,000

Frese per acciaio ad alta velocità

Frese frontali (a 3 taglienti)



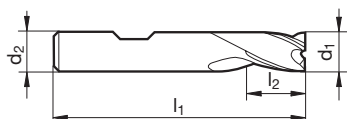
Catalogo n° 64604



P	M	K	N	S	H
●	●	●	○		

Parametri di lav.
ind. a pag. 580

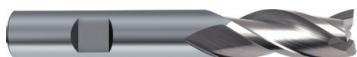
- extra corto
- tagliente al centro
- materiale fino a circa 1200 N/mm²



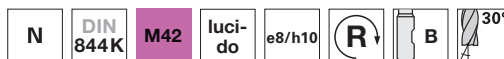
d1 mm	d1	d2 mm	l1 mm	l2 mm	Z	Codice
2,800	h10	6,000	49,000	5,000	3	2,800
3,000	e8	6,000	49,000	5,000	3	3,000
3,800	h10	6,000	51,000	7,000	3	3,800
4,000	e8	6,000	51,000	7,000	3	4,000
4,800	h10	6,000	52,000	8,000	3	4,800
5,000	e8	6,000	52,000	8,000	3	5,000
5,750	h10	6,000	52,000	8,000	3	5,750
6,000	e8	6,000	52,000	8,000	3	6,000
7,000	e8	10,000	60,000	10,000	3	7,000
7,750	h10	10,000	61,000	11,000	3	7,750
8,000	e8	10,000	61,000	11,000	3	8,000
9,700	h10	10,000	63,000	13,000	3	9,700
10,000	e8	10,000	63,000	13,000	3	10,000
11,700	h10	12,000	70,000	13,000	3	11,700
12,000	e8	12,000	73,000	16,000	3	12,000
14,000	e8	12,000	73,000	16,000	3	14,000
16,000	e8	16,000	79,000	19,000	3	16,000
18,000	e8	16,000	79,000	19,000	3	18,000
20,000	e8	20,000	88,000	22,000	3	20,000
25,000	e8	25,000	102,000	26,000	3	25,000

Frese per acciaio ad alta velocità

Frese frontali (a 3 taglienti)



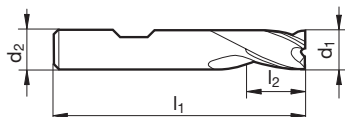
Catalogo n° 74282



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 580

- tagliente al centro
- materiale fino a circa 1200 N/mm²



d1 mm	d1	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	e8	6,000	52,000	8,000	3	3,000
4,000	e8	6,000	55,000	11,000	3	4,000
5,000	e8	6,000	57,000	13,000	3	5,000
5,750	h10	6,000	57,000	13,000	3	5,750
6,000	e8	6,000	57,000	13,000	3	6,000
6,750	h10	10,000	66,000	16,000	3	6,750
7,000	e8	10,000	66,000	16,000	3	7,000
7,750	h10	10,000	69,000	19,000	3	7,750
8,000	e8	10,000	69,000	19,000	3	8,000
9,700	h10	10,000	72,000	22,000	3	9,700
10,000	e8	10,000	72,000	22,000	3	10,000
11,700	h10	12,000	79,000	22,000	3	11,700
12,000	e8	12,000	83,000	26,000	3	12,000
13,700	h10	12,000	83,000	26,000	3	13,700
14,000	e8	12,000	83,000	26,000	3	14,000
15,700	h10	16,000	92,000	32,000	3	15,700
16,000	e8	16,000	92,000	32,000	3	16,000
18,000	e8	16,000	92,000	32,000	3	18,000
20,000	e8	20,000	104,000	38,000	3	20,000

Frese per acciaio ad alta velocità

Frese frontali (a 3 taglienti)



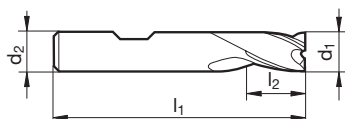
Catalogo n° 64641



P	M	K	N	S	H
●	●	●	○		

Parametri di lav.
ind. a pag. 580

- tagliente al centro
- materiale fino a circa 1200 N/mm²



d1 mm	d1	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	e8	6,000	52,000	8,000	3	3,000
4,000	e8	6,000	55,000	11,000	3	4,000
4,800	h10	6,000	57,000	13,000	3	4,800
5,000	e8	6,000	57,000	13,000	3	5,000
6,000	e8	6,000	57,000	13,000	3	6,000
7,000	e8	10,000	66,000	16,000	3	7,000
8,000	e8	10,000	69,000	19,000	3	8,000
10,000	e8	10,000	72,000	22,000	3	10,000
12,000	e8	12,000	83,000	26,000	3	12,000
14,000	e8	12,000	83,000	26,000	3	14,000
16,000	e8	16,000	92,000	32,000	3	16,000
18,000	e8	16,000	92,000	32,000	3	18,000
20,000	e8	20,000	104,000	38,000	3	20,000

Frese per acciaio ad alta velocità

Frese frontali (a 3 taglienti)



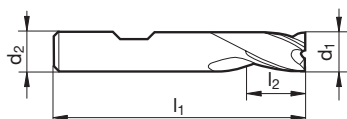
Catalogo n° 54294



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 580

- extra lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm²



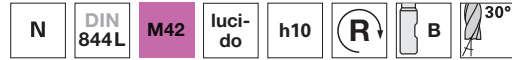
d1 mm	d1	d2 mm	l1 mm	l2 mm	Z	Codice
4,000	e8	6,000	63,000	19,000	3	4,000
5,000	e8	6,000	68,000	24,000	3	5,000
6,000	e8	6,000	68,000	24,000	3	6,000
8,000	e8	10,000	88,000	38,000	3	8,000
10,000	e8	10,000	95,000	45,000	3	10,000
12,000	e8	12,000	110,000	53,000	3	12,000
14,000	e8	12,000	110,000	53,000	3	14,000
16,000	e8	16,000	123,000	63,000	3	16,000
18,000	e8	16,000	123,000	63,000	3	18,000

Frese per acciaio ad alta velocità

Frese frontali (a 3 taglienti)



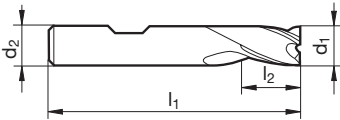
Catalogo n° 74294



P	M	K	N	S	H
•		•	•		

Parametri di lav.
ind. a pag. 580

- extra lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm²



d1 mm	d1	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	h10	6,000	56,000	12,000	3	3,000
4,000	h10	6,000	63,000	19,000	3	4,000
5,000	h10	6,000	68,000	24,000	3	5,000
6,000	h10	6,000	68,000	24,000	3	6,000
8,000	h10	10,000	88,000	38,000	3	8,000
10,000	h10	10,000	95,000	45,000	3	10,000
12,000	h10	12,000	110,000	53,000	3	12,000
14,000	h10	12,000	110,000	53,000	3	14,000
16,000	h10	16,000	123,000	63,000	3	16,000
18,000	h10	16,000	123,000	63,000	3	18,000
20,000	h10	20,000	141,000	75,000	3	20,000

Frese per acciaio ad alta velocità

Mini frese frontali (a 3 taglienti)



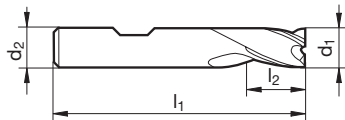
Catalogo n° 54080



P	M	K	N	S	H
○	●	●	●	○	

Parametri di lav.
ind. a pag. 580

- extra corto
- tagliente al centro
- materiale fino a circa 1200 N/mm²



d1 e8 mm	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	6,000	36,000	5,000	3	3,000
4,000	6,000	38,000	7,000	3	4,000
5,000	6,000	39,000	8,000	3	5,000
6,000	6,000	39,000	8,000	3	6,000
8,000	8,000	43,000	11,000	3	8,000
10,000	10,000	50,000	13,000	3	10,000

Frese per acciaio ad alta velocità

Mini frese frontali (a 3 taglienti)



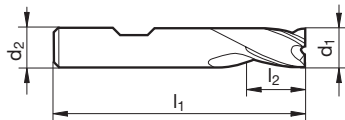
Catalogo n° 54180



P	M	K	N	S	H
○	●	●	●	○	○

Parametri di lav.
ind. a pag. 580

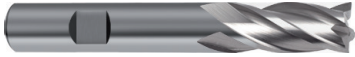
- tagliente al centro
- materiale fino a circa 1200 N/mm²



d1 e8 mm	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	6,000	39,000	8,000	3	3,000
4,000	6,000	42,000	11,000	3	4,000
5,000	6,000	44,000	13,000	3	5,000
6,000	6,000	44,000	13,000	3	6,000
8,000	8,000	51,000	19,000	3	8,000
10,000	10,000	59,000	22,000	3	10,000

Frese per acciaio ad alta velocità

Frese universali, taglienti multipli



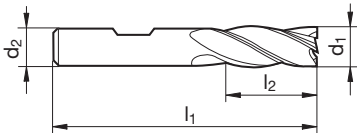
Catalogo n° 74617



P	M	K	N	S	H
●	●	○	○		

Parametri di lav.
ind. a pag. 582

- tagliente al centro
- materiale fino a circa 1200 N/mm²



d1 k10 mm	d2 mm	l1 mm	l2 mm	Z	Codice
2,000	6,000	51,000	7,000	4	2,000
3,000	6,000	52,000	8,000	4	3,000
4,000	6,000	55,000	11,000	4	4,000
5,000	6,000	57,000	13,000	4	5,000
6,000	6,000	57,000	13,000	4	6,000
8,000	10,000	69,000	19,000	4	8,000
9,000	10,000	69,000	19,000	4	9,000
10,000	10,000	72,000	22,000	4	10,000
12,000	12,000	83,000	26,000	4	12,000
14,000	12,000	83,000	26,000	4	14,000
15,000	12,000	83,000	26,000	4	15,000
16,000	16,000	92,000	32,000	4	16,000
18,000	16,000	92,000	32,000	4	18,000
20,000	20,000	104,000	38,000	4	20,000
25,000	25,000	121,000	45,000	5	25,000

Frese per acciaio ad alta velocità

Frese universali, taglienti multipli



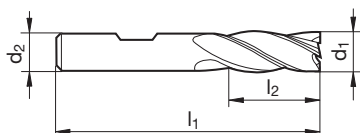
Catalogo n° 64667



P	M	K	N	S	H
•	•	•	○		

Parametri di lav.
ind. a pag. 582

- tagliente al centro
- materiale fino a circa 1200 N/mm²



d1 k10 mm	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	6,000	52,000	8,000	4	3,000
4,000	6,000	55,000	11,000	4	4,000
5,000	6,000	57,000	13,000	4	5,000
6,000	6,000	57,000	13,000	4	6,000
7,000	10,000	66,000	16,000	4	7,000
8,000	10,000	69,000	19,000	4	8,000
9,000	10,000	69,000	19,000	4	9,000
10,000	10,000	72,000	22,000	4	10,000
11,000	12,000	79,000	22,000	4	11,000
12,000	12,000	83,000	26,000	4	12,000
13,000	12,000	83,000	26,000	4	13,000
14,000	12,000	83,000	26,000	4	14,000
15,000	12,000	83,000	26,000	4	15,000
16,000	16,000	92,000	32,000	4	16,000
18,000	16,000	92,000	32,000	4	18,000
20,000	20,000	104,000	38,000	4	20,000
25,000	25,000	121,000	45,000	6	25,000

Frese per acciaio ad alta velocità

Frese universali, taglienti multipli



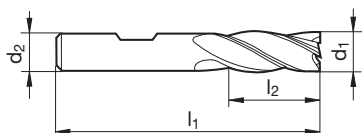
Catalogo n° 74847



P	M	K	N	S	H
●	○	●	○		

Parametri di lav.
ind. a pag. 582

- lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm²



d1 k10 mm	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	6,000	56,000	12,000	4	3,000
4,000	6,000	63,000	19,000	4	4,000
5,000	6,000	68,000	24,000	4	5,000
6,000	6,000	68,000	24,000	4	6,000
7,000	10,000	80,000	30,000	4	7,000
8,000	10,000	88,000	38,000	4	8,000
9,000	10,000	88,000	38,000	4	9,000
10,000	10,000	95,000	45,000	4	10,000
11,000	12,000	102,000	45,000	4	11,000
12,000	12,000	110,000	53,000	4	12,000
14,000	12,000	110,000	53,000	4	14,000
15,000	12,000	110,000	53,000	4	15,000
16,000	16,000	123,000	63,000	4	16,000
18,000	16,000	123,000	63,000	4	18,000
20,000	20,000	141,000	75,000	4	20,000
25,000	25,000	166,000	90,000	5	25,000

Frese per acciaio ad alta velocità

Frese universali, taglienti multipli



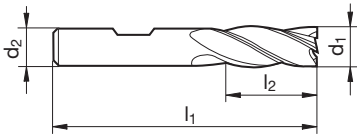
Catalogo n° 54847



P	M	K	N	S	H
•	•	•	○		

Parametri di lav.
ind. a pag. 582

- lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm²



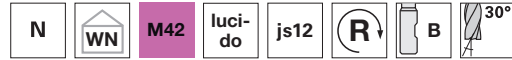
d1 k10 mm	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	6,000	56,000	12,000	4	3,000
4,000	6,000	63,000	19,000	4	4,000
5,000	6,000	68,000	24,000	4	5,000
6,000	6,000	68,000	24,000	4	6,000
7,000	10,000	80,000	30,000	4	7,000
8,000	10,000	88,000	38,000	4	8,000
10,000	10,000	95,000	45,000	4	10,000
12,000	12,000	110,000	53,000	4	12,000
16,000	16,000	123,000	63,000	4	16,000
20,000	20,000	141,000	75,000	4	20,000
25,000	25,000	166,000	90,000	6	25,000
32,000	32,000	186,000	106,000	6	32,000

Frese per acciaio ad alta velocità

Frese frontali (a 4 taglienti)



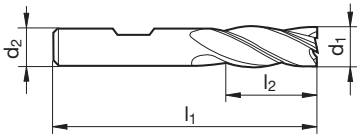
Catalogo n° 74800



P	M	K	N	S	H
●	○				

Parametri di lav.
ind. a pag. 582

- extra lungo
- tagliente al centro
- materiale fino a circa 1000 N/mm²



d1 js12 mm	d2 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	79,000	40,000	4	6,000
8,000	10,000	105,000	56,000	4	8,000
10,000	10,000	112,000	63,000	4	10,000
12,000	12,000	125,000	71,000	4	12,000
14,000	12,000	125,000	71,000	4	14,000
16,000	16,000	141,000	80,000	4	16,000
18,000	16,000	141,000	80,000	4	18,000
20,000	20,000	163,000	100,000	4	20,000

Frese per acciaio ad alta velocità

Frese di semifinitura



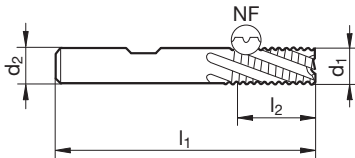
Catalogo n° 54815



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 582

- dentatura zigrinata per sgrossatura fine
- tagliente al centro



d1 k12 mm	d2 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	13,000	4	6,000
8,000	10,000	69,000	19,000	4	8,000
10,000	10,000	72,000	22,000	4	10,000
12,000	12,000	83,000	26,000	4	12,000
14,000	12,000	83,000	26,000	4	14,000
16,000	16,000	92,000	32,000	4	16,000
18,000	16,000	92,000	32,000	4	18,000
20,000	20,000	104,000	38,000	4	20,000
25,000	25,000	121,000	45,000	4	25,000

Frese per acciaio ad alta velocità

Frese a sgrossare (3 taglienti)



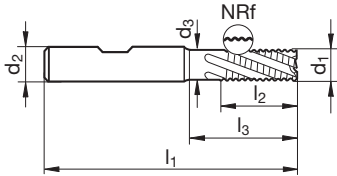
Catalogo n° 74825



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 582

- dentatura zigrinata di sgrossatura fine
- tagliente al centro
- materiali difficilmente asportabili fino a circa 1400 N/mm²



d1 k10 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	13,000	3	6,000
8,000	10,000	69,000	19,000	3	8,000
10,000	10,000	72,000	22,000	3	10,000
12,000	12,000	83,000	26,000	3	12,000
14,000	12,000	83,000	26,000	3	14,000
16,000	16,000	92,000	32,000	3	16,000
18,000	16,000	92,000	32,000	3	18,000
20,000	20,000	104,000	38,000	3	20,000

Frese per acciaio ad alta velocità

Frese a sgrossare (3 taglienti)



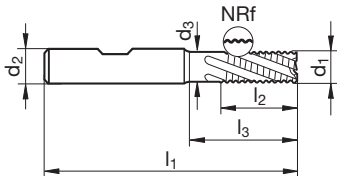
Catalogo n° 54825



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 582

- dentatura zigrinata di sgrossatura fine
- tagliente al centro
- materiali difficilmente asportabili fino a circa 1400 N/mm²



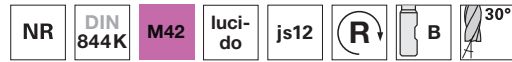
d1 k10 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	13,000	3	6,000
8,000	10,000	69,000	19,000	3	8,000
10,000	10,000	72,000	22,000	3	10,000
12,000	12,000	83,000	26,000	3	12,000
16,000	16,000	92,000	32,000	3	16,000
20,000	20,000	104,000	38,000	3	20,000

Frese per acciaio ad alta velocità

Frese a sgrossare (4 taglienti)



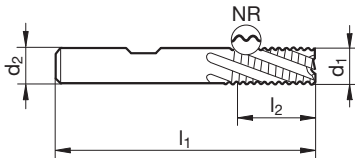
Catalogo n° 74816



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 582

- dentatura grossolana per sgrossatura
- tagliente al centro



d1 js12 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	13,000	4	6,000
7,000	10,000	66,000	16,000	4	7,000
8,000	10,000	69,000	19,000	4	8,000
9,000	10,000	69,000	19,000	4	9,000
10,000	10,000	72,000	22,000	4	10,000
11,000	12,000	79,000	22,000	4	11,000
12,000	12,000	83,000	26,000	4	12,000
14,000	12,000	83,000	26,000	4	14,000
15,000	12,000	83,000	26,000	4	15,000
16,000	16,000	92,000	32,000	4	16,000
18,000	16,000	92,000	32,000	4	18,000
20,000	20,000	104,000	38,000	4	20,000
25,000	25,000	121,000	45,000	4	25,000
28,000	25,000	121,000	45,000	4	28,000
30,000	25,000	121,000	45,000	4	30,000

Frese per acciaio ad alta velocità

Frese a sgrossare (4 taglianti)



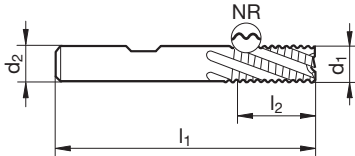
Catalogo n° 54816



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 582

- dentatura grossolana per sgrossatura
- tagliente al centro



d1 k12 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	13,000	4	6,000
8,000	10,000	69,000	19,000	4	8,000
10,000	10,000	72,000	22,000	4	10,000
12,000	12,000	83,000	26,000	4	12,000
14,000	12,000	83,000	26,000	4	14,000
16,000	16,000	92,000	32,000	4	16,000
18,000	16,000	92,000	32,000	4	18,000
20,000	20,000	104,000	38,000	4	20,000
22,000	20,000	104,000	38,000	4	22,000
25,000	25,000	121,000	45,000	4	25,000
28,000	25,000	121,000	45,000	4	28,000
30,000	25,000	121,000	45,000	4	30,000
32,000	32,000	133,000	53,000	4	32,000

Frese per acciaio ad alta velocità

Frese a sgrossare (4 taglienti)



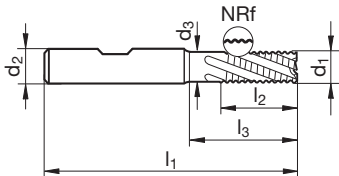
Catalogo n° 74845



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 582

- dentatura zigrinata di sgrossatura fine
- tagliente al centro
- materiali difficilmente asportabili fino a circa 1400 N/mm²



d1 k12 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	13,000	4	6,000
8,000	10,000	69,000	19,000	4	8,000
10,000	10,000	72,000	22,000	4	10,000
12,000	12,000	83,000	26,000	4	12,000
14,000	12,000	83,000	26,000	4	14,000
16,000	16,000	92,000	32,000	4	16,000
18,000	16,000	92,000	32,000	4	18,000
20,000	20,000	104,000	38,000	4	20,000
25,000	25,000	121,000	45,000	5	25,000

Frese per acciaio ad alta velocità

Frese a sgrossare (4 taglienti)



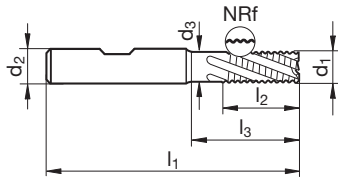
Catalogo n° 54845



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 582

- dentatura zigrinata di sgrossatura fine
- tagliente al centro
- materiali difficilmente asportabili fino a circa 1400 N/mm²



d1 k12 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	13,000	4	6,000
8,000	10,000	69,000	19,000	4	8,000
10,000	10,000	72,000	22,000	4	10,000
12,000	12,000	83,000	26,000	4	12,000
14,000	12,000	83,000	26,000	4	14,000
16,000	16,000	92,000	32,000	4	16,000
18,000	16,000	92,000	32,000	4	18,000
20,000	20,000	104,000	38,000	4	20,000
25,000	25,000	121,000	45,000	5	25,000

Frese per acciaio ad alta velocità

Frese a sgrossare (4 taglienti)



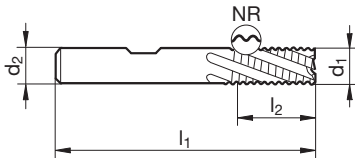
Catalogo n° 74836



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 582

- dentatura grossolana per sgrossatura
- lungo
- tagliente al centro



d1 k12 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	68,000	24,000	4	6,000
8,000	10,000	88,000	38,000	4	8,000
10,000	10,000	95,000	45,000	4	10,000
12,000	12,000	110,000	53,000	4	12,000
16,000	16,000	123,000	63,000	4	16,000
18,000	16,000	123,000	63,000	4	18,000
20,000	20,000	141,000	75,000	4	20,000
25,000	25,000	166,000	90,000	4	25,000

Frese per acciaio ad alta velocità

Frese a sgrossare (4 taglienti)



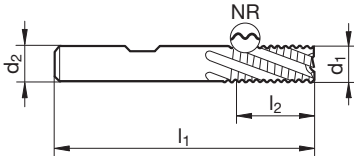
Catalogo n° 54836



P	M	K	N	S	H
•	•	•			

Parametri di lav.
ind. a pag. 582

- dentatura grossolana per sgrossatura
- lungo
- tagliente al centro



d1 k12 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	68,000	24,000	4	6,000
8,000	10,000	88,000	38,000	4	8,000
10,000	10,000	95,000	45,000	4	10,000
12,000	12,000	110,000	53,000	4	12,000
14,000	12,000	110,000	53,000	4	14,000
16,000	16,000	123,000	63,000	4	16,000
18,000	16,000	123,000	63,000	4	18,000
20,000	20,000	141,000	75,000	4	20,000
25,000	25,000	166,000	90,000	4	25,000

Frese per acciaio ad alta velocità

Frese a raggio



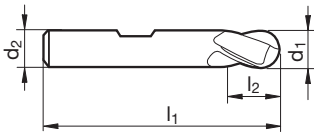
Catalogo n° 54275



P	M	K	N	S	H
•	•	•	•		

Parametri di lav.
ind. a pag. 580

- extra corto
- tagliente al centro
- raggio
- materiale fino a circa 1000 N/mm²



d1 mm	d1	d2 mm	l1 mm	l2 mm	Z	Codice
2,000	e8	6,000	48,000	4,000	2	2,000
3,000	e8	6,000	49,000	5,000	2	3,000
4,000	e8	6,000	51,000	7,000	2	4,000
5,000	e8	6,000	52,000	8,000	2	5,000
6,000	e8	6,000	52,000	8,000	2	6,000
7,000	e8	10,000	60,000	10,000	2	7,000
8,000	e8	10,000	61,000	11,000	2	8,000
10,000	e8	10,000	63,000	13,000	2	10,000
12,000	e8	12,000	73,000	16,000	2	12,000
13,000	h10	12,000	73,000	16,000	2	13,000
14,000	e8	12,000	73,000	16,000	2	14,000
15,000	h10	12,000	73,000	16,000	2	15,000
16,000	e8	16,000	79,000	19,000	2	16,000
20,000	e8	20,000	88,000	22,000	2	20,000

Frese per acciaio ad alta velocità

Frese a raggio



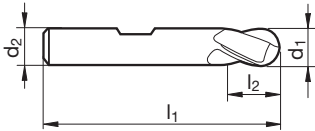
Catalogo n° 54276



P	M	K	N	S	H
•	•	•	•		

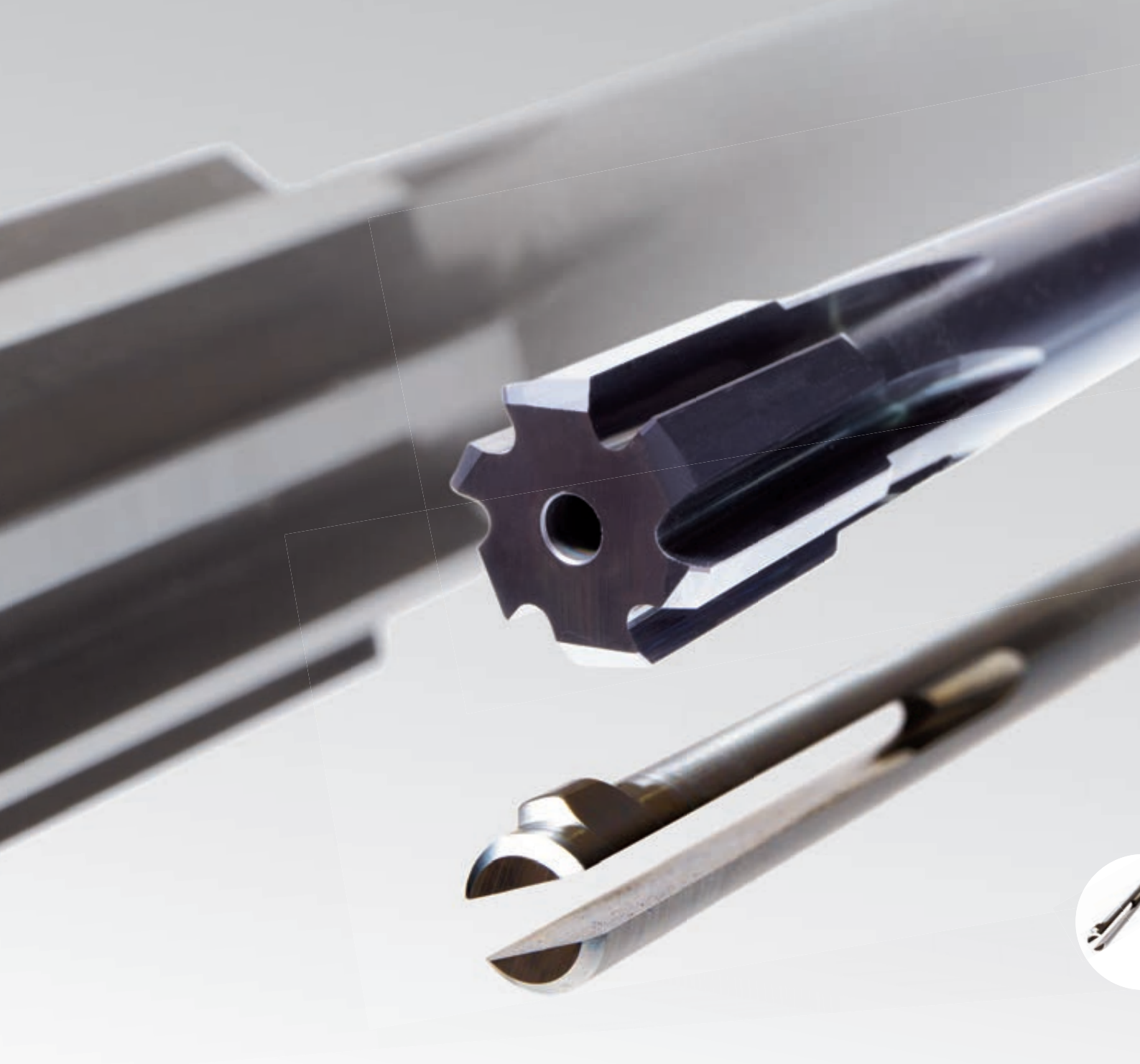
Parametri di lav.
ind. a pag. 580

- tagliente al centro
- raggio
- materiale fino a circa 1000 N/mm²



d1 mm	d1	d2 mm	l1 mm	l2 mm	Z	Codice
3,000	h10	6,000	56,000	8,000	2	3,000
4,000	h10	6,000	63,000	11,000	2	4,000
5,000	h10	6,000	68,000	13,000	2	5,000
6,000	h10	6,000	68,000	13,000	2	6,000
7,000	h10	10,000	80,000	16,000	2	7,000
8,000	h10	10,000	88,000	19,000	2	8,000
10,000	h10	10,000	95,000	22,000	2	10,000
12,000	h10	12,000	110,000	26,000	2	12,000
14,000	h10	12,000	110,000	26,000	2	14,000
16,000	h10	16,000	123,000	32,000	2	16,000
18,000	h10	16,000	123,000	32,000	2	18,000
20,000	h10	20,000	141,000	38,000	2	20,000





UTENSILI PER ALESARE/
SVASARE



CODICI ISO

P	acciaio, acciaio legato in alta percentuale
M	acciaio inossidabile
K	ghisa grigia, ghisa sferoidale e ghisa malleabile
N	alluminio ed altri metalli non ferrosi
S	leghe speciali, superleghe e leghe di titanio
H	acciaio temprato e ghisa temprata

Nelle pagine successive, contenenti programma, trovate per ciascun utensile consigli sull' idoneità in base ai seguenti gruppi di impiego:

- Idoneità ottima
- Idoneità limitata



LEGENDA DEI PITTOGRAMMI

MATERIALE TAGLIANTE	VHM	HM	HSS-E	HSS					
	Int. in metallo duro		Metallo duro						
TRATT. DI SUPERFICIE	luci-do	nitru-rado	tratt. a vapore	AlTiN nano	Al-TiN	TiN			
TOLLERANZA SUL Ø	H7	+0,005	+0,004 +0,005	js9					
ANGOLO DI SVASATURA									
DIREZIONE DI TAGLIO									
	a destra								
FORMA DEL CODOLO									
	Conico Morse								
ANGOLI DELL'ELICA									
NORMA	DIN 9	DIN 206	DIN 208	DIN 212-2	DIN 212-3	DIN 311	DIN 334	DIN 335	DIN 373
	DIN 2179	~DIN 8050	~DIN 8051	~DIN 8093					
	Norma di fabbrica								
TIPO	SuperR-HS-S	SuperR-HS-D	Super AF-60	Super AF-90	Super AF-120	Super AD-90	SuperE-U		
FORMA	A	B	C	D					

P	M	K	N	S	H	Tipo	Direzione di taglio	Forma	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Alesatori ad alto rendimento VHM

	•	•	•	•	•	SuperR-HS-S	destra		Metallo duro	AlTiN nano	Norma di fab.	3,000 - 20,000	72870	694
	•	•	•	•	•	SuperR-HS-D	destra		Metallo duro	AlTiN nano	Norma di fab.	3,000 - 20,000	72871	695
	•	•	•	•	•	SuperR-HS-S	destra	^{1/100}	Metallo duro	AlTiN nano	Norma di fab.	2,970 - 12,030	72872	696
	•	•	•	•	•	SuperR-HS-D	destra	^{1/100}	Metallo duro	AlTiN nano	Norma di fab.	2,970 - 12,030	72873	698

Alesatori a macchina NC

	•	•	•	•	•		destra	B	Metallo duro	lucido	Norma di fab.	0,980 - 12,050	72920	700
	•	•	•	•	•		destra	B	Metallo duro	lucido	Norma di fab.	3,000 - 12,000	72930	702

Alesatori a macchina in MD

	•	•	•	•	•	○	destra	A	Metallo duro	lucido	~DIN 8050	5,000 - 20,000	72868	704
	•	•	•	•	•	○	destra	B	Metallo duro	lucido	~DIN 8050	5,000 - 20,000	72867	705
	•	•	•	•	•	○	destra	A	Metallo duro	lucido	~DIN 8051	10,000 - 30,000	72860	708
	•	•	•	•	•	○	destra	B	Metallo duro	lucido	~DIN 8051	6,000 - 32,000	72859	709
	•	•	•	•	•	○	destra	A	Metallo duro	lucido	~DIN 8093	1,200 - 16,000	72880	706
	•	•	•	•	•	○	destra	B	Metallo duro	lucido	~DIN 8093	1,000 - 16,000	72881	707

P	M	K	N	S	H	Tipo	Direzione di taglio	Forma	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Alesatori a macchina NC

						destra	B	HSS-E	lucido	DIN 212-3	1,000 - 12,030	72900	710
						destra	B	HSS-E	lucido	DIN 212-3	1,500 - 20,000	72910	712

Alesatori a macchina

						destra	A	HSS-E	lucido	DIN 208	8,000 - 35,000	72660	718
						destra	B	HSS-E	lucido	DIN 208	5,000 - 50,000	72670	719
						destra	A	HSS-E	lucido	DIN 212-2	2,200 - 20,000	72640	716
						destra	B	HSS-E	lucido	DIN 212-2	2,200 - 20,000	72650	717
						destra	B	HSS-E	lucido	DIN 212-2	0,980 - 12,000	72654	714

Alesatori a macchina a forte torsione

						destra	C	HSS-E	lucido	DIN 212-2	4,000 - 13,000	72690	720
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Alesatori a macchina per chiodi

						destra		HSS	nitratato	DIN 311	9,500 - 37,000	72680	721
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Alesatori a macchina per spine coniche

						destra		HSS-E	lucido	DIN 2179	2,000 - 12,000	72741	722
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P	M	K	N	S	H	Tipo	Direzione di taglio	Forma	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Alesatori a mano cilindrici, per spine coniche



•	•	•	•	•	•		destra	A	HSS	lucido	DIN 9	1,000 - 16,000	72730	723
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Alesatori a mano



•	•	•	•	•	•		destra	A	HSS	lucido	DIN 206	2,500 - 34,000	72600	724
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•	•	•	•	•	•		destra	B	HSS	lucido	DIN 206	2,000 - 35,000	72610	725
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Svasatori 60°



•	•	•	•	•	•	•	destra	C	HSS	TiN	DIN 334	6,300 - 25,000	62327	727
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•	•	•	•	•	•	•	destra	C	HSS	lucido	DIN 334	6,300 - 25,000	72326	726
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Svasatori 90°



•	•	•	•	•	•	•	destra	A	HSS	trattati a vapore	DIN 335	8,000 - 20,000	72345	731
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•	•	•	•	•	•	•	destra	C	HSS	TiN	DIN 335	4,300 - 31,000	62347	729
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•	•	•	•	•	•	•	destra	C	HSS	lucido	DIN 335	4,300 - 31,000	72346	728
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•	•	•	•	•	•	•	destra	D	HSS	lucido	DIN 335	15,000 - 80,000	72356	730
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P	M	K	N	S	H	Tipo	Direzione di taglio	Forma	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Assortimenti di svasatori cilindrici a 90°



●	○	●	○	○		destra	C	HSS	TiN	DIN 335			62399	733
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●	○	●	○	○		destra	C	HSS	lucido	DIN 335			72399	732
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Frese per sedi viti con guide, esecuzione fine



●	○	●	○	○		destra		HSS	lucido	DIN 373	6,000 - 20,000		72304	734
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Frese per sedi viti con guide, esecuzione media



●	○	●	○	○		destra		HSS	lucido	DIN 373	6,000 - 18,000		72305	735
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Fresa frontali a 60° per sbavatura



●	●	●	●	●		SuperAF-60	destra	Metallo duro	AlTiN	Norma di fab.	4,000 - 12,000		53393	736
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●	●	●	●	●		SuperAF-60	destra	Metallo duro	AlTiN	Norma di fab.	6,000 - 12,000		53394	737
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Fresa frontali a 90° per sbavatura



●	●	●	●	●		SuperAF-90	destra	Metallo duro	AlTiN	Norma di fab.	4,000 - 12,000		53395	738
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P	M	K	N	S	H	Tipo	Direzione di taglio	Forma	Materiale tagliente	Superficie	Norma	d1/mm	Catalogo n°	Pagina
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Fresa frontali a 90° per sbavatura



•	•	•	•	•		SuperAF-90	destra		Metallo duro	AlTiN	Norma di fab.	4,000 - 12,000	53396	739
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Fresa frontali a 120° per sbavatura



•	•	•	•	•		Super-AF-120	destra		Metallo duro	AlTiN	Norma di fab.	4,000 - 12,000	53397	740
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•	•	•	•	•		Super-AF-120	destra		Metallo duro	AlTiN	Norma di fab.	6,000 - 12,000	53398	741
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Sbavatori a 90° ad avanzamento ed estrazione



•	•	•	•	•		SuperAD-90	destra		Metallo duro	AlTiN nano	Norma di fab.	3,000 - 12,000	52365	742
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Utensili sbavatori



•	•	•	○	•		SuperE-U	destra		Metallo duro	lucido	Norma di fab.		52360	743
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Parametri di lavoro indicativi per utensili per alesare

Serie d'avanzamento								
Codice lettera	E	F	G	H	I	J		
Ø utensile mm	3,15	0,080	0,100	0,125	0,300	0,500	0,800	Avanzamento f (mm/giro)
	4,00	0,100	0,125	0,160	0,300	0,500	1,000	
	5,00	0,100	0,125	0,160	0,400	0,600	1,000	
	6,30	0,125	0,160	0,200	0,400	0,700	1,200	
	8,00	0,160	0,200	0,250	0,600	1,000	1,800	
	10,00	0,200	0,250	0,315	0,600	1,200	1,800	
	12,50	0,200	0,250	0,315	0,800	1,200	2,000	
	16,00	0,250	0,315	0,400	0,800	1,400	2,200	
	20,00	0,315	0,400	0,500	0,800	1,400	2,200	

Le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

Diametro	Sottomisure (valori indicativi)
< 6 mm	0,1 - 0,2 mm
< 10 mm	0,2 mm
< 16 mm	0,2 - 0,3 mm
< 25 mm	0,3 - 0,4 mm
> 25 mm	0,4 mm

Impiego del refrigerante:

- olio da taglio attivo, lubrificanti con additivi che reagiscono chimicamente causando uno speciale strato adesivo e abrasivo riducendo il film del lubrificante
- emulsione
- senza lubrificante
- solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input checked="" type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input checked="" type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input checked="" type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Alesatori SuperR-HS

Catalogo n°	72870	72871
Mat. da taglio	M.D./K10	
Superficie	AlTiN nano	
Norma	Stock std.	
Forma		
a pagina	694	695

72872	72873
M.D./K10	
AlTiN nano	
Stock std.	
696	698

Alesatori NC

72920	72930
M.D./K10	
lucida	lucida
Stock std.	
B	B
700	702

Alesatori a macchina

72868	72867	72860	72859	72880	72881
M.D./K10					
lucida	lucida	lucida	lucida	lucida	lucida
8050	8050	8051	8051	8093	8093
A	B	A	B	A	B
704	705	708	709	706	707



v_c m/min	Codice d'avanz.		v_c m/min	Codice d'avanz.		v_c m/min	Codice d'avanz.		v_c m/min	Codice d'avanz.							
185	I-J	I-J	185	I-J	I-J	18	F	F	18	F	F	F	F	F	F	F	F
185	I-J	I-J	185	I-J	I-J	16	F	F	16	F	F	F	F	F	F	F	F
185	I-J	I-J	185	I-J	I-J	18	F	F	18	F	F	F	F	F	F	F	F
185	I-J	I-J	185	I-J	I-J	16	F	F	16	F	F	F	F	F	F	F	F
185	I-J	I-J	185	I-J	I-J	18	E	E	18	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	16	F	F	16	F	F	F	F	F	F	F	F
185	I-J	I-J	185	I-J	I-J	14	E	E	14	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	14	E	E	14	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	12	E	E	12	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	18	E	E	18	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	14	E	E	14	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	12	E	E	12	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	14	E	E	14	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	12	E	E	12	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	12	E	E	12	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	10	E	E	10	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	10	E	E	10	E	E	E	E	E	E	E	E
90	I-J	I-J	90	I-J	I-J												
45	G-H	G-H	45	G-H	G-H												
50	G-H	G-H	50	G-H	G-H												
45	G-H	G-H	45	G-H	G-H												
90	H-I	H-I	90	H-I	H-I	8	E	E	8	E	E	E	E	E	E	E	E
60	H-I	H-I	60	H-I	H-I	6	E	E	6	E	E	E	E	E	E	E	E
90	H-I	H-I	90	H-I	H-I	6	E	E	6	E	E	E	E	E	E	E	E
100	I-J	I-J	100	I-J	I-J	20	E	E	20	E	E	E	E	E	E	E	E
100	I-J	I-J	100	I-J	I-J	18	E	E	18	E	E	E	E	E	E	E	E
185	I-J	I-J	185	I-J	I-J	20	E	E	20	E	E	E	E	E	E	E	E
90	I-J	I-J	90	I-J	I-J	18	E	E	18	E	E	E	E	E	E	E	E
40	H-I	H-I	40	H-I	H-I												
80	I-J	I-J	80	I-J	I-J	16	E	E	16	E	E	E	E	E	E	E	E
80	I-J	I-J	80	I-J	I-J	16	E	E	16	E	E	E	E	E	E	E	E
80	I-J	I-J	80	I-J	I-J												
80	I-J	I-J	80	I-J	I-J												
50	G-H	G-H	50	G-H	G-H												
60	H-I	H-I	60	H-I	H-I	10	E	E	10	E	E	E	E	E	E	E	E
60	H-I	H-I	60	H-I	H-I	10	E	E	10	E	E	E	E	E	E	E	E
						30	G	G	30	G	G	G	G	G	G	G	G
						30	G	G	30	G	G	G	G	G	G	G	G
						40	F	F	40	F	F	F	F	F	F	F	F
						30	F	F	30	F	F	F	F	F	F	F	F
120	I-J	I-J	120	I-J	I-J	25	F	F	25	F	F	F	F	F	F	F	F
						25	F	F	25	F	F	F	F	F	F	F	F
175	I-J	I-J	175	I-J	I-J	35	F	F	35	F	F	F	F	F	F	F	F
						30	F	F	30	F	F	F	F	F	F	F	F
175	I-J	I-J	175	I-J	I-J	35	F	F	35	F	F	F	F	F	F	F	F
175	I-J	I-J	175	I-J	I-J	30	F	F	30	F	F	F	F	F	F	F	F
						30	F	F	30	F	F	F	F	F	F	F	F
						25	F	F	25	F	F	F	F	F	F	F	F
140	I-J	I-J	140	I-J	I-J	20	G	G	20	G	G	G	G	G	G	G	G
140	I-J	I-J	140	I-J	I-J	20	G	G	20	G	G	G	G	G	G	G	G
80	E	E	80	E	E												
80	E	E	80	E	E												

Parametri di lavoro indicativi per utensili per alesare

Serie d'avanzamento								
Codice lettera	E	F	G	H	I	J		
Ø utensile mm	3,15	0,080	0,100	0,125	0,300	0,500	0,800	Avanzamento f (mm/giro)
	4,00	0,100	0,125	0,160	0,300	0,500	1,000	
	5,00	0,100	0,125	0,160	0,400	0,600	1,000	
	6,30	0,125	0,160	0,200	0,400	0,700	1,200	
	8,00	0,160	0,200	0,250	0,600	1,000	1,800	
	10,00	0,200	0,250	0,315	0,600	1,200	1,800	
	12,50	0,200	0,250	0,315	0,800	1,200	2,000	
	16,00	0,250	0,315	0,400	0,800	1,400	2,200	
	20,00	0,315	0,400	0,500	0,800	1,400	2,200	

Le lettere d'identificazione d'avanzamento stampate in grassetto, sono da utilizzarsi principalmente per i gruppi di materiale corrispondenti.

