



FRESATURA / MILLING

2014

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CODIFICA ISO PER CORPI FRESA
ISO IDENTIFICATION SYSTEM

FRESA A MANICOTTO
SHELL CUTTER BODIES
ISO 11529-2
DIN ISO 11529-2

2
Tipo di fresa
Cutting type, designation and/or size of clamping

ISO 6462/A A DIN 8030/A ČSN 22 2301/A	ISO 6462/B B DIN 8030/B ČSN 22 2301/A	ISO 6462/C C DIN 8030/C ČSN 22 2301/C
C ød = 27		
G ød = 32		
H ød = 40		
J ød = 50		
K ød = 60		
M ød = 80		
T		

6
Angoli di attacco
Setting angle

κ_r 90°	
κ_r 75°	
κ_r 60°	
κ_r 45°	
κ_r MO	ø D [mm]

10
Angolo di spoglia
Clearance angle

N α'_N = 0°	E α'_N = 20°
P α'_N = 11°	F α'_N = 25°
D α'_N = 15°	

11
Lunghezza del tagliente (larghezza)
Cutting edge length (width)

B [mm]

l_1 [mm]

1	2	3	4	5	6	7	8	9	10	11
160	H	16	N	S	90	S	N	12	N	12
250	C	16	R	W	45	S	E	12	F	

1
Diametro taglio [mm]
Cutting diameter [mm]

3
N° denti
No. of working edges

4
Direzione di taglio
Direction of cut

R L N

5
Sistema di blaccaggio
Clamping designation

C S W F

7
Forma dell inserto
Insert shape

S C T W R A

8
Angolo di spoglia
Clearance angle

N α_N = 0°	D α_N = 15°
C α_N = 7°	E α_N = 20°
P α_N = 11°	F α_N = 25°

9
Lunghezza tagliente
Insert size or cutting edge length

d [mm]	S	C	T	W	R	A
6,35						9/11
7,94				05		
8,00					08	
9,525	09	09	16	06		12
10,00					10	
12,00					12	
12,70	12	12	22	08		15
15,875	15					
16,00					16	
25,00					25	
25,40	25					

FRESA A CANDELA
SHOULDER END MILLING CUTTERS
ISO 7848
DIN ISO 11529-2

1	1a	3	4	2a	3a	4a	5	7	8	9(11)	10
63	J	4	R	150	H	50	S	SA	P	95	
32	A	4	R	042	B	32	S	A	D	11	E

1a
Tipo di fresa ed angolo di attacco
Cutter type and setting angle

A N E H J K

2a
Sporgenza [mm]
Overhang [mm]

3a
Tipo di gambo
Shank designation

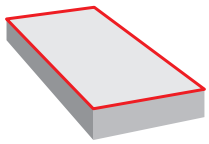
A	DIN 1835-1
B	ISO 3338-2 DIN 1835-2 ČSN ISO 3338-2
E	ISO 296 DIN 228-1 ČSN ISO 296
G	ISO 297 DIN 208-1 ČSN ISO 297
X	ČSN ISO 297
H	ISO/DIS 7388-1 DIN 69871-1 ČSN 22 0434

4a
Dimensione gambo
Shank size

A	øD 08 ÷ 32	ød 10 ÷ 32
B	øD 10; 12; 16 20 25; 32; 40	ød 16; 20 25; 32
E	øD 10; 12; 16 20; 25; 32 40	MORSE No. 02 03 04
G	øD 32 ; 40 (50; 63) 50; 63; 80	7:24 No. 40 50
X		
H	øD 32; 40 50; 63; 80	7:24 No. 40 50

IMPERO PRAMET

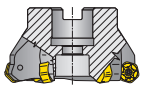
FRESATURA DI SUPERFICI PIANE
MILLING FLAT SURFACES



S45HN06C

45° | $a_{p\,max}$ [mm] 3,0 | ø D [mm] 25 - 125

ECON HN



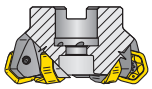
HN 0604	P	M	K
XN 0604	N		H

14 - 19

S45HN09C

45° | $a_{p\,max}$ [mm] 5,0 | ø D [mm] 50 - 315

ECON HN

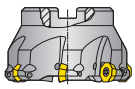


HN 0906	P	M	K
XN 0906	N		H

20 - 21

S45OD05D

45° | $a_{p\,max}$ [mm] 2,5 (7,3) | ø D [mm] 40 - 125

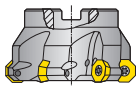


OD.. 0504	P	M	K
	N		H

22 - 23

S45OD06D

45° | $a_{p\,max}$ [mm] 3,1 (8,6) | ø D [mm] 63 - 160

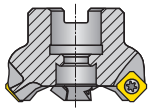


OD.. 0605	P	M	K
RP.. 1505	N		H

24 - 25

S45SE09F

45° | $a_{p\,max}$ [mm] 4,5 | ø D [mm] 20 - 160

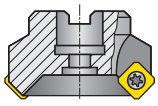


SE 09T3	P	M	K
	N	S	H

26 - 29

S45SN12Z

45° | $a_{p\,max}$ [mm] 6,5 | ø D [mm] 40 - 250



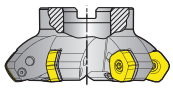
SN 1205	P	M	K
	N	S	H

30 - 31

S57PN13

57° | $a_{p\,max}$ [mm] 10,0 | ø D [mm] 100 - 315

PENTA HD



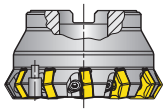
PN 1308	P	M	K
	N	S	H

32 - 33

C60HN09

60° | $a_{p\,max}$ [mm] 6,0 | ø D [mm] 80 - 250

ECON HN



HN 0905	P		K
			H

34 - 35

F60SB22X

60° | $a_{p\,max}$ [mm] 15,0 | ø D [mm] 125 - 315

ROUGH SB

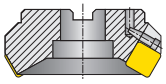


SB 2207	P	M	K
			H

36 - 37

W60SP25P

60° | $a_{p\,max}$ [mm] 18,0 | ø D [mm] 125 - 315



SP 2506	P	M	K
		S	H

38 - 39

C90SC09

90° | $a_{p\,max}$ [mm] 0,5 (4,0) | ø D [mm] 32 - 63

MULTISIDE SC



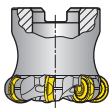
SC 09T3	P	M	K
	N	S	

40 - 43

C90SC12

90° | $a_{p\,max}$ [mm] 0,5 (6,0) | ø D [mm] 32 - 80

MULTISIDE SC



SC 12T3	P	M	K
	N	S	

40 - 43

SMORC12

- | $a_{p\,max}$ [mm] 6,0 | ø D [mm] 40 - 100

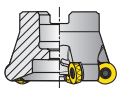


RC 1204	P	M	K
	N	S	H

116 - 117

SMORC16

- | $a_{p\,max}$ [mm] 8,0 | ø D [mm] 63 - 100

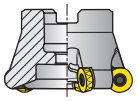


RC 1606	P	M	K
	N	S	H

116 - 117

SMORC20

- | $a_{p\,max}$ [mm] 10,0 | ø D [mm] 80 - 100



RC 2006	P	M	K
	N	S	H

116 - 117

SRD05

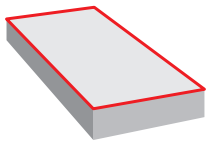
- | $a_{p\,max}$ [mm] 1,5 | ø D [mm] 10 - 15



RD 0501	P	M	K
	N		H

120 - 121

FRESATURA DI SUPERFICI PIANE
MILLING FLAT SURFACES



SRD07

-	$a_{p\,max}$ [mm]	1,8
	ø D [mm]	15 - 25



	RD.. 07T1	P	M	K
	RD.. 0702	N		H

118 - 121

SRD10

-	$a_{p\,max}$ [mm]	2,5
	ø D [mm]	20 - 35



	RD 1003	P	M	K
		N		H

118 - 121

S(C)RD12

-	$a_{p\,max}$ [mm]	3,0
	ø D [mm]	24 - 80



	RD 12T3	P	M	K
		N		H

120 - 123

S(C)RD16

-	$a_{p\,max}$ [mm]	4,0
	ø D [mm]	32 - 100



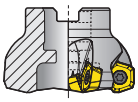
	RD 1604	P	M	K
		N		H

120 - 123

S19PD09

19°	$a_{p\,max}$ [mm]	2
	ø D [mm]	32 - 100

PENTA HF



	PD 0905	P	M	K
		N	S	H

126 - 127

SZD07

-	$a_{p\,max}$ [mm]	1
	ø D [mm]	16 - 32

FEED ZD



	ZD 0703	P	M	K
				H

128 - 131

SZD09

-	$a_{p\,max}$ [mm]	1
	ø D [mm]	25 - 40

FEED ZD



	ZD 09T3	P	M	K
				H

128 - 133

SZD12

-	$a_{p\,max}$ [mm]	1,6
	ø D [mm]	32 - 80

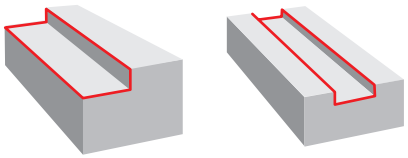
FEED ZD



	ZD 1204	P	M	K
				H

128 - 133

FRESATURA DI SPALLAMENTI E SCANALATURE POCO PROFONDE
MILLING LOW SHOULDERS AND GROOVES



S90AD11E

90° | $a_{p\,max}$ [mm] 9,0 | ø D [mm] 16 -125

FORCE AD



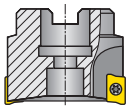
	P	M	K
AD 11T3	N	S	H

44 - 49

S90AD16E

90° | $a_{p\,max}$ [mm] 13,0 | ø D [mm] 25 - 160

FORCE AD



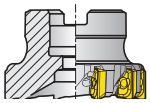
	P	M	K
AD 1606	N	S	H

50 - 55

C90AD15

90° | $a_{p\,max}$ [mm] 12,0 | ø D [mm] 40 - 80

MULTISIDE AD

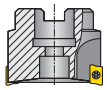


	P	M	K
AD 15T3		S	

56 - 61

S90AP10D

90° | $a_{p\,max}$ [mm] 9,0 | ø D [mm] 10 - 63

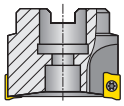


	P	M	K
AP 1003	N	S	H

62 - 65

S90AP16D

90° | $a_{p\,max}$ [mm] 14,0 | ø D [mm] 25 - 160



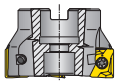
	P	M	K
AP 1604	N	S	H

66 - 69

S90LN12

90° | $a_{p\,max}$ [mm] 9,0 | ø D [mm] 25 - 110

ECON LN



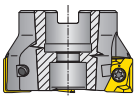
	P	M	K
LN 1205	N		H

70 - 75

S90LN16

90° | $a_{p\,max}$ [mm] 13,0 | ø D [mm] 63 - 175

ECON LN

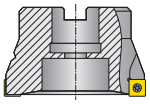


	P	M	K
LN 1607	N		H

76 - 77

S90SO09

90° | $a_{p\,max}$ [mm] 8,0 | ø D [mm] 20 - 125

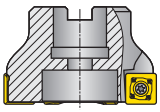


	P	M	K
SO 09T3	N	S	H

78 - 81

S90SD12

90° | $a_{p\,max}$ [mm] 10,0 | ø D [mm] 50 - 160



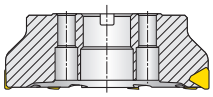
	P	M	K
SD 1205			H

82 - 83

F90TB27X

90° | $a_{p\,max}$ [mm] 18,0 | ø D [mm] 140 - 260

ROUGH TB

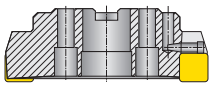


	P	M	K
TB 2707			H

84 - 85

W90SP25P

90° | $a_{p\,max}$ [mm] 22,0 | ø D [mm] 175 - 260

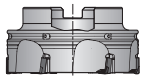


	P	M	K
SP 2506		S	

86 - 87

W90XO12

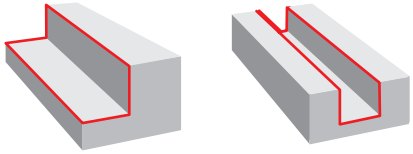
90° | $a_{p\,max}$ [mm] 10,0 | ø D [mm] 50 - 315



XO 12T3		N	

88 - 89

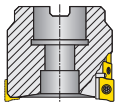
FRESATURA DI SPALLAMENTI E SCANALATURE PROFONDI
MILLING DEEP SHOULDERS AND GROOVES



J-SAD11E

90° | $a_{p\,max}$ [mm] 37,0 - 56,0 | ø D [mm] 25 - 50

FORCE AD



		P	M	K
	AD 11T3	N	S	H

90 - 93

C90SD12X

90° | $a_{p\,max}$ [mm] 44,0 - 87,0 | ø D [mm] 40 - 80

MULTISIDE SD



		P	M	K
	SD 1205	N	S	

94 - 97

SLSN

90° | $a_{p\,max}$ [mm] 104,0 - 134,0 | ø D [mm] 63 - 80

ROUGH SN

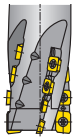


		P		K
	SN 1305			
	LN 1606			H

98 - 99

SSAP

90° | $a_{p\,max}$ [mm] 58,0 -95,0 | ø D [mm] 50 - 63

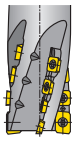


		P	M	K
	SP 1204			
	AP 1504			H

100 - 101

SSAP-A

90° | $a_{p\,max}$ [mm] 58,0 -95,0 | ø D [mm] 50 - 80



		P	M	K
	SP 1204			
	AP 1504			H

102 - 103

2416-E

90° | $a_{p\,max}$ [mm] 40,0 - 63,0 | ø D [mm] 20 - 40



		P		K
	–			

104

S90SN

90° | $a_{p\,max}$ [mm] 4,0 - 14,0 | ø D [mm] 80 - 200

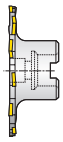


		P	M	K
	SN 11	N	S	H
	SN 12			

106 - 108

S90SN-R

90° | $a_{p\,max}$ [mm] 4,0 - 12,0 | ø D [mm] 63 - 160

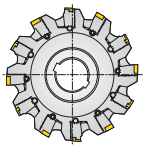


		P	M	K
	SN 11	N	S	H
	SN 12			

110 - 111

S90CN

90° | $a_{p\,max}$ [mm] 14,0 - 18,5 | ø D [mm] 125 - 315

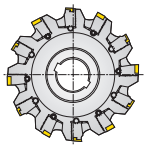


		P	M	K
	CN 1005	N	S	H

112 - 113

S90XN

90° | $a_{p\,max}$ [mm] 19,0 - 30,5 | ø D [mm] 160 - 315



		P	M	K
	XN 1205	N	S	H
	XN 1606			

112 - 113

S90CN(XN)-R

90° | $a_{p\,max}$ [mm] 14,0 - 18,5 | ø D [mm] 125 - 200

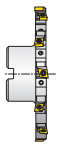


		P	M	K
	CN 1005	N	S	H

114 - 115

S90CN(XN)-R

90° | $a_{p\,max}$ [mm] 19,0 - 30,5 | ø D [mm] 160 - 200



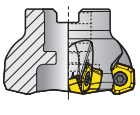
		P	M	K
	XN 1205	N	S	H
	XN 1606			

114 - 115

S19PD09

19° | $a_{p\,max}$ [mm] 2,0 | ø D [mm] 32 - 100

PENTA HF



		P	M	K
	PD 0905	N	S	H

124 - 127

SZD07

- | $a_{p\,max}$ [mm] 1,0 | ø D [mm] 16 - 32

FEED ZD



		P	M	K
	ZD 0703			H

128 - 131

SZD09

- | $a_{p\,max}$ [mm] 1,0 | ø D [mm] 25 - 40

FEED ZD



		P	M	K
	ZD 09T3			H

128 - 133

SZD12

- | $a_{p\,max}$ [mm] 1,6 | ø D [mm] 32 - 80

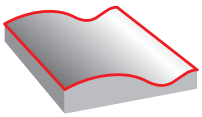
FEED ZD

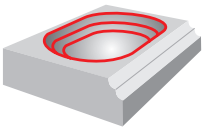


		P	M	K
	ZD 1204			H

128 - 133

FRESATURA DI SUPERFICI SAGOMATE (FRESE A COPIARE)
MILLING SHAPED SURFACES (COPYING CUTTERS)





SMORC12

-	$a_{p\,max}$ [mm]	6,0
	ø D [mm]	40 - 100

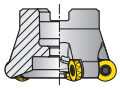


		P	M	K
○	RC 1204	N	S	H

116 - 117

SMORC16

-	$a_{p\,max}$ [mm]	8,0
	ø D [mm]	63 - 100

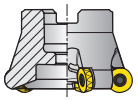


		P	M	K
○	RC 1606	N	S	H

116 - 117

SMORC20

-	$a_{p\,max}$ [mm]	10,0
	ø D [mm]	80 - 100



		P	M	K
○	RC 2006	N	S	H

116 - 117

SRD05

-	$a_{p\,max}$ [mm]	1,5
	ø D [mm]	10 - 15



		P	M	K
○	RD 0501	N		H

120 - 121

SRD07

-	$a_{p\,max}$ [mm]	1,8
	ø D [mm]	15 - 25



		P	M	K
○	RD.. 07T1 RD.. 0702	N		H

118 - 121

SRD10

-	$a_{p\,max}$ [mm]	2,5
	ø D [mm]	20 - 35



		P	M	K
○	RD 1003	N		H

118 - 121

S(C)RD12

-	$a_{p\,max}$ [mm]	3,0
	ø D [mm]	24 - 80



		P	M	K
○	RD 12T3	N		H

120 - 123

S(C)RD16

-	$a_{p\,max}$ [mm]	4,0
	ø D [mm]	32 - 100



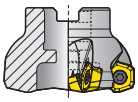
		P	M	K
○	RD 1604	N		H

120 - 123

S19PD09

19°	$a_{p\,max}$ [mm]	2,0
	ø D [mm]	32 - 100

PENTA HF



		P	M	K
⬡	PD 0905	N	S	H

124 - 127

SZD07

-	$a_{p\,max}$ [mm]	1,0
	ø D [mm]	16 - 32

FEED ZD



		P	M	K
○	ZD 0703			H

128 - 131

SZD09

-	$a_{p\,max}$ [mm]	1,0
	ø D [mm]	25 - 40

FEED ZD



		P	M	K
○	ZD 09T3			H

128 - 133

SZD12

-	$a_{p\,max}$ [mm]	1,6
	ø D [mm]	32 - 80

FEED ZD



		P	M	K
○	ZD 1204			H

128 - 133

SZP10

-	$a_{p\,max}$ [mm]	8,9
	ø D [mm]	10



		P	M	K
◇	ZP 10		S	H

134 - 139

SZP12

-	$a_{p\,max}$ [mm]	10,7
	ø D [mm]	12



		P	M	K
◇	ZP 12	N	S	H

134 - 139

SZP16

-	$a_{p\,max}$ [mm]	14,4
	ø D [mm]	16



		P	M	K
◇	ZP 16	N	S	H

134 - 139

SZP20

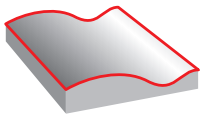
-	$a_{p\,max}$ [mm]	17,9
	ø D [mm]	20

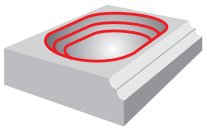


		P	M	K
◇	ZP 20	N	S	H

134 - 139

FRESATURA DI SUPERFICI SAGOMATE (FRESE A COPIARE)
MILLING SHAPED SURFACES (COPYING CUTTERS)





SZP25

-	$a_{p\,max}$ [mm]	22,3
	ø D [mm]	25



ZP 25	P	M	K
	N	S	H

134 - 139

SZP32

-	$a_{p\,max}$ [mm]	28,6
	ø D [mm]	32



ZP 32	P	M	K
	N	S	H

134 - 136

SZP40

-	$a_{p\,max}$ [mm]	35,7
	ø D [mm]	40



ZP 40	P	M	K
	N	S	H

134 - 136

SZP50

-	$a_{p\,max}$ [mm]	44,7
	ø D [mm]	50



ZP 50	P	M	K
	N	S	H

134 - 136

CXP16

-	$a_{p\,max}$ [mm]	8,0
	ø D [mm]	16

MULTISIDE XP



XP 16	P	M	K
		S	H

140 - 143

CXP20

-	$a_{p\,max}$ [mm]	10,0
	ø D [mm]	20

MULTISIDE XP



XP 20	P	M	K
		S	H

140 - 143

CXP25

-	$a_{p\,max}$ [mm]	12,5
	ø D [mm]	25

MULTISIDE XP



XP 25	P	M	K
		S	H

140 - 143

CXP32

-	$a_{p\,max}$ [mm]	16,0
	ø D [mm]	32

MULTISIDE XP

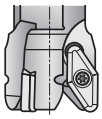


XP 32	P	M	K
		S	H

140 - 143

S90VC22C

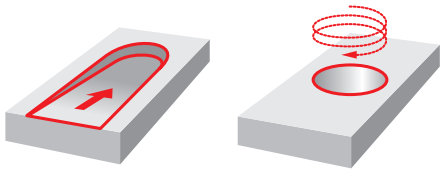
90°	$a_{p\,max}$ [mm]	16,0
	ø D [mm]	32 - 80



VC 220530			
	N		

144 - 149

ENTRATA IN RAMPA
ENTERING AT AN ANGLE



SMORC12

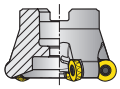
-	$a_{p\,max}$ [mm]	6,0
	ø D [mm]	40 - 100



	RC 1204	P	M	K
		N	S	H
		116 - 117		

SMORC16

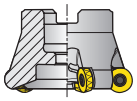
-	$a_{p\,max}$ [mm]	8,0
	ø D [mm]	63 - 100



	RC 1606	P	M	K
		N	S	H
		116 - 117		

SMORC20

-	$a_{p\,max}$ [mm]	10,0
	ø D [mm]	80 - 100



	RC 2006	P	M	K
		N	S	H
		116 - 117		

SRD05

-	$a_{p\,max}$ [mm]	1,5
	ø D [mm]	10 - 15



	RD 0501	P	M	K
		N		H
		120 - ˝121		

SRD07

-	$a_{p\,max}$ [mm]	1,8
	ø D [mm]	15 - 25



	RD.. 07T1	P	M	K
	RD.. 0702	N		H
		118 - 121		

SRD10

-	$a_{p\,max}$ [mm]	2,5
	ø D [mm]	20 - 35



	RD 1003	P	M	K
		N		H
		118 - 121		

S(C)RD12

-	$a_{p\,max}$ [mm]	3,0
	ø D [mm]	24 - 80



	RD 12T3	P	M	K
		N		H
		120 - 123		

S(C)RD16

-	$a_{p\,max}$ [mm]	4,0
	ø D [mm]	32 - 100

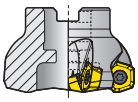


	RD 1604	P	M	K
		N		H
		120 - 123		

S19PD09

19°	$a_{p\,max}$ [mm]	2,0
	ø D [mm]	32 - 100

PENTA HF



	PD 0905	P	M	K
		N	S	H
		124 - 127		

SZD07

-	$a_{p\,max}$ [mm]	1,0
	ø D [mm]	16 - 32

FEED ZD



	ZD 0703	P	M	K
				H
		128 - 131		

SZD09

-	$a_{p\,max}$ [mm]	1,0
	ø D [mm]	25 - 40

FEED ZD



	ZD 09T3	P	M	K
				H
		128 - 133		

SZD12

-	$a_{p\,max}$ [mm]	1,6
	ø D [mm]	32 - 80

FEED ZD



	ZD 1204	P	M	K
				H
		128 - 133		

S90AD11E

90°	$a_{p\,max}$ [mm]	9,0
	ø D [mm]	16 -125

FORCE AD

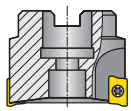


	AD 11T3	P	M	K
		N	S	H
		44 - 49		

S90AD16E

90°	$a_{p\,max}$ [mm]	13,0
	ø D [mm]	25 - 160

FORCE AD

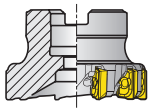


	AD 1606	P	M	K
		N	S	H
		50 - 55		

C90AD15

90°	$a_{p\,max}$ [mm]	12,0
	ø D [mm]	40 - 80

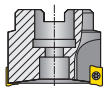
MULTISIDE AD



	AD 15T3	P	M	K
			S	
		56 - 61		

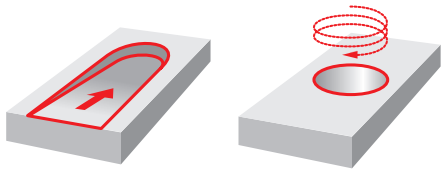
S90AP10D

90°	$a_{p\,max}$ [mm]	9,0
	ø D [mm]	10 - 63



	AP 1003	P	M	K
		N	S	H
		62 - 65		

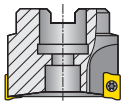
ENTRATA IN RAMPA
ENTERING AT AN ANGLE



S90AP16D

90°

$a_{p\,max}$ [mm]	14,0
ø D [mm]	25 - 160



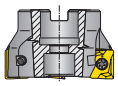
	AP 1604	P	M	K
		N	S	H
		66 - 69		

S90LN12

90°

$a_{p\,max}$ [mm]	9,0
ø D [mm]	25 - 110

ECON *LN*

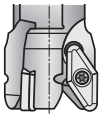


	LN 1205	P	M	K
		N		H
		70 - 75		

S90VC22C

90°

$a_{p\,max}$ [mm]	16,0
ø D [mm]	32 - 80



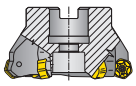
	VC 220530			
		N		
		144 - 149		

S45HN06C

45°

$a_{p\,max}$ [mm]	3,0
ø D [mm]	25 - 125

ECON *HN*



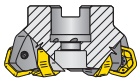
	HN 0604	P	M	K
		N		H
		14 - 19		

S45HN09C

45°

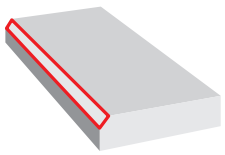
$a_{p\,max}$ [mm]	5,0
ø D [mm]	50 - 315

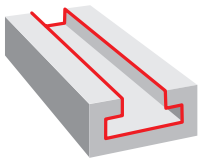
ECON *HN*



	HN 0906	P	M	K
		N		H
		20 - 21		

SMUSSATURA, CIANFRINATURA E SCANALATURE A T
BEVELLING, CHAMFERING AND T-GROOVES





SSD09

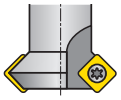
45° | $a_{p\,max}$ [mm] 4,5 | ø D [mm] 10 - 25



SD 0903 | P M K | N S H | 150 - 151

N-SSO09

45° | $a_{p\,max}$ [mm] 4,5 | ø D [mm] 8 - 25



SO 09T3 | P M K | N S H | 152 - 153

2516

45° | $a_{p\,max}$ [mm] 8,5 | ø D [mm] 11 - 19



TC 16T3 | P M K | N S H | 154 - 155

2636

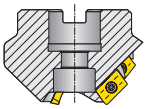
10-80° | $a_{p\,max}$ [mm] 8,5 | ø D [mm] 11 - 19



TC 16T3 | P M K | N S H | 156 - 157

SxxXP

15-75° | $a_{p\,max}$ [mm] 7,0 - 28,0 | ø D [mm] 35 - 45



XP 1604 | P M K | N S | 158 - 159

SCC06

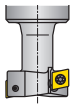
90° | $a_{p\,max}$ [mm] 11,0 | ø D [mm] 25



CC 0603 | P M K | S | 160 - 161

SSC08

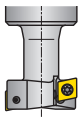
90° | $a_{p\,max}$ [mm] 14,0 | ø D [mm] 32



CC 08T3 | P M K | S | 160 - 161

SSC09

90° | $a_{p\,max}$ [mm] 18,0 | ø D [mm] 40

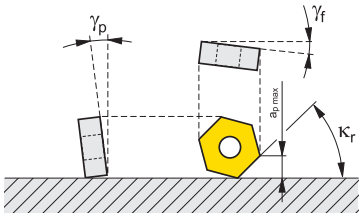


CC 09T3 | P M K | S | 160 - 161

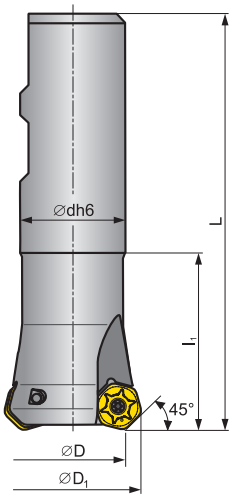
SHN06



γ_p	-7°	κ_r	45°
γ_f	-7°	$a_{p\,max}$	3 mm



ECON HN



Z* - N° denti / Number of teeth

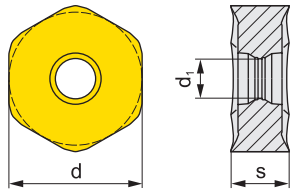
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dh6	L	D_1	l_1	Z*							
25N2R042B25-SHN06C-C	●	25	25	99	32,2	42	2						+	0,32
32N3R042B32-SHN06C-C	●	32	32	103	39,3	42	3						+	0,56

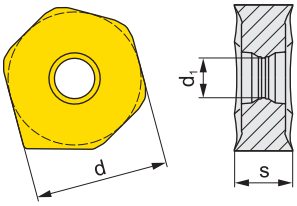
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SHN06

FRESE A CANDELA
END MILLING CUTTERS



HNGX 06



XNGX 06



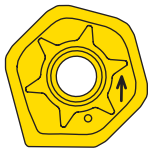
HNGX 06 -F



HNGX 06 -M



HNGX 06 -R



XNGX 06 ANSN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades							Dimensioni / Dimensions		
	M5315	M9315	M9325	M9340	8215	8230	8240	d	s	d_1
HNGX 0604ANSN-F				●	●	●	●	10,500	5,260	3,7
HNGX 0604ANSN-M	●	●	●	●	●	●	●	10,500	5,260	3,7
HNGX 0604ANSN-R	●	●	●		●	●	●	10,500	5,260	3,7
XNGX 0604ANSN					●			10,500	5,260	3,7

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
SHN06	US 3007-T09P	Flag T09P

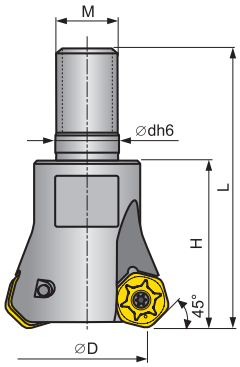
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SHN06

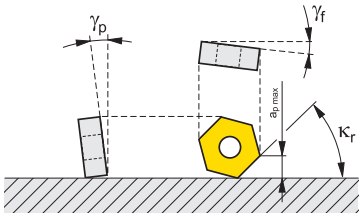
TESTINE PER SISTEMA MODULARE
EXCHANGEABLE HEADS FOR MODULAR SYSTEM



ECON HN



γ_p	-7°	κ_r	45°
γ_f	-7°	$a_{p\,max}$	3 mm



Z* - N° denti / Number of teeth

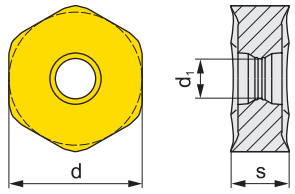
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dh6	M	L	H	Z*							
25N2R033M12-SHN06C-C	●	25	12,5	M12	56	33,0	2						+	0,10
32N3R043M16-SHN06C-C	●	32	17,0	M16	66	43,0	3						+	0,22
40N4R043M16-SHN06C-C	●	40	17,0	M16	66	43,0	4						+	0,27

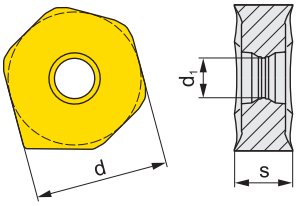
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SHN06

TESTINE PER SISTEMA MODULARE
EXCHANGEABLE HEADS FOR MODULAR SYSTEM



HNGX 06



XNGX 06



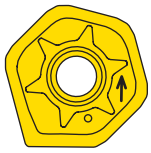
HNGX 06 -F



HNGX 06 -M



HNGX 06 -R



XNGX 06 ANSN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades							Dimensioni / Dimensions		
	M5315	M9315	M9325	M9340	8215	8230	8240	d	s	d_1
HNGX 0604ANSN-F				●	●	●	●	10,500	5,260	3,7
HNGX 0604ANSN-M	●	●	●	●	●	●	●	10,500	5,260	3,7
HNGX 0604ANSN-R	●	●	●		●	●	●	10,500	5,260	3,7
XNGX 0604ANSN					●			10,500	5,260	3,7

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
SHN06	US 3007-T09P	Flag T09P

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

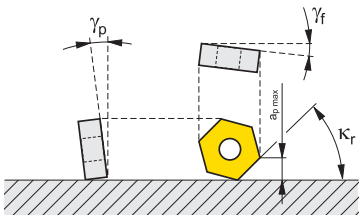
S45HN06

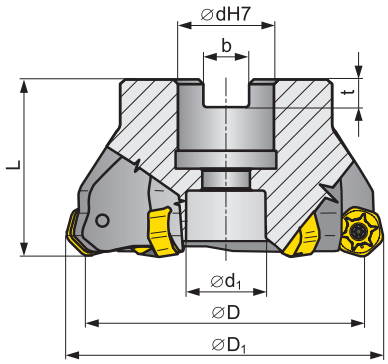
FRESE A SPIANARE NEGATIVE-NEGATIVE
NEGATIVE - NEGATIVE FACE MILLING CUTTERS



ECON *HN*

γ_p	-7°	κ_r	45°
γ_f	-7°	$a_{p\ max}$	3 mm





Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

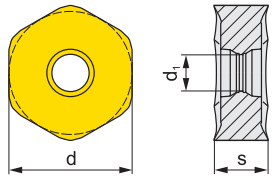
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	D_1	b	t	Z*					
40A05R-S45HN06C-C	●	40	16	14	40	47,3	8,4	5,6	5				+	0,25
50A04R-S45HN06C-C	●	50	22	18	40	57,3	10,4	6,3	4				+	0,42
50A06R-S45HN06C-C	●	50	22	18	40	57,3	10,4	6,3	6				+	0,40
63A06R-S45HN06C-C	●	63	22	18	40	70,3	10,4	6,3	6				+	0,55
63A08R-S45HN06C-C	●	63	22	18	40	70,3	10,4	6,3	8				+	0,55
80A07R-S45HN06C-C	●	80	27	38	50	86,8	12,4	7,0	7				+	1,09
80A10R-S45HN06C-C	●	80	27	38	50	86,8	12,4	7,0	10				+	1,08
100A08R-S45HN06C-C	●	100	32	45	50	107,1	14,4	8,0	8				+	1,81
100A12R-S45HN06C-C	●	100	32	45	50	107,1	14,4	8,0	12				+	1,78
125A10R-S45HN06C-C	●	125	40	56	63	132,2	16,4	9,0	10				+	3,35
125A16R-S45HN06C-C	●	125	40	56	63	132,2	16,4	9,0	16				+	3,31

IMPERO PRAMET

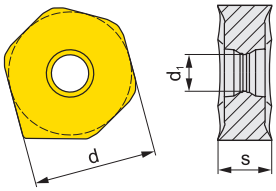
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S45HN06

FRESE A SPIANARE NEGATIVE-NEGATIVE
NEGATIVE - NEGATIVE FACE MILLING CUTTERS



HNGX 06



XNGX 06



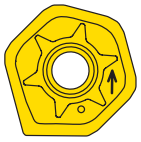
HNGX 06-F



HNGX 06-M



HNGX 06-R



XNGX 06 ANSN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades							Dimensioni / Dimensions		
	M5315	M9315	M9325	M9340	8215	8230	8240	d	s	d_1
HNGX 0604ANSN-F				●	●	●	●	10,500	5,260	3,7
HNGX 0604ANSN-M	●	●	●	●	●	●	●	10,500	5,260	3,7
HNGX 0604ANSN-R	●	●	●		●	●	●	10,500	5,260	3,7
XNGX 0604ANSN					●			10,500	5,260	3,7

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle	Vite di bloccaggio fresa Screw for taper clamping
40	US 3007-T09P	D-T07P/T09P	FG-15	HS 0830C
50 ÷ 63	US 3007-T09P	D-T07P/T09P	FG-15	HS 1030C
80 ÷ 125	US 3007-T09P	D-T07P/T09P	FG-15	-

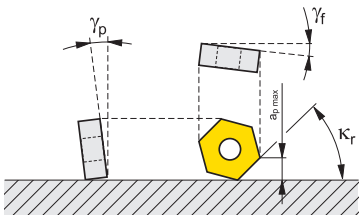
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S45HN09

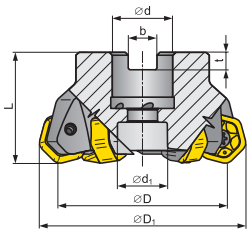
FRESE A SPIANARE NEGATIVE-NEGATIVE
NEGATIVE - NEGATIVE FACE MILLING CUTTERS



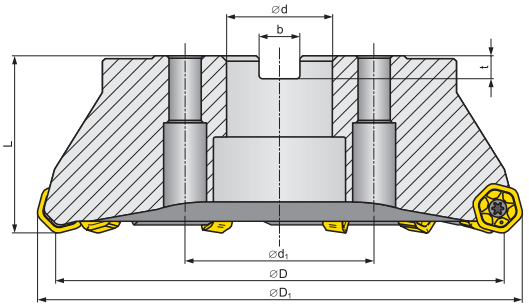
γ_p	-7°	κ_r	45°
γ_f	-7°	$a_{p\ max}$	5 mm



ECON HN



ø 50 ÷ 125 mm



ø 160 ÷ 315 mm

Z* - N° denti / Number of teeth

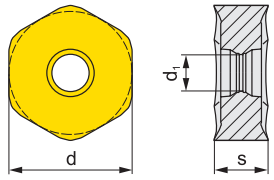
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	d	d_1	L	D_1	b	t	Z*					
50A04R-S45HN09C-CF	■	50	22	18,0	40	61,7	10,4	6,3	4				+	0,35
63A06R-S45HN09C-CF	■	63	22	18,0	40	74,7	10,4	6,3	6				+	0,49
80A06R-S45HN09C-CF	■	80	27	38,0	50	91,7	12,4	7,0	6				+	1,06
80A08R-S45HN09C-CF	■	80	27	38,0	50	91,7	12,4	7,0	8				+	1,06
100A06R-S45HN09C-CF	■	100	32	45,0	50	111,7	14,4	8,0	6				+	1,74
100A08R-S45HN09C-CF	■	100	32	45,0	50	111,7	14,4	8,0	8				+	1,74
100A10R-S45HN09C-CF	■	100	32	45,0	50	111,7	14,4	8,0	10				+	1,74
125A06R-S45HN09C-CF	■	125	40	56,0	63	136,7	16,4	9,0	6				+	3,24
125A10R-S45HN09C-CF	■	125	40	56,0	63	136,7	16,4	9,0	10				+	3,24
125A12R-S45HN09C-CF	■	125	40	56,0	63	136,7	16,4	9,0	12				+	3,24
160C08R-S45HN09CF	■	160	40	66,7	63	171,7	16,4	9,0	8					5,70
160C12R-S45HN09CF	■	160	40	66,7	63	171,7	16,4	9,0	12					5,70
160C14R-S45HN09CF	■	160	40	66,7	63	171,7	16,4	9,0	14					5,70
200C10R-S45HN09CF	■	200	60	101,6	63	211,7	25,7	14,0	10					9,00
250C14R-S45HN09CF	■	250	60	101,6	63	261,7	25,7	14,0	14					12,80
315C16R-S45HN09CF	□	315	60	101,6	80	326,7	25,7	14,0	16					32,20

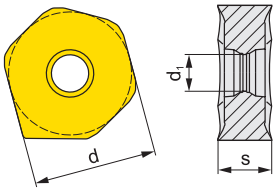
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S45HN09

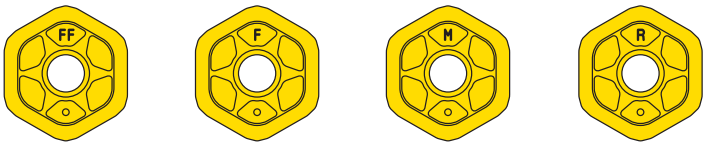
FRESE A SPIANARE NEGATIVE-NEGATIVE
NEGATIVE - NEGATIVE FACE MILLING CUTTERS



HNGX 09



XNGX 09



HNGX 09-FF | HNGX 09-F | HNGX 09-M | HNGX 09-R



XNGX 09 ANSN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades							Dimensioni / Dimensions		
	M5315	M9315	M9325	M9340	8215	8230	8240	d	s	d_1
HNGX 0906ANEN-FF				●	●	●		16,500	6,350	4,90
HNGX 0906ANSN-F				●	●	●	●	16,500	6,350	4,90
HNGX 0906ANSN-M	●	●	●	●	●	●	●	16,500	6,350	4,90
HNGX 0906ANSN-R	●	●	●		●	●	●	16,500	6,350	4,90
XNGX 0906ANSN					●	○		16,500	6,350	4,90

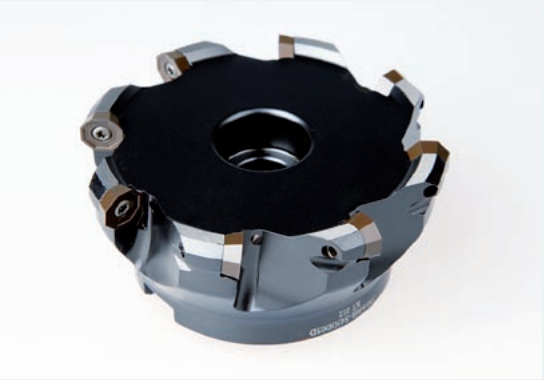
RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

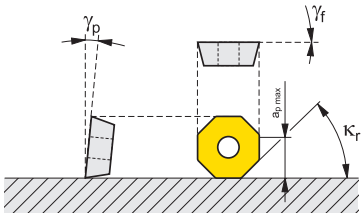
Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle	Vite di bloccaggio fresa Screw for taper clamping
50 ÷ 63	US 54511-T15P	D-T08P/T15P	FG-15	HS 1030C
80 ÷ 315	US 54511-T15P	D-T08P/T15P	FG-15	-

