



C A T A L O G U E 2 0 1 0



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WARNING

read carefully before using our products

- Tools may shatter if broken. The wearing of eye protection is strongly advised in the vicinity of the working area.
- The correct using condition and handling of our tools is essential to secure maximum useful life and hazard free operation.
- Cutting tools have sharp edges and care must be taken when handling to avoid cuts/lacerations to unprotected hands.
- The wearing of gloves is forbidden as the gloves may entangle with turning tools.
- Tools may hurt the user's feet when falling off. Safety shoes should be put on at all time.
- While fitting the tool to machine spindles and/or sleeves, care should be taken to avoid subjecting them to shock or impact.
- Check that workpieces are properly seated and securely held in the chuck before switching on the machine power.
- Do not use a tool whose cutting edges are worn-out or chipped severely.
- Grinding operations may produce potentially hazardous dust particles or vapour. Adequate ventilation equipment should be provided.

VORSICHT

bitte sorgfältig durchlesen, bevor Sie unsere Produkte gebrauchen

- Beschädigte Werkzeuge können vibrieren, es wird daher dringend empfohlen Schutzbrillen in der Nähe der Arbeitsstelle zu tragen.
- Ordnungsgemäß Handhabung und Arbeitsvoraussetzung sind Grundbedingung für lange Lebensdauer und Sicherheit.
- Die Schneidkanten der Werkzeuge sind sehr scharf und können ungeschützte Hände verletzen. Vorsicht bei der Handhabung.
- Handschuhe können sich mit drehenden Werkzeugen verfangen, sie sind daher verboten.
- Unfallschutzschuhe ständig anziehen: beim Hinunterfallen können die Werkzeuge die Füße verletzen.
- Beim Einsetzen der Werkzeuge auf die Maschinen ist darauf zu achten, Stöße zu vermeiden.
- Prüfen Sie vor Inbetriebnahme der Maschine die genaue Befestigung der Werkstücke.
- Werkzeuge mit beschädigten Schneiden nicht mehr verwenden.
- Beim Schleifen können gefährliche Partikel oder Gase entstehen. Angemessene Entlüftung muß gewährleistet sein.

AVVERTENZE

leggere attentamente prima dell'utilizzo dei nostri prodotti

- Gli utensili, se rotti, possono vibrare. L'uso di occhiali protettivi è assolutamente consigliato in prossimità dell'area di lavoro.
- Il corretto utilizzo dei nostri utensili è essenziale al fine di assicurarne la miglior durata ed evitare operazioni pericolose.
- Gli utensili da taglio hanno un tagliente molto affilato che può procurare ferite alle mani se non protette adeguatamente.
- L'uso di guanti è vietato. Il tessuto può legarsi al tagliente ed essere trascinato dall'utensile in rotazione.
- Gli utensili che cadono possono danneggiare i piedi dell'operatore. Le scarpe antinfortunistiche devono essere indossate in qualsiasi momento.
- Nel fissare l'utensile alla macchina fare sempre attenzione a non danneggiarlo.
- Controllare il perfetto posizionamento e fissaggio del pezzo da lavorare prima di azionare la macchina.
- Non riutilizzare utensili fortemente usurati o danneggiati.
- La riaffilatura può generare polveri e vapori pericolosi. Attrezzarsi con un sistema di ventilazione adeguato.

AVERTISSEMENT

à lire attentivement avant l'utilisation de nos produits

- Les outils si cassés peuvent vibrer. Le port de lunettes de sécurité près de la zone de travail est vivement recommandé.
- Des conditions d'emploi correctes de nos produits sont essentielles pour assurer une durée de vie maximum et éviter des accidents.
- Les outils ont des arêtes vives et peuvent blesser les mains non protégées.
- Le port de gants près d'outils en rotation est interdit car ils peuvent être happés par l'outil.
- Des outils tombant à terre peuvent blesser les pieds de l'opérateur: le port de chaussures de sécurité est conseillé.
- En montant les outils sur le porte-outils, veiller à éviter les chocs.
- S'assurer que la pièce soit parfaitement fixée avant de mettre la machine en route.
- Ne pas utiliser des outils usés ou endommagés.
- Le réaffûtage des outils peut provoquer des vapeurs et des poussières dangereuses qui devront être convenablement aspirées.

CATALOGUE 2010

YAMAWA JAPANESE FACTORIES / STABILIMENTI YAMAWA IN GIAPPONE
YAMAWA JAPANISCHE WERKE / USINES YAMAWA AU JAPAN



YONEZAWA - ISO9001 / ISO14001

SPIRAL POINTED TAPS, HAND TAPS, ROLL TAPS
MASCHI CON IMBOCCO CORRETTO, MASCHI A MANO, MASCHI A RULLARE
GEWINDEBOHRER MIT GERADEN NUTEN, HANDGEWINDEBOHRER, GEWINDEFORMER
TARAUDS ENTRÉE HÉLICOÏDALE, TARAUDS À MAIN, TARAUDS À REFOULER



FUKUSHIMA - ISO9001 / ISO14001

SPIRAL FLUTED TAPS, DIES, CENTER DRILLS, MACHINES TOOL, MEASURING MACHINES
MASCHI ELICOIDALI, FILIERE, PUNTE A CENTRARE, MACCHINE UTENSILE, MACCHINE PER MISURAZIONE
SPIRALNUTENGWINDEBOHRER, SCHNEIDEISEN, ZENTRIERBOHRER, WERKZEUGMASCHINEN,
MESSINSTRUMENT
TARAUDS COUPE HÉLICOÏDALE, FILIÈRES, FORETS À CENTRER, MACHINES-OUTILS, MACHINES À MESURER



AIZU - ISO9001 / ISO14001

SPIRAL FLUTED TAPS, CARBIDE TAPS, CENTER DRILLS
MASCHI ELICOIDALI, MASCHI IN METALLO DURO, PUNTE A CENTRARE
SPIRALNUTENGWINDEBOHRER, MICROKÖRNUNG GEWINDEBOHRER, ZENTRIERBOHRER
TARAUDS COUPE HÉLICOÏDALE, TARAUDS CARBURE, FORETS À CENTRER



TSUTSUMI

GRINDING OF UNIVERSAL BLANK
RETTIFICA SEMILAVORATO UNIVERSALE
SCHLEIFEN DER UNIVERSELLER ROHTEIL
AFFÛTAGE DU SEMI-FINI UNIVERSEL

TECHNICAL DATA

 . 7

HIGH PERFORMANCE TAPS

 . 55

TAPS

 . 69

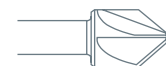
DIES

 .163

CENTER DRILLS

 .168

COUNTERSINKS

 .173

THREAD MILLS

 .175

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0021	171	6110 V	70	9630TH	94
0021TI	171	6211	112-113	9630TI	94
0023	171	6211 F	112-113	9634	95
0023TI	171	6211 V	112-113	9634TC	95
0941	163	6310	150	9635OX	99
0943	164-165	6310 F	150	9635TC	99
0947	167	6310 M	150	9640	74
0949	166	6310 V	150	964005	74
1330JNX NEW	137	6412	139	964010	75
1330NX	134	6412 F	139	96406G	74
1340JOX NEW	137	6412 V	139	9640LH	74
1340OX	130	7130	154	9640OH	82
1341JNI NEW	137	7140OX	154	9640TCOH	82
1341NI	130	7330	158	9640TH	74
1349JNI NEW	137	7330OX	158	9641	84
1349NI	134	7340	158	9641OX	84
1355TC	104-106	7340OX	158	9641OX6G	85
1356TC	104-106	7530	155	9641TC	84
1430JNX NEW	137	7540OX	155	9641TI	85
1430NX	135	7730	159	9642	75
1440JOX NEW	137	7730OX	159	9642 2F	75
1440OX	131	7740	159	9643NI	78
1441JNI NEW	137	7740OX	159	9643TC	78
1441NI	131	8120 C	154	9644OX	78
1449JNI NEW	137	8120 D	154	9645EOX NEW	79
1449NI	135	8311	156	9645OX	78
1630JNX NEW	111	8320 C	156	9645OX6G	79
1630NX	98	8320 D	156	9645TC	79
1640JOX NEW	111	8520 C	155	9646OX	79
1640OX	78	8520 D	155	9647	75
1641JNI NEW	111	8711	157	9647E NEW	75
1641NI	84	8720 C	157	9647OX	75
1641TC	84	8720 D	157	9647TC	75
1649JNI NEW	111	9020	152	9647TI	75
1649NI	98	9320	133	9648OX	79
1649TC	98	9330	134	9665VP NEW	93
1730JNX NEW	111	9335OX	134	9665VPM NEW	93
1730NX	100	9340	130	9685VP NEW	73
1740JOX NEW	111	9345OX	130	9685VPM NEW	73
1740OX	80	9350NI	104-106	9720	89
1741JNI NEW	111	9350TI	104-106	9723NI	100
1741NI	86	9351OX	104-106	9723TC	101
1741TC	86	9352NI	105-107	9726NI	89
1749JNI NEW	111	9352TI	105-107	9726NIOH	90
1749NI	100	9353	105-107	9726TC	89
1749TC	100	9353TC	105-107	9726TCOH	90
1830NX	124-126	9353TI	105-107	9730	96
1840OX	114-116	9354 6G	105-107	973010	97
1841NI	119	9354TI 6G	105-107	97306G	97
1841TC	119	9420	133	9730OH	102
1849NI	124-126	9430	135	9730OX	96
1849TC	124-126	9435OX	135	9730TC	96
1856TC NEW	129	9440	131	9730TCOH	102
2620	88	9445OX	131	9730TH	96
2630	98	9445OX UN-8 NEW	132	9730TI	97
2720	89	9530	71	9734	97
2730	100	9540OX	71	9734TC	97
2820	120-121	9620	88	9735OX	101
2830	124-126	9623NI	98	9735TC	101
2920	142	9623TC	99	9740	76
3626	65	9626NI	88	974005	76
3726	65	9626NIOH	90	974010	77
3926	65	9626TC	88	97406G	76
5980	147	9626TCOH	90	9740LH	76
5984OX	147	9630	94	9740OH	82
5985OX NEW	147	963010	95	9740TCOH	82
5990	148	96306G	95	9740TH	76
6000	109	9630OH	102	9741	86
6110	70	9630OX	94	9741OX	86
6110 F	70	9630TC	94	9741OX6G	87
6110 M	70	9630TCOH	102	9741TC	86

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9743NI	80	LS-PF	144		
9743TC	80	LS-PO	103-128		
9744OX	80	LS-SP	83-118		
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9745OX	80	NC-SD	170		
9745OX6G	81	NC-SD-TC	170		
9745TC	81	N-PO	151		
9746OX	81	N-SP	151		
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9747E NEW	77	PE-Q-V	169		
9747OX	77	PE-S	169		
9747TC	77	PE-S-V	169		
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9748OX	81	PS-L	146		
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9826NI	120-121	PT	149		
9826NIOH	122	PT-L	149		
9826TC	120-121	PT-XL	149		
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9830	124-126	STI-SP	153		
9830TC	125-127	UH-CT	63		
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9835OX	125-127				
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9840OX	114-116				
9840TC	114-116				
9840TH	114-116				
9841	119				
9841OX	119				
9841TC	119				
9845OX	115-117				
9848OX	115-117				
9920	142				
9926NI	142				
9926TC	142				
9930	143				
9930OX	143				
9930TC	143				
9940	140				
9940OX	140				
9940TC	140				
9941	141				
9941OX	141				
9941TC	141				
9944OX	140				
9945OX	140				
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TECHNICAL DATA INFORMAZIONI TECNICHE TECHNISCHE HINWEISE INFORMATIONS TECHNIQUES

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MATERIAL GROUPS

GRUPPI MATERIALE / WERKSTOFFEGRUPPE / GROUPES MATIÈRE

GROUPS / GRUPPI / GRUPPE / GROUPES	AISI	W-stoff	DIN	BS	SS
1 <550 N/mm ² LOW CARBON AND FREE CUTTING STEEL ACCIAI A BASSO TENORE DI CARBONIO ED AUTOMATICI KOHLENSTOFFARME STÄHLE ACIERS BAS CARBONE ET POUR DÉCOLLETAGE	A570-36	1.0038	RSt 37-2	4360 40 C	1311
	A36	1.0044	St 44-2	4360 43 A	1411
	A573-81 65	1.0116	St 37-3	4360 40 B	1312
	1006	1.0201	St 36	-	1160
	A515-65	1.0345	H I	1501 161	1330
	1015	1.0401	C 15	080 M 15	1350
	1020	1.0402	C22	050 A 20	1450
	-	1.0425	H II	-	1432
	1213	1.0715	9 SMn 28	230 M 07	1912
	(12L13)	1.0718	9 SMnPb 28	-	1914
	-	1.0723	15 S 20	210 A 15	1922
	1140	1.0726	35 S 20	212 M 36	1957
	1146	1.0727	45 S 20	212 M 44	1973
	1215	1.0736	9 SMn 36	240 M 07	-
	-	1.0765	-	-	-
	1010	1.1121	Ck 10	045 M 10	1265
	-	1.1121	St 37-1	4360 40 A	1300
	1022	1.1133	GS-20Mn 5	120 M 19	1410
	1015	1.1141	Ck 15	080 M 15	1370
	1025	1.1158	Ck 25	070 M 26	1450
	1018	-	-	-	-
2 450-700 N/mm ² MEDIUM CARBON STEEL ACCIAI A MEDIO TENORE DI CARBONIO MITTELGEKOHLTE FLUSSTÄHLE ACIERS MOYEN CARBONE	A662 C	1.0436	ASt 45	1501 224	2103
	1035	1.0501	C 35	060 A 35	1550
	1035	1.0501	C 35	080 M 36	1550
	1045	1.0503	C 45	080 M 46	1650
	1040	1.0511	C 40	080 M 40	-
	1055	1.0535	C 55	070 M 55	1655
	-	1.0570	St 52-3	4360 50 B	2132
	A738	1.0577	ASt 52	1501 224	2107
	1039	1.1157	40Mn4	150 M 36	-
	1035	1.1181	Ck 35	060 A 35	1572
	1035	1.1183	Cf 35	080 M 36	1572
	1045	1.1191	Ck 45	808 M 46	1672
	1055	1.1203	Ck55	070 M 55	-
	1050	1.1213	Cf 53	060 A 52	1674
	1045	1.1730	C45W	En 43 B	1672
	A572-60	1.8900	StE 380	4360 55 E	2145
	-	1.8905	StE 460	HP 6	-
3 550-850 N/mm ² HIGH CARBON STEEL ACCIAI AD ELEVATO TENORE DI CARBONIO KOHLENSTOFFREICHE STÄHLE ACIERS HAUT CARBONE	1060	1.0601	C60	060 A 62	-
	1064	1.1221	Ck 60	060 A 62	1678
	1070	1.1231	Ck 67	070 A 72	1770
	1080	1.1248	Ck 75	060 A 78	1774
	1095	1.1274	Ck 101	060 A 96	1870
4 600-900 N/mm ² LOW ALLOY STEEL ACCIAI DEBOLMENTE LEGATI NIEDRIGLEGIERTE STÄHLE ACIERS FAIBLEMENT ALLIÉS	9255	1.0904	55 Si 7	250 A 53	2090
	1335	1.1167	36 Mn 5	150 M 36	2120
	1330	1.1170	28 Mn 6	150 M 28	-
	P4	1.2341	X6 CrMo 4	-	-
	52100	1.3505	100 Cr 6	534 A 99	2258
	A204A	1.5415	15 Mo 3	1501 240	2912
	8620	1.6523	21 NiCrMo 2	805 M 20	2506
	8740	1.6546	40NiCrMo22	311-Type 7	-
	-	1.6587	17CrNiMo6	820 A 16	-
	5132	1.7033	34 Cr 4	530 A 32	-
	5140	1.7035	41 Cr 4	530 A 40	-
	5140	1.7035	41 Cr 4	530 A 40	-
	5140	1.7045	42 Cr 4	530 A 40	2245
	5115	1.7131	16 MnCr 5	(527 M 20)	2511
	5155	1.7176	55 Cr 3	527 A 60	2253
	4130	1.7218	25 CrMo 4	1717CDS 110	2225
	4135 (4137)	1.7220	35 CrMo 4	708 A 37	2234
	4142	1.7223	41 CrMo 4	708 M 40	2244
	4140	1.7225	42 CrMo 4	708 M 40	2244
	4137	1.7225	42 CrMo 4	708 M 40	2244
	A387 12-2	1.7337	16 CrMo 4 4	1501 620	2216
	-	1.7361	32CrMo12	722 M 24	2240
	A182 F-22	1.7380	10 CrMo9 10	1501 622	2218
	6150	1.8159	50 CrV 4	735 A 50	2230
	-	1.8515	31 CrMo 12	722 M 24	2240
	-	-	-	-	-

AFNOR	U.N.E. / I.H.A.	JIS	UNI	EN	ISO	TRADE MARK
E 24-2 Ne	-	SS 34	Fe 360B FN	-	-	-
NFA 35-501 E 28	-	-	-	-	-	-
E 24-U	-	-	Fe37-3	-	-	-
Fd 5	-	-	-	-	-	-
A 37 CP	F.1110	SGV 410	-	-	-	-
CC 12	F.111	S 15 C	080 M 15	-	-	-
CC20	F.112	-	C20C21	-	-	-
A 42 CP	A42 RCI	SGV 410	Fe 410 1KW	-	-	-
S 250	11SMn28	SUM 22	CF9SMn28	-	-	AVP
S 250 Pb	11SMnPb28	SUM 22 L	CF9SMnPb28	-	-	-
-	F.210.F	SUM 32	-	-	-	-
35 MF 6	F.210.G	-	-	-	-	-
45 MF 4	-	-	-	-	-	-
S 300	12 SMn 35	SUM 25	CF 9 SMn 36	-	-	AVZ
-	-	-	36SMnPb14	-	-	PR 80
XC 10	F.1510	S 10 C	C10	-	-	-
-	-	S 10 C	-	-	-	-
20 M 5	F.1515	SMnC 420	G22Mn3	-	-	-
XC 18	F.1511	S 15 Ck	080 M 15	-	-	-
XC 25	F.1120	S 25 C	C25	-	-	-
-	-	SS400	Fe 360 B	-	-	-
A 48 FP	-	-	-	-	-	-
CC 35	F.113	S 35 C	C35	-	-	-
CC 35	F.113	S 35 C	C35	-	-	-
CC45	F.114	S 45 C	C45	-	-	-
AF 60 C 40	F.114.A	-	C40	-	-	-
AF 70 C 55	F.115	S 55 C	C55	-	-	-
E 36-3	-	SM 490 A, B, C	Fe 510	-	-	-
A 52 FP	-	-	-	-	-	-
35 M 5	-	-	-	-	-	-
XC 38	F.1130	S 35 C	C35	-	-	-
XC 38 TS	-	S 35 C	C36	-	-	-
XC 45	F.1140	S 45 C	C45	-	-	-
XC 55	F.1203	S55 C	C50	-	-	-
XC 48 TS	-	S 50 C	C53	-	-	-
Y342	F.1140	-	-	-	-	-
-	-	-	FeE390KG	-	-	-
-	-	-	-	-	-	-
CC55	-	-	C60	-	-	-
XC 65	F.1150	S 58 C	C60	-	-	-
XC 68	F.5103	-	C70	-	-	-
XC 75	F.5107	-	-	-	-	-
XC 100	F.5117	SUP 4	-	-	-	-
55 S 7	56Si7	-	55Si8	-	-	-
40 M 5	36Mn5	SMn 438(H)	-	-	-	-
20 M 5	-	SCMn1	C28MN	-	-	-
-	-	-	-	-	-	-
100 C 6	F.131	SUJ 2	100Cr6	-	-	-
15 D 3	16 Mo3	STBA 12	16Mo3 KW	-	-	-
20 NCD 2	F.1522	SNCM 220(H)	20NiCrMo2	-	-	-
40 NCD 2	F.129	SNCM 240	40NiCrMo2(KB)	-	-	-
18 NCD 6	14NiCrMo13	-	-	-	-	-
32 C 4	35Cr4	SCr430(H)	34Cr4(KB)	-	-	-
42 C 2	42 Cr 4	SCr 440 (H)	40Cr4	-	-	-
42 C 2	42 Cr 4	SCr 440 (H)	41Cr4 KB	-	-	-
42 C 4 TS	F.1207	SCr 440	-	-	-	-
16 MC 5	F.1516	-	16MnCr5	-	-	-
55 C 3	-	SUP 9(A)	55Cr3	-	-	-
25 CD 4	F.1251/55Cr3	SCM 420 / SCM430	25CrMo4(KB)	-	-	-
35 CD 4	34 CrMo 4	SCM 432	34CrMo4KB	-	-	-
42 CD 4 TS	42 CrMo 4	SCM 440	41 CrMo 4	-	-	-
40 CD 4	F.1252	SCM 440	40CrMo4	-	-	-
42 CD 4	F.1252	SCM 440	42CrMo4	-	-	-
15 CD 4.5	-	-	12CrMo910	-	-	-
30 CD 12	F.124.A	-	30CrMo12	-	-	-
12 CD 9, 10	F.155 / TU.H	-	12CrMo9 10	-	-	-
50 CV 4	F.143	SUP 10	50CrV4	-	-	-
30 CD 12	F.1712	-	30CrMo12	-	-	-
-	-	-	-	-	-	Weldox 500

All the trademarks or tradenames mentioned belong to their respective owners.

MATERIAL GROUPS

GRUPPI MATERIALE / WERKSTOFFEGRUPPE / GROUPES MATIÈRE

GROUPS / GRUPPI / GRUPPE / GROUPES	AISI	W-stoff	DIN	BS	SS
5 700-1000 N/mm ² ALLOY STEEL ACCIAI LEGATI LEGIERTE STÄHLE ACIERS ALLIÉS	W1	1.1545	C105W1	BW1A	1880
	L3	1.2067	100Cr6	BL 3	(2140)
	L2	1.2210	115 CrV 3	-	-
	P20 + S	1.2312	40 CrMnMoS 8 6	-	-
	-	1.2419	105WCr6	-	2140
	O1	1.2510	100 MnCrW 4	BO1	-
	S1	1.2542	45 WCrV 7	BS1	2710
	4340	1.6582	34 CrNiMo 6	817 M 40	2541
	5120	1.7147	20 MnCr 5	-	-
	-	-	-	-	-
6 900-1200 N/mm ² TOOL AND HIGH ALLOY STEEL ACCIAI DA UTENSILI E ALTO LEGATI WERKZEUG- UND HOCHLEGIERTE STÄHLE ACIERS POUR OUTILS ET FORTEMENT ALLIÉS	D3	1.2080	X210 Cr 12	BD3	2710
	P20	1.2311	40 CrMnMo 7	-	-
	H13	1.2344	X40CrMoV 5 1	BH13	2242
	A2	1.2363	X100 CrMoV 5 1	BA2	2260
	D2	1.2379	X155 CrMoV 12 1	BD2	2310
	D4 (D6)	1.2436	X210 CrW 12	BD6	2312
	H21	1.2581	X30WCrV9 3	BH21	-
	L6	1.2713	55NiCrMoV 6	-	-
	M 35	1.3243	S6/5/2/5	BM 35	2723
	M 2	1.3343	S6/5/2	BM2	2722
	M 7	1.3348	S2/9/2	-	2782
	HW 3	1.4718	X45CrSi 9 3	401 S 45	-
	-	1.7321	20 MoCr 4	-	2625
7 >1200 N/mm ² (35-45HRC) HIGH TENSILE STRENGTH STEEL ACCIAI AD ELEVATA RESISTENZA HOCHFESTE STÄHLE ACIERS HAUTE RÉSIDENCE	A128 (A)	1.3401	G-X120 Mn 12	BW10	2183
8 45-63HRC HARDENED STEEL ACCIAI TEMPRATI GEHÄRTETE STÄHLE ACIERS TREMPÉS	-	-	-	-	-
9 MARTENSITIC AND FERRITIC STAINLESS STEEL ACCIAI INOSSIDABILI MARTENSITICI E FERRITICI MARTENSITISCHE UND FERRITISCHE ROSTFREIE STÄHLE ACIERS INOXYDABLES MARTENSITIQUES ET FERRITIQUES	420 C	1.4034	X43Cr16		
	440 B/1	1.4112	X90 Cr Mo V18		
	-	1.2083	X42 Cr 13	-	2314
	403	1.4000	X6Cr13	403 S 17	2301
	(410S)	1.4001	X7 Cr 14	(403 S17)	2301
	405	1.4002	X6 CrAl 13	405 S 17	-
	416	1.4005	X12 CrS 13	416 S 21	2380
	410	1.4006	X 10 Cr 13	410 S21	2302
	430	1.4016	X6 Cr 17	430 S 17	2320
	420	1.4021	X20 Cr 13	420 S 37	2303
	420F	1.4028	X30 Cr 13	420 S 45	(2304)
	(420)	1.4031	X39Cr13	420 S 45	(2304)
	431	1.4057	X20 CrNi 17 2	431 S 29	2321
	430F	1.4104	X12 CrMoS 17	-	2383
	434	1.4113	X6 CrMo 17	434 S 17	2325
	430Ti	1.4510	X6 CrTi 17	-	-
	409	1.4512	X5 CrTi 12	409 S 17	-
10 AUSTENITIC STAINLESS STEEL (V2A) ACCIAI INOSSIDABILI AUSTENITICI (V2A) AUSTENITISCHE ROSTFREIE STÄHLE (V2A) ACIERS INOXYDABLES AUSTENITIQUES (V2A)	304	1.4301	X5 CrNi 18 9	304 S 15	2332
	305	1.4303	X5 CrNi 18 12	305 S 19	-
	303	1.4305	X12 CrNiS 18 8	303 S 21	2346
	304L	1.4306	X2 CrNiS 18 9	304 S 12	2352
	301	1.4310	X12 CrNi 17 7	-	2331
	304	1.4350	X5 CrNi 18 9	304 S 31	2332
	304	1.4350	X5 CrNi 18 9	304 S 31	2333
	304LN	1.4311	X2 CrNiN 18 10	304 S 62	2371
11 AUSTENITIC STAINLESS STEEL (V4A) ACCIAI INOSSIDABILI AUSTENITICI (V4A) AUSTENITISCHE ROSTFREIE STÄHLE (V4A) ACIERS INOXYDABLES AUSTENITIQUES (V4A)	316	1.4401	X5 CrNiMo 18 10	316 S 16	2347
	316L	1.4404	-	316 S 12/13/14/22/24	2348
	316LN	1.4429	X2 CrNiMoN 18 13	-	2375
	316L	1.4435	X2 CrNiMo 18 12	316 S 12/13/14/22/24	2353
	316	1.4436	-	316 S 33	2343
	317L	1.4438	X2 CrNiMo 18 16	317 S 12	2367
	329	1.4460	X3 CrNiMoN 27 5 2	-	2324
	321	1.4541	X10 CrNiTi 18 9	321 S 12	2337
	347	1.4550	X10 CrNiNb 18 9	347 S 17	2338
	316Ti	1.4571	X10 CrNiMoTi 18 10	320 S 17	2350
	309	1.4828	X15 CrNiSi 20 12	309 S 24	-
	330	1.4864	X12 NiCrSi 36 16	-	-

AFNOR	U.N.E. / I.H.A.	JIS	UNI	EN	ISO	TRADE MARK
Y 105	F.5118	SK 3	C100 KU	-	-	-
Y 100 C 6	F.520 L	-	-	-	-	-
-	-	-	-	-	-	-
40 CMD 8 +S	X210CrW12	-	-	-	-	Holdax
105W C 13	F.5233	SKS 31	107WCr5KU	-	-	-
90MnWCrV5	F.5220	(SK53)	95MnWCr5KU	-	-	-
55W20	F.5241	-	45WCrV8KU	-	-	-
35 NCD 6	F.1280	SNCM 447	35NiCrMo6KB	-	-	-
20 MC 5	-	-	-	-	-	-
-	-	-	-	-	-	Weldox 700
Z200 C 12	F.5212	SKD 1	X210Cr13KU	-	-	K 100
40 CMD 8	F.5263	-	-	-	-	-
Z 40 CDV 5	F.5318	SKD 61	X40CrMoV511KU	-	-	-
Z 100 CDV 5	F.5227	SKD 12	X100CrMoV51KU	-	-	-
Z 160 CDV 12	F.520.A	SKD11	X155CrVMo121KU	-	-	K 110
Z 200 CD 12	F.5213	SKD 2	X215CrW121KU	-	-	-
Z 30 WCV 9	F.526	SKD5	X30WCrV 9 3 KU	-	-	-
55 NCDV 7	F.520.S	SKT4	-	-	-	-
6-5-2-5	F.5613	SKH 55	HS6-5-5	-	-	-
Z 85 WDCV	F.5603	SKH 51	HS6-5-2-2	-	-	-
2 9 2	-	-	HS2-9-2	-	-	-
Z 45 CS 9	F.3220	SUH1	X45CrSi8	-	-	-
-	F.1523	-	30CrMo4	-	-	-
Z 120 M 12	F.8251	SCMnH 1	GX120Mn12	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	WRB WRA
Z 40 C 14	F.5263	SUS 420 J1	-	-	-	-
Z 6 C 13	F.3110	SUS 403	X6Cr13	-	-	-
Z 8 C 13	F.3110	SUS 410 S	X6Cr13	-	-	-
Z 8 CA 12	F.3111	SUS 405	X6 CrAl 13	-	-	-
Z 11 CF 13	F.3411	SUS 416	X12CrS13	-	-	-
Z 10 C 14	F.3401	SUS 410	X12Cr13	-	-	-
Z 8 C 17	F.3113	SUS 430	X8Cr17	-	-	-
Z 20 C 13	F.3402	SUS 420 J1	X20Cr13	-	-	-
Z 30 C 13	F.3403	SUS 420 J2	X30Cr13	-	-	-
Z 40 C 14	F.3404	(SUS 420 J1)	-	-	-	-
Z 15 CNi 16.02	F.3427	SUS 431	X16CrNi16	-	-	-
Z 10 CF 17	F.3117	SUS 430 F	X10CrS17	-	-	-
Z 8 CD 17.01	-	SUS 434	X8CrMo17	-	-	-
Z 4 CT 17	-	SUS 430 LX	X6CrTi17	-	-	-
Z 6 CT 12	-	SUH 409	X6CrTi12	-	-	-
Z 6 CN 18.09	F.3551	SUS 304	X5CrNi18 10	-	-	-
Z 8 CN 18.12	-	SUS 305	X8CrNi19 10	-	-	-
Z 10 CNF 18.09	F.3508	SUS 303	X10CrNiS 18 09	-	-	-
Z 2 CN 18.10	F.3503	SUS 304L	X2CrNi18 11	-	-	-
Z 12 CN 17.07	F.3517	SUS 301	X12CrNi17 07	-	-	-
Z 6 CN 18.09	F.3551	SUS 304	X5CrNi18 10	-	-	-
Z 6 CN 18.09	F.3551	SUS 304	X5CrNi18 10	-	-	-
Z 2 CN 18.10	-	SUS 304 LN	-	-	-	-
Z 6 CND 17.11	F.3543	SUS 316	X5CrNiMo17 12	-	-	-
Z 2 CND 17.13	-	SUS316L	X2CrNiMo17 12	-	-	-
Z 2 CND 17.13	-	SUS 316 LN	-	-	-	-
Z 2 CND 17.13	-	SUS316L	X2CrNiMo17 12	-	-	-
Z 6 CND18-12-03	-	-	X8CrNiMo 17 13	-	-	-
Z 2 CND 19.15	-	SUS 317 L	X2CrNiMo18 16	-	-	-
Z5 CND 27.05.Az	F.3309	SUS 329 J1	-	-	-	-
Z 6 CND 18.10	F.3553	SUS 321	X6CrNiTi18 11	-	-	-
Z 6 CNNb 18.10	F.3552	SUS 347	X6CrNiNb18 11	-	-	-
Z 6 CNDT 17.12	F.3535	-	X6CrNiMoTi 17 12	-	-	-
Z 15 CNS 20.12	-	SUH 309	X16 CrNi 24 14	-	-	-
Z 12 NCS 35.16	-	SUH 330	-	-	-	-

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MATERIAL GROUPS

GRUPPI MATERIALE / WERKSTOFFEGRUPPE / GROUPES MATIÈRE

GROUPS / GRUPPI / GRUPPE / GROUPES	AISI	W-stoff	DIN	BS	SS
12 DUPLEX	S32750	1.4410	X 2 CrNiMoN 25 7 4	-	2328
	S31500	1.4417	X 2 CrNiMoSi 19 5	-	2376
	S31803	1.4462	X 2 CrNiMoN 22 5 3	-	2377
	S32760	1.4501	X 3 CrNiMoN 25 7	-	-
	630	1.4542	X5CrNiCNb16-4	-	-
	A564/630	-	-	-	-
13 GREY CAST IRON GHISA GRIGIA GRAUGUSS FONTE GRISE	A48-20B	0.6010	GG-10	Grade 100	0110-00
	A48-25B	0.6015	GG-15	Grade 150	0115-00
	A48-30B	0.6020	GG-20	Grade 200	0120-00
	A48-40B	0.6025	GG-25	Grade 250	0125-00
	A48-45B	0.6030	GG-30	Grade 300	0130-00
	A48-50B	0.6035	GG-35	Grade 350	0135-00
	A48-60B	0.6040	GG-40	Grade 400	0140-00
	32510	-	GTS-35	B340/12	0815-00
	A220-40010	0.8145	GTS-45	P440/7	0852-00
	A220-50005	0.8155	GTS-55-04	P510/4	0854-00
	A220-70003	0.8165	GTS-65-02	P570/3	0856-00
	A220-70003	-	GTS-65	P570/3	0858
14 NODULAR CAST IRON GHISA SFEROIDALE SPHÄROGUSS FONTE NODULAIRE	-	0.7033	GGG-35.3	350/22L40	0717-15
	60/40/18	0.7040	GGG-40	420/12	0717-02
	(60/40/18)	0.7043	GGG-40.3	370/17	0717-12
	65/45/12	0.7050	GGG-50	500/7	0727-02
	80/55/06	0.7060	GGG-60	600/3	0727-03
	100/70/03	0.7070	GGG-70	700/2	0737-01
	120/90/02	0.7080	GGG-80	800/2	-
15 WROUGHT (ROLLED) ALUMINIUM ALLUMINIO LAMINATO GEWALTZTES ALUMINIUM ALUMINIUM LAMINÉ	1200	3.0205	Al 99	1C	4010
	1050	3.0255	Al 99,5	1B	4007
	1350	3.0257	E-Al	E1E	-
	1070	3.0275	Al 99,7	-	-
	1080	3.0285	Al 99,8	1A	-
	1099	3.0385	AL99,98R	1	-
	3105	3.0505	AlMn0,5Mg0,5	N31	-
	3103	3.0515	AlMn1	N3	4054
	3003	3.0517	AlMn	N3	-
	3005	3.0525	AlMn1Mg0,5	-	-
	3004	3.0526	AlMn1Mg1	-	-
	6012	3.0615	AlMgSiPb	-	-
	2014	3.1255	AlCuSiMn	H15	4338
	2117	3.1305	AlCuMg0,5	L86	-
	2017	3.1325	AlCuMg 1	(H14)	-
	2024	3.1355	AlCuMg 2	DTD5090	-
	2030	3.1645	AlCuMgPb	-	4335
	2011	3.1655	AlCuBiPb	FC1	4355
	6082	3.2315	AlMgSi 1	H30	4212
	6060	3.3206	AlMgSi0,5	H9	4103/4104
	6005	3.3210	AlMgSi0,7	-	-
	6061	3.3211	AlMg1SiCu	H20	-
	5005	3.3315	AlMg1	N41	4106
	5050	3.3316	AlMg1,5	-	-
	5052	3.3523	AlMg2,5	-	4120
	5251	3.3525	AlMg2Mn0,3	N4	-
	5154	3.3535	AlMg3	N5/N56	-
	5454	3.3537	AlMg2,7Mn	N51	-
	5086	3.3545	AlMg4Mn	-	-
	5083	3.3547	AlMg4,5Mn	N8	4140
	5056	3.3555	AlMg5	N6	-
	7020	3.4335	AlZn4,5Mg1	H17	4425
	7075	3.4365	AlZnMgCu1,5	2L95	-
	3304	-	AlMgMn	-	-
	7010	-	AlZn6MgCu	DTD5130	-
16 DIE-CAST ALUMINIUM (Si<12%) ALLUMINIO PRESSOFUSO (Si<12%) AL-GUSSLEGIERUNGEN (Si<12%) ALUMINIUM MOULÉ SOUS PRESSION (Si<12%)	A356	3.2371	G-AlSi7Mg	LM25	4244
	-	3.2373	G-AlSi9Mg	-	-
	A360	3.2381	G-AlSi10Mg	LM9	4253
	A413.2	3.2581	G-AlSi12	LM6	4261
	A413.0	3.2582	GD-AlSi12	-	4247
	A413.1	3.2583	G-AlSi12(Cu)	LM20	4260
	-	3.3561	G-AlMg5	LM5	4252
	-	3.5101	G-MgZn4SE1Zr1	MAG5	-
	-	3.5103	MgSE3Zn2Zr1	MAG6	-
	-	3.5106	G-MgAg3SE2Zr1	MAG 12	-

AFNOR	U.N.E. / I.H.A.	JIS	UNI	EN	ISO	TRADE MARK
Z3 CND 25.06 Az	-	-	-	-	-	-
Z2 CND 18.05.03	-	-	-	-	-	-
Z 3 CND 22.05 (Az)	-	-	-	-	-	-
Z 3 CND 25.06 Az	-	-	-	-	-	ZERON 100
-	-	-	-	-	-	-
-	-	-	-	-	-	17/4 PH
-	-	FC 100	G 10	-	-	-
Ft 15 D	FG 15	FC 150	G 15	-	-	-
Ft 20 D	FG 20	FC 200	G 20	-	-	-
Ft 25 D	FG 25	FC 250	G 25	-	-	-
Ft 30 D	FG 30	FC 300	G 30	-	-	-
Ft 35 D	FG 35	FC 350	G 35	-	-	-
Ft 40 D	-	FC 40	-	-	-	-
MN 35-10	-	FCMW 330	-	-	-	-
MN 450	-	FCMP 440/490	GMN 45	-	-	-
MP 50-5	-	FCMP 490	GMN 55	-	-	-
MN 650-3	-	FCMP 590	GMN 65	-	-	-
MN 60-3	-	FCMP 540	-	-	-	-
MN 700-2	-	FCMP 690	GMN 70	-	-	-
FGS 370/17	-	-	-	-	-	-
FGS 400/12	FGE 38-17	FCD 400	GS 400-12	-	-	-
FGS 370/17	-	-	GSO 42-12	-	-	-
FGS 500/7	FGE 50-7	FCD 500	GS 500-7	-	-	-
FGS 600/3	FGE 60-2	FCD 600	GS 600-3	-	-	-
FGS 700/2	FGE 70-2	FCD 700	GS 700-2	-	-	-
FGS 800/2	-	-	GS-800/2	-	-	-
A4	L-3001	A1x3	9001/1	-	-	-
A5	L-3051	A1x1	9001/2	-	-	-
-	-	-	-	-	-	-
A7	-	-	-	-	-	-
A8	-	-	-	-	-	-
A99	-	-	-	-	-	-
-	-	-	-	-	-	-
-	L-3811	-	9003/3	-	-	-
AM1	L-3810	A2x3	9003/1	-	-	Aluman 100
AMG0,5	-	-	9003/4	-	-	-
AM1G	L-3820	-	9003/2	-	-	-
ASGPB	-	-	-	-	-	-
AU4SG	L-3130	A3x1	9002/3	-	-	Avional 660
AU2G	-	-	9002/1	-	-	Avional 050
AU4G	L-3120	A3x2	9002/2	-	-	Avional 100
AU4G1	L-3140	A3x4	9002/4	-	-	Avional 150
AU4Pb	L-3121	-	9002/8	-	-	-
AU5PbBi	L-3192	-	9002/5	-	-	Recidal 11
ASGM 0,7	L-3451	-	9006/4	-	-	Anticorodal 100
AGS	L-3441	A2x5	9006/1	-	-	Anticorodal 063
ASG0,5	L-3454	A6NO1	9006/6	-	-	-
AGSUC	L-3420	A2x4	9006/2	-	-	Anticorodal 061
AG0,6	L-3350	A2x8	9005/1	-	-	Peraluman 080
-	-	-	9005/7	-	-	Peraluman 150
AG2,5C	L-3360	A2x1	9005/2	-	-	Peraluman 250
AG2M	L-3361	-	-	-	-	-
AG3	-	-	9005/8	-	-	Peraluman 350
AG2,5MC	L-3391	A2x9	9005/3	-	-	-
AG4MC	L-3322	-	9005/4	-	-	-
AG4,5MC	L-3321	A2x7	9005/5	-	-	Peraluman 440
A-G5	-	-	-	-	-	Peraluman 500
AZ5G	L-3741	-	9007/1	-	-	-
AZ5GU	L-3710	A34x6	9007/2	-	-	Ergal 55
AM1G	-	-	-	-	-	-
-	-	-	9007/4	-	-	-
A-S7G	-	AC4C	-	42000	AlSi7Mg	-
-	-	-	-	-	-	-
A-S10G	-	-	-	43100	Al Si 10 Mg	-
A-S12U	-	AC3A	-	44100	Al Si 12	-
-	-	-	-	-	-	-
A-S12	-	-	-	47000	Al Si 12 (Cu)	-
A-SU12	-	AC4A	-	51300	AlMg 6	-
G-Z4TR	-	-	-	-	-	-
G-TR3Z2	-	-	-	-	-	-
G-Ag22,5	-	-	-	-	-	-

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MATERIAL GROUPS

GRUPPI MATERIALE / WERKSTOFFEGRUPPE / GROUPES MATIÈRE

GROUPS / GRUPPI / GRUPPE / GROUPES	AISI	W-stoff	DIN	BS	SS
16 DIE-CAST ALUMINIUM (SI<12%) ALLUMINIO PRESSOFUSO (SI<12%) AL-GUSSLEGIERUNGEN (SI<12%) ALUMINIUM MOULÉ SOUS PRESSION (SI<12%)	-	3.5812	G-MgAl8Zn1	MAG1	-
	-	3.5912	G-MgAl9Zn1	MAG7	-
	355.1	-	G-AlSi5	LM16	-
	A380	-	G-AlSi8Cu3	LM24	4250
	319	-	G-AlSi6Cu4	LM21	-
	319.2	-	G-AlSi6Cu4	LM22	-
17 COPPER RAME KUPFER CUIVRE	C10200	2.0040	OF Cu	C103	-
	C11000	2.0060	E-Cu57	C101	-
	-	2.0065	E-Cu58	-	-
	C10300	2.0070	SE Cu	-	-
	C12200	2.0090	SF Cu	C106	-
	C12500	-	Cu-FRTP	C104	-
	C70320	2.0857	-	-	-
	C14200	2.1202	SB Cu	C107	-
	-	2.1356	Cu Mn 3	-	-
	-	2.1522	Cu Si2 Mn	-	-
	C16200	-	-	C108	-
	C18200	-	-	CC101	-
	C191010	-	-	-	-
	C70250	-	-	CC102	-
	C17200	-	-	CB101	-
	C17300	-	-	-	-
	C17510	-	-	-	-
	C17500	-	-	C112	-
	C15000	-	-	-	-
	C65100	-	-	-	-
	C65500	-	-	CS101	-
	C14500	-	-	C109	-
	C14700	-	-	C111	-
	C18700	-	-	-	-
18 BRASS OTTONE MESSING LAITON	C21000	2.0220	CuZn5	CZ125	-
	C22000	2.0230	CuZn10	Cz101	-
	C23000	2.0240	CuZn15	CZ102	-
	C24000	2.0250	CuZn20	CZ103	-
	C25600	-	CuZn28	-	-
	C26000	2.0265	CuZn30	CZ106	-
	C26800	2.0280	CuZn33	-	-
	C27200	-	CuZn36	-	-
	C27200	2.0321	CuZn37	CZ108	-
	C27000	2.0335	CuZn36	CZ107	-
	C28000	2.0360	CuZn40	CZ109	-
19 DIE-CAST BRASS OTTONE DA FUSIONE GUSSMESSING LAITON MOULÉ SOUS PRESSION	C33500	-	CuZn37Pb0.5	-	-
	C34000	-	CuZn35Pb1	CZ118	-
	C34500	2.0331	CuZn36Pb1,5	CZ119	-
	C34000	2.0331	CuZn36Pb1,5	CZ119	-
	C35300	2.0371	CuZn38Pb1,5	CZ128	-
	C36500	2.0372	CuZn39Pb0,5	CZ123	-
	C36000	2.0375	CuZn36Pb3	CZ124	-
	C37700	2.0380	CuZn39Pb2	CZ 131 / (CZ128)	-
	C38500	2.0401	CuZn39Pb3	CZ121	-
	C38000	2.0402	CuZn40Pb2	CZ122	-
	-	2.0410	CuZn44Pb2	CZ130	-
	C68700	2.0460	CuZn20Al2	CZ110	-
	C44300	2.0470	CuZn28Sn1	CZ111	-
	-	2.0530	CuZn38Sn1	-	-
	-	2.0550	CuZn40Al2	-	-
	-	2.0561	CuZn40Al1	-	-
	-	2.0572	CuZn40Mn2	CZ136	-
	C61400	2.0932	CuAl8Fe3	-	-
	C63000	2.0966	CuAl10Ni5Fe4	CA104	-
20 BRONZE BRONZO BRONZE BRONZE	C50700	2.1010	CuSn2	-	-
	C51100	2.1016	CuSn4	PB101	-
	C51000	-	CuSn5	PB102	-
	C51900	2.1020	CuSn6	PB103	-
	C52100	2.1030	CuSn8	PB104	-
	-	-	CuSn10	-	-
	-	-	CUSn11	-	-
	-	-	CuSn12	-	-
21 AMPCO	-	-	-	-	-
	-	-	-	-	-
	-	-	-	-	-

AFNOR	U.N.E. / I.H.A.	JIS	UNI	EN	ISO	TRADE MARK
G-A9	-	-	-	-	-	-
G-A9Z1	-	-	-	-	-	-
AS4GU	-	-	-	45300	AlSi5Cu 1	-
A-S9U3	-	AC4B	-	46500	Al Si9 Cu3 (Fe) (Zn)	-
A-S5UZ	-	AC2A	-	45000	Al Si 6 Cu 4	-
A-S5U	-	AC2A	-	45400	Al Si 5 Cu 3	-
Cu/c1	-	C1020	-	CW008A	Cu-OF	-
Cu/a1	-	C1100	E-Cu57	CW004A	Cu-ETP	-
-	-	-	-	-	-	-
-	-	-	-	CW021A	-	-
Cu/b	-	C1220	-	CW024A	Cu-DHP	-
Cu/A3	-	-	-	CR006A	-	-
-	-	-	-	CW112C	CuNi3Si	-
-	-	-	-	-	Cu-AsP	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	CuCd1	-
-	-	-	-	CW105C	CuCr1	-
-	-	-	-	CW109C	CuNi1Si	-
-	-	-	-	CW111C	CuNi2Si	-
-	-	-	-	CW101C	CuBe2	-
-	-	-	-	CW102C	CuBe2Pb	-
-	-	-	-	CW110C	CuNi2Be	-
-	-	-	-	CW104C	CuCo2Be	-
-	-	-	-	CW120C	CuZr	-
-	-	-	-	CW115C	CuSi2Mn	-
-	-	-	-	CW116C	CuSi3Mn1	-
-	-	-	-	CW118C	CuTeP	-
-	-	-	-	CW114C	CuSP	-
-	-	-	-	CW113C	CuPb1P	-
-	-	C2100	-	CW500L	-	-
-	-	C2200	-	CW501L	-	-
-	-	C2300	-	CW502L	-	-
-	-	C2400	-	CW503L	-	-
-	-	-	CuZn28	-	-	-
-	-	C2600	-	CW505L	-	-
-	-	C2680	-	CW506L	-	-
-	-	-	-	-	-	-
-	-	C2700	-	CW508L	-	-
-	-	C2700	-	CW507L	-	-
-	-	C2800	-	CW509L	-	-
-	-	-	-	-	-	-
-	-	C3501	-	-	-	-
-	-	-	-	CW601N	-	-
-	-	C3501	-	CW600N	-	-
-	-	-	-	-	-	-
-	-	-	-	CW610N	-	-
-	-	C3601	-	CW603N	-	-
-	-	C3771	-	CW612N	-	-
-	-	C3603	-	CW614N	-	-
-	-	-	-	CW617N	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	CW723R	-	-
-	-	-	-	CW303G	-	-
-	-	-	-	CW307G	-	-
-	-	-	-	-	-	-
-	-	C5111	-	CW450K	-	-
-	-	C5102	-	CW451K	-	-
-	-	C5191	-	CW452K	-	-
-	-	C5212	-	CW453K	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	AMPCO 18
-	-	-	-	-	-	AMPCO 21
-	-	-	-	-	-	AMPCO 22

All the trademarks or tradenames mentioned belong to their respective owners.