Diametro	Sottomisura (valori indicativi)
< 6 mm	0,1 - 0,2 mm
< 10 mm	0,2 mm
< 16 mm	0,2 - 0,3 mm
< 25 mm	0,3 - 0,4 mm
> 25 mm	0,4 mm

Impiego del refrigerante:

olio da taglio attivo, lubrificanti con additivi che reagiscono chimicamente causando uno speciale strato adesivo e abrasivo riducendo il film del lubrificante

emulsione

senza lubrificante

solo refrigerazione ad aria

Gruppo materiale	Esempi materiale, nuova denominazione (tra parentesi vecchia denominazione) Cifre in grassetto = materiale secondo DIN EN	Resist. a trazione MPa (N/mm ²)	Durezza	Refrigerante
Acciai da costruzione generici	1.0035 S185(St33), 1.0486 P275N(StE285), 1.0345 P235GH(H1), 1.0425 P265GH(H2) 1.0050 E295 (St50-2), 1.0070 E360 (St70-2), 1.8937 P500NH (WStE500)	≤500 >500-850		<input checked="" type="checkbox"/>
Acciai automatici	1.0718 11SMnPb30 (9SMnPb28), 1.0736 11SMn37 (9SMn36) 1.0727 46S20 (45S20), 1.0728 (60S20), 1.0757 46SPb20 (45SPb20)	≤850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica non legati	1.0402 C22, 1.1178 C30E (Ck30) 1.0503 C45, 1.1191 C45E (Ck45) 1.0601 C60, 1.1221 C60E (Ck60)	≤ 700 700-850 850-1000		<input checked="" type="checkbox"/>
Acciai da bonifica legati	1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da cementazione non legati	1.0301 (C10), 1.1121 C10E (Ck10)	≤750		<input checked="" type="checkbox"/>
Acciai da cementazione legati	1.7043 38Cr4 1.5752 15NiCr13 (15NiCr13), 1.7131 16MnCr5, 1.7264 20CrMo5	850-≤1000 1000-1200		<input checked="" type="checkbox"/>
Acciai da nitrurazione	1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	≥850-≤1000 >1000-1200		<input checked="" type="checkbox"/>
Acciai da utensile	1.1750 C75W, 1.2067 102Cr6, 1.2307 29CrMoV9 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2767 X45NiCrMo4	≤850 >850-1000		<input checked="" type="checkbox"/>
Acciai rapidi	1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3	≥650-1000		<input checked="" type="checkbox"/>
Acciai per molle	1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 (51CrV4)		≤330 HB	<input checked="" type="checkbox"/>
Acciai temprati	-		≤40-48 HRC >48-60 HRC	<input checked="" type="checkbox"/>
Acciai inossidabili, solforati austenitici martensitisch	1.4005 X12CrS13, 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X8CrNiS18-9 1.4301 X5CrNi18-10 (V2A), 1.4541 X6CrNiTi18-10, 1.4571 X6CrNiMoTi 17-12-2 (V4A) 1.4057 X20CrNi 17 2 (X17CrNi16-2), 1.4122 X39CrMo17-1, 1.4521 X2CrMoTi18-2	≤850 ≤850 ≤850		<input checked="" type="checkbox"/>
Ghisa	0.6010 EN-GJL-100(GG10), 0.6020 EN-GJL-200(GG20) 0.6025 EN-GJL-250(GG25), 0.6035 EN-GJL-350(GG35)	850-≤1000 1000-1200		<input type="checkbox"/>
Ghisa sferoidale e temprata	0.7050 EN-GJS-500-7(GGG50), 0.8035 EN-GJMW-350-4(GTW35) 0.7070 EN-GJS-700-2(GGG70), 0.8170 EN-GJMB-700-2(GTS70)		≤240 HB <300 HB	<input checked="" type="checkbox"/>
Ghisa dura	-		≤350 HB	<input checked="" type="checkbox"/>
Nuova ghisa GGV	EN-GJV250 (GGV25), EN-GJV350 (GGV35) EN-GJV400 (GGV40), EN-GJV500 (GGV50), SiMo6			<input type="checkbox"/>
Nuova ghisa ADI	EN-GJS-800-8 (ADI800), EN-GJS-1000-5 (ADI1000) EN-GJS-1200-2 (ADI1200), EN-GJS-1400-1 (ADI1400)	800-1000 1200-1400		<input type="checkbox"/>
Leghe speciali	Nimonic, Inconel, Monel, Hastelloy	≤1200		<input checked="" type="checkbox"/>
Titanio e sue leghe	3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7165 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5, - TiAl8Mo1V1	≤850 >850-1200		<input checked="" type="checkbox"/>
Alluminio e sue leghe	3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1	≤400		<input checked="" type="checkbox"/>
Leghe di alluminio per lavorazione plastica	3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5	≤450		<input checked="" type="checkbox"/>
Leghe ghisa alluminio ≤ 10 % Si	3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	≤600 ≤600		<input checked="" type="checkbox"/>
Leghe al magnesio	3.5200 MgMn2, 3.5812.05 G-MgAl8Zn1, 3.5612.05 G-MgAl6Zn1	≤450		<input type="checkbox"/>
Rame basso legato	2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb	≤400		<input checked="" type="checkbox"/>
Ottone, a truciolo corto a truciolo lungo	2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0,5	≤600 ≤600		<input checked="" type="checkbox"/>
Bronzi a truciolo corto	2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0790 CuNi18Zn19Pb	≤600 >600-850		<input checked="" type="checkbox"/>
Bronzi a truciolo lungo	2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 2.0980 CuAl11Ni, 2.1247 CuBe2	≤850 >850-1000		<input checked="" type="checkbox"/>
Mat. plastiche termoindurenti	Resina epossidica, Resopal, Pertinax, Moltopren		-	<input type="checkbox"/>
Materie termoplastiche	Plexiglas, Hostalen, Novodur, Makralon		-	<input type="checkbox"/>
Mat. plast. a fibre aramidiche	Kevlar		-	<input type="checkbox"/>
a fibre di vetro/C rinforzate	GFK/CFK		-	<input type="checkbox"/>

Alesatori per chiodi

Alesatori a macchina NC

Alesatori per spine coniche

Alesatori a macchina

Alesatori a forte torsione

Catalogo n°	72680
Mat. da taglio	HSS
Superficie	nitrurata
Norma	311
Forma	
a pagina	721

	72900	72910
	HSS-E	
	lucida	lucida
	Stock std.	
	B	B
	710	712

	72741
	HSS-E
	lucida
	2179
	722

	72640	72654	72650	72660	72670
	HSS-E				
	lucida	lucida	lucida	lucida	lucida
	212	212	212	208	208
	A	B	B	A	B
	716	714	717	718	719

	72690
	HSS-E
	lucida
	212
	720



v _c m/min	Codice d'avanz.
14	F
12	F
10	F
10	E
8	E
6	E
12	F
6	E
8	E
12	E
8	E
5	E
4	E
12	E
12	E
10	E
4	E
3	E
18	G
18	G
18	G
18	G
16	F
16	F
20	E
16	F
14	F
10	F

v _c m/min	Codice d'avanz.	
16	F	F
12	F	F
12	F	F
10	E	E
14	F	F
12	E	E
10	E	E
10	E	E
8	E	E
16	F	F
10	E	E
8	E	E
10	E	E
8	E	E
14	F	F
10	E	E
10	E	E
6	F	F
6	F	F
4	F	F
14	E	E
12	E	E
10	E	E
8	E	E
8	E	E
6	E	E
4	E	E
18	G	G
18	G	G
20	F	F
18	F	F
20	F	F
18	F	F
18	F	F
16	F	F
20	F	F
18	F	F
18	F	F
12	G	G
14	G	G

v _c m/min	Codice d'avanz.
8	F
8	F
8	F
8	E
8	E
8	E
8	E
6	E
6	E
6	E
6	E
6	E
6	E
6	E
6	E
6	E
6	E
8	G
8	G
8	G
8	G
8	F
8	F
8	F
8	F
8	F
8	F

v _c m/min	Codice d'avanz.				
16	F	F	F	F	F
12	F	F	F	F	F
12	F	F	F	F	F
10	E	E	E	E	E
14	F	F	F	F	F
12	E	E	E	E	E
10	E	E	E	E	E
10	E	E	E	E	E
8	E	E	E	E	E
16	F	F	F	F	F
10	E	E	E	E	E
8	E	E	E	E	E
10	E	E	E	E	E
8	E	E	E	E	E
14	F	F	F	F	F
10	E	E	E	E	E
10	E	E	E	E	E
6	F	F	F	F	F
6	F	F	F	F	F
4	F	F	F	F	F
14	E	E	E	E	E
12	E	E	E	E	E
12	E	E	E	E	E
10	E	E	E	E	E
8	E	E	E	E	E
8	E	E	E	E	E
6	E	E	E	E	E
4	E	E	E	E	E
18	G	G	G	G	G
18	G	G	G	G	G
20	F	F	F	F	F
18	F	F	F	F	F
20	F	F	F	F	F
18	F	F	F	F	F
18	F	F	F	F	F
16	F	F	F	F	F
20	F	F	F	F	F
18	F	F	F	F	F
18	F	F	F	F	F
12	G	G	G	G	G
14	G	G	G	G	G

v _c m/min	Codice d'avanz.
16	G
12	G
12	G
14	G
12	G
16	G
10	G
5	E
22	G
22	G
20	G
16	G
18	G
12	G
14	G

Alesatori in metallo duro

Alesatori ad alto rendimento VHM



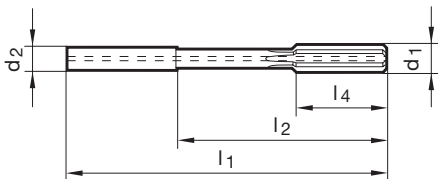
Catalogo n° 72870



P	M	K	N	S	H
•	•	•	•	•	•

Parametri di lav. ind. a pag. 690

- con refrigerazione assiale, per la lavorazione di fori ciechi
- per alti valori di taglio e alta qualità di foratura
- dritto, con divisione estremamente diseguale
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- è possibile un considerevole risparmio nei costi di processo



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
3,000	4,000	68,000	40,000	12,000	4	3,000
3,500	4,000	68,000	40,000	12,000	4	3,500
4,000	4,000	68,000	40,000	12,000	4	4,000
4,500	6,000	76,000	40,000	12,000	4	4,500
5,000	6,000	76,000	40,000	12,000	4	5,000
5,500	6,000	76,000	40,000	12,000	4	5,500
6,000	6,000	76,000	40,000	12,000	4	6,000
6,500	8,000	101,000	65,000	16,000	6	6,500
7,000	8,000	101,000	65,000	16,000	6	7,000
7,500	8,000	101,000	65,000	16,000	6	7,500
8,000	8,000	101,000	65,000	16,000	6	8,000
8,500	10,000	101,000	61,000	19,000	6	8,500
9,000	10,000	101,000	61,000	19,000	6	9,000
9,500	10,000	101,000	61,000	19,000	6	9,500
10,000	10,000	101,000	61,000	19,000	6	10,000
10,500	12,000	130,000	85,000	19,000	6	10,500
11,000	12,000	130,000	85,000	19,000	6	11,000
11,500	12,000	130,000	85,000	19,000	6	11,500
12,000	12,000	130,000	85,000	19,000	6	12,000
13,000	14,000	130,000	85,000	22,000	6	13,000
14,000	14,000	130,000	85,000	22,000	6	14,000
15,000	16,000	150,000	102,000	22,000	6	15,000
16,000	16,000	150,000	102,000	22,000	6	16,000
17,000	18,000	150,000	102,000	25,000	6	17,000
18,000	18,000	150,000	102,000	25,000	6	18,000
19,000	20,000	150,000	100,000	25,000	6	19,000
20,000	20,000	150,000	100,000	25,000	6	20,000

Alesatori in metallo duro

Alesatori ad alto rendimento VHM



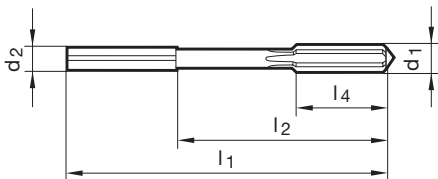
Catalogo n° 72871



P	M	K	N	S	H
•	•	•	•	•	•

Parametri di lav. ind. a pag. 690

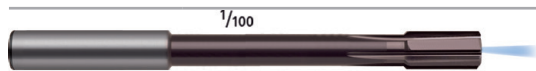
- con scanalature longitudinali sul codolo per alimentazione refrigerante nella lavorazione di fori passanti
- dritto, con divisione estremamente diseguale
- per alti valori di taglio e alta qualità di foratura
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- è possibile un considerevole risparmio nei costi di processo



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
3,000	4,000	68,000	40,000	12,000	4	3,000
3,500	4,000	68,000	40,000	12,000	4	3,500
4,000	4,000	68,000	40,000	12,000	4	4,000
4,500	6,000	76,000	40,000	12,000	4	4,500
5,000	6,000	76,000	40,000	12,000	4	5,000
5,500	6,000	76,000	40,000	12,000	4	5,500
6,000	6,000	76,000	40,000	12,000	4	6,000
6,500	8,000	101,000	65,000	16,000	6	6,500
7,000	8,000	101,000	65,000	16,000	6	7,000
7,500	8,000	101,000	65,000	16,000	6	7,500
8,000	8,000	101,000	65,000	16,000	6	8,000
8,500	10,000	101,000	61,000	19,000	6	8,500
9,000	10,000	101,000	61,000	19,000	6	9,000
9,500	10,000	101,000	61,000	19,000	6	9,500
10,000	10,000	101,000	61,000	19,000	6	10,000
10,500	12,000	130,000	85,000	19,000	6	10,500
11,000	12,000	130,000	85,000	19,000	6	11,000
11,500	12,000	130,000	85,000	19,000	6	11,500
12,000	12,000	130,000	85,000	19,000	6	12,000
13,000	14,000	130,000	85,000	22,000	6	13,000
14,000	14,000	130,000	85,000	22,000	6	14,000
15,000	16,000	150,000	102,000	22,000	6	15,000
16,000	16,000	150,000	102,000	22,000	6	16,000
17,000	18,000	150,000	102,000	25,000	6	17,000
18,000	18,000	150,000	102,000	25,000	6	18,000
19,000	20,000	150,000	100,000	25,000	6	19,000
20,000	20,000	150,000	100,000	25,000	6	20,000

Alesatori in metallo duro

Alesatori ad alto rendimento VHM



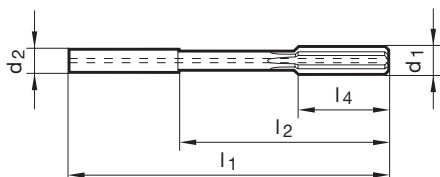
Catalogo n° 72872



P	M	K	N	S	H
•	•	•	•	•	•

Parametri di lav. ind. a pag. 690

- con refrigerazione assiale, per la lavorazione di fori ciechi
- per alti valori di taglio e alta qualità di foratura
- dritto, con divisione estremamente diseguale
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- è possibile un considerevole risparmio nei costi di processo



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
2,970	4,000	68,000	40,000	12,000	4	2,970
2,980	4,000	68,000	40,000	12,000	4	2,980
2,990	4,000	68,000	40,000	12,000	4	2,990
3,000	4,000	68,000	40,000	12,000	4	3,000
3,010	4,000	68,000	40,000	12,000	4	3,010
3,020	4,000	68,000	40,000	12,000	4	3,020
3,030	4,000	68,000	40,000	12,000	4	3,030
3,970	4,000	68,000	40,000	12,000	4	3,970
3,980	4,000	68,000	40,000	12,000	4	3,980
3,990	4,000	68,000	40,000	12,000	4	3,990
4,000	4,000	68,000	40,000	12,000	4	4,000
4,010	4,000	68,000	40,000	12,000	4	4,010
4,020	4,000	68,000	40,000	12,000	4	4,020
4,030	4,000	68,000	40,000	12,000	4	4,030
4,970	6,000	76,000	40,000	12,000	4	4,970
4,980	6,000	76,000	40,000	12,000	4	4,980
4,990	6,000	76,000	40,000	12,000	4	4,990
5,000	6,000	76,000	40,000	12,000	4	5,000
5,010	6,000	76,000	40,000	12,000	4	5,010
5,020	6,000	76,000	40,000	12,000	4	5,020
5,030	6,000	76,000	40,000	12,000	4	5,030
5,970	6,000	76,000	40,000	12,000	4	5,970
5,980	6,000	76,000	40,000	12,000	4	5,980
5,990	6,000	76,000	40,000	12,000	4	5,990
6,000	6,000	76,000	40,000	12,000	4	6,000
6,010	6,000	76,000	40,000	12,000	4	6,010
6,020	6,000	76,000	40,000	12,000	4	6,020
6,030	6,000	76,000	40,000	12,000	4	6,030
7,000	8,000	101,000	65,000	16,000	6	7,000
7,970	8,000	101,000	65,000	16,000	6	7,970
7,980	8,000	101,000	65,000	16,000	6	7,980
7,990	8,000	101,000	65,000	16,000	6	7,990
8,000	8,000	101,000	65,000	16,000	6	8,000
8,010	8,000	101,000	65,000	16,000	6	8,010
8,020	8,000	101,000	65,000	16,000	6	8,020
8,030	8,000	101,000	65,000	16,000	6	8,030
9,000	10,000	101,000	61,000	19,000	6	9,000
9,970	10,000	101,000	61,000	19,000	6	9,970
9,980	10,000	101,000	61,000	19,000	6	9,980
9,990	10,000	101,000	61,000	19,000	6	9,990
10,000	10,000	101,000	61,000	19,000	6	10,000
10,010	10,000	101,000	61,000	19,000	6	10,010
10,020	10,000	101,000	61,000	19,000	6	10,020
10,030	10,000	101,000	61,000	19,000	6	10,030
11,000	12,000	130,000	85,000	19,000	6	11,000
11,970	12,000	130,000	85,000	19,000	6	11,970
11,980	12,000	130,000	85,000	19,000	6	11,980
11,990	12,000	130,000	85,000	19,000	6	11,990

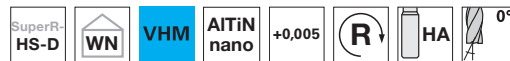
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
12,000	12,000	130,000	85,000	19,000	6	12,000
12,010	12,000	130,000	85,000	19,000	6	12,010
12,020	12,000	130,000	85,000	19,000	6	12,020
12,030	12,000	130,000	85,000	19,000	6	12,030

Alesatori in metallo duro

Alesatori ad alto rendimento VHM



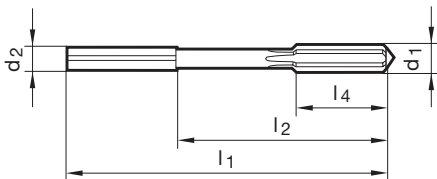
Catalogo n° 72873



P	M	K	N	S	H
•	•	•	•	•	•

Parametri di lav. ind. a pag. 690

- con scanalature longitudinali sul codolo per alimentazione refrigerante nella lavorazione di fori passanti
- dritto, con divisione estremamente diseguale
- per alti valori di taglio e alta qualità di foratura
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- è possibile un considerevole risparmio nei costi di processo

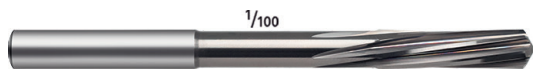


d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
2,970	4,000	68,000	40,000	12,000	4	2,970
2,980	4,000	68,000	40,000	12,000	4	2,980
2,990	4,000	68,000	40,000	12,000	4	2,990
3,000	4,000	68,000	40,000	12,000	4	3,000
3,010	4,000	68,000	40,000	12,000	4	3,010
3,020	4,000	68,000	40,000	12,000	4	3,020
3,030	4,000	68,000	40,000	12,000	4	3,030
3,970	4,000	68,000	40,000	12,000	4	3,970
3,980	4,000	68,000	40,000	12,000	4	3,980
3,990	4,000	68,000	40,000	12,000	4	3,990
4,000	4,000	68,000	40,000	12,000	4	4,000
4,010	4,000	68,000	40,000	12,000	4	4,010
4,020	4,000	68,000	40,000	12,000	4	4,020
4,030	4,000	68,000	40,000	12,000	4	4,030
4,970	6,000	76,000	40,000	12,000	4	4,970
4,980	6,000	76,000	40,000	12,000	4	4,980
4,990	6,000	76,000	40,000	12,000	4	4,990
5,000	6,000	76,000	40,000	12,000	4	5,000
5,010	6,000	76,000	40,000	12,000	4	5,010
5,020	6,000	76,000	40,000	12,000	4	5,020
5,030	6,000	76,000	40,000	12,000	4	5,030
5,970	6,000	76,000	40,000	12,000	4	5,970
5,980	6,000	76,000	40,000	12,000	4	5,980
5,990	6,000	76,000	40,000	12,000	4	5,990
6,000	6,000	76,000	40,000	12,000	4	6,000
6,010	6,000	76,000	40,000	12,000	4	6,010
6,020	6,000	76,000	40,000	12,000	4	6,020
6,030	6,000	76,000	40,000	12,000	4	6,030
7,000	8,000	101,000	65,000	16,000	6	7,000
7,970	8,000	101,000	65,000	16,000	6	7,970
7,980	8,000	101,000	65,000	16,000	6	7,980
7,990	8,000	101,000	65,000	16,000	6	7,990
8,000	8,000	101,000	65,000	16,000	6	8,000
8,010	8,000	101,000	65,000	16,000	6	8,010
8,020	8,000	101,000	65,000	16,000	6	8,020
8,030	8,000	101,000	65,000	16,000	6	8,030
9,000	10,000	101,000	61,000	19,000	6	9,000
9,970	10,000	101,000	61,000	19,000	6	9,970
9,980	10,000	101,000	61,000	19,000	6	9,980
9,990	10,000	101,000	61,000	19,000	6	9,990
10,000	10,000	101,000	61,000	19,000	6	10,000
10,010	10,000	101,000	61,000	19,000	6	10,010
10,020	10,000	101,000	61,000	19,000	6	10,020
10,030	10,000	101,000	61,000	19,000	6	10,030
11,000	12,000	130,000	85,000	19,000	6	11,000
11,970	12,000	130,000	85,000	19,000	6	11,970
11,980	12,000	130,000	85,000	19,000	6	11,980
11,990	12,000	130,000	85,000	19,000	6	11,990

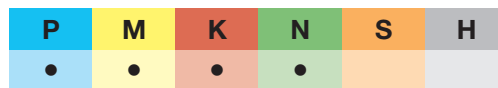
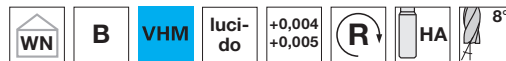
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
12,000	12,000	130,000	85,000	19,000	6	12,000
12,010	12,000	130,000	85,000	19,000	6	12,010
12,020	12,000	130,000	85,000	19,000	6	12,020
12,030	12,000	130,000	85,000	19,000	6	12,030

Alesatori in metallo duro

Alesatori a macchina NC

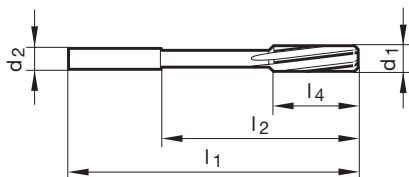


Catalogo n° 72920



Parametri di lav.
ind. a pag. 690

- $\varnothing > 3,75$ con taglienti molto sfalsati
- $\leq \varnothing 5,50$ mm: 0,00/+0,004
- $> \varnothing 5,50$ mm: 0,00/+0,005
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
0,980	4,000	50,000	22,000	6,000	3	0,980
0,990	4,000	50,000	22,000	6,000	3	0,990
1,000	4,000	50,000	22,000	6,000	3	1,000
1,010	4,000	50,000	22,000	6,000	3	1,010
1,020	4,000	50,000	22,000	6,000	3	1,020
1,030	4,000	50,000	22,000	9,000	3	1,030
1,480	4,000	50,000	22,000	9,000	3	1,480
1,490	4,000	50,000	22,000	9,000	3	1,490
1,500	4,000	50,000	22,000	9,000	3	1,500
1,510	4,000	50,000	22,000	9,000	3	1,510
1,520	4,000	50,000	22,000	9,000	3	1,520
1,530	4,000	50,000	22,000	9,000	3	1,530
1,980	4,000	50,000	22,000	12,000	4	1,980
1,990	4,000	50,000	22,000	12,000	4	1,990
2,000	4,000	50,000	22,000	12,000	4	2,000
2,010	4,000	50,000	22,000	12,000	4	2,010
2,020	4,000	50,000	22,000	12,000	4	2,020
2,030	4,000	50,000	22,000	12,000	4	2,030
2,480	4,000	60,000	32,000	16,000	4	2,480
2,490	4,000	60,000	32,000	16,000	4	2,490
2,500	4,000	60,000	32,000	16,000	4	2,500
2,510	4,000	60,000	32,000	16,000	4	2,510
2,520	4,000	60,000	32,000	16,000	4	2,520
2,530	4,000	60,000	32,000	16,000	4	2,530
2,970	4,000	64,000	36,000	17,000	6	2,970
2,980	4,000	64,000	36,000	17,000	6	2,980
2,990	4,000	64,000	36,000	17,000	6	2,990
3,000	4,000	64,000	36,000	17,000	6	3,000
3,010	4,000	64,000	36,000	17,000	6	3,010
3,020	4,000	64,000	36,000	17,000	6	3,020
3,030	4,000	64,000	36,000	17,000	6	3,030
3,970	4,000	77,000	45,000	21,000	6	3,970
3,980	4,000	77,000	45,000	21,000	6	3,980
3,990	4,000	77,000	45,000	21,000	6	3,990
4,000	4,000	77,000	45,000	21,000	6	4,000
4,010	4,000	77,000	45,000	21,000	6	4,010
4,020	4,000	77,000	45,000	21,000	6	4,020
4,030	4,000	77,000	45,000	21,000	6	4,030
4,970	6,000	93,000	59,000	26,000	6	4,970
4,980	6,000	93,000	59,000	26,000	6	4,980
4,990	6,000	93,000	59,000	26,000	6	4,990
5,000	6,000	93,000	59,000	26,000	6	5,000
5,010	6,000	93,000	59,000	26,000	6	5,010
5,020	6,000	93,000	59,000	26,000	6	5,020
5,030	6,000	93,000	59,000	26,000	6	5,030
5,970	6,000	93,000	57,000	26,000	6	5,970
5,980	6,000	93,000	57,000	26,000	6	5,980
5,990	6,000	93,000	57,000	26,000	6	5,990

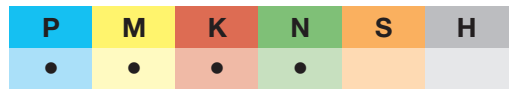
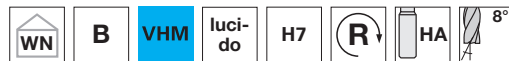
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
6,000	6,000	93,000	57,000	26,000	6	6,000
6,010	6,000	93,000	57,000	26,000	6	6,010
6,020	6,000	93,000	57,000	26,000	6	6,020
6,030	6,000	93,000	57,000	26,000	6	6,030
7,000	8,000	109,000	69,000	31,000	6	7,000
7,970	8,000	117,000	75,000	33,000	6	7,970
7,980	8,000	117,000	75,000	33,000	6	7,980
7,990	8,000	117,000	75,000	33,000	6	7,990
8,000	8,000	117,000	75,000	33,000	6	8,000
8,010	8,000	117,000	75,000	33,000	6	8,010
8,020	8,000	117,000	75,000	33,000	6	8,020
8,030	8,000	117,000	75,000	33,000	6	8,030
8,040	8,000	117,000	75,000	33,000	6	8,040
9,000	10,000	125,000	81,000	36,000	6	9,000
9,970	10,000	133,000	87,000	38,000	6	9,970
9,980	10,000	133,000	87,000	38,000	6	9,980
9,990	10,000	133,000	87,000	38,000	6	9,990
10,000	10,000	133,000	87,000	38,000	6	10,000
10,010	10,000	133,000	87,000	38,000	6	10,010
10,020	10,000	133,000	87,000	38,000	6	10,020
10,030	10,000	133,000	87,000	38,000	6	10,030
10,040	10,000	133,000	87,000	38,000	6	10,040
10,050	10,000	133,000	87,000	38,000	6	10,050
11,970	12,000	151,000	105,000	44,000	6	11,970
11,980	12,000	151,000	105,000	44,000	6	11,980
11,990	12,000	151,000	105,000	44,000	6	11,990
12,000	12,000	151,000	105,000	44,000	6	12,000
12,010	12,000	151,000	105,000	44,000	6	12,010
12,020	12,000	151,000	105,000	44,000	6	12,020
12,030	12,000	151,000	105,000	44,000	6	12,030
12,040	12,000	151,000	105,000	44,000	6	12,040
12,050	12,000	151,000	105,000	44,000	6	12,050

Alesatori in metallo duro

Alesatori a macchina NC

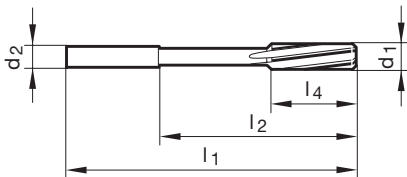


Catalogo n° 72930



Parametri di lav.
ind. a pag. 690

- $\varnothing > 3,75$ con taglienti molto sfalsati
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
3,000	4,000	64,000	36,000	17,000	6	3,000
3,100	4,000	68,000	40,000	18,000	6	3,100
3,200	4,000	68,000	40,000	18,000	6	3,200
3,300	4,000	68,000	40,000	18,000	6	3,300
3,400	4,000	74,000	46,000	20,000	6	3,400
3,500	4,000	74,000	46,000	20,000	6	3,500
3,600	4,000	74,000	46,000	20,000	6	3,600
3,700	4,000	74,000	46,000	20,000	6	3,700
3,800	4,000	77,000	45,000	21,000	6	3,800
3,900	4,000	77,000	45,000	21,000	6	3,900
4,000	4,000	77,000	45,000	21,000	6	4,000
4,100	6,000	82,000	50,000	23,000	6	4,100
4,200	6,000	82,000	50,000	23,000	6	4,200
4,300	6,000	82,000	50,000	23,000	6	4,300
4,400	6,000	82,000	50,000	23,000	6	4,400
4,500	6,000	82,000	50,000	23,000	6	4,500
4,600	6,000	82,000	50,000	23,000	6	4,600
4,700	6,000	82,000	50,000	23,000	6	4,700
4,800	6,000	93,000	59,000	26,000	6	4,800
4,900	6,000	93,000	59,000	26,000	6	4,900
5,000	6,000	93,000	59,000	26,000	6	5,000
5,100	6,000	93,000	59,000	26,000	6	5,100
5,200	6,000	93,000	59,000	26,000	6	5,200
5,300	6,000	93,000	59,000	26,000	6	5,300
5,400	6,000	93,000	57,000	26,000	6	5,400
5,500	6,000	93,000	57,000	26,000	6	5,500
5,600	6,000	93,000	57,000	26,000	6	5,600
5,700	6,000	93,000	57,000	26,000	6	5,700
5,800	6,000	93,000	57,000	26,000	6	5,800
5,900	6,000	93,000	57,000	26,000	6	5,900
6,000	6,000	93,000	57,000	26,000	6	6,000
6,100	8,000	101,000	63,000	28,000	6	6,100
6,200	8,000	101,000	63,000	28,000	6	6,200
6,300	8,000	101,000	63,000	28,000	6	6,300
6,400	8,000	101,000	63,000	28,000	6	6,400
6,500	8,000	101,000	63,000	28,000	6	6,500
6,600	8,000	101,000	63,000	28,000	6	6,600
6,700	8,000	101,000	63,000	28,000	6	6,700
6,800	8,000	109,000	69,000	31,000	6	6,800
6,900	8,000	109,000	69,000	31,000	6	6,900
7,000	8,000	109,000	69,000	31,000	6	7,000
7,100	8,000	109,000	69,000	31,000	6	7,100
7,200	8,000	109,000	69,000	31,000	6	7,200
7,300	8,000	109,000	69,000	31,000	6	7,300
7,400	8,000	109,000	69,000	31,000	6	7,400
7,500	8,000	109,000	69,000	31,000	6	7,500
7,600	8,000	109,000	69,000	31,000	6	7,600
7,700	8,000	117,000	75,000	33,000	6	7,700

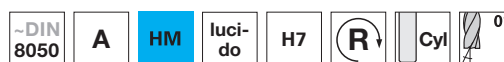
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
7,800	8,000	117,000	75,000	33,000	6	7,800
7,900	8,000	117,000	75,000	33,000	6	7,900
8,000	8,000	117,000	75,000	33,000	6	8,000
8,100	10,000	117,000	75,000	33,000	6	8,100
8,200	10,000	117,000	75,000	33,000	6	8,200
8,300	10,000	117,000	75,000	33,000	6	8,300
8,400	10,000	117,000	75,000	33,000	6	8,400
8,500	10,000	117,000	75,000	33,000	6	8,500
8,600	10,000	117,000	75,000	33,000	6	8,600
8,700	10,000	125,000	81,000	36,000	6	8,700
8,800	10,000	125,000	81,000	36,000	6	8,800
8,900	10,000	125,000	81,000	36,000	6	8,900
9,000	10,000	125,000	81,000	36,000	6	9,000
9,100	10,000	125,000	81,000	36,000	6	9,100
9,200	10,000	125,000	81,000	36,000	6	9,200
9,300	10,000	125,000	81,000	36,000	6	9,300
9,400	10,000	125,000	81,000	36,000	6	9,400
9,500	10,000	125,000	81,000	36,000	6	9,500
9,600	10,000	125,000	81,000	36,000	6	9,600
9,700	10,000	133,000	87,000	38,000	6	9,700
9,800	10,000	133,000	87,000	38,000	6	9,800
9,900	10,000	133,000	87,000	38,000	6	9,900
10,000	10,000	133,000	87,000	38,000	6	10,000
10,100	10,000	133,000	87,000	38,000	6	10,100
10,200	10,000	133,000	87,000	38,000	6	10,200
10,300	10,000	133,000	87,000	38,000	6	10,300
10,400	10,000	133,000	87,000	38,000	6	10,400
10,500	10,000	133,000	87,000	38,000	6	10,500
10,600	10,000	133,000	87,000	38,000	6	10,600
10,700	10,000	142,000	96,000	41,000	6	10,700
10,800	10,000	142,000	96,000	41,000	6	10,800
10,900	10,000	142,000	96,000	41,000	6	10,900
11,000	10,000	142,000	96,000	41,000	6	11,000
11,100	10,000	142,000	96,000	41,000	6	11,100
11,200	10,000	142,000	96,000	41,000	6	11,200
11,300	10,000	142,000	96,000	41,000	6	11,300
11,400	10,000	142,000	96,000	41,000	6	11,400
11,500	10,000	142,000	96,000	41,000	6	11,500
11,600	10,000	142,000	96,000	41,000	6	11,600
11,700	10,000	142,000	96,000	41,000	6	11,700
11,800	10,000	142,000	96,000	41,000	6	11,800
11,900	12,000	151,000	105,000	44,000	6	11,900
12,000	12,000	151,000	105,000	44,000	6	12,000

Alesatori in metallo duro

Alesatori a macchina in MD



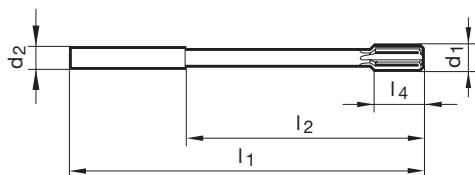
Catalogo n° 72868



P	M	K	N	S	H
•	•	•	•		○

Parametri di lav.
ind. a pag. 690

- > Ø 9,50 mm: taglienti con riporti in MD
- ≤ Ø 9,50 mm: Int. in MD
- ≤ Ø 9,50 mm con centrino su entrambi i lati
- > Ø 9,50 mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1400 N/mm² / 44 HRC



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
5,000	5,000	86,000	52,000	12,000	6	5,000
6,000	5,600	93,000	57,000	12,000	6	6,000
7,000	7,100	109,000	69,000	16,000	6	7,000
8,000	8,000	117,000	75,000	16,000	6	8,000
9,000	9,000	125,000	81,000	19,000	6	9,000
10,000	10,000	133,000	87,000	12,000	6	10,000
12,000	10,000	151,000	105,000	12,000	6	12,000
14,000	12,000	160,000	110,000	16,000	6	14,000
15,000	12,000	162,000	112,000	16,000	6	15,000
16,000	12,000	170,000	120,000	19,000	6	16,000
20,000	16,000	195,000	137,000	19,000	6	20,000

Alesatori in metallo duro

Alesatori a macchina in MD



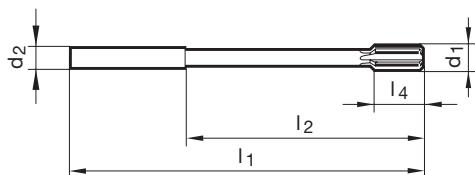
Catalogo n° 72867



P	M	K	N	S	H
•	•	•	•		○

Parametri di lav. ind. a pag. 690

- > Ø 9,50 mm: taglienti con riporti in MD
- ≤ Ø 9,50 mm: Int. in MD
- ≤ Ø 9,50 mm con centrino su entrambi i lati
- > Ø 9,50 mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1400 N/mm² / 44 HRC
- solo per fori passanti



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
5,000	5,000	86,000	52,000	12,000	6	5,000
6,000	5,600	93,000	57,000	12,000	6	6,000
7,000	7,100	109,000	69,000	16,000	6	7,000
8,000	8,000	117,000	75,000	16,000	6	8,000
9,000	9,000	125,000	81,000	19,000	6	9,000
10,000	10,000	133,000	87,000	12,000	6	10,000
11,000	10,000	142,000	96,000	12,000	6	11,000
12,000	10,000	151,000	105,000	12,000	6	12,000
13,000	10,000	151,000	105,000	12,000	6	13,000
14,000	12,000	160,000	110,000	16,000	6	14,000
15,000	12,000	162,000	112,000	16,000	6	15,000
16,000	12,000	170,000	120,000	19,000	6	16,000
18,000	14,000	182,000	130,000	19,000	6	18,000
20,000	16,000	195,000	137,000	19,000	6	20,000

Alesatori in metallo duro

Alesatori a macchina in MD



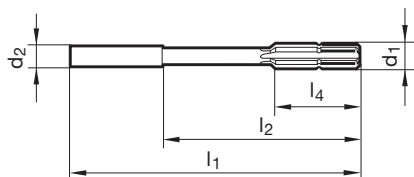
Catalogo n° 72880



P	M	K	N	S	H
•	•	•	•		○

Parametri di lav.
ind. a pag. 690

- $\geq \varnothing 3,0$ mm con taglienti molto sfalsati
- $\leq \varnothing 9,50$ mm: Int. in MD
- $> \varnothing 9,50$ mm: taglienti con riporti in MD
- $\leq \varnothing 9,50$ mm con centrino su entrambi i lati
- $> \varnothing 9,50$ mm con fori di centraggio su entrambi i lati
- shank $\varnothing < 10,0$ mm tolerance h9, shank $\varnothing \geq 10,0$ mm tolerance h6
- per resistenza a trazione fino ad un massimo di 1400 N/mm² / 44 HRC



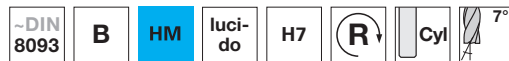
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
1,200	1,200	38,000	16,500	7,500	3	1,200
1,500	1,500	40,000	18,000	8,000	3	1,500
1,600	1,600	43,000	20,000	9,000	3	1,600
2,000	2,000	49,000	24,000	11,000	4	2,000
2,500	2,500	57,000	29,000	14,000	4	2,500
3,000	3,000	61,000	33,000	15,000	6	3,000
4,000	4,000	75,000	43,000	19,000	6	4,000
4,500	4,500	80,000	47,000	21,000	6	4,500
5,000	5,000	86,000	52,000	23,000	6	5,000
6,000	5,600	93,000	57,000	26,000	6	6,000
7,000	7,100	109,000	69,000	31,000	6	7,000
8,000	8,000	117,000	75,000	33,000	6	8,000
9,000	9,000	125,000	81,000	36,000	6	9,000
10,000	10,000	133,000	87,000	38,000	6	10,000
11,000	10,000	142,000	96,000	41,000	6	11,000
12,000	10,000	151,000	105,000	44,000	6	12,000
13,000	10,000	151,000	105,000	44,000	6	13,000
14,000	12,000	160,000	110,000	47,000	6	14,000
16,000	12,000	170,000	120,000	52,000	6	16,000

Alesatori in metallo duro

Alesatori a macchina in MD

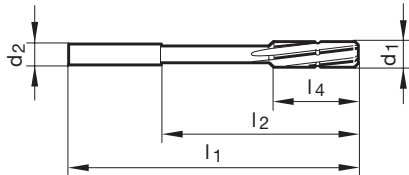


Catalogo n° 72881



P	M	K	N	S	H
•	•	•	•		○

Parametri di lav.
ind. a pag. 690



- $\geq \varnothing 3,0$ mm con taglienti molto sfalsati
- $\leq \varnothing 9,50$ mm: Int. im MD
- $> \varnothing 9,50$ mm: taglienti con riporti in MD
- $\leq \varnothing 9,50$ mm con centrino su entrambi i lati
- $> \varnothing 9,50$ mm con fori di centraggio su entrambi i lati
- shank $\varnothing < 10,0$ mm tolerance h9, shank $\varnothing \geq 10,0$ mm tolerance h6
- per resistenza a trazione fino ad un massimo di 1400 N/mm² / 44 HRC
- solo per fori passanti

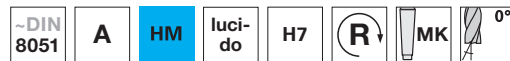
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
1,000	1,000	34,000	15,000	5,500	3	1,000
1,200	1,200	38,000	16,500	7,500	3	1,200
1,500	1,500	40,000	18,000	8,000	3	1,500
2,000	2,000	49,000	24,000	11,000	4	2,000
2,500	2,500	57,000	29,000	14,000	4	2,500
3,000	3,000	61,000	33,000	15,000	6	3,000
3,500	3,500	70,000	42,000	18,000	6	3,500
4,000	4,000	75,000	43,000	19,000	6	4,000
4,500	4,500	80,000	47,000	21,000	6	4,500
5,000	5,000	86,000	52,000	23,000	6	5,000
6,000	5,600	93,000	57,000	26,000	6	6,000
7,000	7,100	109,000	69,000	31,000	6	7,000
8,000	8,000	117,000	75,000	33,000	6	8,000
9,000	9,000	125,000	81,000	36,000	6	9,000
10,000	10,000	133,000	87,000	38,000	6	10,000
11,000	10,000	142,000	96,000	41,000	6	11,000
12,000	10,000	151,000	105,000	44,000	6	12,000
13,000	10,000	151,000	105,000	44,000	6	13,000
14,000	12,000	160,000	110,000	47,000	6	14,000
16,000	12,000	170,000	120,000	52,000	6	16,000

Alesatori in metallo duro

Alesatori a macchina in MD



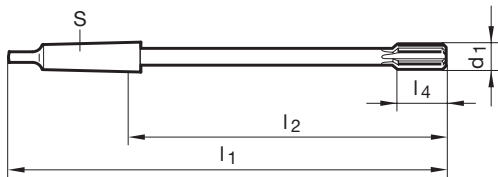
Catalogo n° 72860



P	M	K	N	S	H
•	•	•	•		○

Parametri di lav.
ind. a pag. 690

- $\leq \varnothing 9,50$ mm: Int. in MD
- $> \varnothing 9,50$ mm: taglienti con riporti in MD
- $\leq \varnothing 9,50$ mm lati taglienti con centrino
- codolo con foro di centraggio
- $> \varnothing 9,50$ mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1400 N/mm² / 44 HRC



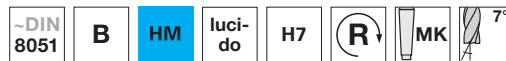
d1 mm	S	l1 mm	l4 mm	l4 mm	Z	Codice
10,000	MK-1	168,000	106,000	12,000	6	10,000
12,000	MK-1	182,000	120,000	12,000	6	12,000
13,000	MK-1	182,000	120,000	12,000	6	13,000
14,000	MK-1	189,000	127,000	16,000	6	14,000
15,000	MK-2	204,000	129,000	16,000	6	15,000
16,000	MK-2	210,000	135,000	19,000	6	16,000
17,000	MK-2	214,000	139,000	19,000	6	17,000
18,000	MK-2	219,000	144,000	19,000	6	18,000
20,000	MK-2	228,000	153,000	19,000	6	20,000
22,000	MK-2	237,000	162,000	22,000	6	22,000
24,000	MK-3	268,000	174,000	22,000	6	24,000
25,000	MK-3	268,000	174,000	22,000	6	25,000
28,000	MK-3	277,000	183,000	25,000	6	28,000
30,000	MK-3	281,000	187,000	25,000	6	30,000

Alesatori in metallo duro

Alesatori a macchina in MD



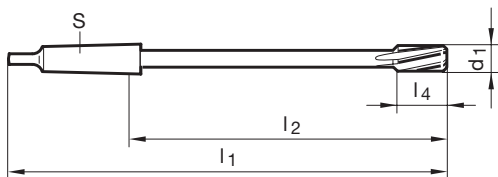
Catalogo n° 72859



P	M	K	N	S	H
•	•	•	•		○

Parametri di lav. ind. a pag. 690

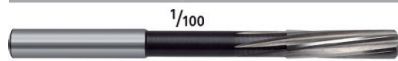
- $\leq \varnothing 9,50$ mm: Int. in MD
- $> \varnothing 9,50$ mm: taglienti con riporti in MD
- $\leq \varnothing 9,50$ mm lati taglienti con centrino
- codolo con foro di centraggio
- $> \varnothing 9,50$ mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1400 N/mm² / 44 HRC



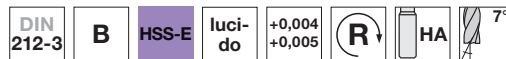
d1 mm	S	l1 mm	l4 mm	l4 mm	Z	Codice
6,000	MK-1	138,000	76,000	12,000	6	6,000
8,000	MK-1	156,000	94,000	16,000	6	8,000
10,000	MK-1	168,000	106,000	12,000	6	10,000
11,000	MK-1	175,000	113,000	12,000	6	11,000
12,000	MK-1	182,000	120,000	12,000	6	12,000
13,000	MK-1	182,000	120,000	12,000	6	13,000
14,000	MK-1	189,000	127,000	16,000	6	14,000
15,000	MK-2	204,000	129,000	16,000	6	15,000
16,000	MK-2	210,000	135,000	19,000	6	16,000
17,000	MK-2	214,000	139,000	19,000	6	17,000
18,000	MK-2	219,000	144,000	19,000	6	18,000
20,000	MK-2	228,000	153,000	19,000	6	20,000
21,000	MK-2	232,000	157,000	22,000	6	21,000
22,000	MK-2	237,000	162,000	22,000	6	22,000
23,000	MK-2	241,000	166,000	22,000	6	23,000
24,000	MK-3	268,000	174,000	22,000	8	24,000
25,000	MK-3	268,000	174,000	22,000	8	25,000
26,000	MK-3	273,000	179,000	22,000	8	26,000
27,000	MK-3	277,000	183,000	25,000	8	27,000
30,000	MK-3	281,000	187,000	25,000	8	30,000
32,000	MK-4	317,000	199,500	25,000	8	32,000

Alesatori in acciaio HSS

Alesatori a macchina NC



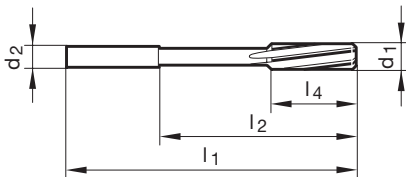
Catalogo n° 72900



P	M	K	N	S	H
●	●	●	●	○	

Parametri di lav. ind. a pag. 692

- > Ø 3,75 mm con fori di centraggio su entrambi i lati
- ≤ Ø 3,75 mm con centrino su entrambi i lati
- ≤ Ø 5,50 mm: 0,00/+0,004
- > Ø 5,50 mm: 0,00/+0,005
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- per resistenza a trazione fino ad un massimo di 1000 N/mm²



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
1,000	1,000	34,000	15,000	5,500	3	1,000
1,010	1,000	34,000	15,000	5,500	3	1,010
1,020	1,000	34,000	15,000	5,500	3	1,020
1,030	1,000	34,000	15,000	5,500	3	1,030
1,500	2,000	40,000	18,000	8,000	3	1,500
1,510	2,000	43,000	20,000	9,000	3	1,510
1,520	2,000	43,000	20,000	9,000	3	1,520
1,530	2,000	43,000	20,000	9,000	3	1,530
1,970	2,000	49,000	24,000	11,000	4	1,970
1,980	2,000	49,000	24,000	11,000	4	1,980
1,990	2,000	49,000	24,000	11,000	4	1,990
2,000	2,000	49,000	24,000	11,000	4	2,000
2,010	2,000	49,000	24,000	11,000	4	2,010
2,020	2,000	49,000	24,000	11,000	4	2,020
2,030	2,000	49,000	24,000	11,000	4	2,030
2,470	3,000	57,000	29,000	14,000	4	2,470
2,480	3,000	57,000	29,000	14,000	4	2,480
2,490	3,000	57,000	29,000	14,000	4	2,490
2,500	3,000	57,000	29,000	14,000	4	2,500
2,510	3,000	57,000	29,000	14,000	4	2,510
2,520	3,000	57,000	29,000	14,000	4	2,520
2,530	3,000	57,000	29,000	14,000	4	2,530
2,970	3,000	61,000	33,000	15,000	6	2,970
2,980	3,000	61,000	33,000	15,000	6	2,980
2,990	3,000	61,000	33,000	15,000	6	2,990
3,000	3,000	61,000	33,000	15,000	6	3,000
3,010	4,000	65,000	37,000	16,000	6	3,010
3,020	4,000	65,000	37,000	16,000	6	3,020
3,030	4,000	65,000	37,000	16,000	6	3,030
3,970	4,000	75,000	47,000	19,000	6	3,970
3,980	4,000	75,000	47,000	19,000	6	3,980
3,990	4,000	75,000	47,000	19,000	6	3,990
4,000	4,000	75,000	47,000	19,000	6	4,000
4,010	4,000	75,000	47,000	19,000	6	4,010
4,020	4,000	75,000	47,000	19,000	6	4,020
4,030	4,000	75,000	47,000	19,000	6	4,030
4,970	5,000	86,000	58,000	23,000	6	4,970
4,980	5,000	86,000	58,000	23,000	6	4,980
4,990	5,000	86,000	58,000	23,000	6	4,990
5,000	5,000	86,000	58,000	23,000	6	5,000
5,010	5,000	86,000	58,000	23,000	6	5,010
5,020	5,000	86,000	58,000	23,000	6	5,020
5,030	5,000	86,000	58,000	23,000	6	5,030
5,970	6,000	93,000	57,000	26,000	6	5,970
5,980	6,000	93,000	57,000	26,000	6	5,980
5,990	6,000	93,000	57,000	26,000	6	5,990
6,000	6,000	93,000	57,000	26,000	6	6,000
6,010	6,000	101,000	65,000	28,000	6	6,010