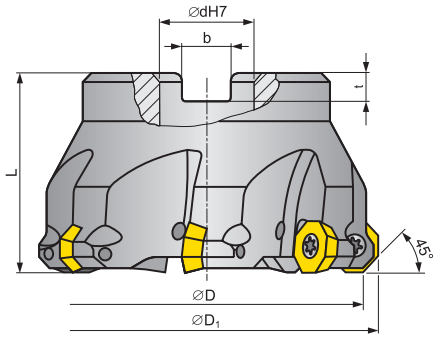
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S45OD05D



γ_p	+7°	κ_r	45°
γ_f	0°	$a_{p\,max}$	7,3 mm





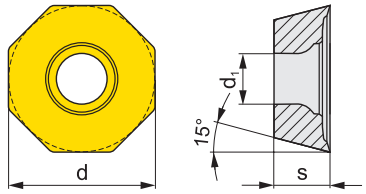
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

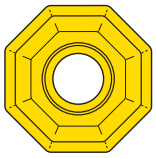
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D_1	D	dH7	L	b	t	Z*						
40A04R-S45OD05D	○	48	40	16	40	8,4	5,6	4					+	1,10
50A05R-S45OD05D	○	58	50	22	40	10,4	6,3	5					+	1,30
63A06R-S45OD05D	○	71	63	22	40	10,4	6,3	6					+	2,00
80A07R-S45OD05D	○	88	80	27	50	12,4	7,0	7					+	2,70
100A08R-S45OD05D	○	108	100	32	50	14,4	8,0	8					+	6,00
125A10R-S45OD05D	○	133	125	40	63	16,4	9,0	10					+	10,00

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S45OD05D



ODMT



ODMT ZZN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades					Dimensioni / Dimensions		
	M5315	M9315	M9325	8230	8240	d	s	d_1
ODMT 0504ZZN	●	●	●	●	●	12,700	4,760	4,40

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

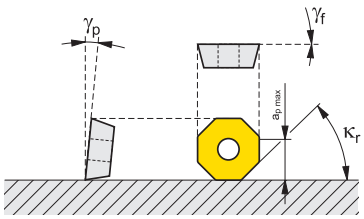
Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
40 ÷ 125	US 3509-T15	SDR T15

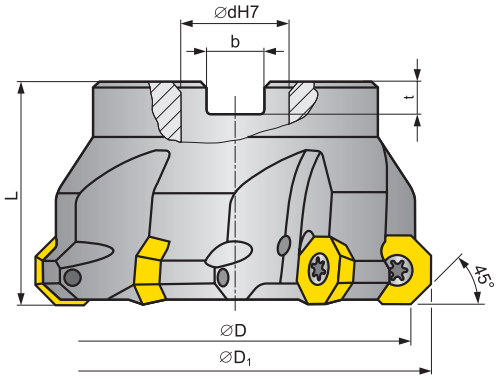
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S45OD06D



γ_p	+5°	κ_r	45°
γ_f	0°	$a_{p\,max}$	8,6 mm





Z* - N° denti / Number of teeth

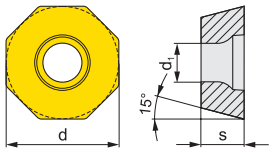
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D_1	D	dH7	L	b	t	Z*						
63A05R-S45OD06D	●	72,5	63	22	40	10,4	6,3	5					+	1,10
80A06R-S45OD06D	●	89,5	80	27	50	12,4	7,0	6					+	1,30
100A07R-S45OD06D	●	109,5	100	32	50	14,4	8,0	7					+	2,00
125A08R-S45OD06D	●	134,5	125	40	63	16,4	9,0	8					+	2,70
160C09R-S45OD06D	●	169,5	160	40	63	16,4	9,0	9						6,00

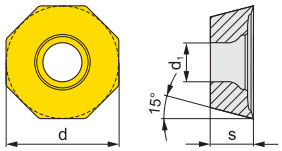
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S45OD06D

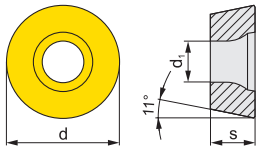
ODEW



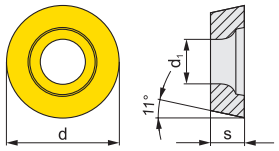
ODMT



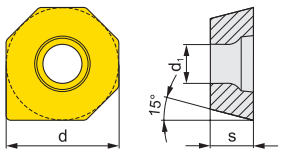
RPEW



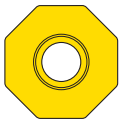
RPET



ODMX



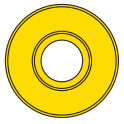
ODEW ZZN



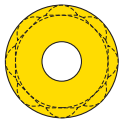
ODMT ZZN



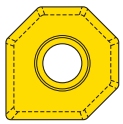
RPEW MOS



RPET MOS-M



ODMX ZZ



INSERTI / INDEXABLE CUTTING INSERTS

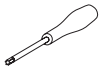
ISO	Qualità / Grades								Dimensioni / Dimensions					
	M5315	M9315	M9325	8215	8230	8240	7010	7040	d	s	d_1			
ODEW 0605ZZN					●				15,875	5,56	5,50			
ODMT 0605ZZN	●	●	●		●	●			15,875	5,56	5,50			
RPEW 1505MOS				●	●		○		15,875	5,56	5,50			
RPET 1505MOS-M					●	●		○	15,875	5,56	5,50			
ODMX 0605ZZ					○				15,875	5,56	5,50			

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
63 ÷ 160	US 4511-T20	SDR T20





IMPERO PRAMET

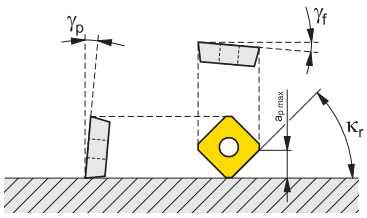
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

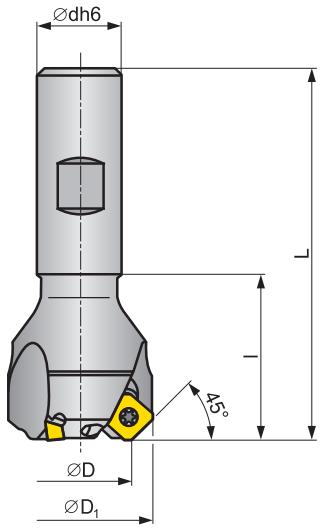
SSE09

FRESE A CANDELA
END MILLING CUTTERS



γ_p	+20°	κ_r	45°
γ_f	-5°	$a_{p\,max}$	4,5 mm





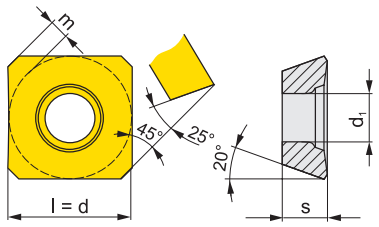
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

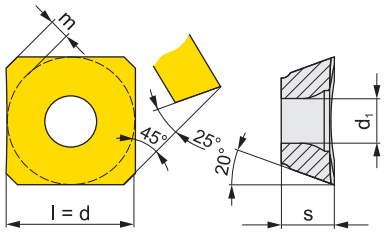
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	D_1	L	l	dh6	Z*							
20N2R032B20-SSE09-C	●	20	29,8	82	32	20	2						+	0,10
25N3R042B25-SSE09-C	○	25	34,8	98	42	25	3						+	0,30
32N4R042B32-SSE09-C	●	32	42,0	102	42	32	4						+	0,60

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

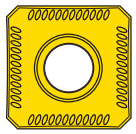
SSE09



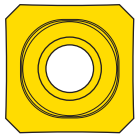
SEMT



SEET



SEMT AFSN



SEET AFEN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades					Dimensioni / Dimensions				
	M9325	M9340	8215	8230	8240	l	d	s	d_1	m
SEMT 09T3AFSN	●	●	●	●	●	9,525	9,525	3,97	3,50	1,212
SEET 09T3AFEN	■	■	■	■	■					

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
20 ÷ 32	US 3007-T09P	SDR T09P

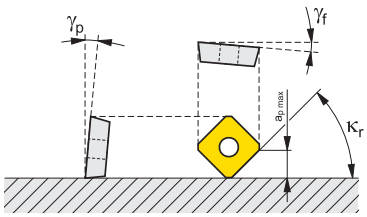
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

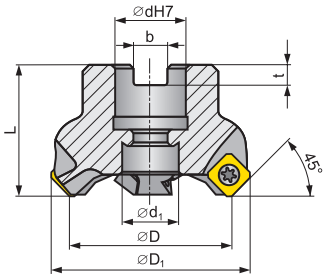
S45SE09F

FRESE A SPIANARE ALTAMENTE POSITIVE
HIGH POSITIVE FACE MILLING CUTTERS

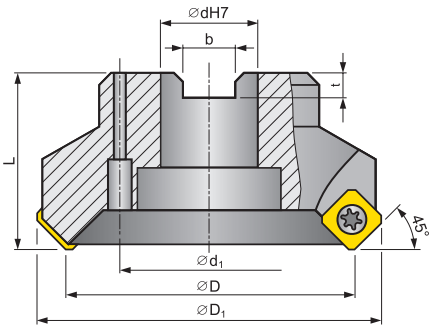


γ_p	+20°	κ_r	45°
γ_f	-5°	$a_{p\,max}$	4,5 mm





ø 32 ÷ 125 mm



ø 160 mm

Z* - N° denti / Number of teeth

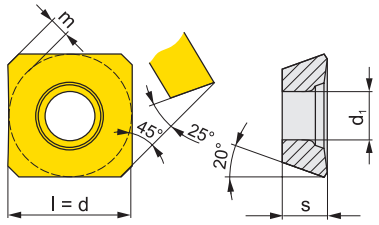
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	D_1	b	t	Z*					
32A04R-S45SE09F-C	○	32	16	14	40	42,0	8,4	6,4	4				+	0,23
40A04R-S45SE09F-C	●	40	16	14	40	53,2	8,4	6,4	4				+	0,34
50A05R-S45SE09F-C	●	50	22	18	40	59,6	10,4	6,4	5				+	0,38
63A05R-S45SE09F-C	■	63	22	18	40	75,8	10,4	6,4	5				+	0,54
63A06R-S45SE09F-C	●	63	22	18	40	75,8	10,4	6,4	6				+	0,56
80A06R-S45SE09F-C	■	80	27	38	50	89,6	12,4	7,0	6				+	1,00
80A08R-S45SE09F-C	●	80	27	38	50	89,6	12,4	7,0	8				+	1,10
100A08R-S45SE09F-C	■	100	32	45	50	110,0	14,4	8,0	8				+	1,38
100A10R-S45SE09F-C	●	100	32	45	50	110,0	14,4	8,0	10				+	1,53
125A09R-S45SE09F-C	■	125	40	60	63	134,5	16,4	9,0	9				+	2,73
125A12R-S45SE09F-C	●	125	40	60	63	134,5	16,4	9,0	12				+	3,12
160C10R-S45SE09F	■	160	40	66,7	63	169,6	16,4	9,0	10					4,73
160C14R-S45SE09F	○	160	40	66,7	63	169,6	16,4	9,0	14					5,10

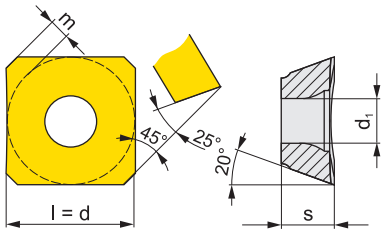
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S45SE09F

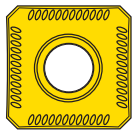
FRESE A SPIANARE ALTAMENTE POSITIVE
HIGH POSITIVE FACE MILLING CUTTERS



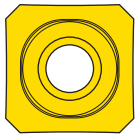
SEMT



SEET



SEMT AFSN



SEET AFEN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades					Dimensioni / Dimensions				
	M9325	M9340	8215	8230	8240	l	d	s	d_1	m
SEMT 09T3AFSN	●	●	●	●	●	9,525	9,525	3,97	3,50	1,212
SEET 09T3AFEN	■	■	■	■	■	9,525	9,525	3,97	3,50	1,212

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver	Vite di bloccaggio fresa Screw for taper clamping
32 ÷ 40	US 3007-T09P	SDR T09P	HS 0830C
50 ÷ 63	US 3007-T09P	SDR T09P	HS 1030C
80 ÷ 160	US 3007-T09P	SDR T09P	-

IMPERO PRAMET

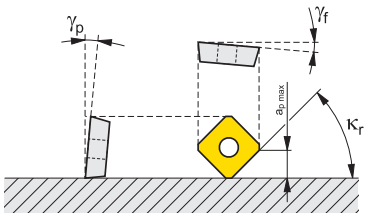
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

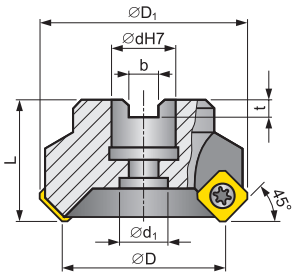
S45SN12Z

FRESE A SPIANARE POSITIVE-NEGATIVE
NEGATIVE - POSITIVE FACE MILLING CUTTERS

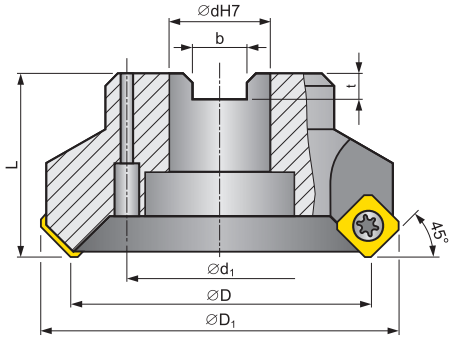


γ_p	+7°30´	κ_r	45°
γ_f	-5°30´	$a_{p\,max}$	6,5 mm





ø 40 ÷ 125 mm



ø 160 ÷ 250 mm

Z* - N° denti / Number of teeth

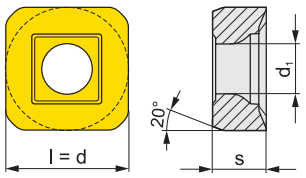
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	D_1	b	t	Z*					
40A03R-S45SN12Z-C	○	40	16	14	40	55	8,4	5,6	3				+	0,60
50A04R-S45SN12Z-C	●	50	22	18	40	65	10,4	6,3	4				+	0,70
63A05R-S45SN12Z-C	●	63	22	18	40	78	10,4	6,3	5				+	1,10
80A06R-S45SN12Z-C	●	80	27	38	50	95	12,4	7,0	6				+	1,30
100A07R-S45SN12Z-C	●	100	32	45	50	115	14,4	8,0	7				+	2,00
125A08R-S45SN12Z-C	●	125	40	56	63	140	16,4	9,0	8				+	2,70
160C10R-S45SN12Z	●	160	40	66,7	63	173	16,4	9,0	10					6,00
200C12R-S45SN12Z	○	200	60	101,6	63	210	25,7	14,0	12					10,00
250C16R-S45SN12Z	○	250	60	101,6	63	260	25,7	14,0	16					17,00

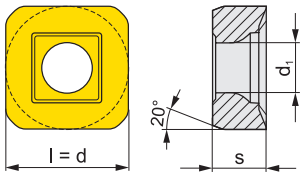
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S45SN12Z

FRESE A SPIANARE POSITIVE-NEGATIVE
NEGATIVE - POSITIVE FACE MILLING CUTTERS



SNMT



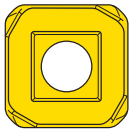
SNKT



SNMT-M



SNMT-R



SNKT-M

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades							Dimensioni / Dimensions			
	M5315	M9315	M9325	M9340	8215	8230	8240	l	d	s	d_1
SNMT 1205AZSR-M		●	●	●	●	●	●	12,700	12,700	5,56	5,2
SNMT 1205AZSR-R	●	●	●		●	●	●	12,700	12,700	5,56	5,2
SNKT 1205AZSR-M			●			●	○	12,700	12,700	5,56	5,2

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver	Vite di bloccaggio fresa Screw for taper clamping
40	US 4511-T20	SDR T20-T	HS 0830C
50 ÷ 63	US 4511-T20	SDR T20-T	HS 1030C
80 ÷ 250	US 4511-T20	SDR T20-T	-

IMPERO PRAMET

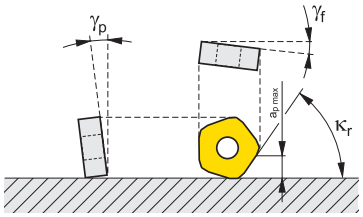
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S57PN13

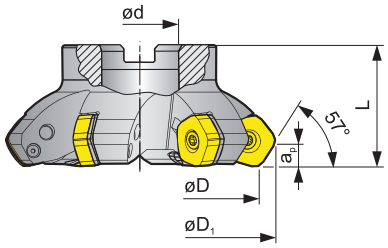
FRESE A SPIANARE NEGATIVE-NEGATIVE
NEGATIVE - NEGATIVE FACE MILLING CUTTERS



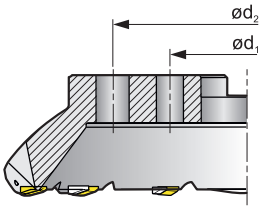
γ_p	-4°	κ_r	57°
γ_f	-8°÷ -5°	$a_{p\ max}$	10,0



PENTA HD



ø 100 ÷ 125 mm



ø 160 ÷ 315 mm

Z* - N° denti / Number of teeth

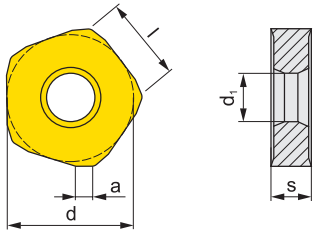
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	D_1	d	L	d_1	d_2	Z*						
100A05R-S57PN13	■	100	115,8	32	50	-	-	5						1,19
125A06R-S57PN13	■	125	140,8	40	63	-	-	6						2,28
160C08R-S57PN13	■	160	175,8	40	63	66,7	-	8						3,20
200C10R-S57PN13	■	200	215,8	60	63	101,6	-	10						6,68
250C12R-S57PN13	■	250	265,8	60	63	101,6	-	12						12,49
315C14R-S57PN13	■	315	330,8	60	80	101,6	177,8	14						20,65

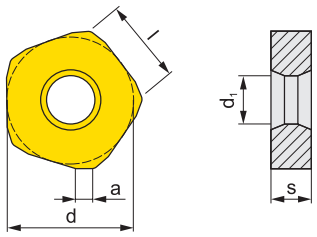
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S57PN13

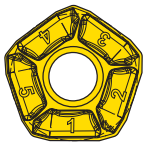
FRESE A SPIANARE NEGATIVE-NEGATIVE
NEGATIVE - NEGATIVE FACE MILLING CUTTERS



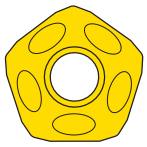
PNMU



PNMQ



PNMU-M



PNMQ

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades				Dimensioni / Dimensions				
	M9340	M8345	8215	8230	l	d	s	d_1	a
PNMU 1308DNSR-M	■	■	■	■	13,000	24,400	7,94	10,0	3,0
PNMQ 1308DNSN	■	■		■	13,000	24,400	7,94	10,0	3,0

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

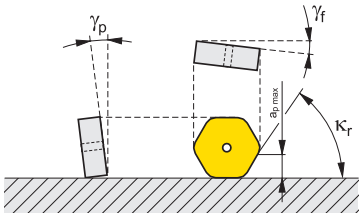
Ø Fresa Ø Cutter	Sottoplacchetta Shim	Vite sottoplacchetta* Clamping screw of shim*	Cacciavite Screwdriver	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
100 ÷ 315	SPN 13T3DN	US 64010-T15P	SDR T15P	US 68026-T30P	SDR T30P-T

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

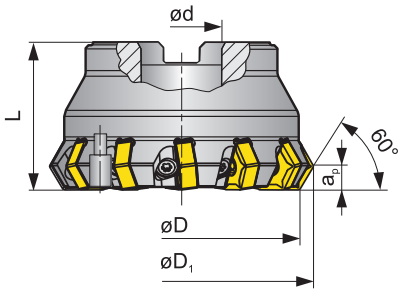
C60HN09



γ_p	-7°	κ_r	60°
γ_f	-5°	$a_{p\,max}$	6,0



ECON HN



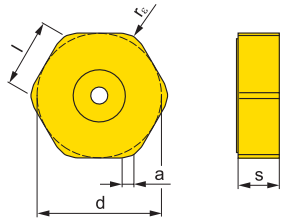
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

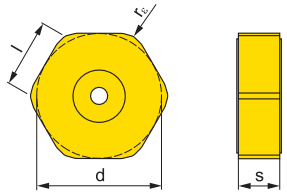
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	D_1	d	L	d_1	d_2	Z*						
80A08R-C60HN09	■	80	89,4	27	50	-	-	8						1,31
80A12R-C60HN09	■	80	89,4	27	50	-	-	12						1,22
100A10R-C60HN09	■	100	109,4	32	50	-	-	10						2,07
100A16R-C60HN09	■	100	109,4	32	50	-	-	16						1,96
125A12R-C60HN09	■	125	134,4	40	63	-	-	12						3,84
125A20R-C60HN09	■	125	134,4	40	63	-	-	20						3,65
160C16R-C60HN09	■	160	169,4	40	63	66,7	-	16						5,82
160C24R-C60HN09	□	160	169,4	40	63	66,7	-	24						5,65
200C20R-C60HN09	■	200	209,4	60	63	101,6	-	20						9,12
200C32R-C60HN09	□	200	209,4	60	63	101,6	-	32						8,89
250C24R-C60HN09	■	250	259,4	60	63	101,6	-	24						12,28
250C40R-C60HN09	□	250	259,4	60	63	101,6	-	40						11,98

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

C60HN09



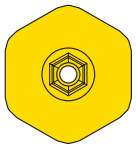
HNEF



HNMF



HNEF-F HNEF-M HNEF-W



HNMF-R

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades					Dimensioni / Dimensions					
	M5315	M9325	M8310	8215		l	d	s	a		r_ε
HNEF 0905DNFN-F	■	□	■	■		9,400	16,200	5,64	1,6		0,4
HNEF 090508EN-M	■	□		■		9,400	16,200	5,64	-		0,8
HNMF 090516SN-R	■	■		■		9,400	16,200	5,64	-		1,6
HNEF 0905ZZL-W	□			□		3,380	16,260	5,64	5,00		0,8
HNEF 0905ZZR-W	■	□	■	■		3,380	16,260	5,64	5,00		0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Chiave Handle	Vite di bloccaggio fresa Screw for taper clamping
80	US 74016-T15P	D-T08P/T15P	FG-15	HS 1230C
100	US 74016-T15P	D-T08P/T15P	FG-15	HS 1635C
125	US 74016-T15P	D-T08P/T15P	FG-15	HS 2040C
160 ÷ 250	US 74016-T15P	D-T08P/T15P	FG-15	-

IMPERO PRAMET

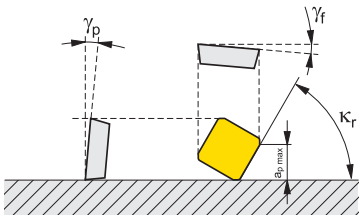
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

F60SB22X

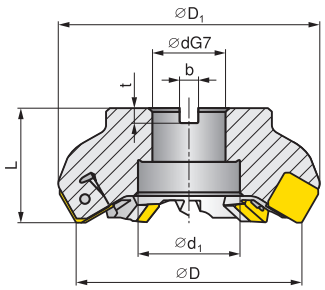
FRESE A SPIANARE PER SGROSSATURA PESANTE
FACE MILLING CUTTERS - FOR HEAVY MACHINING



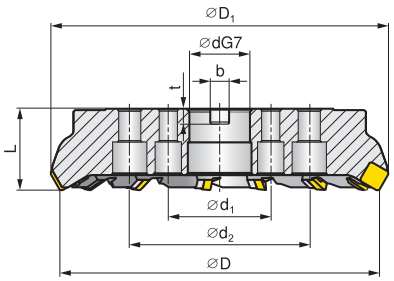
γ_p	+9°	κ_r	60°
γ_f	-9°	$a_{p\ max}$	15 mm



ROUGH SB



ø 125 mm



ø 160 ÷ 315 mm

Z* - N° denti / Number of teeth

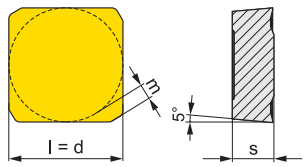
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	D_1	dG7	L	d_1	d_2	t	b	Z*				
125B05R-F60SB22X	○	125	144,4	40	63	56,0	-	9	16,4	5				3,5
125B07R-F60SB22X	●	125	144,4	40	63	56,0	-	9	16,4	7				3,2
160C06R-F60SB22X	○	160	178,7	40	63	66,7	-	9	16,4	6				6,0
160C08R-F60SB22X	●	160	178,7	40	63	66,7	-	9	16,4	8				5,7
200C08R-F60SB22X	○	200	217,9	60	63	101,6	-	14	25,7	8				9,1
200C10R-F60SB22X	●	200	217,9	60	63	101,6	-	14	25,7	10				8,8
250C09R-F60SB22X	●	250	267,4	60	63	101,6	-	14	25,7	9				15,6
250C12R-F60SB22X	●	250	267,4	60	63	101,6	-	14	25,7	12				15,2
315C11R-F60SB22X	○	315	331,8	60	80	101,6	177,8	14	25,7	11				33,7
315C14R-F60SB22X	●	315	331,8	60	80	101,6	177,8	14	25,7	14				33,2

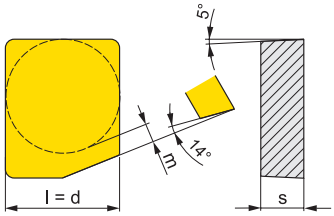
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

F60SB22X

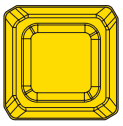
FRESE A SPIANARE PER SGROSSATURA PESANTE
FACE MILLING CUTTERS - FOR HEAVY MACHINING



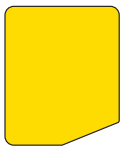
SBMR



SBKX



SBMR DZSR



SBKX DZER

Inserto raschiante
Smothing inserts

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions					
	8026T	8240															l	d	s	m		
SBMR 2207DZSR	●	●															22,000	22,000	8,5	2,82		
SBKX 2207DZER	●																22,000	22,000	8,5	3,22		

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Sottoplacchetta Shim	Vite sottoplacchetta* Clamping screw*	Chiave Key	Cuneo di blocc. Clamping wedge	Vite per cuneo Differential screw	Chiave Key	Vite di bloccaggio fresa Screw for taper clamping
125	LNX 220616	US 6013-T20P	SDR T20P-T	KU SBMR 2207	DS 01Z	KL 04	-
160	LNX 220616	US 6013-T20P	SDR T20P-T	KU SBMR 2207	DS 01Z	KL 04	HS 1240
200 ÷ 315	LNX 220616	US 6013-T20P	SDR T20P-T	KU SBMR 2207	DS 01Z	KL 04	HS 1655

IMPERO PRAMET

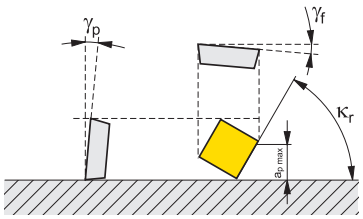
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

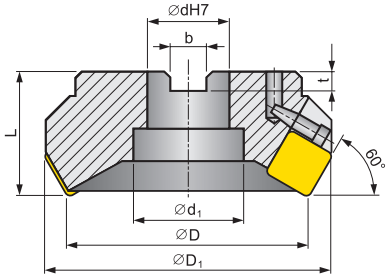
W60SP25P

FRESE A SPIANARE PER SGROSSATURA PESANTE
FACE MILLING CUTTERS - FOR HEAVY MACHINING

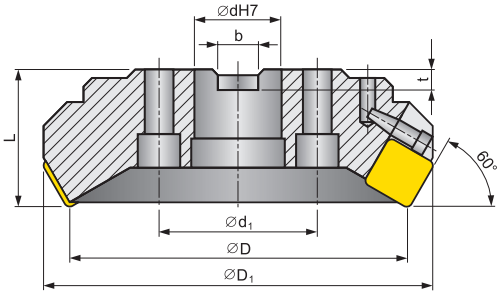


γ_p	+9°	κ_r	60°
γ_f	-3°	$a_{p\,max}$	18 mm





ø 125 mm



ø 160 ÷ 315 mm

Z* - N° denti / Number of teeth

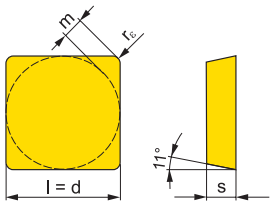
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	d_1	D_1	L	b	t	Z*					
125B05R-W60SP25P	○	125	40	56,0	148	63	16,4	9	5					3,0
160C06R-W60SP25P	○	160	40	66,7	183	63	16,4	9	6					6,5
200C08R-W60SP25P	○	200	60	101,6	223	63	25,7	14	8					10,0
250C10R-W60SP25P	○	250	60	101,6	273	63	25,7	14	10					17,0
315C12R-W60SP25P	○	315	60	101,6	338	80	25,7	14	12					32,0

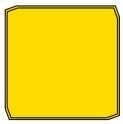
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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W60SP25P

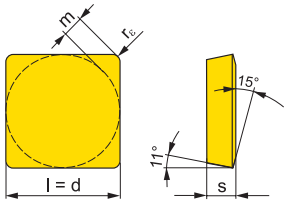
FRESE A SPIANARE PER SGROSSATURA PESANTE
FACE MILLING CUTTERS - FOR HEAVY MACHINING



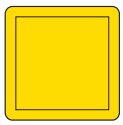
SPGN



SPGN DZSR



SPUN



SPUN S

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades				Dimensioni / Dimensions				
	8240	8026T	5040	S26	l	d	s	m	r_ε
SPGN 2506DZSR	●	●	○		25,000	25,000	6,35	3,54	-
SPUN 250616S		●			25,400	25,400	6,35	4,60	1,6
SPUN 250620S	●	●		●	25,400	25,400	6,35	4,43	2,0

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Sottoplachetta di blocc. Clamping wedge	Vite per Sottoplachetta Differential screw	Spina Stop	Chiave Key
125 ÷ 315	KU 22	DS 02	PS 04	HXK 5

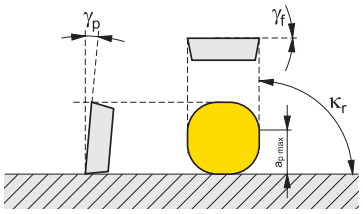
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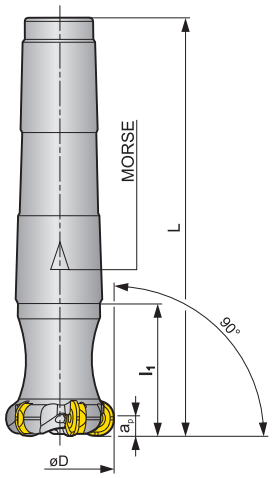
CSC



MULTISIDE SC

γ_p	2°	κ_r	90°
γ_f	0°	$a_{p\,max}$	4,0 ÷ 6,0 mm





Z* - N° denti / Number of teeth

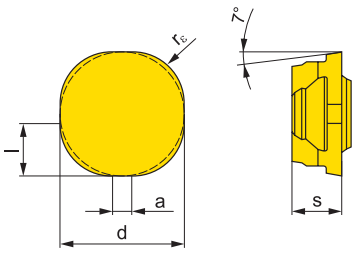
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions D	L	l_1	l_2	Morse	Z*	Inserti Inserts			Refrigerante int. Cooling	[kg]
MORSE												
32A5R050E03-CSC09	□	32	130,7	50	130,7	3	5	SC.. 09T3				0,32
32A3R050E03-CSC12	□	32	130,7	50	130,7	3	3	SC.. 12T3				0,31
40A5R050E04-CSC12	□	40	152,0	50	152,2	4	5	SC.. 12T3				0,63

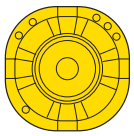
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
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CSC

FRESE A CANDELA
END MILLING CUTTERS



SCKR



SCKR-F

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions					
	8230																	l	d	s	a		r_ε
SCKR 09T340EN-F	□																	4,000	9,525	3,97	1,5		4,0
SCKR 12T360EN-F	□																	6,000	12,700	3,97	1,1		5,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
CSC09	US 63513-T15P	FLAG T15P
CSC12	US 63513-T15P	FLAG T15P

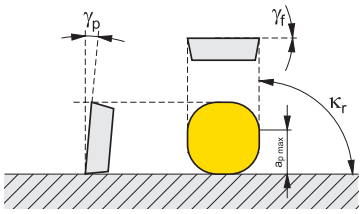
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

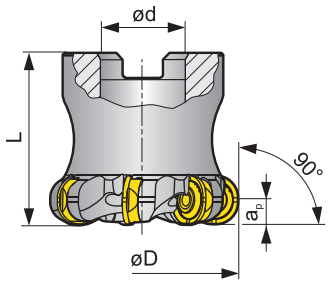
C90SC



MULTISIDE SC

γ_p	2°	κ_r	90°
γ_f	0°	$a_{p\ max}$	4,0 ÷ 6,0 mm





Z* - N° denti / Number of teeth

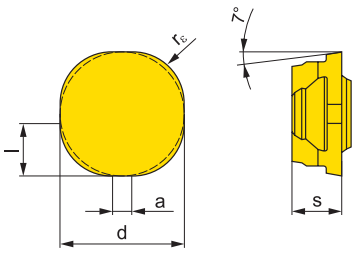
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions D	d	L	Z*	Inserti / Inserts					Refrigerante int. / Cooling	[kg]
40A06R-C90SC09-C	□	40	16	40	6	SC.. 09T3					+	0,14
50A08R-C90SC09-C	□	50	22	45	8	SC.. 09T3					+	0,28
63A10R-C90SC09-C	□	63	22	50	10	SC.. 09T3					+	0,52
50A07R-C90SC12-C	□	50	22	45	7	SC.. 12T3					+	0,23
63A09R-C90SC12-C	□	63	22	50	9	SC.. 12T3					+	0,49
80A10R-C90SC12-C	□	80	27	50	10	SC.. 12T3					+	0,87

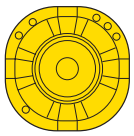
IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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C90SC



SCKR



SCKR-F

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions					
	8230																	l	d	s	a		r_ε
SCKR 09T340EN-F	□																	4,000	9,525	3,97	1,5		4,0
SCKR 12T360EN-F	□																	6,000	12,700	3,97	1,1		5,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Chiave Handle
C90SC09	US 63511D-T15P	D-T08P/T15P	FG-15
C90SC12	US 63511D-T15P	D-T08P/T15P	FG-15

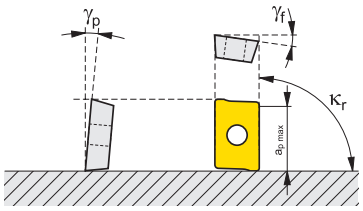
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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SAD11E

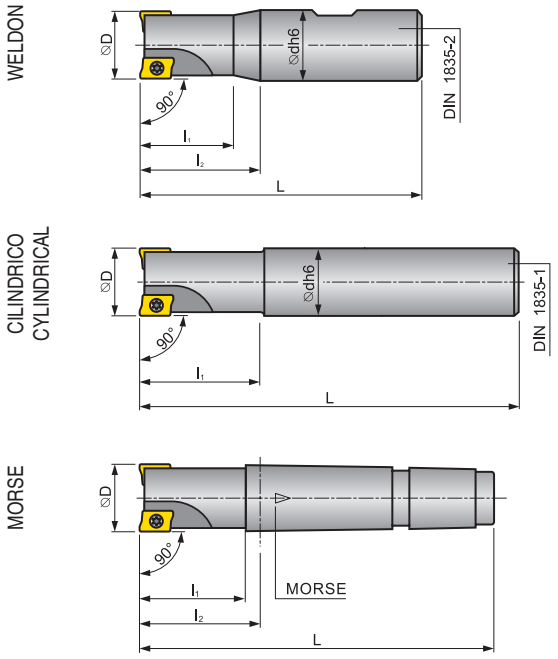
FRESE A CANDELA
SHOULDER END MILLING CUTTERS



γ_p	+4°÷ +8°	κ_r	90°
γ_f	-9°÷ -12,8°	$a_{p\,max}$	9 mm



FORCE *AD*



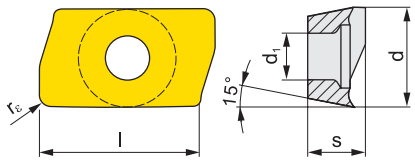
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

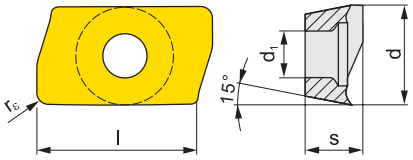
ISO	Disponibilità / Assortment	Dimensioni / Dimensions D	L	l_1	l_2	dh6	Morse	Z*					Refrigerante int. Cooling	[kg]
WELDON														
16A2R027B16-SAD11E-C	●	16	75	27	-	16	-	2					+	0,1
20A2R032B20-SAD11E-C	●	20	82	32	-	20	-	2					+	0,2
20A3R032B20-SAD11E-C	●	20	82	32	-	20	-	3					+	0,2
25A3R042B25-SAD11E-C	●	25	98	42	-	25	-	3					+	0,3
25A4R042B25-SAD11E-C	●	25	98	42	-	25	-	4					+	0,3
32A4R042B32-SAD11E-C	●	32	102	42	-	32	-	4					+	0,4
32A5R042B32-SAD11E-C	●	32	102	42	-	32	-	5					+	0,4
CILINDRICO/CYLINDRICAL														
16A2R024A16-SAD11E-C	●	16	135	24	-	16	-	2					+	0,2
16A2R050A16-SAD11E-C	●	16	135	50	-	16	-	2					+	0,2
18A2R029A20-SAD11E-C	●	18	150	29	-	20	-	2					+	0,3
20A2R029A20-SAD11E-C	●	20	150	29	-	20	-	2					+	0,3
20A2R070A20-SAD11E-C	●	20	150	70	-	20	-	2					+	0,3
20A3R029A20-SAD11E-C	●	20	150	29	-	20	-	3					+	0,3
25A3R034A25-SAD11E-C	●	25	170	34	-	25	-	3					+	0,5
25A3R080A25-SAD11E-C	●	25	170	80	-	25	-	3					+	0,5
25A4R034A25-SAD11E-C	●	25	170	34	-	25	-	4					+	0,5
32A3R090A32-SAD11E-C	○	32	195	90	-	32	-	3					+	0,9
32A5R034A32-SAD11E-C	●	32	195	34	-	32	-	5					+	0,9
MORSE														
16A2R030E02-SAD11E-C	○	16	94	25	30	-	2	2					+	0,1
20A3R035E03-SAD11E-C	●	20	116	30	35	-	3	3					+	0,2
25A4R043E03-SAD11E-C	●	25	124	38	43	-	3	4					+	0,3

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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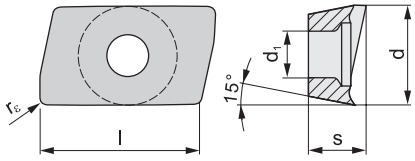
SAD11E



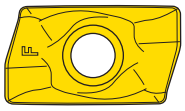
ADMX 11



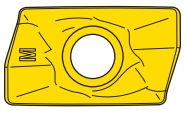
ADMX 11 (16)



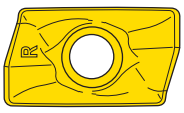
ADEX 11



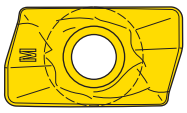
ADMX 11SR-F



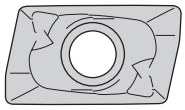
ADMX 11SR-M



ADMX 11PR-R



ADMX 11T316SR-M



ADEX FR-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades								Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
ADMX 11T304SR-F				●	●	●	●		11,000	6,530	3,97	2,90	0,4
ADMX 11T308SR-F				●	●	●	●		11,000	6,530	3,97	2,90	0,8
ADMX 11T304SR-M			●	●	●	●	●		11,000	6,530	3,97	2,90	0,4
ADMX 11T308SR-M	●	●	●	●	●	●	●		11,000	6,530	3,97	2,90	0,8
ADMX 11T316SR-M					●	●	●		11,000	6,530	3,97	2,90	1,6
ADMX 11T308PR-R	●	●	●		●	●	●		11,000	6,530	3,97	2,90	0,8
ADEX 11T304FR-FA								●	11,000	6,530	3,97	2,90	0,4
ADEX 11T308FR-FA								●	11,000	6,530	3,97	2,90	0,8
ADEX 11T316FR-FA								●	11,000	6,530	3,97	2,90	1,6

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
16 ÷ 32	US 2505-T08P	FLAG T08P

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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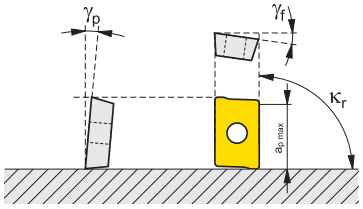
SAD11E