MATERIAL GROUPS

GRUPPI MATERIALE / WERKSTOFFEGRUPPE / GROUPES MATIÈRE

GROUPS / GRUPPI / GRUPPE / GROUPES	AISI	W-stoff	DIN	BS	SS
22 <30HRC NICKEL-BASED ALLOYS LEGHE DI NICKEL NICKELLEGIERUNGEN ALLIAGES DE NICKEL	N08800	1.4876	X10NiCrAlTi32-21	3075(NA15)	-
	N06075	2.4630	NiCr20Ti	HR5,203-4	-
	N07080	2.4631	NiCr20TiAl	HR401,601	-
	N06617	2.4663	-	-	-
	N06002	2.4665	NiCr22FeMo	HR6,204	-
	N06600	2.4816	-	-	-
	N06601	2.4851	NiCr23Fe	-	-
	N06625	2.4856	NiCr22Mo9Nb	-	-
	N08825	2.4858	NiCr21Mo	3072-76	-
23 >30HRC NICKEL-BASED ALLOYS LEGHE DI NICKEL NICKELLEGIERUNGEN ALLIAGES DE NICKEL	N10665	2.4617	NiMo28	-	-
	N10002	-	NiCr17Mo17FeW	-	-
	N10003	-	-	-	-
	-	2.4642	-	-	-
	-	-	NiCo29Cr15MOAlTi	-	-
	N07718	2.4668	NiCr19Fe19NbMo	Hr8	-
	-	-	NiCr16FeTi	-	-
	N07725	-	-	-	-
	N07750	2.4669	NiCr 15 Fe 7 TiAl	HR505	-
24 HARDOX 400, STAVAX, RAMAX	-	-	-	-	-
	-	1.2365	-	-	-
	-	-	-	-	-
25 HARDOX 500	-	-	-	-	-
	-	-	-	-	-
26 TITANIUM ALLOYS LEGHE DI TITANIO TITAN-LEGIERUNGEN ALLIAGES DE TITANE	-	3.7025	Ti 99,8	-	-
	-	3.7035	Ti 99,7a	-	-
	-	3.7055	Ti 99,6	-	-
	-	3.7065	Ti 99,5	-	-
	-	3.7115	TiAl5Sn2.5	TA14/17	-
	-	3.7164	TiAl6V4	TA10-13/TA29	-
	-	3.7175	TiAl6V6Sn2	-	-
	-	3.7185	TiAl4Mo4Sn2	-	-

AFNOR	U.N.E. / I.H.A.	JIS	UNI	EN	ISO	TRADE MARK
-	-	-	-	-	-	Incoloy 800
NC20T	-	-	-	-	-	Nimonic 75
NC20TA	-	-	-	-	-	Nimonic 80A
-	-	-	-	-	-	Inconel 617
NC22FeD	-	-	-	-	-	Hastelloy X
NC15Fe	-	-	-	-	-	Inconel 600
-	-	-	-	-	-	Inconel 601
NC22DNb	-	-	-	-	-	Inconel 625
NC21FeDU	-	-	-	-	-	Incoloy 825
-	-	-	-	-	-	Hastelloy B
NC17DWY	-	-	-	-	-	Hastelloy C
-	-	-	-	-	-	Hastelloy N
-	-	-	-	-	-	Inconel 690
NK27CADT	-	-	-	-	-	Inconel 700
Nc19FeNb	-	-	-	-	-	Inconel 718
Nc16FeTi	-	-	-	-	-	Inconel 722
-	-	-	-	-	-	Inconel 725
NC19FeNB	-	-	-	-	-	Inconel 750-X
-	-	-	-	-	-	Inconel 751
-	-	-	-	-	-	Hardox 400
-	-	-	-	-	-	Ramax
-	-	-	-	-	-	Stavax
-	-	-	-	-	-	Hardox 500
TA 1	-	-	-	-	-	-
TA 2-5	-	-	-	-	-	-
-	-	-	-	-	-	-
TA 6	-	-	-	-	-	-
-A6V	-	-	-	-	-	-
T-A5E	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

All the trademarks or tradenames mentioned belong to their respective owners.



ALSO AVAILABLE
ANCHE DISPONIBILE
AUCH ZUR VERFÜGUNG
DISPONIBLE AUSSI

OX (X)

PV15 $V_c=+50\%$ (TH)

E
Chamfer
Imbocco
Anschnitt
Entrée

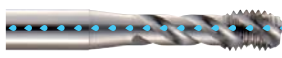
LS
Long shank
Serie lunga
Lang Schaft
Queue longue

OS
Oversized
Maggiorato
Übermass
Surcoté

TiCN $V_c=+50\%$ (TC)

TiN $V_c=+50\%$ (TI)

Vc (m/min)	M (J)	MF	G	Rc	Rp	UNC/UNF (J)	NPT	NPTF
40~80	HFIHS	HFIHS						
40~80	HFISP	HFISP						
20~40	F-SP	F-SP						
10~20	9685							
10~15	9645 / 9745	9845 9945				9345 / 9445 5985		
10~20	9640OH / 9740OH							
5~15	9640 / 9740	9840 9940				9340 / 9440		
10~15	9647 / 9747							
5~15	9641 / 9741	9841 9941						
5~10	9620 / 9720	9820 9920	PT PS			9320 / 9420 5980 5990		
20~40	1356	1856				HP-RZ		
20~40	1355							
10~20	9353		9953					
10~20	9351							
40~70	HFIHS	HFIHS						
40~70	HFISP	HFISP						
20~30	F-SP	F-SP						
10~20	1641 / 1741 (J) 111 ^(J)	1841 137 ^(J)				1341 / 1441 (J)		
10~20	1640 / 1740 (J) 111 ^(J)	1840 137 ^(J)				1340 / 1440 (J)		
10~20	9648 / 9748	9848 9948						
10~20	9685							

ULTRA FAST Ultra-high speed Velocità ultra-rapida Ultra-hohe Geschwindigkeit Ultra haute vitesse		SPECIAL PURPOSE Special purpose Applicazioni specifiche Sonderanwendungen Applications spécifiques		HP ROLL High performance Alto rendimento Hochleistung Haute performance		ROLL Roll Taps Maschi a rullare Gewindeformer Tarauds à refouler			
FAST High speed Alta velocità Hohe Geschwindigkeit Grande vitesse		GENERAL PURPOSE General purpose Applicazioni generiche Allgemeineanwendungen Applications générales							
STEEL / ACCIAIO / STAHL / ACIER 600~1000 N/mm ²		4 5	SPECIAL PURPOSE	45°	HSSE	OX		SP-VA	
		4 5	GENERAL PURPOSE	40°-OH	HSSE	BR		SP-OH	
		4 5	GENERAL PURPOSE	40°	HSSE	BR		SP	
		4 5	GENERAL PURPOSE	BLF40°	HSSE	BR		SP-BLF	
		4 5	GENERAL PURPOSE	15°	HSSE	BR		LOSP	
		4 5	GENERAL PURPOSE	STR	HSSE	BR		STR	
		4 5	HP ROLL	HP-RZ	HSS-P	TiCN		HP-RZ	
		4 5	HP ROLL	OL-RZ	HSS-P	TiCN		OL-RZ	
		4 5	ROLL	R-D	HSSE	BR		R-D	
STEEL / ACCIAIO / STAHL / ACIER 900~1200 N/mm ²		5 6	ULTRA FAST	48°-OH	HSSE	TiCN	SYNCHRO RIGID	HFIHS	
		5 6	ULTRA FAST	8°-OH	HSSE	TiCN	SYNCHRO RIGID	HFISP	
		5 6	FAST	45°	HSSE	TiN	SYNCHRO RIGID	F-SP	
		5 6	SPECIAL PURPOSE	15°	HSS-P	NI	SYNCHRO RIGID	ZET-B	
		5 6	SPECIAL PURPOSE	45°	HSS-P	OX	SYNCHRO RIGID	ZEN-B	
		5 6	SPECIAL PURPOSE	40°	HSSE	OX	SYNCHRO RIGID	PH-SP	
		5 6	SPECIAL PURPOSE	STR	HSS/Co	BR		EH-HT	
STEEL / ACCIAIO / STAHL / ACIER >1200 N/mm ² (35~45 HRC)		7	SPECIAL PURPOSE	L15°	HSS-P	NI	SYNCHRO RIGID	ZET-B	
		7	SPECIAL PURPOSE	STR	HSS/Co	BR		EH-HT	
STEEL / ACCIAIO / STAHL / ACIER 45~63 HRC		8	SPECIAL PURPOSE	STR	CARBIDE	TIAlN	SYNCHRO RIGID	UH-CT	
STAINLESS STEEL V2A ACCIAIO INOSSIDABILE V2A ROSTFREIER STAHL V2A ACIER INOXIDABLE V2A		9 10	ULTRA FAST	48°-OH	HSSE	TiCN	SYNCHRO RIGID	HFIHS	
		9 10	FAST	45°	HSSE	TiN	SYNCHRO RIGID	F-SP	



ALSO AVAILABLE
ANCHE DISPONIBILE
AUCH ZUR VERFÜGUNG
DISPONIBLE AUSSI

OX (X)

PV15 Vc=+50% (TH)

E
Chamfer
Imbocco
Anschnitt
Entrée

LS
Long shank
Serie lunga
Lang Schaft
Queue longue

OS
Oversized
Maggiorato
Übermass
Surcoté

TICN Vc=+50% (TC)

TiN Vc=+50% (TI)

Vc (m/min)	M (J)	MF	G	Rc	Rp	UNC/UNF (J)	NPT	NPTF
10~15	9645 / 9745 78 80	9845 115	9945 140			9345 / 9445 130 131	5985 147	
10~20	9640OH / 9740OH 82 82							
5~15	9640 / 9740 74 76	9840 114	9940 140			9340 / 9440 130 131		
5~15	9647 / 9747 75 77							
5~15	9641 / 9741 84 86	9841 119	9941 141					
5~10	9620 / 9720 88 89	9820 120	9920 142	PT 149	PS 146	9320 / 9420 133 133	5980 147	5990 148
15~30	1356 104 106	1856 129				HP-RZ 136		
15~30	1355 104							
5~20	9353 105 107		9953 145					
30~50	HFHS 58	HFHS 58						
30~50	HFSP 58	HFSP 58						
15~25	F-SP 61	F-SP 61						
5~15	1641 / 1741 (J) 84 111 ^(J) 86	1841 119				1341 / 1441 (J) 130 137 ^(J) 131		
5~15	1640 / 1740 (J) 78 111 ^(J) 80	1840 114				1340 / 1440 (J) 130 137 ^(J) 131		
5~12	9648 / 9748 79 81	9848 115	9948 140					
3~10	2620 / 2720 88 89	2820 120	2920 142					
3~5	1641 / 1741 (J) 84 111 ^(J) 86	1841 119				1341 / 1441 (J) 130 137 ^(J) 131		
3~5	2620 / 2720 88 89	2820 120	2920 142					
<55HRC 2~6 >55HRC 1~4	UH-CT 63							
25~40	HFHS 58	HFHS 58						
15~25	F-SP 61	F-SP 61						



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AUCH ZUR VERFÜGUNG
DISPONIBLE AUSSI

OX (X)

PV15 $V_c=+50\%$ (TH)

E
Chamfer
Imbocco
Anschnitt
Entrée

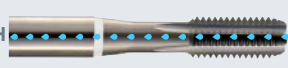
LS
Long shank
Serie lunga
Lang Schaft
Queue longue

OS
Oversized
Maggiorato
Übermass
Surcoté

TICN $V_c=+50\%$ (TC)

TiN $V_c=+50\%$ (TI)

Vc (m/min)	M (J)	MF	G	Rc	Rp	UNC/UNF (J)	NPT	NPTF
10~20	1640 / 1740 (J) 	1840 				1340 / 1440 (J) 		
8~20	9685 							
5~12	9645 / 9745 	9845 	9945 			9345 / 9445 	5985	
10~30	1356 	1856 				HP-RZ 		
10~30	1355 							
25~35	HFIHS 	HFIHS 						
15~25	F-SP 	F-SP 						
5~15	1640 / 1740 (J) 	1840 				1340 / 1440 (J) 		
5~15	9644 / 9744 		9944 					
10~20	1356 	1856 				HP-RZ 		
10~20	1355 							
50~100	HFICT-B 	HFICT-B 						
40~80	HFISP 	HFISP 						
40~80	HFIHS 	HFIHS 						
15~30	F-SP 	F-SP 						
15~30	3626 / 3726 		3926 					
15~25	9626OH / 9726OH 	9826OH 						
10~20	9626 / 9726 	9826 						
8~15	9640 / 9740 	9840 				9340 / 9440 		
5~10	9620 / 9720 	9820 	9920 	PT 	PS 	9320 / 9420 	5980 	5990
100~	HFACT-B 	HFACT-B 						

ULTRA FAST Ultra-high speed Velocità ultra-rapida Ultra-hohe Geschwindigkeiten Ultra haute vitesse		SPECIAL PURPOSE Special purpose Applicazioni specifiche Sonderanwendungen Applications spécifiques		HP ROLL High performance Alto rendimento Hochleistung Haute performance		ROLL Roll Taps Maschi a rullare Gewindeformer Tarauds à refouler			
FAST High speed Alta velocità Hohe Geschwindigkeit Grande vitesse		GENERAL PURPOSE General purpose Applicazioni generiche Allgemeineanwendungen Applications générales							
ALUMINIUM AND ALLOYS ALLUMINIO E LEGHE ALUMINIUM UND LEGIERUNGEN ALUMINIUM ET ALLIAGES	15~20	ULTRA FAST	48°-OH	HSSE TiCN	SYNCHRO RIGID	HFAHS			
	15~20	ULTRA FAST	8°-OH	HSSE TiCN	SYNCHRO RIGID	HFASP			
	15~20	FAST	45°	HSSE TiN	SYNCHRO RIGID	F-SP			
	15~20	SPECIAL PURPOSE	45°	HSSE NI		AL-SP			
	16 19 20	SPECIAL PURPOSE	STR-OH-B	HSSE NI		STR-GG-OH			
	16 19 20	SPECIAL PURPOSE	STR	HSSE NI		STR-GG			
	15~20	GENERAL PURPOSE	40°-OH	HSSE BR		SP-OH			
	15~20	GENERAL PURPOSE	40°	HSSE BR		SP			
	15~20	GENERAL PURPOSE	BLF40°	HSSE BR		SP-BLF			
	15 17 18	GENERAL PURPOSE	45°	HSSE BR		HISP 2F			
	15~20	GENERAL PURPOSE	45°	HSSE BR		HISP			
	16 19 20	GENERAL PURPOSE	STR	HSSE BR		STR			
	15~20	HP ROLL	HP-RZ	HSS-P TiCN		HP-RZ			
	15~20	HP ROLL	OL-RZ	HSS-P TiCN		OL-RZ			
	15~20	ROLL	N-RS	HSSE NI		N-RS			
	15~20	ROLL	N-RS-L	HSSE NI		N-RS-L			
	15~20	ROLL	R-D	HSSE BR		R-D			
SUPERALLOY / SUPERLEGHE SUPERLEGIERUNG / SUPERALLIAGES		22 24	SPECIAL PURPOSE	45°	HSS-P OX	SYNCHRO RIGID	ZEN-B		
SUPERALLOY / SUPERLEGHE SUPERLEGIERUNG / SUPERALLIAGES		21 23 25 26	SPECIAL PURPOSE	L15°	HSS-P NI	SYNCHRO RIGID	ZET-B		



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DISPONIBLE AUSSI

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PV15 $V_c=+50\%$ (TH)

E
Chamfer
Imbocco
Anschnitt
Entrée

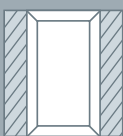
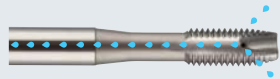
LS
Long shank
Serie lunga
Lang Schaft
Queue longue

OS
Oversized
Maggiorato
Übermass
Surcoté

TiCN $V_c=+50\%$ (TC)

TiN $V_c=+50\%$ (TI)

Vc (m/min)	M (J)	MF	G	Rc	Rp	UNC/UNF (J)	NPT	NPTF
50~100	HFAHS	HFAHS						
50~100	HFASP	HFASP						
20~50	F-SP	F-SP						
10~20	9643 / 9743							
15~25	9626OH / 9726OH	9826OH						
10~20	9626 / 9726	9826	9926					
15~25	9640OH / 9740OH							
10~20	9640 / 9740	9840	9940			9340 / 9440		
10~20	9647 / 9747							
10~20	96422F							
10~20	9642 / 9742							
5~10	9620 / 9720	9820	9920	PT	PS	9320 / 9420	5980	5990
20~40	1356	1856				HP-RZ		
20~40	1355							
10~25	9350							
10~25	9352							
10~25	9353		9953					
3~10	1640 / 1740 (J)	1840				1340 / 1440 (J)		
5~10	1641 / 1741 (J)	1841				1341 / 1441 (J)		

ULTRA FAST Ultra-high speed Velocità ultra-rapida Ultra-hohe Geschwindigkeit Ultra haute vitesse		SPECIAL PURPOSE Special purpose Applicazioni specifiche Sonderanwendungen Applications spécifiques		HP ROLL High performance Alto rendimento Hochleistung Haute performance		ROLL Roll Taps Maschi a rullare Gewindeformer Tarauds à refouler			
FAST High speed Alta velocità Hohe Geschwindigkeit Grande vitesse		GENERAL PURPOSE General purpose Applicazioni generiche Allgemeineanwendungen Applications générales							
STEEL / ACCIAIO / STAHL / ACIER ~850 N/mm²		1 2 3	ULTRA FAST	L15°-OH	HSSE TiCN	SYNCHRO RIGID	HDISL		
		1 2 3	FAST	L15°	HSSE TiN	SYNCHRO RIGID	F-SL		
		1 2 3	SPECIAL PURPOSE	L15°	HSSE OX		SL+VA		
		1 2 3	SPECIAL PURPOSE	PO	HSSE OX		PO-VA		
		1 2 3	GENERAL PURPOSE	PO-OH	HSSE BR		PO-OH		
		1 2 3	GENERAL PURPOSE	PO	HSSE BR		PO		
		1 2 3	GENERAL PURPOSE	STR	HSSE BR		STR		
		1 2 3	HP ROLL	HP-RZ	HSS-P TiCN		HP-RZ		
		1 2 3	HP ROLL	OL-RZ	HSS-P TiCN		OL-RZ		
		1 2 3	ROLL	R-D	HSSE BR		R-D		
		1 2 3	ROLL	N-RZ	HSSE OX		N-RZ		
STEEL / ACCIAIO / STAHL / ACIER 600~1000 N/mm²		4 5	ULTRA FAST	L15°-OH	HSSE TiCN	SYNCHRO RIGID	HDISL		
		4 5	FAST	L15°	HSSE TiN	SYNCHRO RIGID	F-SL		
		4 5	SPECIAL PURPOSE	L15°	HSS-P NI	SYNCHRO RIGID	ZET-P		
		4 5	SPECIAL PURPOSE	PO	HSS-P NX	SYNCHRO RIGID	ZEN-P		
		4 5	SPECIAL PURPOSE	L15°	HSSE OX		SL+VA		
		4 5	SPECIAL PURPOSE	PO	HSSE OX		PO-VA		
		4 5	GENERAL PURPOSE	PO-OH	HSSE BR		PO-OH		
		4 5	GENERAL PURPOSE	PO	HSSE BR		PO		
		4 5	GENERAL PURPOSE	STR	HSSE BR		STR		
		4 5	HP ROLL	HP-RZ	HSS-P TiCN		HP-RZ		



ALSO AVAILABLE
ANCHE DISPONIBILE
AUCH ZUR VERFÜGUNG
DISPONIBLE AUSSI

OX (X)

PV15 $V_c=+50\%$ (TH)

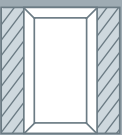
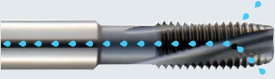
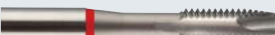
LS
Long shank
Serie lunga
Lang Schaft
Queue longue

OS
Oversized
Maggiorato
Übermass
Surcoté

TiCN $V_c=+50\%$ (TC)

TiN $V_c=+50\%$ (TI)

Vc (m/min)	M (J)	MF	G	Rc	Rp	UNC/UNF (J)	NPT	NPTF
40~80	HDISL 	HDISL 						
20~40	F-SL 	F-SL 						
10~20	9665 							
10~15	9635 / 9735 	9835 				9335 / 9435 		
10~20	9630OH / 9730OH 							
5~15	 9630 / 9730 	 9830 	 9930 			9330 / 9430 		
5~10	 9620 / 9720 	 9820 	 9920 	PT 	PS 	9320 / 9420 		
20~40	1356 	1856 				HP-RZ 		
20~40	1355 							
10~20	 9353 		 9953 					
10~20	9351 							
40~70	HDISL 	HDISL 						
20~30	F-SL 	F-SL 						
10~20	 1649 / 1749(J) 	 1849 				1349 / 1449(J) 		
10~20	 1630 / 1730(J) 	 1830 				1330 / 1430(J) 		
10~20	9665 							
10~15	9635 / 9735 	9835 				9335 / 9435 		
10~20	9630OH / 9730OH 							
5~15	 9630 / 9730 	 9830 	 9930 			9330 / 9430 		
5~10	 9620 / 9720 	 9820 	 9920 	PT 	PS 	9320 / 9420 		
15~30	1356 	1856 				HP-RZ 		

ULTRA FAST Ultra-high speed Velocità ultra-rapida Ultra-hohe Geschwindigkeit Ultra haute vitesse	FAST High speed Alta velocità Hohe Geschwindigkeit Grande vitesse	SPECIAL PURPOSE Special purpose Applicazioni specifiche Sonderanwendungen Applications spécifiques	GENERAL PURPOSE General purpose Applicazioni generiche Allgemeinwendungen Applications générales	HP ROLL High performance Alto rendimento Hochleistung Haute performance	ROLL Roll Taps Maschi a rullare Gewindeformer Tarauds à refouler			
STEEL / ACCIAIO / STAHL / ACIER 600~1000 N/mm ²	4 5	HP ROLL		HSS-P TiCN		OL-RZ		
							R-D 	
STEEL / ACCIAIO / STAHL / ACIER 900~1200 N/mm ²	5 6	ULTRA FAST		HSSE TiCN		HDISL		
	5 6	FAST		HSSE TiN		F-SL		
	5 6	SPECIAL PURPOSE		HSS-P NI		ZET-P		
	5 6	SPECIAL PURPOSE		HSS-P NX		ZEN-P		
	5 6	SPECIAL PURPOSE		HSS/Co BR		EH-PO		
	5 6	SPECIAL PURPOSE		HSS/Co BR		EH-HT		
STEEL / ACCIAIO / STAHL / ACIER >1200 N/mm ² (35~45 HRC)	7	SPECIAL PURPOSE		HSS-P NI		ZET-P		
	7	SPECIAL PURPOSE		HSS-P NX		ZEN-P		
	7	SPECIAL PURPOSE		HSS/Co BR		EH-PO		
	7	SPECIAL PURPOSE		HSS/Co BR		EH-HT		
STEEL / ACCIAIO / STAHL / ACIER 45~63 HRC	8	SPECIAL PURPOSE		CARBIDE TiAlN		UH-CT		
STAINLESS STEEL V2A ACCIAIO INOSSIDABILE V2A ROSTFREIER STAHL V2A ACIER INOXIDABLE V2A	9 10	ULTRA FAST		HSSE TiCN		HDISL		
	9 10	FAST		HSSE TiN		F-SL		
	9 10	SPECIAL PURPOSE		HSS-P NX		ZEN-P		
	9 10	SPECIAL PURPOSE		HSSE OX		SL+VA		
	9 10	SPECIAL PURPOSE		HSSE OX		PO-VA		
	9 10	HP ROLL		HSS-P TiCN		HP-RZ		
	9 10	HP ROLL		HSS-P TiCN		OL-RZ		
STAINLESS STEEL V4A ACCIAIO INOSSIDABILE V4A ROSTFREIER STAHL V4A ACIER INOXIDABLE V4A	11	ULTRA FAST		HSSE TiCN		HDISL		



ALSO AVAILABLE
ANCHE DISPONIBILE
AUCH ZUR VERFÜGUNG
DISPONIBLE AUSSI

OX (X)

PV15 $V_c=+50\%$ (TH)

LS
Long shank
Serie lunga
Lang Schaft
Queue longue

OS
Oversized
Maggiorato
Übermass
Surcoté

TiCN $V_c=+50\%$ (TC)

TiN $V_c=+50\%$ (TI)

Vc (m/min)	M (J)	MF	G	Rc	Rp	UNC/UNF (J)	NPT	NPTF
15~30	1355 							
5~20	9353 		9953 					
30~50	HDISL 	HDISL 						
15~25	F-SL 	F-SL 						
5~15	1649 / 1749(J) 	1849 				1349 / 1449(J) 		
5~15	1630 / 1730(J) 	1830 				1330 / 1430(J) 		
3~12	2630 / 2730 	2830 						
3~8	2620 / 2720 	2820 	2920 					
3~5	1649 / 1749(J) 	1849 				1349 / 1449(J) 		
3~5	1630 / 1730(J) 	1830 				1330 / 1430(J) 		
3~5	2630 / 2730 	2830 						
3~5	2620 / 2720 	2820 	2920 					
<55HRC 2~6 >55HRC 1~4	UH-CT 							
25~40	HDISL 	HDISL 						
15~25	F-SL 	F-SL 						
10~20	1630 / 1730(J) 	1830 				1330 / 1430(J) 		
10~20	9665 							
5~12	9635 / 9735 	9835 				9335 / 9435 		
10~30	1356 	1856 				HP-RZ 		
10~30	1355 							
25~35	HDISL 	HDISL 						



ALSO AVAILABLE
ANCHE DISPONIBILE
AUCH ZUR VERFÜGUNG
DISPONIBLE AUSSI

OX (X)

PV15 $V_c=+50\%$ (TH)

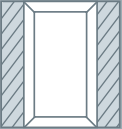
LS
Long shank
Serie lunga
Lang Schaft
Queue longue

OS
Oversized
Maggiorato
Übermass
Surcoté

TiCN $V_c=+50\%$ (TC)

TiN $V_c=+50\%$ (TI)

Vc (m/min)	M (J)	MF	G	Rc	Rp	UNC/UNF (J)	NPT	NPTF
15~25	F-SL 	F-SL 						
5~15	1630 / 1730(J) 	1830 				1330 / 1430(J) 		
5~15	9665 							
5~10	9635 / 9735 	9835 				9335 / 9435 		
10~20	1356 	1856 				HP-RZ 		
10~20	1355 							
50~100	HFICT-P 	HFICT-P 						
40~60	HDISL 	HDISL 						
15~30	F-SL 	F-SL 						
15~30	3626 / 3726 		3926 					
10~20	9626 / 9726 	9826 	9926 					
10~20	9630OH / 9730OH 							
8~15	9630 / 9730 	9830 	9930 			9330 / 9430 		
5~10	9620 / 9720 	9820 	9920 	PT 	PS 	9320 / 9420 	5980 	5990
100~	HFACT-P 	HFACT-P 						
50~100	HDISL 	HDISL 						
20~50	F-SL 	F-SL 						
10~20	9623 / 9723 							
10~20	9626 / 9726 	9826 	9926 					
10~20	9630OH / 9730OH 							
10~20	9634 / 9734 							

ULTRA FAST Ultra-high speed Velocità ultra-rapida Ultra-hohe Geschwindigkeit Ultra haute vitesse	FAST High speed Alta velocità Hohe Geschwindigkeit Grande vitesse	SPECIAL PURPOSE Special purpose Applicazioni specifiche Sonderanwendungen Applications spécifiques	GENERAL PURPOSE General purpose Applicazioni generiche Allgemeinwendungen Applications générales	HP ROLL High performance Alto rendimento Hochleistung Haute performance	ROLL Roll Taps Maschi a rullare Gewindeformer Tarauds à refouler		
ALUMINIUM AND ALLOYS ALLUMINIO E LEGHE ALUMINIUM UND LEGIERUNGEN ALUMINIUM ET ALLIAGES	15~20	GENERAL PURPOSE	PO	HSSE BR		PO	
	16 19 20	GENERAL PURPOSE	STR	HSSE BR		STR	
	15~20	HP ROLL	HP-RZ	HSS-P TiCN		HP-RZ	
	15~20	HP ROLL	OL-RZ	HSS-P TiCN		OL-RZ	
	15~20	ROLL	N-RS	HSSE NI		N-RS	
	15~20	ROLL	N-RS-L	HSSE NI		N-RS-L	
	15~20	ROLL	R-D	HSSE BR		R-D	
SUPERALLOY / SUPERLEGHE SUPERLEGIERUNG / SUPERALLIAGES	22 24	SPECIAL PURPOSE	PO	HSS-P NX	SYNCHRO RIGID	ZEN-P	
SUPERALLOY / SUPERLEGHE SUPERLEGIERUNG / SUPERALLIAGES	21 23 25 26	SPECIAL PURPOSE	L15°	HSS-P NI	SYNCHRO RIGID	ZET-P	



ALSO AVAILABLE
ANCHE DISPONIBILE
AUCH ZUR VERFÜGUNG
DISPONIBLE AUSSI

OX (X)

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Übermass
Surcoté

TiCN $V_c=+50\%$ (TC)

TiN $V_c=+50\%$ (TI)

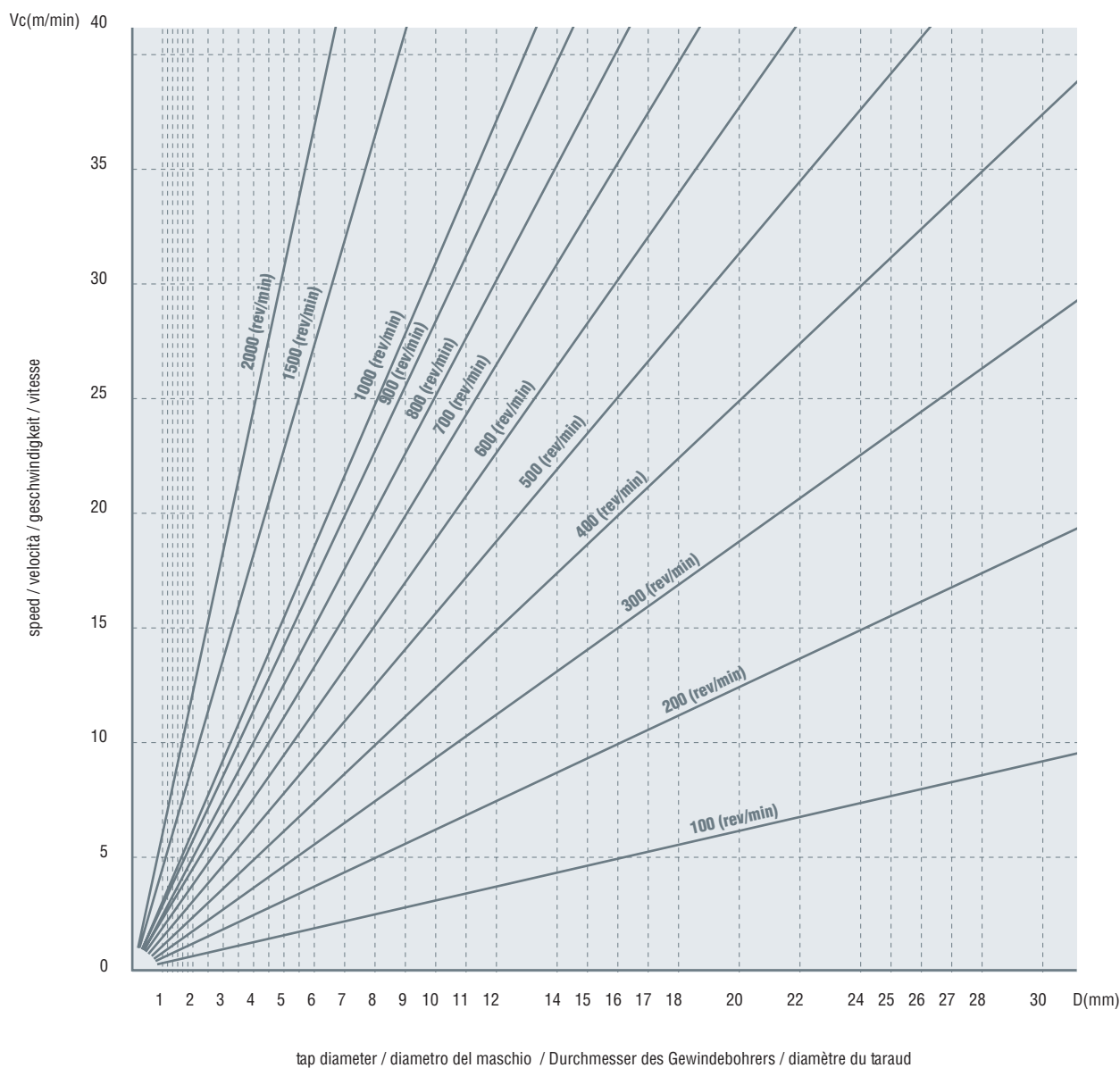
Vc (m/min)	M (J)	MF	G	Rc	Rp	UNC/UNF (J)	NPT	NPTF
10~20	 9630 / 9730 94 96 124 143	 9830 124 143	 9930 143			9330 / 9430 134 135		
5~10	 9620/9720 88 89	 9820 120	 9920 142	PT 149	PS 146	9320/9420 133 133	5980 147	5990 148
20~40	1356 104 106	1856 129				HP-RZ 136		
20~40	1355 104							
10~25	 9350 104 106							
10~25	 9352 105							
10~25	 9353 105 107		 9953 145					
3~10	1630 / 1730(J) 98 111 ^(J) 100	1830 124				1330 / 1430(J) 134 135	137 ^(J)	
5~10	1649/1749(J) 98 111 ^(J) 100	1849 124				1349 / 1449(J) 134 135	137 ^(J)	

HARDNESS

DUREZZE / HÄRTE / DURETÉS

HRC	VICKERS	BRINELL HARDNESS		ROCKWELL HARDNESS			ROCKWELL SUPERFICIAL HARDNESS			SHORE HARDNESS	N/mm ² TENSILE STRENGTH	HRC
		standard ball	tungsten carbide ball	A scale	B scale	D scale	15-N scale	30-N scale	45-N scale			
68	940	-	-	85.6	-	76.9	93.2	84.4	75.4	97	-	68
67	900	-	-	85.0	-	76.1	92.9	83.6	74.2	95	-	67
66	865	-	-	84.5	-	75.4	92.5	82.8	73.3	92	-	66
65	832	-	(739)	83.9	-	74.5	92.2	81.9	72.0	91	-	65
64	800	-	(722)	83.4	-	73.8	91.8	81.1	71.0	88	-	64
63	772	-	(705)	82.8	-	73.0	91.4	80.1	69.9	87	-	63
62	746	-	(688)	82.3	-	72.2	91.1	79.3	68.8	85	-	62
61	720	-	(670)	81.8	-	71.5	90.7	78.4	67.7	83	-	61
60	697	-	(654)	81.2	-	70.7	90.2	77.5	66.7	81	-	60
59	674	-	(634)	80.7	-	69.9	89.8	76.6	65.5	80	-	59
58	653	-	615	80.1	-	69.2	89.3	75.7	64.3	78	-	58
57	633	-	595	79.6	-	68.5	88.9	74.8	63.2	76	-	57
56	613	-	577	79.0	-	67.7	88.3	73.9	62.0	75	-	56
55	595	-	560	78.5	-	66.9	87.9	73.0	60.9	74	2075	55
54	577	-	543	78.0	-	66.1	87.4	72.0	59.8	72	2015	54
53	560	-	525	77.4	-	65.4	86.9	71.2	58.6	71	1950	53
52	544	(500)	512	76.8	-	64.6	86.4	70.2	57.4	69	1880	52
51	528	(487)	496	76.3	-	63.8	85.9	69.4	56.1	68	1820	51
50	513	(475)	481	75.9	-	63.1	85.5	68.5	55.0	67	1760	50
49	498	(464)	469	75.2	-	62.1	85.0	67.6	53.8	66	1695	49
48	484	451	455	74.7	-	61.4	84.5	66.7	52.5	64	1635	48
47	471	442	443	74.1	-	60.8	83.9	65.8	51.4	63	1580	47
46	458	432	432	73.6	-	60.0	83.5	64.8	50.3	62	1530	46
45	446	421	421	73.1	-	59.2	83.0	64.0	49.0	60	1480	45
44	434	409	409	72.5	-	58.5	82.5	63.1	47.8	58	1435	44
43	423	400	400	72.0	-	57.7	82.0	62.2	46.7	57	1385	43
42	412	390	390	71.5	-	56.9	81.5	61.3	45.5	56	1340	42
41	402	381	381	70.9	-	56.2	80.9	60.4	44.3	55	1295	41
40	392	371	371	70.4	-	55.4	80.4	59.5	43.1	54	1250	40
39	382	362	362	69.9	-	54.6	79.9	58.6	41.9	52	1215	39
38	372	353	353	69.4	-	53.8	79.4	57.7	40.8	51	1180	38
37	363	344	344	68.9	-	53.1	78.8	56.8	39.6	50	1160	37
36	354	336	336	68.4	(109.0)	52.3	78.3	55.9	38.4	49	1115	36
35	345	327	327	67.9	(108.5)	51.5	77.7	55.0	37.2	48	1080	35
34	336	319	319	67.4	(108.0)	50.8	77.2	54.2	36.1	47	1055	34
33	327	311	311	66.8	(107.5)	50.0	76.6	53.3	34.9	46	1025	33
32	318	301	301	66.3	(107.0)	49.2	76.1	52.1	33.7	44	1000	32
31	310	294	294	65.8	(106.0)	48.4	75.6	51.3	32.5	43	980	31
30	302	286	286	65.3	(105.5)	47.7	75.0	50.4	31.3	42	950	30
29	294	279	279	64.7	(104.5)	47.0	74.5	49.5	30.1	41	930	29
28	286	271	271	64.3	(104.0)	46.1	73.9	48.6	28.9	41	910	28
27	279	264	264	63.8	(103.0)	45.2	73.3	47.7	27.8	40	880	27
26	272	258	258	63.3	(102.5)	44.6	72.8	46.8	26.7	38	860	26
25	266	253	253	62.8	(101.5)	43.8	72.2	45.9	25.5	38	840	25
24	260	247	247	62.4	(101.0)	43.1	71.6	45.0	24.3	37	825	24
23	254	243	243	62.0	100.0	42.1	71.0	44.0	23.1	36	805	23
22	248	237	237	61.5	99.0	41.6	70.5	43.2	22.0	35	785	22
21	243	231	231	61.0	98.5	40.9	69.9	42.3	20.7	35	770	21
20	238	226	226	60.5	97.8	40.1	69.4	41.5	19.6	34	760	20
(18)	230	219	219	-	96.7	-	-	-	-	33	730	(18)
(16)	222	212	212	-	95.5	-	-	-	-	32	705	(16)
(14)	213	203	203	-	93.9	-	-	-	-	31	675	(14)
(12)	204	194	194	-	92.3	-	-	-	-	29	650	(12)
(10)	196	187	187	-	90.7	-	-	-	-	28	620	(10)
(8)	188	179	179	-	89.5	-	-	-	-	27	600	(8)
(6)	180	171	171	-	87.1	-	-	-	-	26	580	(6)
(4)	173	165	165	-	85.5	-	-	-	-	25	550	(4)
(2)	166	158	158	-	83.5	-	-	-	-	24	530	(2)
(0)	160	152	152	-	81.7	-	-	-	-	24	515	(0)

CONVERSION TABLE / TAVOLA DI CONVERSIONE / UMWANDLUNGSTAFEL / TABLE DE CONVERSION



$$V_c(\text{m/min}) = \frac{\pi \times D \times n}{1000}$$

$$n(\text{rev/min}) = \frac{1000 \times V_c}{\pi \times D}$$

V_c (m/min) = speed / velocità / Geschwindigkeit / vitesse

D (mm) = tap diameter / diametro del maschio / Durchmesser des Gewindebohrers / diamètre du taraud

n (rev/min) = revolutions per minute / nr di giri al minuto / U/min (Umdrehungen pro Minute) / tours par minute

$\pi = 3,14$

TAP DRILL SIZES

TABELLA PREFORI / GEWINDEKERNLÖCHER / DIAMÈTRES DE PERÇAGE

M	Ø  mm
1 x0.25	0.75
1.1x0.25	0.85
1.2x0.25	0.95
1.4x0.3	1.10
1.6x0.35	1.25
1.7x0.35	1.30
1.8x0.35	1.45
2 x0.4	1.60
2.2x0.45	1.75
2.3x0.4	1.90
2.5x0.45	2.10
2.6x0.45	2.20
3 x0.5	2.50
3Mx0.6	2.40
3.5x0.6	2.90
4 x0.7	3.30
4Mx0.75	3.25
4.5x0.75	3.70
5 x0.8	4.20
5Mx0.9	4.10
6 x1	5.00
7 x1	6.00
8 x1.25	6.80
9 x1.25	7.80
10 x1.5	8.50
11 x1.5	9.50
12 x1.75	10.30
14 x2	12.00
16 x2	14.00
18 x2.5	15.50
20 x2.5	17.50
22 x2.5	19.50
24 x3	21.00
27 x3	24.00
30 x3.5	26.50
33 x3.5	29.50
36 x4	32.00
39 x4	35.00
42 x4.5	37.50
45 x4.5	40.50
48 x5	43.00

MF	Ø  mm
2 x0.25	1.75
2.5x0.35	2.20
3 x0.35	2.70
3.5x0.35	3.20
4 x0.5	3.50
4 x0.35	3.70
5 x0.5	4.50
6 x0.75	5.30
6 x0.5	5.50
7 x0.75	6.30
7 x0.5	6.50
8 x1	7.00
8 x0.75	7.30
8 x0.5	7.50
9 x1	8.00
9 x0.75	8.30
10 x1.25	8.80
10 x1	9.00
10 x0.75	9.30
10 x0.5	9.50
11 x1	10.00
12 x1.5	10.50
12 x1.25	10.80
12 x1	11.00
12 x0.75	11.30
12 x0.5	11.50
13 x1	11.90
14 x1.5	12.50
14 x1.25	12.80
14 x1	13.00
14 x0.5	13.40
15 x1.5	13.50
15 x1	14.00
16 x1.5	14.50
16 x1.25	14.80
16 x1	15.00
17 x1.5	15.50
17 x1	16.00
18 x2	16.00
18 x1.5	16.50
18 x1	17.00
20 x2	18.00

MF	Ø  mm
20 x1.5	18.50
20 x1	19.00
22 x2	20.00
22 x1.5	20.50
22 x1	21.00
24 x2	22.00
24 x1.5	22.50
24 x1	23.00
25 x2	23.00
25 x1.5	23.50
25 x1	24.00
26 x2	23.80
26 x1.5	24.50
27 x2	25.00
27 x1.5	25.50
27 x1	26.00
28 x2	26.00
28 x1.5	26.50
28 x1	27.00
30 x3	27.00
30 x2	28.00
30 x1.5	28.50
30 x1	29.00
32 x2	30.00
32 x1.5	30.50
33 x3	30.00
33 x2	31.00
33 x1.5	31.50
34 x1.5	32.40
35 x2	33.00
35 x1.5	33.50
36 x3	33.00
36 x2	34.00
36 x1.5	34.50
38 x1.5	36.50
39 x3	36.00
39 x2	37.00
39 x1.5	37.50
40 x3	37.00
40 x2	38.00
40 x1.5	38.50

MJ	Ø  mm
3 x0.5	2.6
4 x0.7	3.4
5 x0.8	4.3
6 x1	5.1
8 x1.25	6.9
10 x1.5	8.6
12 x1.75	10.4

G	Ø  mm
1/8x28	8.75
1/4x19	11.80
3/8x19	15.25
1/2x14	19.00
5/8x14	21.00
3/4x14	24.50
7/8x14	28.25
1 x11	30.75
1 1/8x11	35.20
1 1/4x11	39.20
1 3/8x11	42.00
1 1/2x11	45.20
1 5/8x11	49.60
1 3/4x11	51.20
2 x11	57.20

Rp (BSPP)	Ø  mm
1/8 - 28	8.50
1/4 - 19	11.40
3/8 - 19	14.90
1/2 - 14	18.60
3/4 - 14	24.00
1 - 11	30.20
1 1/4 - 11	38.80
1 1/2 - 11	44.70
2 - 11	56.50

A
with reaming before tapping
con alesatura prima della maschiatura
mit Benutzung einer Reibahle
avec alésage avant le taraudage

B
without reaming before tapping
senza alesatura prima della maschitura
ohne Benutzung einer Reibahle
sans alésage avant le taraudage

UNJF	Ø  mm
4 - 48	2.40
6 - 40	3.00
8 - 36	3.55
10 - 32	4.15
1/4 - 28	5.55
5/16 - 24	7.00
3/8 - 24	8.80

TAP DRILL SIZES

TABELLA PREFORI / GEWINDEKERNLÖCHER / DIAMÈTRES DE PERÇAGE

EG M - EG MF	Ø  mm
3x0.5	3.10
4x0.7	4.20
5x0.8	5.20
6x1	6.30
8x1.25	8.40
10x1.5	10.50
10x1.25	10.40
10x1	10.30
12x1.75	12.50
12x1.5	12.50
12x1.25	12.50
14x2	14.50
14x1.5	14.50
14x1.25	14.40
16x2	16.50
16x1.5	16.50
18x2.5	18.80
18x1.5	18.50
20x2.5	20.80
20x1.5	20.50
22x2.5	22.80
22x1.5	22.40
24x3	25.00
24x1.5	24.50

EG UNC	Ø  mm
2 - 56	2.30
3 - 48	2.70
4 - 40	3.10
5 - 40	3.40
6 - 32	3.80
8 - 32	4.40
10 - 24	5.20
12 - 24	5.80
1/4 - 20	6.70
5/16 - 18	8.40
3/8 - 16	10.00
7/16 - 14	11.60
1/2 - 13	13.30
5/8 - 11	16.50
3/4 - 10	19.75

EG UNF	Ø  mm
2 - 64	2.30
3 - 56	2.65
4 - 48	3.00
5 - 44	3.30
6 - 40	3.70
8 - 36	4.40
10 - 32	5.10
1/4 - 28	6.60
5/16 - 24	8.25
3/8 - 24	9.80
7/16 - 20	11.50
1/2 - 20	13.10
5/8 - 18	16.25
3/4 - 16	19.50

M ROLL ISO2X(6HX)	Ø hole mm
1x0.25	0.96
1.2x0.25	1.15
1.4x0.3	1.25
1.6x0.35	1.45
1.7x0.35	1.55
1.8x0.35	1.65
2x0.4	1.85
2.3x0.4	2.15
2.5x0.45	2.3
2.6x0.45	2.4
3x0.5	2.8
3.5x0.6	3.25
4x0.7	3.70
5x0.8	4.65
6x1	5.55
8x1.25	7.5
10x1.5	9.4
12x1.75	11.3
14x2	13.1
16x2	15.1

M ROLL ISO3X(6GX)	Ø hole mm
1x0.25	0.98
1.2x0.25	1.17
1.4x0.3	1.29
1.6x0.35	1.47
1.7x0.35	1.57
1.8x0.35	1.67
2x0.4	1.87
2.3x0.4	2.18
2.5x0.45	2.33
2.6x0.45	2.43
3x0.5	2.83
3.5x0.6	3.28
4x0.7	3.75
5x0.8	4.70
6x1	5.6
8x1.25	7.55
10x1.5	9.48
12x1.75	11.40
14x2	13.15
16x2	15.15

MF ROLL	Ø hole mm
8x1	7.55
10x1.25	9.50
10x1	9.55
12x1.5	11.40
12x1.25	11.50
12x1	11.60
14x1.5	13.40
14x1	13.60
16x1.5	15.40
16x1	15.60
18x1.5	17.40
20x1.5	19.40

G ROLL	Ø hole mm
1/8	9.25
1/4	12.5
3/8	16.0
1/2	20.0

UNC/UNF ROLL	Ø hole mm
2 - 56	1.93
2 - 64	1.97
3 - 48	2.22
3 - 56	2.27
4 - 40	2.53
4 - 48	2.58
5 - 40	2.86
5 - 44	2.89
6 - 40	3.11
6 - 32	3.19
8 - 32	3.77
8 - 36	3.81
10 - 24	4.30
10 - 32	4.43
12 - 24	4.96
12 - 28	5.03
1/4 - 20	5.78
1/4 - 28	5.94

CAPTION

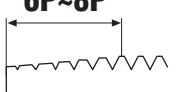
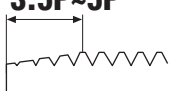
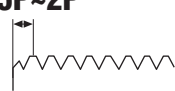
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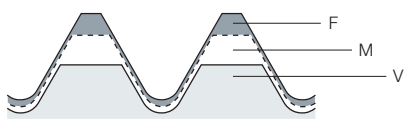
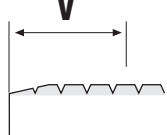
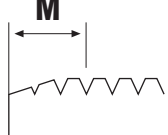
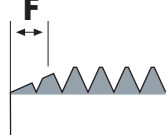
STOCK	
●	stock standard
○	non-standard stock / stock non standard / nicht Standard Lager / stock non standard
△	on request / a richiesta / auf Verlangen / sur demande
EX	stock exhaustion / esaurimento stock / Vorratserschöpfung / épuisement du stock

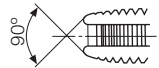
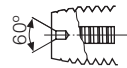
STANDARD PACKING / CONFEZIONE STANDARD / STANDARD PACKUNG / CONDITIONNEMENTS STANDARDS		
DIN371-376-374	M1~M10	10 pcs. / pz. / Stk. / un.
DIN376-374	M11~M16	5 pcs. / pz. / Stk. / un.
DIN376-374	M17~	1 pcs. / pz. / Stk. / un.
DIN5156	G 1/8	10 pcs. / pz. / Stk. / un.
DIN5156	G 1/4~G 3/8	5 pcs. / pz. / Stk. / un.
DIN5156	G 1/2~	1 pcs. / pz. / Stk. / un.