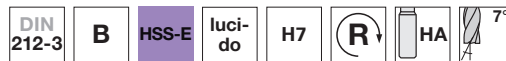
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
6,020	6,000	101,000	65,000	28,000	6	6,020
6,030	6,000	101,000	65,000	28,000	6	6,030
7,970	8,000	117,000	81,000	33,000	6	7,970
7,980	8,000	117,000	81,000	33,000	6	7,980
7,990	8,000	117,000	81,000	33,000	6	7,990
8,000	8,000	117,000	81,000	33,000	6	8,000
8,010	8,000	117,000	81,000	33,000	6	8,010
8,020	8,000	117,000	81,000	33,000	6	8,020
8,030	8,000	117,000	81,000	33,000	6	8,030
9,000	10,000	125,000	85,000	36,000	6	9,000
9,010	10,000	125,000	85,000	36,000	6	9,010
9,020	10,000	125,000	85,000	36,000	6	9,020
9,030	10,000	125,000	85,000	36,000	6	9,030
9,970	10,000	133,000	93,000	38,000	6	9,970
9,980	10,000	133,000	93,000	38,000	6	9,980
9,990	10,000	133,000	93,000	38,000	6	9,990
10,000	10,000	133,000	93,000	38,000	6	10,000
10,010	10,000	133,000	93,000	38,000	6	10,010
10,020	10,000	133,000	93,000	38,000	6	10,020
10,030	10,000	133,000	93,000	38,000	6	10,030
11,970	10,000	151,000	111,000	44,000	6	11,970
11,980	10,000	151,000	111,000	44,000	6	11,980
11,990	10,000	151,000	111,000	44,000	6	11,990
12,000	10,000	151,000	111,000	44,000	6	12,000
12,010	10,000	151,000	111,000	44,000	6	12,010
12,020	10,000	151,000	111,000	44,000	6	12,020
12,030	10,000	151,000	111,000	44,000	6	12,030

Alesatori in acciaio HSS

Alesatori a macchina NC



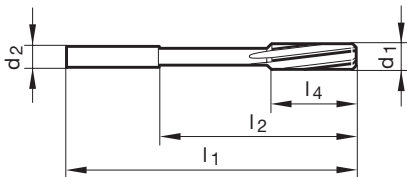
Catalogo n° 72910



P	M	K	N	S	H
•	•	•	•	○	

Parametri di lav.
ind. a pag. 692

- $\leq \varnothing 3,75$ mm con centrino su entrambi i lati
- $> \varnothing 3,75$ mm con fori di centraggio su entrambi i lati
- codolo cilindrico toll. h6 per serraggio in mandrini ad espansione idraulica o mandrini di calettamento
- per resistenza a trazione fino ad un massimo di 1000 N/mm²

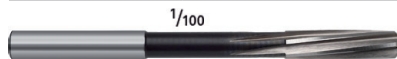


d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
1,500	2,000	40,000	18,000	8,000	3	1,500
1,600	2,000	43,000	20,000	9,000	3	1,600
1,700	2,000	43,000	20,000	9,000	3	1,700
1,800	2,000	46,000	22,000	10,000	4	1,800
1,900	2,000	46,000	22,000	10,000	4	1,900
2,000	2,000	49,000	24,000	11,000	4	2,000
2,100	2,000	49,000	24,000	11,000	4	2,100
2,200	3,000	53,000	25,000	12,000	4	2,200
2,300	3,000	53,000	25,000	12,000	4	2,300
2,400	3,000	57,000	29,000	14,000	4	2,400
2,500	3,000	57,000	29,000	14,000	4	2,500
2,600	3,000	57,000	29,000	14,000	4	2,600
2,700	3,000	61,000	33,000	15,000	6	2,700
2,800	3,000	61,000	33,000	15,000	6	2,800
2,900	3,000	61,000	33,000	15,000	6	2,900
3,000	3,000	61,000	33,000	15,000	6	3,000
3,100	4,000	65,000	37,000	16,000	6	3,100
3,200	4,000	65,000	37,000	16,000	6	3,200
3,300	4,000	65,000	37,000	16,000	6	3,300
3,400	4,000	70,000	42,000	18,000	6	3,400
3,500	4,000	70,000	42,000	18,000	6	3,500
3,600	4,000	70,000	42,000	18,000	6	3,600
3,700	4,000	70,000	42,000	18,000	6	3,700
3,800	4,000	75,000	47,000	19,000	6	3,800
3,900	4,000	75,000	47,000	19,000	6	3,900
4,000	4,000	75,000	47,000	19,000	6	4,000
4,100	4,000	75,000	47,000	19,000	6	4,100
4,200	4,000	75,000	47,000	19,000	6	4,200
4,300	5,000	80,000	52,000	21,000	6	4,300
4,400	5,000	80,000	52,000	21,000	6	4,400
4,500	5,000	80,000	52,000	21,000	6	4,500
4,600	5,000	80,000	52,000	21,000	6	4,600
4,700	5,000	80,000	52,000	21,000	6	4,700
4,800	5,000	86,000	58,000	23,000	6	4,800
4,900	5,000	86,000	58,000	23,000	6	4,900
5,000	5,000	86,000	58,000	23,000	6	5,000
5,100	5,000	86,000	58,000	23,000	6	5,100
5,200	5,000	86,000	58,000	23,000	6	5,200
5,300	5,000	86,000	58,000	23,000	6	5,300
5,400	6,000	93,000	57,000	26,000	6	5,400
5,500	6,000	93,000	57,000	26,000	6	5,500
5,600	6,000	93,000	57,000	26,000	6	5,600
5,700	6,000	93,000	57,000	26,000	6	5,700
5,800	6,000	93,000	57,000	26,000	6	5,800
5,900	6,000	93,000	57,000	26,000	6	5,900
6,000	6,000	93,000	57,000	26,000	6	6,000
6,100	6,000	101,000	65,000	28,000	6	6,100
6,200	6,000	101,000	65,000	28,000	6	6,200

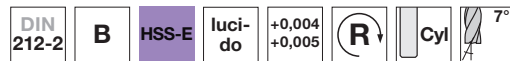
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
6,300	6,000	101,000	65,000	28,000	6	6,300
6,400	6,000	101,000	65,000	28,000	6	6,400
6,500	6,000	101,000	65,000	28,000	6	6,500
6,600	6,000	101,000	65,000	28,000	6	6,600
6,700	6,000	101,000	65,000	28,000	6	6,700
6,800	8,000	109,000	73,000	31,000	6	6,800
6,900	8,000	109,000	73,000	31,000	6	6,900
7,000	8,000	109,000	73,000	31,000	6	7,000
7,100	8,000	109,000	73,000	31,000	6	7,100
7,200	8,000	109,000	73,000	31,000	6	7,200
7,300	8,000	109,000	73,000	31,000	6	7,300
7,400	8,000	109,000	73,000	31,000	6	7,400
7,500	8,000	109,000	73,000	31,000	6	7,500
7,600	8,000	117,000	81,000	33,000	6	7,600
7,700	8,000	117,000	81,000	33,000	6	7,700
7,800	8,000	117,000	81,000	33,000	6	7,800
7,900	8,000	117,000	81,000	33,000	6	7,900
8,000	8,000	117,000	81,000	33,000	6	8,000
8,100	8,000	117,000	81,000	33,000	6	8,100
8,200	8,000	117,000	81,000	33,000	6	8,200
8,300	8,000	117,000	81,000	33,000	6	8,300
8,400	8,000	117,000	81,000	33,000	6	8,400
8,500	8,000	117,000	81,000	33,000	6	8,500
8,600	10,000	125,000	85,000	36,000	6	8,600
8,700	10,000	125,000	85,000	36,000	6	8,700
8,800	10,000	125,000	85,000	36,000	6	8,800
8,900	10,000	125,000	85,000	36,000	6	8,900
9,000	10,000	125,000	85,000	36,000	6	9,000
9,100	10,000	125,000	85,000	36,000	6	9,100
9,200	10,000	125,000	85,000	36,000	6	9,200
9,300	10,000	125,000	85,000	36,000	6	9,300
9,400	10,000	125,000	85,000	36,000	6	9,400
9,500	10,000	125,000	85,000	36,000	6	9,500
9,600	10,000	133,000	93,000	38,000	6	9,600
9,700	10,000	133,000	93,000	38,000	6	9,700
9,800	10,000	133,000	93,000	38,000	6	9,800
9,900	10,000	133,000	93,000	38,000	6	9,900
10,000	10,000	133,000	93,000	38,000	6	10,000
11,000	10,000	142,000	102,000	41,000	6	11,000
12,000	10,000	151,000	111,000	44,000	6	12,000
13,000	10,000	151,000	111,000	44,000	6	13,000
14,000	14,000	160,000	115,000	47,000	8	14,000
15,000	14,000	162,000	117,000	50,000	8	15,000
16,000	14,000	170,000	125,000	52,000	8	16,000
17,000	14,000	175,000	130,000	54,000	8	17,000
18,000	14,000	182,000	137,000	56,000	8	18,000
19,000	16,000	189,000	141,000	58,000	8	19,000
20,000	16,000	195,000	147,000	60,000	8	20,000

Alesatori in acciaio HSS

Alesatori a macchina



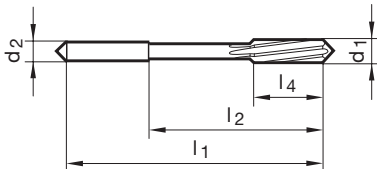
Catalogo n° 72654



P	M	K	N	S	H
●	○	●	●	○	

Parametri di lav. ind. a pag. 692

- per lavorazione in serie su macchine automatiche
- con imbocco corto, $\leq \varnothing 3,75$ mm: 15° , $> \varnothing 3,75$ mm: 45°
- \varnothing in progressione di 0,01 mm
- $\leq \varnothing 3,75$ mm con centrino su entrambi i lati
- $> \varnothing 3,75$ mm con fori di centraggio su entrambi i lati
- tolleranza di costruzione:
 - $\varnothing 0,95 - 5,50$ mm: $0,00/+0,004$
 - $\varnothing 5,51 - 12,05$ mm: $0,00/+0,005$
- per resistenza a trazione fino ad un massimo di 1000 N/mm^2



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
0,980	1,000	34,000	15,000	5,500	3	0,980
0,990	1,000	34,000	15,000	5,500	3	0,990
1,000	1,000	34,000	15,000	5,500	3	1,000
1,010	1,100	34,000	15,000	5,500	3	1,010
1,020	1,100	34,000	15,000	5,500	3	1,020
1,100	1,100	36,000	15,500	6,500	3	1,100
1,200	1,200	38,000	16,500	7,500	3	1,200
1,300	1,300	38,000	16,500	7,500	3	1,300
1,400	1,400	40,000	18,000	8,000	3	1,400
1,480	1,500	40,000	18,000	8,000	3	1,480
1,490	1,500	40,000	18,000	8,000	3	1,490
1,500	1,500	40,000	18,000	8,000	3	1,500
1,510	1,600	43,000	20,000	9,000	3	1,510
1,520	1,600	43,000	20,000	9,000	3	1,520
1,600	1,600	43,000	20,000	9,000	3	1,600
1,700	1,700	43,000	20,000	9,000	3	1,700
1,800	1,800	46,000	22,000	10,000	4	1,800
1,980	2,000	49,000	24,000	11,000	4	1,980
1,990	2,000	49,000	24,000	11,000	4	1,990
2,000	2,000	49,000	24,000	11,000	4	2,000
2,010	2,100	49,000	24,000	11,000	4	2,010
2,030	2,100	49,000	24,000	11,000	4	2,030
2,100	2,000	49,000	24,000	11,000	4	2,100
2,200	2,200	53,000	25,000	12,000	4	2,200
2,300	2,300	53,000	25,000	12,000	4	2,300
2,400	2,500	57,000	29,000	14,000	4	2,400
2,500	2,500	57,000	29,000	14,000	4	2,500
2,600	2,500	57,000	29,000	14,000	4	2,600
2,700	2,800	61,000	33,000	15,000	6	2,700
2,750	2,800	61,000	33,000	15,000	6	2,750
2,800	2,800	61,000	33,000	15,000	6	2,800
2,900	3,000	61,000	33,000	15,000	6	2,900
2,980	3,000	61,000	33,000	15,000	6	2,980
2,990	3,000	61,000	33,000	15,000	6	2,990
3,000	3,000	61,000	33,000	15,000	6	3,000
3,010	3,200	65,000	37,000	16,000	6	3,010
3,020	3,200	65,000	37,000	16,000	6	3,020
3,050	3,200	65,000	37,000	16,000	6	3,050
3,100	3,200	65,000	37,000	16,000	6	3,100
3,200	3,200	65,000	37,000	16,000	6	3,200
3,250	3,200	65,000	37,000	16,000	6	3,250
3,300	3,200	65,000	37,000	16,000	6	3,300
3,400	3,500	70,000	42,000	18,000	6	3,400
3,500	3,500	70,000	42,000	18,000	6	3,500
3,600	3,500	70,000	42,000	18,000	6	3,600
3,700	3,500	70,000	42,000	18,000	6	3,700
3,800	4,000	75,000	47,000	19,000	6	3,800
3,900	4,000	75,000	47,000	19,000	6	3,900

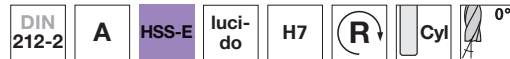
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
3,970	4,000	75,000	47,000	19,000	6	3,970
3,980	4,000	75,000	47,000	19,000	6	3,980
3,990	4,000	75,000	47,000	19,000	6	3,990
4,000	4,000	75,000	47,000	19,000	6	4,000
4,010	4,000	75,000	47,000	19,000	6	4,010
4,020	4,000	75,000	47,000	19,000	6	4,020
4,030	4,000	75,000	47,000	19,000	6	4,030
4,040	4,000	75,000	47,000	19,000	6	4,040
4,100	4,000	75,000	47,000	19,000	6	4,100
4,200	4,000	75,000	47,000	19,000	6	4,200
4,500	4,500	80,000	52,000	21,000	6	4,500
4,800	5,000	86,000	58,000	23,000	6	4,800
4,980	5,000	86,000	58,000	23,000	6	4,980
4,990	5,000	86,000	58,000	23,000	6	4,990
5,000	5,000	86,000	58,000	23,000	6	5,000
5,010	5,000	86,000	58,000	23,000	6	5,010
5,020	5,000	86,000	58,000	23,000	6	5,020
5,030	5,000	86,000	58,000	23,000	6	5,030
5,100	5,000	86,000	58,000	23,000	6	5,100
5,200	5,000	86,000	58,000	23,000	6	5,200
5,500	5,600	93,000	57,000	26,000	6	5,500
5,800	5,600	93,000	57,000	26,000	6	5,800
5,980	5,600	93,000	57,000	26,000	6	5,980
5,990	5,600	93,000	57,000	26,000	6	5,990
6,000	5,600	93,000	57,000	26,000	6	6,000
6,010	6,300	101,000	65,000	28,000	6	6,010
6,020	6,300	101,000	65,000	28,000	6	6,020
6,100	6,300	101,000	65,000	28,000	6	6,100
6,200	6,300	101,000	65,000	28,000	6	6,200
6,350	6,300	101,000	65,000	28,000	6	6,350
6,500	6,300	101,000	65,000	28,000	6	6,500
7,000	7,100	109,000	73,000	31,000	6	7,000
7,010	7,100	109,000	73,000	31,000	6	7,010
7,020	7,100	109,000	73,000	31,000	6	7,020
7,100	7,100	109,000	73,000	31,000	6	7,100
7,500	7,100	109,000	73,000	31,000	6	7,500
7,980	8,000	117,000	81,000	33,000	6	7,980
8,000	8,000	117,000	81,000	33,000	6	8,000
8,010	8,000	117,000	81,000	33,000	6	8,010
8,020	8,000	117,000	81,000	33,000	6	8,020
8,030	8,000	117,000	81,000	33,000	6	8,030
8,050	8,000	117,000	81,000	33,000	6	8,050
8,100	8,000	117,000	81,000	33,000	6	8,100
8,200	8,000	117,000	81,000	33,000	6	8,200
8,500	8,000	117,000	81,000	33,000	6	8,500
8,900	9,000	125,000	85,000	36,000	6	8,900
9,000	9,000	125,000	85,000	36,000	6	9,000
9,010	9,000	125,000	85,000	36,000	6	9,010
9,020	9,000	125,000	85,000	36,000	6	9,020
9,500	9,000	125,000	85,000	36,000	6	9,500
9,980	10,000	133,000	93,000	38,000	6	9,980
10,000	10,000	133,000	93,000	38,000	6	10,000
10,010	10,000	133,000	93,000	38,000	6	10,010
10,020	10,000	133,000	93,000	38,000	6	10,020
10,030	10,000	133,000	93,000	38,000	6	10,030
10,500	10,000	133,000	93,000	38,000	6	10,500
11,000	10,000	142,000	102,000	41,000	6	11,000
11,010	10,000	142,000	102,000	41,000	6	11,010
11,020	10,000	142,000	102,000	41,000	6	11,020
11,500	10,000	142,000	102,000	41,000	6	11,500
12,000	10,000	151,000	111,000	44,000	6	12,000

Alesatori in acciaio HSS

Alesatori a macchina



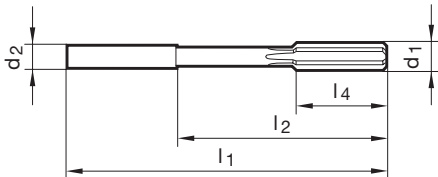
Catalogo n° 72640



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 692

- $\leq \varnothing 3,75$ mm con centrino su entrambi i lati
- $> \varnothing 3,75$ mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1000 N/mm²



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
2,200	2,200	53,000	25,000	12,000	4	2,200
2,800	2,800	61,000	33,000	15,000	6	2,800
3,200	3,200	65,000	37,000	16,000	6	3,200
3,500	3,500	70,000	42,000	18,000	6	3,500
4,000	4,000	75,000	47,000	19,000	6	4,000
4,500	4,500	80,000	52,000	21,000	6	4,500
5,000	5,000	86,000	58,000	23,000	6	5,000
6,000	5,600	93,000	57,000	26,000	6	6,000
7,000	7,100	109,000	73,000	31,000	6	7,000
8,000	8,000	117,000	81,000	33,000	6	8,000
9,000	9,000	125,000	85,000	36,000	6	9,000
10,000	10,000	133,000	93,000	38,000	6	10,000
11,000	10,000	142,000	102,000	41,000	6	11,000
12,000	10,000	151,000	111,000	44,000	6	12,000
13,000	10,000	151,000	111,000	44,000	6	13,000
14,000	12,500	160,000	115,000	47,000	6	14,000
15,000	12,500	162,000	117,000	50,000	6	15,000
16,000	12,500	170,000	125,000	52,000	6	16,000
17,000	14,000	175,000	130,000	54,000	6	17,000
19,000	16,000	189,000	141,000	58,000	6	19,000
20,000	16,000	195,000	147,000	60,000	6	20,000

Alesatori in acciaio HSS

Alesatori a macchina



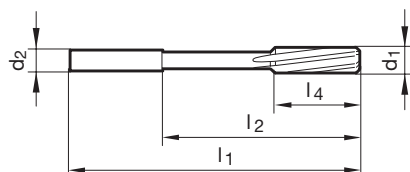
Catalogo n° 72650



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 692

- > Ø 3,75 mm con fori di centraggio su entrambi i lati
- ≤ Ø 3,75 mm con centrino su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1000 N/mm²
- solo per fori passanti



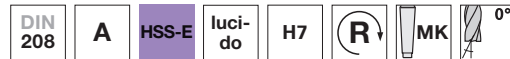
d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
2,200	2,200	53,000	25,000	12,000	6	2,200
2,800	2,800	61,000	33,000	15,000	6	2,800
3,200	3,200	65,000	37,000	16,000	6	3,200
4,000	4,000	75,000	47,000	19,000	6	4,000
4,500	4,500	80,000	52,000	21,000	6	4,500
5,000	5,000	86,000	58,000	23,000	6	5,000
5,500	5,600	93,000	57,000	26,000	6	5,500
6,000	5,600	93,000	57,000	26,000	6	6,000
6,500	6,300	101,000	65,000	28,000	6	6,500
7,000	7,100	109,000	73,000	31,000	6	7,000
8,000	8,000	117,000	81,000	33,000	6	8,000
9,000	9,000	125,000	85,000	36,000	6	9,000
10,000	10,000	133,000	93,000	38,000	6	10,000
11,000	10,000	142,000	102,000	41,000	6	11,000
12,000	10,000	151,000	111,000	44,000	6	12,000
13,000	10,000	151,000	111,000	44,000	6	13,000
14,000	12,500	160,000	115,000	47,000	6	14,000
15,000	12,500	162,000	117,000	50,000	6	15,000
16,000	12,500	170,000	125,000	52,000	6	16,000
17,000	14,000	175,000	130,000	54,000	6	17,000
18,000	14,000	182,000	137,000	56,000	6	18,000
20,000	16,000	195,000	147,000	60,000	6	20,000

Alesatori in acciaio HSS

Alesatori a macchina



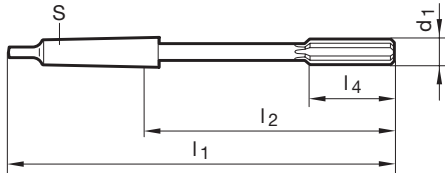
Catalogo n° 72660



P	M	K	N	S	H
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Parametri di lav. ind. a pag. 692

- Ø 3,00 mm lato tagliente con centrino, codolo con foro di centraggio
- ≤ Ø 4,00 mm a norma di fab.
- > Ø 3,00 mm con fori di centraggio su entrambi i lati
- per resistenza a trazione fino ad un massimo di 1000 N/mm²



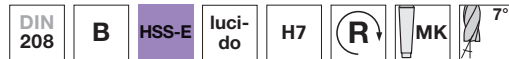
d1 mm	S	l1 mm	l2 mm	l4 mm	Z	Codice
8,000	MK-1	156,000	94,000	33,000	6	8,000
9,000	MK-1	162,000	100,000	36,000	6	9,000
10,000	MK-1	168,000	106,000	38,000	6	10,000
11,000	MK-1	175,000	113,000	41,000	6	11,000
12,000	MK-1	182,000	120,000	44,000	6	12,000
13,000	MK-1	182,000	120,000	44,000	6	13,000
14,000	MK-1	189,000	127,000	47,000	8	14,000
15,000	MK-2	204,000	129,000	50,000	8	15,000
16,000	MK-2	210,000	135,000	52,000	8	16,000
17,000	MK-2	214,000	139,000	54,000	8	17,000
18,000	MK-2	219,000	144,000	56,000	8	18,000
19,000	MK-2	223,000	148,000	58,000	8	19,000
20,000	MK-2	228,000	153,000	60,000	8	20,000
21,000	MK-2	232,000	157,000	62,000	8	21,000
22,000	MK-2	237,000	162,000	64,000	8	22,000
23,000	MK-2	241,000	166,000	66,000	8	23,000
24,000	MK-3	268,000	174,000	68,000	8	24,000
25,000	MK-3	268,000	174,000	68,000	8	25,000
26,000	MK-3	273,000	179,000	70,000	8	26,000
28,000	MK-3	277,000	183,000	71,000	10	28,000
30,000	MK-3	281,000	187,000	73,000	10	30,000
35,000	MK-4	321,000	203,500	78,000	10	35,000

Alesatori in acciaio HSS

Alesatori a macchina



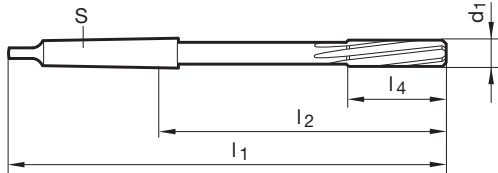
Catalogo n° 72670



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 692

- $\leq \varnothing 4,00$ mm a norma di fab.
- $> \varnothing 3,00$ mm con fori di centraggio su entrambi i lati
- $\varnothing 3,00$ mm lato tagliente con centrino, codolo con foro di centraggio
- per resistenza a trazione fino ad un massimo di 1000 N/mm^2
- solo per fori passanti



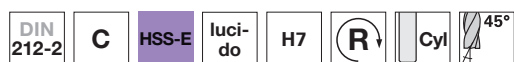
d1 mm	S	l1 mm	l2 mm	l4 mm	Z	Codice
5,000	MK-1	133,000	71,000	23,000	6	5,000
6,000	MK-1	138,000	76,000	26,000	6	6,000
7,000	MK-1	150,000	88,000	31,000	6	7,000
8,000	MK-1	156,000	94,000	33,000	6	8,000
9,000	MK-1	162,000	100,000	36,000	6	9,000
10,000	MK-1	168,000	106,000	38,000	6	10,000
11,000	MK-1	175,000	113,000	41,000	6	11,000
12,000	MK-1	182,000	120,000	44,000	6	12,000
13,000	MK-1	182,000	120,000	44,000	6	13,000
14,000	MK-1	189,000	127,000	47,000	8	14,000
15,000	MK-2	204,000	129,000	50,000	8	15,000
16,000	MK-2	210,000	135,000	52,000	8	16,000
17,000	MK-2	214,000	139,000	54,000	8	17,000
18,000	MK-2	219,000	144,000	56,000	8	18,000
19,000	MK-2	223,000	148,000	58,000	8	19,000
20,000	MK-2	228,000	153,000	60,000	8	20,000
21,000	MK-2	232,000	157,000	62,000	8	21,000
22,000	MK-2	237,000	162,000	64,000	8	22,000
23,000	MK-2	241,000	166,000	66,000	8	23,000
24,000	MK-3	268,000	174,000	68,000	8	24,000
25,000	MK-3	268,000	174,000	68,000	8	25,000
26,000	MK-3	273,000	179,000	70,000	8	26,000
27,000	MK-3	277,000	183,000	71,000	10	27,000
28,000	MK-3	277,000	183,000	71,000	10	28,000
29,000	MK-3	281,000	187,000	73,000	10	29,000
30,000	MK-3	281,000	187,000	73,000	10	30,000
31,000	MK-3	285,000	191,000	75,000	10	31,000
32,000	MK-4	317,000	199,500	77,000	10	32,000
33,000	MK-4	317,000	199,500	77,000	10	33,000
34,000	MK-4	321,000	203,500	78,000	10	34,000
35,000	MK-4	321,000	203,500	78,000	10	35,000
38,000	MK-4	329,000	211,500	81,000	10	38,000
40,000	MK-4	329,000	211,500	81,000	10	40,000
44,000	MK-4	336,000	218,500	83,000	12	44,000
45,000	MK-4	336,000	218,500	83,000	12	45,000
50,000	MK-4	344,000	226,500	86,000	12	50,000

Alesatori in acciaio HSS

Alesatori a macchina a forte torsione

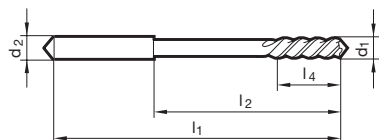


Catalogo n° 72690



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 692



- con imbocco conico, circa 1/6 della lunghezza del tagliente
- la particolare geometria dell'utensile richiede un aumento del sovrametallo dell'alesatura del foro del 50 fino al 100%
- > Ø 3,75 mm con fori di centraggio su entrambi i lati
- ≤ Ø 3,75 mm con centrino su entrambi i lati
- l'avanzamento dovrebbe essere scelto al 50% maggiore come per tutti gli altri alesatori
- per resistenza a trazione fino ad un massimo di 1000 N/mm²

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Codice
4,000	4,000	75,000	47,000	19,000	3	4,000
4,500	4,500	80,000	52,000	21,000	3	4,500
5,000	5,000	86,000	58,000	23,000	3	5,000
5,500	5,600	93,000	57,000	26,000	3	5,500
6,000	5,600	93,000	57,000	26,000	3	6,000
7,000	7,100	109,000	73,000	31,000	3	7,000
8,000	8,000	117,000	81,000	33,000	3	8,000
9,000	9,000	125,000	85,000	36,000	3	9,000
10,000	10,000	133,000	93,000	38,000	3	10,000
12,000	10,000	151,000	111,000	44,000	3	12,000
13,000	10,000	151,000	111,000	44,000	3	13,000

Alesatori in acciaio HSS

Alesatori a macchina per chiodi

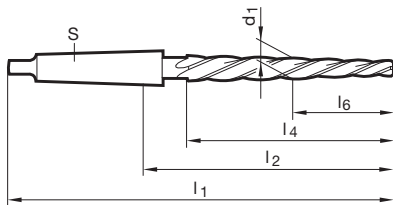


Catalogo n° 72680



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 692



- con imbocco lungo, conico 1:10
- corregge la scentratura del foro delle parti di lamiera ordinate in modo sovrapposto al diametro di foratura desiderato (per esempio per chiodare o collegare a vite)
- tolleranza di costruzione k11
- con fori di centraggio su entrambi i lati
- Area di utilizzo principale:
 - carpenteria metallica, caldaie e container, costruzione navale
 - utensili con alta capacità di truciatura
 - anche per macchine foratrici a mano lente
 - per resistenza a trazione fino ad un massimo di 1000 N/mm²

d1 mm	S	l1 mm	l2 mm	l4 mm	l6 mm	Z	Codice
9,500	MK-1	166,000	104,000	90,000	27,000	4	9,500
10,000	MK-1	171,000	109,000	95,000	30,000	4	10,000
12,000	MK-2	199,000	124,000	105,000	39,000	4	12,000
13,000	MK-2	199,000	124,000	105,000	39,000	4	13,000
15,000	MK-2	219,000	144,000	125,000	45,000	5	15,000
17,000	MK-3	251,000	157,000	135,000	51,000	5	17,000
19,000	MK-3	261,000	167,000	145,000	58,000	5	19,000
20,000	MK-3	271,000	177,000	155,000	62,000	5	20,000
21,000	MK-3	271,000	177,000	155,000	62,000	5	21,000
23,000	MK-3	281,000	187,000	165,000	66,000	5	23,000
25,000	MK-3	296,000	202,000	180,000	72,000	5	25,000
36,000	MK-4	364,000	246,500	220,000	88,000	5	36,000
37,000	MK-4	364,000	246,500	220,000	88,000	5	37,000

Alesatori in acciaio HSS

Alesatori a macchina per spine coniche

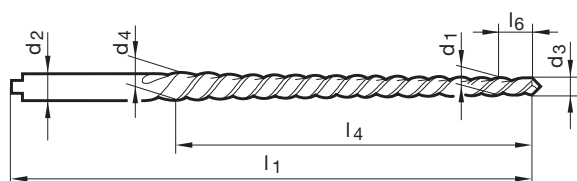


Catalogo n° 72741



P	M	K	N	S	H
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Parametri di lav.
ind. a pag. 692



- per lavorazione singola e riparazioni
- conicità 1:50 per l'alesatura di fori per spine coniche a DIN 1, 258, 7977 e 7978
- $> \varnothing 4,00$ mm con fori di centraggio su entrambi i lati
- $\leq \varnothing 4,00$ mm con centrino su entrambi i lati
- preforatura: cilindrica
- con dente di trascinamento secondo DIN 1809
- per resistenza a trazione fino ad un massimo di 1000 N/mm²

d1 mm	d2 mm	d3 mm	d4 mm	l1 mm	l4 mm	l6 mm	Z	Codice
2,000	3,150	1,900	2,860	86,000	48,000	5,000	3	2,000
2,500	3,150	2,400	3,360	86,000	48,000	5,000	3	2,500
3,000	4,000	2,900	4,060	100,000	58,000	5,000	3	3,000
4,000	5,000	3,900	5,260	112,000	68,000	5,000	3	4,000
5,000	6,300	4,900	6,360	122,000	73,000	5,000	3	5,000
6,000	8,000	5,900	8,000	160,000	105,000	5,000	3	6,000
6,500	8,500	6,400	8,780	188,000	119,000	5,000	3	6,500
8,000	10,000	7,900	10,800	207,000	145,000	5,000	3	8,000
10,000	12,500	9,900	13,400	245,000	175,000	5,000	3	10,000
12,000	16,000	11,860	16,000	290,000	210,000	7,000	3	12,000

Alesatori in acciaio HSS

Alesatori a mano cilindrici, per spine coniche

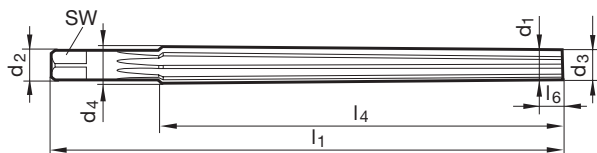


Catalogo n° 72730



P	M	K	N	S	H
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- per lavorazione singola e riparazioni
- conicità 1:50 per l'alesatura di fori per spine coniche
- quadro a DIN 10
- Ø 3,50; 4,50; 5,50; 6,50; 7,00; 9,00; 13,00 e 14,00 mm a norma di fabbrica
- preforatura: cilindrica
- per resistenza a trazione fino ad un massimo di 900 N/mm²



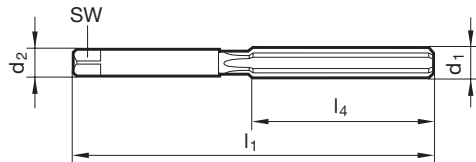
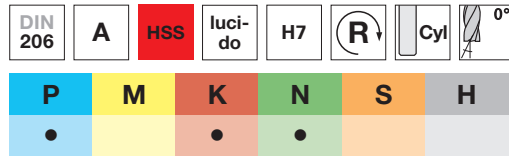
d1 mm	d2 mm	d3 mm	d4 mm	l1 mm	l4 mm	l6 mm	SW mm	Z	Codice
1,000	3,150	0,900	1,460	46,000	28,000	5,000	2,400	3	1,000
1,200	3,150	1,100	1,740	50,000	32,000	5,000	2,400	3	1,200
2,000	3,150	1,900	2,860	68,000	48,000	5,000	2,400	3	2,000
3,000	4,000	2,900	4,060	80,000	58,000	5,000	3,000	5	3,000
4,000	5,000	3,900	5,260	93,000	68,000	5,000	3,800	5	4,000
5,000	6,300	4,900	6,360	100,000	73,000	5,000	4,900	5	5,000
6,000	8,000	5,900	8,000	135,000	105,000	5,000	6,200	6	6,000
8,000	10,000	7,900	10,800	180,000	145,000	5,000	8,000	6	8,000
10,000	12,500	9,900	13,400	215,000	175,000	5,000	10,000	6	10,000
12,000	14,000	11,800	16,000	255,000	210,000	10,000	11,000	8	12,000
16,000	18,000	15,800	20,400	280,000	230,000	10,000	14,500	8	16,000

Alesatori in acciaio HSS

Alesatori a mano



Catalogo n° 72600



- per lavorazione singola e riparazioni
- con imbocco lungo, conico, circa 1/3 della lunghezza del tagliente
- non è adatto per fori ciechi a causa delle lunghezze di taglio
- quadro a DIN 10
- $\leq \varnothing 3,75$ mm con centrino su entrambi i lati
- $> \varnothing 3,75$ mm con fori di centraggio su entrambi i lati
- $\leq 1,75$ mm a norma di fab
- per resistenza a trazione fino ad un massimo di 900 N/mm²

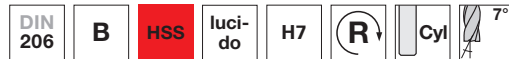
d1 mm	d2 mm	l1 mm	l4 mm	SW mm	Z	Codice
2,500	2,500	58,000	29,000	2,100	4	2,500
3,000	3,000	62,000	31,000	2,400	6	3,000
4,000	4,000	76,000	38,000	3,000	6	4,000
4,500	4,500	81,000	41,000	3,400	6	4,500
5,000	5,000	87,000	44,000	3,800	6	5,000
5,500	5,500	93,000	47,000	4,300	6	5,500
6,000	6,000	93,000	47,000	4,900	6	6,000
8,000	8,000	115,000	58,000	6,200	6	8,000
9,000	9,000	124,000	62,000	7,000	6	9,000
10,000	10,000	133,000	66,000	8,000	6	10,000
11,000	11,000	142,000	71,000	9,000	6	11,000
12,000	12,000	152,000	76,000	9,000	6	12,000
13,000	13,000	152,000	76,000	10,000	6	13,000
14,000	14,000	163,000	81,000	11,000	8	14,000
15,000	15,000	163,000	81,000	12,000	8	15,000
16,000	16,000	175,000	87,000	12,000	8	16,000
17,000	17,000	175,000	87,000	13,000	8	17,000
18,000	18,000	188,000	93,000	14,500	8	18,000
19,000	19,000	188,000	93,000	14,500	8	19,000
20,000	20,000	201,000	100,000	16,000	8	20,000
25,000	25,000	231,000	115,000	20,000	8	25,000
28,000	28,000	247,000	124,000	22,000	10	28,000
32,000	32,000	265,000	133,000	24,000	10	32,000
34,000	34,000	284,000	142,000	26,000	10	34,000

Alesatori in acciaio HSS

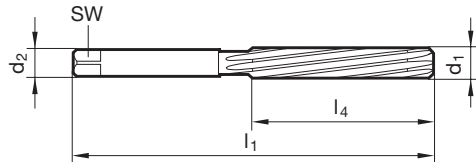
Alesatori a mano



Catalogo n° 72610



P	M	K	N	S	H
•		•	•		



- per lavorazione singola e riparazioni
- con imbocco lungo, conico, circa 1/3 della lunghezza del tagliente
- per fori con taglio interrotto, per esempio pezzi divisi, interruzioni di parete, fori trasversali e simili
- quadro a DIN 10
- $\leq \varnothing 3,75$ mm con centrino su entrambi i lati
- $> \varnothing 3,75$ mm con fori di centraggio su entrambi i lati
- $\leq 1,75$ mm a norma di fab
- per resistenza a trazione fino ad un massimo di 900 N/mm²

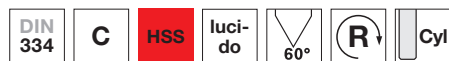
d1 mm	d2 mm	l1 mm	l4 mm	SW mm	Z	Codice
2,000	2,000	50,000	25,000	1,600	4	2,000
2,800	2,800	62,000	31,000	2,100	6	2,800
3,000	3,000	62,000	31,000	2,400	6	3,000
4,000	4,000	76,000	38,000	3,000	6	4,000
4,500	4,500	81,000	41,000	3,400	6	4,500
5,000	5,000	87,000	44,000	3,800	6	5,000
6,000	6,000	93,000	47,000	4,900	6	6,000
7,000	7,000	107,000	54,000	5,500	6	7,000
8,000	8,000	115,000	58,000	6,200	6	8,000
9,000	9,000	124,000	62,000	7,000	6	9,000
10,000	10,000	133,000	66,000	8,000	6	10,000
12,000	12,000	152,000	76,000	9,000	6	12,000
13,000	13,000	152,000	76,000	10,000	6	13,000
14,000	14,000	163,000	81,000	11,000	8	14,000
15,000	15,000	163,000	81,000	12,000	8	15,000
16,000	16,000	175,000	87,000	12,000	8	16,000
18,000	18,000	188,000	93,000	14,500	8	18,000
19,000	19,000	188,000	93,000	14,500	8	19,000
20,000	20,000	201,000	100,000	16,000	8	20,000
22,000	22,000	215,000	107,000	18,000	8	22,000
24,000	24,000	231,000	115,000	18,000	8	24,000
25,000	25,000	231,000	115,000	20,000	8	25,000
28,000	28,000	247,000	124,000	22,000	10	28,000
30,000	30,000	247,000	124,000	24,000	10	30,000
32,000	32,000	265,000	133,000	24,000	10	32,000
34,000	34,000	284,000	142,000	26,000	10	34,000
35,000	35,000	284,000	142,000	29,000	10	35,000

Svasatori en HSS

Svasatori 60°

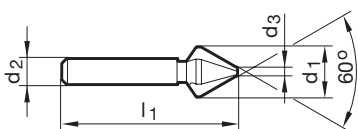


Catalogo n° 72326



P	M	K	N	S	H
●	○	●	●	●	

- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti



d1 mm	d2 mm	d3 mm	l1 mm	Z	Codice
6,300	5,000	1,600	45,000	3	6,300
8,000	6,000	2,000	50,000	3	8,000
12,500	8,000	3,200	56,000	3	12,500
16,000	10,000	4,000	63,000	3	16,000
20,000	10,000	5,000	67,000	3	20,000
25,000	10,000	6,300	71,000	3	25,000

Svasatori en HSS

Svasatori 60°

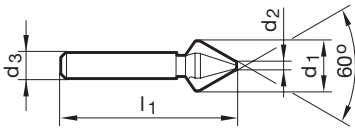


Catalogo n° 62327



P	M	K	N	S	H
•	•	•	•	○	

- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti



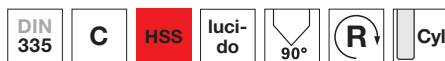
d1 mm	d2 mm	d3 mm	l1 mm	Z	Codice
6,300	5,000	1,600	45,000	3	6,300
8,000	6,000	2,000	50,000	3	8,000
12,500	8,000	3,200	56,000	3	12,500
25,000	10,000	6,300	71,000	3	25,000

Svasatori en HSS

Svasatori 90°

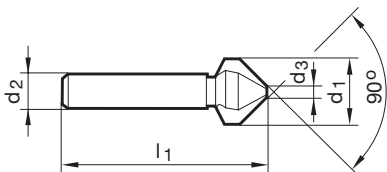


Catalogo n° 72346



P	M	K	N	S	H
●	○	●	●	●	

- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti



d1 mm	d2 mm	d3 mm	l1 mm	Z	Codice
4,300	4,000	1,300	40,000	3	4,300
5,000	4,000	1,500	40,000	3	5,000
5,300	4,000	1,500	40,000	3	5,300
5,800	5,000	1,500	45,000	3	5,800
6,000	5,000	1,500	45,000	3	6,000
6,300	5,000	1,500	45,000	3	6,300
7,000	6,000	1,800	50,000	3	7,000
7,300	6,000	1,800	50,000	3	7,300
8,000	6,000	2,000	50,000	3	8,000
8,300	6,000	2,000	50,000	3	8,300
9,400	6,000	2,200	50,000	3	9,400
10,000	6,000	2,500	50,000	3	10,000
10,400	6,000	2,500	50,000	3	10,400
11,500	8,000	2,800	56,000	3	11,500
12,400	8,000	2,800	56,000	3	12,400
13,400	8,000	2,900	56,000	3	13,400
15,000	10,000	3,200	60,000	3	15,000
16,500	10,000	3,200	60,000	3	16,500
19,000	10,000	3,500	63,000	3	19,000
20,500	10,000	3,500	63,000	3	20,500
23,000	10,000	3,800	67,000	3	23,000
25,000	10,000	3,800	67,000	3	25,000
26,000	10,000	3,800	67,000	3	26,000
28,000	12,000	4,000	71,000	3	28,000
30,000	12,000	4,200	71,000	3	30,000
31,000	12,000	4,200	71,000	3	31,000

Svasatori en HSS

Svasatori 90°

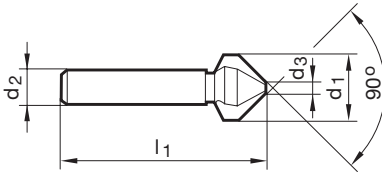


Catalogo n° 62347



P	M	K	N	S	H
●	○	●	○	●	

- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti



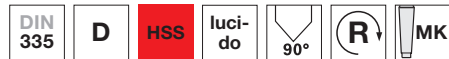
d1 mm	d2 mm	d3 mm	l1 mm	Z	Codice
4,300	4,000		40,000	3	4,300
5,000	4,000	1,500	40,000	3	5,000
6,300	5,000	1,500	45,000	3	6,300
7,300	6,000	1,800	50,000	3	7,300
8,000	6,000	2,000	50,000	3	8,000
8,300	6,000	2,000	50,000	3	8,300
9,400	6,000	2,200	50,000	3	9,400
10,000	6,000	2,500	50,000	3	10,000
10,400	6,000	2,500	50,000	3	10,400
11,500	8,000	2,800	56,000	3	11,500
12,400	8,000	2,800	56,000	3	12,400
15,000	10,000	3,200	60,000	3	15,000
16,500	10,000	3,200	60,000	3	16,500
19,000	10,000	3,500	63,000	3	19,000
20,500	10,000	3,500	63,000	3	20,500
25,000	10,000	3,800	67,000	3	25,000
30,000	12,000	4,200	71,000	3	30,000
31,000	12,000	4,200	71,000	3	31,000

Svasatori en HSS

Svasatori 90°

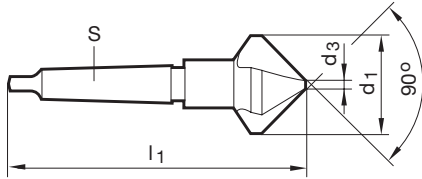


Catalogo n° 72356



P	M	K	N	S	H
●	○	●	●	●	

- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti



d1 mm	S	d3 mm	l1 mm	Z	Codice
15,000	MK-1	3,200	85,000	3	15,000
19,000	MK-2	3,500	100,000	3	19,000
20,500	MK-2	3,500	100,000	3	20,500
25,000	MK-2	3,800	106,000	3	25,000
30,000	MK-2	4,200	112,000	3	30,000
31,000	MK-2	4,200	112,000	3	31,000
34,000	MK-2	4,500	118,000	3	34,000
37,000	MK-2	4,800	118,000	3	37,000
40,000	MK-3	10,000	140,000	3	40,000
50,000	MK-3	14,000	150,000	3	50,000
63,000	MK-4	16,000	180,000	3	63,000
80,000	MK-4	22,000	190,000	3	80,000

Svasatori en HSS

Svasatori 90°

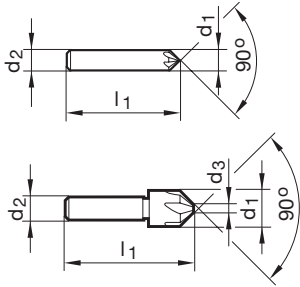


Catalogo n° 72345



P	M	K	N	S	H
•	○	•	•	•	

- taglienti dritti
- taglienti multipli



d1 mm	d2 mm	d3 mm	l1 mm	Z	Codice
8,000	8,000		48,000	5	8,000
12,500	8,000	2,000	48,000	5	12,500
16,000	10,000	3,200	56,000	7	16,000
20,000	10,000	5,000	60,000	7	20,000

Svasatori en HSS

Assortimenti di svasatori cilindrici a 90°



P	M	K	N	S	H
●	○	●	●	○	

- kit in cassette, composti da catalogo n° 72346 Ø 6,3 / 8,3 / 10,4 / 12,4 / 16,5 / 20,5 mm
- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti

Catalogo n° 72399

Codice	d1 mm	Pezzi per set
8,000	6,30-20,50	6

Svasatori en HSS

Assortimenti di svasatori cilindrici a 90°



P	M	K	N	S	H
●	○	●	○	○	

- kit in cassette, composti da catalogo n° 62347 Ø 6,3 / 8,3 / 10,4 / 12,4 / 16,5 / 20,5 mm
- sbavatore e svasatore universale, per esempio per fori
- spogliati radialmente
- a tre taglienti

Catalogo n° 62399

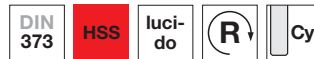
Codice	d1 mm	Pezzi per set
8,000	6,30-20,50	6

Svasatori en HSS

Frese per sedi viti con guide, esecuzione fine

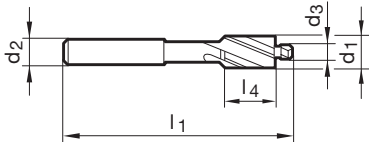


Catalogo n° 72304



P	M	K	N	S	H
●	○	●	●	○	

- con guida fissa
- elica destra



d1 mm	d2 mm	d3 mm	l1 mm	l4 mm	G	Z	Codice
6,000	5,000	3,200	71,000	14,000	M 3	3	6,000
8,000	5,000	4,300	71,000	14,000	M 4	3	8,000
10,000	8,000	5,300	80,000	18,000	M 5	3	10,000
11,000	8,000	6,400	80,000	18,000	M 6	3	11,000
15,000	12,500	8,400	100,000	22,000	M 8	3	15,000
18,000	12,500	10,500	100,000	22,000	M 10	3	18,000
20,000	12,500	13,000	100,000	22,000	M 12	3	20,000