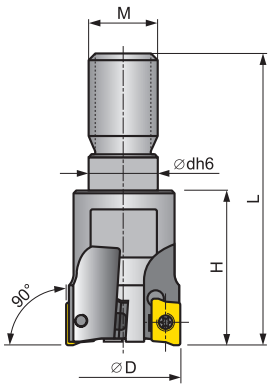
TESTINE PER SISTEMA MODULARE
EXCHANGABLE HEADS FOR MODULAR SYSTEM



FORCE AD

γ_p	+4°÷ +11°	κ_r	90°
γ_f	-8,1°÷ -12,8°	$a_{p\,max}$	9 mm





Z* - N° denti / Number of teeth

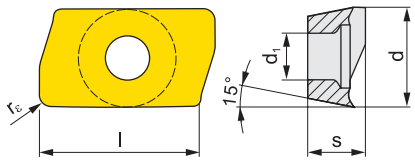
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	H	M	dh6	Z*							
16A2R024M08-SAD11E-C	●	16	38	24	M8	8,5	2						+	0,1
20A2R026M10-SAD11E-C	●	20	45	26	M10	10,5	2						+	0,1
20A3R026M10-SAD11E-C	●	20	45	26	M10	10,5	3						+	0,1
25A3R033M12-SAD11E-C	●	25	55	33	M12	12,5	3						+	0,1
25A4R033M12-SAD11E-C	●	25	55	33	M12	12,5	4						+	0,1
32A4R043M16-SAD11E-C	●	32	66	43	M16	17,0	4						+	0,1
32A5R043M16-SAD11E-C	●	32	66	43	M16	17,0	5						+	0,1
40A4R043M16-SAD11E-C	○	40	66	43	M16	17,0	4						+	0,2
40A6R043M16-SAD11E-C	●	40	66	43	M16	17,0	6						+	0,2

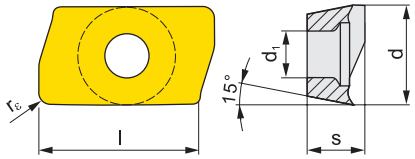
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SAD11E

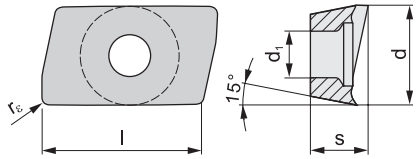
TESTINE PER SISTEMA MODULARE
EXCHANGABLE HEADS FOR MODULAR SYSTEM



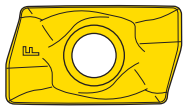
ADMX 11



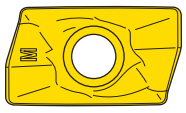
ADMX 11 (16)



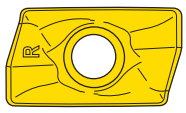
ADEX 11



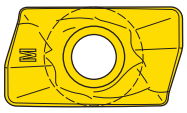
ADMX 11SR-F



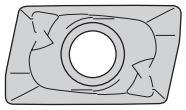
ADMX 11SR-M



ADMX 11PR-R



ADMX 11T316SR-M



ADEX FR-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades								Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
ADMX 11T304SR-F				●	●	●	●		11,000	6,530	3,97	2,90	0,4
ADMX 11T308SR-F				●	●	●	●		11,000	6,530	3,97	2,90	0,8
ADMX 11T304SR-M			●	●	●	●	●		11,000	6,530	3,97	2,90	0,4
ADMX 11T308SR-M	●	●	●	●	●	●	●		11,000	6,530	3,97	2,90	0,8
ADMX 11T316SR-M					●	●	●		11,000	6,530	3,97	2,90	1,6
ADMX 11T308PR-R	●	●	●		●	●	●		11,000	6,530	3,97	2,90	0,8
ADEX 11T304FR-FA								●	11,000	6,530	3,97	2,90	0,4
ADEX 11T308FR-FA								●	11,000	6,530	3,97	2,90	0,8
ADEX 11T316FR-FA								●	11,000	6,530	3,97	2,90	1,6

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
16 ÷ 40	US 2505-T08P	FLAG T08P

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

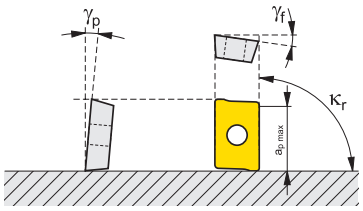
S90AD11E

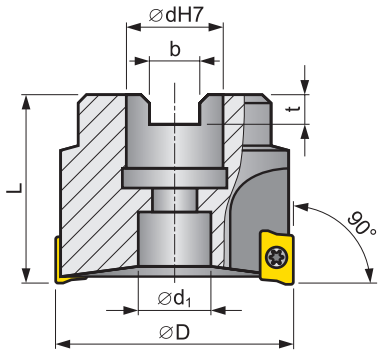
FRESE A SPALLAMENTO RETTO
SHOULDER MILLING CUTTERS



FORCE AD

γ_p	+11°÷ +12°	κ_r	90°
γ_f	-5,2°÷-8,1°	$a_{p\,max}$	9 mm





Z* - N° denti / Number of teeth

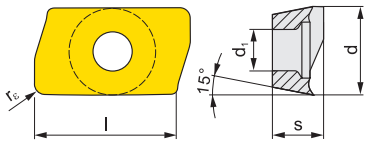
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	b	t	Z*						
40A04R-S90AD11E-C	●	40	16	14	40	8,4	5,6	4					+	0,20
40A06R-S90AD11E-C	●	40	16	14	40	8,4	5,6	6					+	0,20
50A05R-S90AD11E-C	●	50	22	18	40	10,4	6,3	5					+	0,30
50A07R-S90AD11E-C	●	50	22	18	40	10,4	6,3	7					+	0,30
63A06R-S90AD11E-C	●	63	22	18	40	10,4	6,3	6					+	0,50
63A09R-S90AD11E-C	●	63	22	18	40	10,4	6,3	9					+	0,50
80A10R-S90AD11E-C	●	80	27	38	50	12,4	7,0	10					+	1,00
100A11R-S90AD11E-C	○	100	32	45	50	14,4	8,0	11					+	1,70
125A12R-S90AD11E-C	○	125	40	56	63	16,4	9,0	12					+	3,50

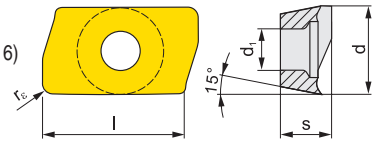
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S90AD11E

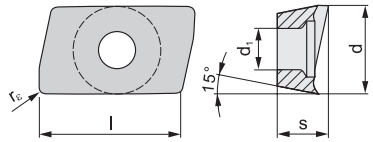
ADMX 11

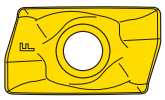


ADMX 11(16)

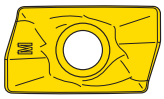


ADEX 11

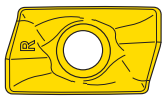




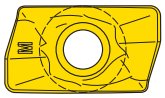
ADMX 11SR-F



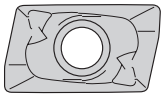
ADMX 11SR-M



ADMX 11PR-R



ADMX 11T316SR-M



ADEX 11 FR-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades								Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
ADMX 11T304SR-F				●	●	●	●		11,000	6,530	3,97	2,9	0,4
ADMX 11T308SR-F				●	●	●	●		11,000	6,530	3,97	2,9	0,8
ADMX 11T304SR-M			●	●	●	●	●		11,000	6,530	3,97	2,9	0,4
ADMX 11T308SR-M	●	●	●	●	●	●	●		11,000	6,530	3,97	2,9	0,8
ADMX 11T316SR-M					●	●	●		11,000	6,530	3,97	2,9	1,6
ADMX 11T308PR-R	●	●	●		●	●	●		11,000	6,530	3,97	2,90	0,80
ADEX 11T304FR-FA								●	11,000	6,530	3,97	2,90	0,40
ADEX 11T308FR-FA								●	11,000	6,530	3,97	2,90	0,80
ADEX 11T316FR-FA								●	11,000	6,530	3,97	2,90	1,60

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle	Vite di bloccaggio fresa Screw for taper clamping
40	US 2505-T08P	D-T08P/T15P	FG-15	HS 0830C
50 ÷ 63	US 2505-T08P	D-T08P/T15P	FG-15	HS 1030C
80 ÷ 125	US 2505-T08P	D-T08P/T15P	FG-15	-

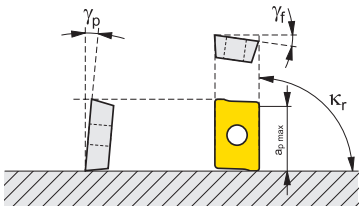
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SAD16E

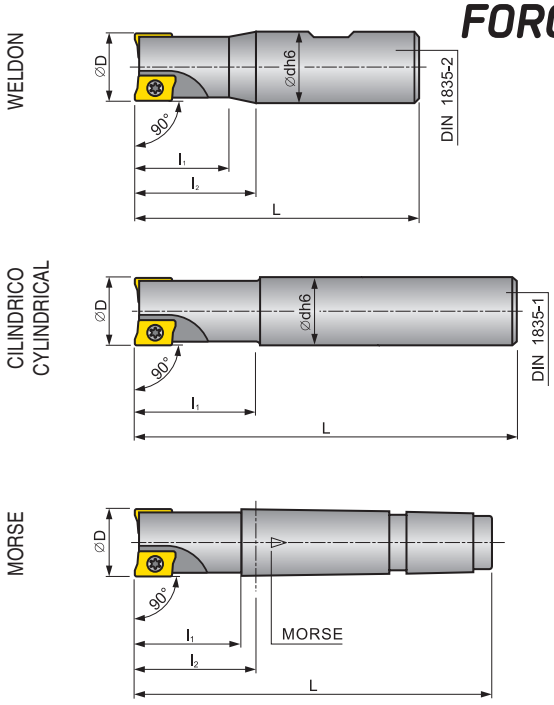
FRESE A CANDELA
SHOULDER END MILLING CUTTERS



γ_p	+5°÷10,5°	κ_r	90°
γ_f	-8,2°÷ -13°	$a_{p\ max}$	13 mm



FORCE *AD*



Z* - N° denti / Number of teeth

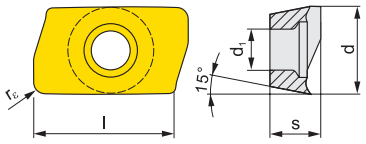
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions D	L	l_1	l_2	dh6	Morse	Z*					Refrigerante int. Cooling	[kg]
WELDON														
25A2R042B25-SAD16E-C	●	25	98	42	-	25	-	2					+	0,30
32A3R040B32-SAD16E-C	●	32	100	40	-	32	-	3					+	0,50
40A3R050B32-SAD16E-C	●	40	110	50	-	32	-	3					+	0,60
40A4R050B32-SAD16E-C	●	40	110	50	-	32	-	4					+	0,60
CILINDRICO/CYLINDRICAL														
25A2R033A25-SAD16E-C	●	25	165	33	-	25	-	2					+	0,50
32A3R033A32-SAD16E-C	●	32	195	33	-	32	-	3					+	0,90
MORSE														
25A2R043E03-SAD16E-C	●	25	98	38	43	-	3	2					+	0,30
32A3R043E03-SAD16E-C	●	32	100	38	43	-	3	3					+	0,50
40A3R054E04-SAD16E-C	○	40	110	48	54	-	4	3					+	0,60
40A4R054E04-SAD16E-C	●	40	110	48	54	-	4	4					+	0,60

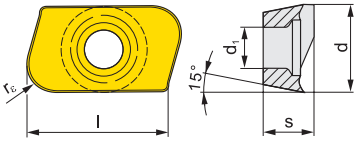
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SAD16E

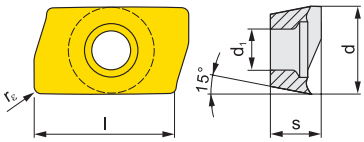
FRESE A CANDELA
SHOULDER END MILLING CUTTERS



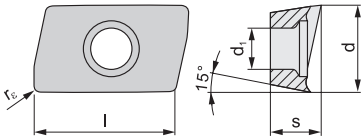
ADMX 16



ADMX 16 (16/32)



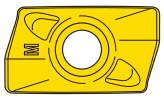
ADEX 16



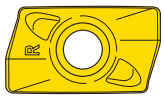
ADEX 16



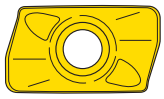
ADMX 16SR-F



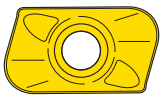
ADMX 16SR-M



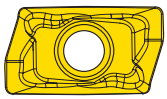
ADMX 16PR-R



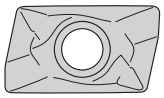
ADMX 160616SR-M



ADMX 160632SR-M



ADEX 16 SR-FM



ADEX 16 FR-FA

INSERTI / INDEXABLE CUTTING INSERTS

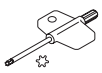
ISO	Qualità / Grades								Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
ADMX 160608SR-F				●	●	●	●		16,000	9,950	6,25	4,50	0,8
ADMX 160608SR-M	●	●	●	●	●	●	●		16,000	9,950	6,25	4,50	0,8
ADMX 160608PR-R	●	●	●		●	●	●		16,000	9,950	6,25	4,50	0,8
ADMX 160616SR-M			●		●	●	●		16,000	9,950	6,25	4,50	1,6
ADMX 160632SR-M			●		○	●	●		16,000	9,950	6,25	4,50	3,2
ADEX 160608SR-FM			●	●	●	●	●		16,000	9,950	6,25	4,50	0,8
ADEX 160608FR-FA								●	16,000	9,950	6,25	4,50	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
25 ÷ 40	US 4008-T15P	FLAG T15P





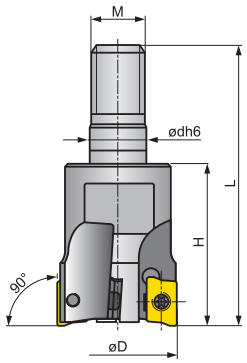
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SAD16E

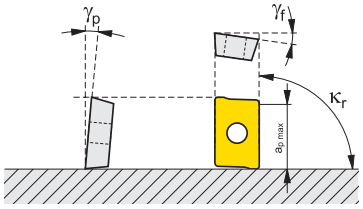
TESTINE PER SISTEMA MODULARE
EXCHANGABLE HEADS FOR MODULAR SYSTEM



FORCE AD



γ_p	+7°÷ +10,5°	κ_r	90°
γ_f	-8,2°÷-12°	$a_{p\ max}$	13 mm



Z* - N° denti / Number of teeth

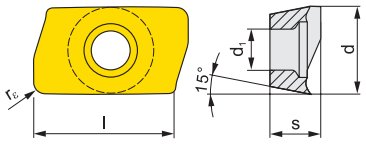
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	H	M	dh6	Z*							
32A3R043M16-SAD16E-C	●	32	66	43	M16	17	3						+	0,20
40A4R043M16-SAD16E-C	●	40	66	43	M16	17	4						+	0,20

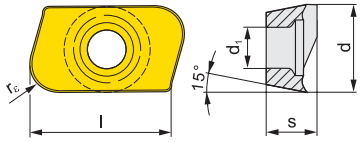
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SAD16E

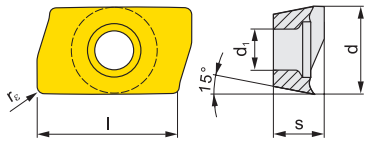
TESTINE PER SISTEMA MODULARE
EXCHANGABLE HEADS FOR MODULAR SYSTEM



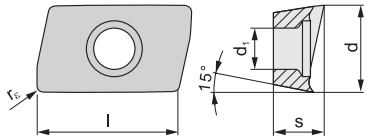
ADMX 16



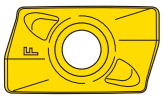
ADMX 16 (16/32)



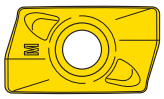
ADEX 16



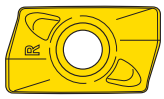
ADEX 16



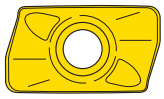
ADMX 16SR-F



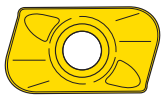
ADMX 16SR-M



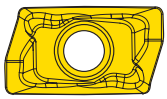
ADMX 16PR-R



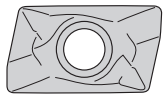
ADMX 160616SR-M



ADMX 160632SR-M



ADEX 16 SR-FM



ADEX 16 FR-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades							Dimensioni / Dimensions				
	M5315	M9315	M9325	8215	8230	8240	HF7	(l)	d	s	d_1	r_e
ADMX 160608SR-F				●	●	●		16,000	9,950	6,25	4,50	0,8
ADMX 160608SR-M	●	●	●	●	●	●		16,000	9,950	6,25	4,50	0,8
ADMX 160608PR-R	●	●	●	●	●	●		16,000	9,950	6,25	4,50	0,8
ADMX 160616SR-M			●	●	●	●		16,000	9,950	6,25	4,50	1,6
ADMX 160632SR-M			●	○	●	●		16,000	9,950	6,25	4,50	3,2
ADEX 160608SR-FM			●	●	●	●		16,000	9,950	6,25	4,50	0,8
ADEX 160608FR-FA							●	16,000	9,950	6,25	4,50	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
32, 40	US 4008-T15P	FLAG T15P

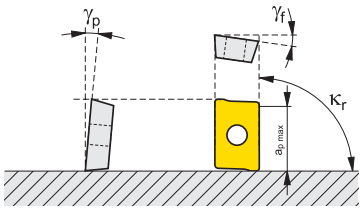
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S90AD16E

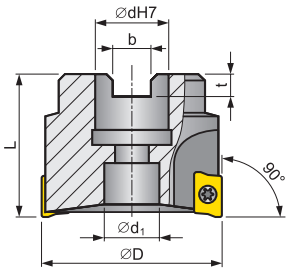
FRESE A SPALLAMENTO RETTO
SHOULDER MILLING CUTTERS



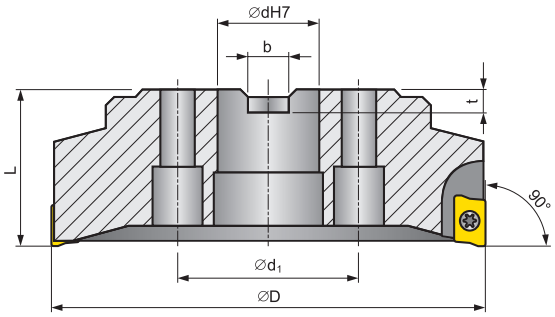
γ_p	+10,5°÷12°	κ_r	90°
γ_f	-3,8°÷ -8,2°	$a_{p\ max}$	13 mm



FORCE AD



ø 40 ÷ 125 mm



ø 160 mm

Z* - N° denti / Number of teeth

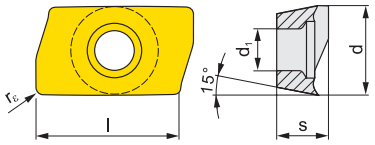
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions										Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	b	t	Z*					
40A04R-S90AD16E-C	●	40	16	14	40	8,4	5,6	4				+	0,20
50A03R-S90AD16E-C	●	50	22	18	40	10,4	6,3	3				+	0,30
50A05R-S90AD16E-C	●	50	22	18	40	10,4	6,3	5				+	0,30
63A04R-S90AD16E-C	●	63	22	18	40	10,4	6,3	4				+	0,50
63A06R-S90AD16E-C	●	63	22	18	40	10,4	6,3	6				+	0,50
80A05R-S90AD16E-C	●	80	27	38	50	12,4	7,0	5				+	1,00
80A07R-S90AD16E-C	●	80	27	38	50	12,4	7,0	7				+	1,00
100A06R-S90AD16E-C	●	100	32	45	50	14,4	8,0	6				+	1,80
100A08R-S90AD16E-C	●	100	32	45	50	14,4	8,0	8				+	1,70
125A09R-S90AD16E-C	●	125	40	56	63	16,4	9,0	9				+	3,50
160C10R-S90AD16E	●	160	40	66,7	63	16,4	9,0	10					5,70

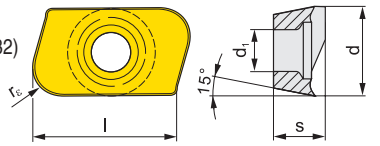
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S90AD16E

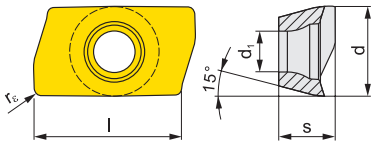
ADMX 16



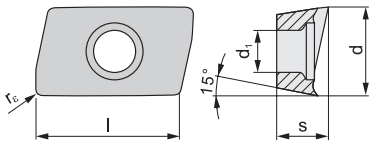
ADMX 16 (16, 32)



ADEX 16



ADEX 16

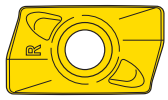




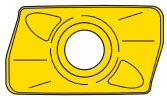
ADMX 16SR-F



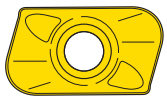
ADMX 16SR-M



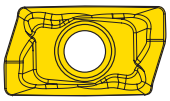
ADMX 16PR-R



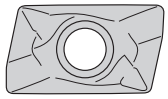
ADMX 160616SR-M



ADMX 160632SR-M



ADEX 16SR-FM



ADEX 16FR-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades								Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
ADMX 160608SR-F				●	●	●	●		16,000	9,950	6,25	4,5	0,8
ADMX 160608SR-M	●	●	●	●	●	●	●		16,000	9,950	6,25	4,5	0,8
ADMX 160608PR-R	●	●	●		●	●	●		16,000	9,950	6,25	4,5	0,8
ADMX 160616SR-M			●		●	●	●		16,000	9,950	6,25	4,5	1,6
ADMX 160632SR-M			●		○	●	●		16,000	9,950	6,25	4,50	3,20
ADEX 160608SR-FM			●	●	●	●	●		16,000	9,950	6,25	4,50	0,80
ADEX 160608FR-FA								●	16,000	9,950	6,25	4,50	0,80

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle	Vite di bloccaggio fresa Clamping screw for taper
40	US 4008-T15P	D-T08P/T15P	FG-15	HS 0830C
50 ÷ 63	US 4011-T15P	D-T08P/T15P	FG-15	HS 1030C
80 ÷ 160	US 4011-T15P	D-T08P/T15P	FG-15	-

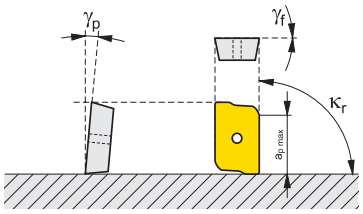
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

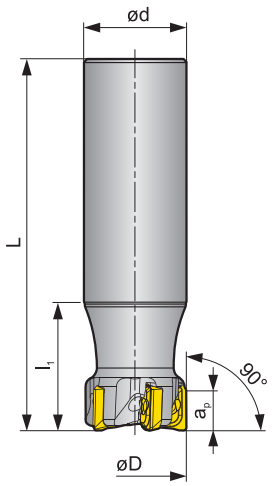
CAD15



MULTISIDE AD

γ_p	2°	κ_r	90°
γ_f	0°	$a_{p\,max}$	10 mm





Z* - N° denti / Number of teeth

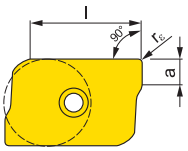
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions D	L	l_1	d	Z*							Refrigerante int. Cooling	[kg]
CILINDRICO/CYLINDRICAL													+	0,50
25A3R040A25-CAD15-C	■	25	160	40	25	3							+	1,04
32A5R040A32-CAD15-C	■	32	200	40	32	5								

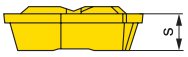
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

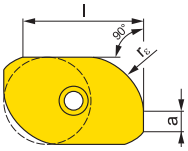
CAD15



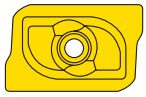


ADKX 15 (04, 08)

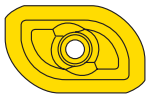




ADKX 15 (30, 40, 60)



ADKX 15 (04, 08)



ADKX 15 (30, 40, 60)

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions					
	M8345	8230															l	d	s	a		r_ε
ADKX 15T304ER-F	■	■															12,200	9,525	3,97	2,60		0,4
ADKX 15T308ER-F	■	■															12,200	9,525	3,97	2,20		0,8
ADKX 15T330ER-F	■	■															12,400	9,525	3,97	2,55		3,0
ADKX 15T340ER-F	■	■															12,500	9,525	3,97	2,55		4,0
ADKX 15T360ER-F*	■	■															12,600	9,525	3,97	2,00		6,0

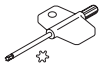
*) per utilizzare inserti con raggio r_ε = 6,0 mm modificare il corpo fresa!
*) When using inserts with corner radius r_ε = 6.0 mm, the cutter body must be modified!

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
25 ÷ 32	US 63511D-T15P	FLAG T15P





IMPERO PRAMET

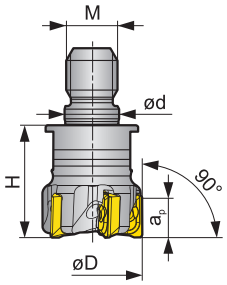
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

CAD15

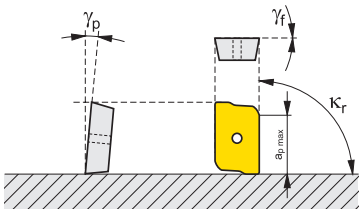
TESTINE PER SISTEMA MODULARE
EXCHANGABLE HEADS FOR MODULAR SYSTEM



MULTISIDE AD



γ_p	2°	κ_r	90°
γ_f	0°	$a_{p\,max}$	10 mm



Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

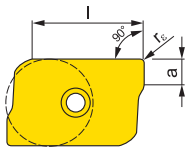
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	H	d	M	Z								
25A3R030M12-CAD15-C	□	25	30	12,5	M12	3							+	0,07
32A5R035M16-CAD15-C	□	32	35	17,0	M16	5							+	0,15
40A6R035M16-CAD15-C	□	40	35	17,0	M16	6							+	0,18

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

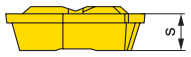
CAD15

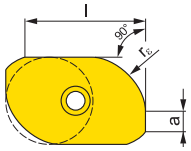
TESTINE PER SISTEMA MODULARE
EXCHANGABLE HEADS FOR MODULAR SYSTEM



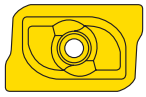


ADKX 15 (04, 08)

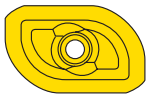




ADKX 15 (30, 40, 60)



ADKX 15 (04, 08)



ADKX 15 (30, 40, 60)

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions					
	M8345	8230															l	d	s	a		r_ε
ADKX 15T304ER-F	■	■															12,200	9,525	3,97	2,60		0,4
ADKX 15T308ER-F	■	■															12,200	9,525	3,97	2,20		0,8
ADKX 15T330ER-F	■	■															12,400	9,525	3,97	2,55		3,0
ADKX 15T340ER-F	■	■															12,500	9,525	3,97	2,55		4,0
ADKX 15T360ER-F*	■	■															12,600	9,525	3,97	2,00		6,0

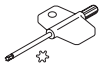
*) per utilizzare inserti con raggio r_ε = 6,0 mm modificare il corpo fresa!
*) When using inserts with corner radius r_ε = 6.0 mm, the cutter body must be modified!

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
25 ÷ 40	US 63511D-T15P	FLAG T15P





IMPERO PRAMET

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

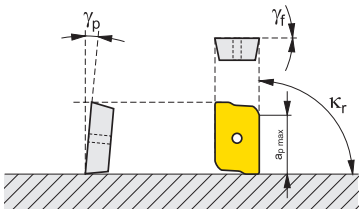
C90AD15

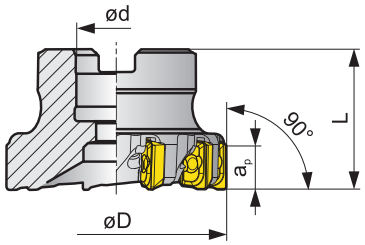
FRESE A SPALLAMENTO RETTO
SHOULDER MILLING CUTTERS



MULTISIDE AD

γ_p	2°	κ_r	90°
γ_f	0°	$a_{p\ max}$	10 mm





Z* - N° denti / Number of teeth

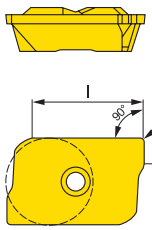
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	d	L	Z									
40A06R-C90AD15-C	■	40	16	40	6								+	0,17
50A08R-C90AD15-C	■	50	22	40	8								+	0,26
63A10R-C90AD15-C	■	63	22	40	10								+	0,40
80A10R-C90AD15-C	■	80	27	50	10								+	0,71
80A14R-C90AD15-C	□	80	27	50	14								+	0,71

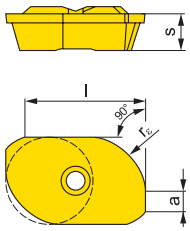
IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

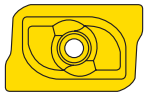
C90AD15



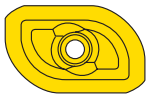
ADKX 15 (04, 08)



ADKX 15 (30, 40, 60)



ADKX 15 (04, 08)



ADKX 15 (30, 40, 60)

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions					
	M8345	8230															l	d	s	a		r_ε
ADKX 15T304ER-F	■	■															12,200	9,525	3,97	2,60		0,4
ADKX 15T308ER-F	■	■															12,200	9,525	3,97	2,20		0,8
ADKX 15T330ER-F	■	■															12,400	9,525	3,97	2,55		3,0
ADKX 15T340ER-F	■	■															12,500	9,525	3,97	2,55		4,0
ADKX 15T360ER-F*	■	■															12,600	9,525	3,97	2,00		6,0

*) per utilizzare inserti con raggio r_ε = 6,0 mm modificare il corpo fresa!
*) When using inserts with corner radius r_ε = 6.0 mm, the cutter body must be modified!

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

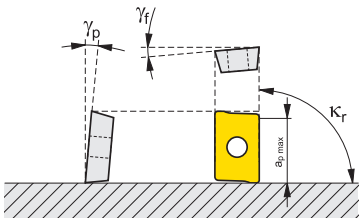
Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle
40 ÷ 80	US 63511D-T15P	D-T08P/T15P	FG-15

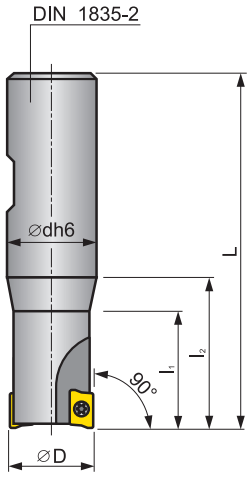
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SAP10D



γ_p	+4°÷ +10°	κ_r	90°
γ_f	+12°	$a_{p\,max}$	9 mm





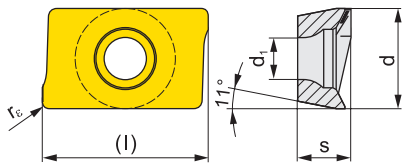
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

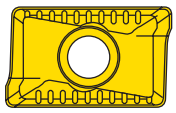
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	l_1	l_2	Z*	dh6							
10A1R020B16-SAP10D-C	●	10	78	20	30	1	16						+	0,1
12A1R027B16-SAP10D-C	●	12	75	-	27	1	16						+	0,2
14A1R027B16-SAP10D-C	●	14	75	-	27	1	16						+	0,2
16A2R032B16-SAP10D-C	●	16	80	-	32	2	16						+	0,3
18A2R032B20-SAP10D-C	●	18	82	-	32	2	20						+	0,4
20A3R032B20-SAP10D-C	●	20	82	-	32	3	20						+	0,8
25A3R042B25-SAP10D-C	●	25	98	-	42	3	25						+	1,1
25A4R042B25-SAP10D-C	○	25	98	-	42	4	25						+	1,1
32A5R042B32-SAP10D-C	○	32	102	-	42	5	32						+	1,5

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

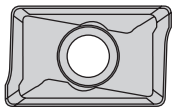
SAP10D



APKT



APKT-M



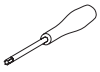
APKT-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades							Dimensioni / Dimensions				
	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
APKT 1003PDER-M	●	●	●	●	●	●		11,000	6,700	3,50	2,88	0,5
APKT 1003PDFR-FA							●	11,000	6,700	3,50	2,88	0,5

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
		
10 ÷ 32	US 2506-T07P	SDR T07P

IMPERO PRAMET

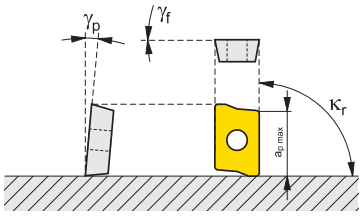
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

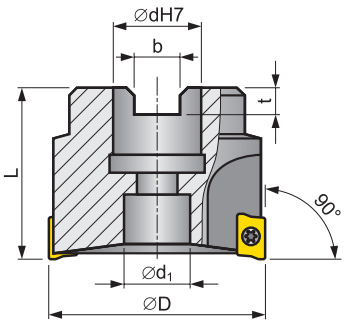
S90AP10D

FRESE A SPALLAMENTO RETTO
SHOULDER MILLING CUTTERS



γ_p	+3°	κ_r	90°
γ_f	0°	$a_{p\,max}$	9 mm





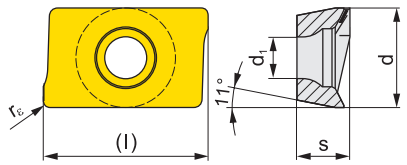
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

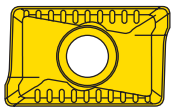
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	b	t	Z*						
40A6R-S90AP10D	○	40	16	14	40	8,4	5,6	6						0,80
50A7R-S90AP10D	○	50	22	18	40	10,4	6,3	7						1,10
63A9R-S90AP10D	○	63	22	18	50	10,4	6,3	9						1,30

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

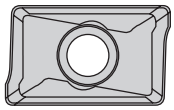
S90AP10D



APKT



APKT-M



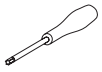
APKT-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades							Dimensioni / Dimensions				
	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
APKT 1003PDER-M	●	●	●	●	●	●		11,000	6,700	3,5	2,88	0,5
APKT 1003PDFR-FA							●	11,000	6,700	3,5	2,88	0,5

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
		
40 ÷ 63	US 2506-T07P	SDR T07P

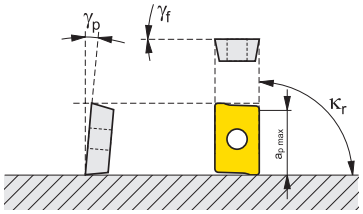
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

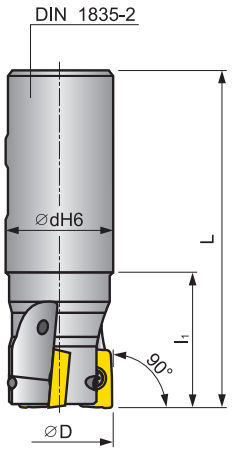
SAP16D

FRESE A CANDELA
END MILLING CUTTERS



γ_p	0° ÷ +8°	κ_r	90°
γ_f	0°	$a_{p\,max}$	13 mm





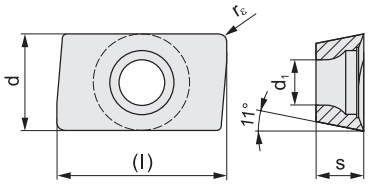
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

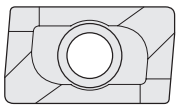
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	l_1	dh6	Z*								
25A2R042B25-SAP16D-C	○	25	98	42	25	2							+	0,4
32A3R040B32-SAP16D-C	○	32	100	40	32	3							+	0,6
40A3R050B32-SAP16D-C	○	40	110	50	32	3							+	0,8
40A4R050B32-SAP16D-C	○	40	110	50	32	4							+	0,8

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

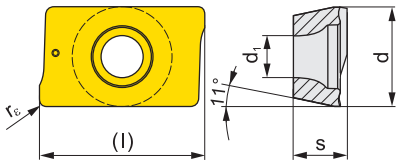
SAP16D



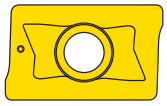
APET



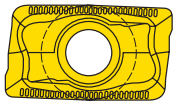
APET-FA



APKT



APKT-HM (04, 08, 16, 31)



APKT-GM

INSERTI / INDEXABLE CUTTING INSERTS

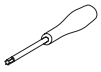
ISO	Qualità / Grades								Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
APET 160408FR-FA								●	17,000	9,600	4,76	4,50	0,8
APKT 1604PDR-GM		●	●	●		●	●		17,000	9,440	5,67	4,60	0,8
APKT 1604PDR-HM	●	●	●		●	●	●		17,000	9,440	5,67	4,60	0,8
APKT 160404-HM							●		17,000	9,440	5,67	4,60	0,4
APKT 160416-HM							●		17,000	9,440	5,67	4,60	1,6
APKT 160431-HM							●		17,000	9,440	5,67	4,60	3,1

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
25	US 4008-T15P	SDR T15P
32 ÷ 40	US 4011-T15P	SDR T15P





IMPERO PRAMET

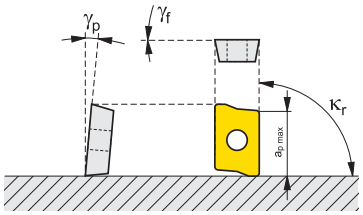
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

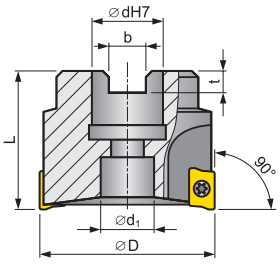
S90AP16D

FRESE A SPALLAMENTO RETTO
SHOULDER MILLING CUTTERS

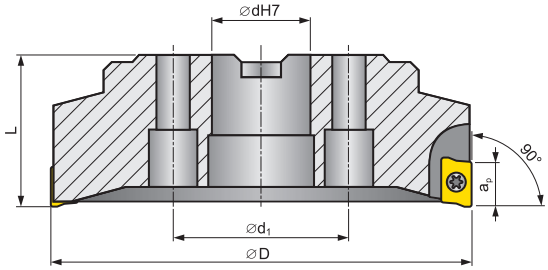


γ_p	+6°	κ_r	90°
γ_f	0°	$a_{p\,max}$	13 mm





ø 40 ÷ 125 mm



ø 160 mm

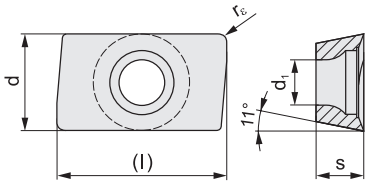
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

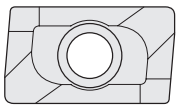
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	b	t	Z*						
40A4R-S90AP16D	●	40	16	11	40	8,4	5,6	4						0,70
50A5R-S90AP16D	●	50	22	18	40	10,4	6,3	5						0,80
63A6R-S90AP16D	●	63	22	18	40	10,4	6,3	6						1,10
80B5R-S90AP16D	●	80	27	38	50	12,4	7,0	5						1,40
80B7R-S90AP16D	○	80	27	38	50	12,4	7,0	7						1,30
100B6R-S90AP16D	○	100	32	45	50	14,4	8,0	6						2,10
100B8R-S90AP16D	○	100	32	45	50	14,4	8,0	8						2,00
125B9R-S90AP16D	●	125	40	60	63	16,4	9,0	9						2,70
160C10R-S90AP16D	○	160	40	66,7	63	16,4	9,0	10						3,70

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

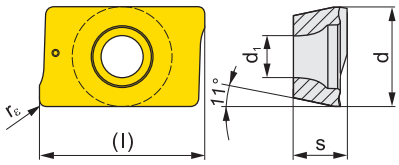
S90AP16D



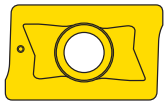
APET



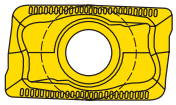
APET-FA



APKT



APKT-HM (04, 08, 16, 31)



APKT-GM

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades								Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
APET 160408FR-FA								●	17,000	9,600	4,76	4,5	0,8
APKT 1604PDR-GM		●	●	●		●	●		17,000	9,400	5,67	4,6	0,8
APKT 1604PDR-HM	●	●	●		●	●	●		17,000	9,400	5,67	4,6	0,8
APKT 160404-HM							●		17,000	9,400	5,67	4,60	0,4
APKT 160416-HM							●		17,000	9,400	5,67	4,60	1,6
APKT 160431-HM							●		17,000	9,400	5,67	4,60	3,1

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
40 ÷ 160	US 4011-T15P	SDR T15P





IMPERO PRAMET

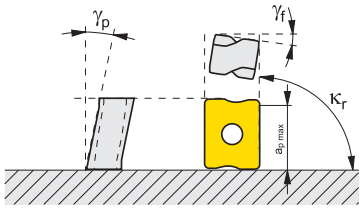
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SLN12

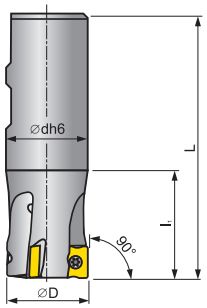
FRESE A CANDELA
SHOULDER END MILLING CUTTERS



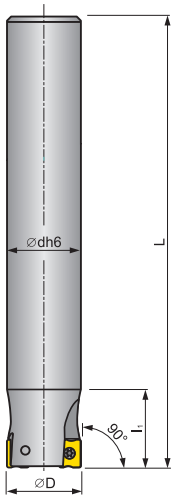
γ_p	-6°÷-8°	κ_r	90°
γ_f	-15°÷-23°	$a_{p\,max}$	9 mm



ECON *LN*



WELDON



CILINDRICO
CYLINDRICAL

Z* - N° denti / Number of teeth

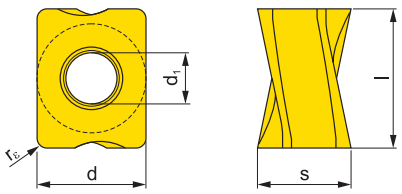
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	l_1	dh6	Z*								
WELDON														
25A2R042B25-SLN12-C	●	25	99	42	25	2							+	0,1
32A3R042B32-SLN12-C	●	32	103	42	32	3							+	0,5
40A4R050B32-SLN12-C	●	40	111	50	32	4							+	0,6
CILINDRICO/CYLINDRICAL														
25A2R034A25-SLN12-C	●	25	170	34	25	2							+	0,5
25A2R080A25-SLN12-C	●	25	170	80	25	2							+	0,5
32A2R034A32-SLN12-C	●	32	195	34	32	2							+	0,9
32A2R090A32-SLN12-C	●	32	195	90	32	2							+	0,9

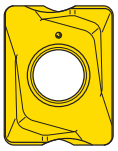
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SLN12