DIMENSIONS / DIMENSIONI / ABMESSUNGEN / DIMENSIONS	
D	nominal diameter / diametro nominale / Nendurchmesser / diamètre nominal
d	shank diameter / diametro del gambo / Schaftdurchmesser / diamètre de queue
L	total length / lunghezza totale / Gesamtlänge / longueur totale
l	thread length / lunghezza del filetto / Gewindelänge / longueur taillant
l1	neck length / lunghezza utile / Nutzlänge / longueur utile
l2	spiral length / lunghezza spirale / Spirallänge / longueur hélice
k	square size / sezione quadro / Vierkant / section du carré
p	pitch / passo / Steigung / pas
n	threads per inch / filetti per pollice / Gangzahl pro Zoll / filets au pouce

SHAPE / FORMA / FORM / FORME	
flutes number (cutting taps) / numero di taglienti (maschi per asportazione) Nutenzahl (Gewindebohrer) / nombre de dents (tarauds à couper)	
grooves number (roll taps) / numero di canalini (maschi a rullare) Ölkanal Nummern (Gewindeformer) / nombre de rainures (tarauds à refouler)	
lobes number (roll taps) / numero di lobi (maschi a rullare) Nase Nummern (Gewindeformer) / nombre de lobes (tarauds à refouler)	

CHAMFER TYPE / TIPO DI IMBOCCO / ANSCHNITT / TYPE D'ENTRÉE			
	6P~8P 		3.5P~5P 
	3.5P~5P 		1.5P~2P 
	2P~3P 		

CHAMFER TYPE / TIPO DI IMBOCCO / ANSCHNITT / TYPE D'ENTRÉE			
   			
DIN hand taps / maschi a mano DIN / DIN Handgewindebohrer / tarauds à main DIN			

CENTERING SHAPE / TIPO DI CENTRATURA / GEWINDEBOHRERKERN / TYPE DE CENTRAGE	
≤ M6 (1/4") M3~M12 VERSION UP	
≥ M7 (5/16")	
ROLL	

CAPTION

LEGENDA / VERZEICHNIS / LÉGENDE

COLOUR RINGS / ANELLI COLORATI / GEFÄRBTE RINGE / ANNEAUX DE COULEUR		
YELLOW GIALLO GELB JAUNE	for sticky and soft steel ≤500N/mm ² per acciaio pastoso e tenero ≤500N/mm ² für Werkstoffe ≤500N/mm ² pour acier à faible teneur en carbone et métaux collants ≤500N/mm ²	
BLUE (VA) BLU (VA) BLAU (VA) BLEU (VA)	for stainless steel and general steel per acciaio inossidabile ed acciaio in genere für rostfreien Stahl und allgemeine Stähle pour acier inoxydable et acier générique	
RED ROSSO ROT ROUGE	for hard steel 30~45 HRC per acciaio duro 30~45 HRC für Hartstahl 30~45 HRC pour acier dur 30~45 HRC	
WHITE BIANCO WEISS BLANC	for cast iron per ghisa für Eisenguß pour fonte	
ORANGE ARANCIO ORANGE ORANGE	for nickel base alloy, alloy steel (CrMo, NiCrMo) and stainless steel (V4A) per acciaio a base di nichel, acciaio legato (CrMo, NiCrMo) e acciaio inossidabile (V4A) für Nickellegierungen, legierten Stahl (CrMo, NiCrMo) und rostfreien Stahl (V4A) pour acier à base de nickel, acier allié (CrMo, NiCrMo) et acier inoxydable (V4A)	
PINK ROSA ROSA ROSE	for titanium alloy, alloy steel (CrMo, NiCrMo) ≥950N/mm ² per leghe di titanio, acciaio legato (CrMo, NiCrMo) ≥950N/mm ² für Titanlegierungen, legierten Stahl (CrMo, NiCrMo) ≥950N/mm ² pour alliages de titane, acier allié (CrMo, NiCrMo) ≥950N/mm ²	
GREEN VERDE GRÜN VERT	for aluminium casting and diecasting (Si≤12%) per alluminio pressofuso (Si≤12%) für Aluminiumspritzguß (Si≤12%) pour aluminium moulé sous pression (Si≤12%)	

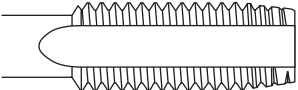
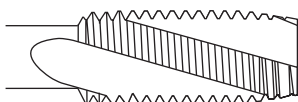
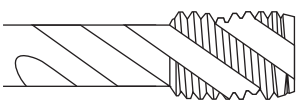
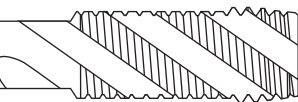
MATERIAL / MATERIALE / WERKSTOFF / MATIÈRE	
HSS ...	hand taps, dies and center drills maschi a mano, filiere e punte a centrare Handgewindebohrer, runde Schneideisen und Zentrierbohrer tarauds à main, filières et forets à centrer
HSSE ...	machine taps maschi a macchina Maschinengewindebohrer tarauds machine
HSS/Co ...	special purpose machine taps maschi a macchina per applicazioni speciali Maschinengewindebohrer für Sonderanwendungen tarauds machine pour applications spéciales
HSS-P ...	special purpose machine taps maschi a macchina per applicazioni speciali Maschinengewindebohrer für Sonderanwendungen tarauds machine pour applications spéciales
CARBIDE ...	micrograin for special purpose micrograna per applicazioni speciali Mikrokörnung für Sonderanwendungen micrograin pour applications spéciales

Thanks to the Japanese advanced research, YAMAWA taps are made of top-quality high speed steel and micrograin carbide.
Grazie all'esperta ricerca dei nostri tecnici, i maschi YAMAWA sono fabbricati utilizzando acciai e metalli duri di altissima qualità.
Dank der Forschung der japanischen Fachleuten, werden die Maschinengewindebohrer von YAMAWA mit hochwertigen Stählen und Hartmetallen hergestellt.
Grâce à une recherche très avancée, les tarauds YAMAWA sont fabriqués en utilisant des aciers et du carbure de très haute qualité.

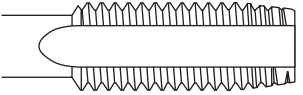
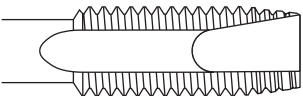
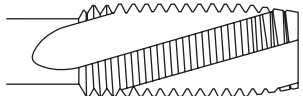
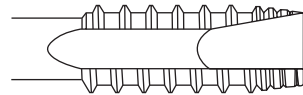
SURFACE TREATMENTS / TRATTAMENTI SUPERFICIALI / OBERFLÄCHENBEHANDLUNGEN / TRAITEMENT DE SURFACE

... BR	NO TREATMENT NESSUN TRATTAMENTO OHNE BEHANDLUNG NON TRAITÉ
... NI	NITRIDING surface hardness 1000~1200HV; reduced cutting friction; reduced welding tendency; increased tool life NITRURAZIONE durezza superficiale 1000~1200HV; riduce l'attrito; evita l'incollaggio, aumenta la durata NITRIERUNG Oberflächenhärte 1000~1200HV; Schneiddrucksenkung; verminderte Aufbauwirkung; längere Standzeit NITRURATION dureté superficielle 1000~1200HV; réduit les frottements; évite les arête rapportées; augmente la durée de vie
... NX	- NITRIDING+VAPORIZATION surface hardness 1000~1200HV; increased surface porosity; increased lubrication; reduced overheating; reduced cutting friction; reduced welding tendency; increased finishing; increased tool life - NITRURAZIONE+VAPORIZZAZIONE durezza superficiale 1000~1200HV; aumenta la porosità superficiale; migliora la lubrificazione; riduce il surriscaldamento; riduce l'attrito; evita l'incollaggio; migliora la finitura; aumenta la durata - NITRIERUNG+DÄMPFUNG Oberflächenhärte 1000~1200HV; bessere Oberflächenporosität; bessere Schmierung; verminderte Überhitzung; Schneiddrucksenkung; verminderte Aufbauwirkung; bessere Fertigstellung; längere Standzeit - NITRURATION+TRAITEMENT VAPEUR dureté superficielle 1000~1200HV; augmente la porosité superficielle; améliore la lubrification; réduit la surchauffe; réduit les frottements; évite les arêtes rapportées; améliore la finition; augmente la durée de vie
... OX	- VAPORIZATION increased surface porosity; increased lubrication; reduced overheating; reduced cutting friction; reduced welding tendency; increased finishing; reduced chipping troubles; increased tool life - VAPORIZZAZIONE aumenta la porosità superficiale; migliora la lubrificazione; riduce il surriscaldamento; riduce l'attrito; evita l'incollaggio; migliora la finitura; riduce le scheggiature; aumenta la durata - DÄMPFUNG bessere Oberflächenporosität; bessere Schmierung; verminderte Überhitzung; Schneiddrucksenkung; verminderte Aufbauwirkung; bessere Fertigstellung; Ausbruchsenkung; längere Standzeit - TRAITEMENT VAPEUR augmente la porosité superficielle; améliore la lubrification; réduit les frottements; évite les arêtes rapportées; améliore la finition; protège l'arête de coupe, augmente la durée de vie
... PV15	- TiAlN surface hardness (3300HV) + WCC (1000HV); resistant ~400°C; black colour; reduced cutting friction; reduced welding tendency; increased finishing; high cutting speed; increased tool life - TiAlN durezza superficiale (3300HV) + WCC (1000HV); resistente ~400°C; colore nero; riduce l'attrito; evita l'incollaggio; migliora la finitura; alta velocità d'impiego; aumenta la durata - TiAlN Oberflächenhärte (3300HV) + WCC (1000HV); hitzebeständig ~400°C; schwarz-gefarbt; Schneiddrucksenkung; verminderte Aufbauwirkung; bessere Fertigstellung; hohe Schnittgeschwindigkeit; längere Standzeit - TiAlN dureté superficielle (3300HV) + WCC (1000HV); résistant ~400°C; couleur noir; réduit les frottements; évite les arêtes rapportées; améliore la finition; vitesse de coupe accrue; augmente la durée de vie
... TiAlN	- ALUMINIUM TITANIUM NITRIDE surface hardness 3300HV; resistant ~900°C; violet/grey colour; reduced cutting friction; reduced welding tendency; increased finishing; high cutting speed; increased tool life - NITRURO DI ALLUMINIO TITANIO durezza superficiale 3300HV; resistente ~900°C; colore viola/grigio; riduce l'attrito; evita l'incollaggio; migliora la finitura; alta velocità d'impiego; aumenta la durata - TITANALUMINIUMNITRID Oberflächenhärte 3300HV; hitzebeständig ~900°C; violett/grau-gefarbt; Schneiddrucksenkung; verminderte Aufbauwirkung; bessere Fertigstellung; hohe Schnittgeschwindigkeit; längere Standzeit - NITRURE D'ALUMINIUM TITANE dureté superficielle 3300HV; résistant ~900°C; couleur pourpre/gris; réduit les frottements; évite les arêtes rapportées; améliore la finition; vitesse de coupe accrue; augmente la durée de vie
... TiCN	- TITANIUM CARBONITRIDE surface hardness 3000HV; resistant ~400°C; blue/grey colour; reduced cutting friction; reduced welding tendency; increased finishing; high cutting speed; increased tool life - CARBONITRURO DI TITANIO durezza superficiale 3000HV; resistente ~400°C; colore blu/grigio; riduce l'attrito; evita l'incollaggio; migliora la finitura; alta velocità d'impiego; aumenta la durata - TITAN CARBON-NITRID Oberflächenhärte 3000HV; hitzebeständig ~400°C; blau/grau-gefarbt; Schneiddrucksenkung; verminderte Aufbauwirkung; bessere Fertigstellung; hohe Schnittgeschwindigkeit; längere Standzeit - CARBONITRURE DE TITANE dureté superficielle 3000HV; résistant ~400°C; couleur bleu/gris; réduit les frottements; évite les arêtes rapportées; améliore la finition; vitesse de coupe accrue; augmente la durée de vie
... TiN	- TITANIUM NITRIDE surface hardness 2000~2500HV; resistant ~600°C; yellow colour; reduced cutting friction; reduced welding tendency; increased finishing; high cutting speed; increased tool life - NITRURO DI TITANIO durezza superficiale 2000~2500HV; resistente ~600°C; colore giallo; riduce l'attrito; evita l'incollaggio; migliora la finitura; alta velocità d'impiego; aumenta la durata - TITAN NITRID Oberflächenhärte 2000~2500HV; hitzebeständig ~600°C; gelb-gefarbt; Schneiddrucksenkung; verminderte Aufbauwirkung; bessere Fertigstellung; hohe Schnittgeschwindigkeit; längere Standzeit - NITRURE DE TITANE dureté superficielle 2000~2500HV; résistant ~600°C; couleur jaune; réduit les frottements; évite les arêtes rapportées; améliore la finition; vitesse de coupe accrue; augmente la durée de vie

BLIND HOLE / FORO CIECO / SACKLOCH / TROU BORGNE

TAP AND CHAMFER STYLE / MASCHIO ED IMBOCCO / GEWINDEBOHRER UND ANSCHNITT / TYPE DE TARAUD ET D'ENTRÉE		
 Straight fluted, C chamfer general purpose Scanalature diritte, imbocco C impiego standard Gerade Nuten, Anschnitt C allgemeine Anwendung Tarauds à goujures droites, entrée C applications générales		 STR
 - 15°~20° low spiral fluted, chamfer D suitable for short blind holes on tough material and for horizontal application - Elicoidale 15°~20°, imbocco D adatto per maschiature cieche poco profonde, materiali resistenti ed applicazioni orizzontali - 15°~20° Spiralnuten, Anschnitt D für kurze Sacklochgewinde in harten Werkstoffen und horizontale Anwendungen - Hélice à 15°~20° à droite, entrée D indiqué pour les trous borgnes peu profonds sur matière tenace et pour des applications horizontales		 LOSP
 - 35°~45° spiral fluted, C chamfer suitable for deep blind holes and long-chip-material - Elicoidale 35°~45°, imbocco C adatto per maschiature cieche profonde e materiali a truciolo lungo - 35°~45° Spiralnuten, Anschnitt C für tiefe Sacklochgewinde auf langspanenden Werkstoffen - Hélice à 35°~45° à droite, entrée C indiqué pour les trous borgnes profonds et matériaux à copeau long		 SP
 - 40° spiral fluted, chamfer C with special BLF geometry for better chips ejection and tap stability. Suitable for deep blind holes and long chip materials - Elicoidale 40°, imbocco C con speciale geometria BLF per migliorare l'evacuazione dei trucioli e la stabilità del maschio. Adatto per filettature cieche profonde e materiali a truciolo lungo - 40° Spiralnuten, Anschnitt C mit Sondergeometrie BLF für besseren Spantransport und Stabilität des Gewindebohrers. Für tiefe Sacklochgewinde und langspanende Materialien geeignet. - Hélice à 40° à droite, entrée C avec géométrie spéciale BLF pour améliorer le dégagement des copeaux et la stabilité du taraud. Indiqué pour trous borgnes profonds et matériaux à copeau long		 SP-BLF
 - 45° spiral fluted, chamfer C suitable for deep blind holes and long-chip-materials - Elicoidale 45°, imbocco C adatto per maschiature cieche profonde e materiali a truciolo lungo - 45° Spiralnuten, Anschnitt C für tiefe Sacklochgewinde auf langspanenden Werkstoffen - Hélice à 45° à droite, entrée C indiqué pour les trous borgnes profonds dans les matériaux à copeau long		 HISP

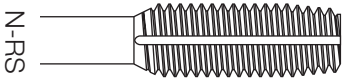
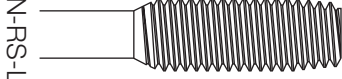
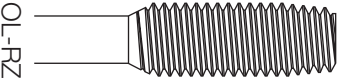
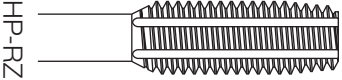
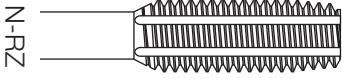
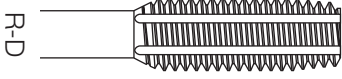
THROUGH HOLE / FORO PASSANTE / DURCHGANGSLOCH / TROU DÉBOUCHANT

TAP AND CHAMFER STYLE / MASCHIO ED IMBOCCO / GEWINDEBOHRER UND ANSCHNITT / TYPE DE TARAUD ET D'ENTRÉE	
 Straight fluted, C and D chamfer general purpose Scanalature diritte, imbocco C e D impiego standard Gerade Nuten, Anschnitt C und D allgemeine Anwendung Tarauds à goujures droites, entrée C et D applications générales	STR 
 - Straight fluted, spiral pointed, chamfer B suitable for a wide variety of through holes, chips flow out in the same tap feeding direction - Scanalature diritte con imbocco corretto, imbocco B adatto per una grande varietà di maschiature passanti, i trucioli vengono evacuati nella stessa direzione dell'avanzamento del maschio - Gerade Nuten, Schälanschnitt B für fast alle Durchgangsgewinde geeignet. Spantransport erfolgt im Gewindegang - Taraud à goujures droites, entrée hélicoïdale, entrée B recommandée pour les trous débouchants dans une grande variété de matériaux. Le dégagement des copeaux se produit dans le sens d'avance du taraud	PO 
 - 15°~20° LEFT low spiral fluted, chamfer D suitable for through holes (special application) - Elica SINISTRA 15°~20°, imbocco D adatto per maschiature passanti (applicazioni speciali) - 15°~20° Spiralnuten LINKSDRALL, Anschnitt D für Durchgangsgewinde (Gewindebohrer für Sonderanwendungen) - Hélice à 15°~20° à GAUCHE, entrée D indiqué pour les trous débouchants (tarauds pour applications spéciales)	LHSP 
 - Similar to PO, with interrupted threads to reduce the cutting pressure and improve chip ejection. Suitable for aluminium and sticky materials. - Simile al tipo PO, con filetti alternati per ridurre l'attrito e migliorare l'evacuazione truciolo. Adatto per leghe leggere e materiali che legano. - PO ähnlich, aber mit unterbrochenen Zähnen um den Schneiddruck zu vermindern und die Spanräumung zu erleichtern. Für Aluminium und griffige Werkstoffe geeignet - Semblable au type PO, avec filets alternés qui permettent de réduire les frottements et améliorer le dégagement des copeaux. Recommandé pour aluminium et matières à faible teneur en carbone et métaux collants	POINT 

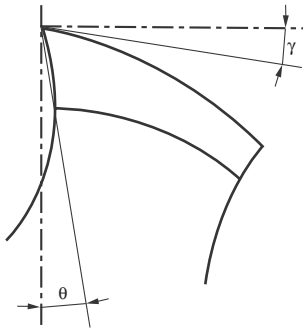
TAPS GEOMETRY

GEOMETRIA DEI MASCHI / GEOMETRIE DER GEWINDEBOHRER / GÉOMETRIE DES TARAUDS

ROLL TAPS / MASCHI A RULLARE / GEWINDEFORMER / TARAUDS À REFOULER

TAP AND CHAMFER STYLE / MASCHIO ED IMBOCCO / GEWINDEBOHRER UND ANSCHNITT / TYPE DE TARAUD ET D'ENTRÉE		
 - Roll taps, designed with lobes and crests geometry specifically designed for non-ferrous materials. With oil groove to allow perfect lubricant feed - Maschi a rullare con geometria (lobi e creste) specificamente studiata per materiali non ferrosi. Con canalino di lubrificazione per un perfetto afflusso del refrigerante - Gewindeformer mit Sondergeometrie speziell für nichteisen Werkstoffe ausgedacht. Mit Schmiernuten für einen perfekten Kühlmittelzufluß - Tarauds à refouler avec géométrie spécifique étudiée pour matériaux non ferreux. Avec rainure pour un afflux parfait du réfrigérant		
 Same as N-RS but without oil groove Come N-RS ma senza canalino di lubrificazione Wie N-RS aber ohne Schmiernuten Comme type N-RS mais sans rainure de lubrification		
 High performance roll taps for universal application and dry tapping Maschi a rullare ad alto rendimento per applicazioni universali e filettatura a secco Hochleistung Gewindeformer für universelle Anwendungen und Trockene Bearbeitung Tarauds à refouler à haut rendement pour application universel et taraudage à sec		
 High performance roll taps for universal application Maschi a rullare ad alto rendimento per applicazioni universali Hochleistung Gewindeformer für universelle Anwendungen Tarauds à refouler à haut rendement pour application universel		
 - Roll taps, designed with lobes and crests geometry specifically designed for ferrous materials (steels). With oil grooves to allow perfect lubricant feed - Maschi a rullare con geometria (lobi e creste) specificamente studiata per materiali ferrosi (acciai). Con canalini di lubrificazione per un perfetto afflusso del refrigerante - Gewindeformer mit Sondergeometrie speziell für Stahl. Mit Schmiernuten für einen perfekten Kühlmittelzufluß - Tarauds à refouler avec géométrie pour matériaux ferreux (aciers). Avec rainures pour un afflux parfait du réfrigérant		
 Roll taps, designed with lobes and crest geometry suitable for general purpose Maschi a rullare con geometria (lobi e creste) adatta per applicazioni generiche Gewindeformer mit Sondergeometrie für allgemeine Anwendungen geeignet. Tarauds à refouler avec géométrie indiquée pour des applications générales		

CUTTING ANGLE AND CHAMFER RELIEF / ANGOLO DI TAGLIO E SPOGLIA SULL'IMBOCCO / SCHNITTWINKEL UND ANSCHNITT-HINTERSCHLIFF / ANGLE DE TAILLE ET DÉPOUILLE SUR L'ENTRÉE



Chordal hook angle.

Cutting angle of hook face; it is the angle between the center line passing the cutting edge and the straight line linking the cutting edge with the thread root.

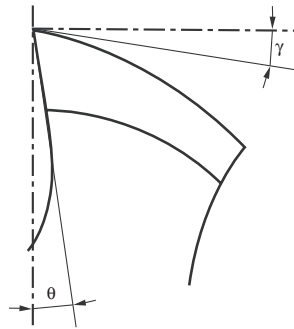
Angolo di taglio cordale (tagliente ad uncino).
Angolo di taglio del tagliente ad uncino, definito tra la linea retta passante per il centro di rotazione e l'estremità del tagliente, e la linea retta congiungente l'estremità e la base del tagliente.

Konkaver Spanwinkel.

Ein konkaver Spanwinkel ist der Winkel, der zwischen Gewindebohrer-Mittellinie und der geraden Linie von der Gewindespitze zum Gewindegrund entsteht.

Angle de taille cordal (arête à crochet).

Angle de taille de l'arête à crochet. C'est l'angle entre la ligne droite qui passe par le centre de rotation et l'extrémité de l'arête et la ligne droite qui relie l'extrémité et la base de l'arête.



Rake angle.

Cutting angle of rake face; it is the angle between the center line passing the cutting edge and the straight line linking the cutting edge with the thread root.

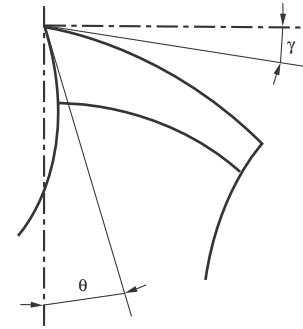
Angolo di taglio (tagliente retto).
Angolo di taglio del tagliente retto, definito tra la linea retta passante per il centro di rotazione e l'estremità del tagliente, e la linea retta congiungente l'estremità e la base del tagliente.

Gerader Spanwinkel.

Der gerade Spanwinkel ist der Winkel, der zwischen der Gewindebohrer-Mittellinie und der Gewindespitze in gerader Linie bis unterhalb des Flankengrunds entsteht.

Angle de taille (arête droit).

Angle de taille du arête droit. C'est l'angle entre la ligne droite qui passe par le centre de rotation et l'extrémité de l'arête et la ligne droite qui relie l'extrémité et la base de l'arête.



Tangential hook angle.

Cutting angle of hook face; it is the angle between the center line passing the cutting edge and the straight line tangent to the rake face on the cutting edge.

Angolo di taglio tangenziale (tagliente ad uncino).
Angolo di taglio del tagliente ad uncino, definito tra la linea retta passante per il centro di rotazione e l'estremità del tagliente, e la linea retta tangente al tagliente in corrispondenza della sua estremità.

Tangentiale Spanwinkel.

Der tangentiale Spanwinkel ist der Winkel, zwischen der Gewindebohrer-Mittellinie und dem Verlauf einer tangentialen Linie an der Spanfläche entsteht.

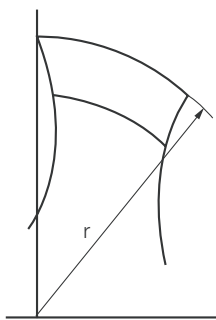
Angle de taille tangentiel (arête à crochet).

Angle de taille de l'arête à crochet. C'est l'angle entre la ligne droite qui passe par le centre de rotation et l'extrémité de l'arête et la ligne droite tangente à l'arête en face de son extrémité.

θ = cutting angle / angolo di taglio / Spanwinkel / angle de taille

γ = chamfer relief / spoglia sull'imbocco / Anschnitt-Hinterschliff / dépouille sur l'entrée

THREAD RELIEF / SPOGLIA SUPERIORE / FLANKENHINTERSCHLIFF / DÉPOUILLE SUPÉRIEURE



Concentric - unrelieved.

No chamfer relief on the land, the crest is concentric to the centre of screw thread.

Profilo concentrico.

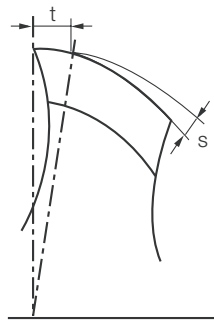
Non è presente una spoglia superiore, la cresta del tagliente è concentrica all'asse della filettatura.

Zentrische Gewindeflanken ohne Hinterschliff.

Kein Flankenhinterschliff über den ganzen Gewindestollen, der Gewindezahn hat zentrische Flanken zum Gewindeprofil.

Profil concentrique.

Dépouille supérieure absente; crête de l'arête concentrique à l'axe du filetage.



Con-eccentric thread relief.

Radial relief on the crest, starting after a concentric margin.

Profilo con spoglia superiore con-eccentrica.

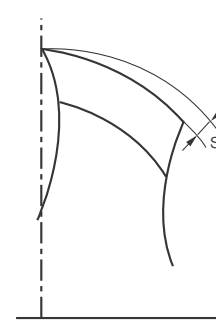
È presente una spoglia superiore sulla cresta del tagliente, che inizia dopo un tratto concentrico all'asse della filettatura chiamato margine.

Zentrischer- exzentrischer Flankenhinterschliff.

Radialer Flankenhinterschliff am Gewindezahn, beginnend nach einer zentrischen Fase der Gewindeflanken.

Profil avec dépouille supérieure con-excentrique.

Dépouille supérieure sur la crête de l'arête, qui commence après un trait concentrique à l'axe du filetage, dit marge.



Eccentric thread relief.

Radial relief on the crest starting from the cutting edge and extending through the whole land.

Profilo con spoglia superiore eccentrica.

La spoglia posteriore sulla cresta del tagliente comincia dall'estremità del tagliente e si estende lungo tutto il tagliente.

Exzentrischer Flankenhinterschliff, beginnend an der Gewindespitze und fortschreitend bis zum Ende des Gewindestollens.

La dépouille postérieure sur la crête de l'arête commence à l'extrémité de l'arête et s'étend le long de l'arête.

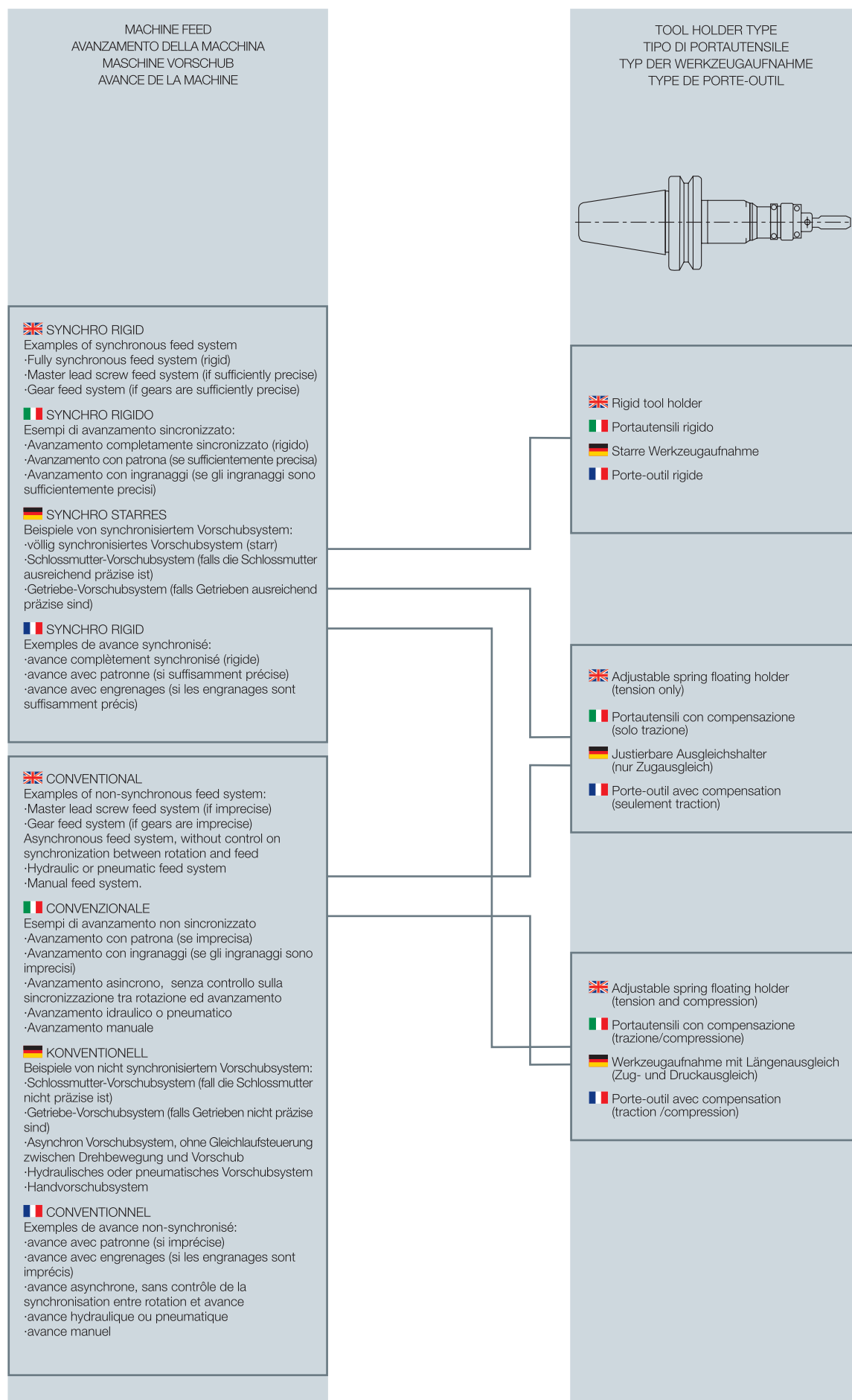
Profil avec dépouille supérieure excentrique.

La dépouille postérieure sur la crête de l'arête commence à l'extrémité de l'arête et s'étend le long de l'arête.

S = thread relief / spoglia / Hinterschliff / dépouille

RELATION BETWEEN MACHINE/FEED TYPE, HOLDER, TAP

RELAZIONE TRA TIPO MACCHINA/AVANZAMENTO, MANDRINO, MASCHIO
 BEZIEHUNG ZWISCHEN TYP DER MASCHINE/VORSCHUB, SPINDEL, GEWINDEBOHERE
 RELATION ENTRE TYPE DE MACHINE/AVANCEMENT, MANDRIN, TARAUD



SELF-GUIDANCE PROPERTIES OF TAPS DEPENDING ON THEIR GEOMETRY / CARATTERISTICHE DI AUTOGUIDA DEL MASCHIO
 GEOMETRIEABHÄNGIGE FÜHRUNGSEIGENSCHAFTEN DER GEWINDEBOHRER / CHARACTERISTIQUES DE AUTOGUIDAGE DU TARAUD

Eccentric thread relief (no margin)

Cutting and machining performances are very high for this type of taps, but they should be used on synchronous feed machines, with rigid toolholder. These taps in fact offer very low self-guidance features and may cause instable tapping, due to lack of margin, when not used properly.

Spoglia superiore eccentrica (margine assente)

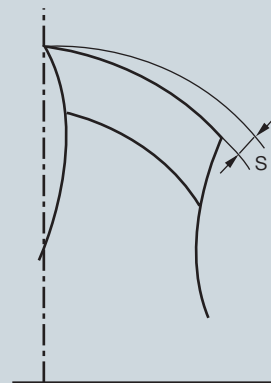
Le prestazioni di tali maschi in termini di qualità del filetto e di produttività sono molto elevate, ma richiedono l'utilizzo su macchine con maschiatura sincronizzata e portautensili rigidi. Infatti questo tipo di maschio ha scarse proprietà di auto-guida e può risultare instabile a causa della mancanza di margine se utilizzato impropriamente.

Exzentrischer Gewindeflankenhinterschliff

Die Leistung dieser Gewindebohrer ist in Bezug auf die Produktivität und Qualität sehr hoch. Sie sollten jedoch nur eingesetzt werden, wenn Maschinen zum synchronisierten Gewindeschneiden ausgerüstet sind und starre Werkzeugaufnahmen verwendet werden. Dieser Gewindebohrertyp hat geringe Selbstführungseigenschaften, da er am Führungsgewinde keine zentrische Fase vor dem exzentrischen Gewindeflankenhinterschliff hat.

Dépouille supérieure excentrique/désaxé (marge absent)

Les performances de ces tarauds, pour ce qui concerne la qualité du filet et de la productivité, sont très élevées, mais ils doivent être utilisés sur machines avec taraudage synchronisé et porte-outil rigide. En effet ce type de taraud a faibles propriétés de autoguidage et il peut résulter instable à cause du manque de marge s'il est utilisé improprement.



Con-eccentric thread relief (margin and thread relief)

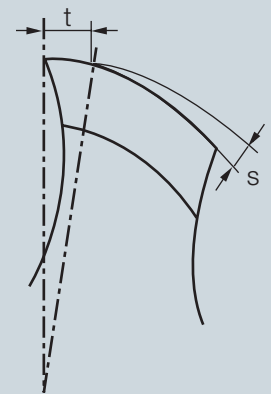
The combination of the right portion of margin and chamfer relief gives the tap appropriate guidance. This geometry can be also applied on synchro-rigid machine but incomplete thread and/or over-cutting may be shown by loosing feed balance.

Spoglia superiore con-eccentrica (margine e spoglia superiore)
La combinazione del margine e della spoglia superiore offre al maschio una adeguata guida. Questa geometria è applicabile anche su macchine con maschiatura non-sincronizzata, ma la perdita del sincronismo nell'avanzamento può causare una filettatura incompleta e/o maggiorata.

Zentrischer-(Fase) und exzentrischer Hinterschliff an den Gewindeflanken
Das richtige Verhältnis zwischen zentrischem (Fase)- und exzentrischem Gewindeflankenhinterschliff verleiht dem Gewindebohrer eine ausreichende Führung. Diese Geometrie ist für Maschinen ohne synchronisierten Vorschub geeignet. Bei schlechtem Vorschub- bzw. Längenausgleich, kann es jedoch zum Ver- oder Überschneiden der Gewinde kommen.

Dépouille supérieur con- excentrique/désaxé (marge et dépouille supérieure)

La combinaison de la marge et de la dépouille supérieur offre au taraud une guidage adéquate. Cette géométrie peut être appliquée sur machines avec taraudage non-synchronisé, mais la perte de synchronisation en avancement peut causer un taraudage incomplet et/ou de Ø supérieur.



Concentric thread relief (no relief)

The lack of thread relief on the cutting edge gives high self-guidance features to these taps also on non-synchronous feed system machines, thanks to the long portion adhering to the screw thread. The quality of cutting surface may result poor, also depending on the workpiece material.

Spoglia superiore concentrica (spoglia superiore assente)

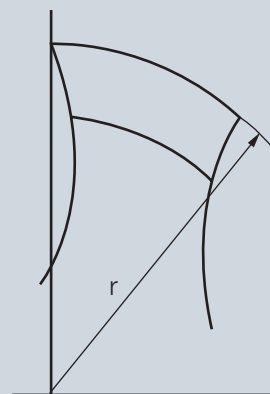
La mancanza di spoglia superiore facilita la guida dell'utensile anche nell'utilizzo su macchine prive di maschiatura sincronizzata, grazie alla grande estensione del tratto aderente alla filettatura. Per contro la finitura superficiale della filettatura potrebbe risultare bassa, in dipendenza anche dal tipo di materiale lavorato.

Zentrischer Gewindeflankenhinterschliff

Die Führung der Gewindebohrer ohne exzentrischen Gewindeflankenhinterschliff, ist bei solchen Maschinen besser, die keinen synchronisierten Vorschub haben. Dies wird durch die vergrößerte Abstützung des Gewindeprofils in der Bohrung erreicht. Je nach Werkstückmaterial kann es aber zu einer Verschlechterung der Oberflächengüte der Gewinde kommen.

Dépouille supérieur concentrique (dépouille supérieure absente)

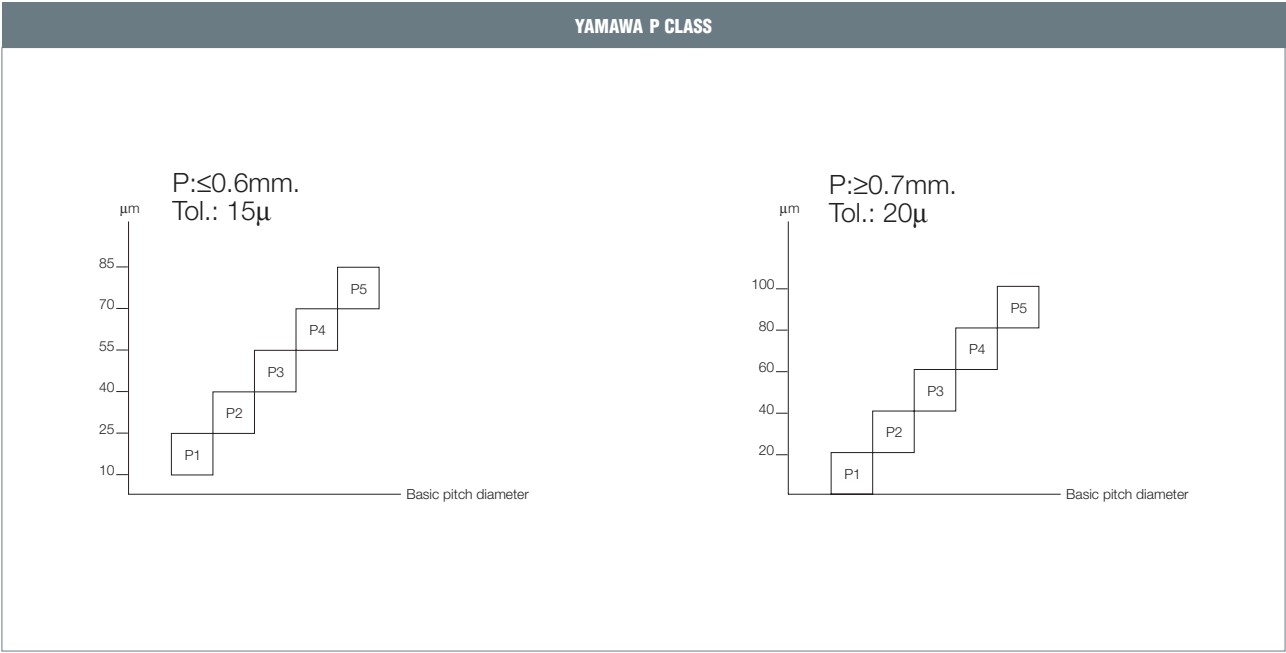
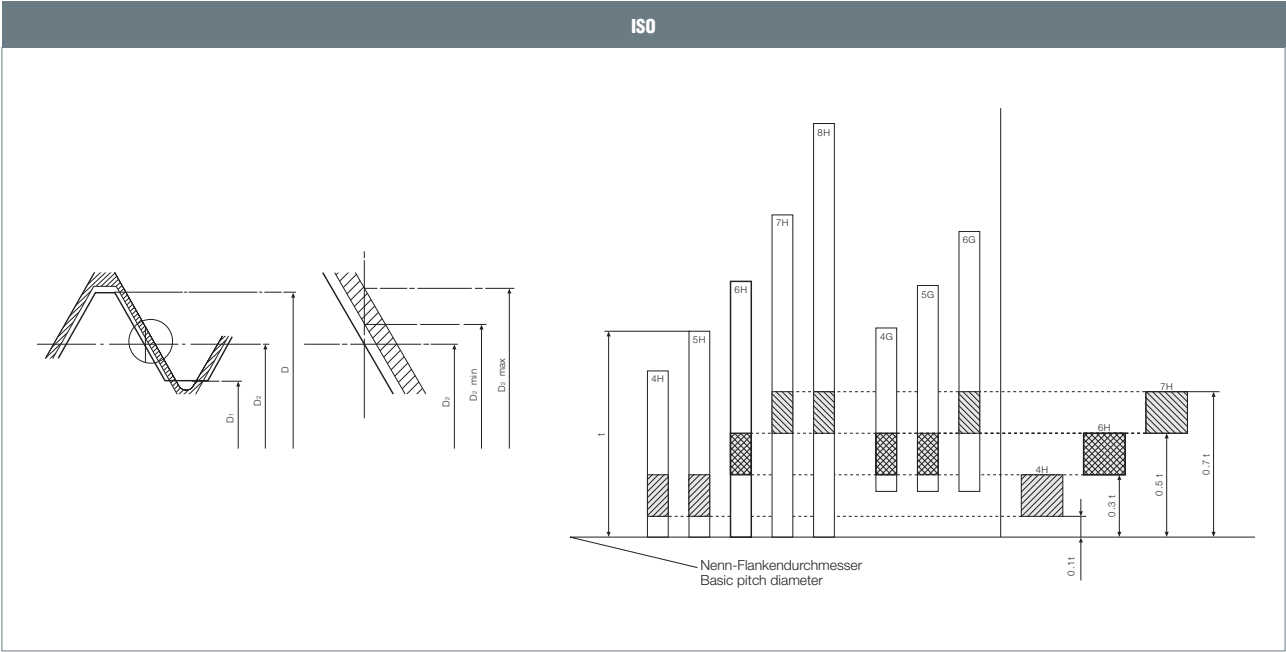
La manque de dépouille supérieure facilite le guidage de l'outil aussi bien sur machine sans taraudage synchronisé, grâce à la grande extension du trait adhérent au filetage. Par contre le finissage de surface peut résulter bas, en conséquence du matériel travaillé.