Svasatori en HSS

Frese per sedi viti con guide, esecuzione media

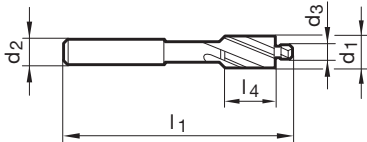


Catalogo n° 72305



P	M	K	N	S	H
●	○	●	●	○	

- con guida fissa
- elica destra
- per svasature a DIN 974, parte 1



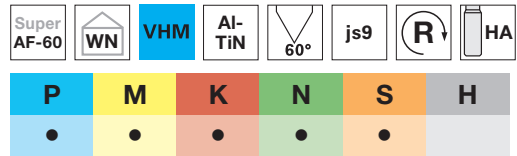
d1 mm	d2 mm	d3 mm	l1 mm	l6 mm	d1	Z	Codice
6,000	5,000	3,400	71,000	14,000	M 3	3	6,000
8,000	5,000	4,500	71,000	14,000	M 4	3	8,000
10,000	8,000	5,500	80,000	18,000	M 5	3	10,000
11,000	8,000	6,600	80,000	18,000	M 6	3	11,000
15,000	12,500	9,000	100,000	22,000	M 8	3	15,000
18,000	12,500	11,000	100,000	22,000	M 10	3	18,000

Utensili di sbavatura e smussatura

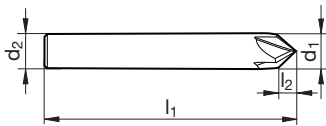
Fresa frontali a 60° per sbavatura



Catalogo n° 53393



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 60°



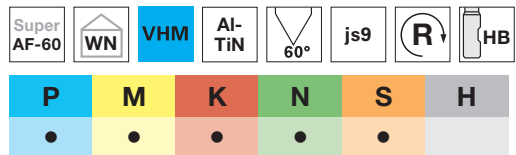
d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
4,000	4,000	50,000	3,500	4	4,000
6,000	6,000	57,000	5,200	4	6,000
8,000	8,000	63,000	7,000	4	8,000
10,000	10,000	72,000	8,700	4	10,000
12,000	12,000	83,000	10,400	4	12,000

Utensili di sbavatura e smussatura

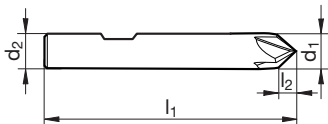
Fresa frontali a 60° per sbavatura



Catalogo n° 53394



- Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 60°



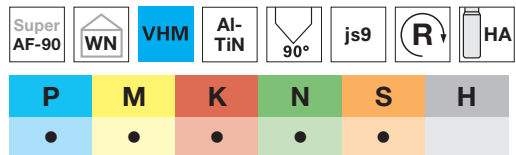
d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	5,200	4	6,000
8,000	8,000	63,000	7,000	4	8,000
10,000	10,000	72,000	8,700	4	10,000
12,000	12,000	83,000	10,400	4	12,000

Utensili di sbavatura e smussatura

Fresa frontali a 90° per sbavatura



Catalogo n° 53395



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 90°



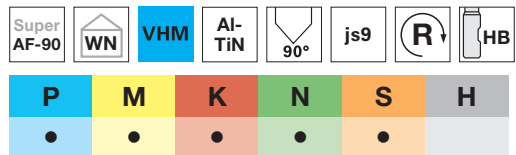
d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
4,000	4,000	50,000	2,000	4	4,000
6,000	6,000	57,000	3,000	4	6,000
8,000	8,000	63,000	4,000	4	8,000
10,000	10,000	72,000	5,000	4	10,000
12,000	12,000	83,000	6,000	4	12,000

Utensili di sbavatura e smussatura

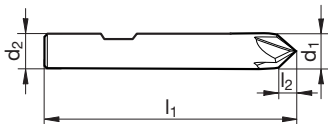
Fresa frontali a 90° per sbavatura



Catalogo n° 53396



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 90°



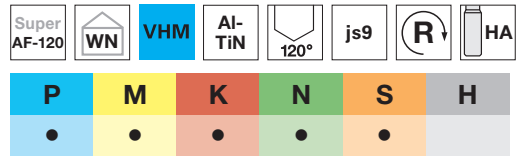
d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
4,000	4,000	50,000	2,000	4	4,000
6,000	6,000	57,000	3,000	4	6,000
8,000	8,000	63,000	4,000	4	8,000
10,000	10,000	72,000	5,000	4	10,000
12,000	12,000	83,000	6,000	4	12,000

Utensili di sbavatura e smussatura

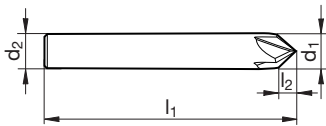
Fresa frontali a 120° per sbavatura



Catalogo n° 53397



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 120°



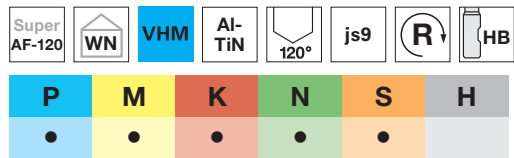
d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
4,000	4,000	50,000	1,200	4	4,000
6,000	6,000	57,000	1,800	4	6,000
8,000	8,000	63,000	2,400	4	8,000
10,000	10,000	72,000	2,900	4	10,000
12,000	12,000	83,000	3,500	4	12,000

Utensili di sbavatura e smussatura

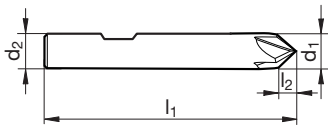
Fresa frontali a 120° per sbavatura



Catalogo n° 53398



• Utensile per sbavatura e smusso per la lavorazione in entrata del foro con angolo di 120°



d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Codice
6,000	6,000	57,000	1,800	4	6,000
8,000	8,000	63,000	2,400	4	8,000
10,000	10,000	72,000	2,900	4	10,000
12,000	12,000	83,000	3,500	4	12,000

Utensili di sbavatura e smussatura

Sbavatori a 90° ad avanzamento ed estrazione

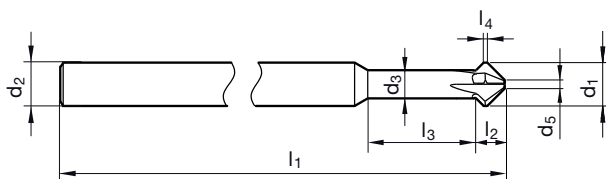


Catalogo n° 52365



P	M	K	N	S	H
•	•				

- Utensile per sbavatura e smussatura per la lavorazione in entrata e uscita dal foro con un angolo di smusso 90°
- per impiego in mandrini ad espansione idraulica e per calettamento
- con codolo a DIN 6535



d1 mm	d2 h6 mm	d3 mm	d5 mm	l1 mm	l2 mm	l3 mm	l4 mm	Z	Codice
3,000	4,000	2,200	0,600	75,000	2,10	9,300	0,500	4	3,000
4,000	4,000	2,900	0,800	75,000	2,70	12,300	0,500	4	4,000
5,000	5,000	3,900	1,000	75,000	3,00	15,000	0,500	4	5,000
6,000	6,000	3,900	1,200	100,000	3,90	14,300	0,500	4	6,000
8,000	6,000	6,000	1,600	100,000	4,70		0,500	4	8,000
10,000	6,000	6,000	2,000	100,000	6,50		0,500	4	10,000
12,000	6,000	6,000	2,400	100,000	8,30		0,500	4	12,000

Utensili di sbavatura e smussatura

Utensili sbavatori

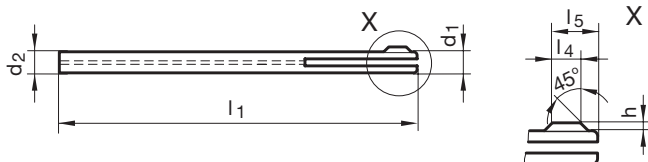


Catalogo n° 52360

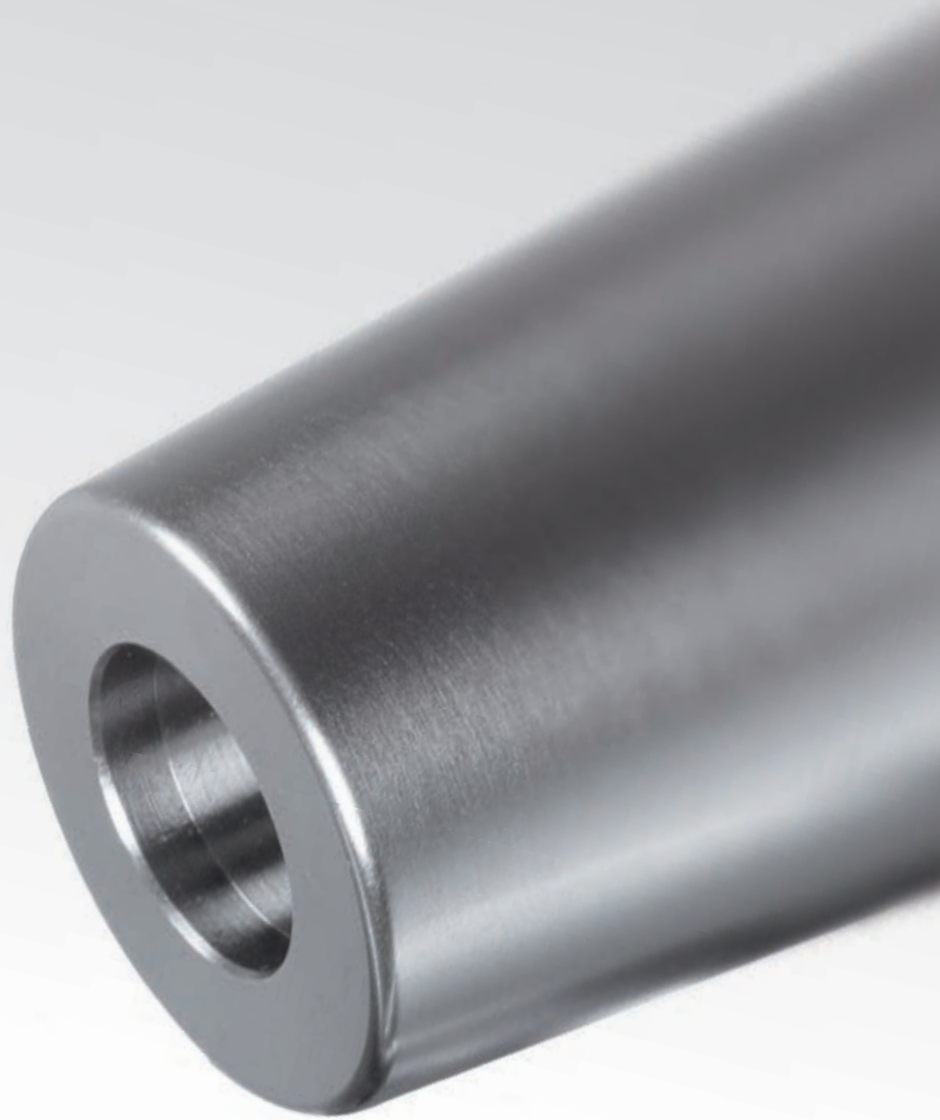


P	M	K	N	S	H
●	●	●	○		

- sbavatore per la lavorazione di fori in entrata e in uscita così come fori trasversali
- con codolo a DIN 6535
- con codolo cilindrico passante per impiego con pinze di serraggio
- con refrigerazione interna
- uso universale







Codice	Campo Ø mm	d1 mm	d2 mm	l1 mm	l4 mm	l5 mm	h mm
2,000	1,91 -2,15	1,900	1,900	80,000	1,000	2,050	0,350
2,250	2,16 -2,40	2,100	2,100	80,000	1,500	2,600	0,400
2,500	2,41 -2,70	2,400	2,400	80,000	1,500	2,900	0,400
2,750	2,71 -2,90	2,600	2,600	90,000	1,500	2,950	0,450
3,000	2,91 -3,25	2,900	2,900	90,000	2,000	3,650	0,450
3,500	3,26 -3,60	3,200	3,200	90,000	2,000	3,800	0,600
4,000	3,61 -4,25	3,600	3,600	90,000	2,000	4,100	0,700
4,500	4,26 -4,75	4,200	4,200	90,000	2,500	4,600	0,700
5,000	4,76 -5,30	4,700	4,700	100,000	2,500	4,850	0,750
5,500	5,31 -5,80	5,200	5,200	100,000	2,500	4,850	0,750
6,000	5,81 -6,20	5,600	5,600	110,000	3,000	5,800	0,800
6,500	6,21 -6,70	6,000	6,000	110,000	3,000	5,900	0,900
7,000	6,71 -7,10	6,500	6,500	110,000	3,000	5,850	0,850
7,500	7,11 -7,60	6,900	6,900	110,000	3,500	6,950	0,950
8,000	7,61 -8,05	7,300	7,300	110,000	3,500	7,000	1,000








ATTACCHI UTENSILI

Attacchi utensili

		SK DIN 69871	MAS/BT JIS B6339	HSK-A DIN 69893
Mandrini ad espansione idraulica		78213 , p. 749	78221 , p. 750	78299 , p. 748
Mandrini di calettamento		78738 , p. 755 78729 con refrigerazione periferica, p. 756	78739 , p. 757	78736 , p. 753 78755 con refrigerazione periferica, p. 754
Attacchi con codolo cilindrico „Weldon“/„Whistle-Notch“		78317 Weldon, p. 760 78322 Whistle-Notch, p. 761	78234 Weldon, p. 763 78233 Whistle-Notch, p. 762	78232 Weldon, p. 758 78334 Whistle-Notch, p. 759
Mandrini per maschiatura sincrona		* 78326 Mandrini di maschiatura sincrona cil. con raffr. interno, p. 767 * 78340 Mandrini di masch. cambio rapido no refrig. interno, p. 769	* 78326 Mandrini di maschiatura sincrona cil. con raffr. interno, p. 767 * 78340 Mandrini di masch. cambio rapido no refrig. interno, p. 769	* 78326 Mandrini di maschiatura sincrona cil. con raffr. interno, p. 767 * 78340 Mandrini di masch. cambio rapido no refrig. interno, p. 769

* in combinazione con il codolo corrispondente o l'attacco utensile adatto

	Mandrini di calettamento	Mandrini idraulici	Attacchi cilindrici „Weldon“/ „Whistle-Notch“
Mandrino / portautensile gambi cilindrici			
Proprietà	Massima concentricità, contorno molto sottile senza interferenze, buona rigidità; elevata forza di serraggio, vite di regolazione certificata che assicura la concentricità.	Alta regolazione con massima concentricità; facilità d'uso, flessibilità d'impiego riducendo le boccole con refrigerazione periferica	robusto, mandrino economico per taglio pesante Velocità e precisione
Principali applicazioni	Foratura, Lamatura, Fresatura, Alesatura, applicazioni universali e HSC	Alesatura, Foratura, Lamatura, HSC-applicazione, leggera Fresatura	sgrossatura, Fresatura, Foratura
Caratteristiche principali	preciso, sottile, alta forza di serraggio	facilità d'uso	facilità d'uso, massima tensione
Circolarità	< 3µm	< 3µm	< 10µm
da 5xD	< 5µm	< 5µm	< 25µm
Serraggio	molto elevato	molto elevato	molto sicuro
Rigidità	molto elevato	elevato	molto elevato
Smorzamento	basso	molto elevato	basso
Profilo di ingombro	piccolo	medio	grosso
Movimentazione	bouno	molto buono / molto flessibile	buono
Funzionamento	Riscaldamento termico	Idraulico	Tramite chiave

Mandrini ad espansione idraulica

Mandrini ad espans. idraulica HSK-A c. maggiore forza di serr.

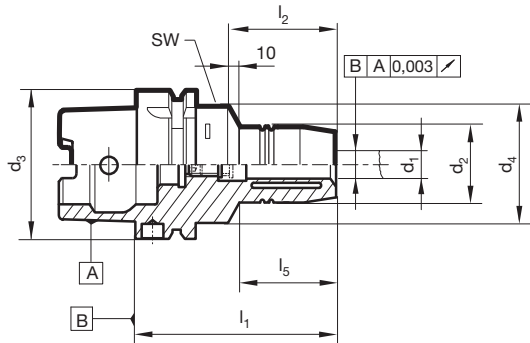


DIN
69882-7

luci-
do

Catalogo n° 78299

- qualità di bilanciamento: G 2.5 / 25.000 giri / min
- regolazione della lunghezza assiale
- adatto per utensili con refrigerazione interna
- per tolleranza codolo h6
- sovrallunghezza l1= 150 mm, 160 mm (concentricità 5 µm) e 200 mm (concentricità 7 µm)
- HSK-A a ISO 12164-1 / DIN 69893-1
- Dotazione:
 - compresa la vite di regolazione
 - compresa la chiave di serraggio
 - ordinare separatamente l'unità di adduzione refrigerante



d3	d1 mm	d2 mm	d4 mm	l1 mm	l2 mm	l5 mm	SW mm	kg	Codice
HSK-A 63	6,000	26,000	50,000	70,000	37,000	24,000	5,0	1,000	6,063
HSK-A 63	8,000	28,000	50,000	70,000	37,000	24,000	5,0	1,056	8,063
HSK-A 63	10,000	30,000	50,000	80,000	41,000	35,000	5,0	1,000	10,063
HSK-A 63	12,000	32,000	50,000	85,000	46,000	40,000	5,0	1,100	12,063
HSK-A 63	14,000	34,000	50,000	85,000	46,000	40,000	5,0	1,100	14,063
HSK-A 63	16,000	38,000	50,000	90,000	49,000	46,000	5,0	1,200	16,063
HSK-A 63	18,000	40,000	50,000	90,000	49,000	47,000	5,0	1,275	18,063
HSK-A 63	20,000	42,000	50,000	90,000	51,000	48,000	5,0	1,200	20,063
HSK-A 63	25,000	57,000	63,000	120,000	57,000	59,000	6,0	2,100	25,063
HSK-A 63	32,000	64,000	75,000	125,000	61,000	63,000	6,0	2,400	32,063
HSK-A 100	6,000	26,000	50,000	75,000	37,000	26,000	5,0	2,400	6,100
HSK-A 100	8,000	28,000	50,000	75,000	37,000	26,000	5,0	2,400	8,100
HSK-A 100	10,000	30,000	50,000	90,000	41,000	42,000	5,0	2,500	10,100
HSK-A 100	12,000	32,000	50,000	95,000	46,000	47,000	5,0	2,500	12,100
HSK-A 100	14,000	34,000	50,000	95,000	46,000	47,000	5,0	2,500	14,100
HSK-A 100	16,000	38,000	50,000	100,000	49,000	53,000	5,0	2,755	16,100
HSK-A 100	18,000	40,000	50,000	100,000	49,000	53,000	5,0	2,700	18,100
HSK-A 100	20,000	42,000	75,000	105,000	51,000	59,000	5,0	3,200	20,100
HSK-A 100	25,000	57,000	75,000	110,000	57,000	62,000	6,0	3,300	25,100
HSK-A 100	32,000	64,000	75,000	110,000	61,000	62,000	6,0	3,800	32,100

Mandrini ad espansione idraulica

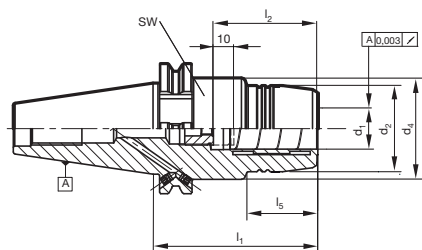
Mandrini ad espan. idraulica SK, maggiore forza di serraggio



Catalogo n° 78213



- SK a DIN ISO 7388-1 Forma AD/AF
- fori per Forma B chiusi, se forniti con perni filettati
- qualità di bilanciamento: G 2.5 / 25.000 giri / min
- regolazione della lunghezza assiale
- per tolleranza codolo h6
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- compresa la chiave di serraggio
- ordinare separatamente i perni



d3	d1 mm	d2 mm	d4 mm	l1 mm	l2 mm	l5 mm	SW mm	kg	Codice
SK 40	6,000	26,000	49,500	80,500	37,000	29,500	5,0	1,500	6,040
SK 40	8,000	28,000	49,500	80,500	37,000	30,000	5,0	1,500	8,040
SK 40	10,000	30,000	49,500	80,500	41,000	31,000	5,0	1,396	10,040
SK 40	12,000	32,000	49,500	80,500	46,000	31,500	5,0	1,500	12,040
SK 40	14,000	34,000	49,500	80,500	46,000	31,500	5,0	1,500	14,040
SK 40	16,000	38,000	49,500	80,500	49,000	33,000	5,0	1,500	16,040
SK 40	18,000	40,000	49,500	80,500	49,000	33,000	5,0	1,500	18,040
SK 40	20,000	49,500	49,500	80,500	51,000		5,0	1,500	20,040
SK 40	20,000	42,000	49,500	80,500	51,000	34,000	5,0	1,500	20,140
SK 50	12,000	32,000	49,500	80,500	46,000	31,500	5,0	3,500	12,050
SK 50	20,000	42,000	49,500	80,500	51,000	34,000	5,0	4,000	20,050
SK 50	32,000	72,000	72,000	81,000	61,000		6,0	4,000	32,050

Mandrini ad espansione idraulica

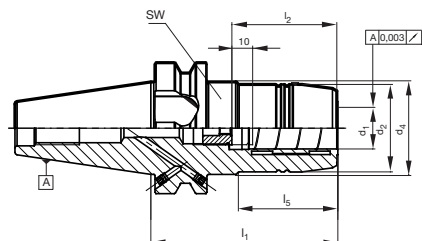
Mandrini ad espan. idraulica MAS/BT, maggiore forza di serr.



Catalogo n° 78221



- qualità di bilanciamento: G 2.5 / 25.000 giri / min
- regolazione della lunghezza assiale
- per tolleranza codolo h6
- adatto per utensili con refrigerazione interna
- MAS/BT a DIN ISO 7388-2 Forma JD/JF (Forma AD/B)
- Dotazione:
 - compresa la vite di regolazione
 - compresa la chiave di serraggio
 - ordinare separatamente i perni



d3	Forma	d1 mm	d2 mm	d4 mm	l1 mm	l2 mm	l5 mm	SW mm	kg	Codice
BT 40	JD/JF	6,000	26,000	44,500	90,000	37,000	43,000	5,0	1,500	6,040
BT 40	JD/JF	8,000	28,000	44,500	90,000	37,000	44,500	5,0	1,500	8,040
BT 40	JD/JF	10,000	30,000	44,500	90,000	41,000	44,500	5,0	1,500	10,040
BT 40	JD/JF	12,000	32,000	44,500	90,000	46,000	44,500	5,0	1,500	12,040
BT 40	JD/JF	14,000	34,000	44,500	90,000	46,000	44,500	5,0	1,500	14,040
BT 40	JD/JF	16,000	38,000	44,500	90,000	49,000	47,500	5,0	1,500	16,040
BT 40	JD/JF	18,000	40,000	44,500	90,000	49,000	47,500	5,0	1,500	18,040
BT 40	JD/JF	20,000	49,500	49,500	72,500	51,000		5,0	1,500	20,040
BT 40	JD/JF	20,000	42,000	44,500	90,000	51,000	47,500	5,0	1,483	20,140
BT 50	JD/JF	12,000	32,000	44,500	90,000	46,000	34,000	5,0	4,000	12,050
BT 50	JD/JF	20,000	42,000	44,500	90,000	51,000	34,000	5,0	4,000	20,050
BT 50	JD/JF	32,000	72,000	72,000	90,000	61,000		6,0	4,000	32,050

Mandrini ad espansione idraulica

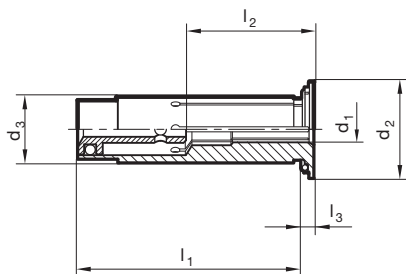
Bussole rid. per mandrini ad espansione idraulica, no refr perf



Catalogo n° 78368



- per serraggio di codoli con differenti Ø in un solo mandrino ad espansione idraulica
- Ø attacco per tolleranza codolo h6
- chiuse frontalmente, quindi a tenuta stagna fino a 80 bar
- precisione concentricità $\leq 2 \mu\text{m}$
- con arresto regolabile
- utilizzando bussole di riduzione, il momento torcente trasmissibile consentito può essere aumentato di ca. il 25% rispetto ad un serraggio diretto
- Dotazione:
- incluso l'elemento di arresto



d3 mm	d1 mm	d2 mm	l1 mm	l3 mm	l2 mm	Codice
12,000	3,000	16,500	45,000	2,000	26,500	3,012
12,000	4,000	16,500	45,000	2,000	26,500	4,012
12,000	6,000	16,500	45,000	2,000	34,500	6,012
12,000	8,000	16,500	45,000	2,000	34,500	8,012
20,000	3,000	24,100	50,500	2,000	28,500	3,020
20,000	4,000	24,100	50,500	2,000	28,500	4,020
20,000	6,000	24,100	50,500	2,000	37,500	6,020
20,000	8,000	24,100	50,500	2,000	37,500	8,020
20,000	10,000	24,100	50,500	2,000	42,500	10,020
20,000	12,000	24,100	50,500	2,000	47,500	12,020
20,000	14,000	24,100	50,500	2,000	47,500	14,020
20,000	16,000	24,100	50,500	2,000	47,500	16,020
32,000	6,000	35,500	60,500	3,000	35,500	6,032
32,000	8,000	35,500	60,500	3,000	35,500	8,032
32,000	10,000	35,500	60,500	3,000	40,500	10,032
32,000	12,000	35,500	60,500	3,000	42,500	12,032
32,000	14,000	35,500	60,500	3,000	42,500	14,032
32,000	16,000	35,500	60,500	3,000	50,500	16,032
32,000	18,000	35,500	60,500	3,000	50,500	18,032
32,000	20,000	35,500	60,500	3,000	50,500	20,032
32,000	25,000	35,500	60,500	3,000	58,500	25,032

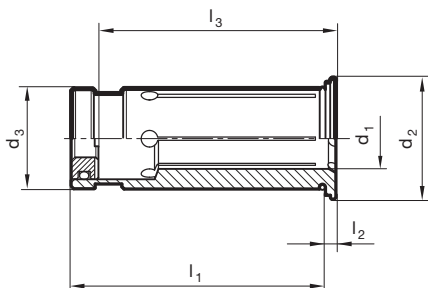
Mandrini ad espansione idraulica

Bussole di riduzione per mandrini ad esp. Idraul.



Catalogo n° 78369

- per serraggio di codoli con differenti Ø in un solo mandrino ad espansione idraulica
- Ø attacco per tolleranza codolo h6
- con intagli frontali per il raffreddamento periferico, migliorando così la lubrificazione
- precisione concentricità $\leq 2 \mu\text{m}$
- con arresto regolabile
- utilizzando bussole di riduzione, il momento torcente trasmissibile consentito può essere aumentato di ca. il 25% rispetto ad un serraggio diretto
- Dotazione:
- incluso l'elemento di arresto



d3 mm	d1 mm	d2 mm	l1 mm	l3 mm	l2 mm	Codice
12,000	3,000	16,500	45,000	2,000	26,500	3,012
12,000	4,000	16,500	45,000	2,000	26,500	4,012
12,000	6,000	16,500	45,000	2,000	34,500	6,012
12,000	8,000	16,500	45,000	2,000	34,500	8,012
20,000	3,000	24,100	50,500	2,000	28,500	3,020
20,000	4,000	24,100	50,500	2,000	28,500	4,020
20,000	6,000	24,100	50,500	2,000	37,500	6,020
20,000	8,000	24,100	50,500	2,000	37,500	8,020
20,000	10,000	24,100	50,500	2,000	42,500	10,020
20,000	12,000	24,100	50,500	2,000	47,500	12,020
20,000	14,000	24,100	50,500	2,000	47,500	14,020
20,000	16,000	24,100	50,500	2,000	47,500	16,020
32,000	6,000	35,500	60,500	3,000	35,500	6,032
32,000	8,000	35,500	60,500	3,000	35,500	8,032
32,000	10,000	35,500	60,500	3,000	40,500	10,032
32,000	12,000	35,500	60,500	3,000	42,500	12,032
32,000	14,000	35,500	60,500	3,000	42,500	14,032
32,000	16,000	35,500	60,500	3,000	50,500	16,032
32,000	18,000	35,500	60,500	3,000	50,500	18,032
32,000	20,000	35,500	60,500	3,000	50,500	20,032
32,000	25,000	35,500	60,500	3,000	58,500	25,032

Mandrini di calettamento

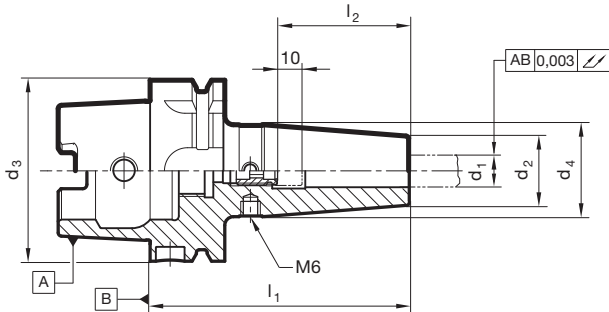
Mandrini di calettamento HSK-A



Catalogo n° 78736



- qualità bilanciamento: G 2.5 / 25.000 giri / min o giri.. ; 1 GMM
- comprese filettature di bilanciamento 4xM6/6xM6
- per tolleranza codolo h6
- sovrallunghezze l1 = 120 mm, 160 mm (concentricità 5 µm) e 200 mm (concentricità 7 µm)
- HSK-A a ISO 12164-1 / DIN 69893-1
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- per refrigerazione tradizionale, ordinare separatamente l'unità di adduzione refrigerante



d3	d1 mm	d2 mm	d4 mm	l1 mm	l2 ± mm	kg	Codice
HSK-A 63	3,000	10,000	18,000	80,000	30,000	0,700	3,063
HSK-A 63	4,000	10,000	18,000	80,000	35,000	0,700	4,063
HSK-A 63	6,000	21,000	27,000	80,000	36,000	0,800	6,063
HSK-A 63	8,000	21,000	27,000	80,000	36,000	0,800	8,063
HSK-A 63	10,000	24,000	32,000	85,000	41,000	0,900	10,063
HSK-A 63	12,000	24,000	32,000	90,000	46,000	0,945	12,063
HSK-A 63	14,000	27,000	34,000	90,000	46,000	1,000	14,063
HSK-A 63	16,000	27,000	34,000	95,000	49,000	1,000	16,063
HSK-A 63	18,000	33,000	42,000	95,000	49,000	1,200	18,063
HSK-A 63	20,000	33,000	42,000	100,000	51,000	1,200	20,063
HSK-A 63	25,000	44,000	53,000	115,000	57,000	1,800	25,063
HSK-A 63	32,000	44,000	53,000	120,000	61,000	1,700	32,063
HSK-A 100	6,000	21,000	27,000	85,000	36,000	2,200	6,100
HSK-A 100	8,000	21,000	27,000	85,000	36,000	2,200	8,100
HSK-A 100	10,000	24,000	32,000	90,000	41,000	2,300	10,100
HSK-A 100	12,000	24,000	32,000	95,000	46,000	2,300	12,100
HSK-A 100	14,000	27,000	34,000	95,000	46,000	2,300	14,100
HSK-A 100	16,000	27,000	34,000	100,000	49,000	2,300	16,100
HSK-A 100	18,000	33,000	42,000	100,000	49,000	2,500	18,100
HSK-A 100	20,000	33,000	42,000	105,000	51,000	2,500	20,100
HSK-A 100	25,000	44,000	53,000	115,000	57,000	3,000	25,100
HSK-A 100	32,000	44,000	53,000	120,000	61,000	3,000	32,100

Mandrini di calettamento

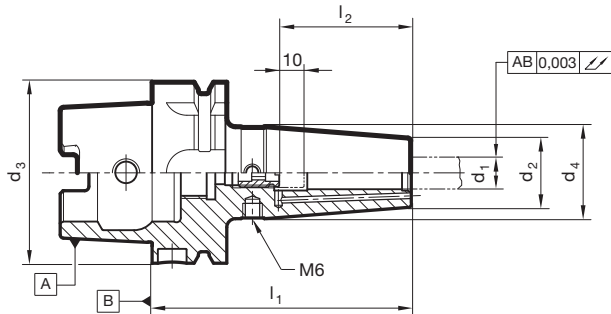
Mandrini a calettamento HSK-A con raffreddamento periferico



Catalogo n° 78755



- qualità bilanciamento: G 2.5 / 25.000 giri / min o giri.. ; 1 GMM
- comprese filettature di bilanciamento 4xM6/6xM6
- per tolleranza codolo h6
- canali refrigeranti: d1 = 6 - 14 mm con due canali refrigeranti, d1 = 16 - 40 mm con quattro canali refrigeranti
- HSK-A a ISO 12164-1 / DIN 69893-1
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- per refrigerazione tradizionale, ordinare separatamente l'unità di adduzione refrigerante



d3	d1 mm	d2 mm	d4 mm	l1 mm	l2 ± mm	kg	Codice
HSK-A 63	6,000	21,000	27,000	80,000	36,000	0,859	6,063
HSK-A 63	8,000	21,000	27,000	80,000	36,000	0,800	8,063
HSK-A 63	10,000	24,000	32,000	85,000	41,000	0,927	10,063
HSK-A 63	12,000	24,000	32,000	90,000	46,000	0,938	12,063
HSK-A 63	14,000	27,000	34,000	90,000	46,000	0,985	14,063
HSK-A 63	16,000	27,000	34,000	95,000	49,000	0,999	16,063
HSK-A 63	18,000	33,000	42,000	95,000	49,000	1,167	18,063
HSK-A 63	20,000	33,000	42,000	100,000	51,000	1,191	20,063
HSK-A 100	6,000	21,000	27,000	85,000	36,000	2,200	6,100
HSK-A 100	8,000	21,000	27,000	85,000	36,000	2,200	8,100
HSK-A 100	10,000	24,000	32,000	90,000	41,000	2,300	10,100
HSK-A 100	12,000	24,000	32,000	95,000	46,000	2,300	12,100
HSK-A 100	14,000	27,000	34,000	95,000	46,000	2,300	14,100
HSK-A 100	16,000	27,000	34,000	100,000	49,000	2,300	16,100
HSK-A 100	18,000	33,000	42,000	100,000	49,000	2,500	18,100
HSK-A 100	20,000	33,000	42,000	105,000	51,000	2,500	20,100
HSK-A 100	25,000	44,000	53,000	115,000	57,000	3,000	25,100
HSK-A 100	32,000	44,000	53,000	120,000	61,000	3,000	32,100

Mandrini di calettamento

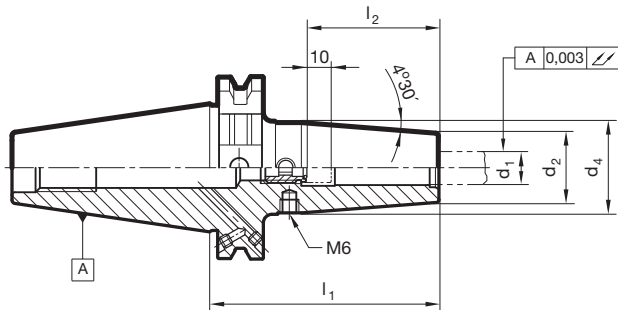
Mandrini di calettamento SK



Catalogo n° 78738



- qualità bilanciamento: G 2.5 / 25.000 giri / min o giri.. ; 1 GMM
- comprese filettature di bilanciamento 4xM6/6xM6
- SK a DIN ISO 7388-1 Forma AD/AF
- per tolleranza codolo h6
- sovrallunghezze I1 = 120 mm, 160 mm (concentricità 5 µm) e 200 mm (concentricità 7 µm)
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- ordinare separatamente i perni



d3	d1 mm	d2 mm	d4 mm	I1 mm	I2 ± mm	kg	Codice
SK 40	3,000	10,000	18,000	80,000	30,000	0,900	3,040
SK 40	4,000	10,000	18,000	80,000	35,000	0,900	4,040
SK 40	6,000	21,000	27,000	80,000	36,000	1,000	6,040
SK 40	8,000	21,000	27,000	80,000	36,000	1,000	8,040
SK 40	10,000	24,000	32,000	80,000	41,000	1,100	10,040
SK 40	12,000	24,000	32,000	81,600	46,000	1,000	12,040
SK 40	14,000	27,000	34,000	81,800	46,000	1,100	14,040
SK 40	16,000	27,000	34,000	82,000	49,000	1,100	16,040
SK 40	18,000	33,000	42,000	82,300	49,000	1,200	18,040
SK 40	20,000	33,000	42,000	82,600	51,000	1,500	20,040
SK 40	25,000	44,000	53,000	103,100	57,000	1,500	25,040
SK 40	32,000	44,000	53,000	100,000	61,000	1,500	32,040
SK 50	3,000	10,000	18,000	80,000	30,000	2,600	3,050
SK 50	4,000	10,000	18,000	80,000	35,000	2,600	4,050
SK 50	6,000	21,000	27,000	80,000	36,000	2,900	6,050
SK 50	8,000	21,000	27,000	80,000	36,000	2,900	8,050
SK 50	10,000	24,000	32,000	80,000	41,000	2,900	10,050
SK 50	12,000	24,000	32,000	81,600	46,000	2,900	12,050
SK 50	14,000	27,000	34,000	81,800	46,000	3,000	14,050
SK 50	16,000	27,000	34,000	82,000	49,000	3,000	16,050
SK 50	18,000	33,000	42,000	82,300	49,000	3,000	18,050
SK 50	20,000	33,000	42,000	82,600	51,000	3,000	20,050
SK 50	25,000	44,000	53,000	103,100	57,000	3,600	25,050
SK 50	32,000	44,000	53,000	100,000	61,000	3,500	32,050

Mandrini di calettamento

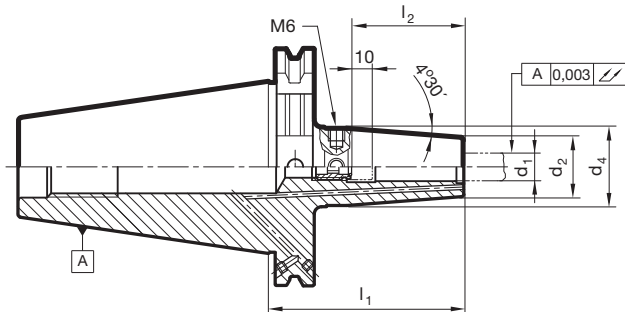
Mandrini di calettamento ISO



Catalogo n° 78729



- qualità bilanciamento: G 2.5 / 25.000 giri / min o giri.. ; 1 GMM
- comprese filettature di bilanciamento 4xM6/6xM6
- SK a DIN ISO 7388-1 Forma AD/AF
- per tolleranza codolo h6
- canali refrigeranti: d1 = 6 - 14 mm con due canali refrigeranti, d1 = 16 - 40 mm con quattro canali refrigeranti
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- ordinare separatamente i perni



d3	d1 mm	d2 mm	d4 mm	l1 mm	l2 ± mm	kg	Codice
SK 40	6,000	21,000	27,000	80,000	36,000	1,000	6,040
SK 40	8,000	21,000	27,000	80,000	36,000	1,019	8,040
SK 40	10,000	24,000	32,000	80,000	41,000	1,100	10,040
SK 40	12,000	24,000	32,000	80,000	46,000	1,000	12,040
SK 40	14,000	27,000	34,000	80,000	46,000	1,100	14,040
SK 40	16,000	27,000	34,000	80,000	49,000	1,100	16,040
SK 40	18,000	33,000	42,000	80,000	49,000	1,234	18,040
SK 40	20,000	33,000	42,000	80,000	51,000	1,500	20,040
SK 50	6,000	21,000	27,000	80,000	36,000	2,800	6,050
SK 50	8,000	21,000	27,000	80,000	36,000	2,800	8,050
SK 50	10,000	24,000	32,000	80,000	41,000	2,800	10,050
SK 50	12,000	24,000	32,000	80,000	46,000	2,800	12,050
SK 50	14,000	27,000	34,000	80,000	46,000	2,800	14,050
SK 50	16,000	27,000	34,000	80,000	49,000	2,800	16,050
SK 50	18,000	33,000	42,000	80,000	49,000	3,000	18,050
SK 50	20,000	33,000	42,000	80,000	51,000	3,000	20,050
SK 50	25,000	44,000	53,000	100,000	57,000	3,500	25,050
SK 50	32,000	44,000	53,000	100,000	61,000	3,300	32,050

Mandrini di calettamento

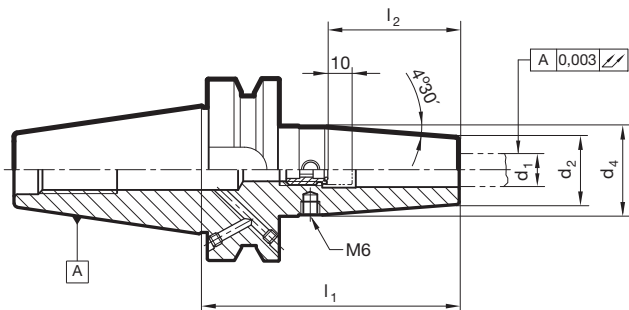
Mandrini di calettamento MAS/BT



Catalogo n° 78739



- qualità bilanciamento: G 2.5 / 25.000 giri / min o giri.. ; 1 GMM
- comprese filettature di bilanciamento 4xM6/6xM6
- MAS/BT a DIN ISO 7388-2 Forma JD/JF (Forma AD/B)
- per tolleranza codolo h6
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di regolazione
- ordinare separatamente i perni



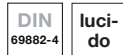
d3	Forma	d1 mm	d2 mm	d4 mm	l1 ± mm	l2 mm	kg	Codice
BT 40	JD/JF	3,000	10,000	18,000	85,000	30,000	1,000	3,040
BT 40	JD/JF	4,000	10,000	18,000	85,000	35,000	1,000	4,040
BT 40	JD/JF	6,000	21,000	27,000	90,000	36,000	1,200	6,040
BT 40	JD/JF	8,000	21,000	27,000	90,000	36,000	1,200	8,040
BT 40	JD/JF	10,000	24,000	32,000	90,000	41,000	1,300	10,040
BT 40	JD/JF	12,000	24,000	32,000	90,000	46,000	1,300	12,040
BT 40	JD/JF	14,000	27,000	34,000	90,000	46,000	1,400	14,040
BT 40	JD/JF	16,000	27,000	34,000	90,000	49,000	1,400	16,040
BT 40	JD/JF	18,000	33,000	42,000	90,000	49,000	1,400	18,040
BT 40	JD/JF	20,000	33,000	42,000	90,000	51,000	1,700	20,040
BT 40	JD/JF	25,000	44,000	53,000	100,000	57,000	1,800	25,040
BT 40	JD/JF	32,000	44,000	53,000	100,000	61,000	1,700	32,040
BT 50	JD/JF	6,000	21,000	27,000	100,000	36,000	2,900	6,050
BT 50	JD/JF	8,000	21,000	27,000	100,000	36,000	2,900	8,050
BT 50	JD/JF	10,000	24,000	32,000	100,000	41,000	2,900	10,050
BT 50	JD/JF	12,000	24,000	32,000	100,000	46,000	2,900	12,050
BT 50	JD/JF	14,000	27,000	34,000	100,000	46,000	3,000	14,050
BT 50	JD/JF	16,000	27,000	34,000	100,000	49,000	3,000	16,050
BT 50	JD/JF	18,000	33,000	42,000	100,000	49,000	1,900	18,050
BT 50	JD/JF	20,000	33,000	42,000	100,000	51,000	1,900	20,050
BT 50	JD/JF	25,000	44,000	53,000	110,000	57,000	2,200	25,050
BT 50	JD/JF	32,000	44,000	53,000	110,000	61,000	2,200	32,050

Attacchi utensili

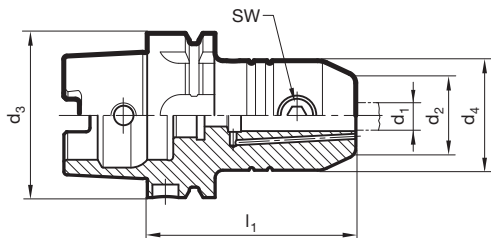
Attacchi cilindrici Weldon HSK-A



Catalogo n° 78232



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- con foro di attacco DIN 1835-2 Forma B „Weldon“
- da supporto d1 = 25 con due viti di serraggio
- con canali refrigeranti per il raffreddamento periferico, migliorando così la lubrificazione
- canali refrigeranti: d1 = 6 - 14 mm con due canali refrigeranti, d1 = 16 - 40 mm con quattro canali refrigeranti
- HSK-A a ISO 12164-1 / DIN 69893-1
- adatto per utensili con refrigerazione interna
- Dotazione:
 - compresa la vite di serraggio
 - ordinare separatamente l'unità di adduzione refrigerante



d3	d1 mm	d2 mm	d4 mm	l1 mm	SW ± mm	kg	Codice
HSK-A 63	6,000	15,000	25,000	65,000	3,0	0,800	6,063
HSK-A 63	8,000	20,000	28,000	65,000	4,0	0,800	8,063
HSK-A 63	10,000	25,000	35,000	65,000	5,0	0,900	10,063
HSK-A 63	12,000	30,000	42,000	80,000	6,0	1,200	12,063
HSK-A 63	14,000	32,000	44,000	80,000	6,0	1,200	14,063
HSK-A 63	16,000	36,000	48,000	80,000	6,0	1,300	16,063
HSK-A 63	18,000	38,000	50,000	80,000	6,0	1,400	18,063
HSK-A 63	20,000	40,000	52,000	80,000	8,0	1,400	20,063
HSK-A 63	25,000	45,000	65,000	110,000	10,0	2,400	25,063
HSK-A 63	32,000	56,000	72,000	110,000	10,0	2,700	32,063
HSK-A 100	6,000	15,000	25,000	80,000	3,0	3,000	6,100
HSK-A 100	8,000	20,000	28,000	80,000	4,0	3,200	8,100
HSK-A 100	10,000	25,000	35,000	80,000	5,0	3,400	10,100
HSK-A 100	12,000	30,000	42,000	80,000	6,0	3,400	12,100
HSK-A 100	14,000	32,000	44,000	80,000	6,0	3,500	14,100
HSK-A 100	16,000	36,000	48,000	100,000	6,0	3,800	16,100
HSK-A 100	18,000	38,000	50,000	100,000	6,0	3,800	18,100
HSK-A 100	20,000	40,000	52,000	100,000	8,0	3,900	20,100
HSK-A 100	25,000	45,000	65,000	100,000	10,0	3,900	25,100
HSK-A 100	32,000	56,000	72,000	100,000	10,0	4,200	32,100
HSK-A 100	40,000	60,000	80,000	110,000	10,0	4,600	40,100

Attacchi utensili

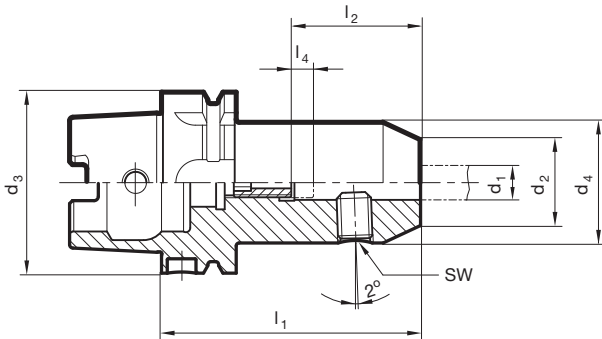
Attacchi per codolo cilindrico Whistle Notch HSK-A