FRESE A CANDELA
SHOULDER END MILLING CUTTERS



LNGX 12



LNGX 12-M

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades							Dimensioni / Dimensions				
	M9315	M9325	M9340	8215	8230	8240		l	d	s	d_1	r_ε
LNGX 120508ER-M	●	●	●	●	●	●		12,000	9,500	7,1	4,5	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
SLN12	US 44012-T15P	FLAG T15P

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

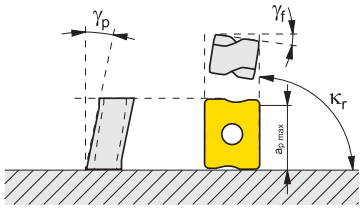
SLN12

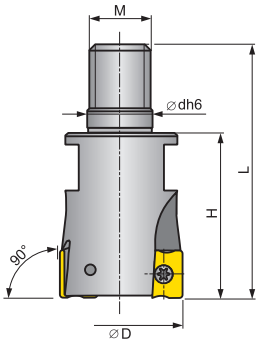
TESTINE PER SISTEMA MODULARE
EXCHANGABLE HEADS FOR MODULAR SYSTEM



ECON *LN*

γ_p	-6°	κ_r	90°
γ_f	-15°	$a_{p\,max}$	9 mm





Z* - N° denti / Number of teeth

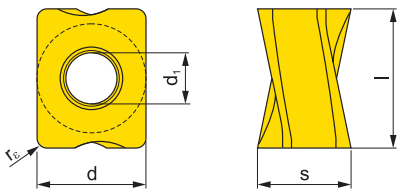
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	H	M	dh6	Z*							
32A2R043M16-SLN12-C	●	32	66	43	M16	17	2						+	0,20
40A3R043M16-SLN12-C	●	40	66	43	M16	17	3						+	0,20

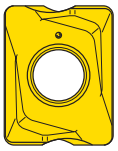
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SLN12

TESTINE PER SISTEMA MODULARE
EXCHANGABLE HEADS FOR MODULAR SYSTEM



LNGX 12



LNGX 12-M

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions				
	M9315	M9325	M9340	8215	8230	8240											(l)	d	s	d_1	r_ε
LNGX 120508ER-M	●	●	●	●	●	●											12,000	9,500	7,1	4,5	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
SLN12	US 44012-T15P	FLAG T15P

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

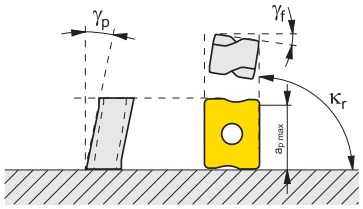
S90LN12

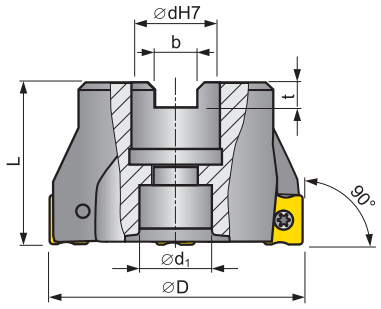
FRESE A SPALLAMENTO RETTO
SHOULDER MILLING CUTTERS



ECON *LN*

γ_p	-6°	κ_r	90°
γ_f	-14°÷-15°	$a_{p\,max}$	9 mm





Z* - N° denti / Number of teeth

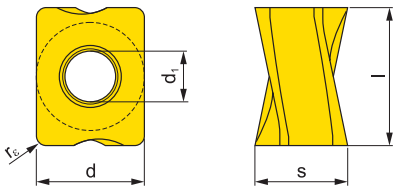
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	b	t	Z*						
40A04R-S90LN12-C	●	40	16	14	40	8,4	5,6	4					+	0,2
50A04R-S90LN12-C	●	50	22	18	40	10,4	6,3	4					+	0,3
50A05R-S90LN12-C	●	50	22	18	40	10,4	6,3	5					+	0,3
63A04R-S90LN12-C	●	63	22	18	40	10,4	6,3	4					+	0,5
63A06R-S90LN12-C	●	63	22	18	40	10,4	6,3	6					+	0,5
80A05R-S90LN12-C	●	80	27	38	50	12,4	7,0	5					+	1,0
80A07R-S90LN12-C	●	80	27	38	50	12,4	7,0	7					+	1,0
100A06R-S90LN12-C	●	100	32	45	50	14,4	8,0	6					+	1,7
100A08R-S90LN12-C	●	100	32	45	50	14,4	8,0	8					+	1,7
110A06R-S90LN12-C	●	110	32	45	50	14,4	8,0	6					+	2,3

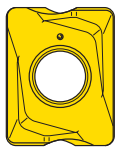
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S90LN12

FRESE A SPALLAMENTO RETTO
SHOULDER MILLING CUTTERS



LNGX 12



LNGX 12-M

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades							Dimensioni / Dimensions				
	M9315	M9325	M9340	8215	8230	8240		l	d	s	d_1	r_ε
LNGX 120508ER-M	●	●	●	●	●	●		12,000	9,500	7,10	4,50	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle	Vite di bloccaggio fresa Screw for taper clamping
40	US 44012-T15P	D-T08P/T15P	FG-15	HS 0830C
50 ÷ 63	US 44012-T15P	D-T08P/T15P	FG-15	HS 1030C
80 ÷ 110	US 44012-T15P	D-T08P/T15P	FG-15	-

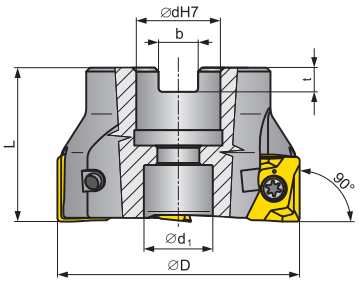
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S90LN16

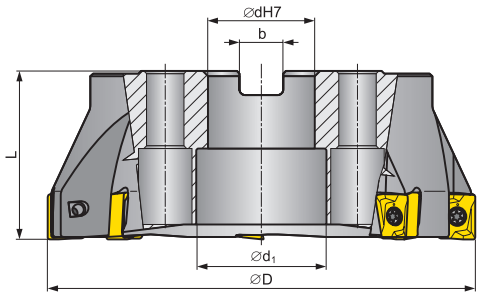
FRESE A SPALLAMENTO RETTO
SHOULDER MILLING CUTTERS



ECON *LN*

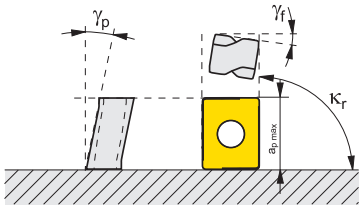


ø 63 ÷ 140 mm



ø 160 ÷ 175 mm

γ_p	-6°	κ_r	90°
γ_f	-10,5°	$a_{p\,max}$	13 mm



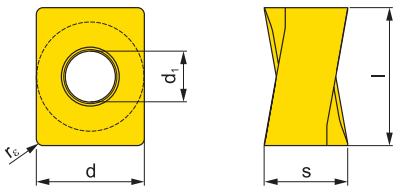
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

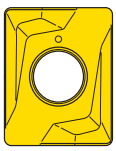
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	b	t	Z*	-	-	-	-		
63A04R-S90LN16-C	●	63	22	18,0	40	10,4	6,3	4					+	0,5
63A05R-S90LN16-C	●	63	22	18,0	40	10,4	6,3	5					+	0,5
80A04R-S90LN16-C	●	80	27	38,0	50	12,4	7,0	4					+	1,0
80A06R-S90LN16-C	●	80	27	38,0	50	12,4	7,0	6					+	1,0
100A05R-S90LN16-C	●	100	32	45,0	50	14,4	8,0	5					+	1,8
100A07R-S90LN16-C	●	100	32	45,0	50	14,4	8,0	7					+	1,7
125A06R-S90LN16-C	●	125	40	56,0	63	16,4	9,0	6					+	3,5
125A08R-S90LN16-C	●	125	40	56,0	63	16,4	9,0	8					+	3,3
140A06R-S90LN16-C	●	140	40	56,0	63	16,4	9,0	6					+	4,5
160C08R-S90LN16	●	160	40	66,7	63	16,4	9,0	8						5,7
175C08R-S90LN16	●	175	40	66,7	63	16,4	9,0	8						6,7

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S90LN16



LNGU 16



LNGU 16-M

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions				
	M9315	M9325	8215	8230	8240												l	d	s	d_1	r_ε
LNGU 160708SR-M	●	●	●	●	●												16,600	13,200	10,00	5,70	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver	Vite di bloccaggio fresa Screw for taper clamping
			
63	US 45012-T20P	SDR T20P-T	HS 1030C
80 ÷ 175	US 45012-T20P	SDR T20P-T	-

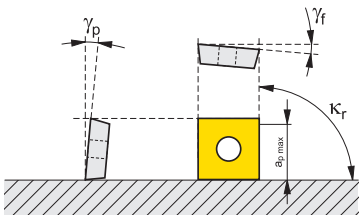
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

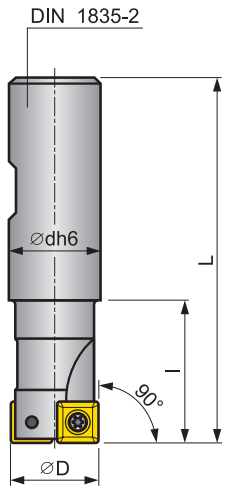
SSO09

FRESE A CANDELA
END MILLING CUTTERS



γ_p	+6 ÷ +10°	κ_r	90°
γ_f	-10° ÷ -12°	$a_{p\,max}$	8 mm





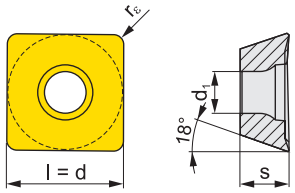
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

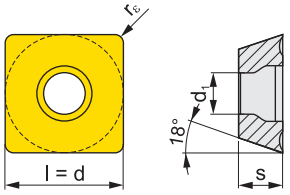
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	l	dh6	Z*								
20A2R032B20-SSO09-C	●	20	82	32	20	2							+	0,1
25A3R042B25-SSO09-C	●	25	98	42	25	3							+	0,3
32A4R042B32-SSO09-C	●	32	102	42	32	4							+	0,7

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

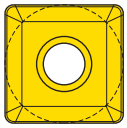
SSO09



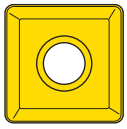
SOMT-P



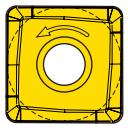
SOMT



SOMT-P



SOMT-MI



SOMT-M

INSERTI / INDEXABLE CUTTING INSERTS

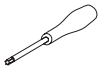
ISO	Qualità / Grades										Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	M8310	8215	8230	8240	7010	7025	l	d	s	d_1	r_ε
SOMT 09T304-P			●				●	●	○	○	9,550	9,550	3,97	3,50	0,4
SOMT 09T304-MI		●		●	■	●	●	●	○		9,550	9,550	3,97	3,50	0,4
SOMT 09T308-M	●	●				●	●	●			9,550	9,550	3,97	3,50	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
20 ÷ 32	US 3006-T09P	SDR T09P





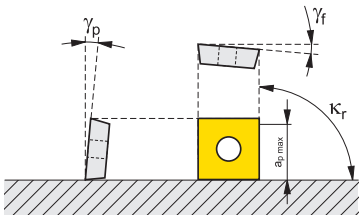
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

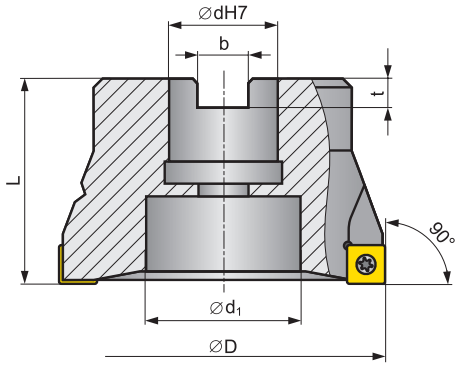
S90SO09

FRESE A SPALLAMENTO RETTO
SHOULDER MILLING CUTTERS



γ_p	+10°	κ_r	90°
γ_f	-8° ÷ -9°	$a_{p\,max}$	8 mm





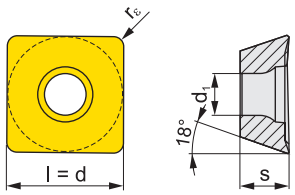
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

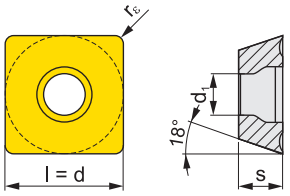
ISO	Disponibilità / Assortment	Dimensioni / Dimensions										Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	b	t	Z*					
40A05R-S90SO09-C	●	40	16	14	40	8,4	5,6	5				+	0,15
50A06R-S90SO09-C	●	50	22	18	40	10,4	6,4	6				+	0,30
63A07R-S90SO09-C	●	63	22	18	40	10,4	6,4	7				+	0,51
80A09R-S90SO09-C	●	80	27	38	50	12,4	7,0	9				+	0,97
100A10R-S90SO09-C	●	100	32	45	50	14,4	8,0	10				+	1,61
125A12R-S90SO09-C	○	125	40	60	63	16,4	9,0	12				+	2,97

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

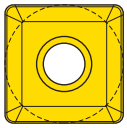
S90SO09



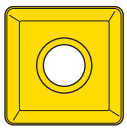
SOMT-P



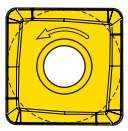
SOMT



SOMT-P



SOMT-MI



SOMT-M

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades										Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	M8310	8215	8230	8240	7010	7025	(l)	d	s	d_1	r_ε
SOMT 09T304-P			●				●	●	○	○	9,550	9,550	3,97	3,5	0,4
SOMT 09T304-MI		●		●	■	●	●	●	○		9,550	9,550	3,97	3,5	0,4
SOMT 09T308-M	●	●				●	●	●			9,550	9,550	3,97	3,5	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver	Vite di bloccaggio fresa Screw for taper clamping
40	US 3006-T09P	SDR T09P	HS 0830C
50 ÷ 63	US 3006-T09P	SDR T09P	HS 1030C
80 ÷ 125	US 3006-T09P	SDR T09P	-

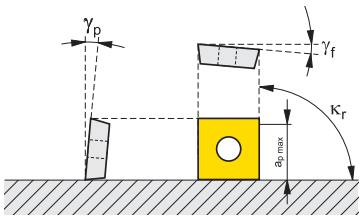
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

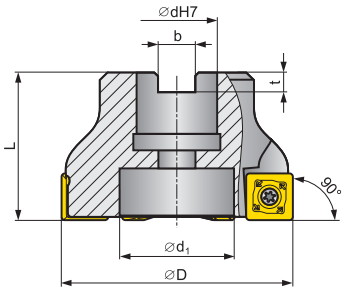
S90SD12

FRESE A SPALLAMENTO RETTO
SHOULDER MILLING CUTTERS

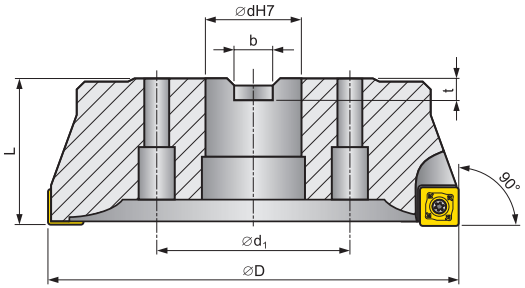


γ_p	+8°	κ_r	90°
γ_f	-5°	$a_{p\,max}$	10 mm





ø 50 ÷ 125 mm



ø 160 mm

Z* - N° denti / Number of teeth

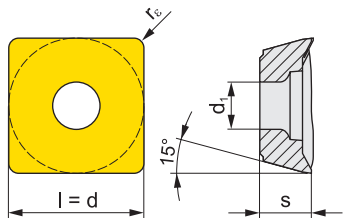
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	b	t	Z*						
50A05R-S90SD12-C	●	50	22	18	40	10,4	6,3	5					+	0,26
63A06R-S90SD12-C	●	63	22	18	40	10,4	6,3	6					+	0,42
80A06R-S90SD12-C	●	80	27	38	50	12,4	7,0	6					+	1,02
100A08R-S90SD12-C	●	100	32	45	50	14,4	8,0	8					+	1,63
125A09R-S90SD12-C	●	125	40	56	63	16,4	9,0	9					+	2,93
160C12R-S90SD12	●	160	40	66,7	63	16,4	9,0	12						6,01

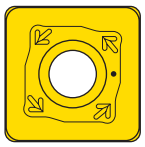
IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

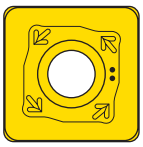
S90SD12



SDMT



SDMT SR-F



SDMT SR-M



SDMT PR-R

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades					Dimensioni / Dimensions				
	M9315	M9325	8215	8230	8240	l	d	s	d_1	r_ε
SDMT 120508SR-F				●	○	12,700	12,700	5,00	4,40	0,8
SDMT 120508SR-M		●	●	●	●	12,700	12,700	5,00	4,40	0,8
SDMT 120508PR-R	●	●		●	●	12,700	12,700	5,00	4,40	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver	Sottoplacchetta Shim	Vite sottoplacchetta Screw of shim	Chiave Key	Vite di bloccaggio fresa Screw for taper clamping
50 ÷ 63	US 3511-T15	SDR T15	-	-	-	HS 1030C
80 ÷ 160	US 3511-T15	SDR T15	SSN 100312	MS 3510	HXK 3,5	-

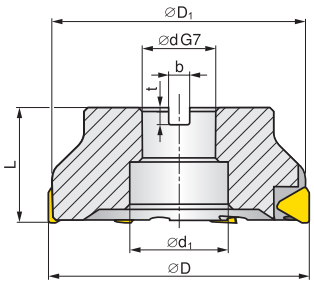
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

F90TB27X

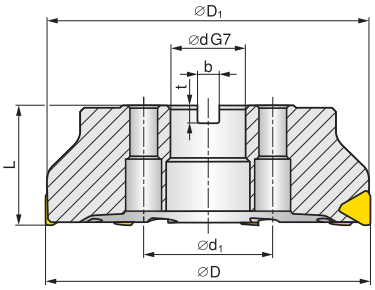
FRESE A SPALLAMENTO RETTO - PER SGROSSATURA PESANTE
FACE MILLING CUTTERS - FOR HEAVY MACHINING



ROUGH *TB*

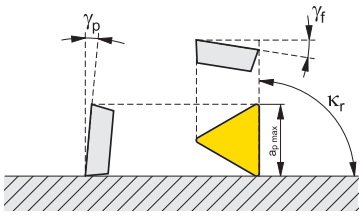


ø 140 mm



ø 175 ÷ 260 mm

γ_p	+9°	κ_r	90°
γ_f	-9°	$a_{p\,max}$	18 mm



Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

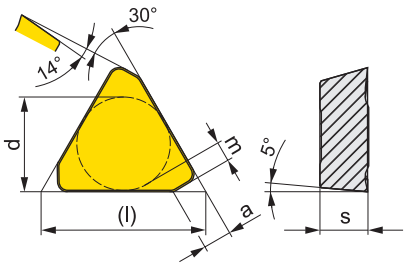
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	D_1	dG7	L	d_1	t	b	Z*					
140B05R-F90TB27X	○	140	135,7	40	63	56,0	9,0	16,4	5					3,9
140B07R-F90TB27X	○	140	135,7	40	63	56,0	9,0	16,4	7					3,7
175C06R-F90TB27X	○	175	169,6	40	63	66,7	16,4	16,4	6					6,5
175C08R-F90TB27X	○	175	169,6	40	63	66,7	16,4	16,4	8					6,3
210C08R-F90TB27X	○	210	204,1	60	63	101,6	25,7	25,7	8					9,4
210C10R-F90TB27X	○	210	204,1	60	63	101,6	25,7	25,7	10					9,1
260C10R-F90TB27X	○	260	253,4	60	63	101,6	25,7	25,7	10					16,4
260C12R-F90TB27X	○	260	253,4	60	63	101,6	25,7	25,7	12					16,2

IMPERO PRAMET

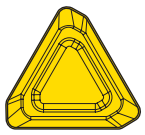
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

F90TB27X

FRESE A SPALLAMENTO RETTO - PER SGROSSATURA PESANTE
FACE MILLING CUTTERS - FOR HEAVY MACHINING



TBMR



TBMR PZSR

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions				
	8026T	8240															l	d	s	m	a
TBMR 2707PZSR	●	●															27,496	15,875	7,94	3,2	4,61

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Sottplacchetta Cuneo	Vite di bloccaggio* Clamping screw*	Chiave Key	Cuneo di blocc. Clamping wedge	Vite per cuneo Differential screw	Chiave Key	Vite di bloccaggio fresa Screw for taper clamping
140	LNK 220616	US 6013-T20P	SDR T20P-T	KU TBMR 2707	DS 01Z	KL 04	-
175	LNK 220616	US 6013-T20P	SDR T20P-T	KU TBMR 2707	DS 01Z	KL 04	HS 1240
210 ÷ 260	LNK 220616	US 6013-T20P	SDR T20P-T	KU TBMR 2707	DS 01Z	KL 04	HS 1655

IMPERO PRAMET

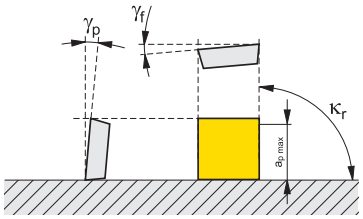
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

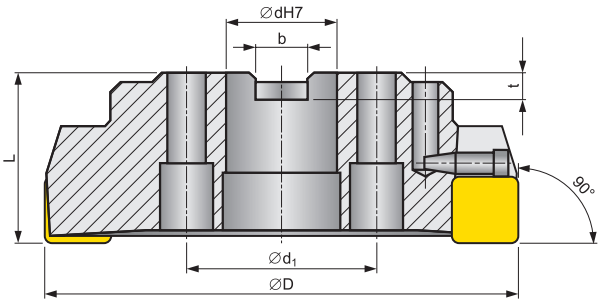
W90SP25P

FRESE A SPALLAMENTO RETTO - PER SGROSSATURA PESANTE
SHOULDER MILLING CUTTERS FOR HEAVY MACHINING



γ_p	+5°	κ_r	90°
γ_f	+2°	$a_{p\,max}$	22 mm





Z* - N° denti / Number of teeth

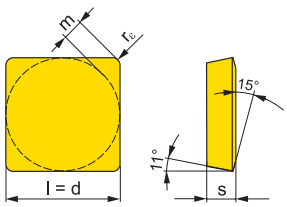
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions										Refrigerante int. Cooling	[kg]
		D	dH7	d_1	L	b	t	Z*					
175C06R-W90SP25P	○	175	40	66,7	63	16,4	9	6					7,5
210C08R-W90SP25P	○	210	60	101,6	63	25,7	14	8					11,0
260C10R-W90SP25P	○	260	60	101,6	63	25,7	14	10					19,0

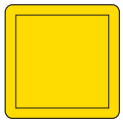
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

W90SP25P

FRESE A SPALLAMENTO RETTO - PER SGROSSATURA PESANTE
SHOULDER MILLING CUTTERS FOR HEAVY MACHINING



SPUN



SPUN S

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades			Dimensioni / Dimensions				
	8240	8026T	S26	(l)	d	s	m	r_ε
SPUN 250616S		●		25,400	25,400	6,35	4,60	1,6
SPUN 250620S	●	●	●	25,400	25,400	6,35	4,43	2,0

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

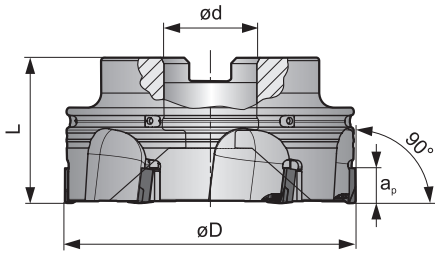
Ø Fresa Ø Cutter	Cuneo di blocc. Clamping wedge	Vite per cuneo Differential screw	Spina Stop	Chiave Key
				
175 ÷ 260	KU 23	DS 02	PS 04	HXK 5

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

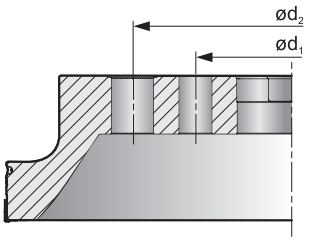
W90XO12

FRESE A SPALLAMENTO RETTO PER LEGHE DI ALLUMINIO
SHOULDER MILLING CUTTERS FOR ALUMINUM ALLOYS



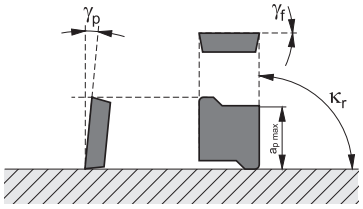


ø 50 ÷ 125 mm



ø 160 ÷ 315 mm

γ_p	8°	κ_r	90°
γ_f	0°÷3°	$a_{p\ max}$	10 mm



Z* - N° denti / Number of teeth

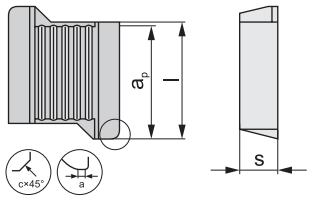
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	d	L	d_1	d_2	Z*							
50A04R-W90XO12	■	50	22	40	-	-	4							0,31
50A06R-W90XO12	□	50	22	40	-	-	6							0,32
63A05R-W90XO12	■	63	22	40	-	-	5							0,49
63A07R-W90XO12	■	63	22	40	-	-	7							0,52
80A06R-W90XO12	■	80	27	50	-	-	6							0,94
80A09R-W90XO12	■	80	27	50	-	-	9							0,98
100A06R-W90XO12	■	100	32	50	-	-	6							1,68
100A12R-W90XO12	■	100	32	50	-	-	12							1,74
125A08R-W90XO12	■	125	40	63	-	-	8							2,54
125A15R-W90XO12	□	125	40	63	-	-	15							2,64
160C10R-W90XO12	□	160	40	63	66,7	-	10							4,23
160C18R-W90XO12	□	160	40	63	66,7	-	18							4,38
200C12R-W90XO12	□	200	60	63	101,6	-	12							6,60
200C24R-W90XO12	□	200	60	63	101,6	-	24							6,74
250C16R-W90XO12	□	250	60	63	101,6	-	16							9,26
250C30R-W90XO12	□	250	60	63	101,6	-	30							9,51
315C20R-W90XO12	□	315	60	80	101,6	177,8	20							17,66
315C36R-W90XO12	□	315	60	80	101,6	177,8	36							17,92

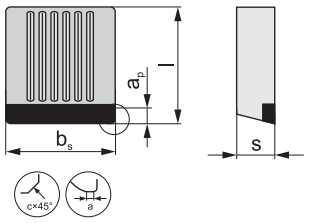
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

W90XO12

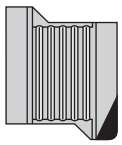
FRESE A SPALLAMENTO RETTO PER LEGHE DI ALLUMINIO
SHOULDER MILLING CUTTERS FOR ALUMINUM ALLOYS



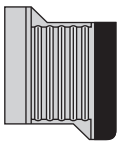
XOEN



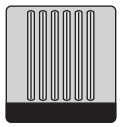
XOEN



XOEN RF/LF



XOEN RH



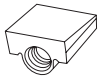
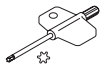
XOEN NH

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions				
	D720																	l	s	c×45°	a	$a_{p\,max}$
XOEN 12T304LF	□																	12,00	4,00	-	5°	3,30
XOEN 12T304RF	■																	12,00	4,00	-	5°	3,30
XOEN 12T308LF	□																	12,00	4,00	-	1,20	3,30
XOEN 12T308RF	■																	12,00	4,00	-	1,20	3,30
XOEN 12T308RH	■																	12,00	4,00	-	1,00	10,00
XOEN 12T304ZZNH	■																	12,00	4,00	-	10,80	0,76
XOEN 12T308ZZNH	■																	12,00	4,00	-	10,10	0,76
XOEN 12T3AZ08RF	■																	12,00	4,00	0,80	1,20	3,30
XOEN 12T3AZ08RH	■																	12,00	4,00	0,80	1,00	10,00
XOEN 12T3AZZ08NH	□																	12,00	4,00	0,80	10,00	0,76

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Cuneo di blocc. Clamping wedge	Vite per cuneo Differential screw	Vite per regolazione Adjustable screw	Chiave Key	Cacciavite Screwdriver
					
50 ÷ 315	KU XO12T3	DS 0420	SS 0413	HXK 2	FLAG T08P

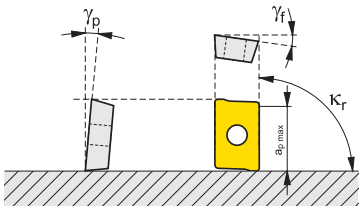
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

J-SAD11E

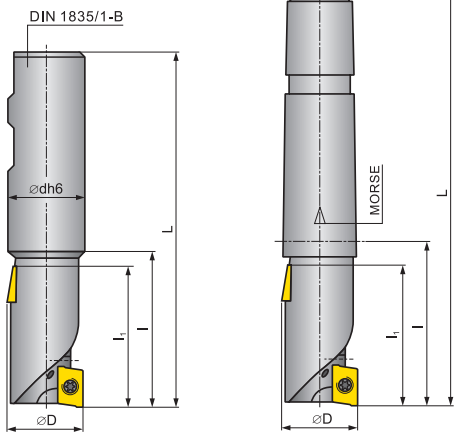
FRESE AD ELICA PER SGROSSATURA
HELICAL END MILLING CUTTERS FOR ROUGHING



γ_p	+11°÷ +12°	κ_r	90°
γ_f	-5,2°÷-8,1°	$a_{p\,max}$	l_1



FORCE *AD*



WELDON MORSE

Z* - N° denti / Number of teeth
ZN* - N° inserti / Number of inserts

Dimensioni [mm]. / Dimensions [mm].

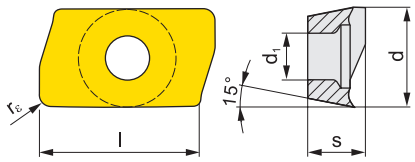
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	l	l_1	dh6	Morse	Z*	ZN*					
WELDON														
25J2R50B25-SAD11E38-C	●	25	106,0	50	38	25	-	2	8				+	0,3
32J2R60B32-SAD11E47-C	●	32	120,0	60	47	32	-	2	10				+	0,6
40J2R60B40-SAD11E47-C	●	40	130,0	60	47	40	-	2	10				+	0,9
40J3R70B40-SAD11E56-C	●	40	140,0	70	56	40	-	3	18				+	1,0
MORSE														
25J2R55E03-SAD11E38-C	●	25	136,0	55	38	-	3	2	8				+	0,4
32J2R65E04-SAD11E47-C	●	32	167,5	65	47	-	4	2	10				+	0,7
40J3R75E04-SAD11E56-C	●	40	177,5	75	56	-	4	3	18				+	1,1

IMPERO PRAMET

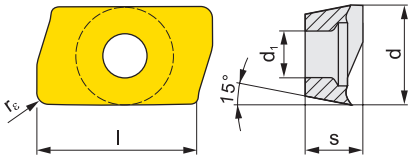
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

J-SAD11E

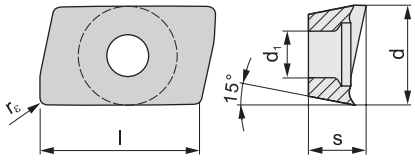
FRESE AD ELICA PER SGROSSATURA
HELICAL END MILLING CUTTERS FOR ROUGHING



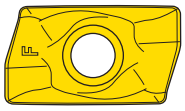
ADMX 11



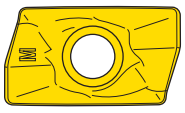
ADMX 11 (16)



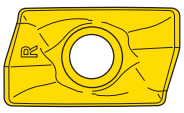
ADEX 11



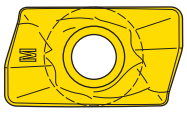
ADMX 11SR-F



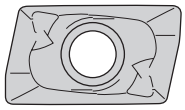
ADMX 11SR-M



ADMX 11PR-R



ADMX 11T316SR-M



ADEX FR-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades								Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
ADMX 11T304SR-F				●	●	●	●		11,000	6,530	3,97	2,9	0,4
ADMX 11T308SR-F				●	●	●	●		11,000	6,530	3,97	2,9	0,8
ADMX 11T304SR-M			●	●	●	●	●		11,000	6,530	3,97	2,9	0,4
ADMX 11T308SR-M	●	●	●	●	●	●	●		11,000	6,530	3,97	2,9	0,8
ADMX 11T316SR-M					●	●	●		11,000	6,530	3,97	2,9	1,6
ADMX 11T308PR-R	●	●	●		●	●	●		11,000	6,530	3,97	2,90	0,80
ADEX 11T304FR-FA								●	11,000	6,530	3,97	2,90	0,40
ADEX 11T308FR-FA								●	11,000	6,530	3,97	2,90	0,80
ADEX 11T316FR-FA								●					

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
25 ÷ 40	US 2506-T07P	FLAG T07P

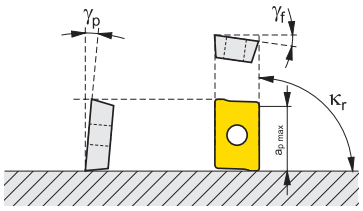
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

T-S90AD11E

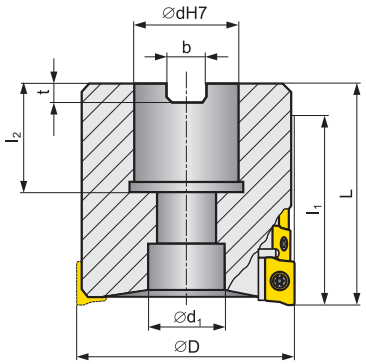
FRESE AD ELICA PER SGROSSATURA
HELICAL END MILLING CUTTERS FOR ROUGHING



γ_p	+11°÷ +12°	κ_r	90°
γ_f	-5,2°÷-8,1°	$a_{p\,max}$	l_1



FORCE AD



Z* - N° denti / Number of teeth
ZN* - N° inserti / Number of inserts

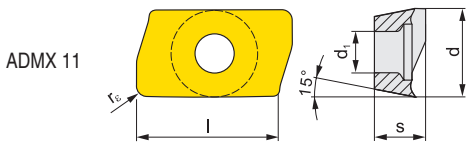
Dimensioni [mm]. / Dimensions [mm].

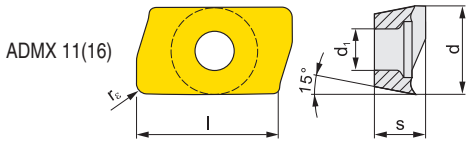
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	l_1	l_2	d_1	dH7	Z*	ZN*					
50T03R-S90AD11E37-C	●	50	58	37	21	18	22	3	12				+	0,50

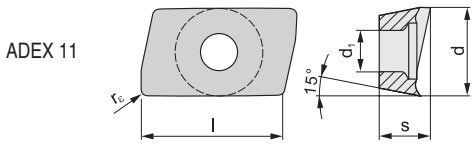
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

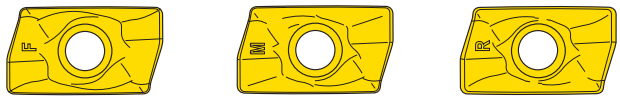
T-S90AD11E

FRESE AD ELICA PER SGROSSATURA
HELICAL END MILLING CUTTERS FOR ROUGHING

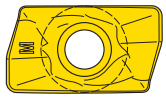




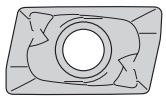




ADMX 11SR-F | ADMX 11SR-M | ADMX 11PR-R



ADMX 11T316SR-M



ADEX 11 FR-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades								Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	8215	8230	8240	HF7	(l)	d	s	d_1	r_ε
ADMX 11T304SR-F				●	●	●	●		11,000	6,530	3,97	2,90	0,4
ADMX 11T308SR-F				●	●	●	●		11,000	6,530	3,97	2,90	0,8
ADMX 11T304SR-M			●	●	●	●	●		11,000	6,530	3,97	2,90	0,4
ADMX 11T308SR-M	●	●	●	●	●	●	●		11,000	6,530	3,97	2,90	0,8
ADMX 11T316SR-M					●	●	●		11,000	6,530	3,97	2,90	1,6
ADMX 11T308PR-R	●	●	●		●	●	●		11,000	6,530	3,97	2,90	0,8
ADEX 11T304FR-FA								●	11,000	6,530	3,97	2,90	0,4
ADEX 11T308FR-FA								●	11,000	6,530	3,97	2,90	0,8
ADEX 11T316FR-FA								●					

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle	Vite di bloccaggio fresa Screw for taper clamping
50	US 2506-T07P	D-T07P/T09P	FG-15	HS 1030C

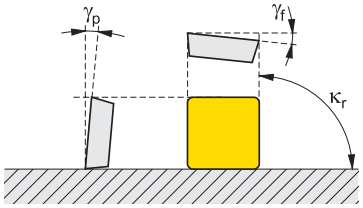
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

J-CSD12X

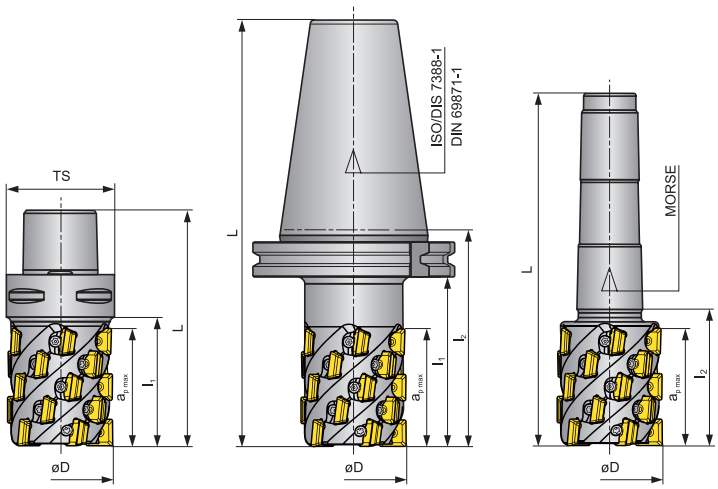
FRESE AD ELICA PER SGROSSATURA
HELICAL END MILLING CUTTERS FOR ROUGHING



γ_p	8°	κ_r	90°
γ_f	-5°	$a_{p\,max}$	–



MULTISIDE SD



CAPTO DIN 69871 MORSE

Z* - N° denti / Number of teeth
ZN* - N° inserti / Number of inserts
TS* - Attacco / Taper size

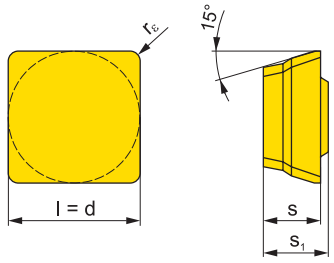
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions									Refrigerante int. Cooling	[kg]
		D	a_{pmax}	L	l_1	l_2	Z*	ZN*	TS*	Attacco Taper		
40J4R080XC5-CSD12X44	□	40	44,1	80,0	59	-	4	16	C5	CAPTO		0,71
50J5R080XC5-CSD12X55	■	50	54,9	80,0	59	-	5	25	C5	CAPTO		0,90
63J6R095XC6-CSD12X66	■	63	65,7	95,0	72	-	6	36	C6	CAPTO		1,86
40J4R090H40-CSD12X44	■	40	44,1	158,4	70	90	4	16	40	ISO/DIS 7388-1		1,17
50J5R100H50-CSD12X55	■	50	54,9	201,7	80	100	5	25	50	ISO/DIS 7388-1		3,35
63J6R110H50-CSD12X66	■	63	65,7	211,7	90	110	6	36	50	ISO/DIS 7388-1		4,10
80J8R130H50-CSD12X88	□	80	87,3	231,9	110	130	8	64	50	ISO/DIS 7388-1		5,49
50J5R065E04-CSD12X55	■	50	54,9	167,5	-	65	5	25	4	MORSE		0,90

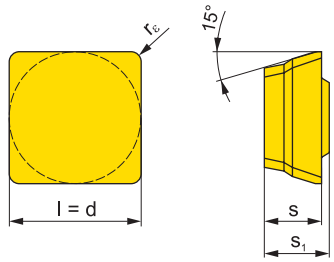
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

J-CSD12X

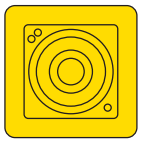
FRESE AD ELICA PER SGROSSATURA
HELICAL END MILLING CUTTERS FOR ROUGHING



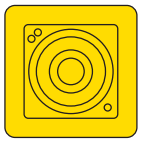
SDGX



SDMX



SDGX-FM



SDMX-M

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions					
	M8345	8230															l	d	s	s_1		r_ε
SDGX 120508EN-FM	■	■															12,700	12,700	5,56	6,35		0,8
SDMX 120508EN-M	■	■															12,700	12,700	5,56	6,35		0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle
40 ÷ 80	US 63511D-T15P	D-T08P/T15P	FG-15

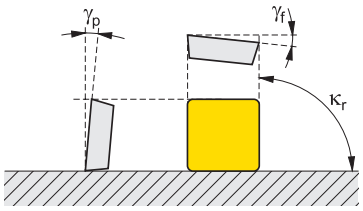
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

C90SD12X

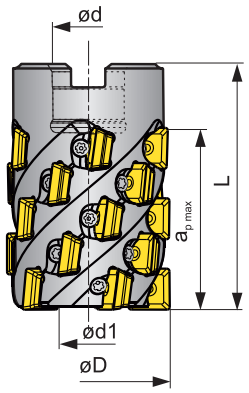
FRESE AD ELICA PER SGROSSATURA
HELICAL END MILLING CUTTERS FOR ROUGHING



γ_p	8°	κ_r	90°
γ_f	-5°	$a_{p\,max}$	-



MULTISIDE SD



Z* - N° denti / Number of teeth
ZN* - N° inserti / Number of inserts

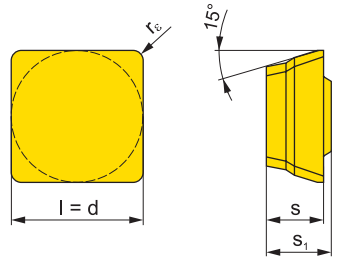
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	a_{pmax}	L	d	Z*	ZN*							
50T05R-C90SD12X55	■	50	54,9	78	22	5	25							0,62
63T06R-C90SD12X66	■	63	65,7	90	27	6	36							1,30
80T08R-C90SD12X88	■	80	87,3	115	40	8	64							2,71