TOLERANCES

TOLLERANZE / TOLERANZ / TOLÉRANCES

DIN EN 22857		DIN 802	internal thread tolerance range campo di tolleranza delle madreviti innengewinde Toleranzfeld gamme de tolérance du taraudage				
denomination denominazione Bezeichnung dénomination	characteristic caratteristica eigenschaft caractéristique						
class 1	ISO 1	4H	4H	5H	-	-	-
class 2	ISO 2	6H	4G	5G	6H	-	-
class 3	ISO 3	6G	-	-	6G	7H	8H
-	-	7G	-	-	-	7G	8G



M - MF	p	4H - 5H (μ)	6H (μ)	7H - 8H (μ)	4G - 5G (μ)	6G (μ)	7G (μ)
0.99 ~ 1.4	0.2	+15 ~ +3	+25 ~ +15	-	-	-	-
0.99 ~ 1.4	0.25	+17 ~ +6	+28 ~ +17	-	-	-	-
0.99 ~ 1.4	0.3	+18 ~ +6	+30 ~ +18	-	-	-	-
1.4 ~ 2.8	0.2	+16 ~ +6	+26 ~ +16	-	+26 ~ +16	-	-
1.4 ~ 2.8	0.25	+18 ~ +6	+30 ~ +18	-	+30 ~ +18	-	-
1.4 ~ 2.8	0.35	+20 ~ +6	+34 ~ +20	-	+34 ~ +20	-	-
1.4 ~ 2.8	0.4	+21 ~ +7	+35 ~ +21	+49 ~ +35	+35 ~ +21	+49 ~ +35	-
2.8 ~ 5.6	0.45	+23 ~ +8	+38 ~ +23	+53 ~ +38	+38 ~ +23	+53 ~ +38	-
2.8 ~ 5.6	0.35	+21 ~ +6	+36 ~ +21	-	+36 ~ +21	-	-
2.8 ~ 5.6	0.5	+24 ~ +8	+40 ~ +24	+56 ~ +40	+40 ~ +24	+56 ~ +40	+72 ~ +56
2.8 ~ 5.6	0.6	+27 ~ +9	+45 ~ +27	+63 ~ +45	+45 ~ +27	+63 ~ +45	+81 ~ +63
2.8 ~ 5.6	0.7 - 0.75	+29 ~ +10	+48 ~ +29	+67 ~ +48	+48 ~ +29	+67 ~ +48	+86 ~ +67
2.8 ~ 5.6	0.8	+30 ~ +10	+50 ~ +30	+70 ~ +50	+50 ~ +30	+70 ~ +50	+90 ~ +70
5.6 ~ 11.2	0.5	+27 ~ +9	+45 ~ +27	+63 ~ +45	+45 ~ +27	+63 ~ +45	+81 ~ +63
5.6 ~ 11.2	0.75	+32 ~ +11	+53 ~ +32	+74 ~ +53	+53 ~ +32	+74 ~ +53	+95 ~ +74
5.6 ~ 11.2	1	+35 ~ +11	+59 ~ +35	+83 ~ +59	+59 ~ +35	+83 ~ +59	+107 ~ +83
5.6 ~ 11.2	1.25	+38 ~ +13	+63 ~ +38	+88 ~ +63	+63 ~ +38	+88 ~ +63	+113 ~ +88
5.6 ~ 11.2	1.5	+42 ~ +14	+70 ~ +42	+98 ~ +70	+70 ~ +42	+98 ~ +70	+126 ~ +98
11.2 ~ 22.4	0.5	+29 ~ +10	+48 ~ +29	+67 ~ +48	+48 ~ +29	+67 ~ +48	+86 ~ +67
11.2 ~ 22.4	0.75	+34 ~ +12	+56 ~ +34	+78 ~ +56	+56 ~ +34	+78 ~ +56	+100 ~ +78
11.2 ~ 22.4	1	+38 ~ +13	+63 ~ +38	+88 ~ +63	+63 ~ +38	+88 ~ +63	+113 ~ +88
11.2 ~ 22.4	1.25	+42 ~ +14	+70 ~ +42	+98 ~ +70	+70 ~ +42	+98 ~ +70	+126 ~ +98
11.2 ~ 22.4	1.5	+45 ~ +15	+75 ~ +45	+105 ~ +75	+75 ~ +45	+105 ~ +75	+135 ~ +105
11.2 ~ 22.4	1.75	+48 ~ +16	+80 ~ +48	+112 ~ +80	+80 ~ +48	+112 ~ +80	+144 ~ +112
11.2 ~ 22.4	2	+51 ~ +17	+85 ~ +51	+119 ~ +85	+85 ~ +51	+119 ~ +85	+153 ~ +119
11.2 ~ 22.4	2.5	+54 ~ +18	+90 ~ +54	+126 ~ +90	+90 ~ +54	+126 ~ +90	+162 ~ +126
22.4 ~ 45	0.5	+30 ~ +10	+50 ~ +30	+70 ~ +50	+50 ~ +30	+70 ~ +50	+90 ~ +70
22.4 ~ 45	0.75	+36 ~ +12	+60 ~ +36	+84 ~ +60	+60 ~ +36	+84 ~ +60	+108 ~ +84
22.4 ~ 45	1	+40 ~ +14	+66 ~ +40	+92 ~ +66	+66 ~ +40	+92 ~ +66	+118 ~ +92
22.4 ~ 45	1.5	+48 ~ +16	+80 ~ +48	+112 ~ +80	+80 ~ +48	+112 ~ +80	+144 ~ +112
22.4 ~ 45	2	+54 ~ +18	+90 ~ +54	+126 ~ +90	+90 ~ +54	+126 ~ +90	+162 ~ +126
22.4 ~ 45	3	+64 ~ +22	+106 ~ +64	+148 ~ +106	+106 ~ +64	+148 ~ +106	+190 ~ +148
22.4 ~ 45	3.5	+67 ~ +22	+112 ~ +67	+157 ~ +112	+112 ~ +67	+157 ~ +112	+202 ~ +157
22.4 ~ 45	4	+71 ~ +24	+118 ~ +71	+165 ~ +118	+118 ~ +71	+165 ~ +118	+212 ~ +165
22.4 ~ 45	4.5	+75 ~ +25	+125 ~ +75	+175 ~ +125	+125 ~ +75	+175 ~ +125	+225 ~ +175
45 ~ 90	0.5	+34 ~ +12	+56 ~ +34	+78 ~ +56	+56 ~ +34	+78 ~ +56	+100 ~ +78
45 ~ 90	0.75	+38 ~ +13	+63 ~ +38	+88 ~ +63	+63 ~ +38	+88 ~ +63	+113 ~ +88
45 ~ 90	1	+45 ~ +15	+75 ~ +45	+105 ~ +75	+75 ~ +45	+105 ~ +75	+135 ~ +105
45 ~ 90	1.5	+51 ~ +17	+85 ~ +51	+119 ~ +85	+85 ~ +51	+119 ~ +85	+153 ~ +119
45 ~ 90	2	+57 ~ +19	+95 ~ +57	+133 ~ +95	+95 ~ +57	+133 ~ +95	+171 ~ +133
45 ~ 90	3	+67 ~ +22	+112 ~ +67	+157 ~ +112	+112 ~ +67	+157 ~ +112	+202 ~ +157
45 ~ 90	4	+75 ~ +25	+125 ~ +75	+175 ~ +125	+125 ~ +75	+175 ~ +125	+225 ~ +175
45 ~ 90	5	+80 ~ +27	+133 ~ +80	+186 ~ +133	+133 ~ +80	+186 ~ +133	+239 ~ +186
45 ~ 90	5.5	+84 ~ +28	+140 ~ +84	+196 ~ +140	+140 ~ +84	+196 ~ +140	+252 ~ +196
45 ~ 90	6	+90 ~ +30	+150 ~ +90	+210 ~ 150	+150 ~ +90	+210 ~ 150	+270 ~ +210

ISO2X (6HX)
ISO3X (6GX)

p = 0.2 mm ~ 0.7 mm	X = + 15 μ
p = 0.75 mm ~ 1 mm	X = + 20 μ
p = 1.25 mm ~ 2.5 mm	X = + 25 μ
p = 2.5 mm ~	X = + 30 μ

G, UNC-UNF, BSW TOLERANCES

TOLLERANZE G, UNC-UNF, BSW /G, UNC-UNF, BSW TOLERANZ / TOLÉRANCES G, UNC-UNF, BSW

G	TOL. μ
1/8x28	+43 ~ +21
1/4x19	+50 ~ +25
3/8x19	+50 ~ +25
1/2x14	+57 ~ +28
5/8x14	+57 ~ +28
3/4x14	+57 ~ +28
7/8x14	+57 ~ +28
1 x11	+72 ~ +36
1 1/8x11	+72 ~ +36
1 1/4x11	+72 ~ +36
1 3/8x11	+72 ~ +36
1 1/2x11	+72 ~ +36
1 3/4x11	+72 ~ +36
2 x11	+72 ~ +36

UNC	TOL. μ
Nr. 1 - 64	+26 ~ +13
Nr. 2 - 56	+28 ~ +14
Nr. 3 - 48	+30 ~ +15
Nr. 4 - 40	+32 ~ +16
Nr. 5 - 40	+32 ~ +16
Nr. 6 - 32	+37 ~ +19
Nr. 8 - 32	+38 ~ +19
Nr.10 - 24	+44 ~ +22
Nr.12 - 24	+44 ~ +22
1/4 - 20	+48 ~ +24
5/16 - 18	+54 ~ +27
3/8 - 16	+58 ~ +29
7/16 - 14	+62 ~ +31
1/2 - 13	+66 ~ +33
9/16 - 12	+69 ~ +34
5/8 - 11	+73 ~ +37
3/4 - 10	+78 ~ +39
7/8 - 9	+83 ~ +42
1 - 8	+89 ~ +45

UNF	TOL. μ
Nr. 0 - 80	+24 ~ +12
Nr. 1 - 72	+25 ~ +12
Nr. 2 - 64	+27 ~ +14
Nr. 3 - 56	+28 ~ +14
Nr. 4 - 48	+32 ~ +16
Nr. 5 - 44	+32 ~ +16
Nr. 6 - 40	+34 ~ +17
Nr. 8 - 36	+36 ~ +18
Nr.10 - 32	+40 ~ +20
Nr.12 - 28	+42 ~ +21
1/4 - 28	+44 ~ +22
5/16 - 24	+48 ~ +24
3/8 - 24	+50 ~ +25
7/16 - 20	+55 ~ +27
1/2 - 20	+57 ~ +28
9/16 - 18	+60 ~ +30
5/8 - 18	+61 ~ +31
3/4 - 16	+66 ~ +33
7/8 - 14	+71 ~ +36
1 - 12	+77 ~ +39

BSW	TOL. μ
1/16 x60	+28 ~ +13
3/32 x48	+32 ~ +15
1/8 x19	+35 ~ +15
5/32 x32	+40 ~ +18
3/16 x24	+44 ~ +21
1/4 x20	+46 ~ +23
5/16 x18	+49 ~ +23
3/8 x16	+51 ~ +25
7/16 x14	+56 ~ +28
1/2 x12	+61 ~ +30
9/16 x12	+61 ~ +30
5/8 x11	+63 ~ +30
3/4 x10	+69 ~ +33
7/8 x 9	+69 ~ +33
1 x 8	+74 ~ +36
1 1/8 x 7	+79 ~ +38
1 1/4 x 7	+79 ~ +38
1 3/8 x 6	+83 ~ +41
1 1/2 x 6	+84 ~ +40
1 5/8 x 5	+90 ~ +45
1 3/4 x 5	+92 ~ +46
1 7/8 x 4.5	+95 ~ +45
2 x 4.5	+96 ~ +48

[illegible]

UNC - UNF	JIS (2B)
Nr. 2 - 56	G4
Nr. 2 - 64	G4
Nr. 3 - 48	G4
Nr. 3 - 56	G4
Nr. 4 - 40	G5
Nr. 4 - 48	G5
Nr. 5 - 40	G5
Nr. 5 - 44	G5
Nr. 6 - 32	G5
Nr. 6 - 40	G5
Nr. 8 - 32	G6
Nr. 8 - 36	G5
Nr. 10 - 24	G6
Nr. 10 - 32	G6
Nr. 12 - 24	G6
Nr. 12 - 28	G6
1/4 - 20	G7
1/4 - 28	G7

ACCURACY OF YAMAWA G CLASS - Tol. μ													
0	13	25	38	51	64	76	89	102	114	127	140	152	165
G1			G4			G7			G10				G13
	G2			G5			G8			G11			
		G3			G6			G9			G12		

JIS DIMENSIONS

DIMENSIONI JIS / JIS ABMESSUNGEN / DIMENSIONS JIS

D	P	L		I		d	K	D	P	L		I		d	K
		SP-PO	HT	SP-PO	HT					SP-PO	HT	SP-PO	HT		
M 1	0.25	32	30	5.5	8	3	2.5	MF16	1.5	95	95	32	45	12.5	10
M 1.1	0.25	32	32	5.5	9	3	2.5	MF16	1.25	95	95	32	38	12.5	10
M 1.2	0.25	32	32	5.5	9	3	2.5	MF16	1	95	75	32	30	12.5	10
M 1.4	0.3	36	34	8	11	3	2.5	M 17	2	95	95	32	45	13	10
M 1.6	0.35	36	36	8	13	3	2.5	MF17	1.5	95	95	32	45	13	10
M 1.7	0.35	36	36	8	13	3	2.5	MF17	1	95	80	32	30	13	10
M 1.8	0.35	36	36	8	13	3	2.5	M 18	2.5	10	100	37	48	14	11
M 2	0.4	42	40	9.5	15	3	2.5	MF18	2	10	95	37	45	14	11
MF 2	0.25	42	40	7	8	3	2.5	MF18	1.5	10	95	37	45	14	11
M 2.2	0.45	42	42	9.5	15	3	2.5	MF18	1	95	80	30	30	14	11
M 2.3	0.4	42	42	9.5	15	3	2.5	M 20	2.5	105	105	37	50	15	12
M 2.5	0.45	44	44	9.5	16	3	2.5	MF20	2	105	95	37	45	15	12
MF 2.5	0.35	44	44	8	10	3	2.5	MF20	1.5	105	95	37	45	15	12
M 2.6	0.45	44	44	9.5	16	3	2.5	MF20	1	95	80	30	30	15	12
M 3	0.5	46	46	11	18	4	3.2	M 22	2.5	115	115	38	55	17	13
MF 3	0.35	46	46	9.5	10	4	3.2	MF22	2	115	95	38	45	17	13
3 M	0.6		46		18	4	3.2	MF22	1.5	115	95	38	45	17	13
M 3.5	0.6	48	48	13	18	4	3.2	MF22	1	95	85	30	30	17	13
MF 3.5	0.35	48	48	9.5	10	4	3.2	M 24	3	120	120	45	58	19	15
M 4	0.7	52	52	13	20	5	4	MF24	2	120	95	45	45	19	15
MF 4	0.5	52	52	13	15	5	4	MF24	1.5	120	95	45	45	19	15
4 M	0.75		52		20	5	4	MF24	1	95	90	30	30	19	15
M 4.5	0.75	55	55	13	20	5	4	MF25	2	125	95	45	45	19	15
M 5	0.8	60	60	16	22	5.5	4.5	MF25	1.5	125	95	45	45	19	15
MF 5	0.5	60	52	13	15	5.5	4.5	MF25	1	95	95	30	30	19	15
5 M	0.9		60		22	5.5	4.5	MF26	2	125	95	45	45	20	15
M 6	1	62	64	19	24	6	4.5	MF26	1.5	125	95	45	45	20	15
MF 6	0.75	62	62	19	20	6	4.5	M 27	3	130	130	45	62	20	15
MF 6	0.5	55	55	13	15	6	4.5	MF27	2	130	95	45	45	20	15
M 7	1	65	65	19	26	6.2	5	MF27	1.5	130	95	45	45	20	15
MF 7	0.75	65	62	19	20	6.2	5	MF27	1	95	95	30	30	20	15
MF 7	0.5	55	55	13	15	6.2	5	MF28	2	130	105	45	45	21	17
M 8	1.25	70	70	22	30	6.2	5	MF28	1.5	130	105	45	45	21	17
MF 8	1	70	70	22	30	6.2	5	MF28	1	105	105	30	30	21	17
MF 8	0.75	70	62	22	20	6.2	5	M 30	3.5	135	135	48	65	23	17
MF 8	0.5	55	55	13	15	6.2	5	MF30	3	135	135	48	65	23	17
M 9	1.25	72	72	22	30	7	5.5	MF30	2	135	105	45	45	23	17
MF 9	1	72	70	22	30	7	5.5	MF30	1.5	135	105	45	45	23	17
MF 9	0.75	72	62	22	20	7	5.5	MF30	1	105	105	30	30	23	17
M 10	1.5	75	75	24	32	7	5.5	MF32	2	135	105	45	45	24	19
MF10	1.25	75	75	24	32	7	5.5	MF32	1.5	135	105	45	45	24	19
MF10	1	75	70	24	30	7	5.5	M 33	3.5	145	145	51	70	25	19
MF10	0.75	75	62	22	20	7	5.5	MF33	3	145	145	51	70	25	19
MF10	0.5	55	55	13	15	7	5.5	MF33	2	135	110	45	45	25	19
M 11	1.5	80	80	25	38	8	6	MF33	1.5	135	110	45	45	25	19
MF11	1	80	70	25	30	8	6	MF34	1.5	135	110	45	45	26	21
M 12	1.75	82	82	29	38	8.5	6.5	MF35	2	135	110	45	45	26	21
MF12	1.5	82	82	29	38	8.5	6.5	MF35	1.5	135	110	45	45	26	21
MF12	1.25	82	80	29	38	8.5	6.5	M 36	4	155	155	57	75	28	21
MF12	1	82	70	29	30	8.5	6.5	MF36	3	155	155	57	75	28	21
MF12	0.75	75	70	22	20	8.5	6.5	MF36	2	135	110	45	45	28	21
MF12	0.5	55	55	13	15	8.5	6.5	MF36	1.5	135	110	45	45	28	21
M 13	1.75	85	85	29	42	9.5	7	MF38	1.5	135	115	45	45	28	21
MF13	1	85	70	29	30	9.5	7	M 39	4	165	165	60	80	30	23
M 14	2	88	88	30	42	10.5	8	MF39	3	165	165	60	80	30	23
MF14	1.5	88	88	30	42	10.5	8	MF39	2	135	115	45	45	30	23
MF14	1.25	88	88	30	38	10.5	8	MF39	1.5	135	115	45	45	30	23
MF14	1	88	70	30	30	10.5	8	MF40	3	165	165	60	80	30	23
MF14	0.5	58	58	13	15	10.5	8	MF40	2	135	115	45	45	30	23
M 15	2	90	90	30	42	10.5	8	MF40	1.5	135	115	45	45	30	23
MF15	1.5	90	90	30	42	10.5	8	M 42	4.5	175	175	60	85	32	26
MF15	1	90	70	30	30	10.5	8	M 45	4.5	180	180	67	85	35	26
M 16	2	95	95	32	45	12.5	10	M 48	5	185	185	67	90	38	29

**HIGH PERFORMANCE TAPS
MASCHI AD ALTO RENDIMENTO
HOCHLEISTUNGGEWINDEBOHRER
TARAUDS HAUTE PERFORMANCE**

SYNCHRO ULTRA FAST .56
SYNCHRO FAST .60
UH-CT CARBIDE .62
CT-FC CARBIDE .64
DRY .66

SYNCHRO ULTRA FAST

🇬🇧 The YAMAWA - ULTRA FAST series has been developed for high speed tapping on rigid clamping and full synchro machines. Coating: TiCN, TiAlN. Geometry: ULTRA FAST taps geometry is specifically designed to minimize the cutting torque and get long tool life even at ultra fast cutting speed. Internal coolant: the ULTRA FAST taps for blind holes are designed with a single central hole. The ULTRA FAST taps for through holes are designed with side holes inside the tap's grooves. Shank: the reinforced shank, designed with the most accurate tolerance, allows high toughness and high precision even at ultra fast cutting speed. Holder: high precision holders or high gripping power holders must be used.

🇮🇹 La serie YAMAWA - ULTRA FAST è ideata per filettature ultra rapide su macchine con maschiatura rigida e sincronizzata. Rivestimento: TiCN, TiAlN. Geometria: la geometria dei maschi ULTRA FAST è specificamente disegnata per ridurre al massimo gli attriti di taglio e garantire una lunga durata dell'utensile anche a velocità ultra rapide. Lubrificazione interna: i maschi per fori ciechi sono disegnati con un unico foro centrale. I maschi per fori passanti, sono disegnati con fori laterali all'interno delle scanalature. Gambo: il gambo rinforzato, costruito con tolleranze molto accurate, garantisce tenacità e massima precisione anche ad altissima velocità. Mandrino: per l'uso dei maschi ULTRA FAST è indispensabile utilizzare mandrini ad alta precisione.

🇩🇪 Die YAMAWA - ULTRA FAST Serie ist für ultraschnelle Gewinde auf synchronisierte Maschinen und mit starrer Befestigung ausgedacht worden. Beschichtung: TiCN, TiAlN. Geometrie: die Geometrie der Gewindebohrer. ULTRA FAST ist besonders für die maximale Schneiddrucksenkung und für eine längere Standzeit auch bei ultraschnellen Geschwindigkeit konzipiert worden. Innere Kühlmittelzuführung: Die Gewindebohrer für Grundlöcher haben einen einzigen zentralen Loch. Die Gewindebohrer für Durchgangslöcher haben seitliche Löcher in den Nuten. Schaft: Der mit genauer Toleranz hergestellte verstärkte Schaft, besorgt Härte und Präzision auch bei ultraschneller Geschwindigkeit. Spindel: für die Benutzung der ULTRAFAST Gewindebohrer braucht man Hochleistungsspindel.

🇫🇷 La série YAMAWA - ULTRA FAST a été étudiée pour le filetage ultra-rapide dans des machines à taraudage rigide et synchronisé. Revêtement: TiCN, TiAlN. Géométrie: la géométrie des tarauds ULTRA FAST est spécialement dessinée pour réduire le plus possible les frottements de coupe et garantir une longue durée de vie de l'outil, même à très grande vitesse. Lubrification intérieure: les tarauds pour trous borgnes sont dessinés avec un seul trou central. Les tarauds pour trous débouchants sont dessinés avec des trous latéraux à l'intérieur des rainures. Queue: la queue renforcée, construite avec des tolérances très soignées, garantit la plus grande précision et tenacité, même à très grande vitesse. Mandrin: pour l'emploi des tarauds ULTRA FAST il est indispensable employer des mandrins de haute précision.



HFHS M8x1,25

machine / macchina	machining centre / centro di lavoro
material / materiale	(15-17HRC) carbon steel / acciaio al carbonio
hole Ø / Ø foro	6,8mm
hole length / lunghezza foro	18mm blind / cieco
thread length / lunghezza filetto	12mm
Vc	50m/min
Vf	synchro controlled / controllo sincro
lubricant / lubrificante	(5%) emulsion / emulsione



thread finishing / finitura filetto
Gewindefertigbearbeitung / finissage du filet



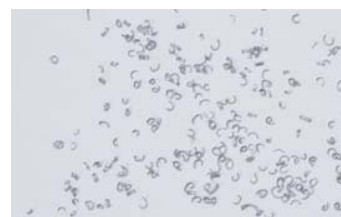
chips / truciolo
Span / copeau

HFASP M8x1,25

machine / macchina	machining centre / centro di lavoro
material / materiale	(50-63HRB) aluminium / alluminio
hole Ø / Ø foro	6,8mm
hole length / lunghezza foro	18mm blind / cieco
thread length / lunghezza filetto	12mm
Vc	100m/min
Vf	synchro controlled / controllo sincro
lubricant / lubrificante	(5%) emulsion / emulsione



thread finishing / finitura filetto
Gewindefertigbearbeitung / finissage du filet



chips / truciolo
Span / copeau

HFICT-P M8x1,25

machine / macchina	machining centre / centro di lavoro
material / materiale	(85HRB) grey cast iron / ghisa grigia
hole Ø / Ø foro	6,8mm
hole length / lunghezza foro	12mm through / passante
thread length / lunghezza filetto	12mm
Vc	50m/min
Vf	synchro controlled / controllo sincro
lubricant / lubrificante	(5%) emulsion / emulsione



thread finishing / finitura filetto
Gewindefertigbearbeitung / finissage du filet



chips / truciolo
Span / copeau

HDISL M8x1,25

machine / macchina	machining centre / centro di lavoro
material / materiale	(15-17HRC) carbon steel / acciaio al carbonio
hole Ø / Ø foro	6,8mm
hole length / lunghezza foro	12mm through / passante
thread length / lunghezza filetto	12mm
Vc	20m/min
Vf	synchro controlled / controllo sincro
lubricant / lubrificante	dry / secco



thread finishing / finitura filetto
Gewindefertigbearbeitung / finissage du filet



chips / truciolo
Span / copeau

HDISL M12x1,5

machine / macchina	machining centre / centro di lavoro
material / materiale	(C40) carbon steel / acciaio al carbonio
hole Ø / Ø foro	10,5mm
hole length / lunghezza foro	32mm through / passante
thread length / lunghezza filetto	32mm
Vc	90m/min
Vf	synchro controlled / controllo sincro
lubricant / lubrificante	(6%) emulsion / emulsione
tool life / durata utensile	3000 thread / filetti

HFISP M20x1,5

macchina / machine	centro di lavoro / machining centre
materiale / material	ghisa nodulare / nodular cast iron (GGG-40)
Ø foro / hole Ø	18,5mm
lunghezza foro / hole length	48mm cieco / blind
lunghezza filetto / thread length	40mm
Vc	56 m/min
Vf	controllo sincro / synchro controlled
lubrificante / lubricant	emulsione / emulsion (7%)
durata utensile / tool life	4900 filetti / thread

HDISL M16x2

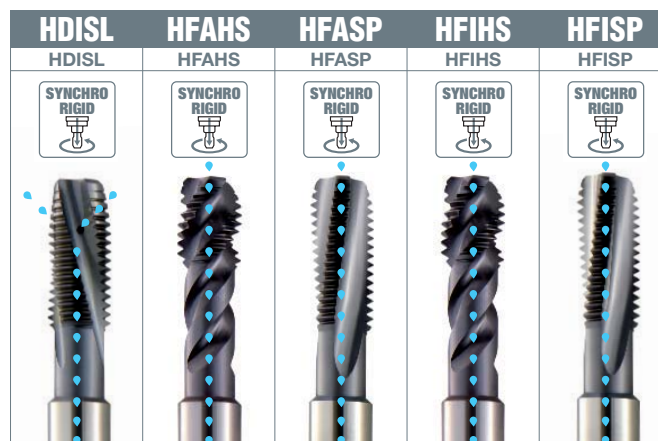
machine / macchina	machining centre / centro di lavoro
material / materiale	(40CrMnMoS 8 6) alloy steel / acciaio legato
hole Ø / Ø foro	14mm
hole length / lunghezza foro	32mm through / passante
thread length / lunghezza filetto	32mm
Vc	50m/min
Vf	synchro controlled / controllo sincro
lubricant / lubrificante	(6%) emulsion / emulsione
tool life / durata utensile	6000 thread / filetti

HFISP M12x1,75

macchina / machine	centro di lavoro / machining centre
materiale / material	ghisa nodulare / nodular cast iron (GGG-40)
Ø foro / hole Ø	10,3mm
lunghezza foro / hole length	38mm cieco / blind
lunghezza filetto / thread length	30mm
Vc	56 m/min
Vf	controllo sincro / synchro controlled
lubrificante / lubricant	emulsione / emulsion (7%)
durata utensile / tool life	7800 filetti / thread

M, MF
YAMAWA
NORM

MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiCN
1-5		40~80
6		30~50
9-10-11		25~45
13-14		40~80
15-20		50~100



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE													
									1-5 6 9-11 13 14 15-20	15-20	15-20	1-5 6 9-11 14	1-5 6 9-11 13 14
									L15°-OH	48°-OH	8°-OH	48°-OH	8°-OH
									HSSE TiCN	HSSE TiCN	HSSE TiCN	HSSE TiCN	HSSE TiCN
									P CLASS	P CLASS	P CLASS	P CLASS	P CLASS
									5 P	2,5 P	2,5 P	2,5 P	2,5 P
D	p	Ø	L	l	*	l1	d	k	Stock	Stock	Stock	Stock	Stock
M 6	1	5.0	62	19	11	27	-	6	● (P4)	● (P4)	● (P4)	● (P4)	● (P4)
8	1.25	6.8	70	22	12		36	8	● (P4)	● (P4)	● (P4)	● (P4)	● (P4)
10	1.5	8.5	75	24	13		37	10	● (P4)	● (P4)	● (P4)	● (P4)	● (P4)
12	1.75	10.3	82	29	15		40	12	● (P4)	● (P4)	● (P4)	● (P4)	● (P4)
14	2	12	88	30			40	12	● (P4)				● (P4)
16	2	14	95	32			43	16	● (P4)				● (P4)
20	2.5	17.5	105	37			45	16	○ (P5)				● (P5)
MF10	1.25	8.8	75	24	12		37	10	● (P4)	○ (P4)	○ (P4)	○ (P4)	● (P4)
12	1.5	10.5	82	29	14		40	12	● (P4)	○ (P4)	○ (P4)	○ (P4)	● (P4)
12	1.25	10.8	82	29	14		40	12	● (P4)	○ (P4)	○ (P4)	○ (P4)	● (P4)
14	1.5	12.5	88	30	14		40	12	● (P4)	○ (P4)	○ (P4)	○ (P4)	● (P4)
16	1.5	14.5	95	32	14		43	16	● (P4)	○ (P4)	○ (P4)	○ (P4)	● (P4)
18	1.5	16.5	100	37	14		45	16	○ (P4)	○ (P4)	○ (P4)	○ (P4)	○ (P4)
20	1.5	18.5	105	37	14		45	16	○ (P5)	○ (P5)	○ (P5)	○ (P5)	○ (P5)

*HDISL, HFISP, HFASP

P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 6 ~ 16	3	3	3	3	3
18 ~ 20	4	3	3	4	4

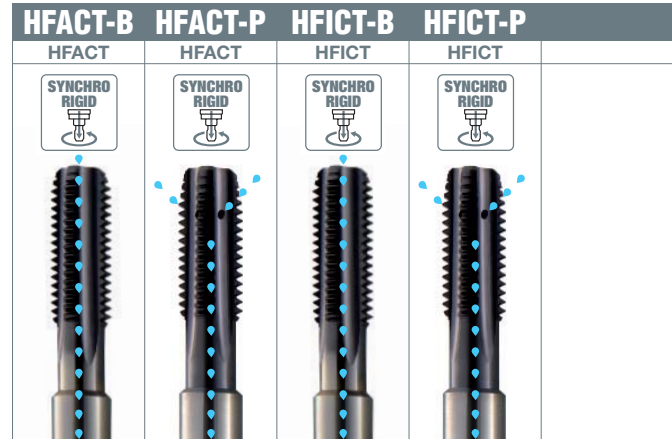
	●				
	●				
		●	○	●	○
		○	●	○	●

● Most suitable / scelta prioritaria / Geeignetest / le plus indiqué

○ Alternative / scelta alternativa / Geeignet / indiqué

M, MF
YAMAWA NORM

MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiAIN
13 - 14		50~100
16		100~



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									HFACT-B	HFACT-P	HFICT-B	HFICT-P	
									16	16	13 14	13 14	
									STR-OH-B	STR-OH-P	STR-OH-B	STR-OH-P	
									CARBIDE	CARBIDE	CARBIDE	CARBIDE	
									TiAIN	TiAIN	TiAIN	TiAIN	
									P CLASS	P CLASS	P CLASS	P CLASS	
									2,5 P	4 P	2,5 P	4 P	
D	p	Ø	L	l	l1	l2	d		Stock	Stock	Stock	Stock	
M 6	1	5.0	62	19	27	-	6		○ (P3)	○ (P3)	○ (P3)	○ (P3)	
8	1.25	6.8	70	22		36	8		○ (P3)	○ (P3)	○ (P3)	○ (P3)	
10	1.5	8.5	75	24		37	10		○ (P3)	○ (P3)	○ (P3)	○ (P3)	
12	1.75	10.2	82	29		40	12		○ (P3)	○ (P3)	○ (P3)	○ (P3)	
MF10	1.25	8.8	75	24		37	10		○ (P3)	○ (P3)	○ (P3)	○ (P3)	
12	1.5	10.5	82	29		40	12		○ (P3)	○ (P3)	○ (P3)	○ (P3)	
12	1.25	10.8	82	29		40	12		○ (P3)	○ (P3)	○ (P3)	○ (P3)	

P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 6 ~ 12	3	3	4	4
	●	●	●	●
	●	●	●	●

● Most suitable / scelta prioritaria / Geeignetest / le plus indiqué

○ Alternative / scelta alternativa / Geeignet / indiqué

SYNCHRO FAST

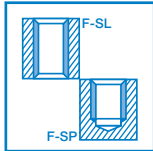
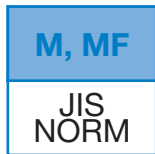
🇬🇧 Using the FAST TAPS, you can reduce the tapping costs thanks to a 3 times higher tapping speed. The FAST TAPS are made of top quality HSSE able to reduce the cutting pressure and to increase the tool breaking resistance. The TiN coating reduces the chance of chip welding. Thanks to their special shape, the FAST TAPS produce accurate threads even at high speed. We recommend the use of FAST TAPS on machines with synchronized feed-rate/rotation and rigid tapping attachment. Steel $\leq 800 \text{ N/mm}^2$.

🇮🇹 Utilizzando i FAST TAPS si riducono i costi di maschiatura, grazie al considerevole aumento della velocità di rotazione, sino a 3 volte i valori standard. I FAST TAPS sono costruiti con i migliori HSSE, specifici per ridurre gli attriti, aumentare la durata e la tenacità dell'utensile. Il rivestimento TiN riduce sensibilmente l'incollaggio del materiale sul tagliente. Grazie alla particolare geometria di taglio, i FAST TAPS producono filetti molto precisi anche ad alta velocità. Raccomandiamo l'uso dei FAST TAPS su macchine sincronizzate, con maschiatura rigida e su acciai $\leq 800 \text{ N/mm}^2$.

🇩🇪 Mit dem Einsatz der FAST TAPS reduziert man die Gewindekosten durch eine 3-mal-höheren Geschwindigkeit als die standard Werte. Die FAST TAPS werden mit dem besten HSSE hergestellt, um den Schneiddruck zu vermindern und die Bruchfestigkeit zu steigern. Die TiN Beschichtung reduziert die Aufbauschneidenbildung. Durch ihre spezielle Form, erzeugen die FAST TAPS genaue Gewinde auch bei hohen Geschwindigkeiten. Es wird empfohlen, die FAST TAPS auf Maschinen mit automatischer Schnitteinteilung zu benutzen. Stahl $\leq 800 \text{ N/mm}^2$.

🇫🇷 Avec les tarauds FAST TAPS on réduit les coûts de taraudage, grâce à la considérable augmentation de la vitesse de rotation jusqu'à 3 fois les valeurs standard. Les FAST TAPS sont fabriqués avec les meilleurs HSSE, spécifiques pour réduire les frottements, augmenter la durée de vie et la ténacité de l'outil. Le revêtement TIN réduit sensiblement le collage sur l'arête de coupe. Grâce à la particulière géométrie de coupe, les FAST TAPS produisent des filets très précis même à grande vitesse. On recommande l'emploi des FAST TAPS sur des machines à broches synchro, avec taraudage rigide et dans des aciers $\leq 800 \text{ N/mm}^2$.





MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN
1-5		20-40
6		15-25
9-10-11		15-25
13-14		15-30
15-20		20-50



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE										1-5 6 9-11 13 14 15-20		1-5 6 9-11 13 14 15-20	
M3 ~ M6 M8 ~										L15°		45°	
										HSSE TiN		HSSE TiN	
										P CLASS		P CLASS	
										5 P		2,5 P	
D	p	Ø	L	l	*	l1	d	k		Stock		Stock	
M 3	0.5	2.5	46	11	5	18	4	3.2	● (P2)	● (P2)			
4	0.7	3.3	52	13	7	21	5	4	● (P2)	● (P2)			
5	0.8	4.2	60	16	9	25	5.5	4.5	● (P2)	● (P2)			
6	1	5.0	62	19	11	30	6	4.5	● (P2)	● (P2)			
8	1.25	6.8	70	22	12		6.2	5	● (P3)	● (P3)			
10	1.5	8.5	75	24	13		7	5.5	● (P3)	● (P3)			
12	1.75	10.3	82	29	15		8.5	6.5	● (P4)	● (P4)			
MF10	1.25	8.8	75	32	12		7	5.5	○ (P3)	○ (P3)			
12	1.5	10.5	82	32	14		8.5	6.5	○ (P3)	○ (P3)			
12	1.25	10.8	82	32	14		8.5	6.5	○ (P4)	○ (P4)			

P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 12 3 3

UH-CT CARBIDE (~HRC63)

🇬🇧 UH-CT made of tungsten carbide; UH-CT TiAlN coated to further increase the taps wear resistance; UH-CT reinforced shank with no recess to increase rigidity; UH-CT special flute design for higher rigidity, consistent cutting performance and good chips generation; UH-CT for threading Alloy steels, Die Steels & Tool Steels with hardness from HRC50 to HRC60. (Max HRC63); UH-CT thread length should be 1.5D or shorter; UH-CT 5 pitches chamfer for longer tool life and consistent cutting performance; UH-CT larger point diameter than conventional taps to increase the effectiveness of the taps chamfer. NOTICE ON USAGE

UH-CT must be used by machine; machines with feedrate/rotation synchronized tapping mechanism are recommended; the maximum rigidity of tap and workpiece holder is recommended; drilled hole must be as large as possible.

🇮🇹 Metallo duro; rivestiti TiAlN per migliorarne la resistenza all'usura; gambo rinforzato senza collare per una maggiore stabilità e rigidità; geometria speciale per migliorarne la durata, l'efficienza di taglio e la forma del truciolo; adatti alla filettatura di acciai temprati HRC50~HRC60 (max.HRC63); adatti alla filettatura di fori ciechi o passanti max. 1,5D; imbocco 5P; diametro punta molto largo per migliorarne l'efficienza dell'imbocco.

CONSIGLI PER UN CORRETTO UTILIZZO

UH-CT deve essere utilizzato a macchina; consigliamo l'impiego di UH-CT su macchine sincronizzate; raccomandiamo condizioni di massima rigidità sia nello staffaggio del pezzo che per il mandrino porta maschio; consigliamo che il preforo sia il più largo possibile.

🇩🇪 UH-CT Hartmetall; UH-CT TiAlN Beschichtung für bessere Verschleißfestigkeit; UH-CT mit verstärktem Schaft für bessere Stabilität und Starrheit; UH-CT Sonderschneidegeometrie für längere Standzeit, bessere Schneidleistung und Spanform; UH-CT für Gewinde auf gehärteten Stahl HRC50-HRC60 (max. HRC63) geeignet; UH-CT für Grundloch- und Durchgangsgewinde max. 1,5D; UH-CT Anschnitt 5P; UH-CT durch den breiten Spitzedurchmesser schneidet den Anschnitt gewiß mit dem ersten Gewinde.

GEBRAUCHSANWEISUNGEN

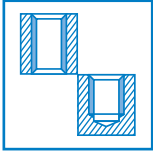
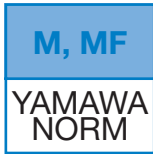
UH-CT ist für das Maschinengewindebohren geeignet; die Anwendung von UH-CT auf synchronisierte Maschinen ist empfohlen; starre Spindel und Werkstückbefestigung sind empfohlen; das größtmögliche Kernloch ist empfohlen.

🇫🇷 UH-CT en carbure monobloc; UH-CT revêtus TiAlN pour en améliorer la résistance à l'usure; UH-CT avec queue renforcée pour en garantir plus de stabilité et rigidité; UH-CT avec une géométrie spéciale pour en améliorer la dureté, le rendement du coupe et la forme du copeau; UH-CT pour le taraudage d'aciers trempés HRC50~HRC60 (max HRC63); UH-CT pour le taraudage de trous borgnes ou débouchants max. 1,5D; UH-CT avec entrée 5P; UH-CT avec un très large diamètre de la pointe pour que l'entrée puisse couper déjà à partir du premier filet.

MODE D'EMPLOI

UH-CT doit être utilisé en machine; nous conseillons l'emploi de UH-CT sur des machines synchronisées; nous recommandons des conditions de rigidité maximum aussi bien dans le blocage de la pièce que pour le mandrin porte-taraud; nous conseillons un diamètre de perçage le plus large possible.





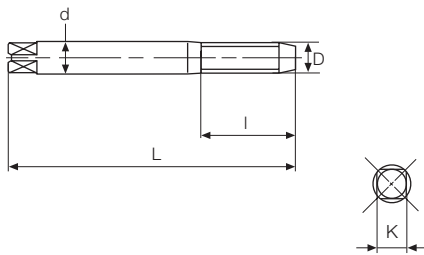
MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiAIN
8 < 55HRC		2~6
8 > 55HRC		1~4

UH-CT
UH-CT



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

8



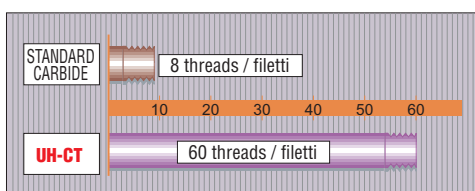
D	p	Ø	L	l	d	k	Stock
M 2	0.4	1.6	40	8	4	3,2	○ (P3)
2.5	0.45	2.1	44	9,5	4	3,2	○ (P3)
2.6	0.45	2.2	44	9,5	4	3,2	○ (P3)
3	0.5	2.5	46	11	5	4	● (P3)
4	0.7	3.4	52	13	5,5	4,5	● (P3)
5	0.8	4.3	60	16	6	4,5	● (P3)
6	1	5.1	62	19	6,2	5	● (P3)
8	1.25	6.9	70	22	7	5,5	● (P4)
10	1.5	8.6	75	24	8,5	6,5	● (P4)
12	1.75	10.4	82	30	10,5	8	● (P4)
14	2	12.2	88	30	12,5	10	○ (P4)
16	2	14.2	95	30	14	11	● (P4)
18	2.5	15.7	100	35	15	12	○ (P4)
20	2.5	17.7	105	35	17	13	● (P4)

P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion

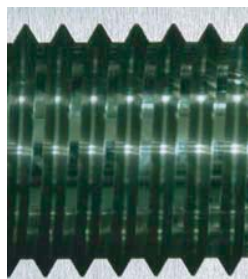


M 2	3
2.5 ~ 4	4
6 ~ 12	5
14 ~ 20	6

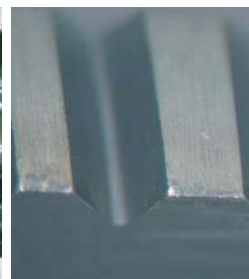


UH-CT M8x1,25 PERFORMANCE

- Machine: CNC synchro rigid
- Material: 60 HRC hardened steel
- Hole Ø: 6,9mm
- Thread length: 16mm through
- Vc: 1,5m/min
- Lubricant: oil



cross sectional shape of
internal thread



wear after 60 threads



chips

CT-FC CARBIDE

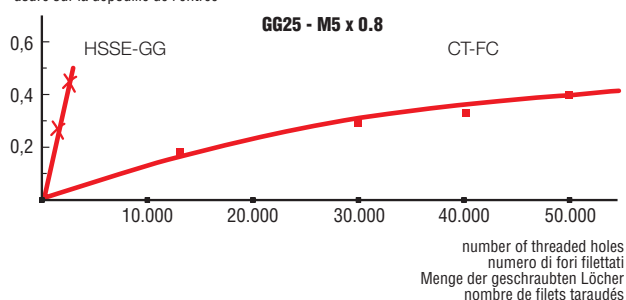
 The Yamawa CT taps are made of ultra-fine micrograin tungsten carbide; the Yamawa CT taps show excellent wear resistance and high toughness, so they are recommended for mass-production threading; the Yamawa CT taps have special geometry and rake angle designed to obtain high quality threads. The Yamawa CT taps if used under proper tapping conditions, assure long life and high cutting speed.

 I maschi Yamawa CT sono prodotti utilizzando metallo duro micrograna ultrafine. Garantiscono eccezionale resistenza all'usura e sorprendente tenacità e sono consigliati per super produzione. Sono disegnati con geometrie di taglio specifiche per ottenere filettature di altissima qualità. I maschi Yamawa CT, se utilizzati in condizioni ottimali, garantiscono lunga durata e alta velocità d'impiego.