Catalogo n° 78334



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- con foro di attacco DIN 1835-2 Forma E „Whistle Notch“ con scanalatura frontale per identificazione
- da supporto d1 = 25 con due viti di serraggio
- HSK-A a ISO 12164-1 / DIN 69893-1
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di serraggio e la vite di regolazione
- ordinare separatamente l'unità di adduzione refrigerante



d3	d1 mm	d2 mm	d4 mm	l1 mm	l2 mm	l4 mm	SW mm	kg	Codice
HSK-A 63	6,000	15,000	25,000	80,000	36,000	10,000	3,0	0,860	6,063
HSK-A 63	8,000	20,000	28,000	80,000	36,000	10,000	4,0	0,900	8,063
HSK-A 63	10,000	25,000	35,000	80,000	40,000	10,000	5,0	1,000	10,063
HSK-A 63	12,000	30,000	42,000	90,000	45,000	10,000	6,0	1,240	12,063
HSK-A 63	14,000	32,000	44,000	90,000	45,000	10,000	6,0	1,280	14,063
HSK-A 63	16,000	36,000	48,000	100,000	48,000	10,000	6,0	1,530	16,063
HSK-A 63	18,000	38,000	50,000	100,000	48,000	10,000	6,0	1,600	18,063
HSK-A 63	20,000	40,000	52,000	100,000	50,000	10,000	8,0	1,650	20,063
HSK-A 63	25,000	45,000	65,000	110,000	56,000	10,000	10,0	2,340	25,063
HSK-A 63	32,000	56,000	72,000	110,000	60,000	10,000	10,0	2,540	32,063
HSK-A 100	6,000	15,000	25,000	90,000	36,000	10,000	3,0	2,600	6,100
HSK-A 100	8,000	20,000	28,000	90,000	36,000	10,000	4,0	2,600	8,100
HSK-A 100	10,000	25,000	35,000	90,000	40,000	10,000	5,0	2,600	10,100
HSK-A 100	12,000	30,000	42,000	100,000	45,000	10,000	6,0	2,800	12,100
HSK-A 100	14,000	32,000	44,000	100,000	45,000	10,000	6,0	2,850	14,100
HSK-A 100	16,000	36,000	48,000	100,000	48,000	10,000	6,0	2,970	16,100
HSK-A 100	18,000	38,000	50,000	100,000	48,000	10,000	6,0	3,100	18,100
HSK-A 100	20,000	40,000	52,000	110,000	50,000	10,000	8,0	3,230	20,100
HSK-A 100	25,000	45,000	65,000	120,000	56,000	10,000	10,0	4,060	25,100
HSK-A 100	32,000	56,000	72,000	120,000	60,000	10,000	10,0	4,400	32,100

Attacchi utensili

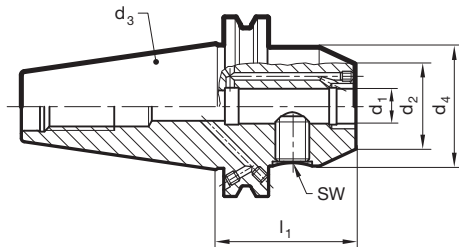
Attacchi cilindrici Weldon SK



Catalogo n° 78317



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- con foro di attacco DIN 1835-2 Forma B „Weldon“
- SK a DIN ISO 7388-1 Forma AD/AF
- fori per Forma B chiusi, se forniti con perni filettati
- con canali refrigeranti nel foro di serraggio per raffreddamento periferico, migliorando così la lubrificazione
- da supporto d1 = 25 con due viti di serraggio
- condotti del liquido di raffreddamento: d1 = 6-14 mm con due condotti di raffreddamento, d1 = 16 - 32 mm con quattro condotti di raffreddamento
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di serraggio
- ordinare separatamente i perni



d3	Forma	d1 mm	d2 mm	d4 mm	l1 ± mm	SW mm	kg	Codice
SK 40	AD/AF	6,000	15,000	25,000	50,000	3,0	0,900	6,040
SK 40	AD/AF	8,000	20,000	28,000	50,000	4,0	0,900	8,040
SK 40	AD/AF	10,000	25,000	35,000	50,000	5,0	1,000	10,040
SK 40	AD/AF	12,000	30,000	42,000	50,000	6,0	1,200	12,040
SK 40	AD/AF	14,000	32,000	44,000	50,000	6,0	1,200	14,040
SK 40	AD/AF	16,000	36,000	48,000	63,000	6,0	1,200	16,040
SK 40	AD/AF	18,000	38,000	50,000	63,000	6,0	1,400	18,040
SK 40	AD/AF	20,000	40,000	52,000	63,000	8,0	1,500	20,040
SK 40	AD/AF	25,000	45,000	65,000	100,000	10,0	2,300	25,040
SK 40	AD/AF	32,000	56,000	72,000	100,000	10,0	2,500	32,040
SK 50	AD/AF	6,000	15,000	25,000	63,000	3,0	2,700	6,050
SK 50	AD/AF	8,000	20,000	28,000	63,000	4,0	2,700	8,050
SK 50	AD/AF	10,000	25,000	35,000	63,000	5,0	2,900	10,050
SK 50	AD/AF	12,000	30,000	42,000	63,000	6,0	3,000	12,050
SK 50	AD/AF	14,000	32,000	44,000	63,000	6,0	3,000	14,050
SK 50	AD/AF	16,000	36,000	48,000	63,000	6,0	3,000	16,050
SK 50	AD/AF	18,000	38,000	50,000	63,000	6,0	3,000	18,050
SK 50	AD/AF	20,000	40,000	52,000	63,000	8,0	3,100	20,050
SK 50	AD/AF	25,000	45,000	65,000	80,000	10,0	3,700	25,050
SK 50	AD/AF	32,000	56,000	72,000	100,000	10,0	4,500	32,050

Attacchi utensili

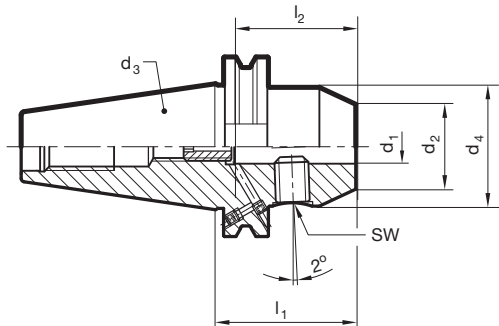
Attacchi per codolo cilindrico Whistle Notch SK



Catalogo n° 78322



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- con foro di attacco DIN 1835-2 Forma E „Whistle Notch“
- SK a DIN ISO 7388-1 Forma AD/AF
- da supporto d1 = 25 con due viti di serraggio
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di serraggio e la vite di regolazione
- ordinare separatamente i perni



d3	d1 mm	d2 mm	d4 mm	l1 mm	l2 ± mm	SW mm	kg	Codice
SK 40	6,000	15,000	25,000	50,000	36,000	3,0	0,900	6,040
SK 40	8,000	20,000	28,000	50,000	36,000	4,0	0,900	8,040
SK 40	10,000	25,000	35,000	50,000	40,000	5,0	1,000	10,040
SK 40	12,000	30,000	42,000	50,000	45,000	6,0	1,200	12,040
SK 40	14,000	32,000	44,000	50,000	45,000	6,0	1,200	14,040
SK 40	16,000	36,000	48,000	63,000	48,000	6,0	1,200	16,040
SK 40	18,000	38,000	50,000	63,000	48,000	6,0	1,400	18,040
SK 40	20,000	40,000	52,000	63,000	50,000	8,0	1,500	20,040
SK 40	25,000	45,000	65,000	100,000	56,000	10,0	2,300	25,040
SK 40	32,000	56,000	72,000	100,000	60,000	10,0	2,500	32,040
SK 50	6,000	15,000	25,000	63,000	36,000	3,0	2,700	6,050
SK 50	8,000	20,000	28,000	63,000	36,000	4,0	2,700	8,050
SK 50	10,000	25,000	35,000	63,000	40,000	5,0	2,900	10,050
SK 50	12,000	30,000	42,000	63,000	45,000	6,0	3,000	12,050
SK 50	14,000	32,000	44,000	63,000	45,000	6,0	3,000	14,050
SK 50	16,000	36,000	48,000	63,000	48,000	6,0	3,000	16,050
SK 50	18,000	38,000	50,000	63,000	48,000	6,0	3,000	18,050
SK 50	20,000	40,000	52,000	63,000	50,000	8,0	3,100	20,050
SK 50	25,000	45,000	65,000	80,000	56,000	10,0	3,700	25,050
SK 50	32,000	56,000	72,000	100,000	60,000	10,0	4,500	32,050

Attacchi utensili

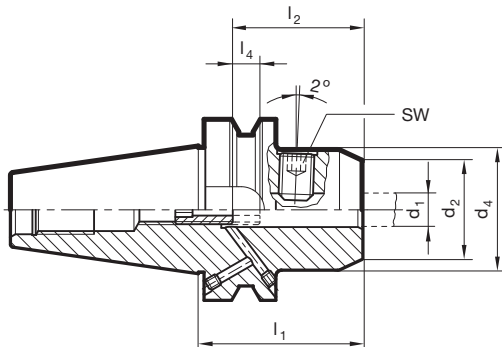
Attacchi per codolo cilindrico WhistleNotch MAS/BT



Catalogo n° 78233



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- MAS/BT a DIN ISO 7388-2 Forma JD/JF
- con foro di attacco DIN 1835-2 Forma E „Whistle Notch“
- da supporto d1 = 25 con due viti di serraggio
- alimentazione di refrigerante Forma JD/JF (* BT50 forma JD senza alimentazione di refrigerante attraverso il collarino)
- adatto per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di serraggio e la vite di regolazione
- ordinare separatamente i perni



d3	Forma	d1 mm	d2 mm	d4 mm	l1 mm	l2 mm	l4 mm	SW mm	kg	Codice
BT 40	JD/JF	6,000	15,000	25,000	50,000	36,000	10,000	3,0	5,882	6,040
BT 40	JD/JF	8,000	20,000	28,000	50,000	36,000	10,000	4,0	5,890	8,040
BT 40	JD/JF	10,000	25,000	35,000	63,000	40,000	10,000	5,0	6,024	10,040
BT 40	JD/JF	12,000	30,000	42,000	63,000	45,000	10,000	6,0	6,160	12,040
BT 40	JD/JF	14,000	32,000	44,000	63,000	45,000	10,000	6,0	6,175	14,040
BT 40	JD/JF	16,000	36,000	48,000	116,400	48,000	10,000	6,0	6,050	16,040
BT 40	JD/JF	18,000	38,000	50,000	63,000	48,000	10,000	6,0	6,280	18,040
BT 40	JD/JF	20,000	40,000	52,000	63,000	50,000	10,000	8,0	6,110	20,040
BT 40	JD/JF	25,000	45,000	63,000	90,000	56,000	10,000	10,0	6,750	25,040
BT 40	JD/JF	32,000	56,000	72,000	100,000	60,000	10,000	10,0	7,180	32,040
BT 50	JD	6,000	15,000	25,000	62,600	36,000	10,000	3,0	8,090	6,050
BT 50	JD	8,000	20,000	28,000	62,600	36,000	10,000	4,0	8,430	8,050
BT 50	JD	10,000	25,000	35,000	62,600	40,000	10,000	5,0	8,490	10,050
BT 50	JD	12,000	30,000	42,000	80,000	45,000	10,000	6,0	8,600	12,050
BT 50	JD	14,000	32,000	44,000	80,000	45,000	10,000	6,0	8,370	14,050
BT 50	JD	16,000	36,000	48,000	80,000	48,000	10,000	6,0	8,370	16,050
BT 50	JD	18,000	38,000	50,000	80,000	48,000	10,000	6,0	8,430	18,050
BT 50	JD	20,000	40,000	52,000	80,000	50,000	10,000	8,0	8,685	20,050
BT 50	JD	25,000	45,000	65,000	100,000	56,000	10,000	10,0	9,240	25,050
BT 50	JD	32,000	56,000	72,000	105,000	60,000	10,000	10,0	9,480	32,050

Attacchi utensili

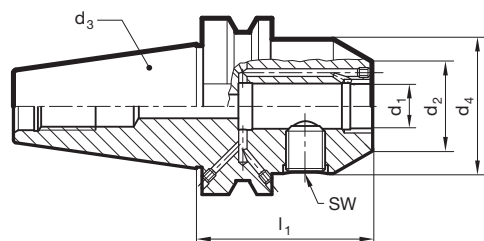
Attacchi cilindrici Weldon MAS/BT



Catalogo n° 78234



- equilibratura: G 6,3 / 15.000 giri/min
- per tolleranza codolo h6
- con foro di attacco DIN 1835-2 Forma B „Weldon“
- da supporto d1 = 25 con due viti di serraggio
- con canali refrigeranti per il raffreddamento periferico, migliorando così la lubrificazione
- alimentazione di refrigerante Forma JD/JF
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la vite di serraggio
- ordinare separatamente i perni



d3	Forma	d1 mm	d2 mm	d4 mm	l1 ± mm	SW mm	kg	Codice
BT 40	JD/JF	6,000	15,000	25,000	50,000	3,0	5,810	6,040
BT 40	JD/JF	8,000	20,000	28,000	50,000	4,0	5,800	8,040
BT 40	JD/JF	10,000	25,000	35,000	63,000	5,0	6,050	10,040
BT 40	JD/JF	12,000	30,000	42,000	63,000	6,0	6,000	12,040
BT 40	JD/JF	14,000	32,000	44,000	63,000	6,0	5,930	14,040
BT 40	JD/JF	16,000	36,000	48,000	63,000	6,0	5,980	16,040
BT 40	JD/JF	18,000	38,000	50,000	63,000	6,0	6,170	18,040
BT 40	JD/JF	20,000	40,000	52,000	63,000	8,0	6,150	20,040
BT 40	JD/JF	25,000	45,000	63,000	90,000	10,0	6,700	25,040
BT 40	JD/JF	32,000	56,000	72,000	100,000	10,0	7,170	32,040

Attacchi utensili

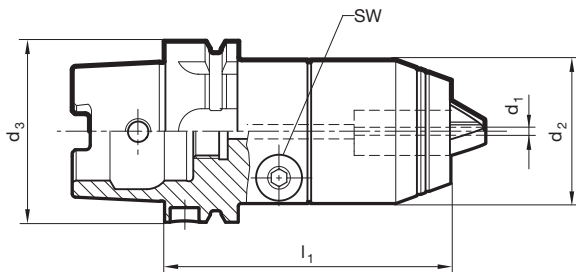
Mandrini portapunte CN HSK-A con raffreddamento interno



Catalogo n° 78346



- per il serraggio di tutti i codoli cilindrici
- HSK-A a ISO 12164-1 / DIN 69893-1
- gamma di serraggio \varnothing continua
- alta forza di serraggio attraverso ingranaggio a vite robusto
- pressione refrigerante max. 50 bar
- i mandrini NC sono adatti per giri fino a 7.000 giri/min. Per equilibratura fine ottimale fino ad un max. di 18.000 giri/min
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la chiave di serraggio
- ordinare separatamente l'unità di adduzione refrigerante



d3	d1	d2 mm	l1 mm	SW mm	kg	Codice
HSK-A 63	1,0-16	50,000	98,000	4,0	1,900	16,063
HSK-A 100	1,0-16	50,000	104,000	4,0	3,300	16,100

Attacchi utensili

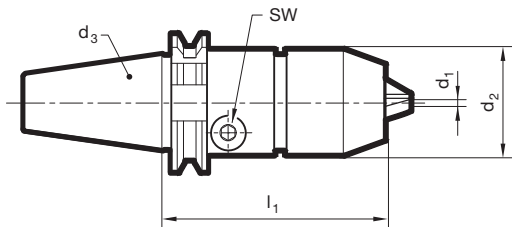
Mandrini portapunte CN ISO DIN 96871 raffreddamento interno



Catalogo n° 78242



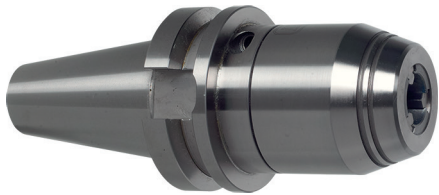
- per il serraggio di tutti i codoli cilindrici
- SK a DIN ISO 7388-1 Forma AD
- gamma di serraggio \varnothing continua
- alta forza di serraggio attraverso ingranaggio a vite robusto
- pressione refrigerante max. 50 bar
- i mandrini NC sono adatti per giri fino a 7.000 giri/min. Per equilibratura fine ottimale fino ad un max. di 18.000 giri/min
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la chiave di serraggio
- ordinare separatamente i perni



d3	d1	d2 mm	l1 mm	SW mm	kg	Codice
SK 40	1,0-16	50,000	80,000	4,0	1,557	16,040
SK 50	1,0-16	50,000	80,000	4,0	3,500	16,050

Attacchi utensili

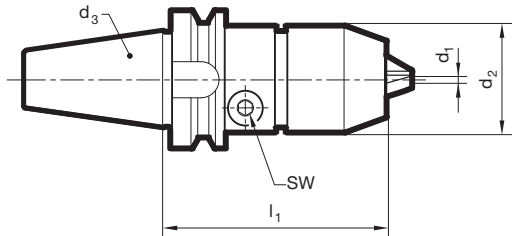
Mandrini portapunte CN MAS/BT con raffreddamento interno



Catalogo n° 78240



- per il serraggio di tutti i codoli cilindrici
- MAS/BT a DIN ISO 7388-2 Forma JD
- gamma di serraggio \varnothing continua
- alta forza di serraggio attraverso ingranaggio a vite robusto
- pressione refrigerante max. 50 bar
- i mandrini NC sono adatti per giri fino a 7.000 giri/min. Per equilibratura fine ottimale fino ad un max. di 18.000 giri/min
- adatto anche per utensili con refrigerazione interna
- Dotazione:
- compresa la chiave di serraggio
- ordinare separatamente i perni



d3	d1	d2 mm	l1 mm	SW mm	kg	Codice
BT 40	1,0-16	50,000	88,000	4,0	1,500	16,040
BT 50	1,0-16	50,000	99,000	4,0	3,500	16,050

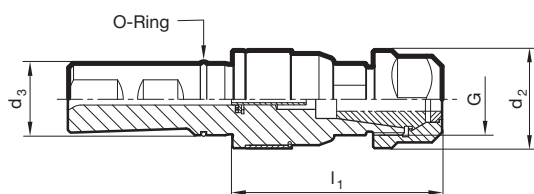
Mandrini per maschiatura sincrona

Mandrini di maschiatura sincrona cil. con raffr. interno



Catalogo n° 78326

- compensazione degli errori di sincronizzazione
- la minima lunghezza di compensazione in spinta e trazione bilancia le piccole differenze tra mandrini synchro e maschi e aumenta la qualità della filettatura e la vita utensile
- la vite di regolazione consente 2-3 mm di regolazione
- adatto per refrigerazione interna
- pressione refrigerante max. 50 bar
- Dotazione:
- compreso manicotto IC/ER chiuso a tenuta stagna
- compresa chiave di regolazione per viti di regolazione
- viti di regolazione „plan“ catalogo-Nr. 78364, pinza a filettare catalogo-Nr. 78308, mole catalogo-Nr. 78335 e chiavi di serraggio da ordinare separatamente



d3 mm	Grandezza nom.	d2 mm	G	l1 mm	± mm	Momento torc. Nm	kg	Codice
25,000	ER20	34,000	M25 X1,5	73,000	0,150	40	0,591	20,025
25,000	ER32	50,000	M40 X1,5	87,500	0,150	170	1,300	32,025

Mandrini per maschiatura sincrona

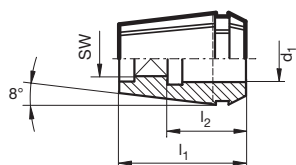
Pinza di serraggio



Catalogo n° 78308



- per il serraggio di utensili a filettare con codolo quadro in mandrini Synchro o pinze



Grandezza nom.	d1 mm	SW mm	l1 mm	l2 mm	Codice
ER20	4,000	3,2	31,500	18,000	4,020
ER20	4,500	3,4	31,500	18,000	4,520
ER20	5,500	4,3	31,500	18,000	5,520
ER20	6,000	4,9	31,500	18,000	6,020
ER20	7,000	5,5	31,500	18,000	7,020
ER20	8,000	6,2	31,500	22,000	8,020
ER20	9,000	7,0	31,500	22,000	9,020
ER20	10,000	8,0	31,500	25,000	10,020
ER20	11,000	9,0	31,500	25,000	11,020
ER32	4,000	3,2	40,000	18,000	4,032
ER32	4,500	3,4	40,000	18,000	4,532
ER32	5,500	4,3	40,000	18,000	5,532
ER32	6,000	4,9	40,000	18,000	6,032
ER32	7,000	5,5	40,000	18,000	7,032
ER32	8,000	6,2	40,000	22,000	8,032
ER32	9,000	7,0	40,000	22,000	9,032
ER32	10,000	8,0	40,000	25,000	10,032
ER32	11,000	9,0	40,000	25,000	11,032
ER32	12,000	9,0	40,000	25,000	12,032
ER32	14,000	11,0	40,000	25,000	14,032
ER32	16,000	12,0	40,000	25,000	16,032
ER32	18,000	14,5	40,000	25,000	18,032
ER32	20,000	16,0	40,000	28,000	20,032

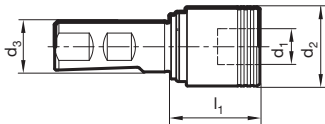
Mandrini per maschiatura sincrona

Mandrini di masch. cambio rapido no refrig. interno



- i mandrini a cambio rapido di filettatura sono equipaggiati con bussole a compensazione assiale, guidate su sfere, che pareggiano la differenza tra avanzamento del mandrino e passo del filetto

Catalogo n° 78340



Grandezza nom.	d1 mm	d2 mm	d3 mm	l1 mm	± mm	kg	Codice
M3-M12	19,000	36,000	25,000	39,000	7,500	0,431	19,025
M8-M20	31,000	53,000	25,000	63,000	10,000	0,900	31,025

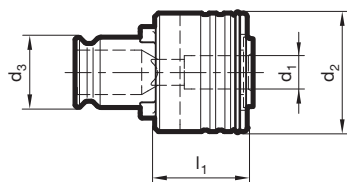
Mandrini per maschiatura sincrona

Attacchi intercambiabili per mandrini



Catalogo n° 78206

- con giunto di sicurezza
- adatto per utensili a filettare in HSS
- per utensili a filettare in MD è necessaria una scanalatura sul codolo per garantire un arresto aggiuntivo dell'utensile
- adatto per refrigerazione interna
- pressione refrigerante max. 50 bar



Grandezza nom.	d1 mm	SW mm	d3 mm	d2 mm	l1 mm	Codice
M3-M12	2,200		19,000	32,000	25,000	19,022
M3-M12	2,500	2,1	19,000	32,000	25,000	19,025
M3-M12	2,800	2,1	19,000	32,000	25,000	19,028
M3-M12	3,500	2,7	19,000	32,000	25,000	19,035
M3-M12	4,000	3,0	19,000	32,000	25,000	19,040
M3-M12	4,500	3,4	19,000	32,000	25,000	19,045
M3-M12	5,500	4,5	19,000	32,000	25,000	19,055
M3-M12	6,000	4,9	19,000	32,000	25,000	19,060
M3-M12	7,000	5,5	19,000	32,000	25,000	19,070
M3-M12	8,000	6,2	19,000	32,000	25,000	19,080
M3-M12	9,000	7,0	19,000	32,000	25,000	19,090
M3-M12	10,000	8,0	19,000	32,000	25,000	19,100
M8-M20	6,000	4,9	31,000	50,000	34,000	31,060
M8-M20	7,000	5,5	31,000	50,000	34,000	31,070
M8-M20	8,000	6,2	31,000	50,000	34,000	31,080
M8-M20	9,000	7,0	31,000	50,000	34,000	31,090
M8-M20	10,000	8,0	31,000	50,000	34,000	31,100
M8-M20	11,000	9,0	31,000	50,000	34,000	31,110
M8-M20	12,000	9,0	31,000	50,000	34,000	31,120
M8-M20	14,000	11,0	31,000	50,000	34,000	31,140
M8-M20	16,000	12,0	31,000	50,000	34,000	31,160

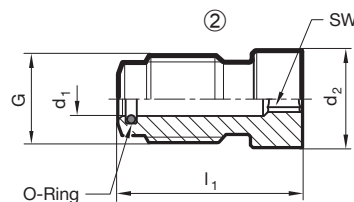
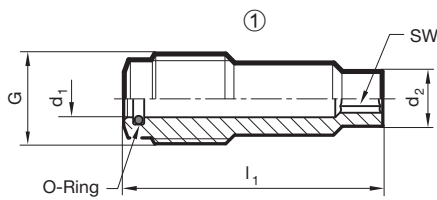
Mandrini per maschiatura sincrona

Viti di regolazione „plan“ per masch. sincro con raffr. interno



Catalogo n° 78364

- per mandrini Synchro con codolo cilindrico catalogo-Nr. 78326
- per refrigerazione interna convenzionale
- con arresto piatto per normali estremità del codolo
- posizionare la vite di regolazione sul codolo del maschio
- la vite di regolazione della lunghezza consente 3 mm di registrazione
- Dotazione:
- con anelli a tenuta stagna sicura



Grandezza nom.	□ mm	G	d1 mm	d2 mm	l1 mm	SW mm	Tipo	Codice
ER20	4,900	M 8X1	3,600	4,800	26,000	2,5	1	6,020
ER20	5,500	M 8X1	3,600	5,400	25,800	2,5	1	7,020
ER20	6,200	M 8X1	3,600	6,100	20,900	2,5	1	8,020
ER20	7,000	M 8X1	3,600	6,900	20,250	2,5	1	9,020
ER20	8,000	M 8X1	3,600	7,800	15,800	2,5	2	10,020
ER20	9,000	M 8X1	3,600	8,800	14,800	2,5	2	11,020
ER32	4,900	M10X1	4,100	4,800	34,000	3,0	1	6,032
ER32	5,500	M10X1	4,100	5,400	33,800	3,0	1	7,032
ER32	6,200	M10X1	4,100	6,100	28,800	3,0	1	8,032
ER32	7,000	M10X1	4,100	6,900	28,250	3,0	1	9,032
ER32	8,000	M10X1	4,100	7,800	23,800	3,0	1	10,032
ER32	9,000	M10X1	4,100	8,800	22,900	3,0	1	11,032
ER32	11,000	M10X1	4,100	10,800	20,650	3,0	2	14,032
ER32	12,000	M10X1	4,100	11,800	19,650	3,0	2	16,032
ER32	14,500	M10X1	4,100	14,300	18,000	3,0	2	18,032

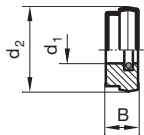
Mandrini per maschiatura sincrona

Dischi di tenuta



- Il campo di applicazione del disco di tenuta catalogo.Nr. 78335 va da un Ø nominale d1 fino alla misura successiva minore, cioè per un Ø di 6,3 mm (grandezza nominale ER20) deve essere ordinato un disco di tenuta mit d1 = 6,5 mm (codice 06,520).

Catalogo n° 78335



Grandezza nom.	d1 mm	d2 mm	l1 mm	Codice
ER 16	3,000	13,000	4,000	3,016
ER 16	3,500	13,000	4,000	3,516
ER 16	4,000	13,000	4,000	4,016
ER 16	4,500	13,000	4,000	4,516
ER 16	5,000	13,000	4,000	5,016
ER 16	5,500	13,000	4,000	5,516
ER 16	6,000	13,000	4,000	6,016
ER 16	6,500	13,000	4,000	6,516
ER 16	7,000	13,000	4,000	7,016
ER 16	7,500	13,000	4,000	7,516
ER 16	8,000	13,000	4,000	8,016
ER 16	8,500	13,000	4,000	8,516
ER 16	9,000	13,000	4,000	9,016
ER 16	9,500	13,000	4,000	9,516
ER 16	10,000	13,000	4,000	10,016
ER 20	3,000	16,000	4,000	3,020
ER 20	3,500	16,000	4,000	3,520
ER 20	4,000	16,000	4,000	4,020
ER 20	4,500	16,000	4,000	4,520
ER 20	5,000	16,000	4,000	5,020
ER 20	5,500	16,000	4,000	5,520
ER 20	6,000	16,000	4,000	6,020
ER 20	6,500	16,000	4,000	6,520
ER 20	7,000	16,000	4,000	7,020
ER 20	7,500	16,000	4,000	7,520
ER 20	8,000	16,000	4,000	8,020
ER 20	8,500	16,000	4,000	8,520
ER 20	9,000	16,000	4,000	9,020
ER 20	9,500	16,000	4,000	9,520
ER 20	10,000	16,000	4,000	10,020
ER 20	10,500	16,000	4,000	10,520
ER 20	11,000	16,000	4,000	11,020
ER 20	11,500	16,000	4,000	11,520
ER 20	12,000	16,000	4,000	12,020
ER 20	12,500	16,000	4,000	12,520
ER 20	13,000	16,000	4,000	13,020
ER 25	3,000	21,000	4,000	3,025
ER 25	3,500	21,000	4,000	3,525
ER 25	4,000	21,000	4,000	4,025
ER 25	4,500	21,000	4,000	4,525
ER 25	5,000	21,000	4,000	5,025
ER 25	5,500	21,000	4,000	5,525

Grandezza nom.	d1 mm	d2 mm	l1 mm	Codice
ER 25	6,000	21,000	4,000	6,025
ER 25	6,500	21,000	4,000	6,525
ER 25	7,000	21,000	4,000	7,025
ER 25	7,500	21,000	4,000	7,525
ER 25	8,000	21,000	4,000	8,025
ER 25	8,500	21,000	4,000	8,525
ER 25	9,000	21,000	4,000	9,025
ER 25	9,500	21,000	4,000	9,525
ER 25	10,000	21,000	4,000	10,025
ER 25	10,500	21,000	4,000	10,525
ER 25	11,000	21,000	4,000	11,025
ER 25	11,500	21,000	4,000	11,525
ER 25	12,000	21,000	4,000	12,025
ER 25	12,500	21,000	4,000	12,525
ER 25	13,000	21,000	4,000	13,025
ER 25	13,500	21,000	4,000	13,525
ER 25	14,000	21,000	4,000	14,025
ER 25	14,500	21,000	4,000	14,525
ER 25	15,000	21,000	4,000	15,025
ER 25	15,500	21,000	4,000	15,525
ER 25	16,000	21,000	4,000	16,025
ER 32	3,000	27,000	4,000	3,032
ER 32	3,500	27,000	4,000	3,532
ER 32	4,000	27,000	4,000	4,032
ER 32	4,500	27,000	4,000	4,532
ER 32	5,000	27,000	4,000	5,032
ER 32	5,500	27,000	4,000	5,532
ER 32	6,000	27,000	4,000	6,032
ER 32	6,500	27,000	4,000	6,532
ER 32	7,000	27,000	4,000	7,032
ER 32	7,500	27,000	4,000	7,532
ER 32	8,000	27,000	4,000	8,032
ER 32	8,500	27,000	4,000	8,532
ER 32	9,000	27,000	4,000	9,032
ER 32	9,500	27,000	4,000	9,532
ER 32	10,000	27,000	4,000	10,032
ER 32	10,500	27,000	4,000	10,532
ER 32	11,000	27,000	4,000	11,032
ER 32	11,500	27,000	4,000	11,532
ER 32	12,000	27,000	4,000	12,032
ER 32	12,500	27,000	4,000	12,532
ER 32	13,000	27,000	4,000	13,032
ER 32	13,500	27,000	4,000	13,532
ER 32	14,000	27,000	4,000	14,032
ER 32	14,500	27,000	4,000	14,532
ER 32	15,000	27,000	4,000	15,032
ER 32	15,500	27,000	4,000	15,532
ER 32	16,000	27,000	4,000	16,032
ER 32	16,500	27,000	4,000	16,532
ER 32	17,000	27,000	4,000	17,032
ER 32	17,500	27,000	4,000	17,532
ER 32	18,000	27,000	4,000	18,032
ER 32	18,500	27,000	4,000	18,532
ER 32	19,000	27,000	4,000	19,032
ER 32	19,500	27,000	4,000	19,532
ER 32	20,000	27,000	4,000	20,032
ER 40	3,500	33,500	4,000	3,540
ER 40	4,000	33,500	4,000	4,040
ER 40	4,500	33,500	4,000	4,540
ER 40	5,000	33,500	4,000	5,040
ER 40	5,500	33,500	4,000	5,540
ER 40	6,000	33,500	4,000	6,040
ER 40	6,500	33,500	4,000	6,540
ER 40	7,000	33,500	4,000	7,040
ER 40	7,500	33,500	4,000	7,540
ER 40	8,000	33,500	4,000	8,040
ER 40	8,500	33,500	4,000	8,540
ER 40	9,000	33,500	4,000	9,040
ER 40	9,500	33,500	4,000	9,540
ER 40	10,000	33,500	4,000	10,040
ER 40	10,500	33,500	4,000	10,540
ER 40	11,000	33,500	4,000	11,040

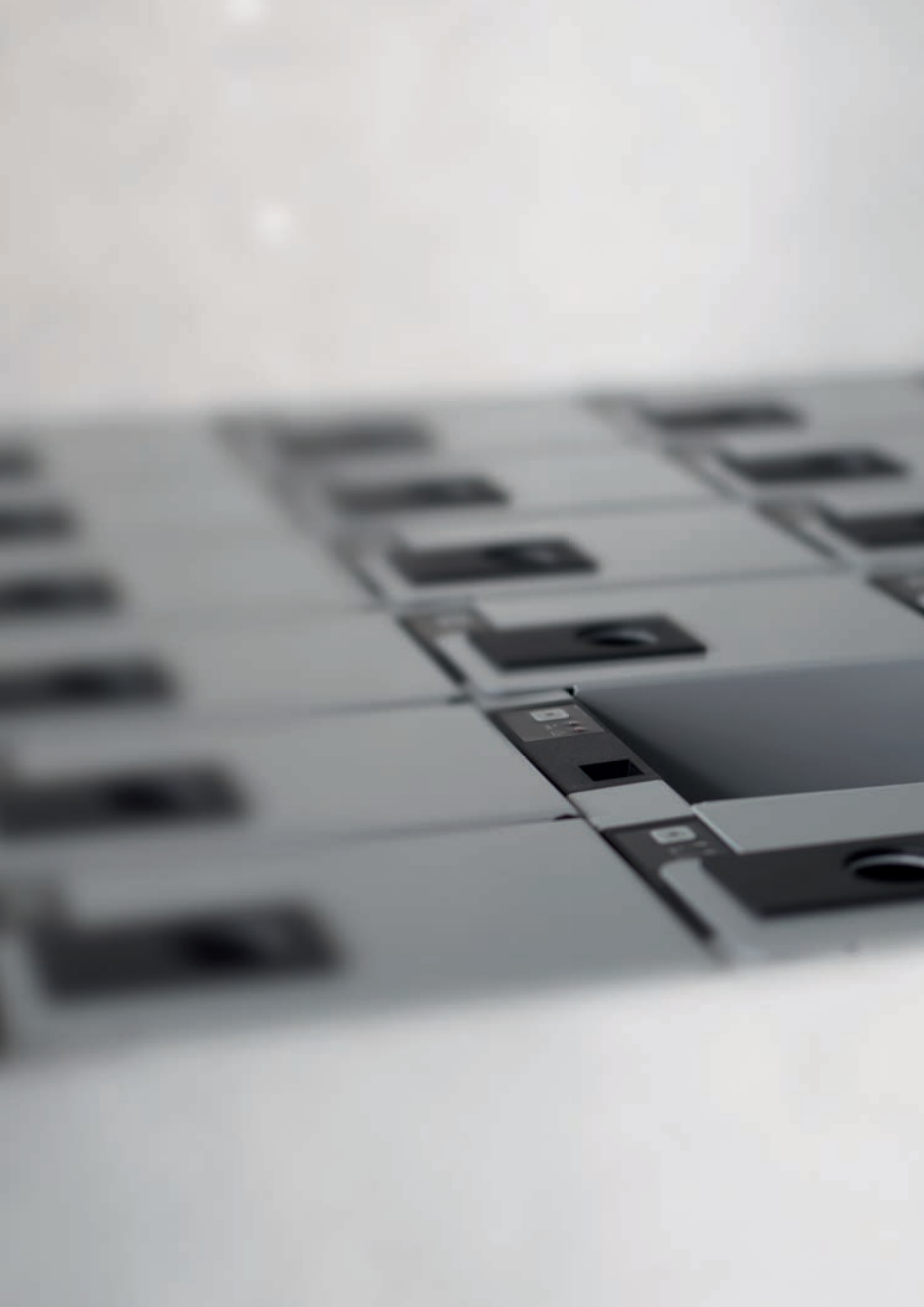
Grandezza nom.	d1 mm	d2 mm	l1 mm	Codice
ER 40	11,500	33,500	4,000	11,540
ER 40	12,000	33,500	4,000	12,040
ER 40	12,500	33,500	4,000	12,540
ER 40	13,000	33,500	4,000	13,040
ER 40	13,500	33,500	4,000	13,540
ER 40	14,000	33,500	4,000	14,040
ER 40	14,500	33,500	4,000	14,540
ER 40	15,000	33,500	4,000	15,040
ER 40	15,500	33,500	4,000	15,540
ER 40	16,000	33,500	4,000	16,040
ER 40	16,500	33,500	4,000	16,540
ER 40	17,000	33,500	4,000	17,040
ER 40	17,500	33,500	4,000	17,540
ER 40	18,000	33,500	4,000	18,040
ER 40	18,500	33,500	4,000	18,540
ER 40	19,000	33,500	4,000	19,040
ER 40	19,500	33,500	4,000	19,540
ER 40	20,000	33,500	4,000	20,040
ER 40	20,500	33,500	4,000	20,540
ER 40	21,000	33,500	4,000	21,040
ER 40	21,500	33,500	4,000	21,540
ER 40	22,000	33,500	4,000	22,040
ER 40	22,500	33,500	4,000	22,540
ER 40	23,000	33,500	4,000	23,040
ER 40	23,500	33,500	4,000	23,540
ER 40	24,000	33,500	4,000	24,040
ER 40	24,500	33,500	4,000	24,540
ER 40	25,000	33,500	4,000	25,040
ER 40	25,500	33,500	4,000	25,540
ER 40	26,000	33,500	4,000	26,040

STOCK UTENSILI SPECIALI

Soluzioni speciali per richieste individuali



Moduli di richiesta a pagina 816.





DISTRIBUTORE AUTOMATICO



TSC mini



Il TSC mini è un sistema controllato elettronicamente a moduli estendibili con tutte le funzionalità del software TSC.

I cassetti elettronicamente bloccabili permettono il prelievo degli utensili in modo controllato. L' altezza degli scomparti e dei cassetti possono essere adattati alle esigenze del cliente.

Sistema per Portautensili



Scomparti elettronici

Scomparti per Inserti



Scomparti Regolabili

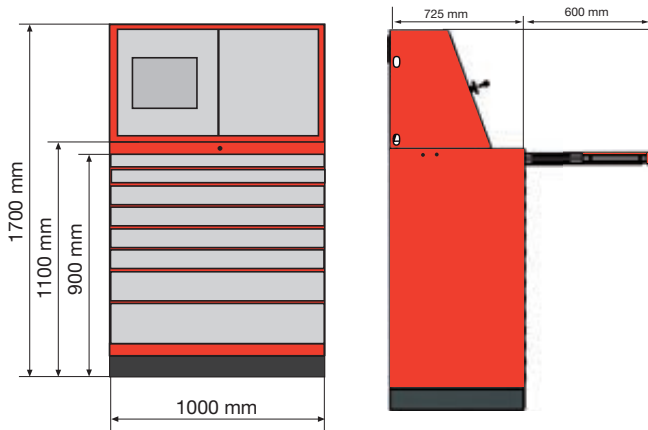


Scomparti Semplici

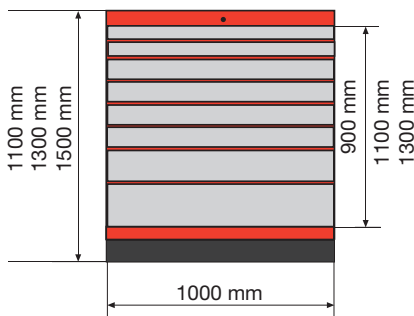


TSC mini - Opzioni e Dimensioni

Unità Base



- Sistema di distribuzione elettronicamente controllato in acciaio
- Cassetti estraibili manualmente e completamente estraibili (portata max. 200 Kg per cassetto)
- Differenti altezze dei cassetti
- Divisori per ogni tipologia di cassetto
- Software TSC
- PC con sistema operativo MS Windows
- Scanner di codici a barre
- Sistema aperto (possono esistere più fornitori)
- E' possibile controllare dall' unità base estensioni anche di altri sistemi (TSC maxi, TSC midi)
- Trasportabile con muletto
- Voltaggio : 230 V / 50 Hz
- Personalizzabile, su richiesta, con colori in base allo standard RAL



Unità Aggiuntiva

- Sistema di distribuzione utensili elettronicamente controllato in acciaio
- Cassetti estraibili manualmente e completamente estraibili (portata max. 200 Kg per cassetto)
- Differenti altezze dei cassetti
- Divisori per ogni tipologia di cassetto
- Disponibile in tre differenti altezze: 1100 mm / 1300 mm / 1500 mm

• Cassetti Standard

Dimensioni interne: 600 x 900 mm

Altezze: 75 mm / 100 mm / 125 mm / 150 mm
200 mm / 250 mm / 300 mm / 400 mm

Tipologie Cassetti Disponibili

- Tappetino Anti-Scivolo
- Scomparti Regolabili
- Scomparti per Inserti
- Scomparti Semplici
- Sistema per Portautensili

• Cassetti con Spirali

Altezza cassetto: 150 mm

Numero massimo di spirali: 10

Il cassetto di ritiro presenta 3 scomparti con serratura manuale

Altezza Cassetto : 150 mm

• Cassetti con scomparti elettronicamente bloccati

Altezze disponibili: 75 / 100 / 150 / 200 / 250 mm

Scomparti per Cassetto	Dim. Int. Scomparto Largh. x Profon.	Disposizione Scomparti Largh. x Profon.
4	440 mm x 259 mm	2 x 2
8	440 mm x 125 mm	2 x 4
12	440 mm x 75 mm	2 x 6
12	225 mm x 200 mm	3 x 4
16	220 mm x 125 mm	4 x 4
18	146 mm x 175 mm	6 x 3
20	220 mm x 95 mm	4 x 5
24	146 mm x 125 mm	6 x 4
24	220 mm x 75 mm	4 x 6
32	109 mm x 125 mm	8 x 4
36	146 mm x 75 mm	6 x 6
40	109 mm x 95 mm	8 x 5
48	109 mm x 75 mm	8 x 6

TSC midi



Il TSC midi fornisce il pieno controllo del prelievo degli utensili in quanto i cassetti si aprono solo in base alla quantità del prodotto selezionato in precedenza. Associando ai prelievi un centro di costo si ottiene la massima trasparenza.

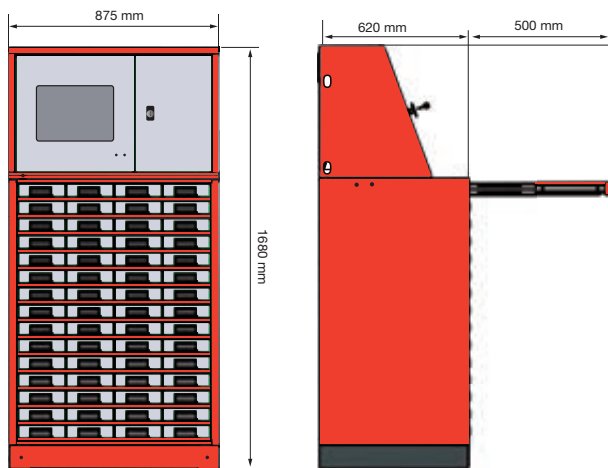
Tipologia di Cassetti

La configurazione dei cassetti è variabile e quindi può essere adattata alle esigenze del cliente.

Altezze Effettive Possibili: 42 / 60 / 113 / 186 / 258 mm

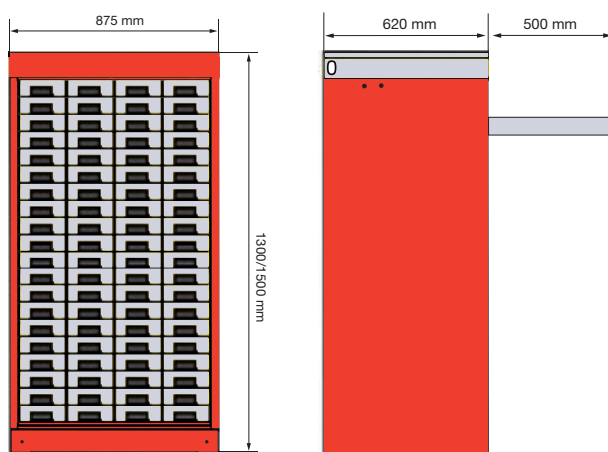
Altezze Effettive Possibili: 50 mm / 8 Schubladen cassetti per livello
110 mm / 5 Schubladen cassetti per livello
150 mm / 4 Schubladen cassetti per livello
215 mm / 3 Schubladen cassetti per livello
350 mm / 2 Schubladen cassetti per livello

TSC midi - Opzioni e dimensioni



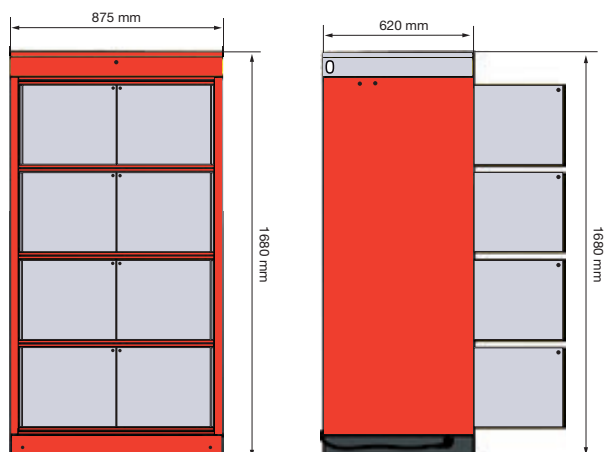
Unità Base

- Sistema di distribuzione elettronicamente controllato in acciaio
- Cassetti estraibili manualmente e completamente estraibili (portata max. 200 Kg per cassetto)
- Differenti altezze dei cassetti
- Software TSC
- PC con sistema operativo MS Windows
- Scanner di codici a barre
- Sistema aperto (possono esistere più fornitori)
- E' possibile controllare dall' unità base estensioni anche di altri sistemi (TSC maxi, TSC midi)
- Trasportabile con muletto
- Voltaggio : 230 V / 50 Hz
- Personalizzabile, su richiesta, con colori in base allo standard RAL



Unità Aggiuntiva con cassetti

- due differenti configurazioni (1300 mm / 1500 mm)
- Sistema di distribuzione elettronicamente controllato in acciaio
- Cassetti estraibili manualmente con estrazione elettronicamente limitata (portata max. 20 Kg per cassetto)
- Altezza e larghezza cassetti standard



Unità Aggiuntiva con cassetti elettronicamente bloccati

- 8 o 16 scomparti elettronicamente bloccati
- 8 Scomparti 360 x 340 x 590 mm (BxHxT)
- 16 Scomparti 360 x 150 x 590 mm (BxHxT)

TSC maxi

Il TSC maxi è la soluzione perfetta per immagazzinare grosse quantità di utensili in uno spazio ridotto. Nel sistema a spirale del TSC maxi, gli utensili sono immagazzinati in modo da occupare il minor spazio possibile, mantenendo però l'assoluta sicurezza. Durante il prelievo gli utensili vengono rilasciati attraverso un sistema di sollevamento.