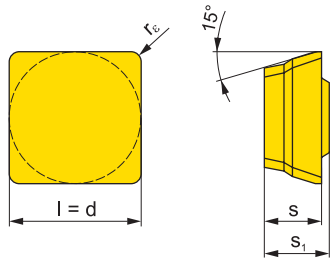
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

C90SD12X

FRESE AD ELICA PER SGROSSATURA
HELICAL END MILLING CUTTERS FOR ROUGHING



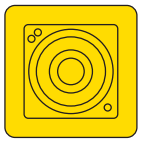
SDGX



SDMX



SDGX-FM



SDMX-M

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions					
	M8345	8230															l	d	s	s_1		r_ε
SDGX 120508EN-FM	■	■															12,700	12,700	5,56	6,35		0,8
SDMX 120508EN-M	■	■															12,700	12,700	5,56	6,35		0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

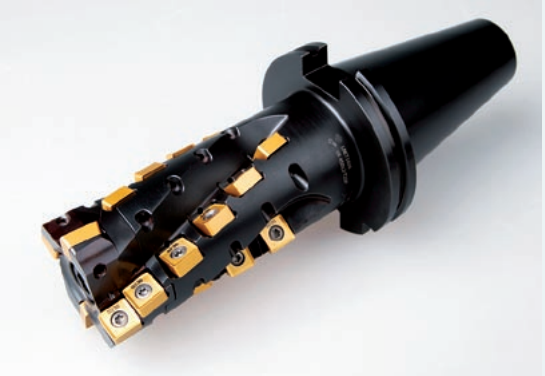
Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle	Vite di bloccaggio fresa Screw for taper clamping
50	US 63511D-T15P	D-T08P/T15P	FG-15	HS 1070
63	US 63511D-T15P	D-T08P/T15P	FG-15	HS 1280
80	US 63511D-T15P	D-T08P/T15P	FG-15	HS 20100

IMPERO PRAMET

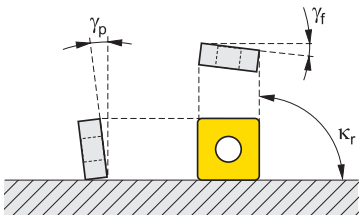
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SLSN

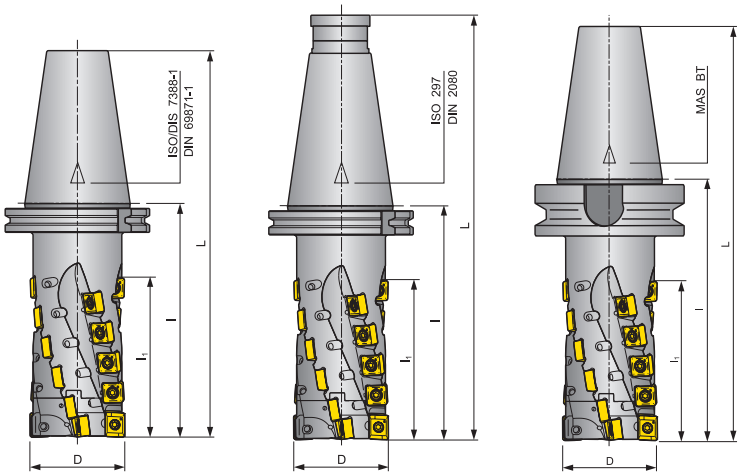
FRESE AD ELICA PER SGROSSATURA-SCOMPONIBILE
HELICAL END MILLING CUTTERS FOR ROUGHING - DIVIDED



γ_p	-10°	κ_r	90°
γ_f	-9°	$a_{p\ max}$	l1



ROUGH *SN*



DIN 69871 DIN 2080 MAS BT

Z* - N° denti / Number of teeth
ZN* - N° inserti / Number of inserts
TS* - Attacco / Taper size

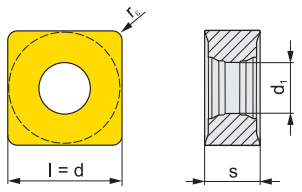
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions								Refrigerante int. Cooling	[kg]
		D	L	l	l_1	Z*	ZN*	TS*	Attacco Taper		
63J2R155H50-SLSN104-C	●	63	257	155	104	2+2	2+20	50	ISO/DIS 7388-1	+	4,2
80J2R190H50-SLSN134-C	●	80	292	190	134	2+2	2+26	50	ISO/DIS 7388-1	+	6,6
63J2R155G50-SLSN104-C	●	63	282	155	104	2+2	2+20	50	ISO 297	+	4,2
80J2R190G50-SLSN134-C	●	80	317	190	134	2+2	2+26	50	ISO 297	+	6,6
63J2R175X50-SLSN104-C	●	63	277	175	104	2+2	2+20	50	MAS BT	+	5,4
80J2R210X50-SLSN134-C	●	80	312	210	134	2+2	2+26	50	MAS BT	+	7,8

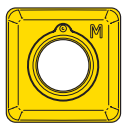
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SLSN

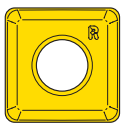
FRESE AD ELICA PER SGROSSATURA-SCOMPONIBILE
HELICAL END MILLING CUTTERS FOR ROUGHING - DIVIDED



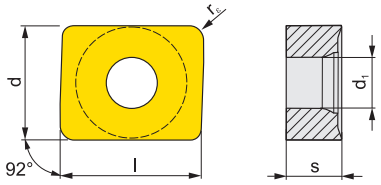
SNGX 13



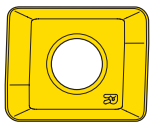
SNGX 13-M



SNGX 13-R



LNET 16



LNET 16-R

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions				
	8230	8240																l	d	s	d_1	r_ε
LNET 160616SR-R	●	●																16,400	13,200	6,38	5,90	1,6
SNGX 130512PN-R	●	●																13,200	13,200	6,36	5,90	1,2
SNGX 130512SN-M	●	●																13,200	13,200	6,36	5,90	1,2

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Parte anteriore senza inserti Indexable front part	Vite di bloccaggio Mounting screw	Chiave Key	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
63	EH6326-SL-C	HS1230	HXK 10	US 45012-T20P	SDR T20P-T
80	EH8036-SL-C	HS1640	HXK 14	US 45012-T20P	SDR T20P-T

IMPERO PRAMET

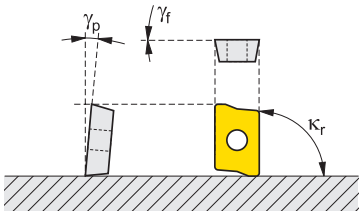
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

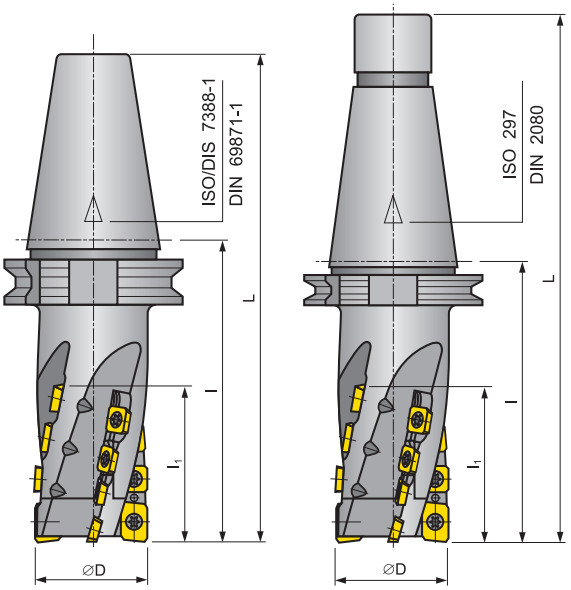
SSAP

FRESE AD ELICA PER SGROSSATURA-SCOMPONIBILE
HELICAL END MILLING CUTTERS FOR ROUGHING - DIVIDED



γ_p	+7°	κ_r	90°
γ_f	0°	$a_{p\ max}$	l_1





Z* - N° denti / Number of teeth
ZN* - N° inserti / Number of inserts
TS* - Attacco / Taper size

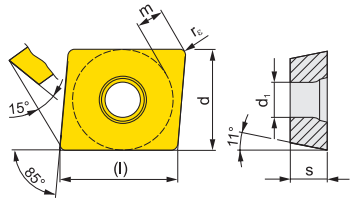
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions								Refrigerante int. Cooling	[kg]
		D	L	l	l_1	Z*	ZN*	TS*	Attacco Taper		
50J4R110H50-SSAP37+21	○	50	212	110	58	2+2	2+12	50	ISO/DIS 7388-1		3,5
50J4R128H50-SSAP55+21	○	50	230	128	76	2+2	2+16	50	ISO/DIS 7388-1		3,8
63J4R150H50-SSAP74+21	○	63	252	150	95	2+2	2+20	50	ISO/DIS 7388-1		4,5
50J4R106X50-SSAP37+21	○	50	233	106	58	2+2	2+12	50	ISO 297		3,5
50J4R124X50-SSAP55+21	●	50	251	124	76	2+2	2+16	50	ISO 297		3,8
63J4R146X50-SSAP74+21	●	63	273	146	95	2+2	2+20	50	ISO 297		4,5

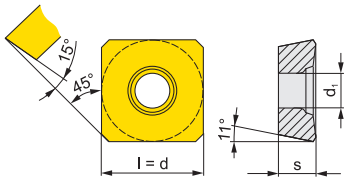
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SSAP

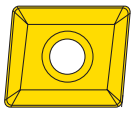
FRESE AD ELICA PER SGROSSATURA-SCOMPONIBILE
HELICAL END MILLING CUTTERS FOR ROUGHING - DIVIDED



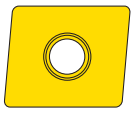
APET / APEW



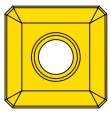
SPET / SPEW



APET EN/SN



APEW EN/SN



SPET EN/SN



SPEW EN/SN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions				
	8230	8240															(l)	d	s	d_1	r_ε
APET 150412EN	●																15,900	12,700	4,76	5,50	1,2
APET 150412SN	●	●															15,900	12,700	4,76	5,50	1,2
APEW 150412ER	●	○															15,900	12,700	4,76	5,50	1,2
APEW 150412SR	●	○															15,900	12,700	4,76	5,50	1,2
SPET 1204ADEN	●	●															12,700	12,700	4,76	5,50	-
SPET 1204ADSN	●	●															12,700	12,700	4,76	5,50	-
SPEW 1204ADEN	●	○															12,700	12,700	4,76	5,50	-
SPEW 1204ADSN	●	●															12,700	12,700	4,76	5,50	-

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Parte anteriore senza inserti Indexable front part	Vite di bloccaggio Mounting screw	Chiave Key	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
50	P50 x 21	SR 25	HXK 6	US 4511-T20	SDR T20
63	P63 x 21	SR 26	HXK 8	US 4511-T20	SDR T20

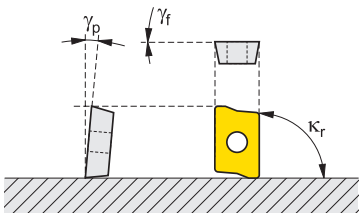
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

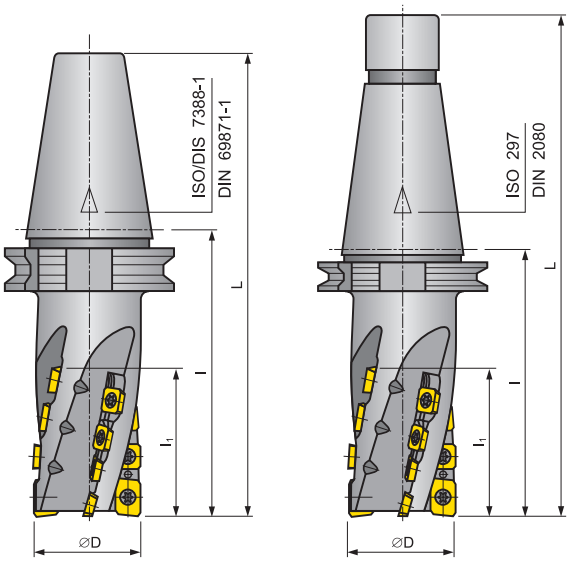
SSAP-A

FRESE AD ELICA NON SCOMPONIBILI
HELICAL END MILLING CUTTERS FOR ROUGHING - UNDIVIDED



γ_p	+7°	κ_r	90°
γ_f	0°	$a_{p\,max}$	l1





Z* - N° denti / Number of teeth
ZN* - N° inserti / Number of inserts
TS* - Attacco / Taper size

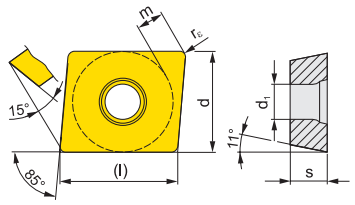
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions								Refrigerante int. Cooling	[kg]
		D	L	l	l_1	Z*	ZN*	TS*	Attacco Taper		
50J4R110H50-SSAP58-A	○	50	212	110	58	2+2	2+12	50	ISO/DIS 7388-1		3,5
50J4R128H50-SSAP76-A	○	50	230	128	76	2+2	2+16	50	ISO/DIS 7388-1		3,8
63J4R150H50-SSAP95-A	○	63	252	150	95	2+2	2+20	50	ISO/DIS 7388-1		4,5
80J6R155H50-SSAP95-A	○	80	257	155	95	3+3	3+30	50	ISO/DIS 7388-1		8,0
50J4R106X50-SSAP58-A	○	50	233	106	58	2+2	2+12	50	ISO 297		3,5
50J4R124X50-SSAP76-A	●	50	251	124	76	2+2	2+16	50	ISO 297		3,8
63J4R146X50-SSAP95-A	●	63	273	146	95	2+2	2+20	50	ISO 297		4,5
80J6R151X50-SSAP95-A	●	80	275	151	95	3+3	3+30	50	ISO 297		8,0

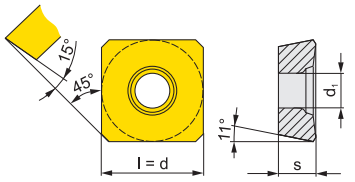
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
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SSAP-A

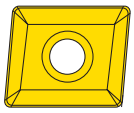
FRESE AD ELICA NON SCOMPONIBILI
HELICAL END MILLING CUTTERS FOR ROUGHING - UNDIVIDED



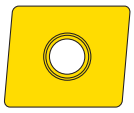
APET / APEW



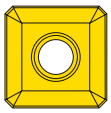
SPET / SPEW



APET EN/SN



APEW EN/SN



SPET EN/SN



SPEW EN/SN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions				
	8230	8240																(l)	d	s	d_1	r_ε
APET 150412EN	●																	15,900	12,700	4,76	5,50	1,2
APET 150412SN	●	●																15,900	12,700	4,76	5,50	1,2
APEW 150412ER	●	○																15,900	12,700	4,76	5,50	1,2
APEW 150412SR	●	○																15,900	12,700	4,76	5,50	1,2
SPET 1204ADEN	●	●																12,700	12,700	4,76	5,50	-
SPET 1204ADSN	●	●																12,700	12,700	4,76	5,50	-
SPEW 1204ADEN	●	○																12,700	12,700	4,76	5,50	-
SPEW 1204ADSN	●	●																12,700	12,700	4,76	5,50	-

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
50, 63, 80	US 4511-T20	SDR T20

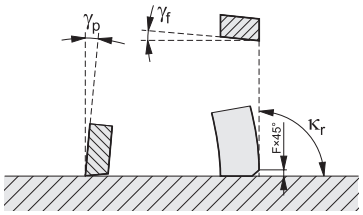
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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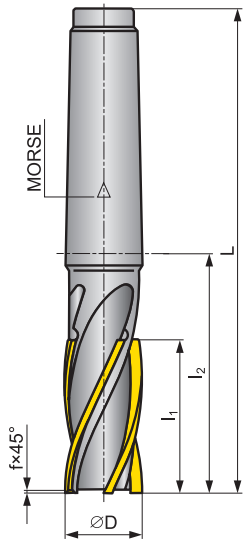
2416-E

FRESE AD ELICA BRASATE
HELICAL MILLING CUTTERS



γ_p	–	κ_r	–
γ_f	–	$a_{p\ max}$	–





Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	l_1	l_2	Z*	Morse	f						
2416-20R-E3-P	●	20	146	40	65	4	3	0,5						0,30
2416-25R-E3-P	●	25	160	50	79	4	3	0,5						0,40
2416-32R-E4-P	●	32	180	50	78	4	4	0,5						0,70
2416-40R-E4-P	●	40	200	63	98	6	4	0,8						1,00

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UP! GRADE®

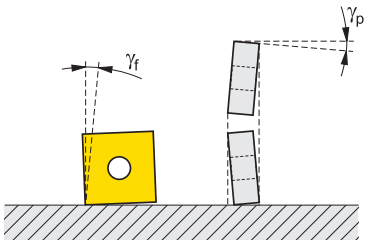


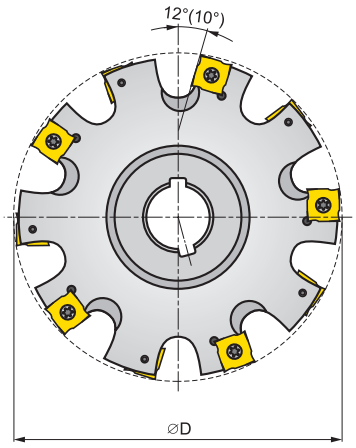
S90SN

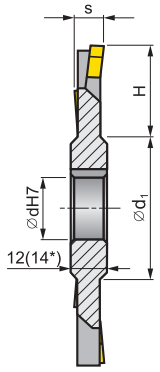
FRESE A DISCO
SIDE AND FACE MILLING CUTTERS

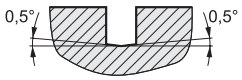


γ_p	-0°30´	κ_r	90°
γ_f	+2°30´	$a_{e\ max}$	H









Z* - N° denti / Number of teeth
* - Per s = 14 mm / For s = 14 mm
** - A richiesta si possono fornire anche con diametri dH7 diversi
- Also available with other dH7 diameters upon request

Dimensioni [mm]. / Dimensions [mm].

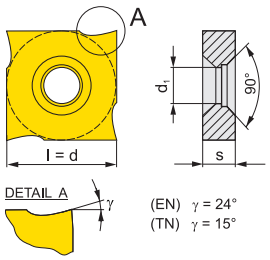
ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7**	H	s	d_1	Z*							
80F8N-S90SN11N4	●	80	27	18	4	42	8							0,2
80F8N-S90SN11N5	○	80	27	18	5	42	8							0,2
80F8N-S90SN12N6	●	80	27	18	6	42	8							0,2
80F8N-S90SN12N8	●	80	27	18	8	42	8							0,3
100G10N-S90SN12N6	●	100	32	25	6	48	10							0,3
100G10N-S90SN12N8	○	100	32	25	10	48	10							0,4
100G10N-S90SN12N10	●	100	32	25	12	48	10							0,5
100G10N-S90SN12N12	○	100	32	25	12	48	10							0,5
125H12N-S90SN12N6	●	125	40	31	6	58	12							0,5
125H12N-S90SN12N8	●	125	40	31	8	58	12							0,6
125H12N-S90SN12N10	○	125	40	31	10	58	12							0,6
125H12N-S90SN12N12	○	125	40	31	12	58	12							0,6
160H16N-S90SN12N6	●	160	40	44	6	58	16							1,0
160H16N-S90SN12N8	○	160	40	44	8	58	16							1,1
160H16N-S90SN12N10	○	160	40	44	10	58	16							1,2
160H16N-S90SN12N12	○	160	40	44	12	58	16							1,3
160H15N-S90SN12N14	○	160	40	44	14	58	15							1,4
200J18N-S90SN12N6	●	200	50	62	6	72	18							1,5
200J18N-S90SN12N8	○	200	50	62	8	72	18							1,6
200J18N-S90SN12N10	○	200	50	62	10	72	18							1,9
200J18N-S90SN12N12	○	200	50	62	12	72	18							2,1
200J18N-S90SN12N14	○	200	50	62	14	72	18							2,3

IMPERO PRAMET

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Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

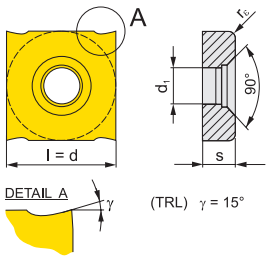
S90SN

SNHQ

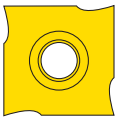


(EN) γ = 24°
(TN) γ = 15°

SNHQ

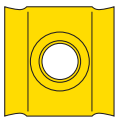


(TRL) γ = 15°



SNHQ AZEN/AZTN

(EN) γ = 24° per lavorare alluminio
for machining aluminium
(TN) γ = 15° per lavorare acciai e ghise
for machining steel and cast iron



SNHQ TRL

(TN) γ = 15° per lavorare acciai e ghise
for machining steel and cast iron

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades			Dimensioni / Dimensions				
	8215	8230	8240	l	s	d_1	γ	r_ε
s = 4 mm								
SNHQ 1102AZTN		●	●	11,000	2,300	4,3	15°	-
s = 5 mm								
SNHQ 1103AZTN		●	○	11,000	2,700	4,3	15°	-
s = 6 mm								
SNHQ 1203AZEN	●		○	12,700	3,200	5,00	24°	-
SNHQ 1203AZTN		●	●	12,700	3,200	5,00	15°	-
SNHQ 120305TRL			●	12,700	3,200	5,00	15°	0,5
SNHQ 120310TRL			●	12,700	3,200	5,00	15°	1,0
SNHQ 120315TRL			○	12,700	3,200	5,00	15°	1,5
s = 8 mm								
SNHQ 1204AZEN	○		○	12,700	4,500	5,00	24°	-
SNHQ 1204AZTN		●	●	12,700	4,500	5,00	15°	-
SNHQ 120405TRL			●	12,700	4,500	5,00	15°	0,5
SNHQ 120410TRL			○	12,700	4,500	5,00	15°	1,0
SNHQ 120415TRL			○	12,700	4,500	5,00	15°	1,5
s = 10 mm								
SNHQ 1205AZEN	○		○	12,700	5,400	5,00	24°	-
SNHQ 1205AZTN		●	●	12,700	5,400	5,00	15°	-
SNHQ 120505TRL			●	12,700	5,400	5,00	15°	0,5
SNHQ 120510TRL			○	12,700	5,400	5,00	15°	1,0
SNHQ 120515TRL			○	12,700	5,400	5,00	15°	1,5
s = 12, 14 mm								
SNHQ 1207AZEN	○		○	12,700	7,000	5,00	24°	-
SNHQ 1207AZTN		●	●	12,700	7,000	5,00	15°	-
SNHQ 120705TRL			○	12,700	7,000	5,00	15°	0,5
SNHQ 120710TRL			●	12,700	7,000	5,00	15°	1,0
SNHQ 120715TRL			○	12,700	7,000	5,00	15°	1,5

IMPERO PRAMET

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S90SN

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
4	US 3504-T09P	SDR T09P
5	US 3504-T09P	SDR T09P
6	US 70	SDR T15
8	US 71	SDR T15
10	US 72	SDR T15
12; 14	US 73	SDR T15

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
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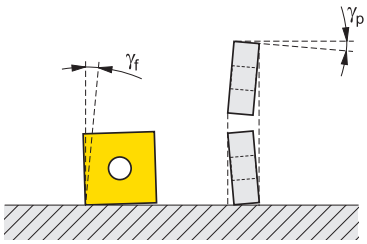
IMPERO
PRAMET

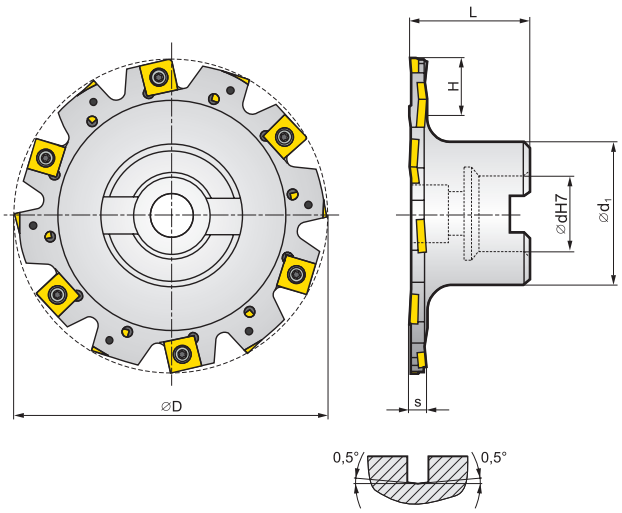
S90SN-R

FRESA A DISCO A MANICOTTO
DISC MILLING CUTTERS



γ_p	-0°30´	κ_r	90°
γ_f	+2°30´	$a_{e\ max}$	H





Z* - N° denti / Number of teeth
K* - N° di denti effettivo / Effective number of teeth

Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dH7	H	s	d_1	Z*	K*	L					
63A03R-S90SN11N4	●	63	16	10,5	4	34	6	3	40					0,5
63A03R-S90SN11N5	○	63	16	10,5	5	34	6	3	40					0,5
63A03R-S90SN12N6	○	63	16	10,5	6	34	6	3	40					0,5
80A04R-S90SN11N5	●	80	22	17,5	5	40	8	4	40					0,6
80A04R-S90SN12N6	●	80	22	17,5	6	40	8	4	40					0,6
100A05R-S90SN12N6	●	100	27	23,5	6	48	10	5	50					0,7
125B06R-S90SN12N6	○	125	40	24,0	6	70	12	6	50					1,5
160B08R-S90SN12N10	○	160	40	41,0	10	70	16	8	50					2,1

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

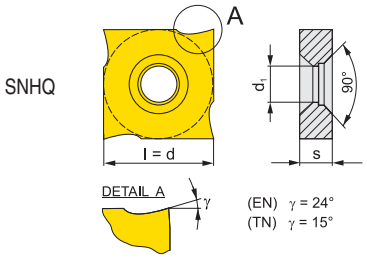
Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver	Vite di bloccaggio fresa Screw for taper clamping
63A03R-S90SN11N4	US 3504-T09P	SDR T09P	HS 0830
63A03R-S90SN11N5	US 3505-T09P	SDR T09P	HS 0830
63A03R-S90SN12N6	US 70	SDR T15	HS 0830
80A04R-S90SN11N5	US 3505-T09P	SDR T09P	HS 1030
80A04R-S90SN12N6	US 70	SDR T15	HS 1030
100A05R-S90SN12N6	US 70	SDR T15	HS 1230
125B06R-S90SN12N6	US 70	SDR T15	-
160B08R-S90SN12N10	US 72	SDR T15	-

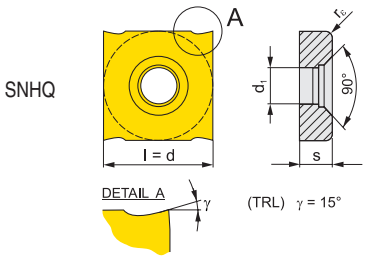
IMPERO PRAMET

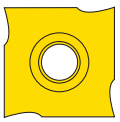
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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S90SN-R

FRESA A DISCO A MANICOTTO
DISC MILLING CUTTERS

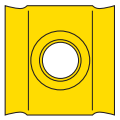






SNHQ AZEN/AZTN

(EN) γ = 24° per lavorare alluminio
for machining aluminium
(TN) γ = 15° per lavorare acciai e ghise
for machining steel and cast iron



SNHQ TRL

(TN) γ = 15° per lavorare acciai e ghise
for machining steel and cast iron

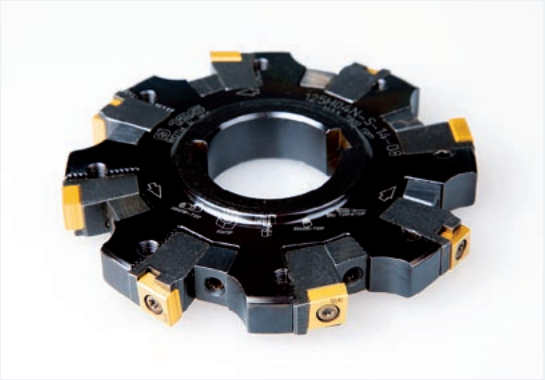
INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades			Dimensioni / Dimensions				
	8215	8230	8240	l	s	d_1	γ	r_ε
s = 4 mm								
SNHQ 1102AZTN		●	●	11,000	2,300	4,3	15°	-
s = 5 mm								
SNHQ 1103AZTN		●	○	11,000	2,700	4,3	15°	-
s = 6 mm								
SNHQ 1203AZEN	●		○	12,700	3,200	5,00	24°	-
SNHQ 1203AZTN		●	●	12,700	3,200	5,00	15°	-
SNHQ 120305TRL			●	12,700	3,200	5,00	15°	0,5
SNHQ 120310TRL			●	12,700	3,200	5,00	15°	1,0
SNHQ 120315TRL			○	12,700	3,200	5,00	15°	1,5
s = 10 mm								
SNHQ 1205AZEN	○		○	12,700	5,400	5,00	24°	-
SNHQ 1205AZTN		●	●	12,700	5,400	5,00	15°	-
SNHQ 120505TRL			●	12,700	5,400	5,00	15°	0,5
SNHQ 120510TRL			○	12,700	5,400	5,00	15°	1,0
SNHQ 120515TRL			○	12,700	5,400	5,00	15°	1,5

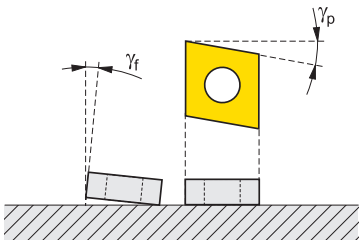
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● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

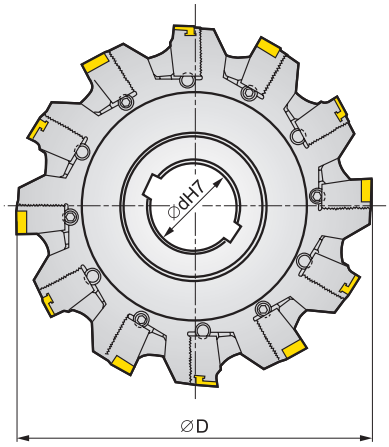
S90CN(XN)

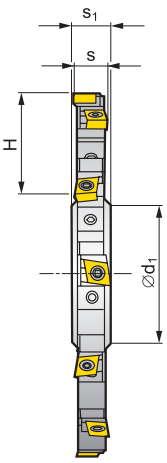
FRESA A DISCO REGISTRABILE
ADJUSTABLE DISC MILLING CUTTERS



γ_p	+4° ÷ +5°	κ_r	90°
γ_f	-8° ÷ -10°	$a_{e\ max}$	H







Z* - N° denti / Number of teeth
K* - N° di denti effettivo / Effective number of teeth

Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions									Refrigerante int. Cooling	[kg]
		D	dH7	s_1	d_1	s	H	Z*	K*	Inserti Inserts		
s = 14,0 ÷ 18,5 mm												
125H04N-S90CN10N18	○	125	40	18	56	14,0 ÷ 18,5	34	8	4	CNHQ 1005AZTN		0,7
160H06N-S90CN10N18	○	160	40	18	56	14,0 ÷ 18,5	50	12	6	CNHQ 1005AZTN		1,2
200J07N-S90CN10N18	○	200	50	18	71	14,0 ÷ 18,5	60	14	7	CNHQ 1005AZTN		2,2
250J09N-S90CN10N18	○	250	50	18	71	14,0 ÷ 18,5	85	18	9	CNHQ 1005AZTN		3,7
315J12N-S90CN10N18	○	315	50	18	71	14,0 ÷ 18,5	110	24	12	CNHQ 1005AZTN		7,4
s = 19,0 ÷ 24,3 mm												
160H05N-S90XN12N24	○	160	40	24	56	19,0 ÷ 24,3	50	10	5	XNHQ 1205AZTN		1,7
200J06N-S90XN12N24	○	200	50	24	71	19,0 ÷ 24,3	60	12	6	XNHQ 1205AZTN		3,7
250J08N-S90XN12N24	○	250	50	24	71	19,0 ÷ 24,3	85	16	8	XNHQ 1205AZTN		6,1
315J10N-S90XN12N24	○	315	50	24	71	19,0 ÷ 24,3	110	20	10	XNHQ 1205AZTN		9,6
s = 24,5 ÷ 30,5 mm												
200J06N-S90XN16N30	○	200	50	30	71	24,5 ÷ 30,5	60	12	6	XNHQ 1606AZTN		4,8
250J08N-S90XN16N30	○	250	50	30	71	24,5 ÷ 30,5	85	16	8	XNHQ 1606AZTN		8,0
315K10N-S90XN16N30	○	315	60	30	85	24,5 ÷ 30,5	110	20	10	XNHQ 1606AZTN		12,7

Quando si ordina una fresa a disco, specificare la larghezza desiderata (impostata entro una tolleranza di +- 0,03 mm). Se nell'ordine non viene specificata la larghezza, la fresa a disco sarà realizzata di default con la larghezza di taglio minima.

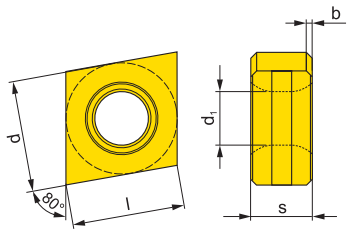
Please specify your desired width (which is set within a tolerance of +/- 0.03 mm) when ordering a disc cutter. If the width is not specified on your order, the disc cutter will be made to the minimum width of cut by default.

IMPERO PRAMET

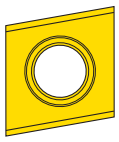
● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S90CN(XN)

FRESA A DISCO REGISTRABILE
ADJUSTABLE DISC MILLING CUTTERS



CNHQ / XNHQ



CNHQ AZTN / XNHQ AZTN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades															Dimensioni / Dimensions				
	8230	8240														(l)	d	s	d_1	b
CNHQ 1005AZTN	●	●														10,000	10,000	5,40	4,70	0,5 x 45°
XNHQ 1205AZTN	●	●														12,700	10,000	5,40	4,70	0,5 x 45°
XNHQ 1606AZTN	○	●														16,000	12,000	6,40	5,90	0,5 x 45°

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Larghezza „s“ Width of cutter „s“	Fresa Body of cutter	Cartuccia L Cassete L	Cartuccia R Cassete R	Cuneo Wedge	Vite cuneo Wedge screw	Chiave Key	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
s = 14 ÷ 18,5 mm										
125H04N-S90CN10N18	125H04N-S-14-08	KL-1418-CN10	KR-1418-CN10	KS 613F	DS 6018F	SDR T20	US 4011-T15P	SDR T15P	SS 6005-T09P	SDR T09
160H06N-S90CN10N18	160H06N-S-14-12									
200J07N-S90CN10N18	200J07N-S-14-14									
250J09N-S90CN10N18	250J09N-S-14-18									
315J12N-S90CN10N18	315J12N-S-14-24									
s = 19 ÷ 24,3 mm										
160H05N-S90XN12N24	160H05N-S-19-10	KL-1924-XN12	KR-1924-XN12	KS 617M	DS 6500	HXK 4	US 4011-T15P	SDR T15P	SS 6005-T09P	SDR T09
200J06N-S90XN12N24	200J06N-S-19-12									
250J08N-S90XN12N24	250J08N-S-19-16									
315J10N-S90XN12N24	315J10N-S-19-20									
s = 24,5 ÷ 30,5 mm										
200J06N-S90XN16N30	200J06N-S-25-12	KL-2530-XN16	KR-2530-XN16	KS 623M	DS 6500	HXK 4	US 5012-T15P	SDR T15P	SS 6005-T09P	SDR T09
250J08N-S90XN16N30	250J08N-S-25-16									
315K10N-S90XN16N30	315K10N-S-25-20									

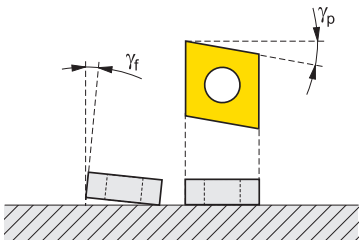
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● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

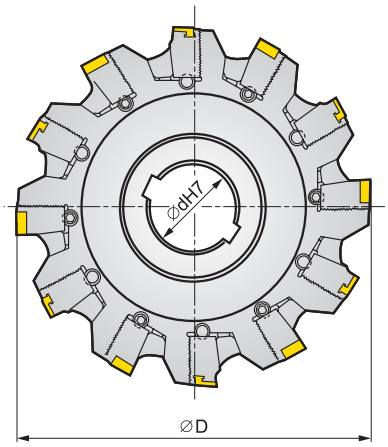
S90CN(XN)-R

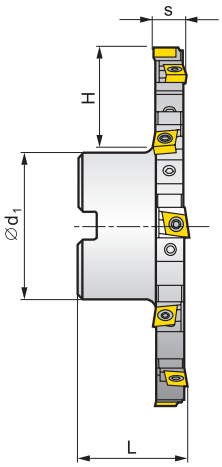
FRESA A DISCO REGISTRABILE
ADJUSTABLE DISC MILLING CUTTERS



γ_p	+4° ÷ +5°	κ_r	90°
γ_f	-8° ÷ -10°	$a_{e\ max}$	H







Z* - N° denti / Number of teeth
K* - N° di denti effettivo / Effective number of teeth

Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions									Refrigerante int. Cooling	[kg]
		D	dH7	L	d_1	s	H	Z*	K*	Inserti Inserts		
s = 14,0 ÷ 18,5 mm												
125B04R-S90CN10N18	○	125	40	50	70	14,0 ÷ 18,5	25	8	4	CNHQ 1005AZTN		1,2
160B06R-S90CN10N18	○	160	40	50	70	14,0 ÷ 18,5	44	12	6	CNHQ 1005AZTN		2,8
200C07R-S90CN10N18	○	200	40	50	90	14,0 ÷ 18,5	52	14	7	CNHQ 1005AZTN		3,3
s = 19,0 ÷ 24,3 mm												
160B05R-S90XN12N24	○	160	40	50	70	19,0 ÷ 24,3	44	10	5	XNHQ 1205AZTN		3,1
200C06R-S90XN12N24	○	200	40	50	90	19,0 ÷ 24,3	52	12	6	XNHQ 1205AZTN		4,6
s = 24,5 ÷ 30,5 mm												
200C06R-S90XN16N30	○	200	60	50	130	24,5 ÷ 30,5	34	12	6	XNHQ 1606AZTN		5,9

Quando si ordina una fresa a disco, specificare la larghezza desiderata (impostata entro una tolleranza di +- 0,03 mm). Se nell'ordine non viene specificata la larghezza, la fresa a disco sarà realizzata di default con la larghezza di taglio minima.

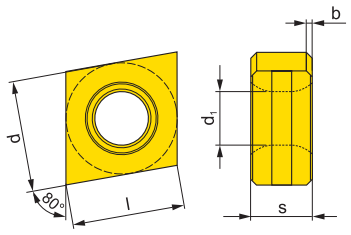
Please specify your desired width (which is set within a tolerance of +/- 0.03 mm) when ordering a disc cutter. If the width is not specified on your order, the disc cutter will be made to the minimum width of cut by default.