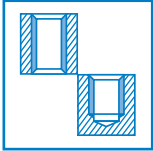
 Die Yamawa CT Gewindebohrer sind aus ultra-feiner Mirkrokornung Hartmetall gefertigt; die Yamawa CT Gewindebohrer zeichnen sich durch Zähigkeit aus, zeigen sehr gute Verschleißfestigkeit und sind daher sehr empfehlenswert für die Gewinde-Massenproduktion; durch speziell entwickelte Geometrien und Spanwinkel, erreichen die Yamawa CT Gewindebohrer sehr hohe Gewindequalität; unter optimalen Konditionen, ermöglichen die Yamawa CT Gewindebohrer lange Lebensdauer und hohe Schnittgeschwindigkeit.

 Les tarauds Yamawa CT sont réalisés en carbure à grain ultrafin; les tarauds Yamawa CT font preuve d'une excellente ténacité et résistance à l'usure et sont donc recommandés pour les travaux en grande série; les tarauds Yamawa CT ont un affûtage et une géométrie spécialement étudiés pour l'obtention de filets de la plus haute qualité; les tarauds Yamawa CT, utilisés dans des conditions optimales, garantissent une excellente durée de vie à vitesse de coupe élevée.

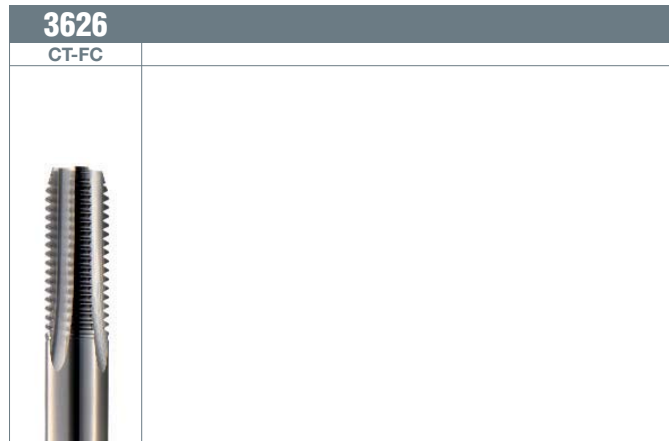
wear of chamfer relief
usura sulla spoglia dell'imbocco
Spanverschleiß
usure sur la dépouille de l'entrée



M, MF, G
DIN371 DIN376 DIN5156



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
13 - 14	15~30	
18~20	20~40	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								13 14 18-20	
								STR CARBIDE BR ISO2X (6HX) 2P~3P C	
D	p	Ø	L	l	d	k	Stock		
• DIN371									
M 3	0.5	2.5	56	11	3.5	2.7	○		
4	0.7	3.3	63	13	4.5	3.4	○		
5	0.8	4.2	70	16	6	4.9	○		
6	1	5	80	19	6	4.9	○		
8	1.25	6.8	90	22	8	6.2	○		
10	1.5	8.5	100	24	10	8	○		
• DIN376								3726	
12	1.75	10.3	110	29	9	7	○		
14	2	12	110	30	11	9	○		
16	2	14	110	32	12	9	○		
• DIN5156								3926	
G 1/8x28	9.728	8.75	90	20	7	5.5	△		
1/4x19	13.157	11.8	100	22	11	9	△		
3/8x19	16.662	15.25	100	22	12	9	○		
1/2x14	20.955	19	125	25	16	12	△		

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3	3
4 ~16	4
G 1/8 ~ 1/2	4

CARBIDE TIPPED
METALLO DURO SALDO BRASATO
HARTMETALL BESTÜCKT
CARBURE SOUDO-BRASÉ

M ≥ 12
G ≥ 1/4

DRY

 Due to the high cost needed for the purchase and disposal of lubricant, and consequently to the observance of the norm ISO14000 on “environmental management”, the request for dry working tools or tools needing minimum quantities of lubricant is becoming more and more urgent. Yamawa is introducing in the world market the new series of HD high performance taps, ensuring exceptional performances even under extremely severe working conditions, like dry threading, MQL (minimum quantity lubricant), or nebulization (mix of air and oil).

 A causa del costo per l'acquisto e smaltimento dei lubrificanti ed in conseguenza del rispetto delle norme ISO14000, riguardante la gestione ambientale, la richiesta di utensili capaci di lavorare a secco o con quantità minime di lubrificante sta diventando sempre più pressante. Yamawa introduce nel mercato mondiale la nuova serie di maschi ad alto rendimento HD capaci di performance eccezionali anche in condizioni di lavoro estremamente gravose quali filettatura a secco, MQL (minima quantità di lubrificante) o nebulizzazione (misto aria + olio).

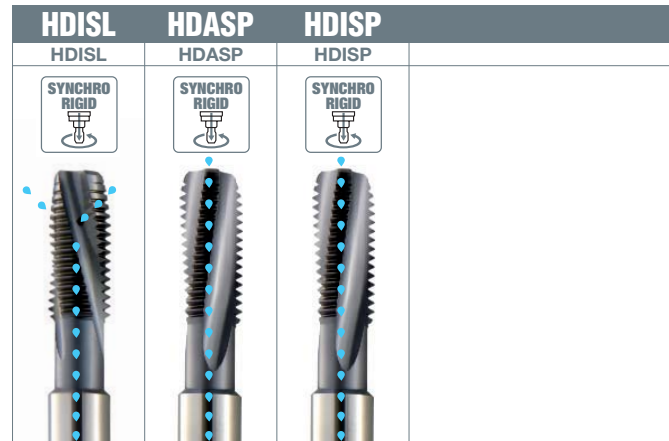
 Aufgrund der hohen Kosten für den Einkauf und Entsorgung der Schmiermittel, und infolge der Beachtung der ISO14000-Normen, die das Umweltmanagement betreffen, ist die Anfrage nach Werkzeugen, die trocken arbeiten oder wenig Schmiermittel benötigen, immer mehr dringend. Yamawa führt auf dem Weltmarkt den neuen Satz von den HD Hoch-Leistung-Gewindebohrern ein, die aussergewöhnliche Leistungen auch unter schweren Arbeitsbedingungen, wie z.B. trockenem Gewindeschneiden, MQL (mindeste Schmiermittel-Menge) oder Zerstäubung (Mischung von Luft und Öl) zufriedenstellen.

 À cause des coûts élevés pour l'achat et l'écoulement du lubrifiant, et par conséquent du respect des normes ISO 14000 qui concernent les systèmes de management de l'environnement, la demande d'outils pour l'orsinage en sec ou avec des petites quantités de lubrifiant devient de plus en plus pressante. Yamawa introduit dans le marché mondial la nouvelle série de tarauds à haut performance HD, qui garantissent des résultats exceptionnels aussi dans les conditions d'utilisation les plus difficiles, comme par exemple filetage en sec, MQL (quantité minimale de lubrifiant) ou nébulisation (mélange d'air et huile).



M, MF
YAMAWA
NORM

MATERIAL GROUP	Vc (m/min)	
	DRY / SECCO TROCKEN - SEC	MQL
1-5	7~10	15~35
9-10		10~20
13-14	7~15	20~40
15-20	15~20	20~45



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 9 10 13 14 15-20			15-20			1-5 9 10 13 14		
								L15°-0H			8°-0H			8°-0H		
								HSSE TiCN			HSSE TiCN			HSSE TiCN		
								P CLASS			P CLASS			P CLASS		
								4P			2,5P			2,5P		
D	p		L	l2	l1	d	d1	Stock			Stock			Stock		
M 6	1	5.0	62	19	27	-	6	● (P4)			○ (P4)			○ (P4)		
8	1.25	6.8	70	22		36	8	● (P4)			○ (P4)			○ (P4)		
10	1.5	8.5	75	24		37	10	● (P4)			○ (P4)			○ (P4)		
12	1.75	10.3	82	29		40	12	● (P4)			○ (P4)			○ (P4)		
14	2	12	88	30		40	12	● (P4)								
16	2	14	95	32		40	12	● (P4)								
20	2.5	17.5	105	37		45	16	○ (P4)								
MF10	1.25	8.8	75	24		37	10	● (P4)			○ (P4)			○ (P4)		
12	1.5	10.5	82	29		40	12	● (P4)			○ (P4)			○ (P4)		
12	1.25	10.8	82	29		40	12	● (P4)			○ (P4)			○ (P4)		
14	1.5	12.5	88	30		40	12	● (P4)			○ (P4)			○ (P4)		
16	1.5	14.5	95	32		43	16	● (P4)			○ (P4)			○ (P4)		
18	1.5	16.5	100	37		45	16	○ (P4)			○ (P4)			○ (P4)		
20	1.5	18.5	105	37		45	16	○ (P5)			○ (P5)			○ (P5)		

P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion

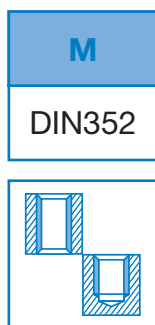


M 6 ~ 16
18 ~ 20

3 3 3
4 3 4

**TAPS
MASCHI
GEWINDEBOHRER
TARAUDS**

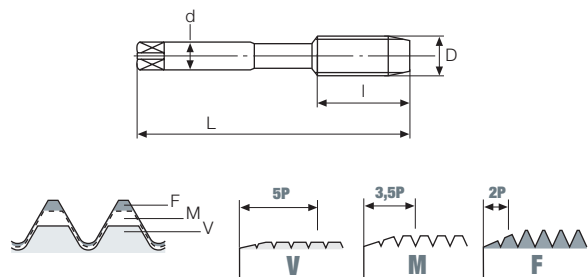
M .	70
MJ .	111
MF .	112
UNC/F - UN-8 .	130
UNJC/F .	137
G - Rp .	139-146
NPT - NPTF - Rc .	147-148-149
BSW .	150
Pg/EG .	152-153
ISO529 .	154



MATERIAL GROUP	Vc (m/min)	
	HAND	MACHINE (6110F)
1-5		5~10
13-14		5~10
16-19-20		5~10



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE



								1-5 13 14 16 19 20				1-5 13 14 16 19 20			
								STR				STR			
								HSS				HSS			
								BR				BR			
								ISO2 (6H)				ISO2 (6H)			
								V+M+F SET				V M F			
D	p	Ø	L	I	d	k		Stock				Stock			
M 1	0.25	0.75	32	5.5	2.5	2.1		○	○	○	○	○	○	○	○
1.1	0.25	0.85	32	5.5	2.5	2.1		○	○	○	○	○	○	○	○
1.2	0.25	0.95	32	5.5	2.5	2.1		○	○	○	○	○	○	○	○
1.4	0.3	1.1	32	7	2.5	2.1		○	○	○	○	○	○	○	○
1.6	0.35	1.25	32	8	2.5	2.1		○	○	○	○	○	○	○	○
1.7	0.35	1.35	32	8	2.5	2.1		○	○	○	○	○	○	○	○
1.8	0.35	1.45	32	8	2.5	2.1		○	○	○	○	○	○	○	○
2	0.4	1.6	36	8	2.8	2.1		●	●	●	●	●	●	●	●
2.2	0.45	1.75	36	9	2.8	2.1		○	○	○	○	○	○	○	○
2.3	0.4	1.9	36	9	2.8	2.1		○	○	○	○	○	○	○	○
2.5	0.45	2.1	40	9	2.8	2.1		●	●	●	●	●	●	●	●
2.6	0.45	2.2	40	9	2.8	2.1		○	○	○	○	○	○	○	○
3	0.5	2.5	40	11	3.5	2.7		●	●	●	●	●	●	●	●
3.5	0.6	2.9	45	13	4	3		○	○	○	○	○	○	○	○
4	0.7	3.3	45	13	4.5	3.4		●	●	●	●	●	●	●	●
4.5	0.75	3.8	50	16	6	4.9		○	○	○	○	○	○	○	○
5	0.8	4.2	50	16	6	4.9		●	●	●	●	●	●	●	●
6	1	5	50	19	6	4.9		●	●	●	●	●	●	●	●
7	1	6	50	19	6	4.9		○	○	○	○	○	○	○	○
8	1.25	6.8	56	22	6	4.9		●	●	●	●	●	●	●	●
9	1.25	7.8	63	22	7	5.5		○	○	○	○	○	○	○	○
10	1.5	8.5	70	24	7	5.5		●	●	●	●	●	●	●	●
12	1.75	10.3	75	29	9	7		●	●	●	●	●	●	●	●
14	2	12	80	30	11	9		●	●	●	●	●	●	●	●
16	2	14	80	32	12	9		●	●	●	●	●	●	●	●
18	2.5	15.5	95	40	14	11		●	●	●	●	●	●	●	●
20	2.5	17.5	95	40	16	12		●	●	●	●	●	●	●	●
22	2.5	19.5	100	40	18	14.5		○	○	○	○	○	○	○	○
24	3	21	110	50	18	14.5		●	●	●	●	●	●	●	●
27	3	24	110	50	20	16		○	○	○	○	○	○	○	○
30	3.5	26.5	125	56	22	18		○	○	○	○	○	○	○	○

*M1 ~ M1.4 Tol. = 4H

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 1 ~ 6
7 ~ 30

3
4

3
4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	
9-10	3~8	
13-14	8~15	
15-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 15-20		1-5 9 10	
								PO	40°		
								HSSE BR	HSSE OX		
								ISO2 (6H)	ISO2 (6H)		
								3.5P-5P B	2P-3P C		
								Stock	Stock		
D	p	Ø	L	l	*	d	k	Stock	Stock		
M 3	0.5	2.5	40	11	5	3.5	2.7	○	○		
4	0.7	3.3	45	13	7	4.5	3.4	●	●		
5	0.8	4.2	50	16	9	6	4.9	●	●		
6	1	5	50	19	11	6	4.9	●	●		
8	1.25	6.8	56	22	12	6	4.9	●	●		
10	1.5	8.5	70	24	13	7	5.5	●	●		
12	1.75	10.3	75	29	15	9	7	○	●		
14	2	12	80	30	18	11	9	○	○		
16	2	14	80	32	18	12	9	○	○		
20	2.5	17.5	95	40	20	16	12	○	○		

*I-9540..

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3	~ 16	3	3
18	~ 20	3	4

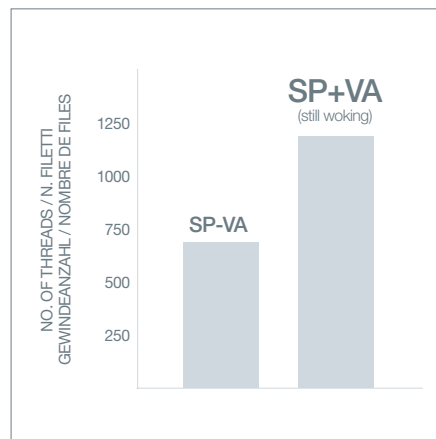
version **UP⁺**

PLUS SHANK TOLERANCE
CUTTING GEOMETRY
FINISHING
CUTTING SPEED
TOOL LIFE

PLUS TOLLERANZA DEL GAMBO
GEOMETRIA DI TAGLIO
FINITURA
VELOCITÀ DI TAGLIO
DURATA UTENSILE

PLUS SCHAFTTOLERANZ
SCHNITTGEOMETRIE
ENDBEARBEITUNG
SCHNITTGESCHWINDIGKEIT
WERZEUGSTANDZEIT

PLUS TOLÉRANCE DE QUEUE
GÉOMÉTRIE DE COUPE
FINITION
VITESSE DE COUPE
DURÉE DE L'OUTIL



version **UP⁺**

SP+VA 1250 holes



chip shape / forma del truciolo
Spanform / forme des copeaux

STANDARD

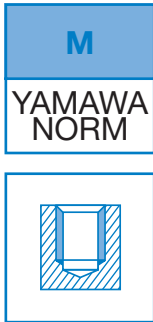
SP-VA 750 holes



chip shape / forma del truciolo
Spanform / forme des copeaux

LASER MARKING ON THE SQUARE TO PROTECT SHANK ACCURACY
MARCATURA LASER SUL QUADRO PER PRESERVARE LA PRECISIONE DEL GAMBO
LASE MARKIERUNG AUF DER VIERKANT UM DER PRÄZISION DER SCHAFT ZU HALTEN
MARQUAGE LASER SUR LE CARRÉ POUR PRÉSERVER LA PRÉCISION DE LA QUEUE





MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	10~20	
9-10	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									1-5 9 10		1-5 9 10					
									45°	45°						
									HSSE OX	HSSE OX						
									ISO2 (6H)	ISO2 (6H)						
									2P-3P C	2P-3P C						
D	p	Ø	L	l	l1	d	k		Stock	Stock						
M 3	0.5	2.5	56	6,5	18	4			●							
4	0.7	3.3	63	9	21	6			●							
5	0.8	4.2	70	10,5	25	6			●							
3	0.5	2.5	56	6,5	18	4	3			●						
4	0.7	3.3	63	9	21	6	4,9			●						
5	0.8	4.2	70	10,5	25	6	4,9			●						
6	1	5	80	15	30	6	4,9			●						
8	1.25	6.8	90	19	35	8	6,2			●						
10	1.5	8.5	100	23	40	10	8			●						
12	1.75	10.3	110	26	45	12	9			●						

● stock standard ○ non-standard stock △ on request EX stock exhaustion



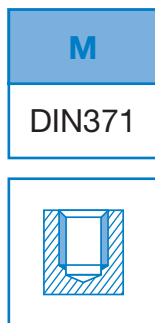
M 3 ~ 8
10 ~ 12



VPM



VP



MATERIAL GROUP	Vc (m/min)	
	BR-0X-NX-NI	TiN-TiCN PV15
1-5	5~15	10~25
9-10	4~8	6~12
13-14	8~15	12~25
15-20	10~20	15~25



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									
		1-5 13 14 15-20	1-5 9 10	1-5 13 14 15-20	1-5 13 14 15-20	1-5 13 14 15-20			
		40°	40°	LH40°	40°	40°			
		HSSE BR	HSSE PV15	HSSE BR	HSSE BR	HSSE BR			
		ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO3 (6G)	ISO2+0,05 (6H+0,05)			
		2P-3P C	2P-3P C	2P-3P C	2P-3P C	2P-3P C			
D	p	Ø	L	l	*	I1	d	k	Stock
M 1	0.25	0.75	40	5.5			2.5	2.1	○**
1.2	0.25	0.95	40	5.5			2.5	2.1	○**
1.4	0.3	1.1	40	7			2.5	2.1	○**
1.6	0.35	1.25	40	8			2.5	2.1	○**
2	0.4	1.6	45	4		9	2.8	2.1	●
2.5	0.45	2.1	50	4		12.5	2.8	2.1	●
2.6	0.45	2.2	50	4		12.5	2.8	2.1	●
3	0.5	2.5	56	5	11	18	3.5	2.7	●
3.5	0.6	2.9	56	7		20	4	3	●
4	0.7	3.3	63	7	13	21	4.5	3.4	●
5	0.8	4.2	70	9	16	25	6	4.9	●
6	1	5	80	11	19	30	6	4.9	●
7	1	6	80	11		30	7	5.5	●
8	1.25	6.8	90	12	22	35	8	6.2	●
10	1.5	8.5	100	13	24	39	10	8	●

*I-9647..

**9640 M1 ~ M1.6 = N-SP

M1 ~ M1.4 = 4H



M 1 ~ 2.6	2				
3 ~ 10	3	3	3	3	3

● stock standard ○ non-standard stock △ on request EX stock exhaustion

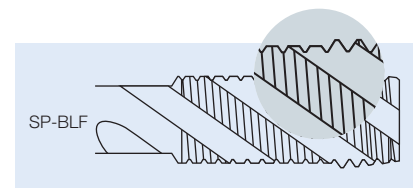
NEW

M (MJ)

964010	9642	96422F	9647	9647E	96470X	9647TC	9647TI			
OS-SP	HISP	HISP	SP-BLF	SP-BLF-E	SP-BLF	SP-BLF	SP-BLF			
oversized / maggiorato / übermaß / surcoté										
	1-5 13 14 15-20	1 2 15-20	15 17 18	1-5 13 14 15-20	1-5 13 14 15-20	1-5 9 10	1-5 9 10 13 14 15 16 18-20	1-5 9 10 13 14 15 16 18-20		
	40°	45°	45°	BLF40°	BLF40°	BLF40°	BLF40°	BLF40°		
	HSSE BR	HSSE BR	HSSE BR	HSSE BR	HSSE BR	HSSE OX	HSSE TiCN	HSSE TiN		
	IS02+0,10 (6H+0,10)	IS02 (6H)	IS02 (6H)	IS02 (6H)	IS02 (6H)	IS02 (6H)	IS02 (6H)	IS02 (6H)		
	2P-3P C	2P-3P C	2P-3P C	2P-3P C	2P-3P C	2P-3P C	2P-3P C	2P-3P C		
Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	D	p
									M 1	0.25
									1.2	0.25
									1.4	0.3
									1.6	0.35
	●								2	0.4
	●								2.5	0.45
									2.6	0.45
○	●	●	●	○	●	●	●		3	0.5
									3.5	0.6
●	●	●	●	●	●	●	●	●	4	0.7
●	●	●	●	●	●	●	●	●	5	0.8
●	●	●	●	●	●	●	●	●	6	1
									7	1
●	●		●	●	●	●	●	●	8	1.25
●	●		●	●	●	●	●	●	10	1.5

● stock standard ○ non-standard stock △ on request EX stock exhaustion

3	3	2	3	3	3	3	3	M 1 ~ 2.6
								3 ~ 10





MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	10~25
9-10	4~8	6~12
13-14	8~15	12~25
15-20	10~20	15~25



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE										1-5 13 14 15-20	1-5 9 10	1-5 13 14 15-20	1-5 13 14 15-20	1-5 13 14 15-20
										40° HSSE BR ISO2 (6H) 2P-3P C	40° HSSE PV15 ISO2 (6H) 2P-3P C	LH40° HSSE BR ISO2 (6H) 2P-3P C	40° HSSE BR ISO3 (6G) 2P-3P C	40° HSSE BR ISO2+0,05 (6H+0,05) 2P-3P C
D	p	Ø	L	l	*	l2	d	k		Stock	Stock	Stock	Stock	Stock
M 3	0.5	2.5	56	5		17	2.2		○					
4	0.7	3.3	63	7		19	2.8	2.1	○					
5	0.8	4.2	70	9		22	3.5	2.7	●					
6	1	5	80	11		25	4.5	3.4	●					
8	1.25	6.8	90	12		28	6	4.9	●					
10	1.5	8.5	100	13		35	7	5.5	●					
12	1.75	10.3	110	15	29	42	9	7	●	●	●	●	○	
14	2	12	110	18	30	49	11	9	●	●	○	○		
16	2	14	110	18	32	56	12	9	●	●	●	○		
18	2.5	15.5	125	20	34	63	14	11	●	○	○			
20	2.5	17.5	140	20	34	70	16	12	●	○	●			
22	2.5	19.5	140	20	34	77	18	14.5	●					
24	3	21	160	25	38	84	18	14.5	●					
27	3	24	160	25	38	95	20	16	●					
30	3.5	26.5	180	30	45	105	22	18	●					
33	3.5	29.5	180	30	50	115	25	20	●					
36	4	32	200	40	55	126	28	22	●					
39	4	35	200	40	60	135	32	24	●					
42	4.5	37.5	200	40		135	32	24	●					
45	4.5	40.5	220	45		155	36	29	○					
48	5	43	250	45		168	36	29	●					

*I-9747..

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 10	3				
12 ~ 16	3	3	3	3	3
18 ~ 48	4	4	4		

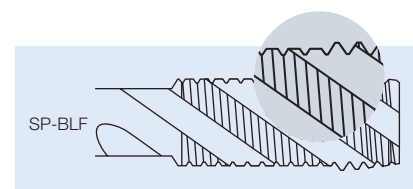
NEW

M (MJ)

974010	9742	97422F	9747	9747E	97470X	9747TC	9747TI			
OS-SP	HISP	HISP	SP-BLF	SP-BLF-E	SP-BLF	SP-BLF	SP-BLF			
oversized / maggiorato / übermaß / surcoté										
										
1~5 13 14 15-20	1 2 15-20	15 17 18	1~5 13 14 15-20	1~5 13 14 15-20	1~5 9 10	1~5 9 10 13 14 15 16 18-20	1~5 9 10 13 14 15 16 18-20			
40° 	45° 	45° 	BLF40° 	BLF40° 	BLF40° 	BLF40° 	BLF40° 			
HSSE BR	HSSE BR	HSSE BR	HSSE BR	HSSE BR	HSSE OX	HSSE TiCN	HSSE TiN			
ISO2+0,10 (6H+0,10)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)			
2P~3P C 	2P~3P C 	2P~3P C 	2P~3P C 	2P~3P E 	2P~3P C 	2P~3P C 	2P~3P C 			
Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	D	p	
								M	3	0.5
									4	0.7
									5	0.8
									6	1
									8	1.25
									10	1.5
●	○		●	●	●	●	●		12	1.75
	○		●	○	●	●	●		14	2
	○		●	○	●	●	●		16	2
			●		●	●	●		18	2.5
			●	○	●	●	●		20	2.5
			○		●	○	○		22	2.5
			●		●	●	●		24	3
					●				27	3
					●				30	3.5
					●				33	3.5
					●				36	4
									39	4
									42	4.5
									45	4.5
									48	5

● stock standard ○ non-standard stock △ on request EX stock exhaustion

3	3	2	3	3	3	3	3	M 3 ~ 10
			4	4	4	4	4	12 ~ 16
								18 ~ 48



M

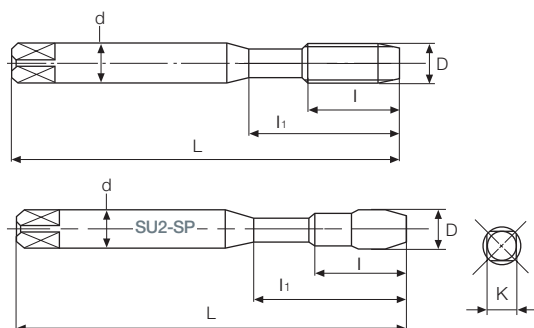
DIN371



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	10~20	15~25
6	5~15	
9~12	5~20	10~20
15~20	10~20	15~30
22~24	3~10	



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE



									4 5 6 9-12 22 24	15-20	15 16 18-20	3-5 9-12	1-5 9 10
									48°	45°	45°	BLF45°	45°
									HSS-P	HSSE	HSSE	HSSE	HSSE
									OX	NI	TiCN	OX	OX
									ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2 (6H)	ISO2 (6H)
									3P	2P-3P C	2P-3P C	2P-3P C	2P-3P C
									Stock	Stock	Stock	Stock	Stock
D	p	Ø	L	l	*	l1	d	k					
M 2	0.4	1.6	45	4		9	2.8	2.1		●	○		●
2.5	0.45	2.1	50	4		12.5	2.8	2.1		●	○		●
3	0.5	2.5	56	5	11	18	3.5	2.7	●	●	●	●	●
4	0.7	3.3	63	7	13	21	4.5	3.4	●	●	●	●	●
5	0.8	4.2	70	9	16	25	6	4.9	●	●	●	●	●
6	1	5	80	11	19	30	6	4.9	●	●	●	●	●
8	1.25	6.8	90	12	22	35	8	6.2	●	●	●	●	●
10	1.5	8.5	100	13	24	39	10	8	●	●	●	●	●

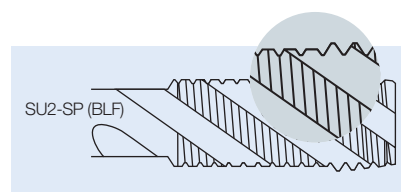
*l-9644.. / 9643..

● stock standard ○ non-standard stock △ on request EX stock exhaustion



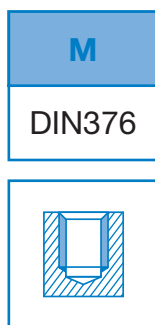
M 2 ~ 2.5
3
3.5 ~ 10

2	2	2	2	2
3	3	3	2	2
3	3	3	3	3



NEW

9645E0X	9645TC	96450X6G	96460X	96480X			
SP-VA-E	SP-VA	OS-SP-VA	SP-NW	PH-SP			
		oversized / maggiorato / übermaß / surcofé 		 ~HRC37 			
1~5 9 10	1~5 9 10	1~5 9 10	1 17	4 5 6			
							
HSSE OX	HSSE TiCN	HSSE OX	HSSE OX	HSSE OX			
ISO2 (6H)	ISO2 (6H)	ISO3 (6G)	ISO2 (6H)	ISO2 (6H)			
							
Stock	Stock	Stock	Stock	Stock			
					D	p	
					M	2	0.4
						2.5	0.45
○	●	○	EX	●		3	0.5
○	●	●	EX	●		4	0.7
○	●	●	EX	●		5	0.8
○	●	●	EX	●		6	1
○	●	●	EX	●		8	1.25
○	●	●	EX	●		10	1.5
● stock standard ○ non-standard stock △ on request EX stock exhaustion							
					M	2 ~ 2.5	
2	2	2	3	3		3	
3	3	3	3	3		3.5 ~ 10	



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	10~20	15~25
6	5~15	
9~12	5~20	10~20
15~20	10~20	15~30
22~24	3~10	



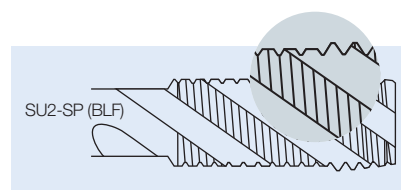
MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									
4 5 6 9-12 22 24 15-20 15 16 18-20 3-5 9-12 1-5 9 10									
48° 45° 45° BLF45° 45°									
HSS-P HSSE HSSE HSSE HSSE									
OX NI TiCN OX OX									
ISO2X (6HX) ISO2X (6HX) ISO2X (6HX) ISO2 (6H) ISO2 (6H)									
3P 2P-3P C 2P-3P C 2P-3P C 2P-3P C									
Stock Stock Stock Stock Stock									
D	p	Ø	L	l	*	l2	d	k	
M 8	1.25	6.8	90	12		28	6	4.9	●
10	1.5	8.5	100	13		35	7	5.5	●
12	1.75	10.3	110	15	29	42	9	7	●
14	2	12	110	18	30	49	11	9	●
16	2	14	110	18	32	56	12	9	○
18	2.5	15.5	125	20	34	63	14	11	○
20	2.5	17.5	140	20	34	70	16	12	●
22	2.5	19.5	140	20	34	77	18	14.5	●
24	3	21	160	25	38	84	18	14.5	●
27	3	24	160	25		95	20	16	●
30	3.5	26.5	180	30		105	22	18	●
36	4	32	200	40		126	28	22	● NEW

*I-9744.. / 9743..

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 8 ~ 10					3
12 ~ 16	3	3	3	4	3
18 ~ 20	4			4	4
22 ~ 36	4			4	4



NEW

9745EOX	9745TC	9745OX6G	9746OX	9748OX	
SP-VA-E	SP-VA	OS-SP-VA	SP-NW	PH-SP	
					
		oversized / maggiorato / übermaß / surcote		SYNCHRO RIGID 	
				~HRC37	
1~5 9 10	1~5 9 10	1~5 9 10	1 17	4 5 6	
					
HSSE OX	HSSE TiCN	HSSE OX	HSSE OX	HSSE OX	
ISO2 (6H)	ISO2 (6H)	ISO3 (6G)	ISO2 (6H)	ISO2 (6H)	
					
Stock	Stock	Stock	Stock	Stock	
					D
					M 8
					10
			EX		12
			EX		14
			EX		16
					18
			EX		20
			EX		22
					24
					27
					30
					36
					p
					1.25
					1.5
					1.75
					2
					2
					2.5
					2.5
					2.5
					3
					3
					3.5
					4

● stock standard ○ non-standard stock △ on request EX stock exhaustion

					M 8
3	3	3	3	4	~ 10
4	4		4	4	~ 16
			4	5	~ 20
					~ 36

M

**DIN371
DIN376**



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	10~20	15~30
9-10		8~15
13-14	10~20	15~30
15-20	10~20	15~30

96400H 9640TCOH

SP-OH

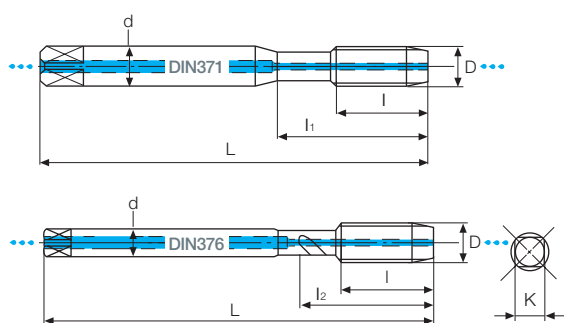
SP-OH



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 13
14 15-20

1-5 9 10 13
14 15 16 18-20



HSSE
BR

HSSE
TiCN

ISO2
(6H)

ISO2
(6H)



D	p	Ø	L	l	l1	d	k	Stock	Stock
• DIN371									
M 6	1	5	80	11	30	6	4.9	○	○
8	1.25	6.8	90	12	35	8	6.2	○	○
10	1.5	8.5	100	13	39	10	8	○	○
D	p	Ø	L	l	l2	d	k	Stock	Stock
• DIN376									
12	1.75	10.3	110	15	42	9	7	○	○
14	2	12	110	18	49	11	9	○	○
16	2	14	110	18	56	12	9	○	○
20	2.5	17.5	140	20	70	16	12	○	○

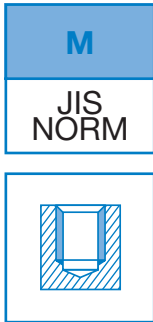
● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 6 ~ 16
20

3
4

3
4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	
13-14	8~15	
15-20	10~20	



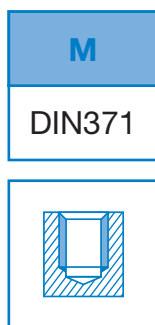
MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								
40° HSSE BR P CLASS 2,5 P								
D	p	Ø	L	l	l1	d	k	Stock
M 3	0.5	2.5	100	11	18	4	3.2	● (P1)
4	0.7	3.3	100	13	21	5	4	● (P2)
5	0.8	4.2	100	16	25	5.5	4.5	● (P2)
6	1	5	100	19	30	6	4.5	● (P2)
8	1.25	6.8	100	22		6.2	5	● (P2)
3	0.5	2.5	150	11	18	4	3.2	○ (P1)
4	0.7	3.3	150	13	21	5	4	● (P2)
5	0.8	4.2	150	16	25	5.5	4.5	● (P2)
6	1	5	150	19	30	6	4.5	● (P2)
8	1.25	6.8	150	22		6.2	5	● (P2)
10	1.5	8.5	150	24		7	5.5	● (P2)
12	1.75	10.3	150	29		8.5	6.5	● (P2)
14	2	12	150	30		10.5	8	○ (P2)
16	2	14	150	32		12.5	10	● (P2)
18	2.5	15.5	150	37		14	11	○ (P3)
20	2.5	17.5	150	37		15	12	● (P3)
10	1.5	8.5	200	24		7	5.5	● (P2)
12	1.75	10.3	200	29		8.5	6.5	● (P2)
14	2	12	200	30		10.5	8	○ (P2)
16	2	14	200	32		12.5	10	● (P2)
18	2.5	15.5	200	37		14	11	○ (P3)
20	2.5	17.5	200	37		15	12	● (P3)
24	3	21	200	45		19	15	● (P3)

P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 16	3
18 ~ 24	4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~20	10~30
6-7	5~10	8~15
13-14	10~15	15~25
15-20	10~20	15~30
21-23-25-26	5~10	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									4 5 6 7 13 14 18-20 21 23 25 26	4 5 6 7 13 14 23 25	1-5 13 14 15-20	1-5	1-5 13 14 15 16 18-20
									15°	15°	20°	20°	20°
									HSS-P NI	HSS-P TiCN	HSS BR	HSSE OX	HSSE TiCN
									ISO2X (6HX)	ISO2X (6HX)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)
									3P	3P	3.5P-5P D	3.5P-5P D	3.5P-5P D
D	p	Ø	L	l	*	I1	d	k	Stock	Stock	Stock	Stock	Stock
M 2	0.4	1.6	45	8			2.8	2.1				○	
2.5	0.45	2.1	50	9			2.8	2.1				○	
3	0.5	2.5	56	11	5	18	3.5	2.7	●	○	●	●	○
4	0.7	3.3	63	13	7	21	4.5	3.4	●	○	●	●	○
5	0.8	4.2	70	16	9	25	6	4.9	●	○	●	●	○
6	1	5	80	19	11	30	6	4.9	●	●	●	●	○
8	1.25	6.8	90	22	12	35	8	6.2	●	●	●	●	○
10	1.5	8.5	100	24	13	39	10	8	●	●	●	●	○

*I-1641..

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 2 ~ 2.6					
3	3	3	2	2	2
4 ~ 10	3	3	3	3	3

9641TI		96410X6G	
LOSP	OS-LOSP		
	oversized / maggiorato / übermaß / surcoté 		
1-5 13 14 15 16 18-20	1-5		
20° HSSE TiN ISO2 (6H) 3.5P-5P D	20° HSSE OX ISO3 (6G) 3.5P-5P D		
Stock	Stock	D	p
		M 2	0.4
		2.5	0.45
○	EX	3	0.5
○	EX	4	0.7
○	EX	5	0.8
○	EX	6	1
○	EX	8	1.25
○	EX	10	1.5

● stock standard ○ non-standard stock △ on request EX stock exhaustion

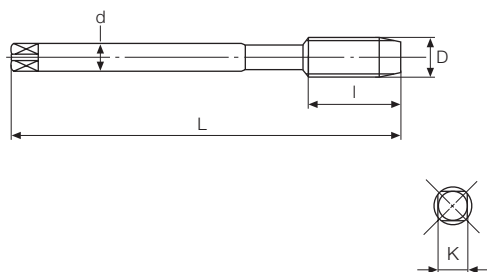
2		M 2 ~ 2.6
2	2	3
3	3	4 ~ 10

M

DIN376



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	5~20	10~30
6~7	5~10	8~15
13~14	10~15	15~25
15~20	10~20	15~30
21~23-25-26	5~10	


MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE


								4 5 6 7 13 14 18-20 21 23 25 26	4 5 6 7 13 14 23 25	1-5 13 14 15-20	1-5	1-5 13 14 15 16 18-20
								15°	15°	20°	20°	20°
								HSS-P NI	HSS-P TiCN	HSSE BR	HSSE OX	HSSE TiCN
								ISO2X (6HX)	ISO2X (6HX)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)
								3P	3P	3.5P-5P D	3.5P-5P D	3.5P-5P D
D	p	Ø	L	I	*	d	k	Stock	Stock	Stock	Stock	Stock
M 3	0.5	2.5	56	11		2.2					○	
4	0.7	3.3	63	13		2.8	2.1				○	
5	0.8	4.2	70	16		3.5	2.7				○	
6	1	5	80	19		4.5	3.4				○	
8	1.25	6.8	90	22		6	4.9				○	
10	1.5	8.5	100	24		7	5.5				○	
12	1.75	10.3	110	29	15	9	7	●	●	●	●	○
14	2	12	110	30	18	11	9	●	○	○	●	○
16	2	14	110	32	18	12	9	●	○	●	●	○
18	2.5	15.5	125	34	20	14	11	○	○		○	
20	2.5	17.5	140	34	20	16	12	●	○	○	●	○
22	2.5	19.5	140	34	20	18	14.5				○	
24	3	21	160	38	25	18	14.5	●	○		●	
27	3	24	160	38		20	16				○	
30	3.5	26.5	180	45		22	18				○	

M 3 ~ M24 LO SP = 20°

M27 ~ LO SP = 15°

*1-1741..

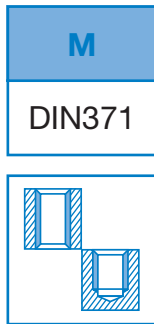


M 3	2
4 ~ 16	3
18 ~ 30	4

● stock standard ○ non-standard stock △ on request EX stock exhaustion

M (MJ)

9741TI 97410X6G				
LOSP	OS-LOSP			
	 oversized / maggiorato / surcote			
1-5 13 14 15 16 18-20	1-5			
				
HSSE TIN	HSSE OX			
ISO2 (6H)	ISO3 (6G)			
3.5P-5P D	3.5P-5P D			
Stock	Stock			
			D	p
			M 3	0.5
			4	0.7
			5	0.8
			6	1
			8	1.25
			10	1.5
○			12	1.75
○	EX		14	2
○			16	2
			18	2.5
○			20	2.5
			22	2.5
			24	3
			27	3
			30	3.5
● stock standard ○ non-standard stock △ on request EX stock exhaustion				
		M 3		
3	3	4 ~ 16		
4	4	18 ~ 30		



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
6-7	3~8	
13-14	10~20	15~30
16-19-20	10~20	15~30
21	3~5	

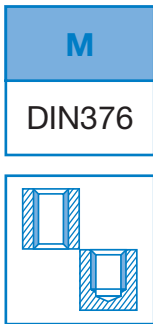


MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								5 6 7	1-5 13 14 16 19 20	13 14 16 19 20 21	13 14 16 19 20
								STR	STR	STR	STR
								HSS/Co BR	HSSE BR	HSSE NI	HSSE TiCN
								ISO2X (6HX)	ISO2 (6H)	ISO2X (6HX)	ISO2X (6HX)
								2P-3P C	2P-3P C	2P-3P C	2P-3P C
D	p	Ø	L	l	l1	d	k	Stock	Stock	Stock	Stock
M 3	0.5	2.5	56	11	18	3.5	2.7	●	○	●	●
4	0.7	3.3	63	13	21	4.5	3.4	●	○	●	●
5	0.8	4.2	70	16	25	6	4.9	●	○	●	●
6	1	5	80	19	30	6	4.9	●	○	●	●
8	1.25	6.8	90	22	35	8	6.2	●	○	●	●
10	1.5	8.5	100	24	39	10	8	●	○	●	●

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3	3	3	3	3
4 ~ 6	3	3	4	4
8 ~ 10	4	3	4	4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
6-7	3~8	
13-14	10~20	15~30
16-19-20	10~20	15~30
21	3~5	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								5 6 7	1-5 13 14 16 19 20	13 14 16 19 20 21	13 14 16 19 20
								STR	STR	STR	STR
								HSS/Co BR	HSSE BR	HSSE NI	HSSE TiCN
								ISO2X (6HX)	ISO2 (6H)	ISO2X (6HX)	ISO2X (6HX)
								2P-3P C	2P-3P C	2P-3P C	2P-3P C
D	p	Ø	L	l	d	k		Stock	Stock	Stock	Stock
M 5	0.8	4.2	70	16	3.5	2.7				○	○
6	1	5	80	19	4.5	3.4				○	○
8	1.25	6.8	90	22	6	4.9				●	●
10	1.5	8.5	100	24	7	5.5				●	●
12	1.75	10.3	110	29	9	7	●		○	●	●
14	2	12	110	30	11	9	●		○	●	●
16	2	14	110	32	12	9	●		○	●	●
18	2.5	15.5	125	34	14	11	○		○	●	●
20	2.5	17.5	140	34	16	12	●		○	●	●
22	2.5	19.5	140	34	18	14.5	○		○	●	●
24	3	21	160	38	18	14.5	●		○	●	●
27	3	24	160	38	20	16			○		
30	3.5	26.5	180	45	22	18			○		
33	3.5	29.5	180	50	25	20			○		
36	4	32	200	56	28	22			○		
39	4	35	200	60	32	24			○		
42	4.5	37.5	200	60	32	24			○		

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 5			4	4
6 ~ 24	4	3	4	4
27 ~ 42		4		

M

DIN371
DIN376



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
13 - 14	15~25	20~40
16 - 19 - 20	10~20	15~30

9626NIOH 9626TCOH

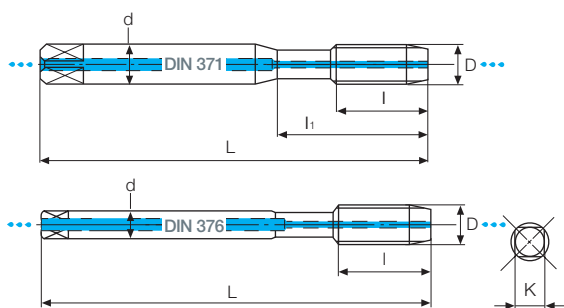
STR-GG-OH STR-GG-OH



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

13 14
16 19 20

13 14
16 19 20



HSSE
NI

HSSE
TiCN

ISO2X
(6HX)

ISO2X
(6HX)

2P~3P
C

2P~3P
C

D	p	Ø	L	l	l1	d	k	Stock	Stock
• DIN371									
M 6	1	5	80	19	30	6	4.9	●	●
8	1.25	6.8	90	22	35	8	6.2	●	●
10	1.5	8.5	100	24	39	10	8	●	●
• DIN376									
12	1.75	10.3	110	29	9	7		●	●
14	2	12	110	30	11	9		●	●
16	2	14	110	32	12	9		●	●
18	2.5	15.5	125	34	14	11		○	○
20	2.5	17.5	140	34	16	12		●	●

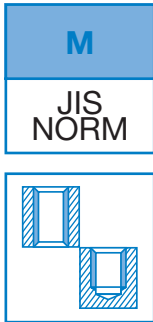
● stock standard ○ non-standard stock △ on request EX stock exhaustion



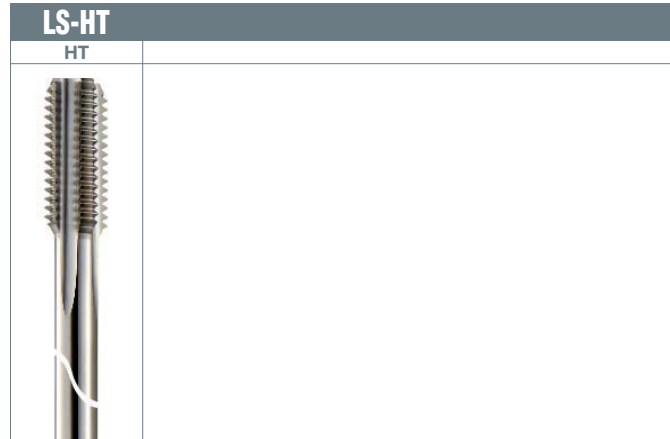
M 6 ~ 20

4

4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
13-14	8~12	
16-19-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									
STR HSSE BR P CLASS 1,5 P									
D	p	Ø	L	l	l1	d	k	Stock	
M 3	0.5	2.5	100	11	18	4	3.2	○ (P1)	
4	0.7	3.3	100	13	21	5	4	○ (P2)	
5	0.8	4.2	100	16	25	5.5	4.5	○ (P2)	
6	1	5	100	19	30	6	4.5	○ (P2)	
8	1.25	6.8	100	22		6.2	5	○ (P2)	
4	0.7	3.3	150	13	21	5	4	○ (P2)	
5	0.8	4.2	150	16	25	5.5	4.5	○ (P2)	
6	1	5	150	19	30	6	4.5	○ (P2)	
8	1.25	6.8	150	22		6.2	5	○ (P2)	
10	1.5	8.5	150	24		7	5.5	○ (P2)	
12	1.75	10.3	150	29		8.5	6.5	○ (P2)	
14	2	12	150	30		10.5	8	○ (P2)	
16	2	14	150	32		12.5	10	○ (P2)	
12	1.75	10.3	200	29		8.5	6.5	○ (P2)	
16	2	14	200	32		12.5	10	○ (P2)	
20	2.5	17.5	200	37		15	12	○ (P3)	

P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 6	3
8 ~ 20	4

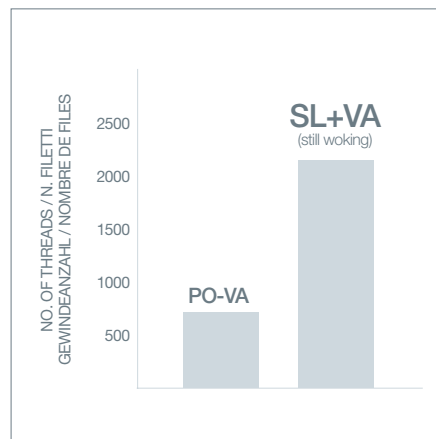
version **UP⁺**

PLUS SHANK TOLERANCE
CUTTING GEOMETRY
FINISHING
CUTTING SPEED
TOOL LIFE

PLUS TOLLERANZA DEL GAMBO
GEOMETRIA DI TAGLIO
FINITURA
VELOCITÀ DI TAGLIO
DURATA UTENSILE

PLUS SCHAFTTOLERANZ
SCHNITTGEOMETRIE
ENDBEARBEITUNG
SCHNITTGESCHWINDIGKEIT
WERZEUGSTANDZEIT

PLUS TOLÉRANCE DE QUEUE
GÉOMÉTRIE DE COUPE
FINITION
VITESSE DE COUPE
DURÉE DE L'OUTIL

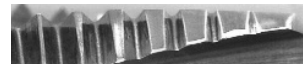


version **UP⁺**

SL+VA 2000 holes



thread profile / profilo filetti
Gewindeprofil / profil du filet



worn out tap / maschio usurato
ausgelaufener Gewindebohrer / taraud usé

STANDARD

PO-VA 700 holes



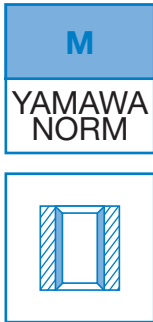
thread profile / profilo filetti
Gewindeprofil / profil du filet



worn out tap / maschio usurato
ausgelaufener Gewindebohrer / taraud usé



LASER MARKING ON THE SQUARE TO PROTECT SHANK ACCURACY.
MARCATURA LASER SUL QUADRO PER PRESERVARE LA PRECISIONE DEL GAMBO.
LASE MARKIERUNG AUF DER VIERKANT UM DER PRÄZISION DER SCHAFT ZU HALTEN.
MARQUAGE LASER SUR LE CARRÉ POUR PRÉSERVER LA PRÉCISION DE LA QUEUE.