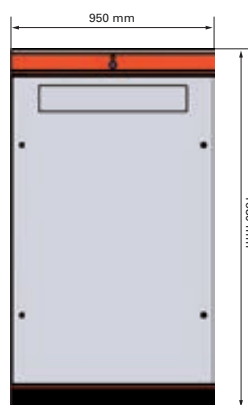


TSC maxi - Opzioni e dimensioni



Unità di Controllo

- 3 Cassetti manuali
- Software TSC
- PC con sistema operativo MS Windows
- Scanner di codici a barre
- Sistema aperto (possono esistere più fornitori)
- E' possibile controllare dall' unità base estensioni anche di altri sistemi (TSC maxi, TSC midi)
- Trasportabile con muletto
- Voltaggio : 230 V / 50 Hz
- Personalizzabile, su richiesta, con colori in base allo standard RAL



Unità di Erogazione/ Stoccaggio

- Principio di prelievo: FIFO
- Portata per ogni livello di spirale: 90 Kg
- Cassetto di ritiro situato nella parte alta dell' unità
- Sistema di sollevamento adattato per la distribuzione di utensili

- **Livelli di Spirale**

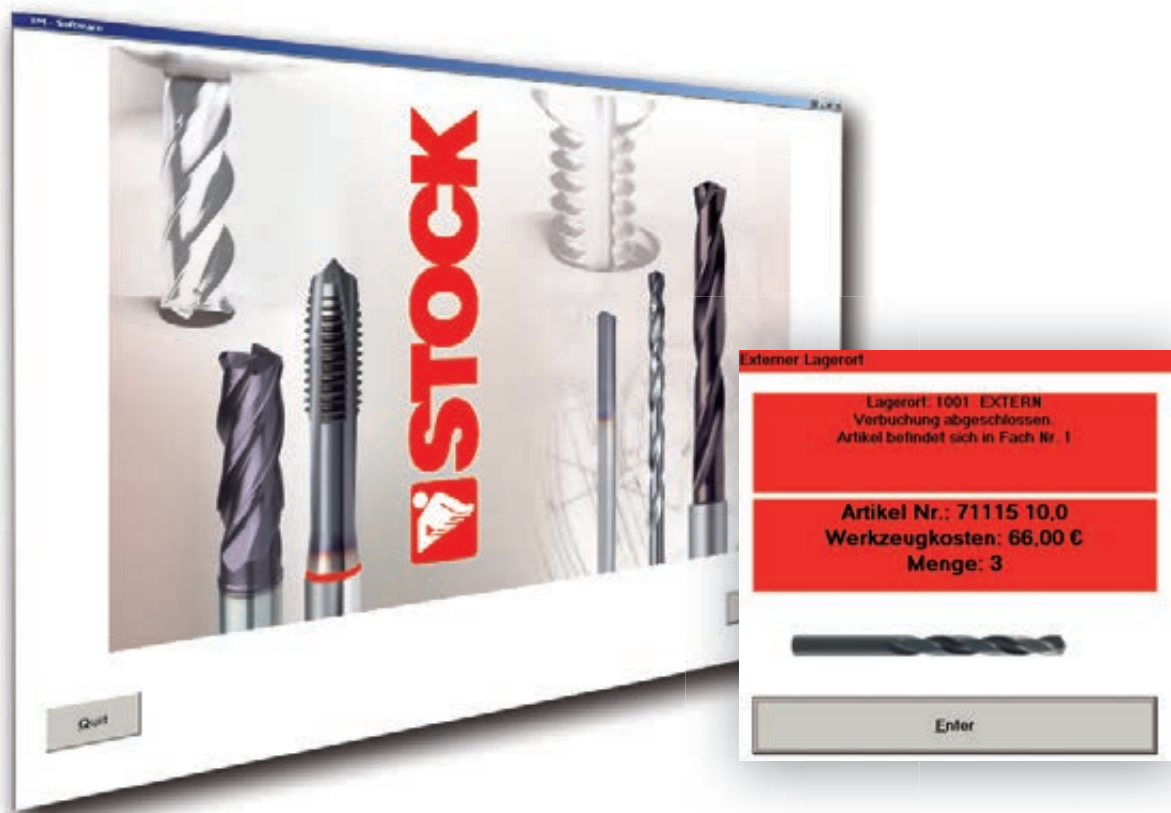
6 / 7 / 8 fino a 10 spirali per livello

- **Partizioni a Spirale**

9 / 13 / 15 / 21 / 24 / 31 ubicazioni

Materiale di separazione, per una gestione ottimale dei prodotti, su richiesta.

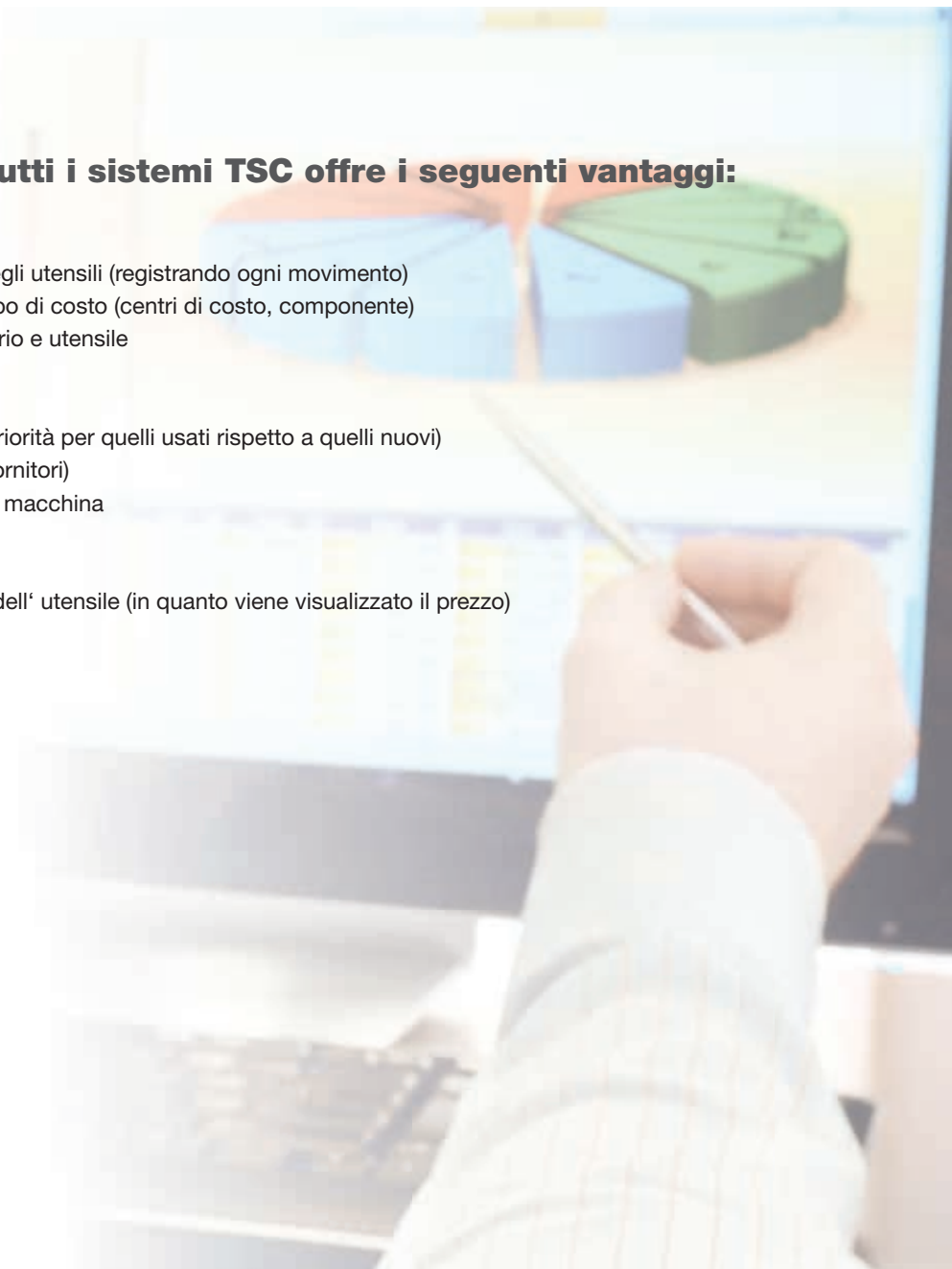
TSC Software



Il software può essere collegato con tutti i sistemi gestionali ERP. Inoltre, c'è la possibilità di controllare e gestire il sistema tramite una terza parte come un paternoster o magazzini verticali. E' possibile anche integrare il software con una struttura già esistente, anche dopo una prima installazione.

Il Software standard per tutti i sistemi TSC offre i seguenti vantaggi:

- Semplice e intuitivo
- Monitoraggio continuo del consumo degli utensili (registrando ogni movimento)
- Attribuzione dei costi utensile per gruppo di costo (centri di costo, componente)
- Analisi ABC, centri di costo/costo unitario e utensile
- Interfaccia con sistemi gestionali ERP
- Connessione via internet con i fornitori
- Gestione degli utensili ri-lavorati (con priorità per quelli usati rispetto a quelli nuovi)
- Sistema aperto (possono esistere più fornitori)
- Gestione degli utensili non ubicati nella macchina
- Gestione della riaffilatura
- Calibrazione
- Consapevolezza dell' utente sul costo dell' utensile (in quanto viene visualizzato il prezzo)



9 S 20

1010

ISO

1.7149

1 1/2

HSCO
HSS-E

bright

TiN

K20-K40

+34

H11

CO content
[M-%]

pitch
P

X 53
CrMnNiN
21 9

BT (min)

SCR 415 (H)

<700°

$9,3 \cdot 10^{-6}$

N7



TABELLE

Materiali taglienti

I più importanti gruppi di metallo duro

Tipo	Contenuto di Co [M-%]	Grandezza grana WC [µm]	Durezza [HV]	Classificazione ISO [ISO 513]	Caratteristiche
DK460UF	10	0,5	1620	K20-K40 ricoperto: P, M20-M40, H, S, N25	Tipo per impiego molto vasto, che, prevalentemente ricoperto, si impiega per lavorare acciai, leghe tenere di Al, ghise, ma anche superleghe come inconel 718. Questo tipo rappresenta la colonna vertebrale della nostra produzione.
DK500UF	12	0,5	1680	K25 ricoperto: P, M, H, S, N25	Questo tipo è stato sviluppato specificatamente per la lavorazione di materiali temprati. Si distingue, rispetto al Dk 460 UF, per durezza superiore e grosse tolleranze di deformazione. Per l'elevato contenuto di Co si consiglia assolutamente di impiegarlo ricoperto.
DK255F	8	0,7	1720	K20 ricoperto: P, M, H, S, N20	Questo tipo è consigliato per lavorare materiali temprati, tipi di ghise molto dure e leghe dure di Al-Si. E' possibile la lavorazione a secco. E' preferibile impiegarlo ricoperto.
DK120	6	1,3	1620	K15 ricoperto: N15	Questo tipo è adatto specialmente per l'impiego con ricopertura diamantata.
DK120UF	7	0,5	1850	K05	Tipo a grana ultra fine con massima resistenza all'usura, adatto per macchine assolutamente stabili, preferito per alesatori.
K55SF	9	0,2 -0,5	1920	K10-K30	Per l'impiego con materiali molto resistenti all'usura, acciai inossidabili, materiali compositi, come kevlar o fibre di vetro rinforzate, lavorazione ad alta velocità e lavorazione a secco.
DK400N	10	0,7	1580	K35M ricoperto: P, M, S, N35M	Tipo molto plastico per la lavorazione di metalli resistenti alle alte temperature.

Acciai super rapidi

Produciamo utensili HSS solo con materiali taglienti di alto valore.

Con la scelta mirata degli elementi di lega, i nostri utensili acquistano le proprietà ottimali per i singoli lavori.

Wolframio: aumenta la rinvenibilità e la resistenza all'usura.

Molibdeno: migliora la plasticità. Vanadio: aumenta la resistenza all'usura per utensili di finitura.

Cobalto: consente superiori temperature nella tempera ed aumenta quindi la resistenza al calore.

Designazione	Designazione acciaio	Nr. materiali (chiave x acciai)	Campo di impiego, proprietà	Acciai esteri corrispondenti					
				USA	Francia	Italia	Gran Bretagna	China	Japan
HSS	HS 6-5-2 (DMo5)	1.3343	Materiale tagliente standard per impiego universale	M 2	Z 90 WDCV 06-05-04-02	HS 6-5-2	BM 2	W6Mo5 Cr4V2	SKH51
HSCO HSS-E	HS 6-5-2-5 (EMo5Co5)	1.3243	Alta resistenza al calore, adatti soprattutto per sgrossare o con refrigerazione insufficiente	M 35	Z 90 WDKCV 06-05-05-04-02	HS 6-5-2-5	BM 35	W6Mo5 Cr4V2Co5	SKH55
HSS-E	HS 6-5-3 (EMo5V3)	1.3344	Alta stabilità degli spigoli taglienti, importante in alesatura	M 3	Z 120 WDCV 06-05-04-03	HS 6-5-3	-	W6Mo5 Cr4V3	SKH52
M42 HSS-E	HS 2-9-1-8	1.3247	Elevata resistenza al calore e durezza, adatti per lavorare in materiali di difficile truciolabilità	M 42	Z 110 DKCWV 09-08-04-02-01	HS 2-9-1-8	BM 42	W2Mo9Cr4 VCo8	SKH59
HSS-E-PM	10-2-5-8 PM52 HS 6-5-3-8 PM30	1.3253 1.3294	Alta durezza, resistenza al calore e stabilità degli spigoli taglienti, struttura molto spessa e costante	-	-	-	-	-	-

Finitura superficiale, rivestimento

Indice base stesso codolo

lucido

Utensili di acciaio super rapido o in metallo duro offrono anche senza trattamenti superficiali e rivestimenti già in generale buone prestazioni. In ogni caso gli utensili lucidi del programma standard offrono la possibilità di un rivestimento economico a scelta del cliente tra tutti i rivestimenti.

vaporizzati-nitruati

nitruati sulle fasi

Valori consigliati per la lavorazione di materiali come ghisa grigia e alluminio con alto contenuto di silicio materie plastiche acciai con alti contenuti di perlite. I nitruati seguono diversi orientamenti di impiego.

Superfici trattamento di raffinazione

Per casi specifici si consiglia una finitura superficiale che elevi la resistenza alla fessurazione e la scorrevolezza e che diminuisca gli attriti. Qui rivestimenti duri perdono ogni significato di finitura superficiale, mentre rivestimenti teneri forniscono risultati molto migliori.

trattati a vapore

Utensili trattati al vapore o saldati come per la lavorazione di acciai a basso contenuto di carbonio possono essere esentati da rivestimenti. Questi sono in ogni caso esclusivamente impiegati per la lavorazione di materiali ferrosi.

I rivestimenti

	AlTiN	AlTiN + AlTiN nano	TiSiN	TiCN	DLC	Diamant
colore	violetto	grigiovioletto	ramato	grigiovioletto	nero	antracite
durezza	3200 HV	3400 HV	4000 HV	3000 HV	> 6000 HV	> 8000 HV
coefficiente di attrito	0,55	0,6	0,5	0,4	< 0,1	< 0,1
max. temperatura di impiego	< 800°	< 900°	< 800°	< 400°	< 700°	< 700°
descrizione breve	durezza rivestimento per applicazioni abrasive HPC e MMS	durezza rivestimento per truciolatura difficile HPC come anche MMS	rivestimento molto duro e resistente alle fessurazioni	rivestimento durezza tenace	rivestimento estremamente duro	rivestimento diamantato estremamente duro

	TiAlN/ TiAlN nano	AlCrN	TiN	TiAlSiN	AlTiZrN	CrN
colore	violetto	grigio-blu	orogiallo	rossobronzo	oro pallido	grigio metallizzato
durezza	3300 - HV	3200 HV	2300 - HV	5500 - HV	3400 HV	3500 HV
coefficiente di attrito	0,6	0,35	0,5	0,55	0,5	0,6
max. temperatura di impiego	< 800°	< 1100°	< 600°	< 800°	< 800°	< 1000°
descrizione breve	rivestimento multistrato anti fessurazione anche per lavorazioni con lubrificazione minimale	rivestimento resistente alle fessurazioni alle ossidazioni e al calore	rivestimento standard economico	rivestimento multistrato duro e resistente al calore	rivestimento duro e resistente alle fessurazioni	rivestimento duro resistente al calore

Informazioni basilari della filettatura

Imbocco, scelta ed impiego

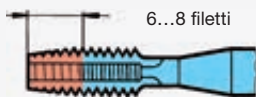
Nel filettare internamente, l'intero lavoro di truciolatura grava sui denti dell'imbocco. Di conseguenza la scelta della forma di imbocco più adatta deve essere molto accurata, poichè da essa dipende non solo la durata del maschio, ma anche la qualità della filettatura.

La forma e la lunghezza dell'imbocco dipendono principalmente dal tipo di preforo, se passante o cieco. Il foro passante non richiede ulteriori definizioni. Al contrario con il termine foro cieco sono indicate tutte le forature nelle quali lo scarico del truciolo è in direzione contraria a quella dell'avanzamento ed esso deve quindi essere tagliato nel ritorno del maschio. Fori ciechi possono anche essere forature passanti.

Anche la lunghezza dell'imbocco deve essere ben ponderata. Per evitare sovraccarichi, blocchi e filettature troppo grosse, non si deve tenere troppo basso il numero dei denti del filetto. D'altra parte un imbocco troppo lungo aumenta il momento di torsione e quindi fa insorgere pericolo di rottura. L'imbocco corretto forma B permette che lo scarico del truciolo avvenga nella direzione dell'avanzamento.

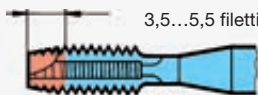
Forme di imbocco a DIN 2197

Forma A



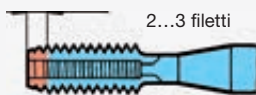
lunga, 6 - 8 filetti
per fori passanti corti

Forma B



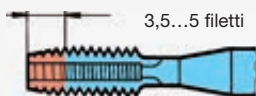
media, 3,5 - 5,5 filetti,
con imbocco corretto,
per tutti i fori passanti e
grosse profondità di filettatura in materiali
a truciolo medio e lungo

Forma C



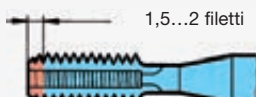
corta, 2 - 3 filetti
per fori ciechi ed
in generale per alu,
ghisa grigia ed ottone

Forma D



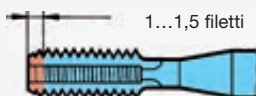
media, 3,5 - 5 filetti
per fori passanti corti

Forma E



molto corta, 1,5-2 filetti,
per fori ciechi con sbocco
del filetto molto corto.

Forma F



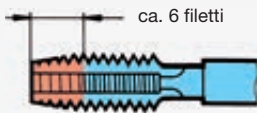
molto corta, 1,5-2 filetti,
per fori ciechi con sbocco
del filetto molto corto.
Da evitare se possibile.

Informazioni basilari della filettatura

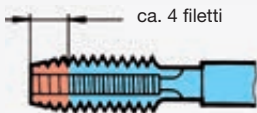
Imbocco, scelta ed impiego

Lunghezza di imbocco per serie di maschi, 3 pezzi

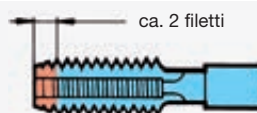
Forma A
per sbozzatore



Forma D
per intermedio

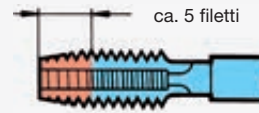


Forma C
per finitore

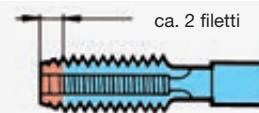


Lunghezza di imbocco per serie di maschi, 2 pezzi

Forma D
per sbozzatore



Forma C
per finitore



Consigli per l'impiego

Mentre il tipo di preforo determina in primo luogo l'imbocco, il resto della geometria del maschio, come forma, numero e direzione dei taglienti, angolo di taglio, ecc., dipendono anche dal materiale da lavorare e dal tipo di lavoro. Perciò i maschi per filettatura metrica ISO od in generale per lavorazione di acciaio hanno, di norma, 3 taglienti fino a M 16, per misure superiori, 4 o più taglienti.

Maschi con taglienti elicoidali sinistri come pure maschi con imbocco corretto spingono i trucioli nella direzione di taglio e di avanzamento e sono quindi molto indicati per la lavorazione di fori passanti. Anche taglienti dritti ed imbocco lungo (forma D) danno in questo caso buoni risultati.

Per fori ciechi consigliamo maschi con taglienti elicoidali destri o dritti con imbocco corto. Gli utensili con taglienti

destri portano i trucioli verso la parte posteriore in direzione del gambo. L'imbocco è concepito in modo tale che, nell'uscire, il truciolo non incollì, bensì sia facilmente asportato.

Per la lavorazione di alluminio, ghisa grigia ed ottone, sono necessari maschi speciali, generalmente con imbocco corto, sia che si tratti di fori passanti che di fori ciechi. Un imbocco lungo in questi materiali allargherebbe solo il preforo sul diametro nominale di filettatura invece di eseguire il filetto.

Maschi a taglienti dritti senza imbocco corretto sono utensili non specifici con lo svantaggio di non dare risultati ottimali nei singoli materiali. Vale la pena di fare lo sforzo di scegliere l'utensile più adatto per i vari tipi di lavorazione.

foro passante



maschi a taglienti dritti con imbocco corretto



maschi con taglienti elicoidali sinistri



maschi a taglienti dritti con imbocco lungo

foro cieco



maschi con taglienti elicoidali destri



maschi a taglienti dritti con imbocco corto

Diametri dei fori di filettatura p. la maschiatura

Filettatura metrica ISO DIN 13					Filettatura metrica ISO, passo fine DIN 13					Filettatura UNC ASME B1.1									
Ø nom.	passo P	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite 6H*		Ø nom.	x passo P	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite 6H		Ø nom.	x passo P	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite 6H		Ø nom.	filetti per pollici	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite 2B	
	mm	mm	min. mm	max. mm		mm	mm	min. mm	max. mm		mm	mm	min. mm	max. mm			mm	min. mm	max. mm
M 1	0,25	0,75	0,729	0,785	M 2,5 x 0,35		2,15	2,121	2,221	M 22 x 1,50		20,50	20,376	20,676	Nr. 1 - 64		1,55	1,425	1,580
M 1,1	0,25	0,85	0,829	0,885	M 3,0 x 0,35		2,65	2,621	2,721	M 22 x 2,00		20,00	19,835	20,210	Nr. 2 - 56		1,85	1,694	1,872
M 1,2	0,25	0,95	0,929	0,985	M 3,5 x 0,35		3,15	3,121	3,221	M 24 x 1,00		23,00	22,917	23,153	Nr. 3 - 48		2,10	1,941	2,146
M 1,4	0,30	1,10	1,075	1,142	M 4,0 x 0,50		3,50	3,459	3,599	M 24 x 1,50		22,50	22,376	22,676	Nr. 4 - 40		2,35	2,157	2,385
M 1,6	0,35	1,25	1,221	1,321	M 4,5 x 0,50		4,00	3,959	4,099	M 24 x 2,00		22,00	21,835	22,210	Nr. 5 - 40		2,65	2,487	2,698
M 1,8	0,35	1,45	1,421	1,521	M 5,0 x 0,50		4,50	4,459	4,599	M 25 x 1,00		24,00	23,917	24,153	Nr. 6 - 32		2,85	2,642	2,896
M 2	0,40	1,60	1,567	1,679	M 5,5 x 0,50		5,00	4,959	5,099	M 25 x 1,50		23,50	23,376	23,676	Nr. 8 - 32		3,50	3,302	3,531
M 2,2	0,45	1,75	1,713	1,838	M 6,0 x 0,75		5,20	5,188	5,378	M 25 x 2,00		23,00	22,835	23,210	Nr. 10 - 24		3,90	3,683	3,937
M 2,5	0,45	2,05	2,013	2,138	M 7,0 x 0,75		6,20	6,188	6,378	M 27 x 1,00		26,00	25,917	26,153	Nr. 12 - 24		4,50	4,343	4,597
M 3	0,50	2,50	2,459	2,599	M 8,0 x 0,50		7,50	7,459	7,599	M 27 x 1,50		25,50	25,376	25,676	1/4 - 20		5,10	4,978	5,258
M 3,5	0,60	2,90	2,850	3,010	M 8,0 x 0,75		7,20	7,188	7,378	M 27 x 2,00		25,00	24,835	25,210	5/16 - 18		6,60	6,401	6,731
M 4	0,70	3,30	3,242	3,422	M 8,0 x 1,00		7,00	6,917	7,153	M 28 x 1,00		27,00	26,917	27,153	3/8 - 16		8,00	7,798	8,153
M 4,5	0,75	3,70	3,688	3,878	M 9,0 x 0,75		8,20	8,188	8,378	M 28 x 1,50		26,50	26,376	26,676	7/16 - 14		9,40	9,144	9,550
M 5	0,80	4,20	4,134	4,334	M 9,0 x 1,00		8,00	7,917	8,153	M 28 x 2,00		26,00	25,835	26,210	1/2 - 13		10,80	10,592	11,024
M 6	1,00	5,00	4,917	5,153	M 10 x 0,75		9,20	9,188	9,378	M 30 x 1,00		29,00	28,917	29,153	9/16 - 12		12,20	11,989	12,446
M 7	1,00	6,00	5,917	6,153	M 10 x 1,00		9,00	8,917	9,153	M 30 x 1,50		28,50	28,376	28,676	5/8 - 11		13,50	13,386	13,868
M 8	1,25	6,80	6,647	6,912	M 10 x 1,25		8,80	8,647	8,912	M 30 x 2,00		28,00	27,835	28,210	3/4 - 10		16,50	16,307	16,840
M 9	1,25	7,80	7,647	7,912	M 11 x 0,75		10,20	10,188	10,378	M 30 x 3,00		27,00	26,752	27,252	7/8 - 9		19,50	19,177	19,761
M 10	1,50	8,50	8,376	8,676	M 11 x 1,00		10,00	9,917	10,153	M 32 x 1,50		30,50	30,376	30,676	1 - 8		22,25	21,971	22,606
M 11	1,50	9,50	9,376	9,676	M 12 x 1,00		11,00	10,917	11,153	M 32 x 2,00		30,00	29,835	30,210	1 1/8 - 7		25,00	24,638	25,349
M 12	1,75	10,20	10,106	10,441	M 12 x 1,25		10,80	10,647	10,912	M 33 x 1,50		31,50	31,376	31,676	1 1/4 - 7		28,00	27,813	28,524
M 14	2,00	12,00	11,835	12,210	M 12 x 1,50		10,50	10,376	10,676	M 33 x 2,00		31,00	30,835	31,210	1 3/8 - 6		30,75	30,353	31,115
M 16	2,00	14,00	13,835	14,210	M 14 x 1,00		13,00	12,917	13,153	M 33 x 3,00		30,00	29,752	30,252	1 1/2 - 6		34,00	33,528	34,290
M 18	2,50	15,50	15,294	15,744	M 14 x 1,25		12,80	12,647	12,912	M 35 x 1,50		33,50	33,376	33,676	1 3/4 - 5		39,50	38,938	39,802
M 20	2,50	17,50	17,294	17,744	M 14 x 1,50		12,50	12,376	12,676	M 36 x 1,50		34,50	34,376	34,676	2 - 4,5		45,00	44,679	45,593
M 22	2,50	19,50	19,294	19,744	M 15 x 1,00		14,00	13,917	14,153										
M 24	3,00	21,00	20,752	21,252	M 15 x 1,50		13,50	13,376	13,676										
M 27	3,00	24,00	23,752	24,252	M 16 x 1,00		15,00	14,917	15,153										
M 30	3,50	26,50	26,211	26,771	M 16 x 1,25		14,80	14,647	14,912										
M 33	3,50	29,50	29,211	29,771	M 16 x 1,50		14,50	14,376	14,676										
M 36	4,00	32,00	31,670	32,270	M 17 x 1,00		16,00	15,917	16,153										
M 39	4,00	35,00	34,670	35,270	M 17 x 1,50		15,50	15,376	15,676										
M 42	4,50	37,50	37,129	37,799	M 18 x 1,00		17,00	16,917	17,153										
M 45	4,50	40,50	40,129	40,799	M 18 x 1,50		16,50	16,376	16,676										
M 48	5,00	43,00	42,587	43,297	M 20 x 1,00		19,00	18,917	19,153										
M 52	5,00	47,00	46,587	47,297	M 20 x 1,50		18,50	18,376	18,676										
M 56	5,50	50,50	50,046	50,796	M 20 x 2,00		18,00	17,835	18,210										
					M 22 x 1,00		21,00	20,917	21,153										

* M 1,1 fino a M 1,4 nom.-Ø madrevite 5H

Filettatura MJ DIN ISO 5855					Filettatura UNC ISO 3161					Filettatura UNF ISO 3161				
Ø nom.	x passo P	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite 5H*		Ø nom.	filetti per pollici	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite 3B		Ø nom.	filetti per pollici	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite 3B	
	mm	mm	min. mm	max. mm			mm	min. mm	max. mm			mm	min. mm	max. mm
MJ 3	x 0,50	2,60	2,513	2,653	Nr. 6 - 32		2,85	2,733	2,939	Nr. 6 - 40		3,00	2,888	3,053
MJ 4	x 0,70	3,40	3,318	3,498	Nr. 8 - 32		3,55	3,393	3,599	Nr. 8 - 36		3,60	3,480	3,663
MJ 5	x 0,80	4,30	4,221	4,421	Nr. 10 - 24		4,00	3,795	4,064	Nr. 10 - 32		4,20	4,054	4,255
MJ 6	x 0,50	5,55	5,513	5,625	Nr. 12 - 24		4,60	4,455	4,704	Nr. 12 - 28		4,75	4,602	4,816
MJ 6	x 0,75	5,35	5,269	5,419	1/4 - 20		5,30	5,113	5,387	1/4 - 28		5,60	5,466	5,662
MJ 6	x 1,00	5,10	5,026	5,216	5/16 - 18		6,75	6,563	6,833	5/16 - 24		7,00	6,906	7,109
MJ 8	x 0,50	7,55	7,513	7,625	3/8 - 16		8,20	7,978	8,255	3/8 - 24		8,60	8,494	8,679
MJ 8	x 0,75	7,35	7,269	7,419	7/16 - 14		9,60	9,346	9,639	7/16 - 20		10,00	9,876	10,084
MJ 8	x 1,00	7,10	7,026	7,216	1/2 - 13		11,00	10,798	11,095	1/2 - 20		11,60	11,463	11,661
MJ 8	x 1,25	6,90	6,782	6,994	9/16 - 12		12,40	12,228	12,482	9/16 - 18		13,00	12,913	13,122
MJ 10	x 1,00	9,10	9,026	9,216	5/8 - 11		13,80	13,627	13,904	5/8 - 18		14,60	14,501	14,702
MJ 10	x 1,25	8,90	8,782	8,994										
MJ 10	x 1,50	8,60	8,539	8,775										
MJ 12	x 1,75	10,40	10,295	10,560										
MJ 16	x 2,00	14,20	14,051	14,351										

* MJ3 x 0,50 fino a MJ 5 x 0,80 nom.-Ø madrevite 6H

Diametri dei fori di filettatura p. la maschiatura

Filettatura UNF ASME B1.1					Filettatura BSW-(Whitworth) BS84					Filettatura (Whitworth-) (a DIN-ISO 228-1)					Filettatura PG a DIN 40430				
Ø nom.	filetti per pollici	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite 2B		Ø nom.	filetti per pollici	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite		Ø nom.	filetti per pollici	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite		Ø nom.	filetti per pollici	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite	
		min. mm	max. mm				min. mm	max. mm				min. mm	max. mm				min. mm	max. mm	
Nr. 1 - 72	1,55	1,473	1,610	W 1/16	60	1,20	1,045	1,230	G 1/16	28	6,80	6,561	6,843	Pg 7	20	11,40	11,280	11,430	
Nr. 2 - 64	1,85	1,755	1,910	W 3/32	48	1,80	1,704	1,912	G 1/8	28	8,80	8,566	8,848	Pg 9	18	14,00	13,860	14,010	
Nr. 3 - 56	2,15	2,024	2,197	W 1/8	40	2,50	2,362	2,591	G 1/4	19	11,80	11,445	11,890	Pg 11	18	17,30	17,260	17,410	
Nr. 4 - 48	2,40	2,271	2,459	W 5/32	32	3,20	2,952	3,214	G 3/8	19	15,25	14,950	15,395	Pg 13,5	18	19,00	19,060	19,210	
Nr. 5 - 44	2,70	2,550	2,741	W 3/16	24	3,60	3,407	3,745	G 1/2	14	19,00	18,631	19,172	Pg 16	18	21,30	21,160	21,310	
Nr. 6 - 40	2,95	2,819	3,023	W 7/32	24	4,50	4,201	4,539	G 5/8	14	21,00	20,587	21,128	Pg 21	16	26,90	26,780	27,030	
Nr. 8 - 36	3,50	3,404	3,607	W 1/4	20	5,10	4,724	5,156	G 3/4	14	24,50	24,117	24,658	Pg 29	16	35,50	35,480	35,730	
Nr. 10 - 32	4,10	3,962	4,166	W 5/16	18	6,50	6,130	6,590	G 7/8	14	28,25	27,877	28,418	Pg 36	16	45,50	45,480	45,730	
Nr. 12 - 28	4,60	4,496	4,724	W 3/8	16	7,90	7,492	7,987	G 1	11	30,75	30,291	30,931	Pg 42	16	52,50	52,480	52,730	
1/4 - 28	5,50	5,359	5,588	W 7/16	14	9,20	8,789	9,330	G 1 1/8	11	35,50	34,939	35,579	Pg 48	16	57,80	57,780	58,030	
5/16 - 24	6,90	6,782	7,036	W 1/2	12	10,50	9,989	10,591	G 1 1/4	11	39,50	38,952	39,592						
3/8 - 24	8,50	8,382	8,636	W 9/16	12	12,00	11,577	12,179	G 1 1/2	11	45,25	44,845	45,485						
7/16 - 20	9,90	9,728	10,033	W 5/8	11	13,50	12,918	13,558	G 1 3/4	11	51,00	50,788	51,428						
1/2 - 20	11,50	11,328	11,608	W 3/4	10	16,25	15,797	16,483	G 2	11	57,00	56,656	57,296						
9/16 - 18	12,90	12,751	13,081	W 7/8	9	19,25	18,611	19,353											
5/8 - 18	14,50	14,351	14,681	W 1	8	22,00	21,334	22,147											
3/4 - 16	17,50	17,323	17,678	W 1 1/8	7	24,50	23,928	24,832											
7/8 - 14	20,40	20,269	20,650	W 1 1/4	7	27,75	27,103	28,007											
1 - 12	23,25	23,114	23,571	W 1 3/8	6	30,50	29,504	30,528											
1 1/8 - 12	26,50	26,289	26,746	W 1 1/2	6	33,50	32,679	33,703											
1 1/4 - 12	29,50	29,464	29,921	W 1 5/8	5	35,50	34,769	35,963											
1 3/8 - 12	32,75	32,639	33,096	W 1 3/4	5	39,00	37,944	39,138											
1 1/2 - 12	36,00	35,814	36,271	W 2	4,5	44,50	43,571	44,877											

Filettatura NPT ANSI B 2.1 filettatura conica americana, conicità 1:16

versione A (da evitare se possibile)	versione B	Ø nom.	filetti per pollici	Ø preforo cilind. (A) d ₁	Ø preforo conico (B) D ₁	prof. t. p. ET mm	prof. fil. BT (min) mm
		1/16 - 27		6,15	6,39	9,29	10,7
		1/8 - 27		8,40	8,74	9,32	10,8
		1/4 - 18		11,10	11,36	13,52	15,6
		3/8 - 18		14,30	14,80	13,83	16,0
		1/2 - 14		17,90	18,32	18,07	20,8
		3/4 - 14		23,30	23,67	18,55	21,3
		1 - 11,5		29,00	29,69	22,29	25,6
		1 1/4 - 11,5		37,70	38,45	22,80	26,1
		1 1/2 - 11,5		43,70	44,52	22,80	26,1
		2 - 11,5		55,60	56,56	23,20	26,5
		2 1/2 - 8		66,30	67,62	31,75	36,3
		3 - 8		82,30	83,52	33,74	38,5

Filett. EG metr./metr. passo fine (EG M 14 x 1,25) per impiego di helicoil DIN 8140				Filettatura EG UNC (UNC-STI) per impiego di helicoil ASME B18.29.1				Filettatura EG UNF (UNF-STI) per impiego di helicoil ASME B18.29.1			
Ø nom.	x passo P mm	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite min. max. mm	Ø nom.	filetti per pollici	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite min. max. mm	Ø nom.	filetti per pollici	Ø preforo (foro) Ø DIN 336 mm	Ø preforo madrevite min. max. mm
EG M 4	0,70	4,20	4,152 4,292	EG Nr. 6	- 32	3,80	3,678 3,879	EG Nr. 6	- 40	3,70	3,644 3,818
EG M 5	0,80	5,25	5,174 5,334	EG Nr. 8	- 32	4,40	4,338 4,524	EG Nr. 8	- 36	4,40	4,321 4,498
EG M 6	1,00	6,30	6,217 6,407	EG Nr. 10	- 24	5,20	5,055 5,283	EG Nr. 10	- 32	5,10	4,999 5,184
EG M 8	1,25	8,40	8,271 8,483	EG Nr. 12	- 24	5,80	5,715 5,944	EG Nr. 12	- 28	5,70	5,682 5,809
EG M10	1,50	10,50	10,324 10,560	EG 1/4	- 20	6,70	6,624 6,868	EG 1/4	- 28	6,60	6,546 6,721
EG M12	1,75	12,50	12,379 12,644	EG 5/16	- 18	8,40	8,242 8,489	EG 5/16	- 24	8,25	8,166 8,352
EG M14 x 1,25	1,25	14,40	14,271 14,483	EG 3/8	- 16	10,00	9,868 10,127	EG 3/8	- 24	9,80	9,754 9,931
EG M16	2,00	16,50	16,433 16,733	EG 7/16	- 14	11,60	11,506 11,783	EG 7/16	- 20	11,50	11,389 11,585
				EG 1/2	- 13	13,30	13,122 13,393	EG 1/2	- 20	13,10	12,974 13,172
				EG 9/16	- 12	14,90	14,747 15,032	EG 9/16	- 18	14,70	14,592 14,798
				EG 5/8	- 11	16,50	16,375 16,673	EG 5/8	- 18	16,25	16,180 16,386

Diametri dei fori consigl. p. maschiatura a rullare

Filettatura metrica ISO DIN 13						
Ø nom.	passo	Ø foro		Ø preforo madrevite 7H*		
		min. mm	max. mm	min. mm	max. mm	
mm	mm	mm	mm	mm	mm	
M 1	0,25	0,75	0,729	0,785		
M 1,1	0,25	0,85	0,829	0,885		
M 1,2	0,25	0,95	0,929	0,985		
M 1,4	0,30	1,10	1,075	1,142		
M 1,6	0,35	1,25	1,221	1,321		
M 1,8	0,35	1,45	1,421	1,521		
M 2	0,40	1,85	1,84	1,88	1,567	1,679
M 2,2	0,45	2,00	2,01	2,05	1,713	1,838
M 2,5	0,45	2,30	2,28	2,32	2,013	2,138
M 3	0,50	2,80	2,78	2,85	2,459	2,639
M 3,5	0,60	3,25	3,23	3,30	2,850	3,050
M 4	0,70	3,70	3,68	3,76	3,242	3,466
M 4,5	0,75	4,20				
M 5	0,80	4,65	4,62	4,71	4,134	4,384
M 6	1,00	5,55	5,52	5,62	4,917	5,217
M 7	1,00	6,55	6,52	6,62	5,917	6,217
M 8	1,25	7,40	7,36	7,47	6,647	6,982
M 9	1,25	8,40	8,36	8,47	7,647	7,982
M 10	1,50	9,30	9,26	9,38	8,376	8,751
M 11	1,50	10,30	10,26	10,38	9,376	9,751
M 12	1,75	11,20	11,15	11,29	10,106	10,531
M 14	2,00	13,10	13,05	13,20	11,835	12,310
M 16	2,00	15,10	15,05	15,20	13,835	14,310
M 18	2,50	16,90	16,83	17,02	15,294	15,854
M 20	2,50	18,90	18,83	19,02	17,294	17,854
M 22	2,50	20,90	20,83	21,02	19,294	19,854
M 24	3,00	22,70	22,62	22,80	20,752	21,382
M 27	3,00	25,70	25,62	25,80	23,752	24,382
M 30	3,50	28,50	28,40	28,60	26,211	26,921
M 33	3,50	31,50	31,40	31,60	29,211	29,921
M 36	4,00	34,30	34,17	34,40	31,670	32,420
M 39	4,00	37,30	37,17	37,40	34,670	35,420
M 42	4,50	40,10	39,95	40,20	37,129	37,979

* M 2 fino a M 2,5 Ø preforo madrevite 6H

Filettatura metrica ISO, passo fine DIN 13											
Ø x passo nom.	Ø foro	Ø foro		Ø preforo madrevite 7H*		Ø x passo nom.	Ø foro	Ø foro		Ø preforo madrevite 7H*	
		min. mm	max. mm	min. mm	max. mm			min. mm	max. mm		
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
M 2,5 x 0,35	2,35	2,35	2,38	2,121	2,221	M 20 x 1,50	19,30	19,26	19,38	18,376	19,751
M 3 x 0,35	2,85	2,85	2,88	2,621	2,721	M 24 x 1,00	23,55	23,52	23,62	22,917	23,217
M 4 x 0,35	3,85	3,85	3,88	3,621	3,721	M 24 x 1,50	23,30	23,26	23,38	22,376	22,751
M 4 x 0,50	3,80	3,78	3,83	3,459	3,639	M 24 x 2,00	23,10	23,05	23,20	21,835	22,310
M 5 x 0,50	4,80	4,78	4,83	4,459	4,639	M 27 x 1,50	26,30	26,26	26,38	25,376	25,751
M 5,5 x 0,50	5,30	5,28	5,33	4,959	5,139	M 30 x 1,50	29,30	29,26	29,38	28,376	28,751
M 6 x 0,75	5,65	5,62	5,70	5,188	5,424	M 33 x 1,50	32,30	32,26	32,38	31,376	31,751
M 7 x 0,75	6,65	6,62	6,70	6,188	6,424	M 36 x 1,50	35,30	35,26	35,38	34,376	34,751
M 8 x 0,75	7,65	7,62	7,70	7,188	7,424	M 39 x 1,50	38,30	38,26	38,38	37,376	37,751
M 8 x 1,00	7,55	7,52	7,62	6,917	7,217	M 42 x 1,50	41,30	41,26	41,38	42,376	42,751
M 9 x 0,75	8,65	8,62	8,70	8,188	8,424						
M 9 x 1,00	8,55	8,52	8,62	7,917	8,217						
M 10 x 0,75	9,65	9,62	9,70	9,188	9,424						
M 10 x 1,00	9,55	9,52	9,62	8,917	9,217						
M 10 x 1,25	9,40	9,36	9,47	8,647	8,982						
M 11 x 0,75	10,65	10,62	10,70	10,188	10,424						
M 11 x 1,00	10,55	10,52	10,62	9,917	10,217						
M 12 x 1,00	11,55	11,52	11,62	10,917	11,217						
M 12 x 1,25	11,40	11,36	11,47	10,647	10,982						
M 12 x 1,50	11,30	11,26	11,38	10,376	10,751						
M 14 x 1,00	13,55	13,52	13,62	12,917	13,217						
M 14 x 1,25	13,40	13,36	13,47	12,647	12,982						
M 14 x 1,50	13,30	13,26	13,38	12,376	12,751						
M 15 x 1,00	14,55	14,52	14,62	13,917	14,217						
M 15 x 1,50	14,30	14,26	14,38	13,376	13,751						
M 16 x 1,00	15,55	15,52	15,62	14,917	15,217						
M 16 x 1,50	15,30	15,26	15,38	14,376	14,751						
M 17 x 1,00	16,55	16,52	16,62	15,917	16,217						
M 17 x 1,50	16,30	16,26	16,38	15,376	15,751						
M 18 x 1,00	17,55	17,52	17,62	16,917	17,217						
M 18 x 1,50	17,30	17,26	17,38	16,376	16,751						
M 18 x 2,00	17,10	17,05	17,20	15,835	16,310						
M 20 x 1,00	19,55	19,52	19,62	18,917	19,217						

* M 2,5 x 0,35 fino a M 4 x 0,35 Ø preforo madrevite 6H

Tolleranza dei diametri di fori di filettatura nei maschi a rullare (a DIN 13, parte 50)

Per ragioni di resistenza, non è necessario mantenere la tolleranza 6H per i fori di filettatura; la tolleranza 7H è sufficiente a garantire che non sia superato il rivestimento del diametro medio di 0,32 x P tra madrevite e bullone. Inoltre, la filettatura a rullare, per la corsa della fase non interrotta e la deformazione a freddo, conferisce di regola una resistenza superiore a quella della filettatura normale.