IMPERO PRAMET

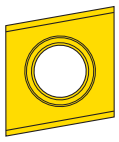
● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S90CN(XN)-R

FRESA A DISCO REGISTRABILE
ADJUSTABLE DISC MILLING CUTTERS



CNHQ / XNHQ



CNHQ AZTN / XNHQ AZTN

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades															Dimensioni / Dimensions				
	8230	8240														(l)	d	s	d_1	b
CNHQ 1005AZTN	●	●														10,000	10,000	5,40	4,70	0,5 × 45°
XNHQ 1205AZTN	●	●														12,700	10,000	5,40	4,70	0,5 × 45°
XNHQ 1606AZTN	○	●														16,000	12,000	6,40	5,90	0,5 × 45°

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Larghezza „s“ Width of cutter „s“	Fresa Body of cutter	Cartuccia L Cassete L	Cartuccia R Cassete R	Cuneo Wedge	Vite cuneo Wedge screw	Chiave Key	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
s = 14 ÷ 18,5 mm										
125B04R-S90CN10N18	125B04R-S-14-08	KL-1418-CN10	KR-1418-CN10	KS 613F	DS 6018F	SDR T20	US 4011-T15P	SDR T15P	SS 6005-T09P	SDR T09
160B06R-S90CN10N18	160B06R-S-14-12									
200C07R-S90CN10N18	200C07R-S-14-14									
s = 19 ÷ 24,3 mm										
160B05R-S90XN12N24	160B05R-S-19-10	KL-1924-XN12	KR-1924-XN12	KS 617M	DS 6500	HXK 4	US 4011-T15P	SDR T15P	SS 6005-T09P	SDR T09
200C06R-S90XN12N24	200C06R-S-19-12									
s = 24,5 ÷ 30,5 mm										
200C06R-S90XN16N30	200C06R-S-25-12	KL-2530-XN16	KR-2530-XN16	KS 623M	DS 6500	HXK 4	US 5012-T15P	SDR T15P	SS 6005-T09P	SDR T09

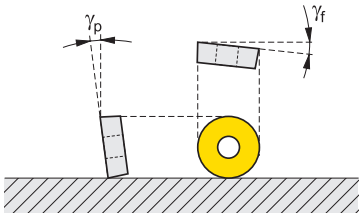
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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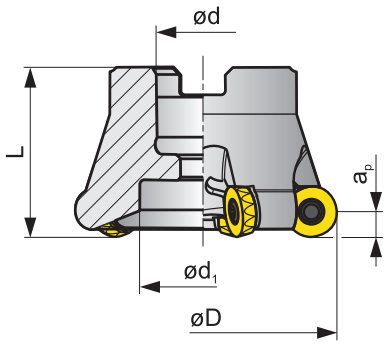
SMORC

FRESE PER COPIATURA
SHOULDER MILLING CUTTERS



γ_p	-7°	κ_r	–
γ_f	-2°÷ -3°	$a_{p\ max}$	6,0 ÷ 10,0 mm





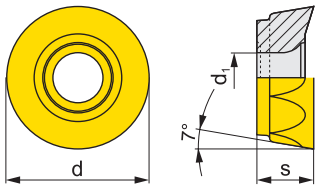
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

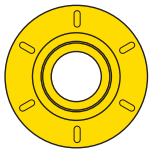
ISO	Disponibilità / Assortment	Dimensioni / Dimensions									Refrigerante int. Cooling	[kg]
		D	d	d_1	L	Z*	Inserti Inserts					
40A03R-SMORC12	■	40	16	12	40	3	RC.. 1204					0,16
50A04R-SMORC12	■	50	22	18	40	4	RC.. 1204					0,26
63A05R-SMORC12	■	63	22	30	40	5	RC.. 1204					0,35
80A05R-SMORC12	■	80	27	37	50	5	RC.. 1204					0,89
100A06R-SMORC12	■	100	32	45	50	6	RC.. 1204					1,55
63A04R-SMORC16	■	63	22	18	50	4	RC.. 1606					0,47
80A05R-SMORC16	■	80	27	37	50	5	RC.. 1606					0,73
100A06R-SMORC16	■	100	32	45	50	6	RC.. 1606					1,05
80A04R-SMORC20	■	80	27	28	50	4	RC.. 2006					0,64
100A05R-SMORC20	■	100	32	45	50	5	RC.. 2006					0,96

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

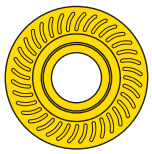
SMORC



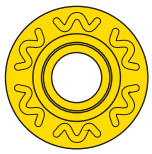
RCMT



RCMT-F



RCMT-M



RCMT-R

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades								Dimensioni / Dimensions		
	M9315	M9325	M9340	M8310	M8345	8215	8230	8240	d	s	d_1
RCMT 1204MOEN-F				■		■	■		12,000	4,760	4,40
RCMT 1204MOEN-R			■				■		12,000	4,760	4,40
RCMT 1204MOSN-M		■	■		■		■		12,000	4,760	4,40
RCMT 1204MOSN-R					■				12,000	4,760	4,40
RCMT 1606MOEN-F				■				■	16,000	6,350	5,50
RCMT 1606MOSN-M		■	■		■		■		16,000	6,350	5,50
RCMT 1606MOSN-R					■				16,000	6,350	5,50
RCMT 2006MOSN-M	■	■	■		■		■		20,000	6,350	6,50
RCMT 2006MOSN-R					■				20,000	6,350	6,50

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle	Cacciavite Screwdriver	Vite di bloccaggio fresa Screw for taper clamping
40A03R-SMORC12	US 63509-T15P	D-T08P/T15P	FG-15	-	HS 90835
50A04R-SMORC12	US 63509-T15P	D-T08P/T15P	FG-15	-	HS 1030C
63A05R-SMORC12	US 63509-T15P	D-T08P/T15P	FG-15	-	HS 1030C
80A05R-SMORC12	US 63509-T15P	D-T08P/T15P	FG-15	-	-
100A06R-SMORC12	US 63509-T15P	D-T08P/T15P	FG-15	-	-
63A04R-SMORC16	US 65014-T20P	-	-	SDR T20P-T	HS 1030C
80A05R-SMORC16	US 65014-T20P	-	-	SDR T20P-T	-
100A06R-SMORC16	US 65014-T20P	-	-	SDR T20P-T	-
80A04R-SMORC20	US 66015-T25P	-	-	SDR T25P-T	HS 1230C
100A05R-SMORC20	US 66015-T25P	-	-	SDR T25P-T	-

IMPERO PRAMET

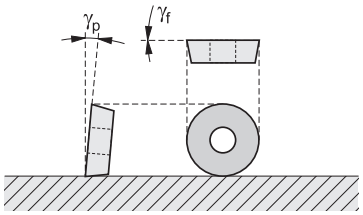
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

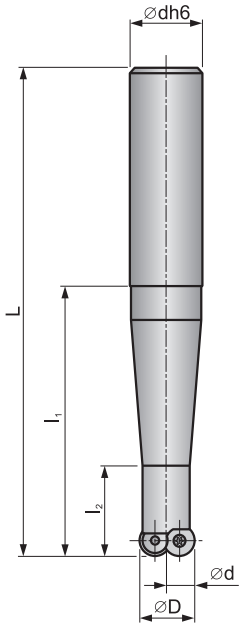
B-SRD

FRESE PER COPIATURA
COPY MILLING CUTTERS



γ_p	+3°	κ_r	–
γ_f	0°	$a_{p\,max}$	2,0; 2,5 mm





Z* - N° denti / Number of teeth

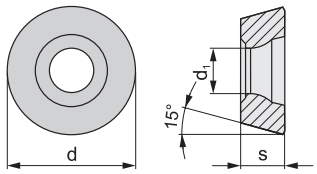
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions								Refrigerante int. Cooling	[kg]
		D	d	L	l_1	l_2	dh6	Z*	Inserti Inserts		
15E2R040B16-SRD07	○	15	7	88	40	20	16	2	RD.. 0702	+	0,15
15E2R060B16-SRD07	●	15	7	108	60	20	16	2	RD.. 0702	+	0,25
15E2R080B20-SRD07	○	15	7	130	80	22	20	2	RD.. 0702	+	0,50
15E2R100B20-SRD07	○	15	7	150	100	22	20	2	RD.. 0702	+	0,75
15E2R120B25-SRD07	○	15	7	176	120	22	25	2	RD.. 0702	+	0,80
20E2R040B20-SRD10	●	20	10	90	40	20	20	2	RD.. 1003	+	0,20
20E2R060B20-SRD10	●	20	10	110	60	22	20	2	RD.. 1003	+	0,30
20E2R080B25-SRD10	○	20	10	136	80	25	25	2	RD.. 1003	+	0,60
20E2R100B25-SRD10	○	20	10	156	100	25	25	2	RD.. 1003	+	0,80
20E2R120B25-SRD10	○	20	10	176	120	25	25	2	RD.. 1003	+	1,00

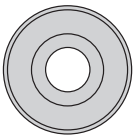
IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

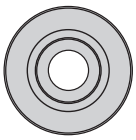
B-SRD



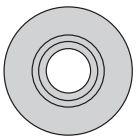
RD..



RDHX MOT



RDGX MOT



RDHT-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades										Dimensioni / Dimensions					
	M9340	M8310	M8325	M8345	7205	7010	7025	7040	5040	HF7	d	d_1	s			
RDHX 0702MOT		■	■		●	○	○				7,000	2,80	2,38			
RDHX 1003MOT		■	■	■	●	○	○	○	○		10,000	3,90	3,18			
RDGT 0702MOT		□	□	□		○	○	○			7,000	2,80	2,38			
RDGT 1003MOT	●	□	■	■		○	○	○			10,000	3,90	3,18			
RDHT 0702MO-FA										●	7,000	2,80	2,38			
RDHT 1003MO-FA										●	10,000	3,90	3,18			

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
..SRD07	US 25	SDR T07
..SRD10	US 3507-T15	SDR T15

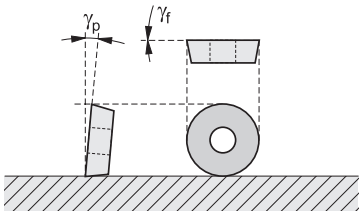
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

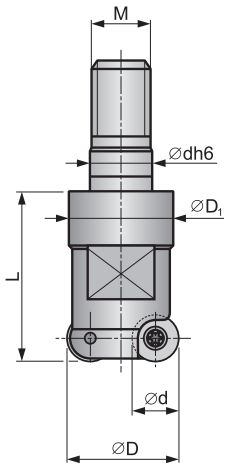
SCRD

TESTINE MODULARI
SCREW MILLING CUTTERS



γ_p	+3°	κ_r	–
γ_f	0°	$a_{p\,max}$	1,5 ÷ 4,0 mm





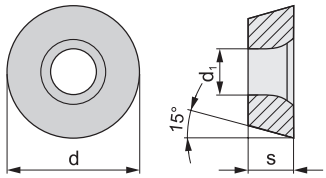
Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

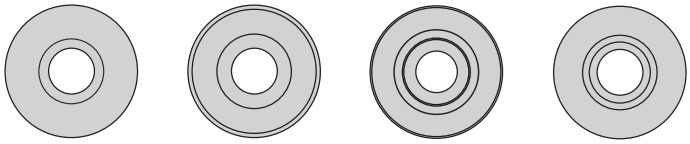
ISO	Disponibilità / Assortment	Dimensioni / Dimensions								Refrigerante int. Cooling	[kg]
		D	d	L	D_1	dh6	M	Z*	Inserti Inserts		
10E2R020M06-SRD05	○	10	5	20	9,8	6,5	M6	2	RD.. 0501	+	0,10
12E3R020M06-SRD05	○	12	5	20	10	6,5	M6	3	RD.. 0501	+	0,10
15E4R020M08-SRD05	●	15	5	20	13,5	8,5	M8	4	RD.. 0501	+	0,10
15E2R028M08-SRD07	●	15	7	28	13,5	8,5	M8	2	RD.. 0702	+	0,10
15E3R028M08-SRD07	●	15	7	28	13,5	8,5	M8	3	RD.. 0702	+	0,20
20E4R028M10-SRD07	●	20	7	28	18	10,5	M10	4	RD.. 0702	+	0,30
25E5R028M12-SRD07	○	25	7	28	21	12,5	M12	5	RD.. 0702	+	0,40
20E2R028M10-SRD10	●	20	10	28	18	10,5	M10	2	RD.. 1003	+	0,30
25E2R032M12-SRD10	○	25	10	32	21	12,5	M12	2	RD.. 1003	+	0,40
25E3R032M12-SRD10	●	25	10	32	21	12,5	M12	3	RD.. 1003	+	0,35
30E4R042M16-SRD10	●	30	10	42	29	17	M16	4	RD.. 1003	+	0,50
35E5R042M16-SRD10	●	35	10	42	29	17	M16	5	RD.. 1003	+	0,55
24E2R032M12-SCRD12	●	24	12	32	21	12,5	M12	2	RD.. 12T3	+	0,35
35E3R042M16-SCRD12	●	35	12	42	29	17	M16	3	RD.. 12T3	+	0,55
35E4R042M16-SRD12	●	35	12	42	29	17	M16	4	RD.. 12T3	+	0,50
42E4R042M16-SCRD12	○	42	12	42	29	17	M16	4	RD.. 12T3	+	0,65
42E5R042M16-SRD12	○	42	12	42	29	17	M16	5	RD.. 12T3	+	0,60
32E2R042M16-SCRD16	○	32	16	42	29	17	M16	2	RD.. 1604	+	0,55

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SCRD



RD..



RDHX MOE | RDHX MOT | RDGX MOT | RDHT-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades										Dimensioni / Dimensions		
	M9340	M8310	M8325	M8345	7205	7010	7025	7040	5040	HF7	d	d_1	s
RDHX 0501MOE		■				○					5,000	2,20	1,51
RDHX 07T1MOT		■	□			○	○				7,000	2,80	1,98
RDHX 0702MOT		■	■		●	○	○				7,000	2,80	2,38
RDHX 1003MOT		■	■	■	●	○	○	○	○		10,000	3,90	3,18
RDHX 12T3MOT		■	■	■	●	○	○	○	○		12,000	3,90	3,97
RDHX 1604MOT		■	■	■		○	○	○	○		16,000	5,20	4,76
RDGT 0702MOT		□	□	□		○	○	○			7,000	2,80	2,38
RDGT 1003MOT	●	□	■	■		○	○	○			10,000	3,90	3,18
RDGT 12T3MOT	●	■	■	■		○	○	○			12,000	3,90	3,97
RDGT 1604MOT	●	□	■	■		○	○	○			16,000	5,20	4,76
RDHT 07T1MO-FA										○	7,000	2,80	1,98
RDHT 0702MO-FA										●	7,000	2,80	2,38
RDHT 1003MO-FA										●	10,000	3,90	3,18
RDHT 12T3MO-FA										●	12,000	3,90	3,97
RDHT 1604MO-FA										○	16,000	5,20	4,76

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Vite di bloccaggio Clamping screw	Staffa Clamp	Cacciavite Screwdriver
..SRD05	US 20	-	-	SDR T06
..SRD07	US 25	-	-	SDR T07
..SRD10	US 3507-T15	-	-	SDR T15
..SCRD12	US 3507-T15	CS12	-	SDR T15
..SRD12	US 3507-T15	-	-	SDR T15
..SCRD16	US 4511-T20	-	LA 12T3	SDR T20
..SRD16	US 4511-T20	-	-	SDR T20

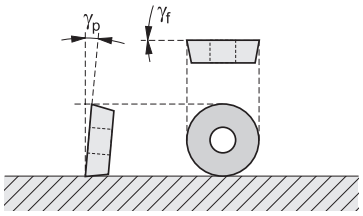
IMPERO PRAMET

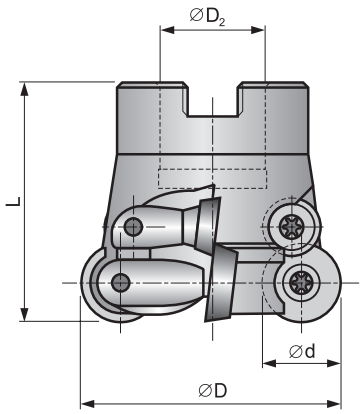
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SCMORD



γ_p	+5°	κ_r	–
γ_f	0°	$a_{p\ max}$	3; 4 mm





Z* - N° denti / Number of teeth

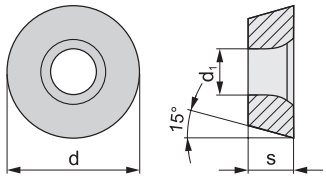
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions									Refrigerante int. Cooling	[kg]
		D	d	D_2	L	Z*	Inserti Inserts					
50A05R-SCMORD12	●	50	12	22	50	5	RD.. 12T3				+	0,70
52A05R-SCMORD12	●	52	12	22	50	5	RD.. 12T3				+	0,70
66A06R-SCMORD12	●	66	12	27	50	6	RD.. 12T3				+	0,90
80B07R-SCMORD12	●	80	12	27	52	7	RD.. 12T3				+	1,40
52A04R-SCMORD16*	●	52	16	22	50	4	RD.. 1604				+	0,70
66A05R-SCMORD16	●	66	16	27	50	5	RD.. 1604				+	0,90
80A06R-SCMORD16	●	80	16	27	52	6	RD.. 1604				+	1,40
100A07R-SCMORD16	○	100	16	32	52	7	RD.. 1604					2,00

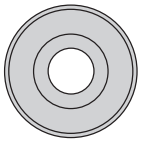
*) angolo assiale 0° / axial angle 0°

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

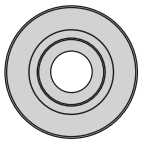
SCMORD



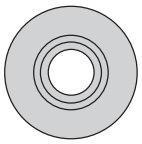
RD..



RDHX MOT



RDGX MOT



RDHT-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades										Dimensioni / Dimensions		
	M9340	M8310	M8325	M8345	7205	7010	7025	7040	5040	HF7	d	d_1	s
RDHX 12T3MOT		■	■	■	●	○	○	○	○		12,000	3,90	3,97
RDHX 1604MOT		■	■	■		○	○	○	○		16,000	5,20	4,76
RDGT 12T3MOT	●	■	■	■		○	○	○			12,000	3,90	3,97
RDGT 1604MOT	●	□	■	■		○	○	○			16,000	5,20	4,76
RDHT 12T3MO-FA										●	12,000	3,90	3,97
RDHT 1604MO-FA										○	16,000	5,20	4,76

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Vite di bloccaggio Clamping screw	Staffa Clamp	Cacciavite Screwdriver
..SCMORD12	US 3507-T15	CS 12	-	SDR T15
..SCMORD16	US 4511-T20	-	LA 12T3	SDR T20

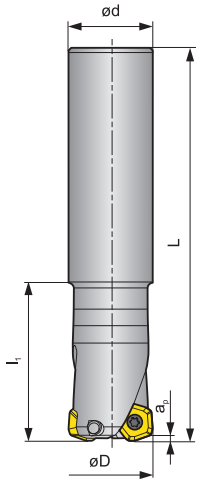
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SPD09

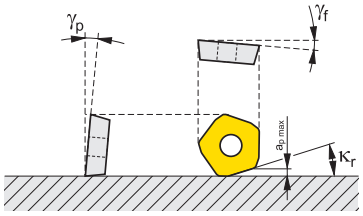
FRESE AD ALTO AVANZAMENTO
HFC MILLING CUTTERS



PENTA HF



γ_p	10°	κ_r	19°
γ_f	-10°÷ -24°	$a_{p\,max}$	2 mm



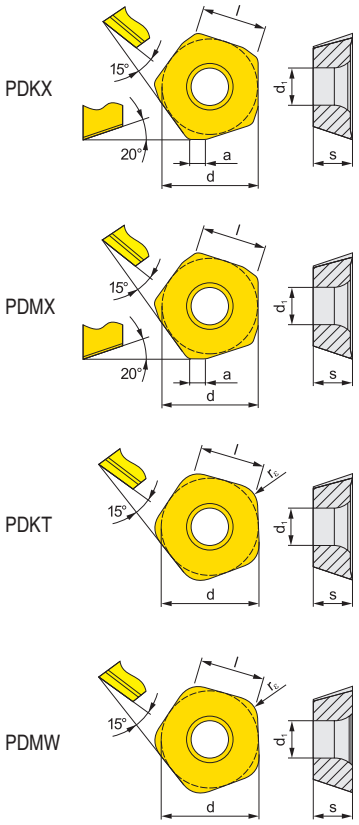
Z* - N° denti / Number of teeth

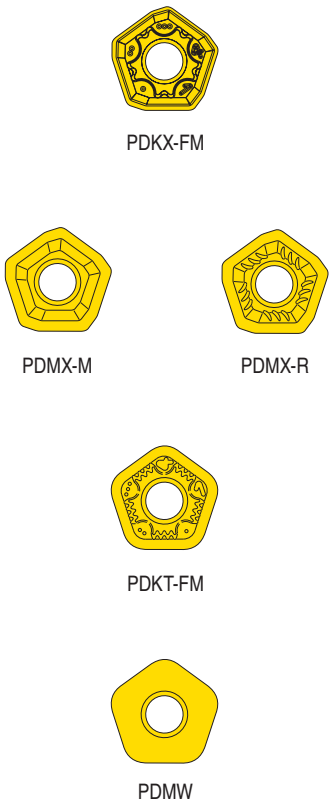
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	L	l_1	d	Z*								
32E2R060A32-SPD09	■	32	250	60	32	2								1,42
40E3R060A32-SPD09	■	40	250	60	32	3								1,50

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SPD09





INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensions [mm]					
	M9325	M9340	M8345	8215	8230													l	d	s	d_1	a	r_ε
PDKX 0905ZEER-FM		■	■															9,00	13,50	5,47	5,50	2,00	-
PDMX 0905ZEER-M		■	■	■	■													9,00	13,50	5,47	5,50	2,00	-
PDMX 0905ZESR-R			■	■	■													9,00	13,50	5,47	5,50	2,00	-
PDKT 090530ER-FM			■	■	■													9,00	13,50	5,47	5,50	-	3,0
																							-
PDMW 090530SR	■		■															9,00	13,50	5,47	5,50	-	3,0

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
32 ÷ 40	US 45011-T20P	FLAG T20P

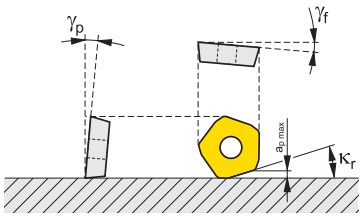
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S19PD09

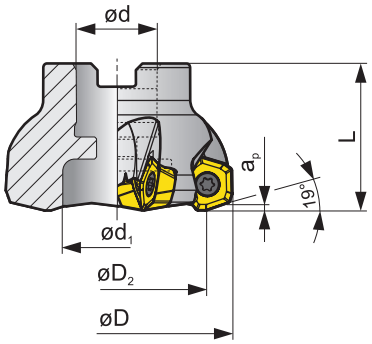
FRESE AD ALTO AVANZAMENTO
HFC MILLING CUTTERS



γ_p	10°	κ_r	19°
γ_f	-1° ÷ -24°	$a_{p\,max}$	2 mm



PENTA HF



Z* - N° denti / Number of teeth

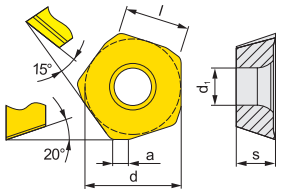
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	d	d_1	L	D_2	Z*							
42A03R-S19PD09-C	■	42	16	12	40	28	3						+	0,18
50A04R-S19PD09-C	■	50	22	18	40	36	4						+	0,23
52A04R-S19PD09-C	■	52	22	18	40	38	4						+	0,24
63A05R-S19PD09-C	■	63	22	18	40	49	5						+	0,31
66A06R-S19PD09-C	■	66	22	18	40	52	6						+	0,32
80A05R-S19PD09-C	■	80	27	37	50	66	5						+	0,83
100A06R-S19PD09-C	■	100	32	45	50	86	6						+	1,40
100A08R-S19PD09-C	■	100	32	45	50	86	8						+	1,38

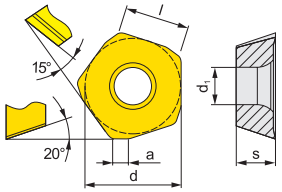
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S19PD09

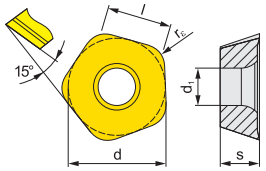
PDKX



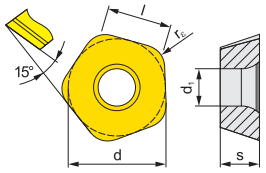
PDMX



PDKT



PDMW





PDKX-FM



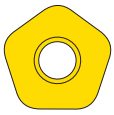
PDMX-M



PDMX-R



PDKT-FM



PDMW

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades						Dimensioni / Dimensions					
	M9325	M9340	M8345	8215	8230	8240	l	d	s	d_1	a	r_ε
PDKX 0905ZEER-FM		■	■				9,00	13,50	5,47	5,50	2,0	-
PDMX 0905ZEER-M		■	■	■	■		9,00	13,50	5,47	5,50	2,0	-
PDMX 0905ZESR-R			■	■	■		9,00	13,50	5,47	5,50	2,0	-
PDKT 090530ER-FM			■	■	■		9,00	13,50	5,47	5,50	-	3,0
PDMW 090530SR	■		■				9,00	13,50	5,47	5,50	-	3,0

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver	Vite di bloccaggio fresa Screw for taper clamping
			
42	US 45011-T20P	SDR T20P-T	HS 90835
50 ÷ 66	US 45011-T20P	SDR T20P-T	HS 1030C
80 ÷ 100	US 45011-T20P	SDR T20P-T	-

IMPERO PRAMET

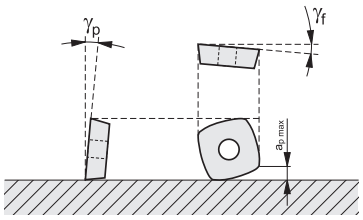
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SZD

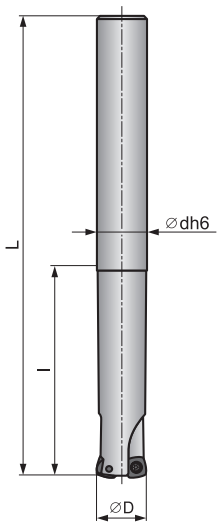
FRESE AD ALTO AVANZAMENTO
HFC MILLING CUTTERS



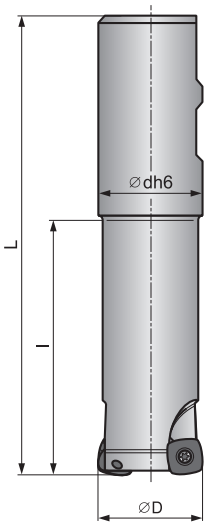
γ_p	+8°; +10°	κ_r	–
γ_f	-5°; -6°	$a_{p\,max}$	1,0; 1,6 mm



FEED ZD



CYLINDRICO
CYLINDRICAL



WELDON

Z* - N° denti / Number of teeth

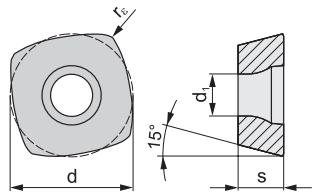
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions D	L	l	dh6	Z*	Inserti Inserts				Refrigerante int. Cooling	[kg]
CILINDRICO / CYLINDRICAL												
16E2R030A16-SZD07	●	16	100	30	16	2	ZD.. 0703				+	0,1
16E2R065A16-SZD07	●	16	145	65	16	2	ZD.. 0703				+	0,2
20E3R040A20-SZD07	●	20	120	40	20	3	ZD.. 0703				+	0,3
20E3R080A20-SZD07	●	20	165	80	20	3	ZD.. 0703				+	0,3
25E3R050A25-SZD07	●	25	140	50	25	3	ZD.. 0703				+	0,5
25E3R100A25-SZD07	●	25	190	100	25	3	ZD.. 0703				+	0,6
WELDON												
25E2R080B25-SZD09-C	●	25	140	80	25	2	ZD.. 09T3				+	0,5
25E2R140B25-SZD09-C	●	25	200	140	25	2	ZD.. 09T3				+	0,7
25E2R240B25-SZD09-C	○	25	300	240	25	2	ZD.. 09T3				+	1,0
32E2R080B32-SZD09-C	●	32	140	80	32	2	ZD.. 09T3				+	0,8
32E2R140B32-SZD09-C	●	32	200	140	32	2	ZD.. 09T3				+	1,1
32E2R240B32-SZD09-C	○	32	300	240	32	2	ZD.. 09T3				+	1,6
40E4R080B32-SZD12-C	●	40	140	80	32	4	ZD.. 1204				+	0,8
40E4R140B32-SZD12-C	○	40	200	140	32	4	ZD.. 1204				+	1,1
40E4R240B32-SZD12-C	○	40	300	240	32	4	ZD.. 1204				+	1,3

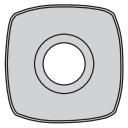
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SZD

FRESE AD ALTO AVANZAMENTO
HFC MILLING CUTTERS



ZDCW / ZDEW



ZDCW / ZDEW

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades									Dimensioni / Dimensions				
	M8310	M8325	M8345	7205	7215	7230	7010	7025	7040	l	d	s	d_1	r_ε
ZDCW 070304		■	■		●	●		○	○	6,800	6,800	3,18	2,60	0,4
ZDCW 09T304	■	■	■	○	●	●	○	○	○	9,525	9,525	3,97	3,40	0,4
ZDEW 120408	■	■	■	●			○	○	○	12,700	12,700	4,76	4,40	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
..SZD07	US 2205-T07P	FLAG T07P
..SZD09	US 3006-T09P	FLAG T09P
..SZD12	US 4011-T15P	FLAG T15P

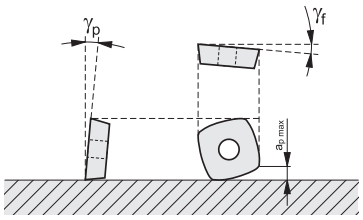
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
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SZD

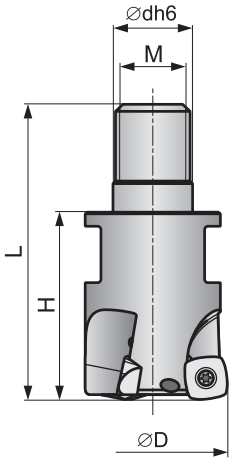
FRESE AD ALTO AVANZAMENTO
HFC MILLING CUTTERS



γ_p	+8°; +10°	κ_r	–
γ_f	-5°; -6°	$a_{p\,max}$	1,0; 1,6 mm



FEED ZD



Z* - N° denti / Number of teeth

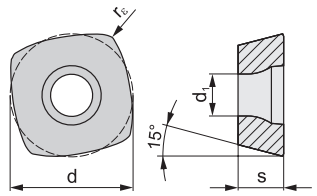
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions										Refrigerante int. Cooling	[kg]
		D	H	L	dh6	M	Z*	Inserti Inserts					
16E2R030M08-SZD07	●	16	30	48	8,5	M8	2	ZD.. 0703				+	0,00
20E3R030M10-SZD07	●	20	30	49	10,5	M10	3	ZD.. 0703				+	0,10
25E3R032M12-SZD07	●	25	32	54	12,5	M12	3	ZD.. 0703				+	0,10
25E4R032M12-SZD07	●	25	32	54	12,5	M12	4	ZD.. 0703				+	0,10
32E4R040M16-SZD07	○	32	40	65	17,0	M16	4	ZD.. 0703				+	0,20
25E2R032M12-SZD09-C	●	25	32	54	12,5	M12	2	ZD.. 09T3				+	0,10
25E3R032M12-SZD09-C	●	25	32	54	12,5	M12	3	ZD.. 09T3				+	0,10
32E3R040M16-SZD09-C	●	32	40	63	17,0	M16	3	ZD.. 09T3				+	0,20
32E3R040M16-SZD12-C	●	32	40	63	17,0	M16	3	ZD.. 1204				+	0,17
40E4R040M16-SZD12-C	●	40	40	63	17,0	M16	4	ZD.. 1204				+	0,20

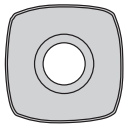
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SZD

FRESE AD ALTO AVANZAMENTO
HFC MILLING CUTTERS



ZDCW / ZDEW



ZDCW / ZDEW

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades								Dimensioni / Dimensions				
	M8310	M8325	M8345	7205	7215	7230	7010	7025	7040	l	d	s	d_1	r_ε
ZDCW 070304		■	■		●	●		○	○	6,800	6,800	3,18	2,60	0,4
ZDCW 09T304	■	■	■	○	●	●	○	○	○	9,525	9,525	3,97	3,40	0,4
ZDEW 120408	■	■	■	●			○	○	○	12,700	12,700	4,76	4,40	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
..SZD07	US 2205-T07P	FLAG T07P
..SZD09	US 3006-T09P	FLAG T09P
..SZD12	US 4011-T15P	FLAG T15P

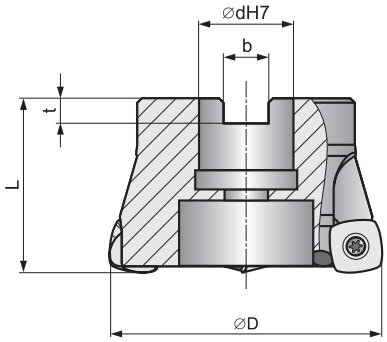
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SMOZD

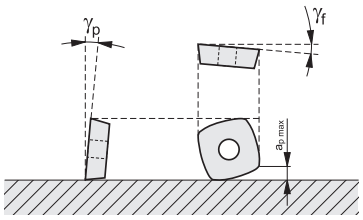
FRESE AD ALTO AVANZAMENTO
HFC MILLING CUTTERS



FEED ZD



γ_p	+10°	κ_r	–
γ_f	-6°	$a_{p\,max}$	1,0; 1,6 mm



Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

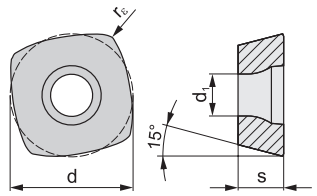
ISO	Disponibilità / Assortment	Dimensioni / Dimensions								Refrigerante int. Cooling	[kg]
		D	dH7	L	b	t	Z*	Inserti Inserts			
40A03R-SMOZD09-C	○	40	16	40	8,4	5,6	3	ZD.. 09T3		+	0,2
40A04R-SMOZD09-C	●	40	16	40	8,4	5,6	4	ZD.. 09T3		+	0,2
50A04R-SMOZD12-C	●	50	22	40	10,4	6,4	4	ZD.. 1204		+	0,2
63A04R-SMOZD12-C	○	63	22	40	10,4	6,4	4	ZD.. 1204		+	0,5
63A05R-SMOZD12-C	●	63	22	40	10,4	6,4	5	ZD.. 1204		+	0,4
80A05R-SMOZD12-C	●	80	27	50	12,0	7,0	5	ZD.. 1204		+	1,0

IMPERO PRAMET

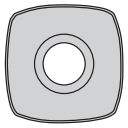
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SMOZD

FRESE AD ALTO AVANZAMENTO
HFC MILLING CUTTERS



ZDCW / ZDEW



ZDCW / ZDEW

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades									Dimensioni / Dimensions				
	M8310	M8325	M8345	7205	7215	7230	7010	7025	7040	l	d	s	d_1	r_ε
ZDCW 09T304	■	■	■	○	●	●	○	○	○	9,525	9,525	3,97	3,40	0,4
ZDEW 120408	■	■	■	●			○	○	○	12,700	12,700	4,76	4,40	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle	Vite di bloccaggio fresa Screw for taper clamping
40	US 3006-T09P	D-T07P/T09P	FG-15	HS 0830C
50, 63	US 4011-T15P	D-T08P/T15P	FG-15	HS 1030C
80	US 4011-T15P	D-T08P/T15P	FG-15	-

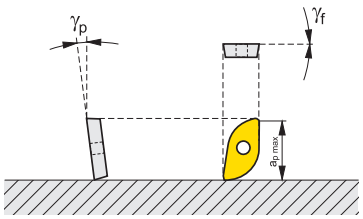
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

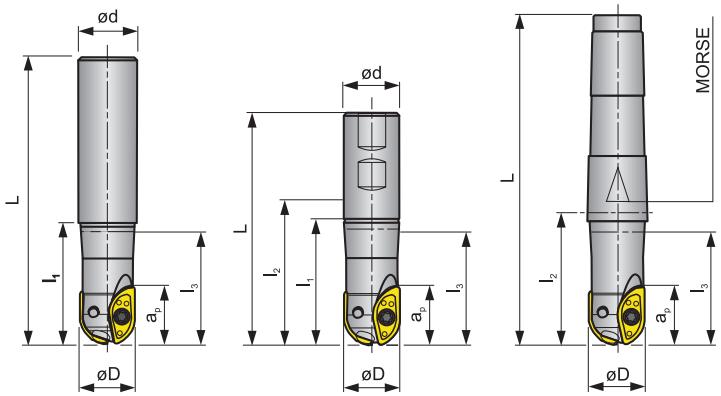
L2-SZP

FRESE PER COPIATURA
COPY MILLING CUTTERS



γ_p	-10°	κ_r	–
γ_f	0°	$a_{p\ max}$	–





Z* - N° denti / Number of teeth

Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions D	L	l_1	l_2	l_3	d	Morse	Z*	Inserti Inserts	a_{pmax}	Refrigerante int. Cooling	[kg]
CILINDRICO / CYLINDRICAL													
10L2R050A16-SZP10	■	10	160	50,0	-	22,3	16	-	2	ZP 10..	8,9		0,21
12L2R045A20-SZP12	■	12	200	44,8	-	22,0	20	-	2	ZP 12..	10,7		0,43
16L2R045A20-SZP16-C	■	16	200	44,5	-	29,4	20	-	2	ZP 16..	14,4	+	0,43
20L2R050A20-SZP20-C	■	20	250	50,0	-	-	20	-	2	ZP 20..	17,9	+	0,85
20L2R055A25-SZP20-C	■	20	200	54,4	-	36,1	25	-	2	ZP 20..	17,9	+	0,65
20L2R055A32-SZP20-C	■	20	250	55,7	-	34,5	32	-	2	ZP 20..	17,9	+	1,40
25L2R060A25-SZP25-C	■	25	250	60,0	-	-	25	-	2	ZP 25..	22,3	+	1,29
25L2R065A32-SZP25-C	■	25	250	64,7	-	43,0	32	-	2	ZP 25..	22,3	+	1,29
32L2R070A32-SZP32-C	■	32	250	70,3	-	-	32	-	2	ZP 32..	28,6	+	1,37
WELDON													
12L2R040B20-SZP12	□	12	91	40	66,5	21,5	20	-	2	ZP 12..	10,7		0,16
12L2R060B20-SZP12	■	12	111	60	86,5	23,8	20	-	2	ZP 12..	10,7		0,19
16L2R040B20-SZP16-C	■	16	91	40	66,5	28,3	20	-	2	ZP 16..	14,4	+	0,16
16L2R060B20-SZP16-C	■	16	111	60	86,5	32,9	20	-	2	ZP 16..	14,4	+	0,20
20L2R050B25-SZP20-C	■	20	107	50	75,5	35,1	25	-	2	ZP 20..	17,9	+	0,29
20L2R070B25-SZP20-C	■	20	127	70	95,5	39,5	25	-	2	ZP 20..	17,9	+	0,35
25L2R060B25-SZP25-C	■	25	117	60	85,5	-	25	-	2	ZP 25..	22,3	+	0,35
25L2R080B25-SZP25-C	■	25	137	80	105,0	-	25	-	2	ZP 25..	22,3	+	0,41
32L2R070B32-SZP32-C	■	32	131	70	95,5	-	32	-	2	ZP 32..	28,6	+	0,62
32L2R100B32-SZP32-C	■	32	161	100	125,5	-	32	-	2	ZP 32..	28,6	+	0,79
40L2R070B32-SZP40-C	■	40	131	70	95,5	-	32	-	2	ZP 40..	35,7	+	0,72
40L2R100B40-SZP40-C	■	40	171	100	131,0	-	40	-	2	ZP 40..	35,7	+	1,33
50L2R100B50-SZP50-C	□	50	181	100	136,5	-	50	-	2	ZP 50..	44,7	+	2,13

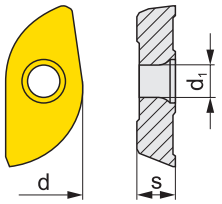
IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

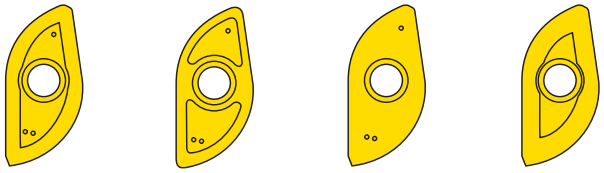
L2-SZP

FRESE PER COPIATURA
COPY MILLING CUTTERS

ISO	Disponibilità / Assortment	Dimensioni / Dimensions										Refrigerante int. Cooling	[kg]
		D	L	l_1	l_2	l_3	d	Morse	Z	Inserti Inserts	a_{pmax}		
MORSE													
10L2R050E02-SZP10	■	10	114	-	50	21,9	-	2	2	ZP 10..	8,9		0,12
12L2R040E02-SZP12	■	12	104	-	40	22,5	-	2	2	ZP 12..	10,7		0,11
12L2R060E02-SZP12	■	12	124	-	60	25,8	-	2	2	ZP 12..	10,7		0,14
12L2R090E02-SZP12	■	12	154	-	90	25,8	-	2	2	ZP 12..	10,7		0,19
16L2R040E02-SZP16	□	16	104	-	40	31,3	-	2	2	ZP 16..	14,4		0,12
16L2R060E02-SZP16	■	16	124	-	60	42,2	-	2	2	ZP 16..	14,4		0,15
16L2R090E02-SZP16	■	16	154	-	90	75,9	-	2	2	ZP 16..	14,4		0,19
20L2R050E03-SZP20	□	20	131	-	50	36,6	-	3	2	ZP 20..	17,9		0,27
20L2R070E03-SZP20	■	20	151	-	70	-	-	3	2	ZP 20..	17,9		0,33
20L2R100E03-SZP20	■	20	181	-	100	77,4	-	3	2	ZP 20..	17,9		0,39
25L2R080E03-SZP25	■	25	161	-	80	-	-	3	2	ZP 25..	22,3		0,39
25L2R110E04-SZP25	■	25	213	-	110	92,7	-	4	2	ZP 25..	22,3		0,76
32L2R100E04-SZP32	■	32	203	-	100	-	-	4	2	ZP 32..	28,6		0,83
32L2R150E04-SZP32	■	32	253	-	150	-	-	4	2	ZP 32..	28,6		1,10
50L2R100E05-SZP50	□	50	230	-	100	-	-	5	2	ZP 50..	44,7		2,00



ZP


ZP-F ZP-FM ZP-M ZP-R

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades				Dimensioni / Dimensions		
	M8310	M8345	8230	8240	d	s	d_1
ZP 20ER-F	■				20,00	3,97	4,0
ZP 50ER-F	□				50,00	7,94	9,6
ZP 10ER-FM	■	■			10,00	1,70	2,2
ZP 12ER-FM	■	■			12,00	2,38	2,9
ZP 16ER-FM	■	■			16,00	3,18	2,9
ZP 20ER-FM	■	□			20,00	3,97	4,0
ZP 25ER-FM	■	□			25,00	4,76	4,7
ZP 32ER-FM	■	□			32,00	6,35	5,9
ZP 12ER-M		■	■	■	12,00	2,38	2,9
ZP 16ER-M		■	■	■	16,00	3,18	2,9
ZP 20ER-M		■	■		20,00	3,97	4,0

IMPERO PRAMET

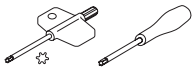
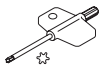
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

L2-SZP

ISO	Qualità / Grades																Dimensioni / Dimensions					
	M8310	M8345	8230	8240													d	s	d_1			
ZP 25ER-M		■	■														25,00	4,76	4,7			
ZP 32ER-M		■	■														32,00	6,35	5,9			
ZP 16ER-R		■															16,00	3,18	2,9			
ZP 20ER-R		■															20,00	3,97	4,0			
ZP 25ER-R		■															25,00	4,76	4,7			
ZP 32ER-R		■	■														32,00	6,35	5,9			
ZP 40ER-R		■															40,00	7,94	7,0			
ZP 50ER-R		□															50,00	7,94	9,6			