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	10~20	
9~11	5~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									1-5 9-11		1-5 9-11				
									L15°	L15°					
									HSSE OX	HSSE OX					
									ISO2X (6HX)	ISO2X (6HX)					
									3.5P-5P D	3.5P-5P D					
D	p	Ø	L	l	l1	d	k		Stock	Stock					
M 3	0.5	2.5	56	6.5	18	4		●							
4	0.7	3.3	63	9	21	6		●							
5	0.8	4.2	70	10.5	25	6		●							
3	0.5	2.5	56	6.5	18	4	3			●					
4	0.7	3.3	63	9	21	6	4.9			●					
5	0.8	4.2	70	10.5	25	6	4.9			●					
6	1	5	80	15	30	6	4.9			●					
8	1.25	6.8	90	19	35	8	6.2			●					
10	1.5	8.5	100	23	40	10	8			●					
12	1.75	10.3	110	26	45	12	9			●					

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 12

3

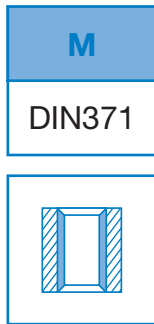
3



VPM



VP



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	10~25
9-10	4~8	6~12
13-14	8~15	12~25
15-20	10~20	15~25



MATERIAL GROUPS / GRUPPI MATERIE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 15-20		1-5 9 10		1-5 9 10 13 14 15 16 18-20				1-5 9 10		1-5 9 10 13 14 15-20			
								PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
								HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE
								BR	OX	TiCN	PV15	TiN									
								ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)
								3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B
D	p	Ø	L	l	l1	d	k	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock
M 1	0.25	0.75	40	5.5		2.5	2.1	○*													
1.2	0.25	0.95	40	5.5		2.5	2.1	○*													
1.4	0.3	1.1	40	7		2.5	2.1	○													
1.6	0.35	1.25	40	8		2.5	2.1	●													
2	0.4	1.6	45	8		2.8	2.1	●											○		
2.2	0.45	1.75	45	9		2.8	2.1	○													
2.5	0.45	2.1	50	9		2.8	2.1	●											○		
2.6	0.45	2.2	50	9		2.8	2.1	○													
3	0.5	2.5	56	11	18	3.5	2.7	●	●	●	●	●	●	●	●	●	●	●	●	●	●
3.5	0.6	2.9	56	13	20	4	3	●													
4	0.7	3.3	63	13	21	4.5	3.4	●	●	●	●	●	●	●	●	●	●	●	●	●	●
5	0.8	4.2	70	16	25	6	4.9	●	●	●	●	●	●	●	●	●	●	●	●	●	●
6	1	5	80	19	30	6	4.9	●	●	●	●	●	●	●	●	●	●	●	●	●	●
7	1	6	80	19	30	7	5.5	●													
8	1.25	6.8	90	22	35	8	6.2	●	●	●	●	●	●	●	●	●	●	●	●	●	●
10	1.5	8.5	100	24	39	10	8	●	●	●	●	●	●	●	●	●	●	●	●	●	●

*9630 M1 ~ 1.2 = N-PO

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 1 ~ 1.8	2				
2 ~ 2.6	2				2
3 ~ 10	3	3	3	3	3

96306G	963010	9634	9634TC	
OS-PO	OS-PO	PO-INT	PO-INT	
oversized / maggiorato / übermaß / surcote	oversized / maggiorato / übermaß / surcote			
				
1-5 13 14 15-20	1-5 13 14 15-20	1-5 9 10 15-20	1-5 9 10 15 16 18-20	
PO 	PO 	PO INT 	PO INT 	
HSSE BR	HSSE BR	HSSE BR	HSSE TiCN	
ISO3 (6G)	ISO2+0,10 (6H+0,10)	ISO2 (6H)	ISO2 (6H)	
3.5P-5P B 	3.5P-5P B 	3.5P-5P B 	3.5P-5P B 	
Stock	Stock	Stock	Stock	
				D
				M 1
				1.2
				1.4
				1.6
		●	○	2
		●	○	2.2
		●	○	2.5
		●	○	2.6
●		●	○	3
●	●	●	●	3.5
●	●	●	●	4
●	●	●	●	5
●	●	●	●	6
●	●	●	●	7
●	●	●	●	8
●	●	●	○	10
				p
				0.25
				0.25
				0.3
				0.35
				0.4
				0.45
				0.45
				0.45
				0.5
				0.6
				0.7
				0.8
				1
				1
				1.25
				1.5

● stock standard ○ non-standard stock △ on request EX stock exhaustion

				M 1 ~ 1.8
				2 ~ 2.6
3	3	3	3	3 ~ 10



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	5~15	10~25
9~10	4~8	6~12
13~14	8~15	12~25
15~20	10~20	15~25



MATERIAL GROUPS / GRUPPI MATERIE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 15-20	1-5 9 10	1-5 9 10 13 14 15 16 18-20	1-5 9 10	1-5 9 10 13 14 15-20
								PO	PO	PO	PO	PO
								HSSE BR	HSSE OX	HSSE TiCN	HSSE PV15	HSSE TiN
								ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)
								3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B	3.5P-5P B
D	p	Ø	L	I	d	k		Stock	Stock	Stock	Stock	Stock
M 3	0.5	2.5	56	11	2.2		○					
4	0.7	3.3	63	13	2.8	2.1	●					
5	0.8	4.2	70	16	3.5	2.7	●					
6	1	5	80	19	4.5	3.4	●	○	○			○
8	1.25	6.8	90	22	6	4.9	●	○	○			○
10	1.5	8.5	100	24	7	5.5	●	○	○			○
12	1.75	10.3	110	29	9	7	●	●	●	●	●	●
14	2	12	110	30	11	9	●	●	●	●	●	●
16	2	14	110	32	12	9	●	●	●	●	●	●
18	2.5	15.5	125	34	14	11	●	○	●	○	●	●
20	2.5	17.5	140	34	16	12	●	●	●	○	●	●
22	2.5	19.5	140	34	18	14.5	●		○			○
24	3	21	160	38	18	14.5	●		●			●
27	3	24	160	38	20	16	●					○
30	3.5	26.5	180	45	22	18	●					○
33	3.5	29.5	180	50	25	20	●					
36	4	32	200	56	28	22	●					

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 24	3	3	3	3	3
27 ~ 36	4		4		4

97306G	973010	9734	9734TC	
OS-PO	OS-PO	PO-INT	PO-INT	
oversized / maggiorato / übermaß / surcote	oversized / maggiorato / übermaß / surcote			
				
1-5 13 14 15-20	1-5 13 14 15-20	1-5 9 10 15-20	1-5 9 10 15 16 18-20	
PO 	PO 	PO INT 	PO INT 	
HSSE BR	HSSE BR	HSSE BR	HSSE TiCN	
ISO3 (6G)	ISO2+0,10 (6H+0,10)	ISO2 (6H)	ISO2 (6H)	
3.5P-5P B 	3.5P-5P B 	3.5P-5P B 	3.5P-5P B 	
Stock	Stock	Stock	Stock	
				D
				M 3
				4
				5
				6
		○		8
		○		10
●	○	●	○	12
○		○	○	14
○		○	○	16
		○		18
		○		20
				22
				24
				27
				30
				33
				36

● stock standard ○ non-standard stock △ on request EX stock exhaustion

3	3	3	3	M 3 ~ 24
				27 ~ 36

M

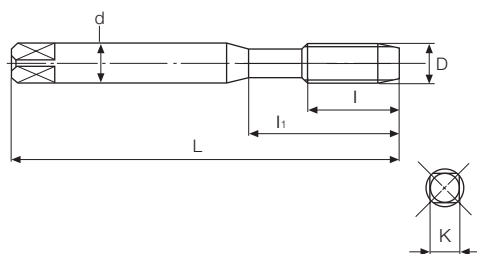
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MATERIAL GROUP	Vc (m/min)	
	BR-0X-NX-NI	TiN-TiCN PV15
3 - 4 - 5	10~20	15~30
6 - 7	5~10	8~15
9~12	5~15	10~20
13 - 14	8~15	12~30
15~20	10~20	15~30
21-23-25-26	5~10	
22 - 24	3~10	



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE



								3 4 6 7	4 5 6 7	4 5 6 7	5 6 7	15-20
								9-12	13 14 18-20	13 14 23 25		
								22 23 24 25	21 23 25 26			
								PO	L15°	L15°	PO	STR
								HSS-P	HSS-P	HSS-P	HSS/Co	HSSE
								NX	NI	TiCN	BR	NI
								ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)
								3.5P-5P B	3.5P-5P D	3.5P-5P D	3.5P-5P B	3.5P-5P D
D	p	Ø	L	l	l1	d	k	Stock	Stock	Stock	Stock	Stock
M 2	0.4	1.6	45	8		2.8	2.1					
2.5	0.45	2.1	50	9		2.8	2.1					
3	0.5	2.5	56	11	18	3.5	2.7	●	●	○	●	●
4	0.7	3.3	63	13	21	4.5	3.4	●	●	○	●	●
5	0.8	4.2	70	16	25	6	4.9	●	●	○	●	●
6	1	5	80	19	30	6	4.9	●	●	○	●	●
8	1.25	6.8	90	22	35	8	6.2	●	●	○	●	●
10	1.5	8.5	100	24	39	10	8	●	●	○	●	●

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 2 ~ 2.5
3 ~ 6
8 ~ 10

3 3 3 3 4

M (MJ)

9623TC			96350X			9635TC		
LA-O			PO-VA			PO-VA		
								
15 16 18-20			1-5 9-11			1-5 9-11		
STR 			PO 			PO 		
HSSE TiCN			HSSE OX			HSSE TiCN		
ISO2X (6HX)			ISO2X (6HX)			ISO2X (6HX)		
3.5P~5P D			3.5P~5P B			3.5P~5P B		
Stock			Stock			Stock		
			●					
			●					
○			●			●		
○			●			●		
○			●			●		
○			●			●		
○			●			●		
○			●			●		
			●					

M

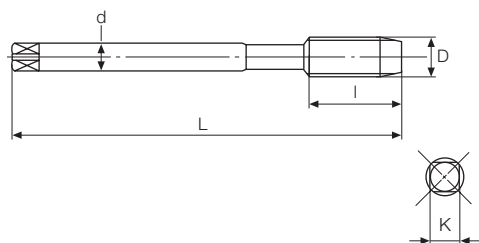
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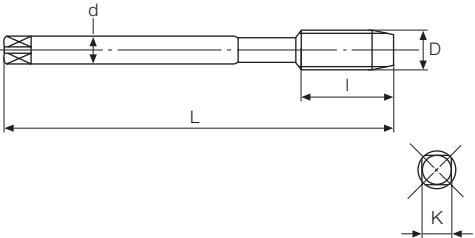


MATERIAL GROUP	Vc (m/min)	
	BR-0X-NX-NI	TiN-TiCN PV15
3 - 4 - 5	10~20	15~30
6 - 7	5~10	8~15
9~12	5~15	10~20
13 - 14	8~15	12~30
15~20	10~20	15~30
21-23-25-26	5~10	
22 - 24	3~10	



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE							3467 9-12 22232425	4567 131418-20 21232526	4567 13142325	567	15-20
							 HSS-P NX ISO2X (6HX) 3.5P-5P B	 HSS-P NI ISO2X (6HX) 3.5P-5P D	 HSS-P TiCN ISO2X (6HX) 3.5P-5P D	 HSS/Co BR ISO2X (6HX) 3.5P-5P B	 HSSE NI ISO2X (6HX) 3.5P-5P D
D	p	Ø	L	l	d	k	Stock	Stock	Stock	Stock	Stock
M 8	1.25	6.8	90	22	6	4.9					
10	1.5	8.5	100	24	7	5.5					
12	1.75	10.3	110	29	9	7	●	●	○	●	●
14	2	12	110	30	11	9	○	○	○	●	○
16	2	14	110	32	12	9	●	○	○	●	○
18	2.5	15.5	125	34	14	11	○			●	
20	2.5	17.5	140	34	16	12	●			●	
22	2.5	19.5	140	34	18	14.5				○	
24	3	21	160	38	18	14.5	●			●	
27	3	24	160	38	20	16					
30	3.5	26.5	180	45	22	18					
36	4	32	200	56	28	24					

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 8 ~24	3	3	3	3	4
27 ~36					

M (MJ)

9723TC				97350X				9735TC			
LA-O				PO-VA				PO-VA			
											
15 16 18-20				1-5 9-11				1-5 9-11			
											
											
											
											
											
Stock				Stock				Stock			
				●							
				●							
○				●				●			
				●				○			
				●				●			
				●							
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M

**DIN371
DIN376**



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1 ~ 5	10~20	15~30
9 - 10		8~15
13 - 14	10~20	15~30
15~20	10~20	15~30

96300H 9630TCOH

PO-OH

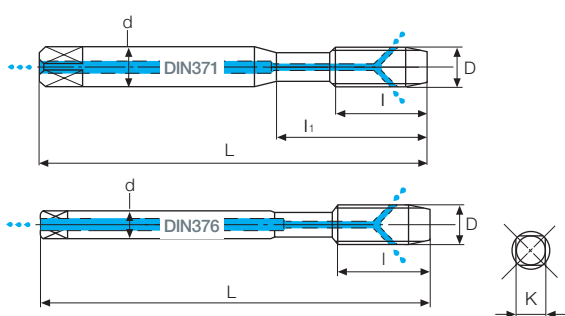
PO-OH



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 13
14 15-20

1-5 9 10 13
14 15 16 18-20



D	p		L	I	I1	d	k	Stock	Stock	
•DIN371										
M 6	1	5	80	19	30	6	4.9	○	○	
8	1.25	6.8	90	22	35	8	6.2	○	○	
10	1.5	8.5	100	24	39	10	8	○	○	
•DIN376									97300H	9730TCOH
12	1.75	10.3	110	29		9	7	○	○	
14	2	12	110	30		11	9	○	○	
16	2	14	110	32		12	9	○	○	

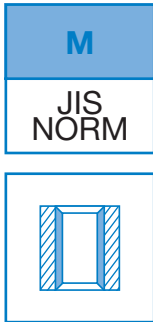
● stock standard ○ non-standard stock △ on request EX stock exhaustion



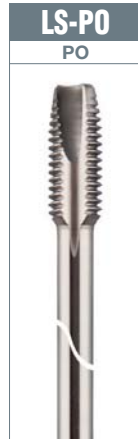
M 6 ~ 16

3

3



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	
13-14	8~15	
15-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								
PO HSSE BR P CLASS 5 P 1-5 13 14 15-20								
D	p		L	l	l1	d	k	Stock
M 3	0.5	2.5	100	11	18	4	3.2	● (P2)
4	0.7	3.3	100	13	21	5	4	● (P2)
5	0.8	4.2	100	16	25	5.5	4.5	● (P2)
6	1	5	100	19	30	6	4.5	● (P2)
8	1.25	6.8	100	22		6.2	5	● (P3)
3	0.5	2.5	150	11	18	4	3.2	○ (P2)
4	0.7	3.3	150	13	21	5	4	● (P2)
5	0.8	4.2	150	16	25	5.5	4.5	● (P2)
6	1	5	150	19	30	6	4.5	● (P2)
8	1.25	6.8	150	22		6.2	5	● (P3)
10	1.5	8.5	150	24		7	5.5	● (P3)
12	1.75	10.3	150	29		8.5	6.5	● (P4)
14	2	12	150	30		10.5	8	○ (P4)
16	2	14	150	32		12.5	10	● (P4)
18	2.5	15.5	150	37		14	11	○ (P4)
20	2.5	17.5	150	37		15	12	○ (P4)
10	1.5	8.5	200	24		7	5.5	○ (P3)
12	1.75	10.3	200	29		8.5	6.5	○ (P4)
14	2	12	200	30		10.5	8	○ (P4)
16	2	14	200	32		12.5	10	● (P4)
18	2.5	15.5	200	37		14	11	○ (P4)
20	2.5	17.5	200	37		15	12	○ (P4)
24	3	21	200	45		19	15	○ (P4)

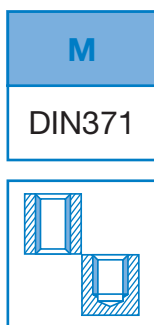
P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 24

3



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1 ~ 5	10~20	15~40
9 - 10 - 11	5~15	10~30
15~20	10~25	20~40

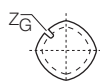


MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1~5 9~11 15~20		1~5 9~11 15~20		15~20	15~20	1 2 9 10
								OL-RZ		HP-RZ		N-RS	N-RS	N-RZ
								HSS-P TiCN		HSS-P TiCN		HSSE NI	HSSE TiN	HSSE OX
								ISO2X (6HX)		ISO2X (6HX)		ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)
								4P		2P		2P~3P C	2P~3P C	2P~3P C
D	p	Ø	L	l	l1	d	k	Stock		Stock		Stock	Stock	Stock
M 1	0.25	0.96	32	5.5		3	2.5	○*		○*				
1.2	0.25	1.15	32	5.5		3	2.5	○*		○*				
1.4	0.3	1.25	36	7		3	2.5	○*		○*				
1.6	0.35	1.45	36	8		3	2.5	○*		○*				
2	0.4	1.85	45	8		2.8	2.1		●			●		○
2.5	0.45	2.3	50	9		2.8	2.1		●			○		○
3	0.5	2.8	56	11	18	3.5	2.7	○	●			●		○
3.5	0.6	3.25	56	13	20	4	3							○
4	0.7	3.7	63	13	21	4.5	3.4	○	●			●		●
5	0.8	4.65	70	16	25	6	4.9	○	●			●		●
6	1	5.55	80	19	30	6	4.9	○	●			●		●
8	1.25	7.5	90	22	35	8	6.2		●			●		●
10	1.5	9.4	100	24	39	10	8		●			○		○

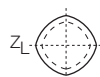
*1355TC M1 ~ M1.6 = OL-RZ JIS

1356TC M1 ~ M1.6 = HP-RZ JIS

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 1 ~ 2.5	0	0	0	0	0
3 ~ 6	0	2	1	1	4
8		3	1	1	3
10		4	1	1	4



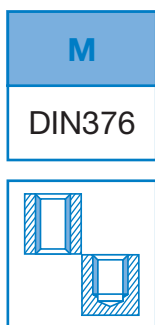
M 1 ~ 1.6	3	3	3	3	3
2 ~ 6	4	4	4	4	4
8		6	6	6	6
10		8	6	6	8

9352	9352TI	9353	9353TC	9353TI	9354	9354TI	
N-RS-L	N-RS-L	R-D	R-D	R-D	OS-R-D	OS-R-D	
							
15-20	15-20	1 2 15-20	1~4 15-20	1~4 15-20	oversized / maggiorato / übermaß / surcoté 1 2 15-20	oversized / maggiorato / übermaß / surcoté 1~4 15-20	
							
HSSE NI	HSSE TIN	HSSE BR	HSSE TiCN	HSSE TIN	HSSE BR	HSSE TIN	
ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO3X (6GX)	ISO3X (6GX)	
2P~3P C	2P~3P C	2P~3P C	2P~3P C	2P~3P C	2P~3P C	2P~3P C	
Stock	Stock	Stock	Stock	Stock	Stock	Stock	
							D p
							M 1 0.25
							1.2 0.25
							1.4 0.3
							1.6 0.35
9350NI	9350TI	●	○	●	○	○	2 0.4
9350NI	9350TI	●	○	●	○	○	2.5 0.45
○	○	●	○	●	○	○	3 0.5
		●	○	●			3.5 0.6
○	○	●	●	●	●	●	4 0.7
○	○	●	●	●	●	●	5 0.8
○	○	●	●	●	●	●	6 1
○	○	●	●	●	●	●	8 1.25
○	○	●	●	●	○	○	10 1.5

● stock standard ○ non-standard stock △ on request EX stock exhaustion

0	0	0	0	0	0	0	M 1 ~ 2.5
0	0	4	4	4	4	4	3 ~ 6
0	0	3	3	3	3	3	8
0	0	4	4	4	4	4	10

3	3	3	3	3	3	3	M 1 ~ 1.6
4	4	4	4	4	4	4	2 ~ 6
6	6	6	6	6	6	6	8
6	6	8	8	8	8	8	10

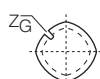


MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1 ~ 5	10~20	15~40
9 - 10 - 11	5~15	10~30
15~20	10~25	20~40



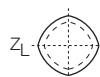
MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 9-11 15-20		1-5 9-11 15-20		15-20	15-20	1 2 9 10
								 HSS-P TiCN ISO2X (6HX) 4P	 HSS-P TiCN ISO2X (6HX) 2P	 HSSE NI ISO2X (6HX) 2P-3P C	 HSSE TiN ISO2X (6HX) 2P-3P C	 HSSE OX ISO2X (6HX) 2P-3P C		
D	p		L	l	l1	d	k	Stock	Stock	Stock	Stock	Stock		
M 12	1.75	11.3	110	29		9	7		●	○	○	○		
14	2	13.10	110	30		11	9		○ NEW			○		
16	2	15.10	110	32		12	9		○ NEW			○		
20	2.5	18.9	140	34		16	12		△ NEW					

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 12 ~20

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 12 ~20

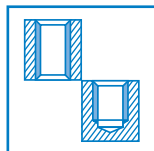
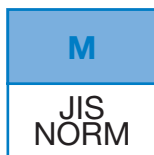
8 6 6 8

9352	9352TI	9353	9353TC	9353TI	9354	9354TI			
N-RS-L	N-RS-L	R-D	R-D	R-D	OS-R-D	OS-R-D			
					 oversized / maggiorato / übermaß / surcoté		 oversized / maggiorato / übermaß / surcoté		
15-20	15-20	1 2 15-20	1-4 15-20	1-4 15-20					
									
HSSE NI	HSSE TIN	HSSE BR	HSSE TiCN	HSSE TIN	HSSE BR	HSSE TIN			
ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO3X (6GX)	ISO3X (6GX)			
2P-3P C	2P-3P C	2P-3P C	2P-3P C	2P-3P C	2P-3P C	2P-3P C			
Stock	Stock	Stock	Stock	Stock	Stock	Stock			
		●	○	●	○	○		D	p
		○	○	○				M 12	1.75
		●	○	●				14	2
								16	2
								20	2.5

● stock standard ○ non-standard stock △ on request EX stock exhaustion

4	4	4	4	4	M 12 ~20
---	---	---	---	---	----------

8	8	8	8	8	M 12 ~20
---	---	---	---	---	----------



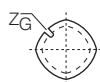
MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
15~20	10~20	



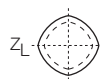
MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								15~20	
								N-RS	
								HSSE	
								NI	
								ISO2X (6HX)	
								2P	
D	p	Ø	L	l	d	k	Stock		
M 3	0.5	2.75	100	11	4	3.2	○ (G6)		
4	0.7	3.69	100	13	5	4	● (G7)		
6	1	5.55	100	19	6	4.5	○ (G7)		

G CLASS page 53

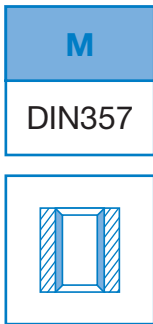
● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 6 1



M 3 ~ 6 4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1 - 2	5~10	
9 - 10	3~7	
17~19	5~10	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									
STR HSS BR ISO2 (6H)									
D	p	Ø	L	l	l1	d	k	Stock	
M 3	0.5	2.5	70	22	16	2.2		○	
4	0.7	3.3	90	25	18	2.8	2.1	●	
5	0.8	4.2	100	28	20	3.5	2.7	●	
6	1	5	110	32	22	4.5	3.4	●	
8	1.25	6.8	125	40	28	6.0	4.9	●	
10	1.5	8.5	140	45	32	7.0	5.5	●	
12	1.75	10.3	180	50	36	9.0	7.0	○	
14	2	12	200	56	36	11.0	9.0	○	
16	2	14	200	63	40	12.0	9.0	○	
18	2.5	15.5	220	63	45	14.0	11.0	○	
20	2.5	17.5	250	70	50	16.0	12.0	○	

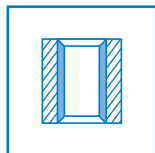
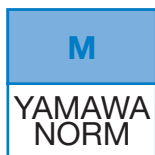
● stock standard ○ non-standard stock △ on request EX stock exhaustion



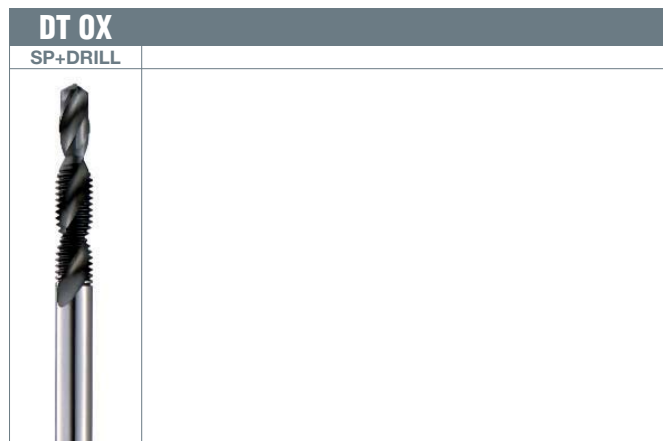
M 3 ~ 20

3

M (MJ)



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1 - 2	5~10	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									1 2	
									35°	
									HSSE	
									OX	
									ISO2 (6H)	
									2 P	
D	p	Ø	L	l	l1	d	k		Stock	
M 3	0.5	2.5	65	10	7	3.5	2.80	●		
4	0.7	3.3	65	12	8	4.0	3.15	●		
5	0.8	4.2	69	15	10	5.0	4.00	●		
6	1	5	84	18	12	6.0	4.50	●		
8	1.25	6.8	96	21	16	8.0	6.30	●		
10	1.5	8.5	108	22	20	10.0	8.00	●		
12	1.75	10.3	113	29	24	12.0	10.00	●		

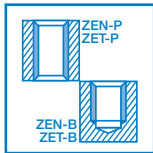
● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 12

2

MJ
DIN371
DIN376



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
4~5	10~20	
6~7	5~10	
9~12	5~15	
13~14	10~15	
21-23-25-26	5~10	
22~24	3~10	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE										4 5 6 7 9-12 22 23 24 25		4 5 6 9-12 22 24		4 5 6 7 13 14 18-20 21 23 25 26		4 5 6 7 13 14 18-20 21 23 25 26	
										HSS-P	HSS-P	HSS-P	HSS-P				
										NX	OX	NI	NI				
										ISO1X (4HX)	ISO1X (4HX)	ISO1X (4HX)	ISO1X (4HX)				
										3.5P-5P B	3P	3.5P-5P D	3P				
D	p		L	l	*	l1	d	k		Stock	Stock	Stock	Stock				
• DIN371																	
MJ 3	0.5	2.6	56	5	11	18	3.5	2.7		○	○	○	○				
4	0.7	3.4	63	7	13	21	4.5	3.4		○	○	○	○				
5	0.8	4.3	70	9	16	25	6	4.9		○	○	○	○				
6	1	5.1	80	11	19	30	6	4.9		○	○	○	○				
8	1.25	6.9	90	12	22	35	8	6.2		○	○	○	○				
10	1.5	8.6	100	13	24	39	10	8		○	○	○	○				
• DIN376										1730JNX	1740JOX	1749JNI	1741JNI				
12	1.75	10.4	110	15	29	42	9	7		○	○	○	○				

*l-ZEN-P / ZET-P

● stock standard ○ non-standard stock △ on request EX stock exhaustion



MJ 3 ~ 12

3

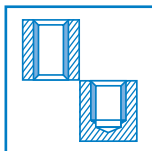
3

3

3

MF

DIN2181



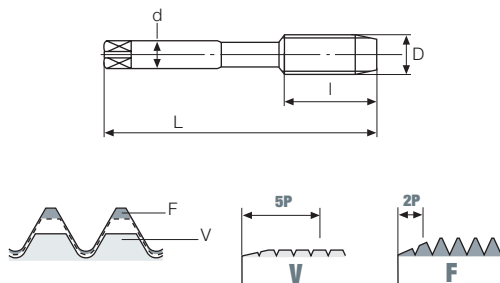
MATERIAL GROUP	Vc (m/min)	
	HAND	MACHINE (6211F)
1-5		5~10
13-14		5~10
16-19-20		5~10

6211

6211 (V-F)

HT

HT


 MATERIAL GROUPS / GRUPPI MATERIALE
 WERKSTOFFEGRUPPE / GROUPES MATIÈRE
1-5 13
14 16 19 201-5 13
14 16 19 20

HSS

BR

ISO2 (6H)



HSS

BR

ISO2 (6H)



D	p	Ø	L	I	d	k	Stock	Stock	Stock
M 3	0.35	2.7	40	9	3.5	2.7	○	○	○
4	0.5	3.5	45	10	4.5	3.4	○	○	○
5	0.5	4.5	50	12	6	4.9	○	○	○
6	0.75	5.3	50	14	6	4.9	○	○	○
6	0.5	5.5	50	14	6	4.9	○	○	○
7	0.75	6.3	50	14	6	4.9	○	○	○
8	1	7	56	22	6	4.9	○	○	○
8	0.75	7.3	50	19	6	4.9	○	○	○
8	0.5	7.5	50	19	6	4.9	○	○	○
9	1	8	63	22	7	5.5	○	○	○
9	0.75	8.3	56	19	7	5.5	○	○	○
10	1.25	8.8	70	24	7	5.5	○	○	○
10	1	9	63	20	7	5.5	○	○	○
10	0.75	9.3	63	20	7	5.5	○	○	○
10	0.5	9.5	63	20	7	5.5	○	○	○
12	1.5	10.5	70	22	9	7	○	○	○
12	1.25	10.8	70	22	9	7	○	○	○
12	1	11	70	22	9	7	○	○	○
14	1.5	12.5	70	22	11	9	○	○	○
14	1.25	12.8	70	22	11	9	○	○	○
14	1	13	70	22	11	9	○	○	○
16	1.5	14.5	70	22	12	9	○	○	○
16	1.25	14.8	70	22	12	9	○	○	○
16	1	15	70	22	12	9	○	○	○

● stock standard ○ non-standard stock △ on request EX stock exhaustion


 M 3 ~ 6
 7 ~

3

4

3

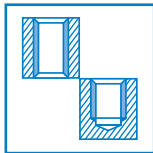
4

3

4

MF

DIN2181



MATERIAL GROUP	Vc (m/min)	
	HAND	MACHINE (6211F)
1-5		5~10
13-14		5~10
16-19-20		5~10



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 16 19 20		1-5 13 14 16 19 20	
								STR	STR		
								HSS	HSS		
								BR	BR		
								ISO2 (6H)	ISO2 (6H)		
								V-F SET	V F		
D	p	Ø	L	I	d	k		Stock		Stock	
M 18	2	16	80	22	14	11		○		○	○
18	1.5	16.5	80	22	14	11		○		○	○
18	1	17	80	22	14	11		○		○	○
20	2	18	80	22	16	12		○		○	○
20	1.5	18.5	80	22	16	12		○		○	○
20	1	19	80	22	16	12		○		○	○
22	2	20	80	22	18	14.5		○		○	○
22	1.5	20.5	80	22	18	14.5		○		○	○
22	1	21	80	22	18	14.5		○		○	○
24	2	22	90	22	18	14.5		○		○	○
24	1.5	22.5	90	22	18	14.5		○		○	○
24	1	23	90	22	18	14.5		○		○	○
25	2	23	90	22	18	14.5		○		○	○
25	1.5	23.5	90	22	18	14.5		○		○	○
26	1.5	24.5	90	22	18	14.5		○		○	○
27	2	25	90	22	20	16		○		○	○
27	1.5	25.5	90	22	20	16		○		○	○
27	1	26	90	22	20	16		○		○	○
28	2	26	90	22	20	16		○		○	○
28	1.5	26.5	90	22	20	16		○		○	○
28	1	27	90	22	20	16		○		○	○
30	1.5	28.5	90	22	22	18		○		○	○
30	1	29	90	22	22	18		○		○	○

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 6

7 ~

3

4

3

4

3

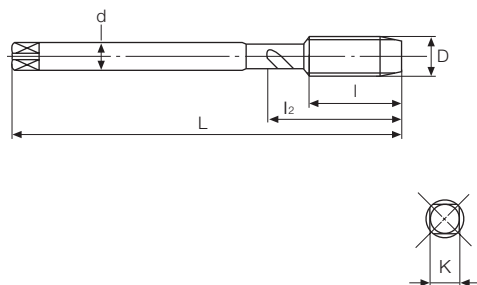
4

MF

DIN374



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	5~20	15~25
6	5~10	
9~12	5~20	8~20
13~14	8~15	12~25
15~20	10~20	15~25
22~24	3~10	


MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE


								4 5 6 9-12 22 24	1-5 13 14 15-20	1-5 9 10	1-5 9 10 13 14	1-5 9 10
								48° HSS-P OX ISO2X (6HX) 3P	40° HSSE BR ISO2 (6H) 2P-3P C	40° HSSE OX ISO2 (6H) 2P-3P C	40° HSSE TiCN ISO2 (6H) 2P-3P C	40° HSSE PV15 ISO2 (6H) 2P-3P C
D	p	Ø	L	l	l2	d	k	Stock	Stock	Stock	Stock	Stock
M 3	0.35	2.7	59	5	17	2.2	-			○		
4	0.5	3.5	63	5	19	2.8	2.1			○		
5	0.5	4.5	70	6	22	3.5	2.7			●		
6	0.75	5.3	80	8	25	4.5	3.4			●		
6	0.5	5.5	80	8	25	4.5	3.4			●		
8	1	7	90	12	28	6	4.9		●	●	●	
8	0.75	7.3	80	10	28	6	4.9			●		
10	1.25	8.8	100	12	35	7	5.5	○	●	●	●	●
10	1	9	90	12	35	7	5.5		●	●	●	
10	0.75	9.3	90	12	35	7	5.5			●		
12	1.5	10.5	100	14	42	9	7	○	●	●	●	●
12	1.25	10.8	100	14	42	9	7	○	●	●	●	●
12	1	11	100	14	42	9	7		●	●	●	
14	1.5	12.5	100	14	49	11	9	○	●	●	●	●
14	1.25	12.8	100	14	49	11	9			●		
14	1	13	100	14	49	11	9			●		
16	1.5	14.5	100	14	56	12	9	○	●	●	●	●
16	1	15	100	14	56	12	9			●		
18	2	16	125	18	63	14	11			○		
18	1.5	16.5	110	14	63	14	11		●	●	○	
18	1	17	110	14	63	14	11			●		

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 10	3	3	3	3	3
12 ~ 16	3	3	3	3	3
18 ~ 20	4	4	4	4	4
22 ~ 36	4	4	4	4	4

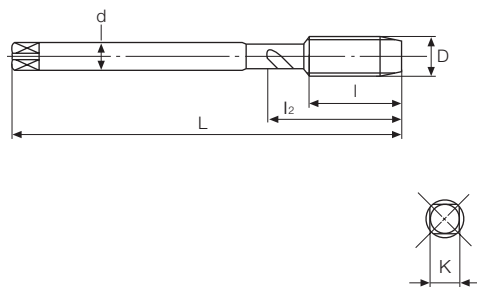
98450X 98480X				
SP-VA	PH-SP			
	SYNCHRO RIGID  ~HRC37			
1~5 9 10	4 5 6			
45° 	40° 			
HSSE	HSSE			
OX	OX			
ISO2 (6H)	ISO2 (6H)			
2P~3P C	3 P			
Stock	Stock			
			D	p
			M 3	0.35
			4	0.5
			5	0.5
			6	0.75
			6	0.5
●	●		8	1
			8	0.75
●	○		10	1.25
●	●		10	1
			10	0.75
●	●		12	1.5
●	○		12	1.25
●	●		12	1
			14	1.5
			14	1.25
			14	1
●	●		16	1.5
			16	1
			18	2
●	○		18	1.5
			18	1
● stock standard	○ non-standard stock	△ on request	EX stock exhaustion	
3	3	M 3~ 10		
3	4	12 ~ 16		
4	4	18 ~ 20		
4	5	22 ~ 36		

MF

DIN374



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	5~20	15~25
6	5~10	
9~12	5~20	8~20
13~14	8~15	12~25
15~20	10~20	15~25
22~24	3~10	


MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE


4 5 6 9-12 22 24	1-5 13 14 15-20	1-5 9 10	1-5 9 10 13 14	1-5 9 10
48°	40°	40°	40°	40°
HSS-P OX	HSSE BR	HSSE OX	HSSE TiCN	HSSE PV15
ISO2X (6HX)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)
3P	2P~3P C	2P~3P C	2P~3P C	2P~3P C

D	p	Ø	L	l	l2	d	k	Stock	Stock	Stock	Stock	Stock
M 20	2	18	140	18	70	16	12			●		
20	1.5	18.5	125	14	70	16	12		●	●	○	
20	1	19	125	14	70	16	12			●		
22	2	20	140	18	77	18	14.5			○		
22	1.5	20.5	125	14	77	18	14.5		○	●	○	
22	1	21	125	14	77	18	14.5			○		
24	2	22	140	18	84	18	14.5			●		
24	1.5	22.5	140	18	84	18	14.5		○	●	○	
24	1	23	140	18	84	18	14.5			○		
25	1.5	23.5	140	18	88	18	14.5			●		
26	1.5	24.5	140	18	90	18	14.5			●		
27	2	25	140	20	90	20	16			●		
27	1.5	25.5	140	20	90	20	16			○		
27	1	26	140	20	90	20	16			○		
28	2	26	140	20	90	20	16			○		
28	1.5	26.5	140	20	90	20	16			●		
28	1	27	140	20	90	20	16			○		
30	2	28	150	20	100	22	18			●		
30	1.5	28.5	150	20	100	22	18			●		
30	1	29	150	20	100	22	18			○		
32	1.5	30.5	150	20	100	22	18			●		
33	2	31	160	20	105	25	20			●		
33	1.5	31.5	160	20	105	25	20			○		
35	1.5	33.5	170	20	105	28	22			●		
36	3	33	200	30	105	28	22			●		
36	2	34	170	20	105	28	22			●		
36	1.5	34.5	170	20	105	28	22			○		

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 10	3	3	3	3	3
12 ~ 16	3	3	3	3	3
18 ~ 20	4	4	4	4	4
22 ~ 36	4	4	4	4	4

98450X		98480X	
SP-VA		PH-SP	
			
		SYNCHRO RIGID	
		~HRC37	
1~5 9 10		4 5 6	
			
HSSE		HSSE	
OX		OX	
ISO2 (6H)		ISO2 (6H)	
			
Stock	Stock	D	
		M 20	2
●	●	20	1.5
		20	1
		22	2
●	○	22	1.5
		22	1
	●	24	2
●	○	24	1.5
		24	1
		25	1.5
		26	1.5
	○	27	2
		27	1.5
		27	1
		28	2
		28	1.5
		28	1
	●	30	2
	○	30	1.5
		30	1
		32	1.5
		33	2
		33	1.5
		35	1.5
		36	3
		36	2
		36	1.5
● stock standard ○ non-standard stock △ on request EX stock exhaustion			
3	3	M 3	~ 10
3	4	12	~ 16
4	4	18	~ 20
4	5	22	~ 36

MF

JIS
NORM



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	
13-14	8~15	
15-20	10~20	

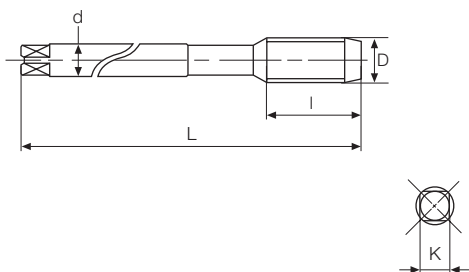
LS-SP

SP



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 13
14 15-20



HSSE

BR

P
CLASS



D	p	Ø	L	l	d	k	Stock
M 10	1.25	8.8	150	24	7	5.5	○ (P2)
12	1.5	10.5	150	29	8.5	6.5	○ (P2)
12	1.25	10.8	150	29	8.5	6.5	○ (P2)
14	1.5	12.5	150	30	10.5	8	○ (P2)
16	1.5	14.5	150	32	12.5	10	○ (P2)

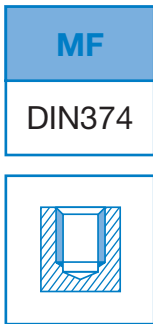
P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 10 ~ 16

3



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~20	10~30
6-7	5~10	8~15
13-14	10~15	15~25
15-20	10~20	15~30
21-23-25-26	5~10	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE							4 5 6 7 13 14 18-20 21 23 25 26		4 5 6 7 13 14 23 25		1-5 13 14 15-20	1-5	1-5 13 14 15 16 18-20
							15°	15°	20°	20°	20°		
							HSS-P NI	HSS-P TiCN	HSSE BR	HSSE OX	HSSE TiCN		
							ISO2X (6HX)	ISO2X (6HX)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)		
							3P	3P	3.5P-5P D	3.5P-5P D	3.5P-5P D		
D	p	Ø	L	l	**	d	k	Stock	Stock	Stock	Stock	Stock	Stock
M 5	0.5	4.5	70	12		3.5	2.7					○	
6	0.75	5.3	80	14		4.5	3.4					○	
8	1	7	90	22		6	4.9				○	●	○
8	0.75	7.3	80	19		6	4.9					○	
10	1.25	8.8	100	24	12	7	5.5	○	○	○		●	○
10	1	9	90	20		7	5.5			○		●	○
12	1.5	10.5	100	22	14	9	7	○	○	○		●	○
12	1.25	10.8	100	22	14	9	7	○	○	○		●	○
12	1	11	100	22		9	7			○		○	○
14	1.5	12.5	100	22		11	9	○	○	○		●	○
14	1	13	100	22		11	9					○	
16	1.5	14.5	100	22		12	9	○	○	○		●	○
16	1	15	100	22		12	9					○	
18	2	16	125	34		14	11					○	
18	1.5	16.5	110	25		14	11					●	
20	2	18	140	34		16	12					○	
20	1.5	18.5	125	25		16	12					●	
22	1.5	20.5	125	25		18	14.5					●	
24	2	22	140	28		18	14.5					○	
24	1.5	22.5	140	28		18	14.5					○	
25	1.5	23.5	140	28		18	14.5					○	
27	2	25	140	28		20	16					○	
30	1.5	28.5	150	28		22	18					○	

*M3 ~ M24 LOSP = 20°

*M25 ~ LOSP = 15°

**I-1841..

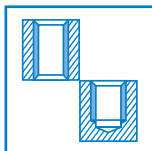


M 5 ~ 16	3	3	3	3	3
18 ~ 30	4	4	4	4	4

● stock standard ○ non-standard stock △ on request EX stock exhaustion

MF

DIN374



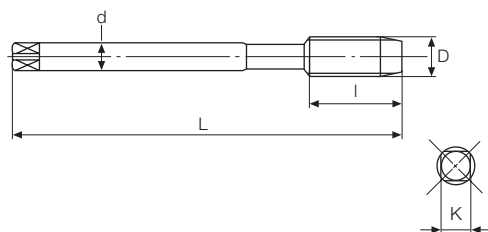
MATERIAL GROUP	Vc (m/min)	
	BR-0X-NX-NI	TiN-TiCN PV15
1-5	5~10	
6-7	3~8	
13-14	10~20	15~30
16-19-20	10~20	15~30
21	3~5	


MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

5 6 7

1-5 13 14
16 19 20

13 14 16
19 20 21

13 14 16
19 20

HSS/Co
BR

ISO2X
(6HX)

2P-3P
C

HSSE
BR

ISO2
(6H)

2P-3P
C

HSSE
NI

ISO2X
(6HX)