Diametri dei fori consigl. p. maschiatura a rullare

Filettatura UNC ASME B1.1						
Ø nom.	filetti per pollici	Ø foro		Ø preforo madrevite 2B		
		min. mm	max. mm	min. mm	max. mm	
Nr. 1 - 64		1,68	1,67	1,70	1,425	1,580
Nr. 2 - 56		1,98	1,97	2,01	1,694	1,872
Nr. 3 - 48		2,28	2,27	2,32	1,941	2,146
Nr. 4 - 40		2,55	2,54	2,59	2,157	2,385
Nr. 5 - 40		2,90	2,89	2,94	2,487	2,698
Nr. 6 - 32		3,15	3,14	3,19	2,642	2,896
Nr. 8 - 32		3,80	3,78	3,82	3,302	3,531
Nr. 10 - 24		4,35	4,33	4,39	3,683	3,937
Nr. 12 - 24		5,00	4,97	5,03	4,343	4,597
1/4 - 20		5,75	5,72	5,80	4,978	5,258
5/16 - 18		7,30	7,26	7,37	6,401	6,731
3/8 - 16		8,80	8,77	8,88	7,798	8,153
7/16 - 14		10,30	10,27	10,37	9,144	9,550
1/2 - 13		11,80	11,77	11,88	10,592	11,024
9/16 - 12		13,30	13,28	13,39	11,989	12,446
5/8 - 11		14,80	14,78	14,90	13,386	13,868
3/4 - 10		17,90	17,85	17,97	16,307	16,840
7/8 - 9		21,00	20,95	21,10	19,177	19,761
1 - 8		24,00	23,95	24,12	21,971	22,606

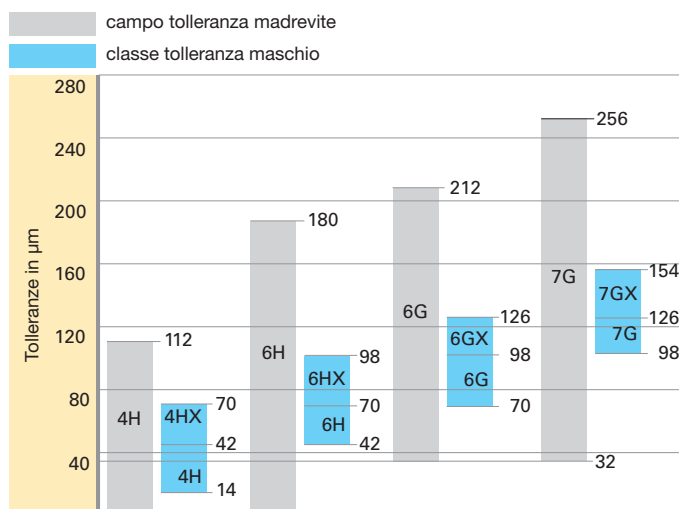
Filettatura UNF ASME B1.1						
Ø nom.	filetti per pollici	Ø foro		Ø preforo madrevite 2B		
		min. mm	max. mm	min. mm	max. mm	
Nr. 1 - 72		1,70	1,69	1,72	1,473	1,610
Nr. 2 - 64		2,00	1,99	2,03	1,755	1,910
Nr. 3 - 56		2,30	2,29	2,34	2,024	2,197
Nr. 4 - 48		2,60	2,59	2,63	2,271	2,459
Nr. 5 - 44		2,90	2,89	2,93	2,550	2,741
Nr. 6 - 40		3,20	3,19	3,24	2,819	3,023
Nr. 8 - 36		3,85	3,83	3,88	3,404	3,607
Nr. 10 - 32		4,45	4,43	4,49	3,962	4,166
Nr. 12 - 28		5,10	5,07	5,13	4,496	4,724
1/4 - 28		5,95	5,92	5,99	5,359	5,588
5/16 - 24		7,45	7,42	7,50	6,782	7,036
3/8 - 24		9,05	9,02	9,10	8,838	9,636
7/16 - 20		10,55	10,48	10,58	9,728	10,033
1/2 - 20		12,10	12,08	12,18	11,328	11,608
9/16 - 18		13,65	13,61	13,72	12,751	13,081
5/8 - 18		15,25	15,21	15,32	14,351	14,681
3/4 - 16		18,35	18,30	18,41	17,323	17,678
7/8 - 14		21,40	21,35	21,49	20,269	20,650
1 - 12		24,45	24,40	24,54	23,114	23,571

Filettatura (Whitworth-) DIN EN ISO 228-1						
Ø nom.	filetti per pollici	Ø foro		Ø preforo madrevite		
		min. mm	max. mm	min. mm	max. mm	
G 1/16 28		7,30	7,28	7,35	6,561	6,843
G 1/8 28		9,30	9,28	9,35	8,566	8,848
G 1/4 19		12,50	12,48	12,55	11,445	11,890
G 3/8 19		16,00	15,98	16,05	14,950	15,395
G 1/2 14		20,00	19,98	20,12	18,631	19,172
G 5/8 14		22,00	21,98	22,12	20,587	21,128
G 3/4 14		25,50	25,48	25,62	24,117	24,658
G 7/8 14		29,25	29,23	29,37	27,877	28,418
G 1 11		32,00	31,98	32,15	30,291	30,931
G 1 1/4 11		40,75	40,70	40,85	38,952	39,592

I campi di tolleranze/le classi di tolleranze

La qualità e la posizione determinano la tolleranza. Essa è designata usando le rispettive cifre e lettere. L'indicazione per la classe di tolleranza del maschio corrisponde a quella della madrevite per la quale il maschio è prevalentemente usato. Quindi essa non è identica in ciascun caso di impiego alla tolleranza della madrevite maschiata. Maschi con differenti tolleranze a DIN 802 parte 1 sono contraddistinti dall'aggiunta della lettera »X« (6 HX, 6 GX). Noi consigliamo di impiegare i maschi secondo la sottostante tabella:

Ordinamento campo/classe di tolleranza



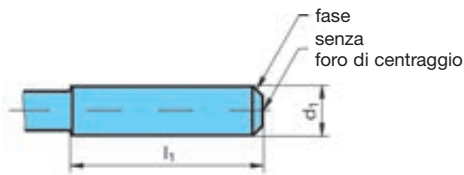
DIN EN 22857		Tolleranza della madrevite da maschiare				DIN 802 parte 1 (ritirata)
Classe di impiego del maschio	Indicazione*	Designazione				Tolleranza del maschio
classe 1	ISO 1	4H	5H			4H
classe 2	ISO 2		6H			6H
classe 3	ISO 3			6G		6G
-	-				7G	7G

* Le tolleranze delle tre classi di impiego, in base alle indicazioni sotto-segnate, sono calcolate secondo un'unità di tolleranza t, il cui valore corrisponde alla tolleranza del diametro medio TD2 con classe di tolleranza 5 della madrevite (estrapolata fino al passo 0,2 mm):
t = TD2 tolleranza 5 della madrevite

Esecuzione dei codoli

Codoli cilindrici per punte elicoidali e frese frontali in acciaio super rapido DIN 6535

Forma HA, liscio

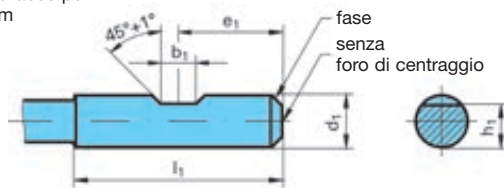


Misure in mm

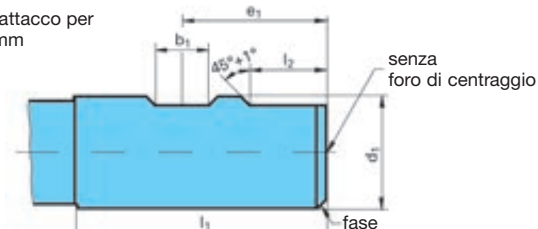
d1	l1	d1	l1
h6	+2 0	h6	+2 0
2	28	14	45
3	28	16	48
4	28	18	48
5	28	20	50
6	36	25	56
8	36	32	60
10	40		
12	45		

Forma HB, con piano di attacco laterale

con un piano di attacco per
d1 = 6 und 20 mm



con due piani di attacco per
d1 = 25 und 32 mm



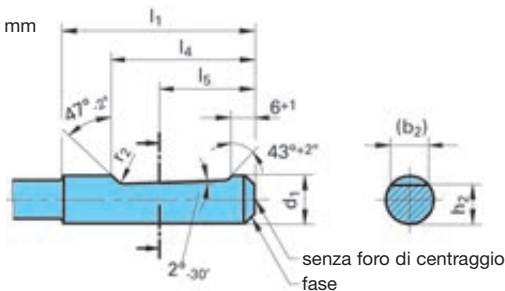
Misure in mm

d1	b1	e1	h1	l1	l2
h6	+0,05 0	0 -1	h11	+2 0	+1 0
6	4,2	18	5,1	36	-
8	5,5	18	6,9	36	-
10	7	20	8,5	40	-
12	8	22,5	10,4	45	-
14	8	22,5	12,7	45	-
16	10	24	14,2	48	-
18	10	24	16,2	48	-
20	11	25	18,2	50	-
25	12	32	23	56	17
32	14	36	30	60	19

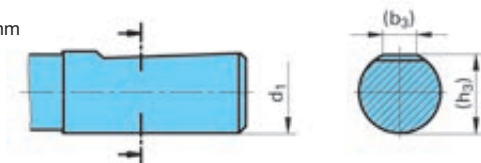
Forma HE, con piano di attacco inclinato, senza fori di refrigerazione*

* Esecuzione: codoli cilindrici a DIN 6535 sono eseguiti senza o con fori di refrigerazione. L'impiego dell'esecuzione per differenti utensili come pure indicazioni dimensionali e designazione per la posizione dei fori di refrigerazione sono contenute nelle corrispondenti norme.

per d1 = da 6 a 20 mm



per d1 = 25 e 32 mm



Misure in mm

d1	(b2)	(b3)	h2	(h3)	l1	l4	l5	r2
h6	≈		h11		+2 0	0 -1	misura nom.	min.
6	4,3	-	5,1	-	36	25	18	1,2
8	5,5	-	6,9	-	36	25	18	1,2
10	7,1	-	8,5	-	40	28	20	1,2
12	8,2	-	10,4	-	45	33	22,5	1,2
14	8,1	-	12,7	-	45	33	22,5	1,2
16	10,1	-	14,2	-	48	36	24	1,6
18	10,8	-	16,2	-	48	36	24	1,6
20	11,4	-	18,2	-	50	38	25	1,6
25	13,6	9,3	23,0	24,1	56	44	32	1,6
32	15,5	9,9	30,0	31,2	60	48	35	1,6

I raccordi HSK

Tecnica e vantaggi

- **Elevata trasmissione del momento torcente e posizionamento radiale preciso**

Durante il serraggio del codolo cavo, per attrito, scaturiscono forze molto alte sull'intera superficie del codolo e sulle superfici piane (figura 1). Due chiavette, che si trovano al termine del codolo dell'attacco, afferrano l'utensile e provvedono ad un posizionamento radiale preciso e non modificabile.

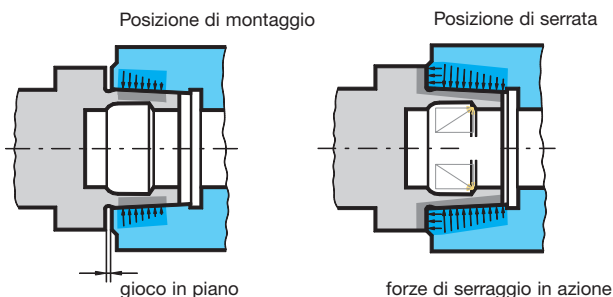
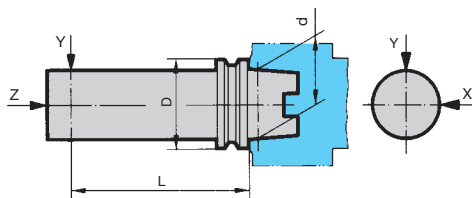


Figura 1
Forze di precarico e frizione del codolo cavo nei raccordi automatico e manuale.

- **Elevata precisione di cambio e ripetibilità**

La presa a forma di anello delle morse di serraggio all'interno del codolo cavo dell'utensile garantisce il collegamento assolutamente privo di gioco tra codolo e mandrino od attacco (figure 1 e 2).



HSK-Grand. D	d mm	L mm	X mm	Y mm	Z mm
32	24	50	0,002	0,002	0,002
40	30	60	0,002	0,002	0,002
50	38	75	0,002	0,002	0,002
63	48	100	0,002	0,002	0,002
100	75	150	0,002	0,002	0,002

Figura 2
Precisione ripetibilità radiale ed assiale dei raccordi automatico e manuale.

- **Idoneità all'alta velocità**

Ad un maggiore numero di giri, corrisponde una forza superiore di bloccaggio del meccanismo di serraggio tra codoli conici. L'iniziale precarico tra codolo cavo ed attacco del mandrino compensa l'espansione del mandrino, provocata dalla forza centrifuga, in modo che il gioco radiale sia completamente eliminato (figura 1). La superficie piana evita lo slittamento assiale.

- **Brevi tempi di cambio**

Razionale cambio utensili, dovuto alla ridotta lun-ghezza (ca. 1/3 del cono ISO convenzionale) ed al peso limitato (ca. 50% del cono ISO).

- **Costruzione del codolo semplice e conveniente**

Il corpo monolitico significa anche nessuna pezzo usurabile.

- **Insensibilità allo sporco**

Il piano a forma di anello non è interrotto, quindi si semplifica la pulizia del sistema. Con il cambio automatico dell'utensile è consigliabile la pulizia con aria durante il cambio.

- **Codifica ovvero identificazione**

Per permettere sistemi di identificazione convenzionali, è stato previsto, in prossimità del collarino, un foro con $\varnothing 10$ mm e 4,5 mm di profondità per collocazione dei dati (code-chip).

- **Standardizzazione, normalizz. del raccordo autom.**

corrisponde a ISO 12164-1/DIN 69893

- **Alimentazione del refrigerante**

Gli utensili per cambio automatico HSK-A ed E sono predisposti per alimentazione centrale del refrigerante mediante tubo di adduzione od attraverso il collarino. Anche per utensili a cambio manuale con raccordo GM 300 l'alimentazione avviene centralmente. Gli elementi di serraggio sono a completa tenuta stagna, in tal modo l'interno del mandrino non può entrare in contatto con il refrigerante.

- **Montaggio unità di adduzione refrigerante**

Per tutti i moduli GM 300 A è necessaria l'unità di adduzione refrigerante Il montaggio dell'unità è a carico dell'utilizzatore.

Attacchi utensili SK DIN 69871 e MAS/BT JIS B 6339-2

Tecnica e vantaggi

Abbiamo sensibilmente ampliato il nostro programma nell'ambito degli attacchi utensili ISO e MAS-BT. Naturalmente anche questi attacchi sono della massima qualità. Vale a dire che produciamo attacchi ISO e MAS-BT in acciaio speciale legato da cementazione, con una resistenza nel nucleo di almeno 900 N/mm², temprato con un procedimento a bassa deformazione a HRC 58 con una profondità di tempra da 0,8 fino a 1,0 mm. La superficie degli attacchi è protetta dalla corrosione e sabbiata per una lunga durata.

Qualità derivata da precisione

Il nostro impegno per la massima precisione si estende anche al campo degli attacchi utensili, perciò i mandrini ISO e MAS-BT sono rettificati: nel campo del cono ISO con Ra ≤ 0,2, dal lato attacco con Ra ≤ 0,4. la tolleranza del cono è superiore ad AT 3 con una sicurezza di misurazione di ≤ 1 μm. Troverete indicazione dettagliate delle tolleranze di forma e posizionamento sulle pagine del catalogo per i singoli attacchi utensili. Le tolleranze dei fori e dei perni di attacco sono max. 2/3 della tolleranza DIN.

Qualità equilibratura

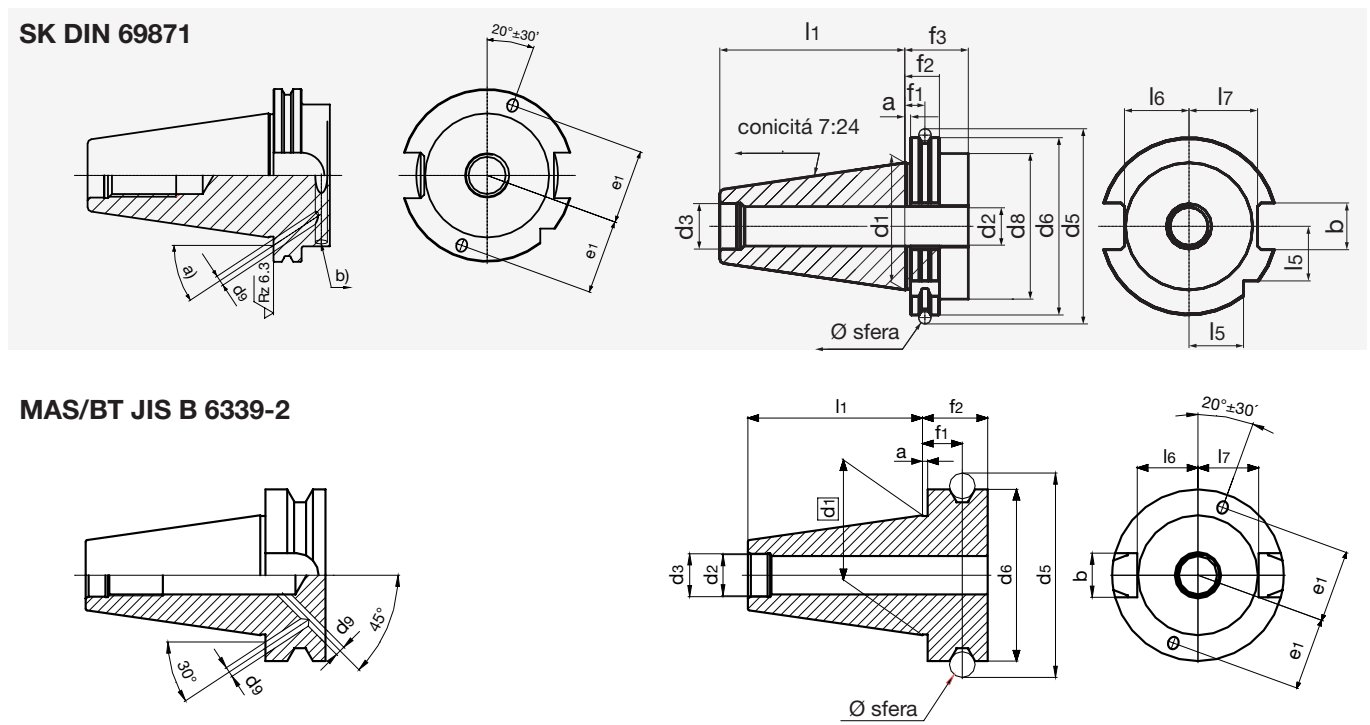
Generalmente attacchi utensili adatti per alti numeri di giri sono equilibrati. A questo scopo abbiamo determinato lo squilibrio ed inserito nei disegni superfici e fori di equilibratura. In tal modo lo squilibrio è ampiamente compensato e si può evitare un'equilibratura di fine almeno sino a ca. 8000 giri/min. Con superiori numeri di giri, gli attacchi preequilibrati devono essere equilibrati di fine a G 6,3 ovvero G 2,5.

Esecuzione AD/AF

Produciamo gli attacchi utensili ISO generalmente nell'esecuzione AD/AF; se è fornita l'esecuzione AD, i fori per refrigerante sul collare sono chiusi con viti.

Misure e tolleranze generali

Per i nostri attacchi utensili ISO e MAS-BT valgono le seguenti misure:



Cono ISO	Ø sfera		b mm	d1 mm	d2 mm	d3 mm	d5 mm	d6 mm	d8 mm	d9 mm	e1 mm	f1 mm	f2 mm	f3 mm	l1 mm	l5 mm	l6 mm	l7 mm
	a mm	mm																
SK30	3,2	7	16,1	31,75	M12	13	59,3	50,00	45	4	21	11,1	19,1	35	47,80	15,00	16,4	19,0
SK40	3,2	7	16,1	44,45	M16	17	72,3	63,55	50	4	27	11,1	19,1	35	68,40	18,5	22,8	25,0
SK50	3,2	7	25,7	69,85	M24	25	107,25	97,50	80	6	42	11,1	19,1	35	101,75	30,0	35,5	37,7
BT30	2,0	8	16,1	31,75	M12	12,5	56,03	46,00	-	-	-	13,6	22,0	-	48,40	-	16,3	16,3
BT40	2,0	10	16,1	44,45	M16	17	75,56	63,00	-	4	27	16,6	27,0	-	65,4	-	22,6	22,6
BT50	3,0	15	25,7	69,85	M24	25	118,89	100,00	-	5,4	42	23,2	38,0	-	101,8	-	35,4	35,4

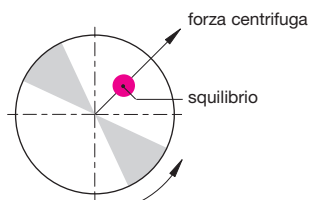
Influsso dello squilibrio su mandrini, attacchi utensili ed utensili

Lo squilibrio

Uno squilibrio causa nel mandrino in rotazione una forza centrifuga, che disturba la corsa tranquilla dell'utensile. Questo squilibrio influenza il processo produttivo e la durata dei cuscinetti del mandrino.

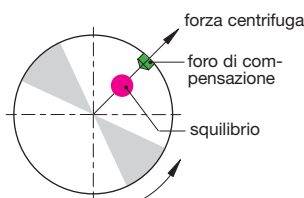
La forza centrifuga F cresce linearmente con lo squilibrio S ed al quadrato con il numero di giri secondo la formula qui sotto.

$$F = U \cdot \omega$$



Equilibratura

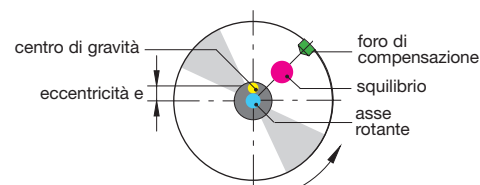
Per compensare forze centrifughe indesiderate, si deve ricostruire la distribuzione simmetrica della massa, allo scopo di eliminare qualsiasi forza centrifuga che influenzi i cuscinetti del mandrino. Negli attacchi utensili sono normalmente presenti fori o superfici di compensazione, tramite i quali si tende a portare la somma di tutte le forze centrifughe, che agiscono sull'asse, verso lo zero (v. DIN ISO 1940).



Spostamento del centro di gravità

Lo squilibrio di un albero sposterà il suo centro di gravità dall'asse baricentrale con uno scostamento in direzione dello squilibrio. Questo scostamento è anche detto eccentricità residua „ e “ oppure spostamento del centro di gravità. Maggiore è il peso della massa „ m “, superiore può risultare lo squilibrio „ S “ consentito.

$$e = \frac{U}{m}$$



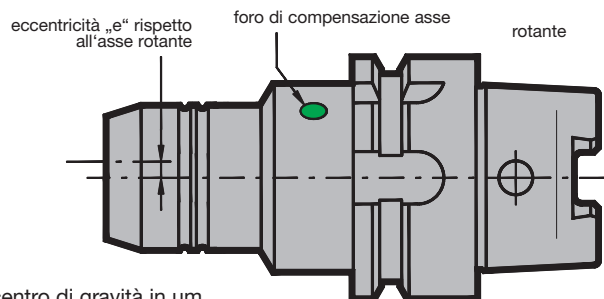
Calcolo dello squilibrio

Lo squilibrio è una misura che indica di quanto la massa distribuita in modo asimmetrico si scosti radialmente dall'asse baricentrale.

Esso è indicato in gmm. La misura di scostamento „ e “ determina di quanto il centro di gravità di un pezzo si discosta dall'asse rotante. Lo squilibrio si ottiene come segue:

$$U = m \cdot e$$

U = squilibrio in gmm
 e = scostamento dal centro di gravità in μm
 m = massa in kg



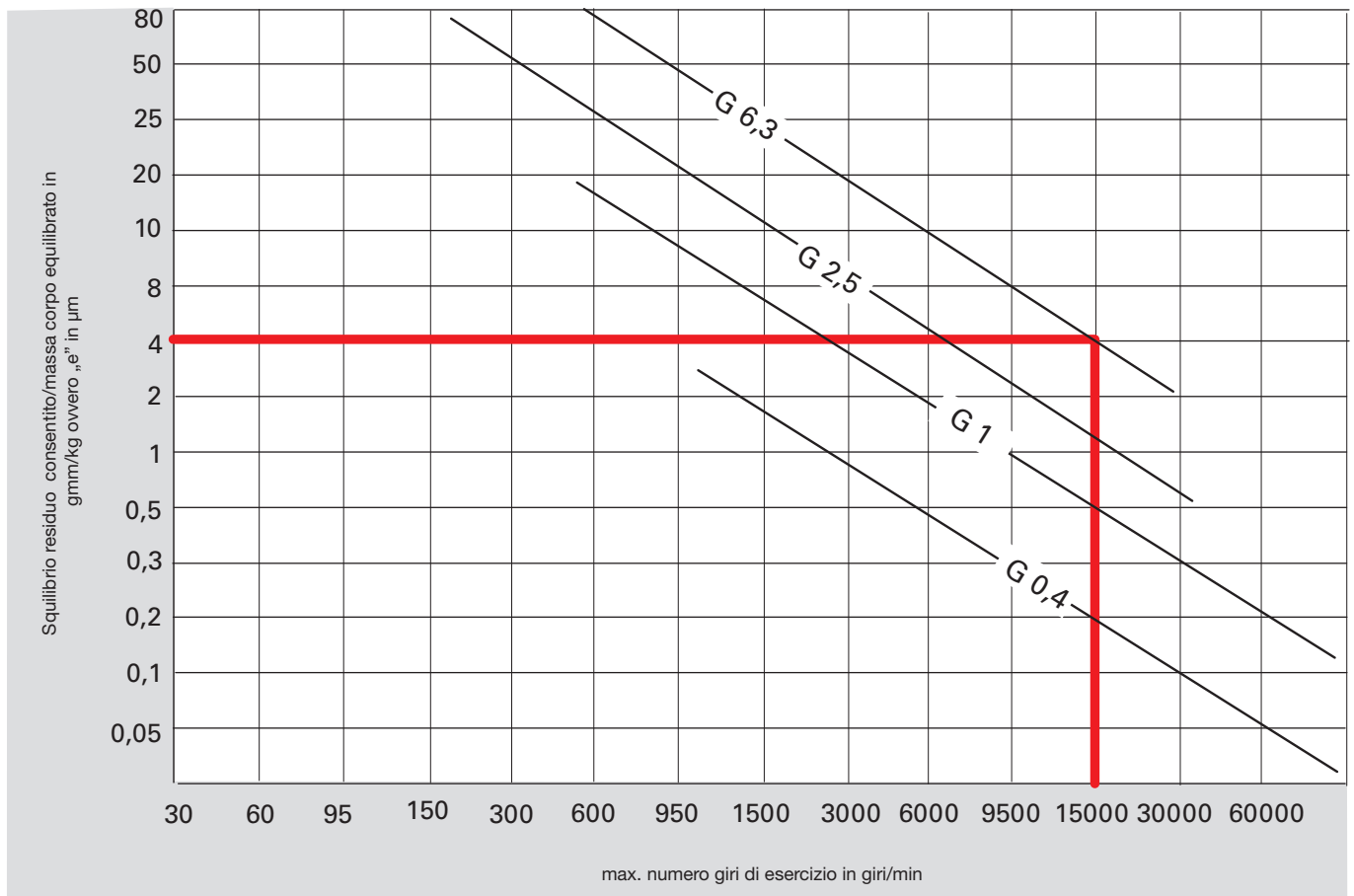
Limiti dell'equilibratura

In base alla DIN ISO 1940 la qualità dell'equilibratura è indicata con G nonchè dalle unità gmm/kg ovvero μm e si basa sul numero di giri. Con un numero di giri di 15.000 giri/min ed un peso 1 kg., G6,3 corrisponde ad uno scostamento consentito dal centro tra asse rotante e centro di gravità del mandrino di 4 μm .

Raddoppiando il numero di giri a 30.000 giri/min sarebbe di 2 μm . Se l'attacco utensile però pesa la metà, cioè 0,5 kg, allora la tolleranza di squilibrio consentita si dimezza. Scopo dell'equilibratura deve essere di trovare un compromesso tra fattibilità tecnica e logica economica. Dato che la precisione di cambio radiale di un attacco HSK nuovo può già essere di 2 - 3 μm e per un attacco ISO di 5 - 10 μm , significa disporre già di un limite di qualità di G2,5 ovvero G6,3 a 10.000 giri/min.

Il grafico nella pagina accanto mostra la qualità di equilibratura alla DIN ISO 1940-1, quindi gli squilibri residui consentiti, basati sulla massa del corpo equilibrato, per differenti qualità G di equilibratura, a seconda del massimo numero di giri utilizzato.

Influsso dello squilibrio su mandrini, attacchi utensili ed utensili



Gli attacchi utensili Stock sono equilibrati a G2,5/25.000 giri/min o a G6,3/15.000 giri/min. A richiesta, specialmente su prescrizione dei produttori di macchine, possiamo equilibrare di fine, con protocollo di equilibratura, sino ad avere uno squilibrio residuo di 0,3 gmm.

Mandrini ed apparecchi di calettamento

Tecnica e vantaggi

I mandrini di calettamento ottengono un'unione ottimale tra mandrino e codolo dell'utensile. Mentre alcuni fornitori utilizzano normale acciaio da cementazione, STOCK impiega uno speciale acciaio utensile orientato all'impiego. Il risultato è una maggiore dilatabilità ed una migliore tollerabilità al calore. Calettamento e dissaldamento si possono effettuare quante volte si voglia.

I Vantaggi:

- brevi tempi di calettamento
- massima forza di serraggio
- mandrini di calettamento per codoli dell'utensile con diam. da 3 a 32 mm
- lunga durata

Questi vantaggi sono evidenti soprattutto per: fresatura HSC, truciolatura di materiali temprati, sgrossatura, foratura, alesatura e tornitura interna, lavorazione di legno.

Principali proprietà:

- eccellente precisione di coassialità
- ottime forza di serraggio e rigidità
- superiore durata di impiego
- minimo squilibrio della simmetria di rotazione
- convenienza

Il principio di serraggio

Riscaldamento e raffreddamento sono i soli fattori determinanti nel serraggio dell'utensile nel mandrino di calettamento per ottenere una sicura tenuta. Il riscaldamento provoca la dilatazione del mandrino, che permette di serrare e disserrare un utensile. Il raffreddamento lo fa contrarre di nuovo, serrando l'utensile montato con la massima forza di bloccaggio. Poiché il riscaldamento rende il mandrino di calettamento molto caldo ed inoltre si serrano e disserrano utensili con spigoli acuminati, si devono assolutamente indossare guanti in kevlar, per proteggersi da scottature e tagli.

Prolunghe di calettamento: aumentano il rendimento

Le prolunghe di calettamento incrementano la capacità di rendimento di un utensile e ne riducono gli spigoli di disturbo. Come con il mandrino, l'utensile è serrato nella prolunga e quindi bloccato in modo ideale nel mandrino ad espansione idraulica. Naturalmente le prolunghe si possono montare anche nel mandrino di calettamento.

Il team perfetto: mandrini ed apparecchi di calettamento

Per il serraggio ed il disserraggio di utensili nei nostri mandrini di calettamento, offriamo differenti apparecchi per le specifiche esigenze della Vostra produzione.



Montaggio dell'unità di adduzione refrigerante per nebulizzazione MMS

1. L'attacco HSK deve essere pulito e privo di trucioli e danni.
2. Ingrassare gli anello O prima del montaggio.
3. Inserire l'unità adduzione refrigerante (tubo di adduzione, dado di risvolto e 2 anelli O) completamente e centrarla nell' HSK, con l'aiuto della chiave a tubo.

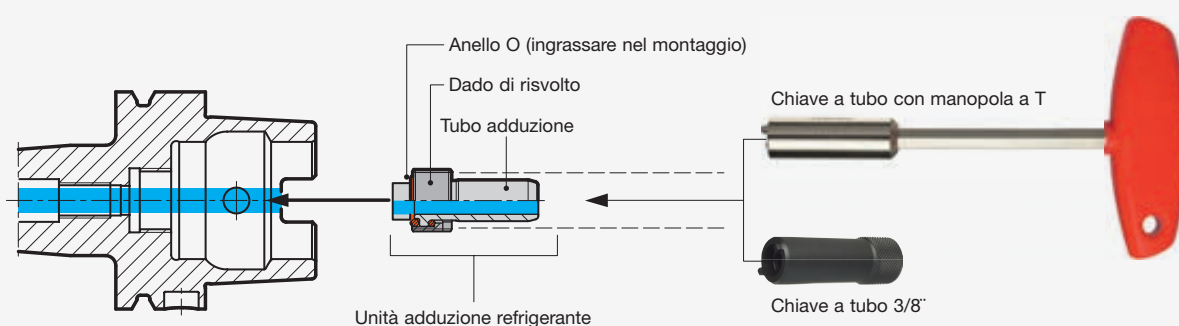
Nell'inserire l'unità di adduzione per nebulizzazione, prestare molta attenzione a che il tubicino di nebulizzazione sia inserito nella vite di regolazione centrato e senza danni (senza deviazioni).

4. Avvitare e stringere bene l'unità di adduzione refrigerante (per momento torcente, vedere tabella a destra).
5. Verificare la possibilità di mobilità radiale del tubo di adduzione.

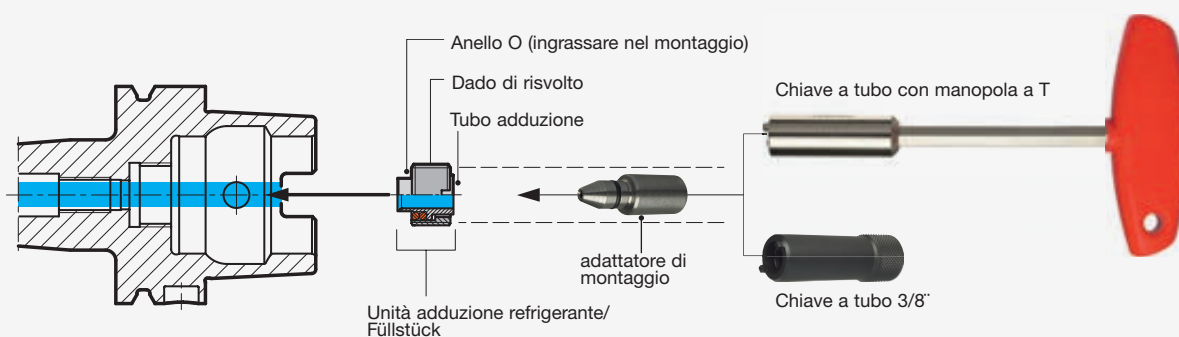
Momento torcente

per HSK	MA Nm
32	7
40	11
50	15
63	20
80	25
100	30

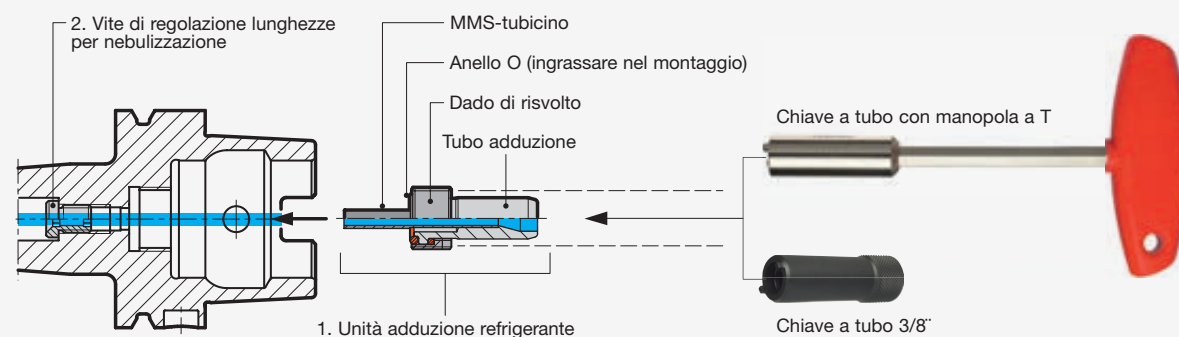
Montaggio unità adduzione refrigerante per nebulizzazione MMS



Montaggio unità adduzione refrigerante per nebulizzazione MMS monoblocco



Montaggio unità adduzione refrigerante per nebulizzazione MMS



Consigli per l'impiego di mandrini ad espansione idraulica

Tecnica e vantaggi

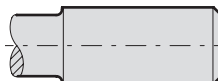
Serraggio di codolo utensili normalizzati a DIN 6535 in mandrini ad espansione idraulica

Codoli utensili per serraggio diretto
Circolarità $\leq 0,003$ mm

forma HA $\varnothing 6 \dots 20$ mm



forma HA $\varnothing 25 \dots 32$ mm

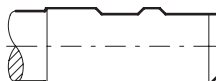


forma HB $\varnothing 6 \dots 20$ mm



Codoli utensili per serraggio con bussola di riduzione
Circolarità $\leq 0,005$ mm

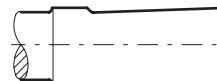
forma HB $\varnothing 25 \dots 32$ mm



forma HE $\varnothing 6 \dots 20$ mm



forma HE $\varnothing 25 \dots 32$ mm



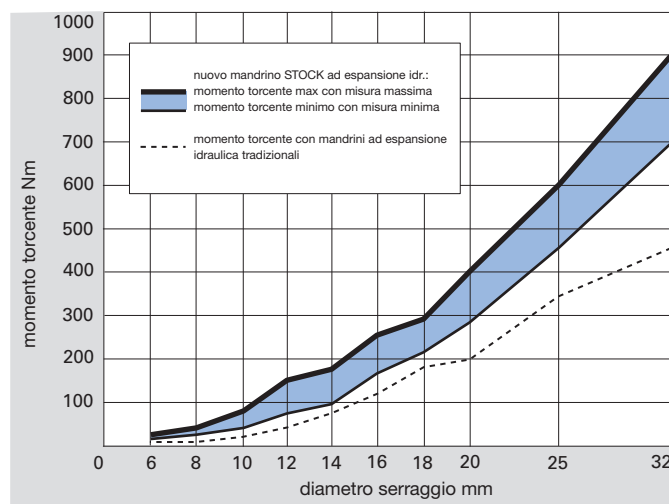
Consigli generali:

i nostri mandrini ad espansione idraulica non devono essere azionati con utensili comandati a motore (registratore di impulso o simili). La chiave esagonale non dovrebbe (sull'intera lunghezza) superare la misura della vite, in questo modo si evita ampiamente di trasferire un momento torcente eccessivo. Consigliamo l'impiego della chiave esagonale più comune, art. 4912. Non si dovrebbe superare una coppia di serraggio di 10 Nm.

Il mandrino ad espansione idraulica Stock con maggiore forza di serraggio è adatto per bloccare utensili a rotazione simmetrica o pezzi da lavorare. Con utensili con codolo, si possono serrare direttamente sia codoli cilindrici lisci fino al $\varnothing 32$ mm che codoli a DIN 6535 forme HA e HB fino al $\varnothing 20$ mm. Nell'uso non si devono superare i valori della tabella. La mancata osservanza della profondità minima di inserimento o l'impiego di codoli differenti da quelli citati porta a perdite di precisione e forza di serraggio!

Soprattutto con alti numeri di giri per „high speed cutting“ insorgono specifiche esigenze per gli attacchi utensili. In questo ambito il serraggio dell'utensile nel mandrino ad espansione assume una particolare importanza. Per questo motivo ha sviluppato un mandrino ad espansione, che serra con un superiore momento torcente in modo sicuro e forte, quindi assicura una tenuta particolarmente buona dell'utensile nell'attacco.

Il nuovo mandrino ad espansione si contraddistingue, oltre che per l'esatta concentricità (errore max 3 μ m), per il cambio utensile molto veloce e semplice, nonché per l'azione di smorzamento delle vibrazioni della camera di serraggio ad espansione, anche per effettuare lavori con massime esigenze. Ne risultano ottimali durate degli utensili e migliori finiture di superficie, nonché tenute di misura del pezzo lavorato.



Superiore:
la forza di serraggio del nuovo mandrino ad espansione idraulica HSK-A STOCK rispetto ad un mandrino ad espansione tradizionale.

Mandrini ad espansione idraulica

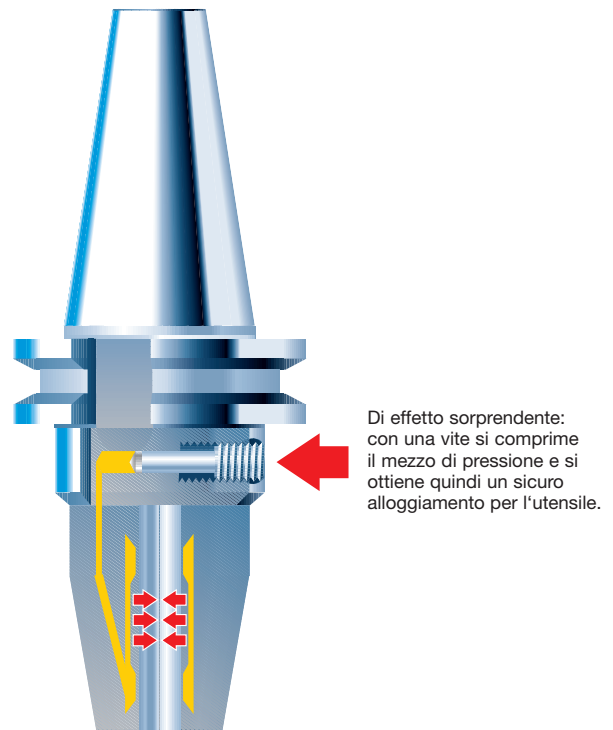
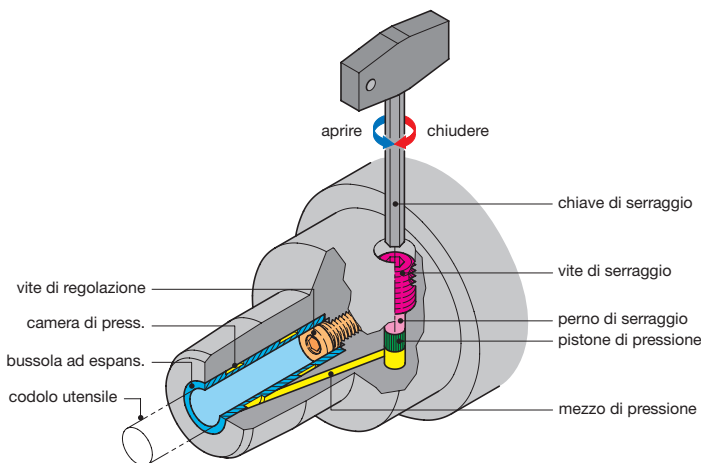
Tecnica e vantaggi

Gli attacchi utensili devono adeguarsi alle particolari esigenze dei moderni procedimenti di truciatura. Mandrini ad espansione idraulica offrono perciò la migliore tenuta, unita ad una esatta Circolarità. Inoltre consentono un facile e veloce cambio utensili, al quale contribuisce una speciale chiave di estrazione.

Ruotando la vite a pressione si forma nella camera una pressione sufficientemente alta, che porta alla deformazione elastica della bussola di espansione, tramite la quale l'utensile è serrato con forza, con l'esatta Circolarità. Ciò permette un alloggiamento sicuro e dinamicamente accoppiato. Se si utilizzano bussole di riduzione, che possono montare utensili con differenti diametri, si amplia la gamma di utensili impiegabili. Se però non la si usa, bisogna porre la massima attenzione sulla profondità di inserimento minima!

Vantaggi:

- serraggio utensili preciso con errore di coassialità massimo di 3 μm ;
- trasmissione di alti momenti torcenti con sistema di bussola ad espansione ottimizzato (massimo serraggio);
- adatti all'alta velocità (nessuna forza centrifuga attraverso i segmenti di serraggio);
- precisa Circolarità, quindi eccellente finitura di superficie e tenuta di misura nel pezzo da lavorare;
- rapido cambio utensile tramite vite di serraggio facilmente azionabile;
- ottimale durata di impiego dell'utensile;
- effetto di smorzamento vibrazioni con cuscinetti idraulici.



per \varnothing attacco in mm	max. no. giri in 1/min	momento torcente trasmissibile in Nm	minima prof. bloccaggio in mm	max. registrazione l_3 in mm	forza rad. F consentita su mandrino con 50 mm sporgenza in N	temper. esercizio in $^{\circ}\text{C}$	max. pressione refrig. in bar
6 h6	50 000	16	27	10	225	20 - 50	80
8 h6	50 000	26	27	10	370	20 - 50	80
10 h6	50 000	50	31	10	540	20 - 50	80
12 h6	50 000	82	36	10	650	20 - 50	80
14 h6	50 000	125	36	10	900	20 - 50	80
16 h6	50 000	190	39	10	1410	20 - 50	80
18 h6	50 000	275	39	10	1580	20 - 50	80
20 h6	50 000	310	41	10	1860	20 - 50	80
25 h6	25 000	520	47	10	4400	20 - 50	80
32 h6	25 000	770	51	10	6500	20 - 50	80

Confronto internazionale dei materiali

Germania		Gran Bretagna		Giappone	Stati Uniti
No. di mat.	DIN	BS	EN	JIS	AISI/SAE/ASTM
1.0711	9 S 20	220 M 07	-	SUM 21	1212
1.0715	9 SMn 28	230 M 07	-	SUM 22	1213
1.0718	9 SMnPb 28	-	-	SUM 22 L	12 L 13
1.0721	10 S 20	210 M 15	-	-	1108
1.0722	10 SPb 20	-	-	-	11 L 08
1.0723	15 S 20	210 A 15	-	SUM 32	-
1.0736	9 SMn 36	240 M 07	1B	-	1215
1.0737	9 SMnPb 36	-	-	-	12 L 14
1.0726	35 S 20	212 M 36	8M	-	1140
1.0727	45 S 20	212 M 44	-	-	1146
1.0728	60 S 20	-	-	-	-
1.0037	St 37-2	-	-	STKM 12 C	-
1.0044	St 44-2	4360-43 B	-	SM 41 B	A 570 Gr. 40
1.0116	St 37-3	4360-40 C	-	-	A 573 Gr. 58
1.0144	St 44-3	4360-43 C	-	SM 41 C	A 573 Gr. 70
1.0050	St 50-2	4360-50 B	-	SS 50	A 570 Gr. 50
1.0570	St 52-3	4360-50 B	-	SM 50 YA	-
1.0060	St 60-2	4360-SSE; SS	-	SM 58	-
1.5415	15 Mo 3	1501-240	-	-	A 204 Gr. A
1.5423	16 Mo 5	1503-245-420	-	-	4520
1.5622	14 Ni 6	-	-	-	A 350-LF 5
1.5680	12 Ni 19	-	-	-	2515
1.7335	13 CrMo 4 4	1501-620 Gr.	-	-	A 182-F11; F12
1.7337	16 CrMo 4 4	1501-620 Gr.	-	-	A 387 Gr. 12 C
1.7380	10 CrMo 9 10	1501-622 Gr.	-	-	A 182-F22
1.7709	21 CrMoV 5 7	-	-	-	-
1.7715	14 MoV 6 3	1503-660-440	-	-	-
1.7735	14 CrMoV 6 9	-	-	-	-
1.0904	55 Si 7	250 A 53	45	-	9255
1.0961	60 SiCr 7	-	-	SUP 7	9262
1.1231	CK 67	060 A 67	-	-	1070
1.1248	CK 75	060 A 78	-	-	1078; 1080
1.1274	CK 101	060 A 96	-	SUP 4	1095
1.7103	67 SiCr 5	-	-	-	-
1.7176	55 Cr 3	527 A 60	48	SUP 9 (A)	5155
1.8159	50 CrV 4	735 A 50	47	SUP 10	6150
1.0301	C 10	045 M 10	-	S 10 C	1010
1.0401	C 15	080 M 15	-	-	1015
1.1121	CK 10	045 M 10	-	S 10 C; S 9 CK	1010
1.1141	CK 15	080 M 15	32C	S 15 C; S 15 CK	1015
1.7012	13 Cr 2	-	-	-	-
1.7015	15 Cr 3	523 M 15	-	SCR 415 (H)	5015
1.5732	14 NiCr 10	-	-	SNC 415 (H)	3415
1.5752	14 NiCr 14	655 M 13	36A	SNC 815 (H)	3310; 9314
1.5860	14 NiCr 18	-	-	-	-
1.5919	15 CrNi 6	S 107	-	-	-
1.5920	18 NiCr 8	-	-	-	-
1.6523	21 NiCrMo 2	805 M 20	362	SNCM 220 (H)	8620
1.6587	17 CrNiMo 6	820 A 16	-	-	-
1.7131	16 MnCr 5	527 M 17	-	SCR 415	5115
1.7139	16 MnCrS 5	-	-	-	-
1.7147	20 MnCr 5	-	-	SMnC 420 (H)	5120
1.7149	20 MnCrS 5	-	-	-	-
1.7262	15 CrMo 5	-	-	SCM 415 (H)	-
1.7264	20 CrMo 5	-	-	SCM 421	-
1.7271	23 CrMoB 3 3	-	-	-	-
1.7311	20 CrMo 2	-	-	-	-
1.7321	20 MoCr 4	-	-	-	-
1.7323	20 MoCrS 4	-	-	-	-
1.7325	25 MoCr 4	-	-	-	-
1.7326	25 MoCrS 4	-	-	-	-
1.8504	34 CrAl 6	-	-	-	-
1.8506	34 CrAlS 5	-	-	-	-
1.8507	34 CrAlMo 5	905 M 31	-	-	A 355 Cl. D
1.0038	RSt37-2	4360 40C	1A	STKM 12A;C	A570.36