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver	Sottoplacchetta Pad	Vite sottoplacchetta Pad screw	Cacciavite Screwdriver
					
SZP10	US 62004-T06P	FLAG T06P	-	-	-
SZP12	US 62506-T08P	FLAG T08P	-	-	-
SZP16	US 62508-T08P	FLAG T08P	-	-	-
SZP20	US 63510-T10P	FLAG T10P	-	-	-
SZP25	US 4011A-T15P	FLAG T15P	-	-	-
SZP32	US 65013-T20	SDR T20	-	-	-
SZP40	US 66015-T25P	SDR T25P	-	-	-
SZP50	US 68020-T30P	SDR T30	SZN 400322	US3508-T15P	FLAG T15P

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

UP! GRADE®



FRESE A SPIANARE
FACE MILLING CUTTERS

FRESE A SPALLAMENTO RETTO
SHOULDER END MILLING CUTTERS

FRESE AD ELICA/A DISCO
HELICAL/DISC MILLING CUTTERS

FRESE PER COPIATURA
COPY MILLING CUTTERS

FRESE PER APPLICAZIONI SPECIALI
CUTTERS FOR SPECIAL APPLICATION

INSERTI PER FRESATURA
INDEXABLE INSERTS

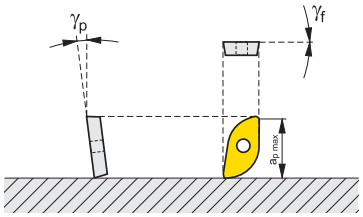
IMPERO
PRAMET

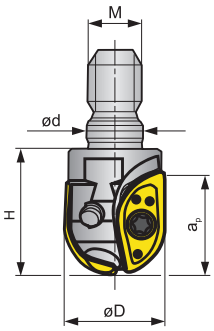
L2-SZP

TESTINE PER SISTEMA MODULARE
COPY EXCHANGABLE HEADS FOR MODULAR SYSTEM



γ_p	-10°	κ_r	–
γ_f	0°	$a_{p\ max}$	$a_{p\ max}$





Z* - N° denti / Number of teeth

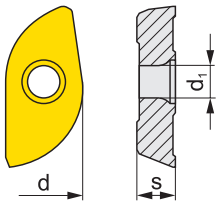
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions									Refrigerante int. Cooling	[kg]
		D	H	d	M	Z*	Inserti Inserts	$a_{p\ max}$				
10L2R025M08-SZP10	□	10	25	8,5	M8	2	ZP 10..	8,9				0,02
12L2R025M08-SZP12	■	12	25	8,8	M8	2	ZP 12..	10,7				0,02
16L2R025M08-SZP16	■	16	25	8,5	M8	2	ZP 16..	14,4				0,02
20L2R030M10-SZP20-C	■	20	30	10,5	M10	2	ZP 20..	17,9			+	0,04
25L2R035M12-SZP25-C	■	25	35	12,5	M12	2	ZP 25..	22,3			+	0,07

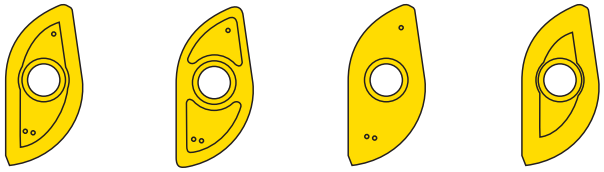
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

L2-SZP

TESTINE PER SISTEMA MODULARE
COPY EXCHANGABLE HEADS FOR MODULAR SYSTEM



ZP



ZP-F ZP-FM ZP-M ZP-R

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions					
	M8310	M8345	8230	8240													d	s	d_1			
ZP 20ER-F	■																20,00	3,97	4,0			
ZP 10ER-FM	■	■															10,00	1,70	2,2			
ZP 12ER-FM	■	■															12,00	2,38	2,9			
ZP 16ER-FM	■	■															16,00	3,18	2,9			
ZP 20ER-FM	■	□															20,00	3,97	4,0			
ZP 25ER-FM	■	□															25,00	4,76	4,7			
ZP 12ER-M		■	■	■													12,00	2,38	2,9			
ZP 16ER-M		■	■	■													16,00	3,18	2,9			
ZP 20ER-M		■	■														20,00	3,97	4,0			
ZP 25ER-M		■	■														25,00	4,76	4,7			
ZP 16ER-R		■															16,00	3,18	2,9			
ZP 20ER-R		■															20,00	3,97	4,0			
ZP 25ER-R		■															25,00	4,76	4,7			

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
SZP10	US 62004-T06P	FLAG T06P
SZP12	US 62506-T08P	FLAG T08P
SZP16	US 62508-T08P	FLAG T08P
SZP20	US 63510-T10P	FLAG T10P
SZP25	US 4011A-T15P	FLAG T15P

IMPERO PRAMET

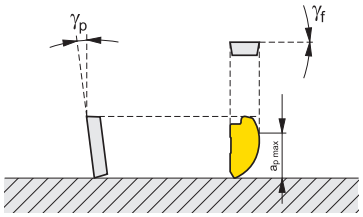
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

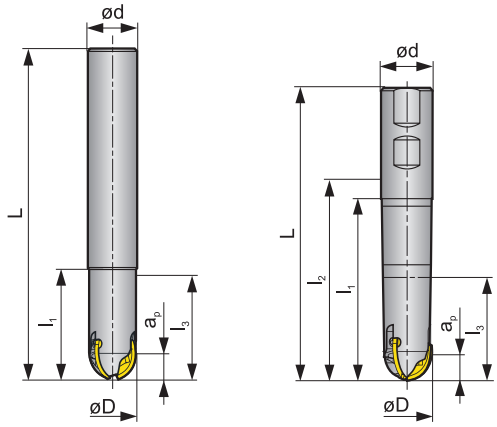
K3-CXP



MULTISIDE XP

γ_p	-5°	κ_r	–
γ_f	0°	$a_{p\ max}$	–





CYLINDRICO
CYLINDRICAL

WELDON

Z* - N° denti / Number of teeth

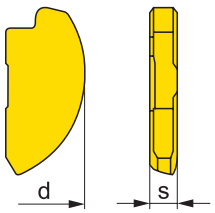
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions									Refrigerante int. Cooling	[kg]
		D	L	l_1	l_2	l_3	d	Z*	Inserti Inserts	a_{pmax}		
CILINDRICO / CYLINDRICAL												
16K3R050A16-CXP16	■	16	200	50	-	-	16	3	XP 16..	8,0		0,29
16K3R050A20-CXP16	■	16	200	50	-	42,2	20	3	XP 16..	8,0		0,43
20K3R050A20-CXP20	■	20	200	50	-	-	20	3	XP 20..	10,0		0,45
20K3R060A25-CXP20	■	20	250	60	-	43,9	25	3	XP 20 ..	10,0		0,85
25K3R060A25-CXP25	■	25	250	60	-	-	25	3	XP 25..	12,5		0,88
32K3R080A32-CXP32	■	32	250	80	-	-	32	3	XP 32..	16,0		1,42
WELDON												
16K3R060B20-CXP16	■	16	111	60	86,5	44,4	20	3	XP 16..	8,0		0,20
20K3R070B25-CXP20	■	20	127	70	95,5	46,3	25	3	XP 20..	10,0		0,36
25K3R080B25-CXP25	■	25	137	80	105	-	25	3	XP 25..	12,5		0,44

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

K3-CXP

FRESE PER COPIATURA
COPY MILLING CUTTERS



XP



XP-FM

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions						
	M8310	M8345	8230														d	s					
XP 16ER-FM	■	■	■														16,00	2,00					
XP 20ER-FM	■	■	■														20,00	2,50					
XP 25ER-FM	■	■	■														25,00	3,17					
XP 32ER-FM	■	■	■														32,00	4,00					

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
CXP16	US 63009-T09P	FLAG T09P
CXP20	US 63513-T15P	FLAG T15P
CXP25	US 64014-T15P	FLAG T15P
CXP32	US 65017-T20P	FLAG T20P

IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

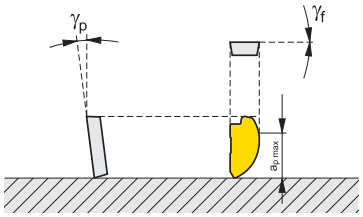
K3-CXP

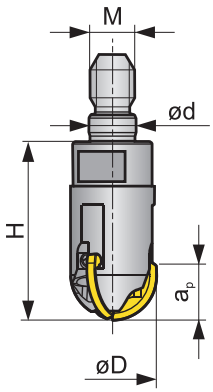
TESTINE PER SISTEMA MODULARE
COPY EXCHANGABLE HEADS FOR MODULAR SYSTEM



MULTISIDE XP

γ_p	-5°	κ_r	–
γ_f	0°	$a_{p\,max}$	–





Z* - N° denti / Number of teeth

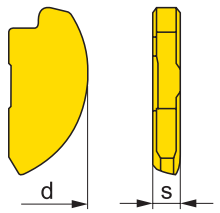
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions									Refrigerante int. Cooling	[kg]
		D	H	d	M	Z*	Inserti Inserts	a_{pmax}				
16K3R035M08-CXP16	■	16	35	8,5	M8	3	XP 16..	8,0				0,04
16K3R035M10-CXP16	■	16	35	10,5	M10	3	XP 16..	8,0				0,05
20K3R040M10-CXP20	■	20	40	10,5	M10	3	XP 20..	10,0				0,07
25K3R045M12-CXP25	■	25	45	12,5	M12	3	XP 25..	12,5				0,11
32K3R055M16-CXP32	■	32	55	17,0	M16	3	XP 32..	16,0				0,24

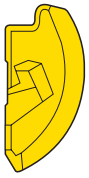
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
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Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

K3-CXP

TESTINE PER SISTEMA MODULARE
COPY EXCHANGABLE HEADS FOR MODULAR SYSTEM



XP



XP-FM

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions						
	M8310	M8345	8230															d	s					
XP 16ER-FM	■	■	■															16,00	2,00					
XP 20ER-FM	■	■	■															20,00	2,50					
XP 25ER-FM	■	■	■															25,00	3,17					
XP 32ER-FM	■	■	■															32,00	4,00					

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
CXP16	US 63009-T09P	FLAG T09P
CXP20	US 63513-T15P	FLAG T15P
CXP25	US 64014-T15P	FLAG T15P
CXP32	US 65017-T20P	FLAG T20P

IMPERO PRAMET

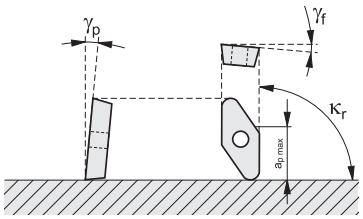
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

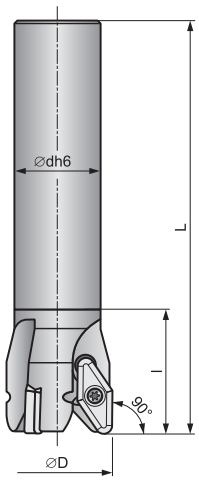
SVC22C

FRESE PER LAVORAZIONE DI ALLUMINIO
CUTTERS FOR MACHINING OF ALUMINIUM



γ_p	+3°	κ_r	90°
γ_f	+4° ÷ +8°	$a_{p\ max}$	16 mm





Z* - N° denti / Number of teeth

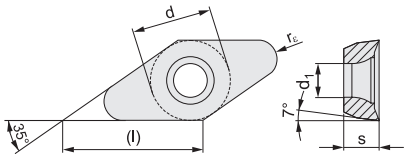
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions D	dh6	L	l	Z							Refrigerante int. Cooling	[kg]
32A2R045A25-SVC22C	●	32	25	120	45	2							+	0,41
40A3R045A32-SVC22C	○	40	32	150	45	3							+	0,84

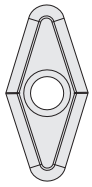
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SVC22C

FRESE PER LAVORAZIONE DI ALLUMINIO
CUTTERS FOR MACHINING OF ALUMINIUM



VCGT



VCGT-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions				
	HF7																	(l)	d	s	d_1	r_ε
VCGT 220530F-FA	●																	22,000	12,700	5,50	5,20	3,0

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Chiave dinamometrica Torque handle
32 ÷ 40	US 4511-T20	D-T20	MR-5,0

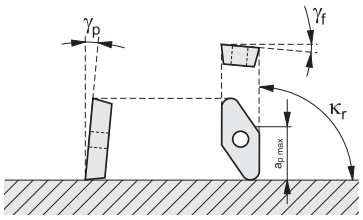
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

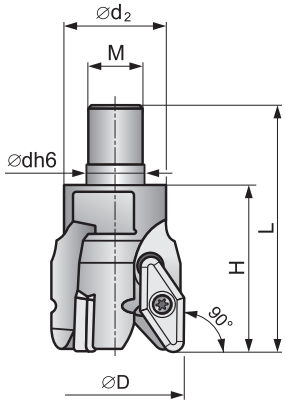
SVC22C

TESTINE MODULARI PER LAVORAZIONE DI ALLUMINIO
EXCHANGABLE HEADS FOR MACHINING ALUMINIUM



γ_p	+3°	κ_r	90°
γ_f	+11° ÷ +13°	$a_{p\,max}$	16 mm





Z* - N° denti / Number of teeth

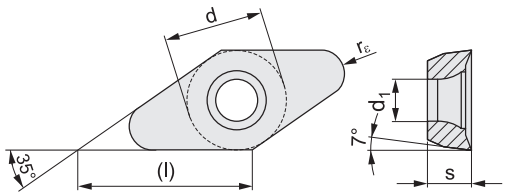
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	dh6	d_2	M	L	H	Z*						
32A2R048M16-SVC22C	●	32	17	29	M16	71	48	2					+	0,20
40A3R048M16-SVC22C	●	40	17	29	M16	71	48	3					+	0,24

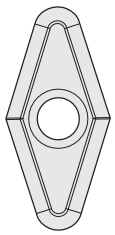
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SVC22C

TESTINE MODULARI PER LAVORAZIONE DI ALLUMINIO
EXCHANGABLE HEADS FOR MACHINING ALUMINIUM



VCGT



VCGT-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions				
	HF7																	(l)	d	s	d_1	r_ε
VCGT 220530F-FA	●																	22,000	12,700	5,50	5,20	3,0

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Chiave dinamometrica Torque handle
			
32 ÷ 40	US 4511-T20	D-T20	MR-5,0

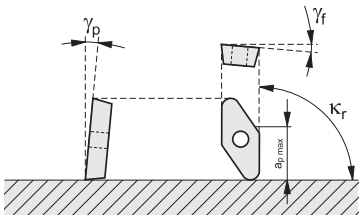
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

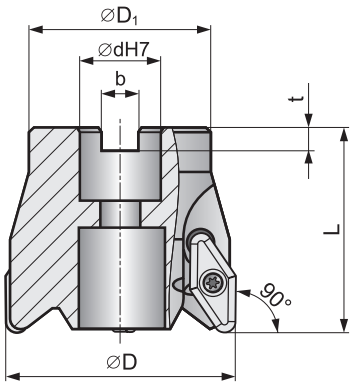
S90VC22C

FRESE A MANICOTTO PER LAVORAZIONE DI ALLUMINIO
SHELL CUTTERS FOR MACHINING ALUMINIUM



γ_p	+3°	κ_r	90°
γ_f	+4° ÷ +8°	$a_{p\,max}$	16 mm





Z* - N° denti / Number of teeth

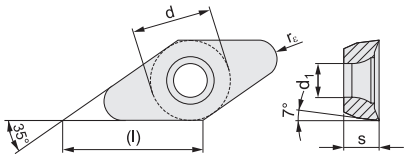
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions										Refrigerante int. Cooling	[kg]
		D	dH7	D_1	L	b	t	Z*					
50A03R-S90VC22C	●	50	22	40	56	10	6,3	3				+	0,37
63A04R-S90VC22C	●	63	22	50	56	10	6,3	4				+	0,65
80A05R-S90VC22C	○	80	27	63	56	12	7,0	5				+	1,10

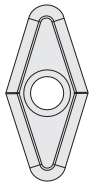
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

S90VC22C

FRESE A MANICOTTO PER LAVORAZIONE DI ALLUMINIO
SHELL CUTTERS FOR MACHINING ALUMINIUM



VCGT



VCGT-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions				
	HF7																	(l)	d	s	d_1	r_ε
VCGT 220530F-FA	●																	22,000	12,700	5,50	5,20	3,0

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Chiave dinamometrica Torque handle	Vite di bloccaggio fresa Screw for taper clamping
50 ÷ 63	US 4511-T20	D-T20	MR-5,0	HS 1030
80	US 4511-T20	D-T20	MR-5,0	-

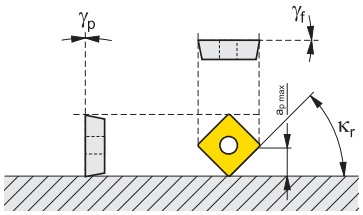
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SSD09

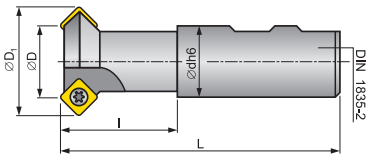
FRESE PER SMUSSI A 45°
SHANK CUTTERS FOR 45° CHAMFERING



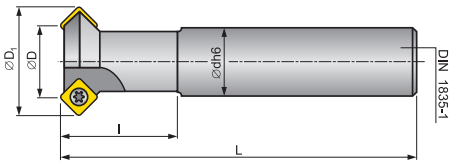
γ_p	0°	κ_r	45°
γ_f	0°	$a_{p\,max}$	4,5 mm



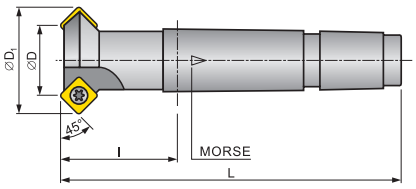
WELDON



CILINDRICO
CYLINDRICAL



MORSE



Z* - N° denti / Number of teeth

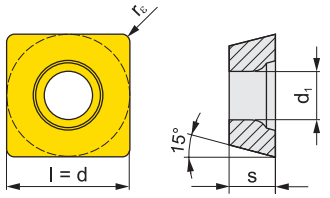
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions D	D_1	L	l	Morse	dh6	Z*					Refrigerante int. Cooling	[kg]
WELDON														
10N1R027B16-SSD09-A	●	10	22	75	27	-	16	1						0,12
16N2R027B16-SSD09-A	●	16	28	75	27	-	16	2						0,20
25N3R042B25-SSD09-A	●	25	37	98	42	-	25	3						0,40
CILINDRICO/CYLINDRICAL														
16N2R027A16-SSD09	●	16	28	200	27	-	16	2						0,40
25N3R042A25-SSD09	●	25	37	200	42	-	25	3						0,70
MORSE														
10N1R030E02-SSD09-A	○	10	22	94	30	2	-	1						0,20
16N2R030E02-SSD09-A	●	16	28	94	30	2	-	2						0,25
25N3R043E03-SSD09-A	●	25	37	124	43	3	-	3						0,50

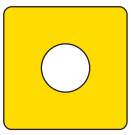
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SSD09

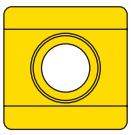
FRESE PER SMUSSI A 45°
SHANK CUTTERS FOR 45° CHAMFERING



SDEW / SDEX



SDEW EN/SN



SDEX-74

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades			Dimensioni / Dimensions				
	8215	8230	8240	l	d	s	d_1	r_ε
SDEW 090308EN		●	●	9,525	9,525	3,18	4,40	0,8
SDEW 090308SN	●	●	●	9,525	9,525	3,18	4,40	0,8
SDEX 090308FN-74		●		9,525	9,525	3,18	4,40	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
10 ÷ 16	US 3507-T15	SDR T15
25	US 3509-T15	SDR T15

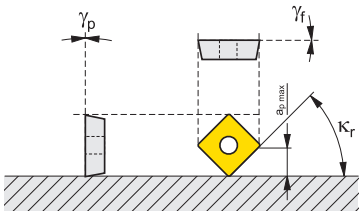
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

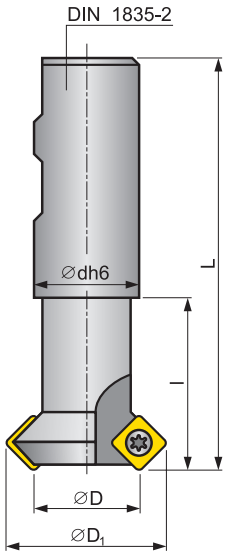
N-SSO09

FRESE PER SMUSSI A 45°
SHANK CUTTERS FOR 45° CHAMFERING



γ_p	0°	κ_r	45°
γ_f	0°	$a_{p\ max}$	4,5 mm





Z* - N° denti / Number of teeth

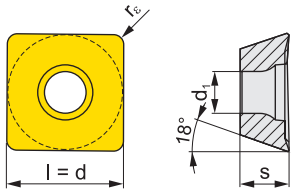
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	D_1	L	Z*	l	dh6							
8N1R027B16-SSO09-C	●	8	20,5	90	1	27	16						+	0,12
16N2R027B16-SSO09-C	●	16	28,8	110	2	27	16						+	0,15
25N3R042B25-SSO09-C	●	25	37,8	125	3	42	25						+	0,40

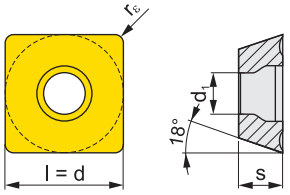
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

N-SSO09

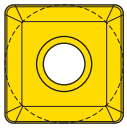
FRESE PER SMUSSI A 45°
SHANK CUTTERS FOR 45° CHAMFERING



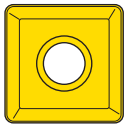
SOMT-P



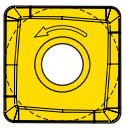
SOMT



SOMT-P



SOMT-MI



SOMT-M

INSERTI / INDEXABLE CUTTING INSERTS

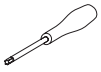
ISO	Qualità / Grades										Dimensioni / Dimensions				
	M5315	M9315	M9325	M9340	M8310	8215	8230	8240	7010	7025	(l)	d	s	d_1	r_ε
SOMT 09T304-P			●				●	●	○	○	9,550	9,550	3,97	3,50	0,4
SOMT 09T304-MI		●		●	■	●	●	●	○		9,550	9,550	3,97	3,50	0,4
SOMT 09T308-M	●	●				●	●	●			9,550	9,550	3,97	3,50	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
8 ÷ 25	US 3006-T09P	SDR T09P





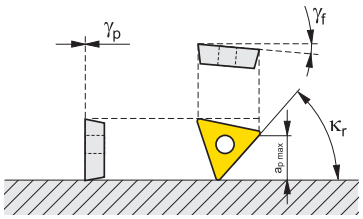
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

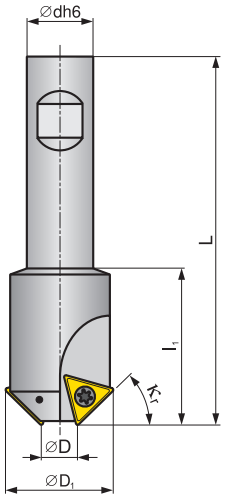
2516

FRESE PER SMUSSI A 45°
SHANK CUTTERS FOR 45° CHAMFERING



γ_p	0°	κ_r	45°
γ_f	-9°	$a_{p\,max}$	8,5 mm





Z* - N° denti / Number of teeth

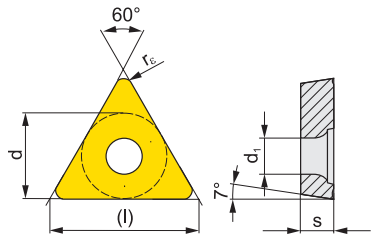
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	D_1	L	Z	l	dh6							
2516-45-11	●	11	31	100	2	30	16						+	0,25
2516-45-19	●	19	39	100	2	30	20						+	0,35

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

2516

FRESE PER SMUSSI A 45°
SHANK CUTTERS FOR 45° CHAMFERING



TCMT



TCMT-FM

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions				
	T8315	T8330																l	d	d_1	s	r_ε
TCMT 16T308E-FM	●	●																16,50	9,53	4,40	3,97	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
2516-45-11	US 4011-T15P	SDR T15P
2516-45-19	US 4011-T15P	SDR T15P

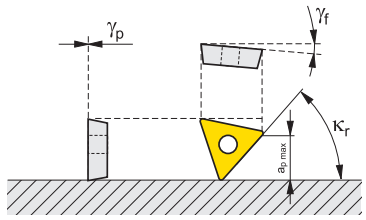
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

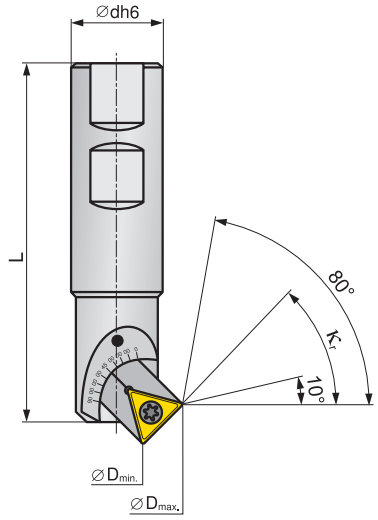
2636

FRESE PER SMUSSI - REGOLABILI
ADJUSTABLE SHANK CUTTERS FOR EDGE CHAMFERING



γ_p	0°	κ_r	10° ÷ 80°
γ_f	-8°	$a_{p\,max}$	–





Z* - N° denti / Number of teeth

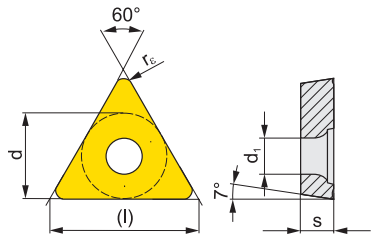
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions dh6	L	κ_r	D_{min}	D_{max}	Refrigerante int. Cooling	[kg]
2636-05-25	●	25	100	10°	5,0	31,0		0,30
				15°	5,5	31,0		0,30
				30°	7,0	29,5		0,30
				45°	11,0	29,5		0,30
				60°	16,0	28,5		0,30
				75°	21,0	26,5		0,30
				80°	23,0	26,0		0,30

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

2636

FRESE PER SMUSSI - REGOLABILI
ADJUSTABLE SHANK CUTTERS FOR EDGE CHAMFERING



TCMT



TCMT-FM

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions				
	T8315	T8330																l	d	d_1	s	r_ε
TCMT 16T304E-FM	●	●																16,50	9,53	4,40	3,97	0,4
TCMT 16T308E-FM	●	●																16,50	9,53	4,40	3,97	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Codice fresa Marking of cutter	Cartuccia Cassette	Vite di bloccaggio* Clamping screw*	Vite Screw	Cacciavite Screwdriver
2636-05-25	CA 2669	US 4011-T15P	USI 0614	SDR T15P

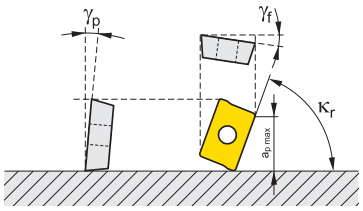
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

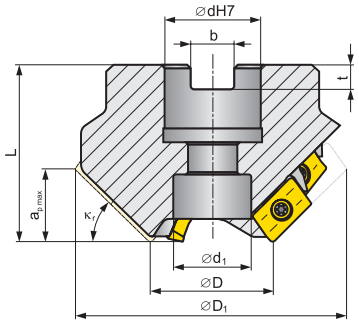
SxxXP

FRESE PER SMUSSI
MILLING CUTTERS FOR CHAMFERING



γ_p	-1° ÷ +5°	κ_r	15° ÷ 75°
γ_f	-6° ÷ -4°	$a_{p\,max}$	–





Z* - N° denti / Number of teeth
ZN* - N° inserti / Number of inserts

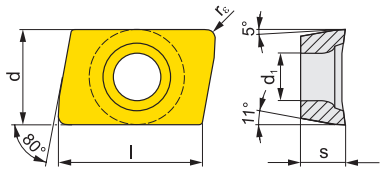
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions											Refrigerante int. Cooling	[kg]
		D	k_r	$a_{p\,max}$	dH7	d_1	L	D_1	b	t	Z*	ZN*		
35T03R-S15XP1607-C	○	35	15	7	27	22	50	88	12,4	7	3	6	+	1,18
35T03R-S25XP1612-C	○	35	25	12	27	22	50	84	12,4	7	3	6	+	1,05
35T03R-S30XP1614-C	○	35	30	14	27	22	50	82	12,4	7	3	6	+	0,97
35T03R-S35XP1616-C	○	35	35	16	27	22	50	81	12,4	7	3	6	+	0,93
35T03R-S40XP1618-C	●	35	40	18	27	22	50	79	12,4	7	3	6	+	0,86
35T03R-S45XP1620-C	●	35	45	20	27	22	50	74	12,4	7	3	6	+	0,77
35T03R-S50XP1622-C	●	35	50	22	27	22	50	71	12,4	7	3	6	+	0,69
35T03R-S55XP1623-C	○	35	55	23	27	22	50	66	12,4	7	3	6	+	0,61
35T03R-S60XP1625-C	●	35	60	25	27	22	50	64	12,4	7	3	6	+	0,53
45T04R-S25XP1612-C	○	45	25	12	27	22	50	94	12,4	7	4	8	+	1,14
45T04R-S30XP1614-C	●	45	30	14	27	22	50	92	12,4	7	4	8	+	1,08
45T04R-S35XP1616-C	○	45	35	16	27	22	50	92	12,4	7	4	8	+	1,12
45T04R-S40XP1618-C	●	45	40	18	27	22	50	89	12,4	7	4	8	+	0,98
45T04R-S45XP1620-C	●	45	45	20	27	22	50	85	12,4	7	4	8	+	0,90
45T04R-S50XP1622-C	●	45	50	22	27	22	50	82	12,4	7	4	8	+	0,83
45T04R-S55XP1623-C	○	45	55	23	27	22	50	76	12,4	7	4	8	+	0,75
45T04R-S60XP1625-C	●	45	60	25	27	22	50	73	12,4	7	4	8	+	0,68
45T03R-S75XP1628-C	●	45	75	28	27	22	50	60	12,4	7	3	6	+	0,51

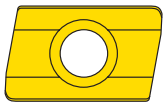
IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

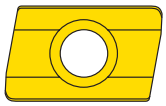
SxxXP



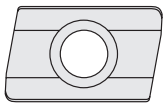
XPHT



XPHT 16-E



XPHT 16-S



XPHT 16-FA

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																Dimensioni / Dimensions				
	M9325	M9340	8215	8230	8240	HF7											l	d	d_1	s	r_ε
XPHT 160412E			●	●													15,875	9,525	4,40	4,76	1,2
XPHT 160412S	●	●	●	●	●												15,875	9,525	4,40	4,76	1,2
XPHT 160408F-FA						●											15,875	9,525	4,40	4,76	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Shank	Impugnatura Handle	Vite di bloccaggio fresa Screw for taper clamping
35 ÷ 45	US 3509-T15	D-T07P/T15	FG-15	HS 1230C

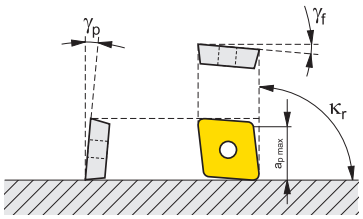
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

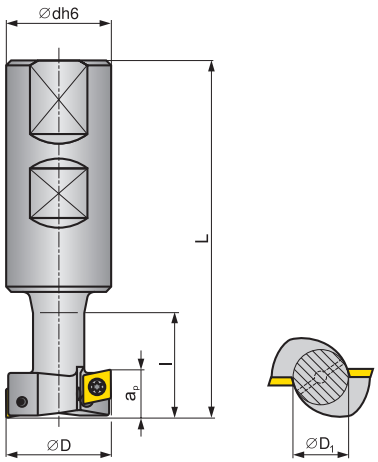
SCC

FRESE PER SCANALATURA A T
MILLING CUTTERS FOR T-SLOTS



γ_p	+2°	κ_r	90°
γ_f	-4°	$a_{p\,max}$	a_p





Z* - N° denti / Number of teeth
K* - N° di denti effettivo / Effective number of teeth

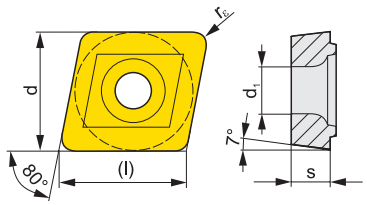
Dimensioni [mm]. / Dimensions [mm].

ISO	Disponibilità / Assortment	Dimensioni / Dimensions									Refrigerante int. Cooling	[kg]
		D	L	l	dh6	D_1	a_p	Z*	K*	Inserti Inserts		
25F1R030B25-SCC06-C	●	25	86	25	25	12	11	2	1	CCMX 0603	+	0,20
32F1R038B32-SCC08-C	●	32	98	33	32	16	14	2	1	CCMX 08T3	+	0,40
40F2R046B32-SCC09-C	●	40	105	41	32	20	18	4	2	CCMX 09T3	+	0,50

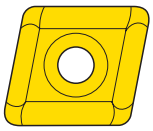
● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SCC

FRESE PER SCANALATURA A T
MILLING CUTTERS FOR T-SLOTS



CCMX



CCMX-TS1

INSERTI / INDEXABLE CUTTING INSERTS

ISO	Qualità / Grades																	Dimensioni / Dimensions				
	8230	8240																l	d	s	d_1	r_ε
CCMX 060304S-TS1	○	●																6,400	6,350	3,50	2,80	0,4
CCMX 08T308S-TS1	●	○																8,100	8,030	4,40	3,50	0,8
CCMX 09T308S-TS1	●	○																9,700	9,525	3,97	3,50	0,8

RICAMBI / SPARE PARTS

*) Per coppia di serraggio vedere pagina / For screw torques see pages: 318 - 321.

Ø Fresa Ø Cutter	Vite di bloccaggio* Clamping screw*	Cacciavite Screwdriver
25	US 2506-T07P	SDR T07P
32	US 3007-T09P	SDR T09P
40	US 3007-T09P	SDR T09P

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

CODIFICA ISO INSERTI PER FRESATURA
ISO CODE DESIGNATION - INDEXABLE CUTTING INSERTS FOR MILLING

1
Forma dell'inserto
Insert shape

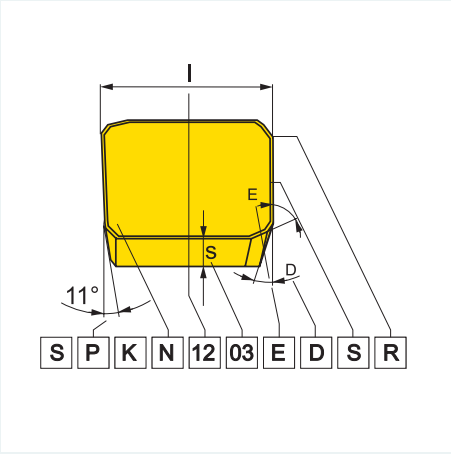
H	O	P	R
S	T	C 80°	D 55°
E 75°	M 86°	V 35°	W 80°
L	A 85°	B 82°	K 55°

2
Angolo di spoglia
Clearance angle

A 3°	B 5°
C 7°	D 15°
E 20°	F 25°
G 30°	N 0°
P 11°	O Speciale / Special

4
Tipo
Insert type

N	R
F	A
M	G
W	T
Q	X Speciale / Special



ISO

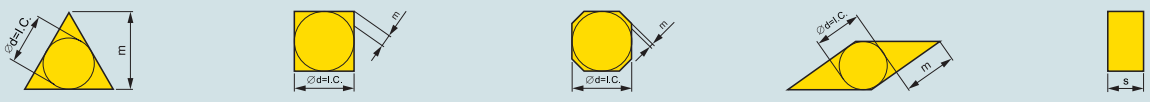
1	2	3	4
S	P	G	N
S	P	K	N

ANSI

1	2	3	4
S	P	G	
S	P	K	N

3
Tolleranza
Tolerances

Classe di tolleranza / Symbol	Tolleranza / Tolerances [mm]			Tolleranza / Tolerances ["]		
	m (±)	s (±)	d = I.C. (±)	m (±)	s (±)	d = I.C. (±)
A	0,005	0,025	0,025	0,0002	0,001	0,0010
F	0,005	0,025	0,013	0,0002	0,001	0,0005
C	0,013	0,025	0,025	0,0005	0,001	0,0010
H	0,013	0,025	0,013	0,0005	0,001	0,0005
E	0,025	0,025	0,025	0,0010	0,001	0,0010
G	0,025	0,130	0,025	0,0010	0,005	0,0010
J	0,005	0,025	0,05 ÷ 0,13	0,0002	0,001	0,002 ÷ 0,005
K	0,013	0,025	0,05 ÷ 0,13	0,0005	0,001	0,002 ÷ 0,005
L	0,025	0,025	0,05 ÷ 0,13	0,0010	0,001	0,002 ÷ 0,005
M	0,08 ÷ 0,18	0,130	0,05 ÷ 0,13	0,003 ÷ 0,007	0,005	0,002 ÷ 0,005
N	0,08 ÷ 0,18	0,025	0,05 ÷ 0,13	0,003 ÷ 0,007	0,001	0,002 ÷ 0,005
U	0,05 ÷ 0,38	0,130	0,05 ÷ 0,13	0,005 ÷ 0,015	0,005	0,003 ÷ 0,010



CODIFICA ISO INSERTI PER FRESATURA
ISO CODE DESIGNATION - INDEXABLE CUTTING INSERTS FOR MILLING

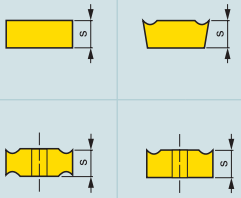
5

Lunghezza tagliente
Cutting edge length

d = I.C.		R	S	T	C	D	V	W
mm	["]							
3,97	5/32"			06				
5,00	-	05						
5,56	7/32"			09				03
6,00	-	06						
6,35	1/4"			11	06	07		04
8,00	-	08						
9,525	3/8"	09	09	16	09	11	16	06
10,0	-	10						
12,0	-	12						
12,7	1/2"	12	12	22	12	15		08
15,875	5/8"	15	15	27	16			
16,0	-	16						
19,05	3/4"	19	19	33	19			
20,0	-	20						
25,0	-	25						
25,4	1"	25	25		25			
31,75	1 1/4"	31						
32,0	-	32						

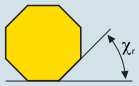
6

Spessore
Thickness



Symbol	s	
	[mm]	["]
01	1,59	1/16"
T1	1,98	5,64"
02	2,38	3/32"
03	3,18	1/8"
T3	3,97	5,32"
04	4,76	3/16"
05	5,56	7/32"
06	6,35	1/4"
07	7,94	5/16"
09	9,52	3/8"

7

Angolo di attacco Cutting edge angles		Angolo di spoglia Clearance angle	
			
	χ_r		α'_n
A	45°	A	3°
D	60°	B	5°
E	75°	C	7°
F	85°	D	15°
P	90°	E	20°
Z	Spec./Spec.	F	25°
		G	30°
		N	0°
		P	11°
		Z	Spec./Spec.

ZZ - Speciale / Special

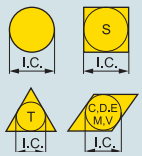
5	6	7	8	9
12	03	08		
12	03	ED	S	R

5a	6a	7a	8	9
4	2	2		
4	2	ED	S	R

ANSI

5a

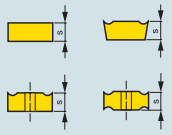
Cerchio inscritto
Inscribed circle



Valore Symbol	d = I.C.	
	[mm]	["]
1	3,175	1/8"
(1.2)	3,969	5/32"
(1.5)	4,763	3/16"
(1.8)	5,556	7/32"
2	6,350	1/4"
(2.5)	7,938	5/16"
3	9,525	3/8"
4	12,700	1/2"
5	15,875	5/8"
6	19,050	3/4"
7	22,225	7/8"
8	25,400	1"
10	31,750	5/8"

6a

Spessore
Thickness



Valore Symbol	s	
	[mm]	["]
1	1,588	1/16"
(1.2)	1,984	5/64"
(1.5)	2,381	3/32"
(1.8)	3,175	1/8"
2	3,969	5/32"
(2.5)	4,763	3/16"
3	5,556	7/32"
4	6,350	1/4"
5	7,938	5/16"
6	9,525	3/8"
7	11,113	7/16"
8	12,700	1/2"
9	14,288	9/16"
10	15,875	5/8"

7a

Raggio di punta
Nose radius



Valore Symbol	r_ε	
	[mm]	["]
0	0,050	1/512"
(0.2)	0,099	1/256"
(0.5)	0,198	1/128"
1	0,397	1/64"
2	0,794	1/32"
3	1,191	3/64"
4	1,588	1/16"
5	1,984	5/64"
6	2,381	3/32"
7	2,778	7/64"
8	3,175	1/8"
10	3,969	5/32"
12	4,763	3/16"
14	5,556	7/32"
16	6,350	1/4"
x	ostat.	