2P-3P
C

HSSE
TiCN

ISO2X
(6HX)

2P-3P
C

D	p	Ø	L	I	d	k	Stock	Stock	Stock	Stock
M 8	1	7	90	22	6	4.9	○	○	○	○
10	1.25	8.8	100	24	7	5.5	○	○	●	●
10	1	9	90	20	7	5.5	○	○	●	●
12	1.5	10.5	100	22	9	7	○	○	●	●
12	1.25	10.8	100	22	9	7	○	○	●	●
12	1	11	100	22	9	7	○	○	●	○
14	1.5	12.5	100	22	11	9	○	○	●	●
14	1	13	100	22	11	9	○	○	○	○
16	1.5	14.5	100	22	12	9	○	○	●	●
16	1	15	100	22	12	9	○	○	○	○
18	1.5	16.5	110	25	14	11	○	○	●	●
18	1	17	110	25	14	11	○	○	○	○
20	2	18	140	34	16	12	○	○	○	○
20	1.5	18.5	125	25	16	12	○	○	●	●
20	1	19	125	25	16	12	○	○	○	○
22	1.5	20.5	125	25	18	14.5	○	○	●	●
22	1	21	125	25	18	14.5	○	○	○	○
24	2	22	140	28	18	14.5	○	○	○	○
24	1.5	22.5	140	28	18	14.5	○	○	●	●
24	1	23	140	28	18	14.5	○	○	○	○
25	1.5	23.5	140	28	18	14.5	○	○	○	○
26	1.5	24.5	140	28	18	14.5	○	○	○	○
27	2	25	140	28	20	16	○	○	○	○
28	1.5	26.5	140	28	20	16	○	○	○	○
30	2	28	150	28	22	18	○	○	○	○

● stock standard ○ non-standard stock △ on request EX stock exhaustion


M 8 ~ 24
25 ~ 36

4

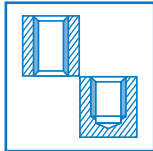
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4

4

4

MF

DIN374



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
6-7	3~8	
13-14	10~20	15~30
16-19-20	10~20	15~30
21	3~5	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								5 6 7	1-5 13 14 16 19 20	13 14 16 19 20 21	13 14 16 19 20
								STR	STR	STR	STR
								HSS/Co BR	HSSE BR	HSSE NI	HSSE TiCN
								ISO2X (6HX)	ISO2 (6H)	ISO2X (6HX)	ISO2X (6HX)
								2P-3P C	2P-3P C	2P-3P C	2P-3P C
								Stock	Stock	Stock	Stock
D	p	Ø	L	l	d	k					
M 30	1.5	28.5	150	28	22	18			○		
32	1.5	30.5	150	28	22	18			○		
33	1.5	31.5	160	30	25	20			○		
35	1.5	33.5	170	30	28	22			○		
36	3	33	200	56	28	22			○		
36	2	34	170	30	28	22			○		

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 8 ~ 24
25 ~ 36

4

3

4

4

MF

DIN374



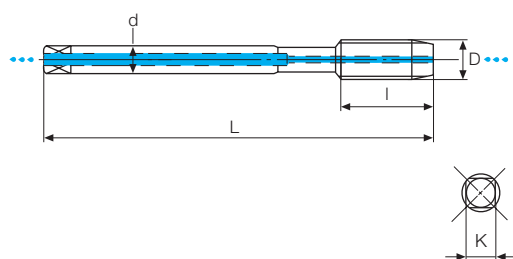
MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
13 - 14	15~25	20~40
16 - 19 - 20	10~20	15~30

9826NIOH 9826TCOH

STR-GG-OH STR-GG-OH



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE



13 14
16 19 20

STR-OH-B	STR-OH-B
HSSE	HSSE
NI	TiCN
ISO2X (6HX)	ISO2X (6HX)
2P~3P C	2P~3P C

D	p	Ø	L	l	d	k	Stock	Stock
MF 8	1	7	90	22	6	4.9	○	○
10	1.25	8.8	100	24	7	5.5	●	●
10	1	9	90	20	7	5.5	●	●
12	1.5	10.5	100	22	9	7	○	○
12	1.25	10.8	100	22	9	7	●	●
12	1	11	100	22	9	7		
14	1.5	12.5	100	22	11	9	●	●
16	1.5	14.5	100	22	12	9	●	●
18	1.5	16.5	110	25	14	11	●	●
20	1.5	18.5	125	25	16	12	●	●

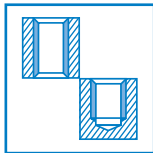
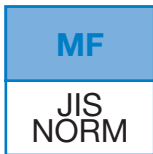
● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 8 ~ 20

4

4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
13-14	8~12	
16-19-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 16 19 20	
								STR HSSE BR P CLASS 1,5 P	
D	p	Ø	L	l	d	k	Stock		
M 10	1.25	8.8	150	24	7	5.5	○ (P2)		
12	1.25	10.8	150	29	8.5	6.5	○ (P2)		
14	1.5	12.5	150	30	10.5	8	○ (P2)		

P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 10 ~ 16

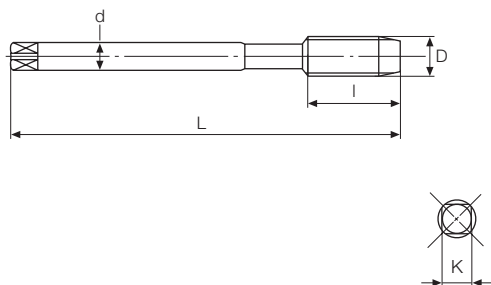
4

MF

DIN374



MATERIAL GROUP	Vc (m/min)	
	BR-0X-NX-NI	TiN-TiCN PV15
1~5	5~20	10~30
6~7	5~10	8~15
9~12	5~20	10~20
13~14	8~15	12~30
15~20	10~20	15~30
21~23~25~26	5~10	
22~24	3~10	


MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE


								4 5 6 7	4 5 6 7	4 5 6 7	5 6	1~5 13
								9-12	13 14 18-20	14 23 25	7 14	14 15-20
								22 23 24 25	21 23 25 26			
								PO	L15°	L15°	PO	PO
								HSS-P	HSS-P	HSS-P	HSS/Co	HSSE
								NX	NI	TiCN	BR	BR
								ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2 (6H)
								3.5P-5P B	3.5P-5P D	3.5P-5P D	3.5P-5P B	3.5P-5P B
D	p	Ø	L	I	d	k		Stock	Stock	Stock	Stock	Stock
M 4	0.5	3.5	63	10	2.8	2.1						○
5	0.5	4.5	70	12	3.5	2.7						○
6	0.75	5.3	80	14	4.5	3.4						●
6	0.5	5.5	80	14	4.5	3.4						○
8	1	7	90	22	6	4.9					○	●
8	0.75	7.3	80	19	6	4.9						○
10	1.25	8.8	100	24	7	5.5	○	○ NEW	○ NEW		○	●
10	1	9	90	20	7	5.5					○	●
10	0.75	9.3	90	20	7	5.5						○
12	1.5	10.5	100	22	9	7	○	○ NEW	○ NEW		○	●
12	1.25	10.8	100	22	9	7	○	○ NEW	○ NEW		○	●
12	1	11	100	22	9	7						●
14	1.5	12.5	100	22	11	9	○	○ NEW	○ NEW		○	●
14	1.25	12.8	100	22	11	9						○
14	1	13	100	22	11	9						●
16	1.5	14.5	100	22	12	9	○	○ NEW	○ NEW		○	●
16	1	15	100	22	12	9						●
18	2	16	125	34	14	11						○
18	1.5	16.5	110	25	14	11					○	●
18	1	17	110	25	14	11						●
20	2	18	140	34	16	12						○
20	1.5	18.5	125	25	16	12					○	●
20	1	19	125	25	16	12						●
22	2	20	140	34	18	14.5						○
22	1.5	20.5	125	25	18	14.5						●
22	1	21	125	25	18	14.5						○
24	2	22	140	28	18	14.5						●
24	1.5	22.5	140	28	18	14.5						●

● stock standard ○ non-standard stock △ on request EX stock exhaustion


M 3 ~ 24
27 ~ 30

3

3

3

3

3

4

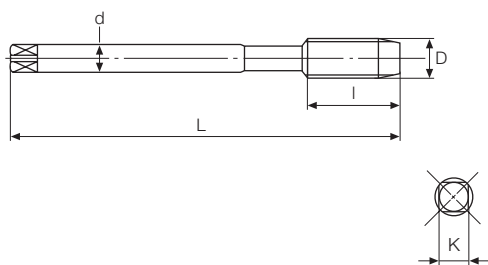
9830TC				9830TH				98350X			
PO				PO				PO-VA			
											
1~5 9 10 13 14 15 16 18-20				1~5 9 10				1~5 9-11			
											
HSSE TiCN				HSSE PV15				HSSE OX			
ISO2 (6H)				ISO2 (6H)				ISO2X (6HX)			
											
Stock				Stock				Stock			
○											
●								●			
○											
●				●				●			
●								●			
●				●				●			
●				●				●			
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○								●			
○											

MF

DIN374



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	5~20	10~30
6~7	5~10	8~15
9~12	5~20	10~20
13~14	8~15	12~30
15~20	10~20	15~30
21~23~25~26	5~10	
22~24	3~10	


MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE


							4 5 6 7 9-12 22 23 24 25	4 5 6 7 13 14 18-20 21 23 25 26	4 5 6 7 13 14 23 25	5 6 7 14	1-5 13 14 15-20
							PO	L15°	L15°	PO	PO
							HSS-P NX	HSS-P NI	HSS-P TiCN	HSS/Co BR	HSSE BR
							ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2X (6HX)	ISO2 (6H)
							3.5P-5P B	3.5P-5P D	3.5P-5P D	3.5P-5P B	3.5P-5P B
D	p	Ø	L	l	d	k	Stock	Stock	Stock	Stock	Stock
M 24	1	23	140	28	18	14.5					○
25	1.5	23.5	140	28	18	14.5					●
26	1.5	24.5	140	28	18	14.5					○
27	2	25	140	28	20	16					○
27	1.5	25.5	140	28	20	16					○
28	2	26	140	28	20	16					○
28	1.5	26.5	140	28	20	16					○
30	2	28	150	28	22	18					●
30	1.5	28.5	150	28	22	18					●

● stock standard ○ non-standard stock △ on request EX stock exhaustion


M 3 ~ 24
27 ~ 30

3

3

3

3

3

4

9830TC				9830TH				98350X			
PO				PO				PO-VA			
											
1-5 9 10 13 14 15 16 18-20				1-5 9 10				1-5 9-11			
											
HSSE TiCN				HSSE PV15				HSSE OX			
ISO2 (6H)				ISO2 (6H)				ISO2X (6HX)			
											
Stock				Stock				Stock			

MF

**JIS
NORM**



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	
13-14	5~15	
15-20	10~20	

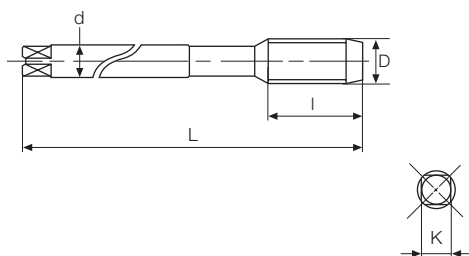
LS-P0

PO



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 13
14 15-20



D	p	Ø	L	l	d	k	Stock
M 10	1.25	8.8	150	24	7	5.5	○ (P3)
12	1.5	10.5	150	29	8.5	6.5	○ (P3)
12	1.25	10.8	150	29	8.5	6.5	○ (P4)
14	1.5	12.5	150	30	10.5	8	○ (P3)
16	1.5	14.5	150	32	12.5	10	● (P3)

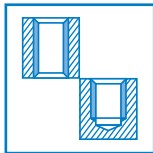
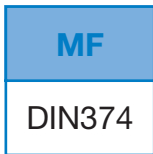
P CLASS page 50

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 10 ~ 16

3



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5		20~40
9 ~ 11		10~30
15~20		20~40

NEW

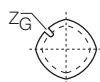
1856TC

HP-RZ



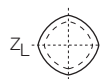
MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1~5 9~11 15~20	
D	p	Ø	L	l	d	k	Stock		
MF10	1.25	9.5	100	24	7	5.5	●		
12	1.5	11.4	100	22	9	7	●		
12	1.25	11.5	100	22	9	7	●		
14	1.5	13.4	100	22	11	9	●		
16	1.5	15.4	100	22	12	9	●		

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 10 ~16

4



M 10 ~16

8

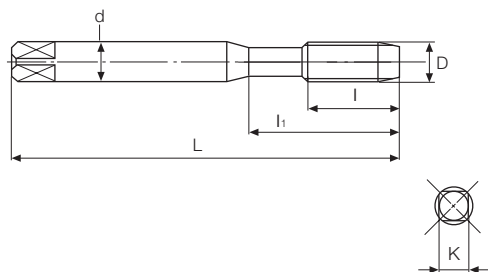
MF

UNC
UNF

DIN371



MATERIAL GROUP	Vc (m/min)	
	BR-0X-NX-NI	TiN-TiCN PV15
1~5	5~20	
6~7	5~10	
9~12	5~20	
13~14	8~12	
15~20	10~20	
21~23-25-26	5~10	
22~24	3~10	


MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE


									4 5 6 9-12 22 24	4 5 6 7 13 14 18-20 21 23 25 26	1-5 13 14 15-20	1-5 9 10		
									48°	15°	40°	45°		
									HSS-P OX	HSS-P NI	HSSE BR	HSSE OX		
									2BX	2BX	2B	2B		
									3P	3P	2P~3P C	2P~3P C		
D	UNC UNF	D(mm)	Ø	L	l	l1	d	k	Stock	Stock	Stock	Stock		
Nr. 4	40	2.845	2.3	56	5	18	3.5	2.7	●	●	●	●		
4	48	2.845	2.4	56	4.5	18	3.5	2.7						
5	40	3.175	2.6	56	5	18	3.5	2.7						
5	44	3.175	2.7	56	5	18	3.5	2.7						
6	32	3.505	2.8	56	6	20	4	3	●	●	●	●		
6	40	3.505	2.9	56	6	20	4	3			●			
8	32	4.166	3.5	63	6.5	21	4.5	3.4	●	●	●	●		
8	36	4.166	3.5	63	6.5	21	4.5	3.4			●			
10	24	4.826	3.9	70	8	25	6	4.9	●	●	●	●		
10	32	4.826	4.1	70	8	25	6	4.9	●	●	●	●		
12	24	5.486	4.5	80	8.5	25	6	4.9						
12	28	5.486	4.5	80	8.5	25	6	4.9						
1/4	20	6.35	5.2	80	10	30	7	5.5	●	●	●	●		
1/4	28	6.35	5.5	80	8.5	30	7	5.5	●	●	●	●		
5/16	18	7.938	6.6	90	11	35	8	6.2	●	●	●	●		
3/8	16	9.525	8	100	13	39	9	7	●	●	●	●		

● stock standard ○ non-standard stock △ on request EX stock exhaustion



Nr. 4 ~ 3/8

3

3

3

3



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	5~20	
6~7	5~10	
9~12	5~20	
13~14	8~12	
15~20	10~20	
21~23-25-26	5~10	
22~24	3~10	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE													
										4 5 6 9-12 22 24	4 5 6 7 13 14 18-20 21 23 25 26	1-5 13 14 15-20	1-5 9 10
										48° HSS-P OX 2BX 3P	15° HSS-P NI 2BX 3P	40° HSSE BR 2B 2P-3P C	45° HSSE OX 2B 2P-3P C
										Stock	Stock	Stock	Stock
D	UNC UNF	D(mm)	Ø	L	l	l2	d	k					
5/16	24	7.938	6.9	90	9	35	6	4.9	●	●	●	●	
3/8	24	9.525	8.5	100	9	39	7	5.5	●	●	●	●	
7/16	14	11.112	9.4	100	14	42	8	6.2			●	●	
7/16	20	11.112	9.9	100	14	42	8	6.2			●	●	
1/2	13	12.7	10.75	110	15	45	9	7	●	●	●	●	
1/2	20	12.7	11.5	100	15	45	9	7	●	●	●	●	
9/16	12	14.288	12.25	110	17	52	11	9			●	●	
9/16	18	14.288	12.9	100	17	52	11	9			●	●	
5/8	11	15.875	13.6	110	18	59	12	9	○ NEW	○	●	●	
5/8	18	15.875	14.5	100	17	59	12	9	○ NEW		●	●	
3/4	10	19.05	16.5	125	20	66	14	11	○ NEW	○	●	●	
3/4	16	19.05	17.5	110	17	66	14	11	○ NEW		●	●	
7/8	9	22.225	19.5	140	22	73	18	14.5	○ NEW		●	●	
7/8	14	22.225	20.5	125	18	73	18	14.5	○ NEW		●	●	
1	8	25.4	22.25	160	25	87	18	14.5	○ NEW		●	●	
1	12	25.4	23.3	140	18	87	18	14.5	○ NEW		●	●	
1 1/8	7	28.575	25	180	35	85	22	18				○ NEW	
1 1/8	12	28.575	26.5	150	22	70	22	18				○ NEW	
1 1/4	7	31.75	28	180	35	85	22	18				○ NEW	
1 1/4	12	31.75	29.5	150	22	70	22	18				○ NEW	
1 3/8	6	34.925	30.75	200	40	100	28	22				○ NEW	
1 3/8	12	34.925	32.75	170	24	80	28	22				○ NEW	
1 1/2	6	38.1	34	200	40	100	28	22				○ NEW	
1 1/2	12	38.1	36	170	24	80	28	22				○ NEW	

● stock standard ○ non-standard stock △ on request EX stock exhaustion



5/16 ~ 9/16	3	3	3	3
5/8	3	4	3	3
3/4 ~ 1 1/2	4	4	4	4

UN-8

DIN376



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	5~15	
9~10	5~12	

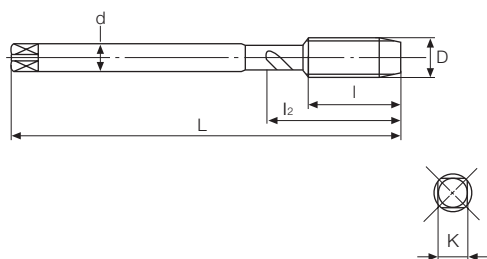
NEW

94450X

SP-VA


 MATERIAL GROUPS / GRUPPI MATERIALE
 WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 9 10



HSSE

OX

2B



D	UN-8	D(mm)	Ø	L	l	l2	d	k	Stock	
1 1/8	8	28.575	25.4	180	28	85	22	18	○	
1 1/4	8	31.75	28.6	180	28	85	22	18	○	
1 3/8	8	34.925	31.75	200	30	100	28	22	○	
1 1/2	8	38.1	35	200	30	100	28	22	○	
1 5/8	8	41.275	38.1	200	30	100	32	24	○	
1 3/4	8	44.45	41.3	200	40	100	36	29	○	
2	8	50.8	47.7	225	40	125	40	32	○	

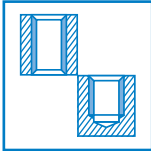
● stock standard ○ non-standard stock △ on request EX stock exhaustion



1 1/8 ~ 2

4

UNC UNF
DIN371 DIN374 DIN376



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
13-14	8~12	
16-19-20	10~20	

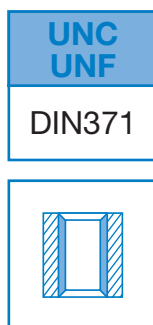


MATERIAL GROUPS / GRUPPI MATERIE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									
D	UNC UNF	D(mm)	Ø	L	l	l1	d	k	Stock
● DIN371									
Nr. 4	40	2.845	2.3	56	11	18	3.5	2.7	
4	48	2.845	2.4	56	11	18	3.5	2.7	
5	40	3.175	2.6	56	11	18	3.5	2.7	
5	44	3.175	2.7	56	11	18	3.5	2.7	
6	32	3.505	2.8	56	12	20	4	3	
6	40	3.505	2.9	56	12	20	4	3	
8	32	4.166	3.5	63	13	21	4.5	3.4	
8	36	4.166	3.5	63	13	21	4.5	3.4	
10	24	4.826	3.9	70	15	25	6	4.9	
10	32	4.826	4.1	70	14	25	6	4.9	
12	24	5.486	4.5	80	16	26	6	4.9	
12	28	5.486	4.6	80	15	26	6	4.9	
1/4	20	6.35	5.2	80	17	30	7	5.5	○
1/4	28	6.35	5.5	80	16	30	7	5.5	○
5/16	18	7.938	6.6	90	20	35	8	6.2	○
3/8	16	9.525	8	100	22	39	9	7	○
● DIN374 - DIN376									
5/16	24	7.938	6.9	90	17	6	4.9	○	
3/8	24	9.525	8.5	100	18	7	5.5	○	
7/16	14	11.112	9.4	100	22	8	6.2	○	
7/16	20	11.112	9.9	100	20	8	6.2	○	
1/2	13	12.7	10.75	110	25	9	7	○	
1/2	20	12.7	11.5	100	22	9	7	○	
9/16	12	14.288	12.25	110	25	11	9	○	
9/16	18	14.288	12.9	100	22	11	9	○	
5/8	11	15.875	13.6	110	28	12	9	○	
5/8	18	15.875	14.5	100	22	12	9	○	
3/4	10	19.05	16.5	125	32	14	11	○	
3/4	16	19.05	17.5	110	25	14	11	○	
7/8	9	22.225	19.5	140	32	18	14.5	○	
7/8	14	22.225	20.5	125	26	18	14.5	○	
1	8	25.4	22.25	160	36	18	14.5	○	
1	12	25.4	23.3	140	28	18	14.5	○	

● stock standard ○ non-standard stock △ on request EX stock exhaustion



Nr. 2	~4	2
5	~ 1/4	3
5/16	~1	4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~5	5~20	
6~7	5~10	
9~12	5~20	
13~14	8~12	
15~20	10~20	
21~23-25-26	5~10	
22~24	3~10	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									1330NX	1349NI	9330	93350X
									ZEN-P	ZET-P	PO	PO-VA
									4 5 6 7 9-12 22 23 24 25	4 5 6 7 13 14 18-20 21 23 25 26	1-5 13 14 15-20	1-5 9-11
									PO HSS-P NX 2BX 3.5P-5P B	L15° HSS-P NI 2BX 3.5P-5P D	PO HSSE BR 2B 3.5P-5P B	PO HSSE OX 2BX 3.5P-5P B
									Stock	Stock	Stock	Stock
D	UNC UNF	D(mm)	Ø	L	l	l1	d	k				
Nr. 4	40	2.845	2.3	56	11	18	3.5	2.7			●	●
4	48	2.845	2.4	56	11	18	3.5	2.7				
5	40	3.175	2.6	56	11	18	3.5	2.7				
5	44	3.175	2.7	56	11	18	3.5	2.7				
6	32	3.505	2.8	56	12	20	4	3	●		●	●
6	40	3.505	2.9	56	12	20	4	3			○	
8	32	4.166	3.5	63	13	21	4.5	3.4	●		●	●
8	36	4.166	3.5	63	13	21	4.5	3.4			○	
10	24	4.826	3.9	70	15	25	6	4.9	●		●	●
10	32	4.826	4.1	70	14	25	6	4.9	●		●	●
12	24	5.486	4.5	80	16	26	6	4.9				
12	28	5.486	4.6	80	15	26	6	4.9				
1/4	20	6.35	5.2	80	17	30	7	5.5	●		●	●
1/4	28	6.35	5.5	80	16	30	7	5.5	●		●	●
5/16	18	7.938	6.6	90	20	35	8	6.2	●		●	●
3/8	16	9.525	8	100	22	39	9	7	●		●	●

● stock standard ○ non-standard stock △ on request EX stock exhaustion



Nr. 4	~ 3/8	3	3	3	3
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MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~20	
6-7	5~10	
9-12	5~20	
13-14	8~12	
15-20	10~20	
21-23-25-26	5~10	
22-24	3~10	

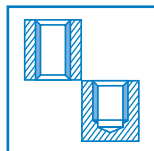


MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE													
										4 5 6 7 9-12 22 23 24 25	4 5 6 7 13 14 18-20 21 23 25 26	1-5 13 14 15-20	1-5 9-11
										PO HSS-P NX 2BX 3.5P-5P B	L15° HSS-P NI 2BX 3.5P-5P D	PO HSSE BR 2B 3.5P-5P B	PO HSSE OX 2BX 3.5P-5P B
D	UNC UNF	D(mm)	Ø	L	I	I1	d	k		Stock	Stock	Stock	Stock
5/16	24	7.938	6.9	90	17	-	6	4.9	●			●	●
3/8	24	9.525	8.5	100	18	-	7	5.5	●			●	●
7/16	14	11.112	9.4	100	22	-	8	6.2				●	○
7/16	20	11.112	9.9	100	20	-	8	6.2				●	
1/2	13	12.7	10.75	110	25	-	9	7	●			●	●
1/2	20	12.7	11.5	100	22	-	9	7	●			●	○
9/16	12	14.288	12.25	110	25	-	11	9				●	○
9/16	18	14.288	12.9	100	22	-	11	9				●	
5/8	11	15.875	13.6	110	28	-	12	9	○ NEW			●	●
5/8	18	15.875	14.5	100	22	-	12	9	○ NEW			●	
3/4	10	19.05	16.5	125	32	-	14	11	○ NEW			●	○
3/4	16	19.05	17.5	110	25	-	14	11	○ NEW			●	
7/8	9	22.225	19.5	140	32	-	18	14.5	○ NEW			●	○
7/8	14	22.225	20.5	125	26	-	18	14.5	○ NEW			●	
1	8	25.4	22.25	160	36	-	18	14.5	○ NEW			●	○
1	12	25.4	23.3	140	28	-	18	14.5	○ NEW			●	
1 1/8	7	28.575	25	180	40	-	22	18					
1 1/8	12	28.575	26.5	150	28	-	22	18					
1 1/4	7	31.75	28	180	40	-	22	18					
1 1/4	12	31.75	29.5	150	28	-	22	18					
1 3/8	6	34.925	30.75	200	50	-	28	22					
1 3/8	12	34.925	32.75	170	30	-	28	22					
1 1/2	6	38.1	34	200	50	-	28	22					
1 1/2	12	38.1	36	170	30	-	28	22					

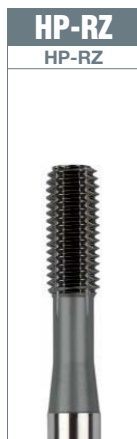
● stock standard ○ non-standard stock △ on request EX stock exhaustion



5/16 ~ 5/8	3	3	3	3
3/4 ~ 1	3	4	3	3
1 1/8 ~ 1 1/2			4	

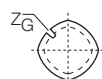


MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5		20~40
9-10-11		10~30
15-20		20~40



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								
1-5 9-11 15-20 HP-RZ HSS-P TiCN 2BX 2P								
D	UNC UNF	D(mm)	Ø	L	l	d	k	Stock
Nr. 2	56	2.184	1.93	42	9.5	3	2.5	Δ (G4)
2	64	2.184	1.97	42	9.5	3	2.5	Δ (G4)
3	48	2.515	2.22	44	9.5	3	2.5	Δ (G4)
3	56	2.515	2.27	44	9.5	3	2.5	Δ (G4)
4	40	2.845	2.53	44	11	3	2.5	Δ (G5)
4	48	2.845	2.58	44	11	3	2.5	Δ (G5)
5	40	3.175	2.86	46	11	4	3.2	Δ (G5)
5	44	3.175	2.89	46	11	4	3.2	Δ (G5)
6	32	3.505	3.11	48	13	4	3.2	Δ (G5)
6	40	3.505	3.19	48	13	4	3.2	Δ (G5)
8	32	4.166	3.77	52	13	5	4	Δ (G6)
8	36	4.166	3.81	52	13	5	4	Δ (G5)
10	24	4.826	4.3	60	16	5.5	4.5	Δ (G6)
10	32	4.826	4.43	60	16	5.5	4.5	Δ (G6)
12	24	5.486	4.96	60	17	5.5	4.5	Δ (G6)
12	28	5.486	5.03	60	17	5.5	4.5	Δ (G6)
1/4	20	6.35	5.78	62	19	6	4.5	Δ (G7)
1/4	28	6.35	5.94	62	19	6	4.5k (G7)	Δ (G7)

● stock standard ○ non-standard stock Δ on request EX stock exhaustion



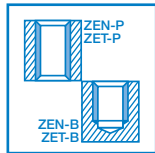
Nr. 2	~4	0
5	~ 1/4	2



Nr. 2~	1/4	4
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**UNJC
UNJF**

**DIN371
DIN374**



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
4-5	10~20	
6-7	5~10	
9-12	5~20	
14	8~12	
18-20	10~20	
21-23-25-26	5~10	
22-24	3~10	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE											4 5 6 7 9-12 22 23 24 25	4 5 6 9-12 22 24	4 5 6 7 13 14 18-20 21 23 25 26	4 5 6 7 13 14 18-20 21 23 25 26
											 HSS-P NX 3BX 3.5P-5P B	 HSS-P OX 3BX 3P	 HSS-P NI 3BX 3.5P-5P D	 HSS-P NI 3BX 3P
D	UNJC	UNJF	D(mm)	Ø	L	l	*	l1	d	k	Stock	Stock	Stock	Stock
• DIN371														
Nr. 4	40		2.745	2.3	56	5	11	18	3.5	2.7				
4	48		2.745	2.4	56	4.5	11	18	3.5	2.7				
6	32		3.505	2.85	56	6	12	20	4	3	○	○	○	○
6	40		3.505	3	56	6	12	20	4	3				
8	32		4.166	3.5	63	6.5	13	21	4.5	3.4	○	○	○	○
8	36		4.166	3.55	63	6.5	13	21	4.5	3.4				
10	24		4.826	3.93	70	8	15	25	6	4.9	○	○	○	○
10	32		4.826	4.15	70	8	14	25	6	4.9	● NEW	● NEW	● NEW	● NEW
1/4	20		6.35	5.25	80	10	17	30	7	5.5	○	○	○	○
1/4	28		6.35	5.55	80	8.5	17	30	7	5.5	● NEW	● NEW	● NEW	● NEW
5/16	18		7.938	6.7	90	11	20	35	8	6.2	○	○	○	○
3/8	16		9.525	8.1	100	13	22	39	9	7	○	○	○	○
• DIN374														
5/16	24		7.938	7	90	9	17		6	4.9	● NEW	● NEW	● NEW	● NEW
3/8	24		9.525	8.6	100	9	18		7	5.5	● NEW	● NEW	● NEW	● NEW

*1-ZEN-P / ZET-P

● stock standard ○ non-standard stock △ on request EX stock exhaustion



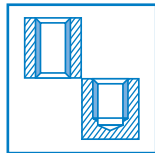
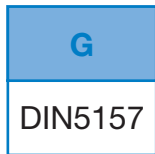
Nr. 4 ~ 3/8

3

3

3

3



MATERIAL GROUP	Vc (m/min)	
	HAND	MACHINE (6412F)
1-5		5~10
13-14		5~10
16-19-20		5~10



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 16 19 20		1-5 13 14 16 19 20	
								STR	STR		
								HSS	HSS		
								BR	BR		
								Tol *	Tol *		
								V-F SET	V F		
Dxn	D(mm)	Ø	L	l	d	k		Stock		Stock	
G 1/8x28	9.728	8.75	63	20	7	5.5		●		●	●
1/4x19	13.157	11.8	70	22	11	9		●		●	●
3/8x19	16.662	15.25	70	22	12	9		●		●	●
1/2x14	20.955	19	80	22	16	12		●		●	●
5/8x14	22.911	21	80	22	18	14.5					
3/4x14	26.441	24.5	90	22	20	16		○		○	○
7/8x14	30.201	28.25	90	22	22	18					
1 x11	33.249	30.75	100	25	25	20		○		○	○
1 1/8x11	37.897	35.2	125	40	28	22					
1 1/4x11	41.910	39.2	125	40	32	24					
1 3/8x11	44.320	42	125	40	36	29					
1 1/2x11	47.803	45.2	140	40	36	29					
1 3/4x11	53.746	51.2	140	40	40	32					
2 x11	59.614	57.2	160	40	45	35					

*Tol. page 52

● stock standard ○ non-standard stock △ on request EX stock exhaustion



G 1/8 ~1 1/4	4	4
1 3/8 ~2	6	6

A diagram showing a square hole with a chamfered corner. The hole is represented by a square with a smaller square inside it, and the corner of the inner square is chamfered. The area around the hole is shaded with diagonal lines.

9940	99400X	9940TC	99440X	99450X	99480X
SP	SP	SP	SU2-SP	SP-VA	PH-SP
			 		 ~HRC37

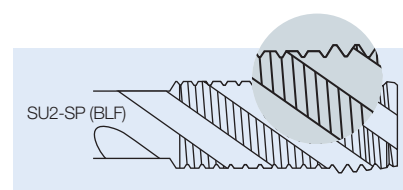
Technical drawing of a cable assembly. The top view shows a cable with diameter d and length L , connected to a connector with outer diameter D . The connector has a length l and a mounting bracket length l_2 . The bottom view shows the same cable assembly with the label "SU2-SP" on the cable. A cross-section view labeled "K" shows the cable's internal structure with a central conductor and insulation.

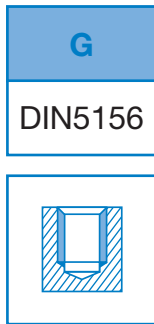
**-9944OX

● stock standard ○ non-standard stock △ on request EX stock exhaustion



G 1/8	3	3	3	3	3
1/4 ~ 3/8	3	3	3	3	4
1/2 ~ 5/8	4	4	4	4	4
3/4~1	4	4	4	4	5
1 1/4~1 1/2		4			





MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	10~20
13-14	10~15	15~25
15-20	10~20	15~25



GRUPPI MATERIALE / MATERIAL GROUPS WERKSTOFFEGRUPPE / GROUPES MATIÈRE										
								1-5 13 14 15-20	1-5	1-5 13 14 15 16 18-20
								HSSE BR	HSSE OX	HSSE TiCN
								Tol *	Tol *	Tol *
Dxn	D(mm)	Ø	L	l	d	k		Stock	Stock	Stock
G 1/8x28	9.728	8.75	90	20	7	5.5	●	●	●	
1/4x19	13.157	11.8	100	22	11	9	●	●	●	
3/8x19	16.662	15.25	100	22	12	9	○	●	○	
1/2x14	20.955	19	125	25	16	12	○	●	○	
3/4x14	26.441	24.5	140	28	20	16		○		
1 x11	33.249	30.75	160	30	25	20			○	

*Tol. page 52

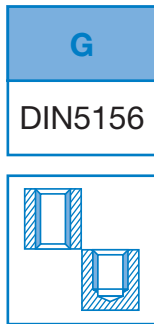
**G 1/8 ~ G 5/8 LOSP = 20°

**G 3/4 ~ LOSP = 15°

● stock standard ○ non-standard stock △ on request EX stock exhaustion



G 1/8 ~ 3/8	3	3	3
1/2 ~ 1	4	4	4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
6-7	3~8	
13-14	10~20	15~30
16-19-20	10~20	15~30
21	3~5	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE											
								5 6 7	1-5 13 14 16 19 20	13 14 16 19 20 21	13 14 16 19 20
								STR	STR	STR	STR
								HSS/Co BR	HSSE BR	HSSE NI	HSSE TiCN
								Tol *	Tol *	Tol *	Tol *
								2P-3P C	2P-3P C	2P-3P C	2P-3P C
Dxn	D(mm)	Ø	L	l	d	k		Stock	Stock	Stock	Stock
G 1/8x28	9.728	8.75	90	20	7	5.5	●	○	●	●	
1/4x19	13.157	11.8	100	22	11	9	●	○	●	●	
3/8x19	16.662	15.25	100	22	12	9	●	○	●	●	
1/2x14	20.955	19	125	25	16	12	●	○	●	●	
3/4x14	26.441	24.5	140	28	20	16			●	○	
1 x11	33.249	30.75	160	30	25	20			●	○	

*Tol. page 52

● stock standard ○ non-standard stock △ on request EX stock exhaustion

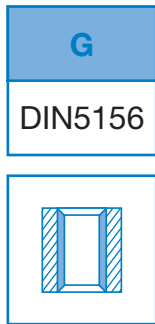

G 1/8 ~ 1/2
3/4 ~ 1

4
4

3
4

4
4

4
4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	10~25
9-10	3~7	5~10
13-14	8~15	12~25
15-20	10~20	15~25



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 15-20		1-5 9 10 13 14 15 16 18-20	
 								 PO HSSE BR Tol 3.5P-5P B	 PO HSSE OX Tol 3.5P-5P B	 PO HSSE TiCN Tol 3.5P-5P B	
Dxn	D(mm)	Ø	L	l	d	k	Stock	Stock	Stock		
G 1/8x28	9.728 8.75		90	20	7 5.5		●	●	●		
1/4x19	13.157 11.8		100	22	11 9		●	●	●		
3/8x19	16.662 15.25		100	22	12 9		●	●	●		
1/2x14	20.955 19		125	25	16 12		●	●	●		
5/8x14	22.911 21		125	25	18 14.5		○				
3/4x14	26.441 24.5		140	28	20 16		●	●	○		
7/8x14	30.201 28.25		150	28	22 18						
1 x11	33.249 30.75		160	30	25 20		●	●	○		
1 1/4x11	41.910 39.2		170	30	32 24		●				
1 1/2x11	47.803 45.2		190	32	36 29		●				

*Tol. page 52

● stock standard ○ non-standard stock △ on request EX stock exhaustion

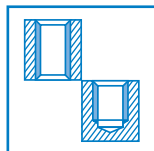


G 1/8 ~ 5/8
3/4 ~ 1 1/2

3
4

3
4

3
4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
13-14	8~12	
16-19-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 16 19 20	
								STR HSSE BR Tol * 3P	
Dxn	D(mm)	Ø	L	l	d	k	Stock		
G1/8 x28	9.147	8.75	150	19	8	6	●		
1/4 x19	12.301	11.8	150	28	11	9	●		
3/8 x19	15.806	15.25	150	28	14	11	○		
1/2 x14	19.793	19	150	35	18	14	○		

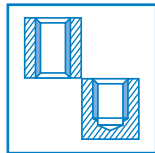
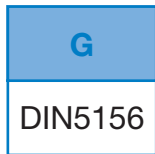
*Tol. page 52

● stock standard ○ non-standard stock △ on request EX stock exhaustion



G 1/8 ~ 1/2

4



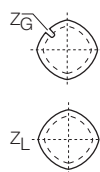
MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1~4	10~20	15~30
15~20	10~20	15~30



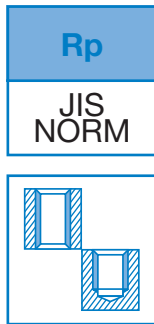
MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1 2 15-20		1-4 15-20	
								R-D		R-D	
								HSSE		HSSE	
								BR		TiN	
								Tol *		Tol *	
								2P~3P C		2P~3P C	
Dxn	D(mm)	Ø	L	I	d	k		Stock		Stock	
G 1/8x28	9.728	9.25	90	20	7	5.5		●		●	
1/4x19	13.157	12.5	100	22	11	9		●		●	
3/8x19	16.662	16.0	100	22	12	9		●		●	

*Tol. page 52

● stock standard ○ non-standard stock △ on request EX stock exhaustion



G 1/8 ~ 3/8	4	4
G 1/8 ~ 3/8	8	8



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
13-14	8~12	
16-19-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 16 19 20	1-5 13 14 16 19 20	1-5 13 14 16 19 20
								STR	STR	STR
								HSSE BR	HSSE BR	HSSE BR
								3,5 P	3,5 P	3,5 P
Dxn	D(mm)	Ø	L	I	d	k		Stock	Stock	Stock
Rp 1/8x28	9.728	8.5	55	19	8	6		○		
	9.728	8.5	100	19	8	6			○	
	9.728	8.5	150	19	8	6				○
1/4x19	13.157	11.4	62	28	11	9		○		
	13.157	11.4	100	28	11	9			○	
	13.157	11.4	150	28	11	9				○
3/8x19	16.662	14.9	65	28	14	11		○		
	16.662	14.9	100	28	14	11			○	
	16.662	14.9	150	28	14	11				○
1/2x14	20.955	18.6	80	35	18	14		○		
	20.955	18.6	150	35	18	14				○
3/4x14	26.441	24	85	35	23	17		○		
	26.441	24	150	35	23	17				○
1 x11	33.249	30.2	95	45	26	21		○		
	33.249	30.2	150	45	26	21				○
1 1/4x11	41.910	38.8	105	45	32	26		○		
1 1/2x11	47.803	44.7	110	45	38	29		○		
2 x11	59.614	56.5	120	50	46	35		○		

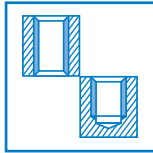
● stock standard ○ non-standard stock △ on request EX stock exhaustion



Rp 1/8 ~ 3/8	4	4	4
1/2 ~ 3/4	4		4
1 ~ 1 1/4	5		5
1 1/2 ~ 2	6		

NEW

NPT
DIN376-374 ANSI B94.9



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	
9-11	3~12	
13-14	8~12	
16-19-20	10~20	

5980	59840X	59850X
STR	STR-INT	SP-VA

MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									
				1-5 13 14 16 19 20		1-5 9 10		1-5 9-11	
 				STR	STR INT	45°			
				HSSE BR	HSSE OX	HSSE OX			
				3P	3P	2,5P			
Dxn	A	B	L	I	I2	d	k	Stock	Stock
• ANSI									
NPT 1/16 x27	5.94	6.15	54	17.45	12	7.937	5.943	●	○
1/8 x27	8.33	8.43	54	19.05	12.05	11.112	8.331	●	●
1/4 x18	10.72	11.13	61.9	27	17.45	14.287	10.693	●	●
3/8 x18	14.27	14.57	65.1	27	17.65	17.78	13.487	●	○
1/2 x14	17.48	17.86	79.4	34.95	22.85	17.462	13.081	●	●
3/4 x14	22.63	23.01	82.55	34.95	22.95	23.02	17.246	●	○
1 x11.5	28.58	28.98	95.25	44.45	27.4	28.575	21.412	●	○
• DIN371-374									
1/8 x27	8.33	8.43	90	12	26	10	8		●
1/4 x18	10.72	11.13	100	18	34.5	14	11		●
3/8 x18	14.27	14.57	110	18		14	11		●
1/2 x14	17.48	17.86	140	23		16	12		●
3/4 x14	22.63	23.01	150	24		20	16		○
1 x11.5	28.58	28.98	170	30		25	20		○

A with reaming before tapping / con alesatura prima della maschiatura
mit Benutzung einer Reibahle / avec alésage avant le taraudage

B without reaming before tapping / senza alesatura prima della maschiatura
ohne Benutzung einer Reibahle / sans alésage avant le taraudage

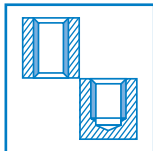
● stock standard ○ non-standard stock △ on request EX stock exhaustion



NPT 1/16	4	3	
1/8 ~ 3/8	4	5	3
1/2	4	5	4
3/4 ~1	5	5	4

NPTF

**ANSI
B94.9**



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
13-14	8~12	
16-19-20	10~20	

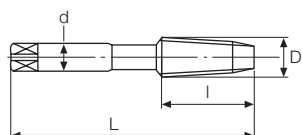
5990

STR



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 13 14
16 19 20



Dxn	A	B	L	I	I1	d	k	Stock
NPTF1/16 x27	5.94	6.15	54	17.45	12	7.937	5.943	○
1/8 x27	8.33	8.43	54	19.05	12.05	11.112	8.331	●
1/4 x18	10.72	11.13	61.9	27	17.45	14.287	10.693	●
3/8 x18	14.27	14.57	65.1	27	17.65	17.78	13.487	○
1/2 x14	17.48	17.86	79.4	34.95	22.85	17.462	13.081	●
3/4 x14	22.63	23.01	82.55	34.95	22.95	23.02	17.246	○
1 x11.5	28.58	28.98	95.25	44.45	27.4	28.575	21.412	○

A with reaming before tapping / con alesatura prima della maschiatura

mit Benutzung einer Reibahle / avec alésage avant le taraudage

B without reaming before tapping / senza alesatura prima della maschiatura

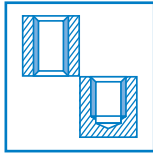
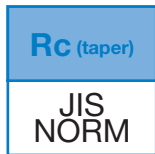
ohne Benutzung einer Reibahle / sans alésage avant le taraudage

● stock standard ○ non-standard stock △ on request EX stock exhaustion



NPTF1/16 ~ 1/2
3/4 ~1

4
5



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
13-14	8~12	
16-19-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									1-5 13 14 16 19 20			1-5 13 14 16 19 20			1-5 13 14 16 19 20		
									STR			STR			STR		
									HSSE			HSSE			HSSE		
									BR			BR			BR		
									2,5 P			2,5 P			2,5 P		
Dxn		A	B	L	l	l1	d	k	Stock	Stock	Stock						
Rc 1/8 x28		8.10	8.20	55	19	13	8	6	●								
		8.10	8.20	100	19	13	8	6		●							
		8.10	8.20	150	19	13	8	6				○					
1/4 x19		10.70	11.00	62	28	21	11	9	●								
		10.70	11.00	100	28	21	11	9		●							
		10.70	11.00	150	28	21	11	9					○				
3/8 x19		14.20	14.50	65	28	21	14	11	●								
		14.20	14.50	100	28	21	14	11			○						
		14.20	14.50	150	28	21	14	11					○				
1/2 x14		17.60	18.00	80	35	25	18	14	●								
		17.60	18.00	150	35	25	18	14						○			
		23.00	23.30	85	35	25	23	17	○						○		
3/4 x14		23.00	23.30	150	35	25	23	17							○		
		28.80	29.25	95	45	32	36	21	○						○		
		28.80	29.25	150	45	32	36	21							○		
1 x11		37.30	37.80	105	45	32	32	26	○								
1 1/4 x11		43.40	44.00	110	45	32	38	29	○								
2 x11		55.50	56.00	120	50	35	46	35	○								

A with reaming before tapping / con alesatura prima della maschiatura

mit Benutzung einer Reibahle / avec alésage avant le taraudage

B without reaming before tapping / senza alesatura prima della maschiatura

ohne Benutzung einer Reibahle / sans alésage avant le taraudage

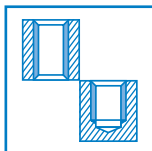
● stock standard ○ non-standard stock △ on request EX stock exhaustion