Confronto internazionale dei materiali

Germania		Gran Bretagna		Giappone	Stati Uniti
No. di mat.	DIN	BS	EN	JIS	AISI/SAE/ASTM
1.0402	C22	050 A 20	2C	-	1020
1.5026	55 Si 7	250 A 53	-	-	9255
1.8509	41 CrAlMo 7	905 M 39	41B	SACM 645	A 355 Cl. A
1.8515	31 CrMo 12	722 M 24	-	-	-
1.8519	31 CrMoV 9	-	-	-	-
1.8521	15 CrMoV 5 9	-	-	-	-
1.8523	39 CrMoV 13 9	897 M 39	40C	-	-
1.8550	34 CrAlNi 7	-	-	-	-
1.0402	C 22	050 A 20	2D	-	1020
1.0406	C 25	070 M 26	-	-	1025
1.0501	C 35	060 A 35	-	-	1035
1.0503	C 45	080 M 46	-	-	1045
1.0511	C 40	-	-	-	1040
1.0528	C 30	-	-	-	-
1.1151	Ck 22	050 A 20	-	S 20 C; S 20 CK	1023
1.1158	Ck 25	070 M 26	-	S 25 C	1025
1.1178	Ck 30	-	-	-	-
1.1181	Ck 35	080 M 36	-	S 35 C	1035
1.1186	Ck 40	080 M 40	-	S 40 C	1040
1.1191	Ck 45	080 M 46	-	S 45 C	1045
1.0535	C 55	070 M 55	-	-	1055
1.0540	C 50	-	-	-	-
1.0601	C 60	080 A 62	43D	-	1060
1.1203	Ck 55	070 M 55	-	S 55 C	1055
1.1206	Ck 50	080 M 50	-	-	1050
1.1221	Ck 60	080 A 62	43D	S 58 C	1060
1.1133	20 Mn 5	120 M 19	-	-	1022; 1518
1.3505	100 Cr 6	534 A 99	31	SUJ 2	52100
1.5120	38 MnSi 4	-	-	-	-
1.5121	46 MnSi 4	-	-	-	-
1.5141	53 MnSi 4	-	-	-	-
1.5710	36 NiCr 6	640 A 35	111A	SNC 236	3135
1.6546	40 NiCrMo	311-Type7	-	SNM 240	8740
1.6565	40 NiCrMo	311-Type6	-	SNM 439	4340
1.7003	38 Cr 2	-	-	-	-
1.7006	46 Cr 2	-	-	-	5045
1.7020	32 Cr 2	-	-	-	-
1.7030	28 Cr 4	530 A 30	-	-	5130
1.7033	34 Cr 4	530 A 32	18B	SCr 430 (H)	5132
1.7218	25 CrMo 4	1717 CDS 110	-	SCM 420; SCM	4130
1.7220	34 CrMo 4	708 A 37	19B	SCM 432; SCCrM	4135; 4137
1.7223	41 CrMo 4	708 M 40	19A	SCM 440	4142; 4140
1.7225	42 CrMo 4	708 M 40	19A	SCM 440	4142; 4140
1.7228	50 CrMo 4	708 A 47	-	SCM 445 (H)	4150
1.1157	40 Mn 4	150 M 36	15	-	1039
1.1165	30 Mn 5	120 M 36	-	SMn 433 H; SCMn	1330
1.1167	36 Mn 5	150 M 36	-	SMn 438 H; SCMn	1335
1.1170	28 Mn 5	150 M 28	14A	SCMn 1	1330
1.3561	44 Cr 2	-	-	-	-
1.3563	43 CrMo 4	-	-	-	-
1.3565	48 CrMo 4	817 M 40	-	SNC 836	-
1.5120	38 MnSi 4	-	-	-	-
1.5121	46 MnSi 4	-	-	-	-
1.5122	37 MnSi 4	-	-	-	-
1.5131	50 MnSi4	-	-	-	-
1.5141	53 MnSi 4	-	-	-	-
1.5223	42 MnV 7	-	-	-	-
1.5710	36 NiCr 6	640 A 35	111A	SNC 236	3135
1.5736	36 NiCr 10	-	-	SNC 631 (H)	3435
1.5755	31 NiCr 14	653 M 31	-	SNC 836	-
1.6511	36 CrNiMo	816 M 40	110	SNC 836	9840
1.6513	28 NiCrMo	-	-	-	-
1.7003	38 Cr 2	-	-	-	-
1.7006	46 Cr 2	-	-	-	5045
1.7030	28 Cr 4	530 A 30	-	-	5130

Confronto internazionale dei materiali

Germania		Gran Bretagna		Giappone	Stati Uniti
No. di mat.	DIN	BS	EN	JIS	AISI/SAE/ASTM
1.7033	34 Cr 4	530 A 32	18B	SCr 430 (H)	5132
1.7034	37 Cr 4	530 A 36	-	SCr 435 (H)	5135
1.7035	41 Cr 4	530 M 40	18	SCr 440 (H)	5140
1.7218	25 CrMo 4	1717 CDS 110	-	SCM 420; SCM 430	4130
1.7220	34 CrMo 4	708 A 37	19B	SCM 432; SCCrM 3	4135; 4137
1.7223	41 CrMo 4	708 M 40	19A	SCM 440	4142; 4140
1.7225	42 CrMo 4	708 M 40	19A	SCM 440	4142; 4140
1.7228	50 CrMo 4	708 A 47	-	SCM 445 (H)	4150
1.7561	42 CrV 6	-	-	-	-
1.7735	14 CrMoV 6 9	-	-	-	-
1.8159	50 CrV 4	735 A 50	47	SUP 10	6150
1.3563	43 CrMo 4	-	-	-	-
1.3565	48 CrMo 4	817 M 40	-	SNC 836	-
1.5120	38 MnSi 4	-	-	-	-
1.5121	46 MnSi 4	-	-	-	-
1.5122	37 MnSi 4	-	-	-	-
1.5223	42 MnV 7	-	-	-	-
1.5710	36 NiCr 6	640 A 35	111A	SNC 236	3135
1.5736	36 NiCr 10	-	-	SNC 631 (H)	3435
1.5864	35 NiCr 18	-	-	-	-
1.6511	36 CrNiMo 4	816 M 40	110	SNC 836	9840
1.6580	30 CrNiMo 8	823 M 30	-	SNM 431	-
1.6582	34 CrNiMo 6	817 M 40	24	SNM 447	4340
1.7033	34 Cr 4	530 A 32	18B	SCr 430 (H)	5132
1.7034	37 Cr 4	530 A 36	-	SCr 435 (H)	5135
1.7035	41 Cr 4	530 M 40	18	-	5140
1.7045	42 Cr 4	530 A 40	-	2245	5140
1.7218	25 CrMo 4	1717 CDS 110	-	2225	4130
1.7220	34 CrMo 4	708 A 37	19B	2234	4135; 4137
1.7223	41 CrMo 4	708 M 40	19A	2244	4142; 4140
1.7225	42 CrMo 4	708 M 40	19A	2244	4142; 4140
1.7228	50 CrMo 4	708 A 47	-	-	4150
1.7361	32 CrMo 12	722 M 24	40B	2240	-
1.7561	42 CrV 6	-	-	-	-
1.7707	30 CrMoV 9	-	-	-	-
1.7735	14 CrMoV 6 9	-	-	-	-
1.8159	50 CrV 4	735 A 50	47	2230	6150
1.8161	58 CrV 4	-	-	-	-
1.1520	C 70 W1	-	-	-	-
1.1525	C 80 W1	-	-	-	W 108
1.1545	C 105 W1	-	-	-	W 110
1.1620	C 70 W2	-	-	-	-
1.1625	C 80 W2	BW 1B	-	-	W 1
1.1645	C105 W2	-	-	-	-
1.1654	C 110 W	-	-	-	-
1.1663	C 125 W	-	-	-	W 112
1.1673	C 135 W	-	-	-	-
1.1730	C 45 W	-	-	-	-
1.1740	C 60 W	-	-	-	-
1.1744	C 67 W	-	-	-	-
1.1750	C 75 W	BW 1A	-	-	W 1
1.1820	C 55 W	-	-	-	-
1.1830	C 85 W	-	-	-	-
1.2067	100 Cr 6	BL 3	-	-	L 3
1.2101	62 SiMnCr 4	-	-	-	-
1.2103	58 SiCr 8	-	-	-	-
1.2108	90 CrSi 5	-	-	-	-
1.2162	21 MnCr 5	-	-	-	-
1.2210	115 CRV 3	-	-	-	L 2
1.2330	35 CrMo 4	708 A 37	-	2234	4135
1.2332	47 CrMo 4	709 M 40	-	2244	4142
1.2419	105 WCr 6	-	-	-	-
1.2510	100 MnCrW 4	BO 1	-	2140	O 1
1.2516	120 W 4	BF 1	-	-	-
1.2542	45 WCrV 7	BS 1	-	2710	S 1

Confronto internazionale dei materiali

Germania		Gran Bretagna		Giappone	Stati Uniti
No. di mat.	DIN	BS	EN	JIS	AISI/SAE/ASTM
1.2550	60 WCrV 7	-	-	-	-
1.2721	50 NiCr 13	-	-	-	-
1.2735	15 NiCr 14	-	-	SNC 22	-
1.2762	75 CrMoNiW 6 7	-	-	-	-
1.2826	60 MnSiCr 4	-	-	-	-
1.2833	100 V 1	BW 2	-	SKS 43	W 210
1.2842	90 MnCrV 8	BO 2	-	-	O 2
1.2080	X 210 Cr 12	BD 3	-	SKD 1	D 3
1.2341	X 6 CrMo 4	-	-	-	-
1.2363	X 100 CrMoV 5 1	BA 2	-	SKD 12	A 2
1.2379	X 155 CrVMo12 1	BD 2	-	SKD 11	D 2
1.2436	X 210 CrW 12	-	-	SKD 2	-
1.2601	X 165 CrMoV 12	-	-	-	-
1.2311	40 CrMnMo 7	-	-	-	-
1.2312	40 CrMnMoS 8 6	-	-	-	-
1.2711	54 NiCrMoV 6	-	-	-	-
1.2713	55 NiCrMoV 6	-	-	SKT 4	L 6
1.2738	40 CrMnNiMo 8	-	-	-	-
1.2744	57 NiCrMoV 77	-	-	-	-
1.2764	X 19 NiCrMo 4	-	-	-	-
1.2767	X 45 NiCrMo 4	-	-	-	-
1.2083	X 42 Cr 13	-	-	SUS 420 J 2	-
1.2343	X 38 CrMoV 5 1	BH 11	-	SKD 6	H 11
1.2344	X 40 CrMoV 5 1	BH 13	-	SKD 61	H 13
1.2365	X 32 CrMoV 3 3	BH 10	-	SKD 7	H 10
1.2567	X 30 WCrV 5 3	-	-	SKD 4	-
1.2581	X 30 WCrV 9 3	BH 21	-	SKD 5	H 21
1.2885	X 32 CrMoV 3 3 3	-	-	-	-
1.2316	X 36 CrMo 17	-	-	-	-
1.0420	GS-38	-	-	-	-
1.1118	GS-24 Mn 6	-	-	-	-
1.1120	GS-20 Mn 5	-	-	-	-
1.5419	GS-22 Mo 4	-	-	-	-
1.5633	GS-24 Ni 8	-	-	-	-
1.5681	GS-10 Ni 19	-	-	-	-
1.6309	GS-20 Mn MoNi 5 5	-	-	-	-
1.6582	GS-34 CrNiMo 6	-	24	-	-
1.6748	GS-40 NiCrMo 6 5 6	-	-	-	-
1.4311	X 2 CrNi 18 10	304 S 62	-	SUS 304 LN	304 LN
1.4401	X 5 CrNiMo 18 10	316 S 16	58J	SUS 316	316
1.4404	X 2 CrNiMo 17 13 2	316 S 11	-	SUS 316 L	316 L
1.4406	X 2 CrNiMoN 17 12 2	316 S 61	58C	SUS 316 LN	316 LN
1.4429	X 2 CrNiMoN 17 13 3	316 S 62	-	SUS 316 LN	316 LN
1.4435	X 2 CrNiMo 18 14 3	317 S 12	-	SCS 16; SUS 316	316 L
1.4436	X 5 CrNiMo 17 13 3	316 S 16	-	SUS 316	316
1.4438	X 2 CrNiMo 18 16 4	317 S 12	-	SUS 317 L	317 L
1.4460	X 8 CrNiMo 27 5	-	-	SUS 329 J 1	329
1.4462	X 2 CrNiMoN 22 5	-	-	-	-
1.4541	X 6 CrNiTi 18 10	321 S 12	58B	SUS 321	321
1.4542	X 5 CrNiCuNb 17 14	-	-	SCS 124; SUS 630	630
1.4546	X 5 CrNiNb 18 10	347 S 18	-	-	348
1.4550	X 6 CrNiNb 18 10	347 S 17	58F	SUS 347	347
1.4571	X 6 CrNiMoTi 17 12 2	320 S 31	58J	-	316 Ti
1.4580	X 6 CrNiMoNb 17 12 2	318 S 17	-	-	316 Cb
1.4301	X 5 CrNi 18 9	304 S 15	58E	SUS 304	304; 304 H
1.4303	X 5 CrNi 18 12	305 S 19	-	SUS 305	308; 305
1.4305	X 10 CrNiS 18 9	303 S 21	58M	SUS 303	303
1.4306	X 2 CrNi 19 11	304 S 12	-	SCS 19	304 L
1.4310	X 12 CrNi 17 7	301 S 21	-	SUS 301	301
1.4350	X 5 CrNi 18 9	304 S 31	58E	SUS 302	304
1.4573	X 10 CrNiMoTi 18 12	320 S 33	-	-	316 Ti
1.4583	X 10 CrNiMoNb 18 12	-	-	-	318
1.4000	X 6 Cr 13	403 S 17	-	SUS 403	403
1.4002	X 6 CrAl 13	405 S 17	-	SUS 405	405
1.4016	X 6 Cr 17	430 S 15	960	SUS 430	430

Confronto internazionale dei materiali

Germania		Gran Bretagna		Giappone	Stati Uniti
No. di mat.	DIN	BS	EN	JIS	AISI/SAE/ASTM
1.4113	X 6 CrMo 17	434 S 17	-	SUS 434	434
1.4313	X 5 CrNi 13 4	425 C 11	-	SCS 5	CA 6-NM
1.4510	X 6 CrTi 17	-	-	SUS 430 LX	XM 8; 430 Ti
1.4512	X 5 CrTi 12	409 S 19	-	SUH 409	409
1.4005	X 12 CrS 13	416 S 21	-	SUS 416	416
1.4006	X 10 Cr 13	410 S 21	56A	SUS 410	410; CA-15
1.4021	X 20 Cr 13	420 S 37	-	SUS 420 J 1	420
1.4028	X 30 Cr 13	420 S 45	-	SUS 420 J 2	-
1.4031	X 38 Cr 13	-	-	SUS 420 J 2	-
1.4034	X 46Cr 13	420 S 45	56D	SUS 420 J 2	-
1.4057	X 20 CrNi 17 2	431 S 29	57	SUS 431	431
1.4104	X 12 CrMoS 17	-	-	SUS 430 F	430 F
1.4125	X 105 CrMo 17	-	-	SUS 440 C	440 C
1.4742	X 10 CrAl 18	430 S 15	60	SUS 430; SUH	430
1.4747	X 80 CrNiSi 20	443 S 65	59	SUH 4	HNv 6
1.4762	X 10 CrAl 24	-	-	-	446
1.4876	X 10 NiCrAlTi 33	NA 15 (H)	-	NCF 800	B 163
0.6010	GG-10	-	-	FC 10	A48-20 B
0.6015	GG-15	Grade 150	-	FC 15	A48-25 B
0.6020	GG-20	Grade 220	-	FC 20	A48-30 B
0.6025	GG-25	Grade 260	-	FC 25	A48-40 B
0.6030	GG-30	Grade 300	-	FC 30	A48-45 B
0.6035	GG-35	Grade 350	-	FC 35	A48-50 B
0.6040	GG-40	Grade 400	-	-	A48-60 B
0.6655	GGL-NiCuCr 15 6	L-NUC 15 6 2	-	-	A-436 Type 1
0.7040	GGG-40	SNG 420/12	-	FCD 40	60-40-18
0.7050	GGG-50	SNG 500/7	-	FCD 50	65-45-12
0.7060	GGG-60	SNG 600/3	-	FCD 60	80-55-06
0.7070	GGG-70	SNG 700/2	-	FCD 70	100-70-03
0.7080	GGG-80	SNG 800/2	-	-	120-90-02
0.7660	GGG-NiCr 20 2	S-NiCr 20 2	-	-	A 439 Type D-2
0.7661	GGG-NiCr 20 3	S-NiCr 20 3	-	-	A 439 Type D-2B
0.7670	GGG-Ni 22	S-Ni 22	-	-	A 439 Type D-2C
0.7673	GGG-NiMn 23 4	S-NiMn 23 4	-	-	A 439 Type D-2M
0.7676	GGG-NiCr 30 3	S-NiCr 30 3	-	-	A 439 Type D-3
0.7677	GGG-NiCr 30 1	S-NiCr 30 1	-	-	A 439 Type D-3A
0.7680	GGG-NiSiCr 30 5	S-NiSiCr 30 5 5	-	-	A 439 Type D-4
0.7683	GGG-Ni 35	S-Ni 35	-	-	A 439 Type D-5
0.7685	GGG-NiCr 35 3	S-NiCr 35 3	-	-	A 439 Type D-5B
0.8135	GTS-35	B340/12	-	-	32510
0.8145	GTS-45	P440/7	-	-	40010
0.8155	GTS-55	P510/4	-	-	50005
0.8165	GTS-65	P570/3	-	-	70003
0.8170	GTS-70	P690/2	-	-	90001
0.8035	GTW-35	W340/3	-	-	-
3.0225	Al99.5	1B	-	A1x1	-
3.0305	Al99.9	-	-	-	-
3.0505	AlMn0.5Mg0.5	N31	-	-	-
3.0515	AlMn1	N3	-	144054	-
3.0525	AlMn1Mg0.5	-	-	-	-
3.3315	AlMg1	N41	-	A2x8	-
3.3535	AlMg3	N5	-	-	-
3.1325	AlCuMg1	H14	-	-	-
3.1355	AlCuMg2	2L97	-	A3x4	-
3.2315	AlMgSi1	H30	-	-	-
3.3206	AlMgSi0.5	H9	-	A2x5	-
3.3211	AlMg1SiCu	-	-	-	-
3.4345	AlZnMgCu0.5	L86	-	-	7050
3.4365	AlZnMgCu1.5	L87	-	-	7175
-	Al1Mg1SiCrTi	-	-	-	6011
-	Al0.3Cu1Mg0.6SiCr	-	-	-	6061
-	Al1Cu1.1Mg1.4Si0.8Mn	-	-	-	6066
3.2134	G-AlSi5Cu1Mg	-	-	-	-
3.3241	G-AlMg3Si	-	-	-	-
3.3292	GD-AlMg9	-	-	-	-

Confronto internazionale dei materiali

Germania		Gran Bretagna		Giappone	Stati Uniti
No. di mat.	DIN	BS	EN	JIS	AISI/SAE/ASTM
3.3541	GD-AlMg3	-	-	-	-
3.2161	G-AISI8Cu3	-	-	-	-
3.2373	G-AISI9Mg	-	-	-	-
3.2381	G-AISI10Mg	LM9	-	-	-
3.2383	G-AISI10Mg(Cu)	LM 9	-	-	A 360.2
3.2581	G-AISI12	LM 6	-	-	A 413.2
2.2583	G-AISI12(Cu)	LM 20	-	-	A 413.1
2.0240	CuZn15	CZ 102	-	-	C23000
2.0265	CuZn30	CZ 106	-	-	C26000
2.0321	CuZn37	CZ 108	-	-	C27200
2.0335	CuZn36	-	-	-	-
2.0360	CuZn40	-	-	-	-
2.0401	CuZn39Pb3	-	-	-	-
2.1016	CuSn4	-	-	-	-
2.1030	CuSn8	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
2.0975	G-CuAl10Ni	-	-	-	-
2.1096.01	G-CuSn5ZnPb	-	-	-	-
2.1090.01	G-CuSn7ZnPb	-	-	-	-
2.1086.01	G-CuSn10Zn	-	-	-	-
2.4360	NiCu30Fe	NA 13	-	-	Monel 400
2.4375	NiCu30Al	NA 18	-	-	Monel K-500
2.4685	G-NiMo28	-	-	-	Hastelloy B
2.4610	NiMo16Cr16Ti	-	-	-	Hastelloy C-4
2.4810	G-NiMo30	-	-	-	Hastelloy C
2.4630, 2.4951	NiCr20Ti	HR 5	-	-	Nimonic 75
2.4631	NiCr20TiAl	HR 401; 601	-	NCF 80 A	Nimonic 80 A
2.4632	NiCr20Co18Ti	-	-	-	Nimonic 90
2.4634	NiCo20Cr15MoAlTi	-	-	-	Nimonic 105
2.4662	NiCr13Mo6Ti3	-	-	-	Nimonic 901
2.4670	-	-	-	-	Nimocast 713
2.4674	-	-	-	-	Nimocast PK 24
2.6554	-	-	-	-	Waspaloy
Hardox 400	-	-	-	-	Hardox 400
Hardox 500	-	-	-	-	Hardox 500
2.4856	NiCr22Mo9Nb	NA 21	-	-	Inconel 625
2.4668	NiCr19FeNbMo	-	-	-	Inconel 718
3.7024	Ti99.5	TA 6	-	-	-
3.7064	Ti99.2	TA 7	-	-	R50400
Ti99.9	Ti99.9	TA 9	-	-	R50700
3.7112	Ti5Al2.5Sn	TA 14/17	-	-	R54520
3.7165	TiAl6V4	TA 28	-	-	R56400
1.4718	X 45 CrSi 9 3	401 S 45	52	SUH 1	HNV 3
1.4828	X 15 CrNiSi 20 12	309 S 24	-	SUH 309	309
1.4841	X 15 CrNiSi 25 20	-	-	SUH 310	314; 310
1.4845	X 12 CrNi 25 21	310 S 24	-	SUH 310; SUS 310 S	310 S
1.4864	X 12 NiCrSi 36 16	NA 17	-	SUH 330	330
1.4871	X 53 CrMnNiN 21 9	349 S 54	-	SUH 35; SUH 36	EV 8
1.4878	X 12 CrNiTi 18 9	321 S 20	-	SUS 321	321

Basi di frese

Comparazione durezza

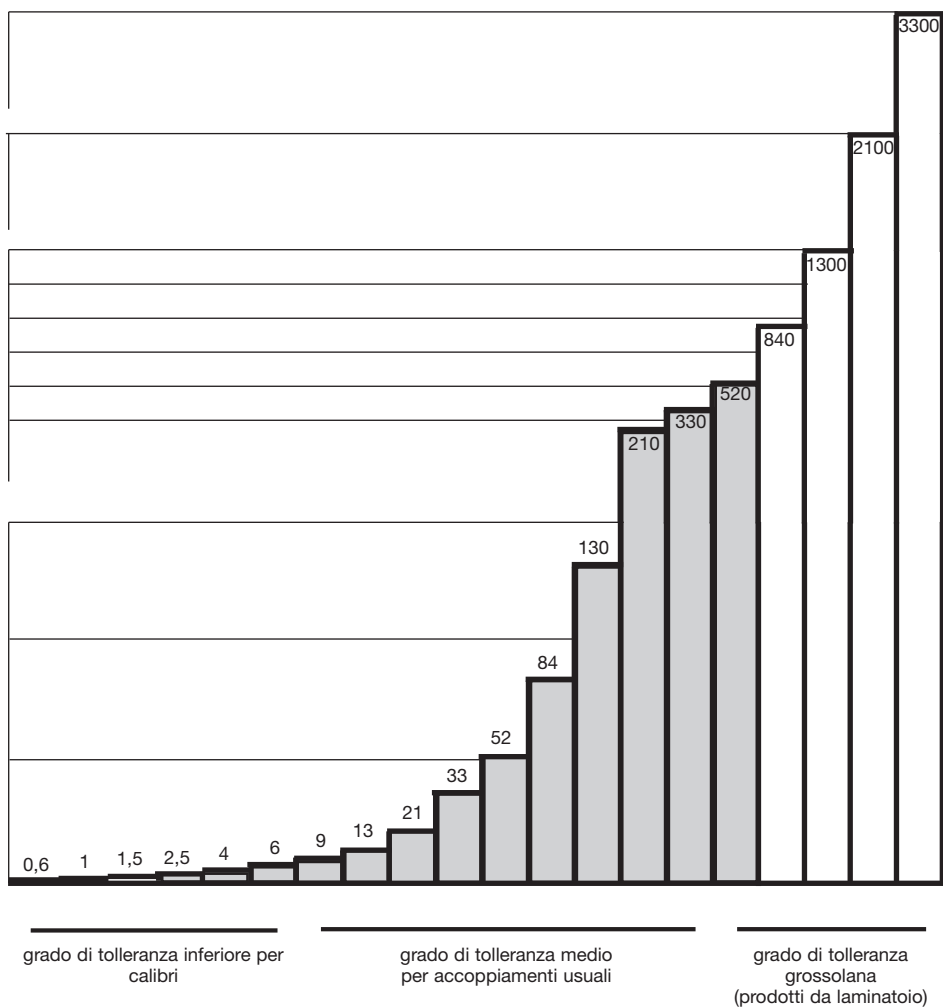
Rm (N/mm ²)	HRC	HB30	HV10	Rm (N/mm ²)	HRC	HB30	HV10
240		71	75	1110	35	328	345
255		76	80	1140	36	337	355
270		81	85	1170	37	346	364
285		86	90	1200	38	354	373
305		90	95	1230	39	363	382
320		95	100	1260	40	372	392
335		100	105	1300	41	383	403
350		105	110	1330	42	393	413
370		109	115	1360	43	402	423
385		114	120	1400	44	413	434
400		119	125	1440	45	424	446
415		124	130	1480	46	435	458
430		128	135	1530	47	449	473
450		133	140	1570	48	460	484
465		138	145	1620	49	472	497
480		143	150	1680	50	488	514
495		147	155	1730	51	501	527
510		152	160	1790	52	517	544
530		157	165	1845	53	532	560
545		162	170	1910	54	549	578
560		166	175	1980	55	567	596
575		171	180	2050	56	584	615
595		176	185	2140	57	607	639
610		181	190	2180	58	622	655
625		185	195		59		675
640		190	200		60		698
660		195	205		61		720
675		199	210		62		745
690		204	215		63		773
705		209	220		64		800
720		214	225		65		829
740		219	230		66		864
755		223	235		67		900
770		228	240		68		940
785		233	245				
800	22	238	250				
820	23	242	255				
835	24	247	260				
860	25	255	268				
870	26	258	272				
900	27	266	280				
920	28	273	287				
940	29	278	293				
970	30	287	302				
995	31	295	310				
1020	32	301	317				
1050	33	311	327				
1080	34	319	336				

Tolleranze di costruzione

Tolleranze base ISO p. misure di lunghezze 1 - 120 mm DIN ISO 286-1

Misure nominali		IT in μm											
		3	4	5	6	7	8	9	10	11	12	13	14
da	1	2	3	4	6	10	14	25	40	60	100	140	250
fino a	3	2.5	4	5	8	12	18	30	48	75	120	180	300
oltre	6	2.5	4	6	9	15	22	36	58	90	150	220	360
fino a	10	3	5	8	11	18	27	43	70	110	180	270	430
oltre	18	4	6	9	13	21	33	52	84	130	210	330	520
fino a	30	4	7	11	16	25	39	62	100	160	250	390	620
oltre	50	5	8	13	19	30	46	74	120	190	300	460	740
fino a	80	6	10	15	22	35	54	87	140	220	350	540	870
oltre	120												

Esempio di tolleranza base ISO per misure nominali oltre 18 fino a 30 mm



Gli accoppiamenti più utilizzati in μm

Diametri nominali in mm		A		B				C			
oltre	fino a	9	11	8	9	10	11	8	9	10	11
0	3	+295	+330	+154	+165	+180	+200	+74	+85	+100	+120
		+270	+270	+140	+140	+140	+140	+60	+60	+60	+60
3	6	+300	+345	+158	+170	+188	+215	+88	+100	+118	+145
		+270	+270	+140	+140	+140	+140	+70	+70	+70	+70
6	10	+316	+370	+172	+186	+208	+240	+102	+116	+138	+170
		+280	+280	+150	+150	+150	+150	+80	+80	+80	+80
10	18	+333	+400	+177	+193	+220	+260	+122	+138	+165	+205
		+290	+290	+150	+150	+150	+150	+95	+95	+95	+95
18	30	+352	+430	+193	+212	+244	+290	+143	+162	+194	+240
		+300	+300	+160	+160	+160	+160	+110	+110	+110	+110
30	40	+372	+470	+209	+232	+270	+330	+159	+182	+220	+280
		+310	+310	+170	+170	+170	+170	+120	+120	+120	+120
40	50	+382	+480	+219	+242	+280	+340	+169	+192	+230	+290
		+320	+320	+180	+180	+180	+180	+130	+130	+130	+130
50	65	+414	+530	+236	+264	+310	+380	+186	+214	+260	+330
		+340	+340	+190	+190	+190	+190	+140	+140	+140	+140
65	80	+434	+550	+246	+274	+320	+390	+196	+224	+270	+340
		+360	+360	+200	+200	+200	+200	+150	+150	+150	+150
80	100	+467	+600	+274	+307	+360	+440	+224	+257	+310	+390
		+380	+380	+220	+220	+220	+220	+170	+170	+170	+170
100	120	+497	+630	+294	+327	+380	+460	+234	+267	+320	+400
		+410	+410	+240	+240	+240	+240	+180	+180	+180	+180

Diametri nominali in mm		D					E			F			
oltre	fino a	8	9	10	11	12	7	8	9	6	7	8	9
0	3	+34	+45	+60	+80	+120	+24	+28	+39	+12	16	+20	+31
		+20	+20	+20	+20	+20	+14	+14	+14	+6	+6	+6	+6
3	6	+48	+60	+78	+105	+150	+32	+38	+50	+18	+22	+28	+40
		+30	+30	+30	+30	+30	+20	+20	+20	+10	+10	+10	+10
6	10	+62	+76	+98	+130	+190	+40	+47	+61	+22	+28	+35	+49
		+40	+40	+40	+40	+40	+25	+25	+25	+13	+13	+13	+13
10	18	+77	+93	+120	+160	+230	+50	+59	+75	+27	+34	+43	+59
		+50	+50	+50	+50	+50	+32	+32	+32	+16	+16	+16	+16
18	30	+98	+117	+149	+195	+275	+61	+73	+92	+33	+41	+53	+72
		+65	+65	+65	+65	+65	+40	+40	+40	+20	+20	+20	+20
30	50	+119	+142	+180	+240		+75	+89	+112	+41	+50	+64	+87
		+80	+80	+80	+80		+50	+50	+50	+25	+25	+25	+25
50	80	+146	+174	+220	+290		+90	+106	+134	+49	+60	+76	+104
		+100	+100	+100	+100		+60	+60	+60	+30	+30	+30	+30
80	120	+174	+207	+260	+340		+107	+126	+159	+58	+71	+90	+123
		+120	+120	+120	+120		+72	+72	+72	+36	+36	+36	+36
120	180							+148					
								+85					
180	250							+172					
								+100					

Gli accoppiamenti più utilizzati in μm

Diametri nominali in mm		G		H							J		
oltre	fino a	6	7	6	7	8	9	10	11	12	6	7	8
0	3	+8	+12	+6	+10	+14	+25	+40	+60	+100	+2	+4	+6
		+2	+2	0	0	0	0	0	0	0	-4	-6	-8
3	6	+12	+16	+8	+12	+18	+30	+48	+75	+120	+5	+6	+10
		+4	+4	0	0	0	0	0	0	0	-3	-6	-8
6	10	+14	+20	+9	+15	+22	+36	+58	+90	+150	+5	+8	+12
		+5	+5	0	0	0	0	0	0	0	-4	-7	-10
10	18	+17	+24	+11	+18	+27	+43	+70	+110	+180	+6	+10	+15
		+6	+6	0	0	0	0	0	0	0	-5	-8	-12
18	30	+20	+28	+13	+21	+33	+52	+84	+130	+210	+8	+12	+20
		+7	+7	0	0	0	0	0	0	0	-5	-9	-13
30	50	+25	+34	+16	+25	+39	+62	+100	+160	+250	+10	+14	+24
		+9	+9	0	0	0	0	0	0	0	-6	-11	-15
50	80	+29	+40	+19	+30	+46	+74	+120	+190	+300	+13	+18	+28
		+10	+10	0	0	0	0	0	0	0	-6	-12	-18
80	120	+34	+47	+22	+35	+54	+87	+140	+220	+350	+16	+22	+34
		+12	+12	0	0	0	0	0	0	0	-6	-13	-20
120	180		+54	+25	+40	+63	+100	+160	+250		+18	+26	+41
			+14	0	0	0	0	0	0	0		-7	-14
180	250		+61	+29	+46	+72	+115	+185	+290		+22	+30	+47
			+15	0	0	0	0	0	0		-7	-16	-25

Diametri nominali in mm		JS				K			M		
oltre	fino a	6	7	8	9	6	7	8	6	7	8
0	3	+3	+5	+7	+12,5	0	0	0	-2	-2	-4
		-3	-5	-7	-12,5	-6	-10	-14	-8	-12	-18
3	6	+4	+6	+9	+15	+2	+3	+5	-1	0	+2
		-4	-6	-9	-15	-6	-9	-13	-9	-12	-16
6	10	+4,5	+7,5	+11	+18	+2	+5	+6	-3	0	+1
		-4,5	-7,5	-11	-18	-7	-10	-16	-12	-215	-21
10	18	+5,5	+9	+13,5	+21,5	+2	+6	+8	-4	0	+2
		-5,5	-9	-13,5	-21,5	-9	-12	-19	-15	-18	-25
18	30	+6,5	+10,5	+16,5	+26	+2	+6	+10	-4	0	+4
		-6,5	-10,5	-16,5	-26	-11	-15	-23	-17	-21	-29
30	50	+8	+12,5	+19,5	+31	+3	+7	+12	-4	0	+5
		-8	-12,5	-19,5	-31	-13	-18	-27	-20	-25	-34
50	80	+9,5	+15	+23	+37	+4	+9	+14	-5	0	+5
		-9,5	-15	-23	-37	-15	-21	-32	-24	-30	-41
80	120	+11	+17,5	+27	+43,5	+4	+10	+16	-6	0	+6
		-11	-17,5	-27	-43,5	-18	-25	-38	-28	-35	-48
120	180					+4	+12				
						-21	-28				
180	250					+5	+13				
						-24	-33				

Gli accoppiamenti più utilizzati in μm

Diametri nominali in mm		N						P			R	
oltre	fino a	6	7	8	9	10	11	6	7	9	6	7
0	3	-4	-4	-4	-4	-4	-4	-6	-6	-6	-10	-10
		-10	-14	-8	-29	-44	-64	-12	-16	-31	-16	-20
3	6	-5	-4	-2	0	0	0	-9	-8	-12	-12	-11
		-13	-16	-20	-30	-48	-75	-17	-20	-42	-20	-23
6	10	-7	-4	-3	0	0	0	-12	-9	-15	-16	-13
		-16	-19	-25	-36	-58	-90	-21	-24	-51	-25	-28
10	18	-9	-5	-3	0	0	0	-15	-11	-18	-20	-16
		-20	-23	-30	-43	-70	-110	-26	-29	-61	-31	-34
18	30	-11	-7	-3	0	0	0	-18	-14	-22	-24	-20
		-24	-28	-36	-52	-84	-130	-31	-35	-74	-37	-41
30	50	-12	-8	-3	0	0	0	-21	-17	-26	-29	-25
		-28	-33	-42	-62	-100	-160	-37	-42	-88	-45	-50
50	65	-14	-9	-4	0	0	0	-26	-21	-32	-35	-30
		-33	-39	-50	-74	-120	-190	-45	-51	-106	-54	-60
65	80	-14	-9	-4	0	0	0	-26	-21	-32	-37	-32
		-33	-39	-50	-74	-120	-190	-45	-51	-106	-56	-62
80	100	-16	-10	-4	0	0	0	-30	-24	-37	-44	-38
		-38	-45	-58	-87	-140	-220	-52	-59	-124	-66	-73
100	120	-16	-10	-4	0	0	0	-30	-24		-47	-41
		-38	-45	-58	-87	-140	-220	-52	-59		-69	-76

Diametri nominali in mm		S		T	U			X		Z	
oltre	fino a	6	7	6	6	7	10	10	11	10	11
0	3	-14	-14	-18	-18	-18	-18	-20	-20	-26	-26
		-20	-24	-24	-24	-28	-58	-60	-80	-66	-86
3	6	-16	-15	-20	-20	-19	-23	-28	-28	-35	-35
		-24	-27	-28	-28	-31	-71	-76	-103	-83	-110
6	10	-20	-17	-25	-25	-22	-28	-34	-34	-42	-42
		-29	-32	-34	-34	-37	-86	-92	-124	-100	-132
10	14	-25	-21	-30	-30	-26	-33	-40	-40	-50	-50
		-36	-39	-41	-41	-44	-103	-110	-150	-120	-160
14	18	-25	-21	-30	-30	-26	-33	-45	-45	-60	-60
		-36	-39	-41	-41	-44	-103	-115	-155	-130	-170
18	24	-31	-27	-37	-37	-33	-41	-54	-54	-73	-73
		-44	-48	-50	-50	-54	-125	-138	-184	-157	-203
24	30	-31	-27	-37	-44	-40	-48	-64	-64	-88	-88
		-44	-48	-50	-57	-61	-132	-148	-194	-172	-218
30	40	-38	-34	-43	-55	-51	-60	-80	-80	-112	-112
		-54	-59	-59	-71	-76	-160	-180	-240	-212	-272
40	50	-38	-34	-49	-65	-61	-70	-97	-97	-136	-136
		-54	-59	-65	-81	-86	-170	-197	-257	-236	-296
50	65	-47	-42	-60	-81	-76	-87	-122	-122	-172	-172
		-66	-72	-79	-100	-106	-207	-242	-312	-292	-362
65	80	-53	-48	-69	-96	-91	-102	-146	-146	-210	-210
		-72	-78	-88	-115	-121	-222	-266	-336	-330	-400
80	100	-64	-58	-84	-117	-111	-124	-178	-178	-258	-258
		-86	-93	-106	-139	-146	-264	-318	-398	-398	-478
100	120	-72	-66	-97	-137	-131	-144	-210	-210	-310	-310
		-94	-101	-119	-159	-166	-284	-350	-430	-450	-530

PUNTE

Modulo soluzione speciali

Quantità _____

Nr. Fori _____

Materiale

Materiale da lavorare _____

Caprico di rottura durezza _____ N/mm² HRC

Pezzo da lavorare

Profondità del foro _____ mm

Tolleranza _____

Utensile in

Metallo Duro HSS-E HSCO HSS

Refrigerazione

Interna Esterna

Pressione iletta Refrigerazione _____ bar

Simile allo standard codice

Gambo

Form HA Cilindrico

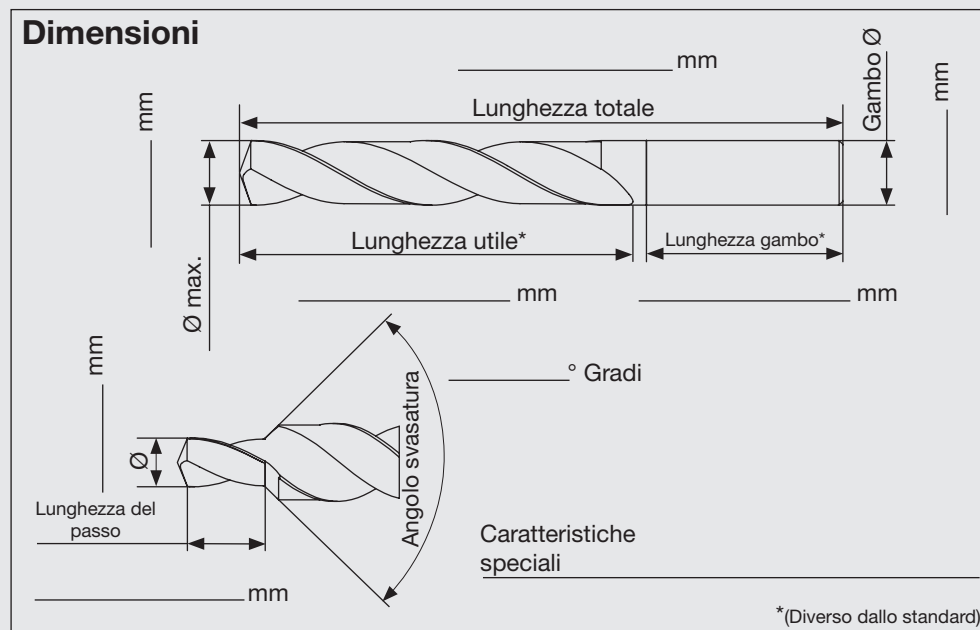
Form HB Weldon

Forma HE Whistle Notch

Cilindrico

Cono Morse

_____ Misura



Rivestimento

superficie lucida TiN TiAlN AlTiN nano TiAlSiN _____ (altro)

Contatto

Società: _____

Timbro società

Persona: _____

Telefono/Fax: _____

Data: _____

E-Mail: _____

Firma: _____

FILETTARE

Modulo soluzione speciali

Quantità _____

Nr. Fori _____

Materiale

Materiale da lavorare _____

Caprico di rottura N/mm²
durezza _____ HRC

Pezzo da lavorare

Lunghezza Filetto _____ mm

Misura Filetto _____
as. M18x0,5 ISO3/6H

Utensile in

Metallo duro HSS-E-PM HSS-E

Refrigerazione

Interna Esterna

Simile allo standard codice

Gambo

DIN 371 codolo rinforzato

DIN 374 / DIN 376

Dimensioni

Caratteristiche speciali _____

*(Diverso dallo standard)

Tipo di foro

Foro passante

Foro Cielo

Utensile

a filettare

maschi a rullare

Rivestimento

superficie lucida vaporizzato TiN TiCN TiAlN AlCrN

Contatto

Società: _____

Timbro società

Persona: _____

Telefono/Fax: _____

Data: _____

E-Mail: _____

Firma: _____

FRESE

Modulo soluzione speciali

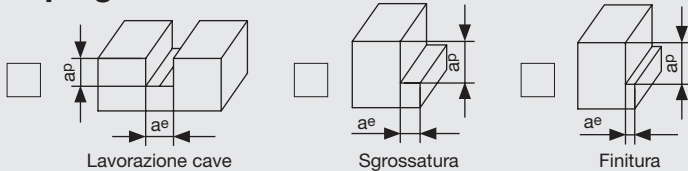
Quantità 5 10 >10 _____ Pezzi.

Materiale

Materiale da lavorare _____

Caprico di rottura durezza _____ N/mm² HRC

Impiego



Profondita di taglio ap: _____ mm

Laghezza di taglio ae: _____ mm

Utensile in

Metallo Duro HSS-E-PM HSCO M 42

Angolo Radiale

X R

Testa sferica Smusso Esterno Raggio Esterno

Simile allo standard codice

Dimensioni

Caratteristiche speciali _____

* (Diverso dallo standard)

Gambo

Form HA
plano

Form HB
Weldon

Nr. dei Taglienti

Taglio al centro

Rivestimento

superficie lucida TiN TiAlN

AlTiN nano TiAlSiN _____ (altro)

Forma del Profilo

Contatto

Società: _____

Persona: _____

Telefono/Fax: _____

E-Mail: _____

Timbro società _____

Data: _____

Firma: _____

ALESATORI

Modulo soluzione speciali

Quantità

_____ (quantità minima 5 pezzi)

Simile allo standard codice _____

Materiale

Materiale da lavorare _____


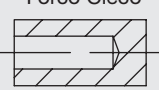
Capricio di rottura durezza _____ N/mm² HRC

Pezzo da lavorare

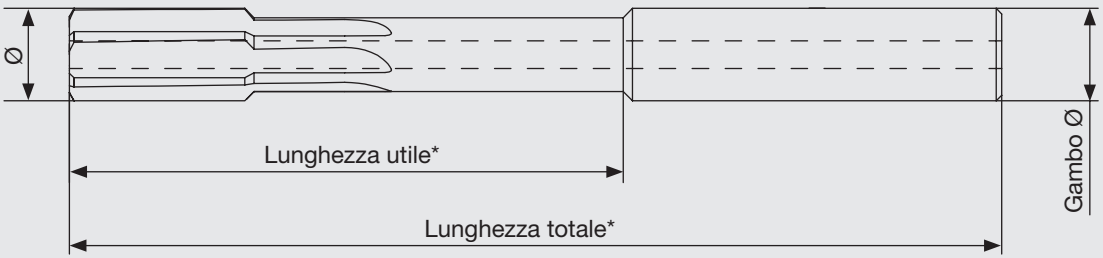
Profondità _____ mm

Diametro-Ø _____ mm

Tolleranza _____

<h4>Tipologia del Foro</h4> <p><input type="checkbox"/> Foro Passante</p>  <p><input type="checkbox"/> Forco Cieco</p> 	<h4>Refrigerazione</h4> <p><input type="checkbox"/> Esterna</p> <p><input type="checkbox"/> Interna</p> <p><input type="checkbox"/> _____ Pressione della Refrigerazione</p>	<h4>Utensile in</h4> <p><input type="checkbox"/> Metallo Duro</p> <p><input type="checkbox"/> Cuspide in Metallo Duro</p> <p><input type="checkbox"/> HSS-E</p> <p><input type="checkbox"/> Cuspide in Cermet</p> <p><input type="checkbox"/> Super R-HS</p>
--	--	--

Dimensioni



no si _____

Caratteristiche speciali _____

*(Diverso dallo standard)

Contatto

Società: _____

Timbro società

Persona: _____

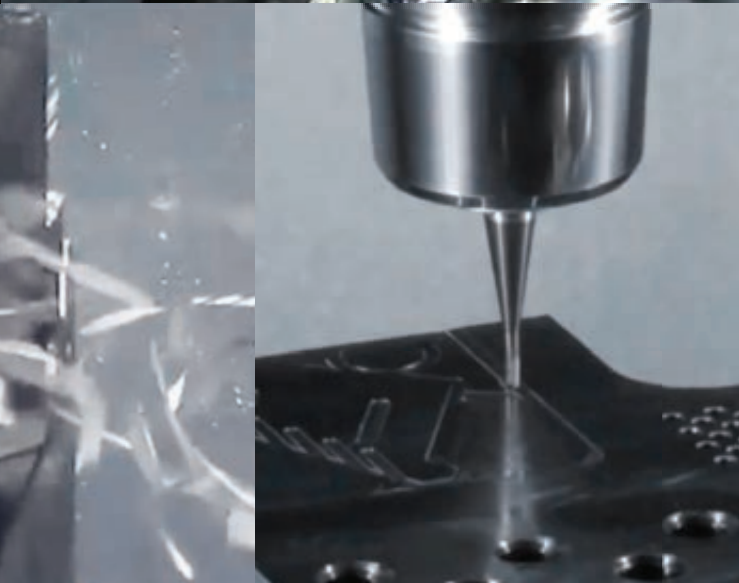
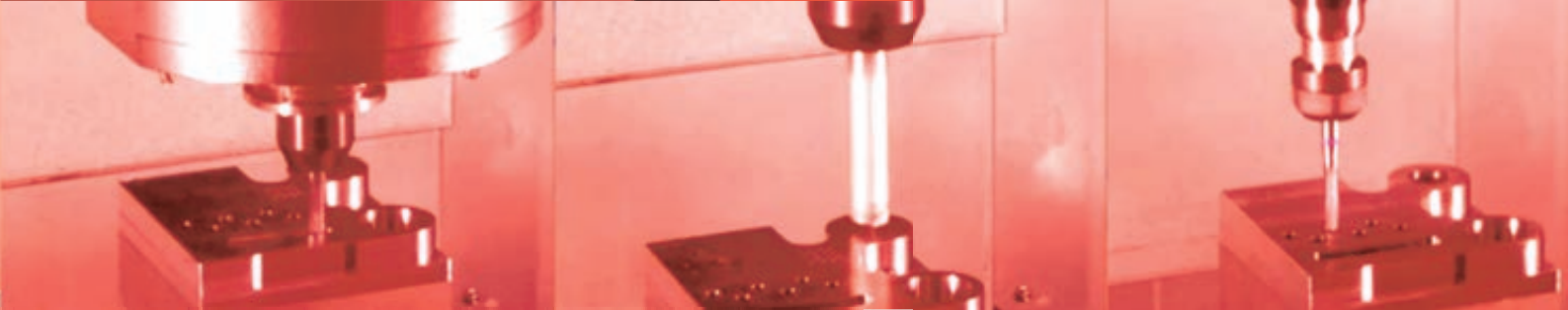
Telefono/Fax: _____

Data: _____

E-Mail: _____

Firma: _____





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