Rc 1/8 ~ 3/8	4	4	4
1/2 ~ 3/4	4		4
1 ~ 1 1/4	5		5
1 1/2 ~ 2	6		

BSW

DIN351



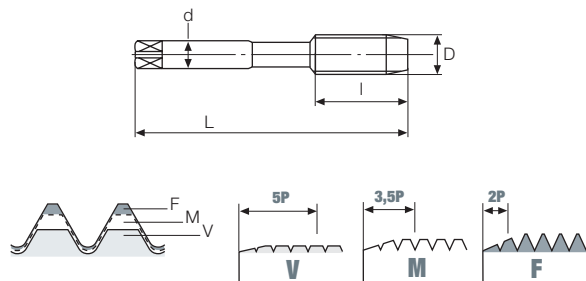
MATERIAL GROUP	Vc (m/min)	
	HAND	MACHINE (6310F)
1 ~ 5		5~10
13 ~ 14		5~10
16 - 19 - 20		5~10

6310

6310 (V-M-F)

SET

SET


 MATERIAL GROUPS / GRUPPI MATERIE
 WERKSTOFFEGRUPPE / GROUPES MATIÈRE
1-5 13 14
16 19 201-5 13 14
16 19 20

Dxn	D(mm)	Ø	L	l	d	k	Stock	Stock	Stock	Stock
BSW1/16x60	1.316	1.2	32	10	2.5	2.1				
3/32x48	2.042	1.9	36	11	2.8	2.1	EX	EX	EX	EX
1/8 x40	3.175	2.55	40	12	3.5	2.7	EX	EX	EX	EX
5/32x32	3.969	3.2	45	14	4.5	3.4	EX	EX	EX	EX
3/16x24	4.762	3.7	50	18	5.5	4.3				
1/4 x20	6.350	5.1	56	22	6	4.9				
5/16x18	7.938	6.5	63	25	6	4.9	EX	EX	EX	EX
3/8 x16	9.525	7.9	70	28	7	5.5				
7/16x14	11.112	9.25	75	30	8	6.2	EX	EX	EX	EX
1/2 x12	12.700	10.5	80	32	9	7				
9/16x12	14.288	12.1	80	32	11	9	EX	EX	EX	EX
5/8 x11	15.875	13.5	90	36	12	9				
3/4 x10	19.050	16.3	105	40	14	11				
7/8 x 9	22.225	19.25	110	45	18	14.5	EX	EX	EX	EX
1 x 8	25.400	22	110	50	20	16	EX	EX	EX	EX

*Tol. page 52

● stock standard ○ non-standard stock △ on request EX stock exhaustion

BSW 1/16 ~ 1/4
5/16 ~ 1

3

3

3

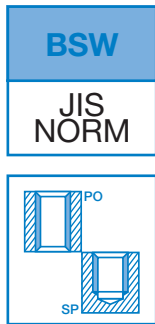
3

4

4

4

4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	10~15	
13-14	10~15	
15-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									
								1-5 13 14 15-20	1-5 13 14 15-20
								HSSE	HSSE
								BR	BR
								Tol *	Tol *
Dxn	D(mm)	Ø	L	l	l1	d	k	Stock	Stock
BSW 1/8 x40	3.175	2.55	46	11	18	4	3.2	○	○
5/32x32	3.969	3.2	52	13	21	5	4	○	○
3/16x24	4.762	3.7	60	16	25	5.5	4.5	○	○
1/4 x20	6.350	5.1	62	19	30	6	4.5	○	○
5/16x18	7.938	6.5	70	22		6.1	5	○	○
3/8 x16	9.525	7.9	75	24		7	5.5	○	○
7/16x14	11.112	9.25	80	25		8	6	○	○
1/2 x12	12.700	10.5	85	29		9	7	○	○
9/16x12	14.288	12.1	90	30		10.5	8	○	○
5/8 x11	15.875	13.5	95	32		12	9	○	○
3/4 x10	19.050	16.3	105	37		14	11	○	○
7/8 x 9	22.225	19.25	115	38		17	13	○	○
1 x 8	25.400	22	125	45		20	15	○	○

*Tol. page 52

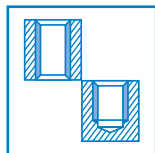
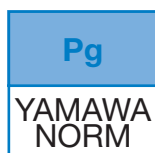
● stock standard ○ non-standard stock △ on request EX stock exhaustion



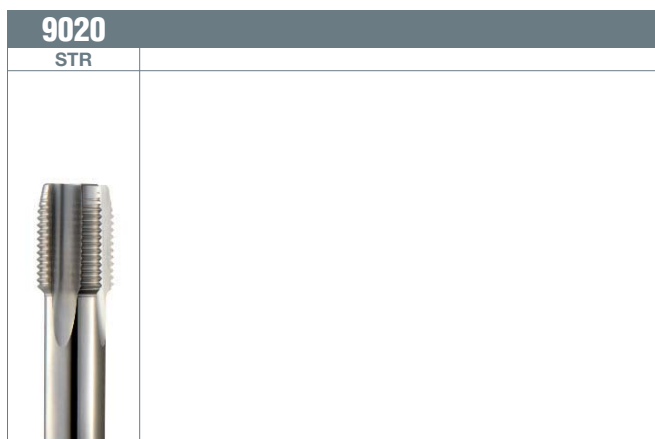
BSW 1/8 ~ 5/8
3/4 ~1

3
3

3
4

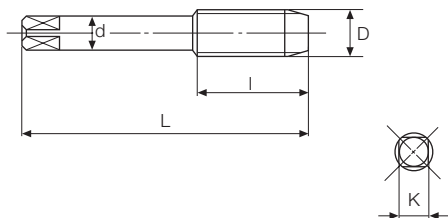


MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	
13-14	8~15	
16-19-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 13 14
16 19 20



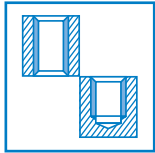
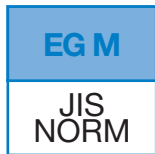
Dxn	D(mm)	Ø	L	I	d	k	Stock
Pg 7 x20	12.5	11.4	70	20	9	7	●
9 x18	15.2	14	70	22	12	9	●
11 x18	18.6	17.25	80	22	14	11	●
13.5x18	20.4	19	80	22	16	12	●
16 x18	22.5	21.25	80	22	18	14.5	●
21 x16	28.3	27	90	22	20	16	●
29 x16	37.0	35.5	110	25	28	22	○

● stock standard ○ non-standard stock △ on request EX stock exhaustion



Pg 7 ~29

4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~10	
13-14	8~12	
15-20	10~20	

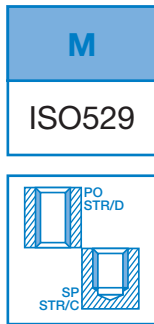


MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									1-5 13 14 16 19 20	1-5 13 14 15-20
M3 ~ M5 M6 ~									STR HSSE BR 1,5 P	40° HSSE BR 2,5 P
Dxp	D(mm)	Ø	L	l	l1	d	k		Stock	Stock
M 3x0.5	3.650	3.1	52	13	21	5	4		○	●
4x0.7	4.909	4.2	60	16	25	5.5	4.5		○	●
5x0.8	6.039	5.2	62	19	30	6	4.5		○	●
6x1	7.299	6.3	70	22		6.2	5		○	●
8x1.25	9.264	8.4	75	24		7	5.5		○	●
10x1.5	11.949	10.5	82	29		8.5	6.5		○	●
12x1.75	14.273	12.5	90	30		10.5	8		○	●
14x2	16.598	14.5	95	32		13	10			
16x2	18.598	16.5	105	37		14	11		○	○

● stock standard ○ non-standard stock △ on request EX stock exhaustion



EG M 3	3	3
4 ~14	3	4
16	4	4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	
9-10	3~7	
13-14	5~15	
15-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIE WERKSTOFFEGRUPPE / GROUPES MATIÈRE									1-5 13 14 15-20	1-5 9 10	1-5 13 14 16 19 20	1-5 13 14 16 19 20
									PO	40°	STR	STR
									HSSE BR	HSSE OX	HSS BR	HSS BR
									ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)
									3.5P-5P B	2P-3P C	2P-3P C	3.5P-5P D
D	p	Ø	L	l	*	l1	d	k	Stock	Stock	Stock	Stock
M 2	0.4	1.6	41	8	8		2.5	2	○	○	○	○
2.5	0.45	2.1	44.5	9.5	9.5		2.8	2.24	○	○	○	○
3	0.5	2.5	48	11	5	18	3.15	2.5	○	●	○	○
4	0.7	3.3	53	13	7	21	4	3.15	●	●	○	○
5	0.8	4.2	58	16	9	25	5	4	●	●	○	○
6	1	5	66	19	11	30	6.3	5	●	●	○	○
8	1.25	6.8	72	22	12	35	8	6.3	●	●	○	○
10	1.5	8.5	80	24	13	39	10	8	●	●	○	○

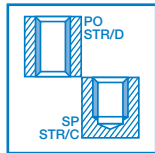
*l-7140..

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 2 ~ 2.5	2	2	3	3
3 ~ 6	3	3	3	3
8 ~ 10	3	3	4	4

M
ISO529



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-3-5	5~15	
9-10	3~7	
13-14	5~15	
15-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 15-20		1-5 9 10		1-5 13 14 16 19 20		1-5 13 14 16 19 20	
								PO	40°	STR	STR	STR	STR	STR	STR
								HSSE BR	HSSE OX	HSS BR	HSS BR	HSS BR	HSS BR	HSS BR	HSS BR
								ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)	ISO2 (6H)
								3.5P-5P B	2P-3P C	2P-3P C	2P-3P C	3.5P-5P D	3.5P-5P D	3.5P-5P D	3.5P-5P D
D	p	Ø	L	l	*	d	k	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock
M 12	1.75	10.3	89	29	15	9	7.1	●	●	○	○	○	○	○	○
14	2	12	95	30	18	11.2	9	○	○	○	○	○	○	○	○
16	2	14	102	32	18	12.5	10	●	●	○	○	○	○	○	○
18	2.5	15.5	112	37	20	14	11.2	○	○	○	○	○	○	○	○
20	2.5	17.5	112	37	20	14	11.2	○	●	○	○	○	○	○	○

*I-7540..

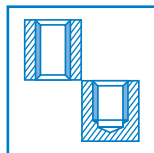
● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 12 ~ 16	3	3	4	4
18 ~ 24	3	4	4	4
27 ~ 30	4	4	4	4

**UNC
UNF**

ISO529



MATERIAL GROUP	Vc (m/min)	
	HAND	MACHINE (8320)
1-5		5~10
13-14		5~10
16-19-20		5~10

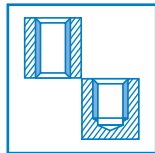


MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE										1-5 13 14 16 19 20		1-5 13 14 16 19 20		1-5 13 14 16 19 20	
D	UNC UNF	D(mm)	Ø	L	l	l1	d	k	Stock	Stock	Stock				
Nr. 1	64	1.854	1.55	41	8		2.5	2	EX						
1	72	1.854	1.55	41	8		2.5	2							
2	56	2.184	1.8	44.5	9.5		2.8	2.24							
2	64	2.184	1.85	44.5	9.5		2.8	2.24	EX						
3	48	2.515	2.1	44.5	9.5		2.8	2.24	EX						
3	56	2.515	2.1	44.5	9.5		2.8	2.24	EX						
4	40	2.845	2.3	48	11	18	3.15	2.5	EX	EX	EX				
4	48	2.845	2.4	48	11	18	3.15	2.5	EX	EX	EX				
5	40	3.175	2.6	48	11	18	3.15	2.5	EX	EX	EX				
5	44	3.175	2.7	48	11	18	3.15	2.5	EX						
6	32	3.505	2.8	50	13	20	3.55	2.8	EX	EX	EX				
6	40	3.505	2.9	50	13	20	3.55	2.8	EX	EX	EX				
8	32	4.166	3.5	53	13	21	4.5	3.55	EX						
8	36	4.166	3.5	53	13	21	4.5	3.55	EX	EX	EX				
10	24	4.826	3.9	58	16	25	5	4	EX	EX	EX				
10	32	4.826	4.1	58	16	25	5	4							
12	24	5.486	4.5	62	17	26	5.6	4.5	EX	EX	EX				
12	28	5.486	4.6	62	17	26	5.6	4.5	EX	EX	EX				
1/4	20	6.350	5.2	66	19	30	6.3	5		EX	EX				
1/4	28	6.350	5.5	66	19	30	6.3	5	EX	EX	EX				
5/16	18	7.938	6.6	72	22	35	8	6.3	EX	EX	EX				
5/16	24	7.938	6.9	72	22	35	8	6.3	EX						
3/8	16	9.525	8	80	24	39	10	8							
3/8	24	9.525	8.5	80	24	39	10	8							

● stock standard ○ non-standard stock △ on request EX stock exhaustion



Nr. 0	~4	2	2	2
5	~ 1/4	3	3	3
5/16 ~ 3/8		4	4	4



MATERIAL GROUP	Vc (m/min)	
	HAND	MACHINE (8720)
1-5		5~10
13-14		5~10
16-19-20		5~10



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE								1-5 13 14 16 19 20	1-5 13 14 16 19 20	1-5 13 14 16 19 20
								STR	STR	STR
								HSS	HSS	HSS
								BR	BR	BR
								2B	2B	2B
								D+C SET	2P~3P C	3.5P~5P D
D	UNC UNF	D(mm)	Ø	L	I	d	k	Stock	Stock	Stock
7/16	14	11.112	9.4	85	25	8	6.3		EX	EX
7/16	20	11.112	9.9	85	25	8	6.3			
1/2	13	12.700	10.75	89	29	9	7.1			
1/2	20	12.700	11.5	89	29	9	7.1		EX	EX
9/16	12	14.288	12.25	95	30	11.2	9		EX	EX
9/16	18	14.288	12.9	95	30	11.2	9			
5/8	11	15.875	13.6	102	32	12.5	10			
5/8	18	15.875	14.5	102	32	12.5	10	EX	EX	EX
3/4	10	19.050	16.5	112	37	14	11.2	EX	EX	EX
3/4	16	19.050	17.5	112	37	14	11.2			
7/8	9	22.225	19.5	118	38	16	12.5	EX	EX	EX
7/8	14	22.225	20.5	118	38	16	12.5	EX	EX	EX
1	8	25.400	22.25	130	45	18	14	EX	EX	EX
1	12	25.400	23.3	130	45	18	14	EX	EX	EX

● stock standard ○ non-standard stock △ on request EX stock exhaustion

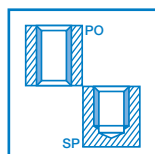


7/16 ~ 1

4

4

4



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	
9-10	3~7	
13-14	5~15	
15-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE										1-5 13 14 15-20	1-5 9 10	1-5 13 14 15-20	1-5 9 10
										PO	PO	40°	40°
										HSSE	HSSE	HSSE	HSSE
										BR	OX	BR	OX
										2B	2B	2B	2B
										3.5P-5P B	3.5P-5P B	2P-3P C	2P-3P C
D	UNC UNF	D(mm)	Ø	L	l	*	l1	d	k	Stock	Stock	Stock	Stock
Nr. 4	40	2.845	2.3	48	11	5	18	3.15	2.5				EX
4	48	2.845	2.4	48	11	5	18	3.15	2.5				
5	40	3.175	2.6	48	11	5	18	3.15	2.5				EX
5	44	3.175	2.7	48	11	5	18	3.15	2.5	EX			EX
6	32	3.505	2.8	50	13	7	20	3.55	2.8				
6	40	3.505	2.9	50	13	7	20	3.55	2.8	EX			
8	32	4.166	3.5	53	13	7	21	4.5	3.55				
8	36	4.166	3.5	53	13	7	21	4.5	3.55	EX			EX
10	24	4.826	3.9	58	16	9	25	5	4	EX			
10	32	4.826	4.1	58	16	9	25	5	4				
12	24	5.486	4.5	62	17	9	26	5.6	4.5	EX			
12	28	5.486	4.6	62	17	9	26	5.6	4.5	EX			EX
1/4	20	6.350	5.2	66	19	11	30	6.3	5		EX		
1/4	28	6.350	5.5	66	19	11	30	6.3	5			EX	
5/16	18	7.938	6.6	72	22	12	35	8	6.3		EX		
5/16	24	7.938	6.9	72	22	12	35	8	6.3	EX	EX		
3/8	16	9.525	8	80	24	13	39	10	8			EX	
3/8	24	9.525	8.5	80	24	12	39	10	8		EX		EX

*1-7340..

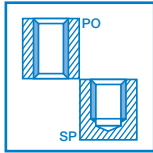
● stock standard ○ non-standard stock △ on request EX stock exhaustion



Nr. 4		2	2	2	2
5	~ 8	3	3	2	2
10	~ 3/8	3	3	3	3

**UNC
UNF**

ISO529



MATERIAL GROUP	Vc (m/min)	
	BR-OX-NX-NI	TiN-TiCN PV15
1-5	5~15	
9-10	3~7	
13-14	5~15	
15-20	10~20	



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE										1-5 13 14 15-20	1-5 9 10	1-5 13 14 15-20	1-5 9 10
										PO	PO	40°	40°
										HSSE BR	HSSE OX	HSSE BR	HSSE OX
										2B	2B	2B	2B
										3.5P-5P B	3.5P-5P B	2P-3P C	2P-3P C
D	UNC UNF	D(mm)	Ø	L	l	*	l2	d	k	Stock	Stock	Stock	Stock
7/16	14	11.112	9.4	85	25	14	31	8	6.3	EX	EX		
7/16	20	11.112	9.9	85	25	14	30	8	6.3				
1/2	13	12.700	10.75	89	29	15	35	9	7.1				EX
1/2	20	12.700	11.5	89	29	14	30	9	7.1	EX	EX		
9/16	12	14.288	12.25	95	30	18	36	11.2	9	EX	EX		EX
9/16	18	14.288	12.9	95	30	14	32	11.2	9				
5/8	11	15.875	13.6	102	32	18	38	12.5	10				
5/8	18	15.875	14.5	102	32	14	31	12.5	10		EX		EX
3/4	10	19.050	16.5	112	37	20	43	14	11.2				
3/4	16	19.050	17.5	112	37	14	35	14	11.2				
7/8	9	22.225	19.5	118	38	20	44	16	12.5	EX	EX		
7/8	14	22.225	20.5	118	38	18	39	16	12.5				EX
1	8	25.400	22.25	130	45	25	51	18	14		EX		
1	12	25.400	23.3	130	45	18	41	18	14				

*I-7740..

● stock standard ○ non-standard stock △ on request EX stock exhaustion



7/16 ~ 5/8	3	3	3	3
3/4 ~ 1	3	3	4	4

DIES - CENTER DRILLS - COUNTERSINKS - THREAD MILLS
FILIERE - PUNTE A CENTRARE - SVASATORI - FRESE A FILETTARE
SCHNEIDEISEN - ZENTRIER BOHRER - KEGELSENKER - GEWINDEFÄHRER
FILIÈRES - FORETS A CENTRER - FRAISES À CHANFREINER - FRAISES À FILETER

DIES / FILIERE / SCHNEIDEISEN / FILIÈRES .163
CENTER DRILLS / PUNTE A CENTRARE / ZENTRIER BOHRER / FORETS A CENTRER .168
COUNTERSINKS / SVASATORI / KEGELSENKER / FRAISES À CHANFREINER .173
THREAD MILLS / FRESE A FILETTARE / GEWINDEFÄHRER / FRAISES À FILETER .175



M

**DIN223B
JIS NORM**

0941

AR-D-LH

PO

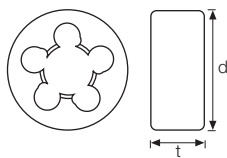
AR-D-LH



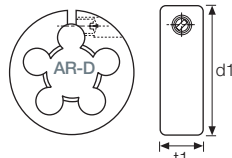
MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-3 9 10 15 16 18 19

1-3 9 10 15 16 18 19



DIN223B



JIS



HSS

BR

6g

1,5P



HSS

BR

6g

1P-2,5P

D	p	d	t	d1	t1	Stock	Stock
M 1	0.25	16	5			○	
1.1	0.25	16	5			○	
1.2	0.25	16	5			○	
1.4	0.3	16	5			○	
1.6	0.35	16	5			○	
2	0.4	16	5			●	
2.3	0.4	16	5			○	
2.5	0.45	16	5			●	
2.6	0.45	16	5			○	
3	0.5	20	5	20	7	●	EX
3.5	0.6	20	5			○	
4	0.7	20	5	20	7	●	EX
5	0.8	20	7	20	7	●	EX
6	1	20	7	20	7	●	EX
7	1	25	9			○	
8	1.25	25	9	25	9	●	EX
9	1.25	25	9			●	
10	1.5	30	11	25	9	●	EX
11	1.5	30	11			○	
12	1.75	38	14	38	13	●	EX
14	2	38	14	38	13	●	
16	2	45	18	38	13	●	EX
18	2.5	45	18	50	16	●	
20	2.5	45	18	50	16	●	EX
22	2.5	55	22	50	16	●	
24	3	55	22	50	16	●	
27	3	65	25			●	
30	3.5	65	25			●	
33	3.5	65	25			○	
36	4	65	25			○	

*M1 ~ M1.4 Tol. = 6h

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 1 ~ 4
5 ~ 12
14 ~ 20
22 ~ 24
27 ~ 30

3
4
5
5
6

3
4
5
6
6

MF

DIN223B
JIS NORM

0943

AR-D-LH

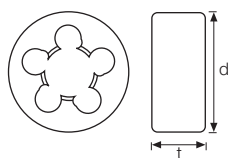
PO

AR-D

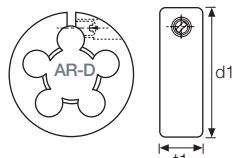
MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-3 9 10 15 16 18 19

1-3 9 10 15 16 18 19



DIN223B



JIS



HSS

BR

6g

1,5P



HSS

BR

6g

1P-2,5P

D	p	d	t	d1	t1	Stock	Stock
M 3	0.35	20	5			○	
4	0.5	20	5			○	
5	0.5	20	5			○	
6	0.75	20	7			○	
6	0.5	20	7			○	
7	0.75	25	9			○	
8	1	25	9	25	9	●	EX
8	0.75	25	9			○	
8	0.5	25	9			○	
9	1	25	9			○	
9	0.75	25	9			○	
10	1.25	30	11	25	9	●	EX
10	1	30	11	25	9	●	
10	0.75	30	11	25	9	○	
10	0.5	30	11	25	9	○	
12	1.5	38	10			●	EX
12	1.25	38	10	38	13	●	
12	1	38	10	38	13	●	EX
14	1.5	38	10	38	13	●	EX
14	1.25	38	10			○	
14	1	38	10			○	
16	1.5	45	14	38	13	●	
16	1	45	14			○	
18	2	45	14			○	

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 4
5 ~ 12
14 ~ 16
18 ~ 24
27 ~ 30

3
4
5
5
6

4
5
6

MF

**DIN223B
JIS NORM**

0943

AR-D-LH

PO

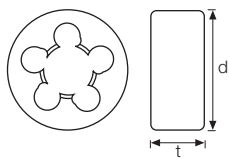
AR-D



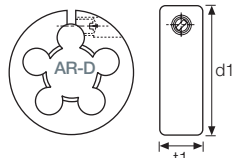
MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-3 9 10 15 16 18 19

1-3 9 10 15 16 18 19



DIN223B



JIS



HSS

BR

6g

1,5P



HSS

BR

6g

1P-2,5P

D	p	d	t	d1	t1	Stock	Stock
M 18	1.5	45	14	50	16	●	
18	1	45	14			○	
20	2	45	14			○	
20	1.5	45	14	50	16	●	
20	1	45	14			○	
22	2	55	16			○	
22	1.5	55	16	50	16	●	
22	1	55	16			○	
24	2	55	16			●	
24	1.5	55	16	50	16	●	EX
24	1	55	16			○	
25	1.5	55	16			○	
25	1	55	16				
26	2	55	16			○	
26	1.5	55	16			○	
27	2	65	18			○	
27	1.5	65	18			○	
27	1	65	18			○	
28	2	65	18			○	
28	1.5	65	18			○	
28	1	65	18				
30	2	65	18			○	
30	1.5	65	18			○	
30	1	65	18			○	

● stock standard ○ non-standard stock △ on request EX stock exhaustion



M 3 ~ 4
5 ~ 12
14 ~ 16
18 ~ 24
27 ~ 30

3
4
5
5
6

4
5
6

UNC
UNF

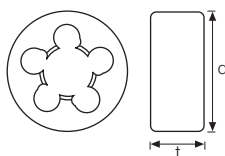
DIN223B

0949

PO

MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-3 9 10 15 16 18 19



D	UNC	UNF	d	t	Stock	
Nr. 2	56		16	5	○	
2		64	16	5	○	
3	48		16	5	○	
3		56	16	5	○	
4	40		20	5	○	
4		48	20	5	○	
5	40		20	5	○	
5		44	20	5	○	
6	32		20	5	○	
6		40	20	5	○	
8	32		20	7	○	
8		36	20	7	○	
10	24		20	7	○	
10		32	20	7	○	
12	24		20	7	○	
12		28	20	7	○	
1/4	20		25	9	○	
1/4		28	25	9	○	
5/16	18		25	9	○	
5/16		24	25	9	○	
3/8	16		30	11	○	
3/8		24	30	11	○	
7/16	14		30	11	○	
7/16		20	30	11	○	
1/2	13		38	14	○	
1/2		20	38	10	○	
9/16	12		38	14	○	
9/16		18	38	10	○	
5/8	11		45	18	○	
5/8		18	45	14	○	
3/4	10		45	18	○	
3/4		16	45	14	○	
7/8	9		55	22	○	
7/8		14	55	16	○	
1	8		55	22	○	
1		12	55	16	○	

● stock standard ○ non-standard stock △ on request EX stock exhaustion



Nr. 0 ~ 8 3
 10 ~ 3/8 4
 7/16 ~ 1 5

G

DIN5158

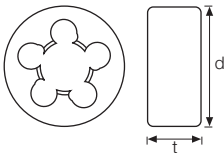
0947

PO



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-3 9 10 15 16 18 19



D	d	t	Stock	
G 1/8 x 28	30	11	●	
1/4 x 19	38	10	●	
3/8 x 19	45	14	●	
1/2 x 14	45	16	●	
5/8 x 14	55	16	○	
3/4 x 14	55	16	●	
7/8 x 14	65	18		
1 7/8 x 11	65	18	●	
1 1/4 x 11	75	20		
1 1/2 x 11	90	22		
2 7/8 x 11	105	22		

● stock standard ○ non-standard stock △ on request EX stock exhaustion



G 1/8 ~	4
1/4 ~ 5/8	5
3/4 ~ 7/8	5
1 ~2	6



POINT DRILLS

🇬🇧 COST REDUCTION / HIGH PRECISION DOUBLE FUNCTION / SAFETY

Thanks to double edge POINT DRILLS enable tool cost reduction.

New POINT DRILLS geometry enables high precision centering and chamfering.

Point angle: 125° - chamfering angle 90°/60°.

Thanks to the double angle POINT DRILLS enable both centering and chamfering process.

POINT DRILLS available on request with extended shank enable smooth and safety chips ejection.

🇮🇹 RIDUZIONE COSTI / ALTA PRECISIONE DOPPIA FUNZIONE / SICUREZZA

Grazie al doppio tagliente POINT DRILLS garantiscono una riduzione del costo utensile.

L'innovativa geometria di POINT DRILLS garantisce massima precisione.

Angolo punte: 125° - angolo svasatura 90°/60°.

Grazie al doppio angolo POINT DRILLS sono adatte sia al centraggio che alla svasatura.

POINT DRILLS, disponibili anche nella serie lunga ed extra lunga, garantiscono ottima evacuazione dei trucioli.

🇩🇪 KOSTENSENKUNG / HOHE PRÄZISION DOPPELFUNKTION / SICHERHEIT

Dank der Doppelschneide, garantieren POINT DRILLS die Werkzeugkostensenkung.

Dank der innovativen Geometrie garantieren Point Drills die größte Präzision.

Spitzwinkel: 125° - Senkungswinkel 90°/60°.

Dank dem Doppelwinkel, sind Point Drills sowohl für die Zentrierung als auch für die Senkung geeignet.

Point Drills, auch mit langem und extra-langem Schaft lieferbar, erlauben sehr gute Späneentsorgung.

🇫🇷 RÉDUCTION DES COÛTS / HAUTE PRÉCISION DOUBLE FONCTION / SÉCURITÉ

Grâce au double arête, POINT DRILLS garantissent une réduction du coût de l'outil.

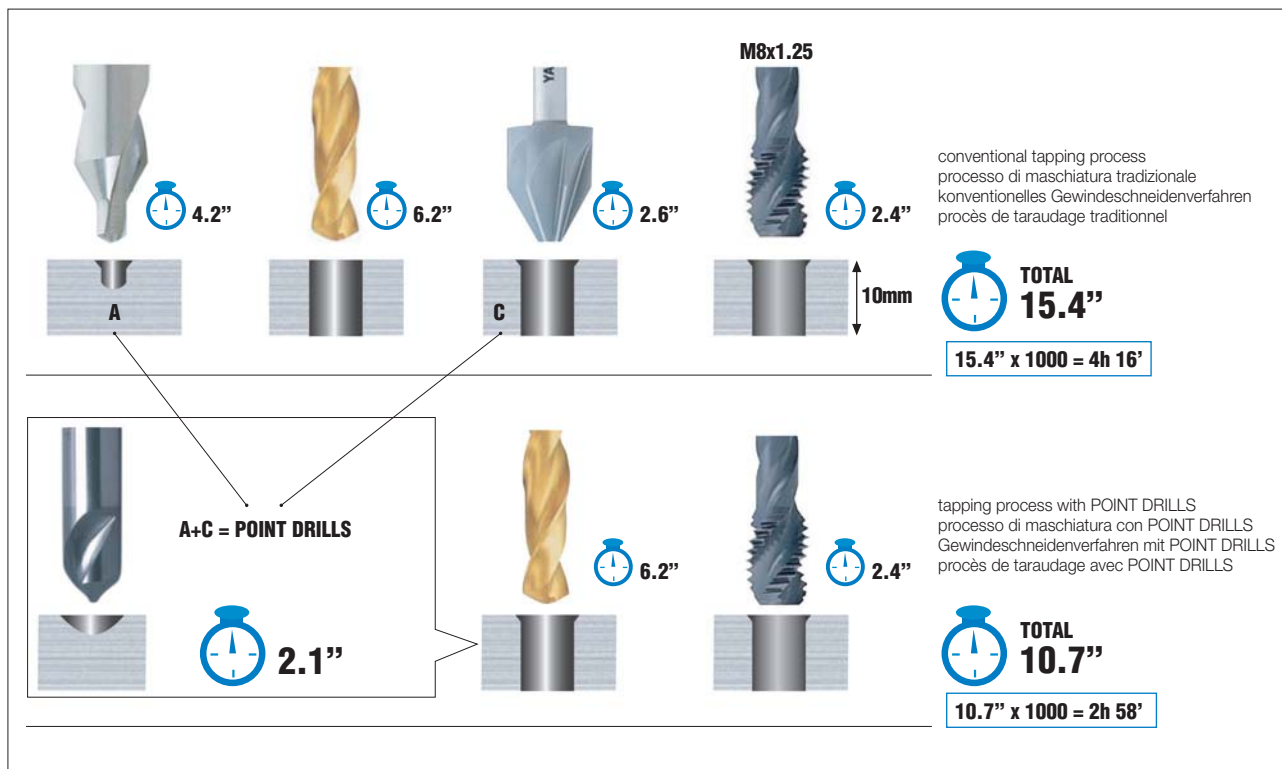
Grâce à l'innovatrice géométrie, point drills garantissent la plus haute précision.

Angle de la pointe: 125° - angle de fraisure 90°/60°.

Grâce au double angle, Point Drills sont des outils indiqués soit au centrage soit au chanfrein.

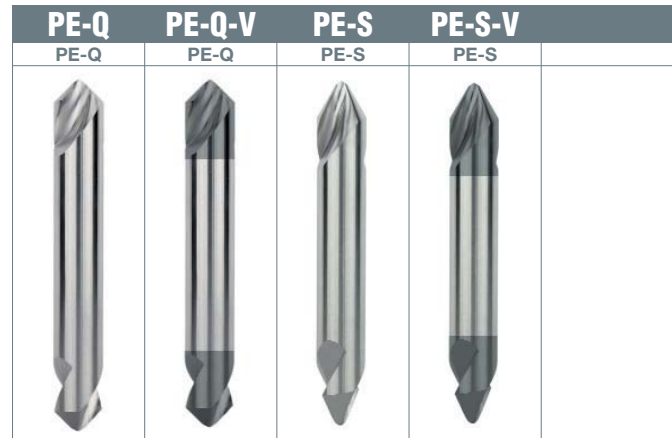
POINT DRILLS, disponibles aussi avec queue longue et extra longue, garantissent un excellent écoulement des copeaux.

APPLICATION-TIME COMPARISON / COMPARAZIONE DEI TEMPI DI LAVORO BEARBEITUNGSZEITEN / COMPARATION DES TEMPS D'USINAGE



60° - 90°

**YAMAHA
NORM**



MATERIAL GROUPS / GRUPPI MATERIALE WERKSTOFFEGRUPPE / GROUPES MATIÈRE				1-5 9 10 15 16	1-5 9 10 15 16	1-5 9 10 15 16	1-5 9 10 15 16
				 HSS BR	 HSS TiCN	 HSS BR	 HSS TiCN
D	d	L		Stock	Stock	Stock	Stock
3	0.5	40		○	○	○	○
4	1	45		○	○	○	○
6	2	55		○	○	○	○
8	2.5	65		○	○	○	○
10	3	75		○	○	○	○
12	3.5	85		○	○	○	○
16	4	90		○	○	○	○
20	5	100		○	○	○	○

● stock standard ○ non-standard stock △ on request EX stock exhaustion

MATERIALE MATERIAL WERKSTOFF MATIERE	1 2	3	4 5	9 10	15 16
N/mm²	~700	600~900	600~1000		
Vc(m/min)	30~40	22~30	20~25	10~15	70~100
Ø mm.	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)
3	0.04 ~ 0.08	0.04 ~ 0.08	0.04 ~ 0.08	0.04 ~ 0.08	0.10 ~ 0.22
4	0.05 ~ 0.10	0.05 ~ 0.10	0.05 ~ 0.10	0.05 ~ 0.10	0.12 ~ 0.26
6	0.06 ~ 0.12	0.06 ~ 0.12	0.06 ~ 0.12	0.06 ~ 0.12	0.15 ~ 0.30
8	0.08 ~ 0.15	0.08 ~ 0.15	0.08 ~ 0.15	0.08 ~ 0.15	0.18 ~ 0.35
10	0.10 ~ 0.18	0.10 ~ 0.18	0.10 ~ 0.18	0.10 ~ 0.18	0.21 ~ 0.40
12	0.12 ~ 0.22	0.12 ~ 0.22	0.12 ~ 0.22	0.12 ~ 0.22	0.25 ~ 0.45
16	0.16 ~ 0.26	0.16 ~ 0.26	0.16 ~ 0.26	0.16 ~ 0.26	0.32 ~ 0.50
20	0.20 ~ 0.35	0.20 ~ 0.35	0.20 ~ 0.35	0.20 ~ 0.35	0.40 ~ 0.60

TiCN: Vc = +30% ~ +50%

90° - 125°

YAMAWA
NORM

NCSD90 NCSDTC90 NCSD125 NCSDTC125

NC-SD

NC-SD

NC-SD

NC-SD



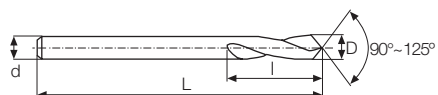
MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 9 10
13 14 15-19

1-5 9 10
13 14 15-19

1-5 9 10
13 14 15-19

1-5 9 10
13 14 15-19



HSS/Co
BR



HSS/Co
TiCN



HSS/Co
BR



HSS/Co
TiCN

D	d	L	I	Stock	Stock	Stock	Stock
3	3	46	12	○	○	○	○
4	4	55	15	○	○	○	○
5	5	62	18	○	○	○	○
6	6	66	20	●	●	●	●
8	8	79	26	●	●	●	●
10	10	89	30	●	●	●	●
12	12	102	36	●	●	●	●
16	16	115	41	●	●	●	●
20	20	131	46	●	●	○	○
25	25	151	52	○	○	○	○

● stock standard ○ non-standard stock △ on request EX stock exhaustion

MATERIALE MATERIAL WERKSTOFF MATIÈRE	1	2	3	4	5	9 10	13 14	15 16	18 19
N/mm²	~700	450~700	600~900	600~1000	700~1000				
Vc(m/min)	20~26	15~20	10~15	9~15	5~9	5~15	15~25	50~70	40~60
Ø mm.	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)
1~3	0.03~0.06	0.03~0.06	0.03~0.06	0.03~0.06	0.03~0.06	0.03~0.06	0.03~0.06	0.03~0.06	0.03~0.06
3~4	0.05~0.10	0.05~0.10	0.05~0.10	0.05~0.10	0.05~0.10	0.05~0.10	0.05~0.10	0.05~0.10	0.05~0.10
4~6	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15	0.08~0.15
6~8	0.10~0.20	0.10~0.20	0.10~0.20	0.10~0.20	0.10~0.20	0.10~0.20	0.10~0.20	0.10~0.20	0.10~0.20
8~11	0.15~0.25	0.15~0.25	0.15~0.25	0.15~0.25	0.15~0.25	0.15~0.25	0.15~0.25	0.15~0.25	0.15~0.25
11~15	0.20~0.30	0.20~0.30	0.20~0.30	0.20~0.30	0.20~0.30	0.20~0.30	0.20~0.30	0.20~0.30	0.20~0.30
15~18	0.23~0.33	0.23~0.33	0.23~0.33	0.23~0.33	0.23~0.33	0.23~0.33	0.23~0.33	0.23~0.33	0.23~0.33
18~21	0.25~0.36	0.25~0.36	0.25~0.36	0.25~0.36	0.25~0.36	0.25~0.36	0.25~0.36	0.25~0.36	0.25~0.36
21~24	0.28~0.38	0.28~0.38	0.28~0.38	0.28~0.38	0.28~0.38	0.28~0.38	0.28~0.38	0.28~0.38	0.28~0.38

TiCN: Vc = +30%~+50%

60° A - R

DIN333

0021

0021 T

0023

0023TI

A

A

R

R



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1~5 6

1~5 6
13 14 18~2

1~5 6
13 14 18~2

1~5 6
13 14 18~20



HSS

HSS

HSS

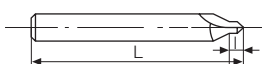
HS

BR

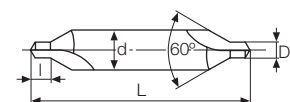
BR

Til

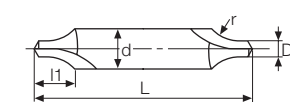
0021 ~ mm.0.8



0021 mm.1 ~



0023



D	d	L	l	l1	r-max	r-min	Stock	Stock	Stock	Stock
0.5	3.15	25	0.8				○	○	○	○
0.8	3.15	25	1.1				○	○	○	○
1	3.15	31.5	1.3	3	3.15	2.5	●	○	○	○
1.25	3.15	31.5	1.6	3.35	4	3.15	○	○	○	○
1.6	4	35.5	2	4.25	5	4	●	○	○	○
2	5	40	2.5	5.3	6.3	5	●	●	○	○
2.5	6.3	45	3.1	6.7	8	6.3	●	●	○	○
3.15	8	50	3.9	8.5	10	8	●	●	●	○
4	10	56	5	10.6	12.5	10	●	●	●	○
5	12.5	63	6.3	13.2	16	12.5	●	●	●	○
6.3	16	71	8	17	20	16	●	○	●	○
8	20	80	10.1	21.2	25	20	●	○	○	○
10	25	100	12.8	26.5	31.5	25	●	○	○	○

● stock standard ○ non-standard stock △ on request EX stock exhaustion

[illegible]TiN: $V_c = +30\% \sim +50\%$

60° A

YAMAWA
NORM

CD-S-L CD-S-XL

A

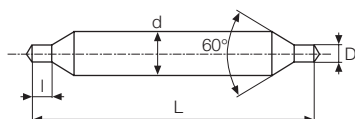
A



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 6
13 14 18-20

1-5 6
13 14 18-20



HSS
BR



HSS
BR

D	d	L	l	Stock	Stock	
1	4	100	1	○		
1	4	150	1		○	
1.5	5	100	1.5	○		
1.5	5	150	1.5		○	
2	6	100	2	●		
2	6	150	2		○	
2.5	8	100	2.5	●		
2.5	8	150	2.5		○	
3	8	100	3	●		
3	8	150	3		○	
4	10	100	4.5	●		
4	10	150	4.5		○	
5	12	100	5.5	●		
5	12	150	5.5		○	

● stock standard ○ non-standard stock △ on request EX stock exhaustion

90°

**YAMAHA
NORM**

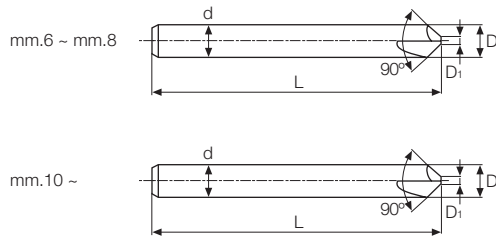
CS-Q

CS-Q



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 6 9-12
13 14 15-20



HSS

BR

D	d	D1	L	I	Stock	
6	6	1	50	-	○	
8	8	1.3	50	-	○	
10	8	1.6	46	40.5	○	
15	10	3.2	56	48.5	○	
20	10	4	60	50	○	
25	10	7	65	54	○	
30	12	9	70	57.5	○	
35	12	11	75	60	○	
40	12	12.5	80	63	○	
45	12	14	85	66.5	○	
50	12	16	90	70	○	
60	16	20	100	76	○	

● stock standard ○ non-standard stock △ on request EX stock exhaustion



mm 6 ~ 60

1



60° - 90°

YAMAWA
NORM

CS-QM 90°

CS-QM



CS-QM 60°

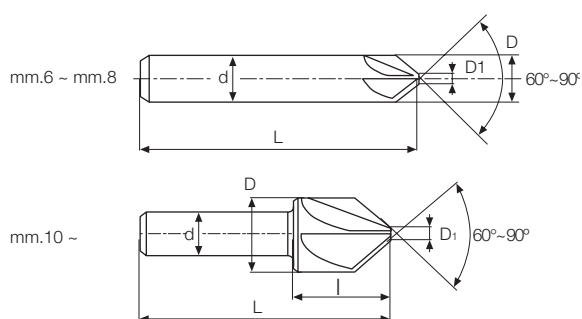
CS-QM



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 6 9-12
13 14 15-20

1-5 6 9-12
13 14 15-20



HSS
BR



HSS
BR

D	d	D1	L-90°	I-90°	L-60°	I-60°	Stock	Stock
6	6	1.2	42	-	46	-	○	
8	8	1.6	44	-	48	-	○	○
10	8	2	46	32	50	32	○	
12	8	2.5	48	32	52	32	○	
16	10	3.2	56	36	60	36	○	○
20	10	4	60	36	64	36	○	○
25	10	7	65	36	69	36	○	○
30	12	9	68	36	76	36	○	
35	12	11	70	36	79	36	○	
40	12	12.5	71	36	81	36	○	

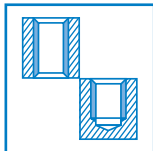
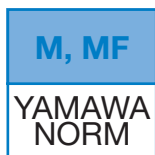
● stock standard ○ non-standard stock △ on request EX stock exhaustion



mm 6 ~ 10
12 ~ 20
25 ~ 40

3
5
7

3
5
7



MATERIAL GROUP	V _c (m/min)	f _z (mm/z)
1-5	20~45	0.02~0.05
6	10~25	0.02~0.04
9 - 10 - 11	10~25	0.02~0.05
13 - 14	30~50	0.03~0.08
15~20	40~80	0.03~0.05

MC-HLC

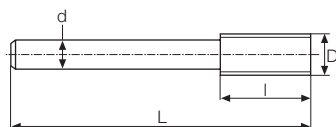
MC-HLC



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 6 9-11
13 14 15-20

I = MC-HLC



D	p	Ø min	L	I	d	z	Stock
mm 10	1	14	90	20	10	4	EX
10	1.5	14	90	20	10	4	EX
12	1	17	100	25	12	4	EX
12	1.5	17	100	25	12	4	EX
12	2	17	100	25	12	4	EX
16	1	23	110	30	16	4	EX
16	1.5	23	110	30	16	4	EX
16	2	23	110	30	16	4	EX
16	2.5	23	110	30	16	4	EX
20	1	28	140	50	20	5	EX
20	1.5	28	140	50	20	5	EX
20	2	28	140	50	20	5	EX
20	3	28	140	50	20	5	EX
20	3.5	28	140	50	20	5	EX
25	1	36	160	50	20	6	EX
25	1.5	36	160	50	20	6	EX
25	2	36	160	50	20	6	EX
25	3	36	160	50	20	6	EX
25	3.5	36	160	50	20	6	EX
32	1.5	45	200	50	25	6	EX
32	2	45	200	50	25	6	EX
32	3	45	200	50	25	6	EX

● stock standard ○ non-standard stock △ on request EX stock exhaustion

RIGHT-HAND INTERNAL THREAD / FILETTO INTERNO DESTRO
FILET INTÉRIEUR À DROITE / INNERES RECHTSGEWINDE

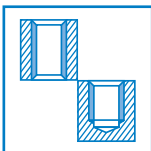


FILETTO INTERNO SINISTRO · LEFT-HAND INTERNAL THREAD
INNERES LINKSGEWINDE · FILET INTÉRIEUR À GAUCHE



G, Rp

**YAMAWA
NORM**



MATERIAL GROUP	V _c (m/min)	f _z (mm/z)
1-5	20~45	0.02~0.05
6	10~25	0.02~0.04
9 - 10 - 11	10~25	0.02~0.05
13 - 14	30~50	0.03~0.08
15-20	40~80	0.03~0.05

MC-HLC

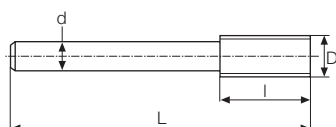
MC-HLC



MATERIAL GROUPS / GRUPPI MATERIALE
WERKSTOFFEGRUPPE / GROUPES MATIÈRE

1-5 6 9-11
13 14 15-20

I = MC-HLC



HSS/Co

TIN

D	n	Ø min	L	I	d	z	Stock
mm 10	19	3/8	70	15	10	4	EX
12	14	1/2	80	20	12	4	EX
20	11	1	100	30	20	5	EX
32	11	2 1/2	200	50	25	6	EX

● stock standard ○ non-standard stock △ on request EX stock exhaustion

YAMAWA EUROPEAN STOCK CENTRE

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