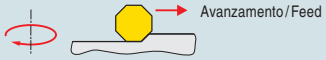
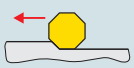
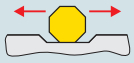
8

Finitura del tagliente / Cutting edge design

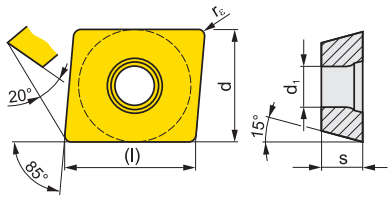
F	Tagliente vivo Sharp edges	E	Tagliente arrotondato Rounded edges
T	Tagliente con smusso di rinforzo Edges with facet	S	Tagliente arrotondato con smusso di rinforzo Rounded edges with facet
K	Tagliente con doppio smusso di rinforzo Edges with double facet	P	Tagliente arrotondato con doppio smusso di rinforzo Rounded edges with double facet

9

Senzo di avanzamento / Feed direction

R	 Avanzamento / Feed
L	Avanzamento / Feed 
N	Avanzamento / Feed  Avanzamento / Feed

ADEW 12

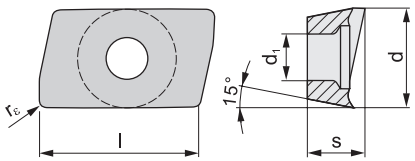


Dimensioni Dimensions	l	d	d_1	s		
1203	12,800	9,525	4,40	3,18		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**ADEW 120308SR**	●																0,8	0,20	0,30	1,0	10,0

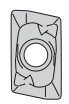
ADEX-FA



Dimensioni Dimensions	l	d	d_1	s		
11T3	9,700	6,350	2,90	3,50		
1606	16,000	9,950	4,50	6,25		

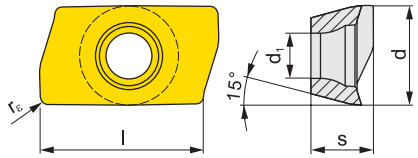
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 44, 46, 48, 50, 52, 54, 90, 92

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		HF7																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**ADEX 11T304FR-FA**	●																0,4	0,03	0,30	0,5	9,0
	ADEX 11T308FR-FA	●																0,8	0,03	0,30	1,0	9,0
	ADEX 11T316FR-FA	●																1,6	0,03	0,30	1,6	9,0
	ADEX 160608FR-FA	●																0,8	0,05	0,30	1,0	13,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

ADEX 16-FM



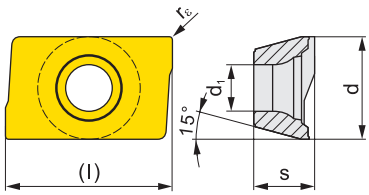
Dimensioni Dimensions	l	d	d_1	s		
1606	16,000	9,950	4,50	6,25		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 50, 52, 54

Geometria Geometry	ISO	Qualità / Grade					Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**ADEX 160608SR-FM**	●	●	●	●	●	0,8	0,10	0,25	1,0	13,0

ADKT 15



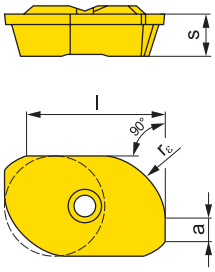
Dimensioni Dimensions	l	d	d_1	s		
1505	15,550	9,525	4,40	5,60		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade				Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9315	M9325	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**ADKT 1505PDER-M**	●	●	●	●	0,8	0,15	0,30	1,0	13,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

ADKX 15



Dimensioni Dimensions	l	d	s	a		
15T304ER-F	12,200	9,525	3,97	2,60		
15T308ER-F	12,200	9,525	3,97	2,20		
15T330ER-F	12,400	9,525	3,97	2,55		
15T340ER-F	12,500	9,525	3,97	2,55		
15T360ER-F	12,600	9,525	3,97	2,00		

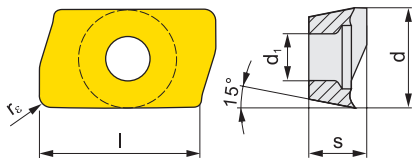
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 56, 58, 60

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8345	8230	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**ADKX 15T304ER-F**	■	■	0,4	0,05	0,09	0,3	10,0
	ADKX 15T308ER-F	■	■	0,8	0,05	0,12	0,3	10,0
	**ADKX 15T330ER-F**	■	■	3,0	0,05	0,15	0,3	10,0
	ADKX 15T340ER-F	■	■	4,0	0,05	0,19	0,3	10,0
	ADKX 15T360ER-F	■	■	6,0	0,05	0,26	0,3	10,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

ADMX 11



Dimensioni Dimensions	l	d	d_1	s		
11T3	11,000	6,530	2,90	3,97		

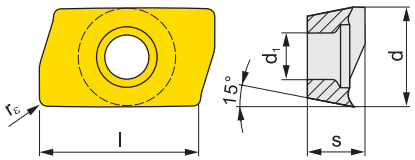
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 44, 46, 48, 90, 92

Geometria Geometry	ISO	Qualità / Grade							Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	M9315	M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**ADMX 11T304SR-F**				●	●	●	●	0,4	0,07	0,12	0,5	9,0
	ADMX 11T308SR-F				●	●	●	●	0,8	0,07	0,12	1,0	9,0
	**ADMX 11T304SR-M**			●	●	●	●	●	0,4	0,10	0,18	0,5	9,0
	ADMX 11T308SR-M	●	●	●	●	●	●	●	0,8	0,10	0,18	1,0	9,0
	ADMX 11T316SR-M					●	●	●	1,6	0,10	0,22	1,8	9,0
	**ADMX 11T308PR-R**	●	●	●		●	●	●	0,8	0,15	0,25	1,0	9,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

ADMX 16



Dimensioni Dimensions	l	d	d_1	s		
1606	16,000	9,950	4,5	6,25		

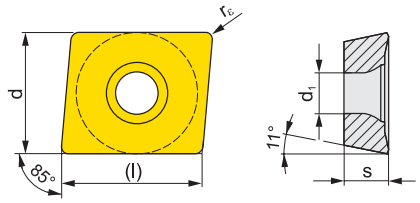
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 50, 52, 54

Geometria Geometry	ISO	Qualità / Grade							Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	M9315	M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**ADMX 160608SR-F**				●	●	●	●	0,8	0,07	0,15	1,0	13,0
	**ADMX 160608SR-M**	●	●	●	●	●	●	●	0,8	0,10	0,25	1,0	13,0
	ADMX 160616SR-M			●		●	●	●	1,6	0,10	0,30	1,8	13,0
	ADMX 160632SR-M			●		○	●	●	3,2	0,10	0,30	1,0	13,0
	**ADMX 160608PR-R**	●	●	●		●	●	●	0,8	0,17	0,35	1,0	13,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

APET 15



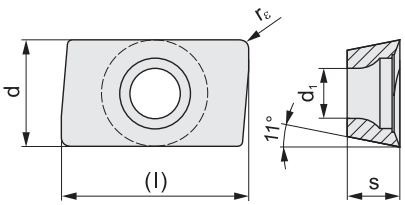
Dimensioni Dimensions	l	d	d_1	s		
1504	15,900	12,700	5,50	4,76		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 100, 102

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**APET 150412EN**	●																1,2	0,10	0,35	1,5	12,0
	APET 150412SN	●	●															1,2	0,20	0,35	1,5	12,0

APET 16-FA



Dimensioni Dimensions	l	d	d_1	s		
1604	17,000	9,600	4,50	4,76		

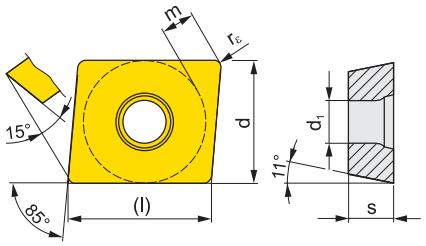
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 66, 68

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		HF7																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**APET 160408FR-FA**	●																0,8	0,05	0,40	0,8	15,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

APEW 15



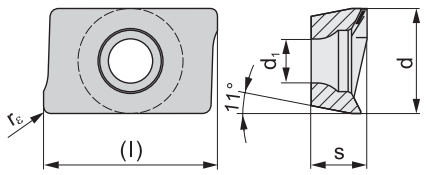
Dimensioni Dimensions	l	d	d_1	s		
1504	15,900	12,700	5,50	4,76		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 100, 102

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	APEW 150412ER	●	○															1,2	0,10	0,30	1,2	12,0
	APEW 150412SR	●	○															1,2	0,20	0,40	1,2	12,0

APKT 10-FA



Dimensioni Dimensions	l	d	d_1	s		
1003	11,000	6,700	2,88	3,50		

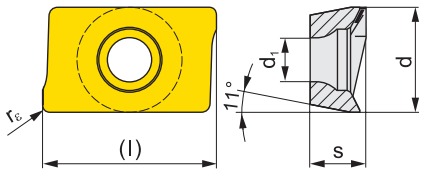
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 62, 64

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		HF7																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	APKT 1003PDFR-FA	●																0,5	0,05	0,30	0,8	9,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

APKT 10-M



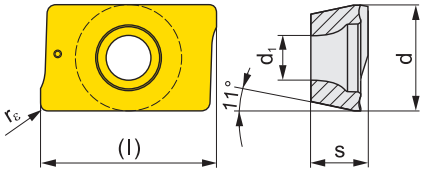
Dimensioni Dimensions	l	d	d_1	s		
1003	11,000	6,700	2,88	3,50		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 62, 64

Geometria Geometry	ISO	Qualità / Grade						Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9315	M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**APKT 1003PDER-M**	●	●	●	●	●	●	0,5	0,10	0,25	1,0	9,0

APKT 16



Dimensioni Dimensions	l	d	d_1	s		
1604	17,000	9,440	4,60	5,67		

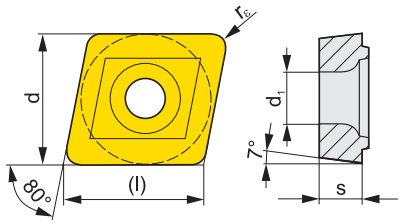
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 66, 68

Geometria Geometry	ISO	Qualità / Grade							Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	M9315	M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**APKT 1604PDR-GM**		●	●	●		●	●	0,8	0,15	0,23	1,0	13,0
	APKT 1604PDR-HM	●	●	●		●	●	●	0,8	0,20	0,35	1,0	13,0
	**APKT 160404-HM**							●	0,4	0,20	0,35	0,5	13,0
	APKT 160416-HM							●	1,6	0,20	0,35	2,0	13,0
	APKT 160431-HM							●	3,1	0,20	0,35	3,5	13,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

CCMX-TS1



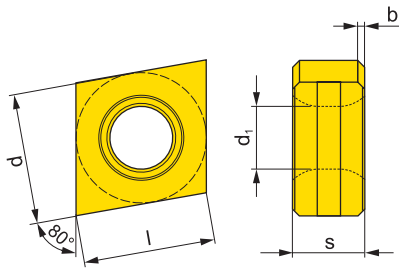
Dimensioni Dimensions	l	d	d_1	s		
0603	6,400	6,350	2,80	3,50		
08T3	8,100	8,030	3,50	4,40		
09T3	9,700	9,525	3,50	3,97		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 160

Geometria Geometry	ISO	Qualità / Grade 8230	8240	Raggio Radius r_ε	Avanzamento al dente Feed per tooth f_{min}	f_{max}	Profondità di taglio Cutting depth $a_{p\,min}$	$a_{p\,max}$
	CCMX 060304S-TS1	○	●	0,4	0,08	0,14	6,0	6,0
	CCMX 08T308S-TS1	●	○	0,8	0,10	0,16	8,0	8,0
	CCMX 09T308S-TS1	●	○	0,8	0,10	0,18	9,0	9,0

CNHQ 10



Dimensioni Dimensions	l	d	d_1	s	b	
1005	10,000	10,000	4,70	5,40	0,5 x 45°	

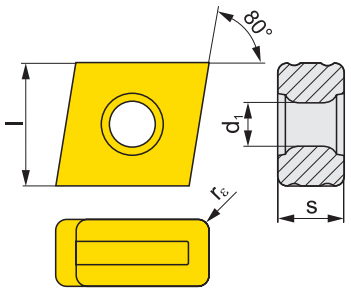
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 112, 114

Geometria Geometry	ISO	Qualità / Grade 8230	8240	Raggio Radius r_ε	Avanzamento al dente Feed per tooth f_{min}	f_{max}	Profondità di taglio Cutting depth $a_{p\,min}$	$a_{p\,max}$
	CNHQ 1005AZTN	●	●		0,10	0,50	-	-

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

CNM



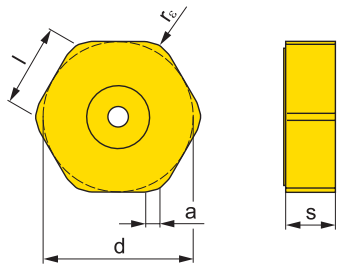
Dimensioni Dimensions	l	d	s			
563	15,000	5,500	8,00			

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade			Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**CNM 563**	●	●	●	1,2	0,20	0,40	2,0	14,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

HNEF 09



Dimensioni Dimensions	l	d	s	a		
090508EN-M	9,400	16,200	5,64	-		
0905DNFN-F	9,400	16,200	5,64	1,60		
0905ZZL-W	9,380	16,260	5,64	5,00		
0905ZZR-W	9,380	16,260	5,64	5,00		

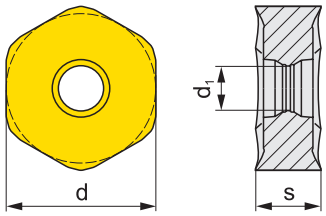
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 34

Geometria Geometry	ISO	Qualità / Grade				Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	M9325	M8310	8215	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**HNEF 0905DNFN-F**	■	□	■	■		0,07	0,20	0,3	3,0
	**HNEF 090508EN-M**	■	□		■	0,8	0,17	0,30	1,0	4,0
	**HNEF 0905ZZL-W**	□			□		0,07	0,20	0,3	3,0
	HNEF 0905ZZR-W	■	□	■	■		0,07	0,20	0,3	3,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

HNGX 06



Dimensioni Dimensions	d	s	d_1			
0604	10,500	5,26	3,70			

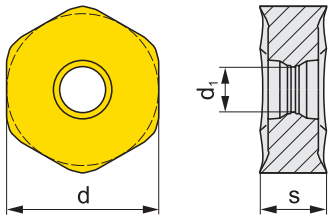
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 14, 16, 18

Geometria Geometry	ISO	Qualità / Grade							Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	M9315	M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**HNGX 0604ANSN-F**				●	●	●	●		0,08	0,17	0,3	3,0
	**HNGX 0604ANSN-M**	●	●	●	●	●	●	●		0,13	0,25	0,6	3,0
	**HNGX 0604ANSN-R**	●	●	●		●	●	●		0,18	0,30	1,0	3,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

HNGX 09



Dimensioni Dimensions	d	s	d_1			
0906	16,500	6,35	4,90			

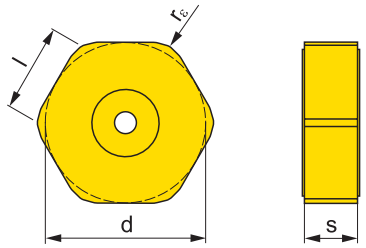
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 20

Geometria Geometry	ISO	Qualità / Grade							Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	M9315	M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**HNGX 0906ANEN-FF**				●	●	●			0,05	0,20	0,5	5,0
	**HNGX 0906ANSN-F**				●	●	●	●		0,10	0,20	0,5	5,0
	**HNGX 0906ANSN-M**	●	●	●	●	●	●	●		0,17	0,35	0,8	5,0
	**HNGX 0906ANSN-R**	●	●	●		●	●	●		0,30	0,50	1,0	5,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

HNMF 09



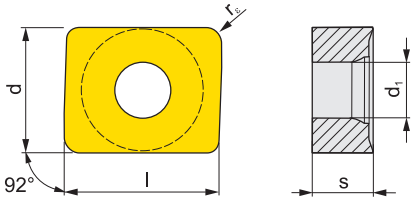
Dimensioni Dimensions	l	d	s			
0905	9,400	16,200	5,64			

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 34

Geometria Geometry	ISO	Qualità / Grade			Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	M9325	8215	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**HNMF 090516SN-R**	■	■	■	1,6	0,22	0,50	1,5	6,0

LNET 16-R



Dimensioni Dimensions	l	d	s	d_1		
1606	16,400	13,200	6,38	5,90		

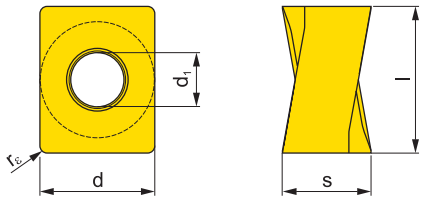
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 98

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**LNET 160616SR-R**	●	●	1,6	0,15	0,40	-	-

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

LNGU 16-M



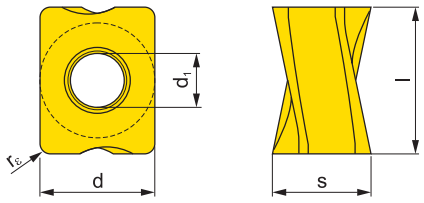
Dimensioni Dimensions	l	d	s	d_1		
1607	16,600	13,200	10,00	5,70		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 76

Geometria Geometry	ISO	Qualità / Grade					Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9315	M9325	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**LNGU 160708SR-M**	●	●	●	●	●	0,8	0,10	0,25	1,0	13,0

LNGX 12-M



Dimensioni Dimensions	l	d	s	d_1		
1205	12,000	9,500	7,10	4,50		

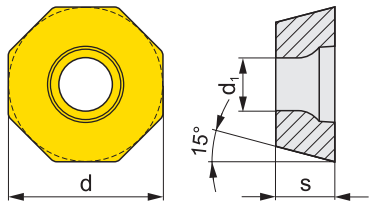
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 70, 72, 74

Geometria Geometry	ISO	Qualità / Grade						Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9315	M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**LNGX 120508ER-M**	●	●	●	●	●	●	0,8	0,05	0,15	1,0	9,0

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

ODEW 06



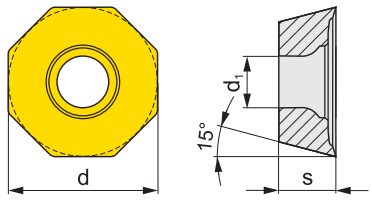
Dimensioni Dimensions	d	s	d_1			
0605	15,875	5,56	5,50			

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 24

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	ODEW 0605ZZN	●																0,15	0,45	1,0	8,6

ODMT



Dimensioni Dimensions	d	s	d_1			
0504	12,700	4,76	4,40			
0605	15,875	5,56	5,50			

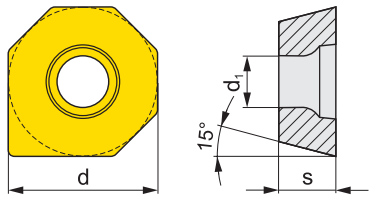
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 22, 24

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	M9315	M9325	8230	8240											r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	ODMT 0504ZZN	●	●	●	●	●												0,12	0,40	1,0	7,3
	ODMT 0605ZZN	●	●	●	●	●												0,15	0,45	1,0	8,6

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

ODMX 06



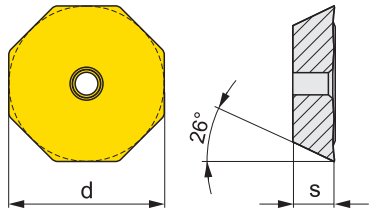
Dimensioni Dimensions	d	s	d_1
0605	15,875	5,56	5,50

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 24

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	ODMX 0605ZZ	○																	0,15	0,45	1,0	8,6

OFKR 07-M



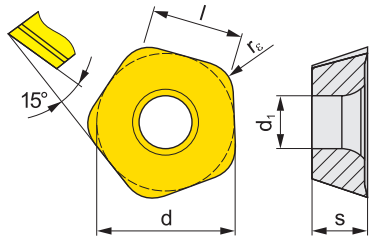
Dimensioni Dimensions	d	s
0704	17,845	4,56

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9340	8230	8240														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	OFKR 0704SN-M	●	●	●															0,10	0,30	0,5	12,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

PDKT 09-FM



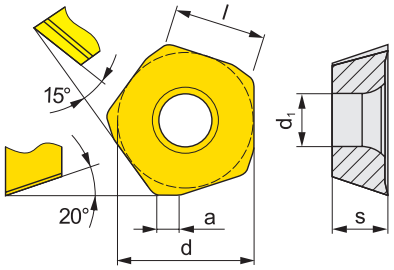
Dimensioni Dimensions	l	d	s	d_1		
0905	9,000	13,500	5,47	5,50		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 124, 126

Geometria Geometry	ISO	Qualità / Grade			Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8345	8215	8230	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**PDKT 090530ER-FM**	■	■	■	3,0	0,50	2,50	0,3	2,0

PDKX 09-FM



Dimensioni Dimensions	l	d	s	d_1	a	
0905	9,000	13,500	5,47	5,50	2,00	

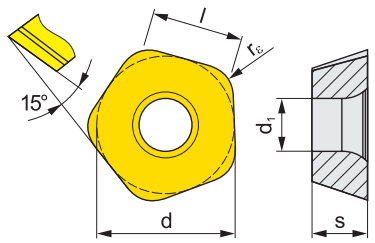
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 124, 126

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9340	M8345	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**PDKX 0905ZEER-FM**	■	■		0,50	2,50	0,3	2,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

PDMW 09



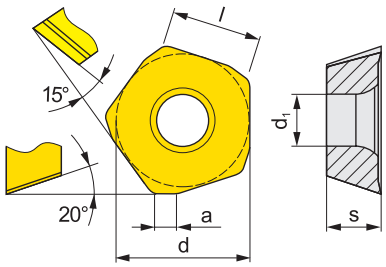
Dimensioni Dimensions	l	d	s	d_1		
0905	9,000	13,500	5,47	5,50		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 124, 126

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	M8345	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	PDMW 090530SR	■	■	3,0	0,50	2,50	0,3	2,0

PDMX 09



Dimensioni Dimensions	l	d	s	d_1	a	
0905	9,000	13,500	5,47	5,50	2,00	

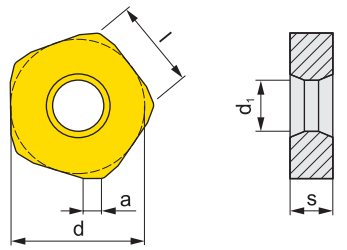
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 124, 126

Geometria Geometry	ISO	Qualità / Grade				Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9340	M8345	8215	8230	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	PDMX 0905ZEER-M	■	■	■	■		0,50	2,50	0,3	2,0
	PDMX 0905ZESR-R		■	■	■		0,50	2,50	0,3	2,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

PNMQ 13



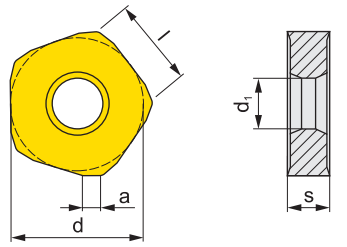
Dimensioni Dimensions	l	d	s	d_1	a
1308	13,000	24,400	7,94	10,00	3,00

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 32

Geometria Geometry	ISO	Qualità / Grade			Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9340	M8345	8230	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**PNMQ 1308DNSN**	■	■	■		0,30	0,70	0,5	10,0

PNMU 13-M



Dimensioni Dimensions	l	d	s	d_1	a
1308	13,000	24,400	7,94	10,00	3,00

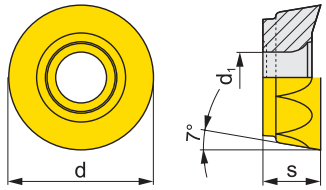
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 32

Geometria Geometry	ISO	Qualità / Grade				Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9340	M8345	8215	8230	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**PNMU 1308DNSR-M**	■	■	■	■		0,25	0,70	0,5	10,0

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

RCMT



Dimensioni Dimensions	d	s	d_1			
1204	12,000	4,76	4,40			
1606	16,000	6,35	5,50			
2006	20,000	6,35	5,50			

Dimensioni [mm]. / Dimensions [mm].

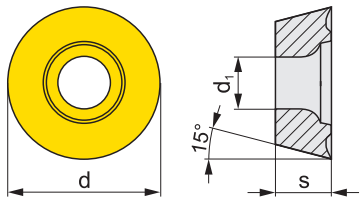
Frese vedi pagine / See tools on pages: 116

Geometria Geometry	ISO	Qualità / Grade								Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9315	M9325	M9340	M8310	M8345	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**RCMT 1204MOEN-F**				■		■	■			0,05	0,20	0,3	6,0
	RCMT 1606MOEN-F				■				■		0,05	0,25	0,3	8,0
	RCMT 2006MOSN-F			■				■			0,08	0,30	0,3	10,0
	**RCMT 1204MOSN-M**		■	■		■		■			0,15	0,30	0,3	6,0
	RCMT 1606MOSN-M		■	■		■		■			0,15	0,30	0,3	8,0
	RCMT 2006MOSN-M	■	■	■		■		■			0,15	0,30	0,3	10,0
	**RCMT 1204MOEN-R**			■				■			0,20	0,50	0,3	6,0
	RCMT 1204MOSN-R					■					0,20	0,50	0,3	6,0
	RCMT 1606MOSN-R					■					0,20	0,50	0,3	8,0
	RCMT 2006MOSN-R					■					0,20	0,50	0,3	10,0

IMPERO PRAMET

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

RDET

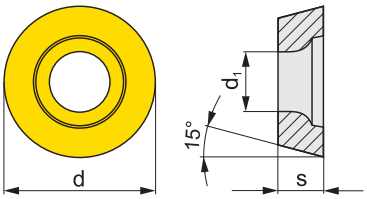


Dimensioni Dimensions	d	d_1	s			
0802	8,000	3,40	2,38			
1003	10,000	4,40	3,18			
10T3	10,000	4,40	3,97			
12T3	12,000	4,40	3,97			

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDET 0802MOSN		○																0,10	0,20	0,5	2,0
	RDET 1003MOSN	●	●																0,10	0,30	0,5	2,5
	RDET 10T3MOSN		●																0,10	0,35	0,5	2,5
	RDET 12T3MOSN	●	●																0,10	0,35	0,5	3,0

RDEW



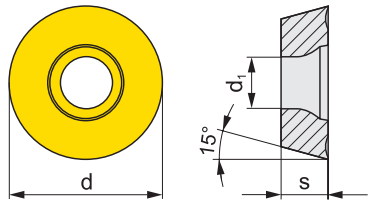
Dimensioni Dimensions	d	d_1	s			
1003	10,000	4,40	3,18			
10T3	10,000	4,40	3,97			
12T3	12,000	4,40	3,97			
1604	16,000	5,50	4,76			

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8215	8230															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDEW 1003MOSN	●	●																0,10	0,35	0,5	2,5
	RDEW 10T3MOSN		●																0,10	0,35	0,5	2,5
	RDEW 12T3MOSN		●																0,12	0,40	0,5	3,0
	RDEW 1604MOSN		●																0,22	0,40	0,5	4,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

RDEX-12

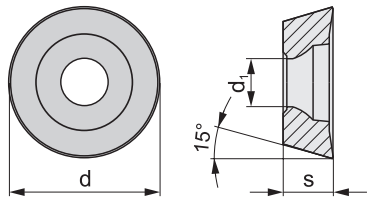


Dimensioni Dimensions	d	d_1	s
1204	12,000	4,40	4,76
1604	16,000	5,50	4,76

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDEX 1204MOSN-12	●	●		0,12	0,40	0,5	3,0
	RDEX 1604MOSN-12	●	●		0,22	0,40	0,5	4,0

RDGT



Dimensioni Dimensions	d	d_1	s
0702	7,000	2,80	2,38
1003	10,000	3,90	3,18
12T3	12,000	3,90	3,97
1604	16,000	5,20	4,76

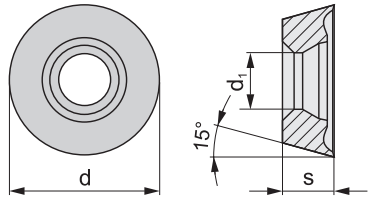
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 118, 120, 122

Geometria Geometry	ISO	Qualità / Grade							Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9340	M8310	M8325	M8345	7010	7025	7040	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDGT 0702MOT		□	□	□	○	○	○		0,10	0,20	0,3	2,0
	RDGT 1003MOT	●	□	■	■	○	○	○		0,10	0,30	0,5	2,5
	RDGT 12T3MOT	●	■	■	■	○	○	○		0,10	0,35	1,0	3,0
	RDGT 1604MOT	●	□	■	■	○	○	○		0,10	0,40	1,0	4,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

RDHT-FA



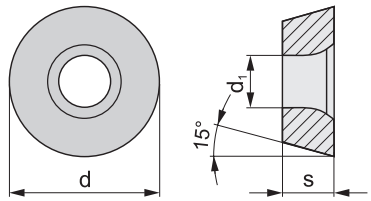
Dimensioni Dimensions	d	d_1	s			
0702	7,000	2,80	2,38			
07T1	7,000	2,80	1,98			
1003	10,000	3,90	3,18			
12T3	12,000	3,90	3,97			
1604	16,000	5,20	4,76			

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 118, 120, 122

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		HF7																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDHT 07T1MO-FA	○																	0,10	0,20	0,3	2,0
	RDHT 0702MO-FA	●																	0,10	0,20	0,3	2,0
	RDHT 1003MO-FA	●																	0,10	0,30	0,3	2,5
	RDHT 12T3MO-FA	●																	0,10	0,30	0,3	3,0
	RDHT 1604MO-FA	○																	0,10	0,40	0,3	4,0

RDHX 05 MOE



Dimensioni Dimensions	d	d_1	s			
0501	5,000	2,20	1,51			

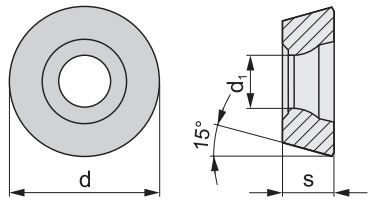
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 120

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8310	7010															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDHX 0501MOE	■	○																0,05	0,15	0,3	1,5

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

RDHX MOT



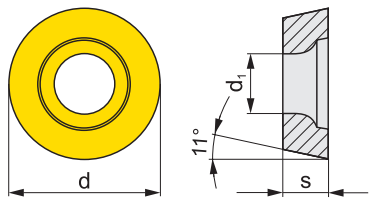
Dimensioni Dimensions	d	d_1	s			
0702	7,000	2,80	2,38			
07T1	7,000	2,80	1,98			
1003	10,000	3,90	3,18			
12T3	12,000	3,90	3,97			
1604	16,000	5,20	4,76			
2006	20,000	5,20	6,35			

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 118, 120, 122

Geometria Geometry	ISO	Qualità / Grade								Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8310	M8325	M8345	7205	7010	7025	7040	5040	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RDHX 07T1MOT	■	□			○	○				0,10	0,17	0,5	2,0
	RDHX 0702MOT	■	■		●	○	○				0,10	0,20	0,5	2,0
	RDHX 1003MOT	■	■	■	●	○	○	○	○		0,10	0,30	0,5	2,5
	RDHX 12T3MOT	■	■	■	●	○	○	○	○		0,10	0,35	1,0	3,0
	RDHX 1604MOT	■	■	■		○	○	○	○		0,20	0,40	1,0	4,0
	RDHX 2006MOT	□	■			○	○				0,20	0,60	1,0	5,0

RPET 12



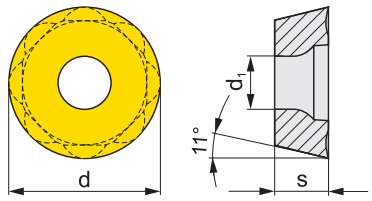
Dimensioni Dimensions	d	d_1	s			
1204	12,000	4,40	4,76			

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade			Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RPET 1204MOSN	●	●	●		0,12	0,40	0,5	3,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

RPET 15-M



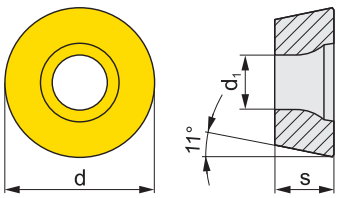
Dimensioni Dimensions	d	d_1	s			
1505	15,875	5,50	5,56			

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 24

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240	7040														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RPET 1505MOS-M	●	●	○															0,12	0,50	0,5	3,5

RPEW 12



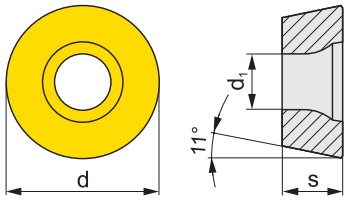
Dimensioni Dimensions	d	d_1	s			
1204	12,000	4,40	4,76			

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8325	8215	8230	8240	7025												r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	RPEW 1204MOSN	■	●	●	○	○													0,10	0,40	0,5	3,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

RPEW 15



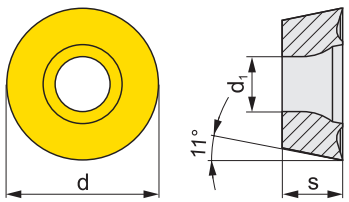
Dimensioni Dimensions	d	d_1	s			
1505	15,875	5,50	5,56			

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 24

Geometria Geometry	ISO	Qualità / Grade			Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8215	8230	7010	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**RPEW 1505MOS**	●	●	○		0,15	0,50	0,5	3,5

RPEX-12



Dimensioni Dimensions	d	d_1	s			
1204	12,000	4,40	4,76			

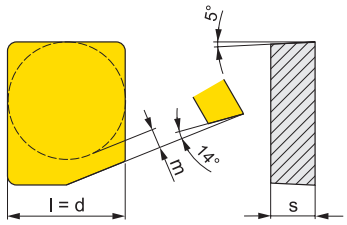
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: XXX

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**RPEX 1204MOSN-12**	●	●		0,12	0,40	0,5	3,0

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SBKX 22



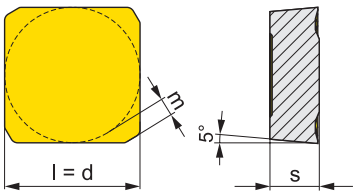
Dimensioni Dimensions	l	d	s	m		
2207	22,000	22,000	8,50	3,22		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 36

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8026T																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SBKX 2207DZER	●																	0,35	0,80	0,5	3,0

SBMR 22



Dimensioni Dimensions	l	d	s	m		
2207	22,000	22,000	8,50	2,82		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 36

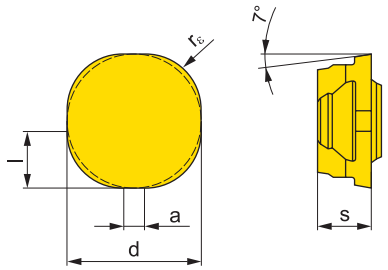
Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8240	8026T															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SBMR 2207DZSR	●	●																0,35	0,80	1,2	15,0



IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SCKR-F



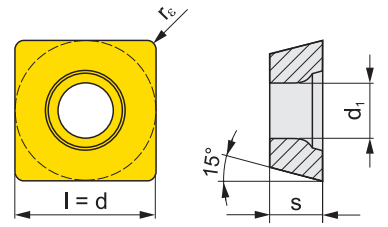
Dimensioni Dimensions	l	d	s	a		
09T3	4,000	9,525	3,97	1,50		
12T3	6,000	12,700	3,97	1,10		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 40, 42

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SCKR 09T340EN-F	□															4,0	0,05	0,21	0,3	4,0
	SCKR 12T360EN-F	□															6,0	0,08	0,26	0,3	6,0

SDEW 09



Dimensioni Dimensions	l	d	s	d_1		
0903	9,525	9,525	3,18	4,40		

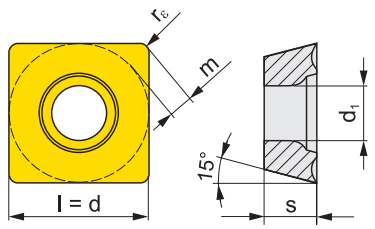
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 150

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8215	8230	8240													r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SDEW 090308EN		●	●													0,80	0,10	0,30	1,0	4,5
	SDEW 090308SN	●	●	●													0,80	0,10	0,30	1,0	4,5

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SDEX 09-74



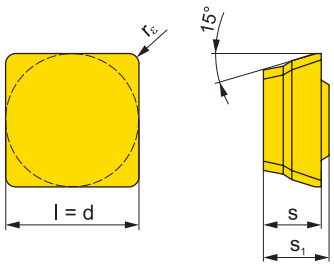
Dimensioni Dimensions	l	d	s	d_1		
0903	9,525	9,525	3,18	4,40		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 150

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SDEX 090308FN-74	●															0,8	0,10	0,30	0,5	4,5

SDGX 12-FM



Dimensioni Dimensions	l	d	s	s_1		
1205	12,700	12,700	5,56	6,35		

Dimensioni [mm]. / Dimensions [mm].

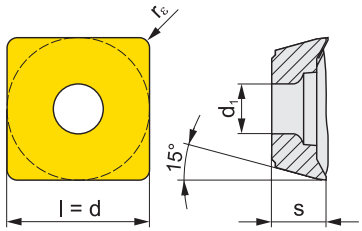
Frese vedi pagine / See tools on pages: 94, 96

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8345	8230														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SDGX 120508EN-FM	■	■														0,8	0,05	0,15	1,0	12,0

IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SDMT 12



Dimensioni Dimensions	l	d	s	d_1		
1205	12,700	12,700	5,00	4,40		

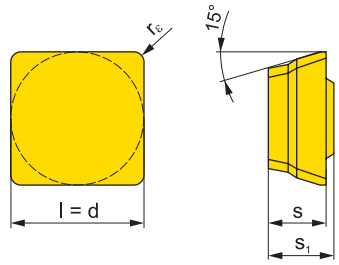
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 82

Geometria Geometry	ISO	Qualità / Grade					Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9315	M9325	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SDMT 120508SR-F**				●	○	0,8	0,07	0,25	1,0	5,0
	**SDMT 120508SR-M**		●	●	●	●	0,8	0,10	0,25	1,0	10,0
	**SDMT 120508PR-R**	●	●		●	●	0,8	0,10	0,25	1,0	10,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SDMX 12-M



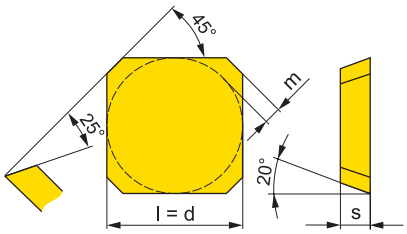
Dimensioni Dimensions	l	d	s	s_1		
1205	12,700	12,700	5,56	6,35		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 94, 96

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8345	8230														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SDMX 120508EN-M	■	■														0,8	0,08	0,18	1,0	12,0

SEEN



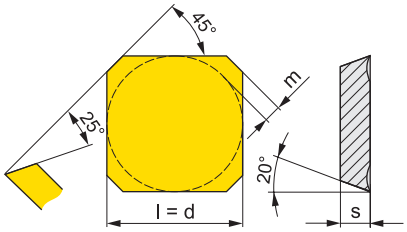
Dimensioni Dimensions	l	d	s	m		
1203	12,700	12,700	3,18	1,6		
1204	12,700	12,700	4,76	1,6		
1504	15,875	15,875	4,76	2,0		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9315	M9325	M9340	8215	8230	8240										r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SEEN 1203AFFN			●		●	●											0,05	0,30	0,5	6,5
	SEEN 1203AFSN	●	●	●	●	●	●											0,15	0,40	1,0	6,5
	SEEN 1204AFFN					●	○											0,05	0,40	0,5	6,5
	SEEN 1204AFSN					●	●											0,15	0,40	1,0	6,5
	SEEN 1504AFSN	●	●	●		●	●											0,20	0,40	1,0	9,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SEER

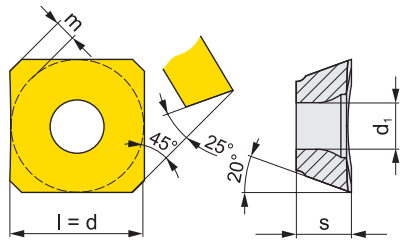


Dimensioni Dimensions	l	d	s	m		
1203	12,700	12,700	3,18	1,6		
1204	12,700	12,700	4,76	1,6		
1504	15,875	15,875	4,76	2,0		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade				Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	M9340	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SEER 1203AFEN			●			0,20	0,30	0,5	6,5
	SEER 1203AFSN	●	●	●	●		0,20	0,40	1,0	6,5
	SEER 1204AFEN			○			0,20	0,40	0,5	6,5
	SEER 1204AFSN			●	●		0,20	0,40	1,0	6,5
	SEER 1504AFEN			○			0,20	0,40	0,5	9,0
	SEER 1504AFSN	●	●	●	●		0,20	0,40	0,5	9,0

SEET 09



Dimensioni Dimensions	l	d	s	d_1		
09T3	9,525	9,525	3,97	3,50		

Dimensioni [mm]. / Dimensions [mm].

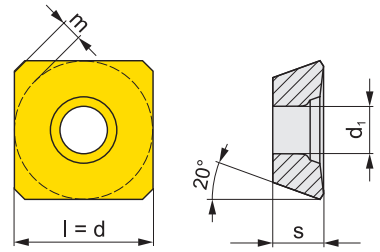
Frese vedi pagine / See tools on pages: 26, 28

Geometria Geometry	ISO	Qualità / Grade					Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SEET 09T3AFEN	■	■	■	■	■		0,08	0,30	0,3	4,5

IMPERO PRAMET

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SEET 12

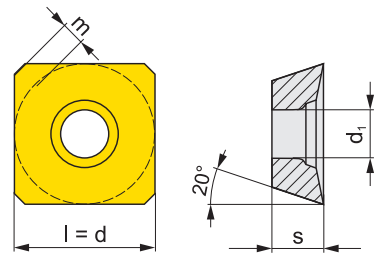


Dimensioni Dimensions	l	d	s	d_1	m	
1204	12,700	12,700	4,76	5,50	1,60	

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade					Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SEET 1204AFEN				●			0,20	0,40	0,5	6,5
	SEET 1204AFSN	●	●	●	●	●		0,20	0,40	1,0	6,5

SEET 12-FA



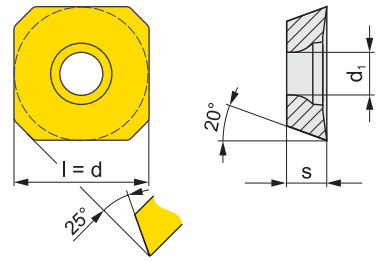
Dimensioni Dimensions	l	d	s	d_1	m	
1204	12,700	12,700	4,76	5,50	1,60	

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M0315	HF7	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SEET 1204AFFN-FA	■	●		0,05	0,40	0,2	4,5

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SEET 12-PM

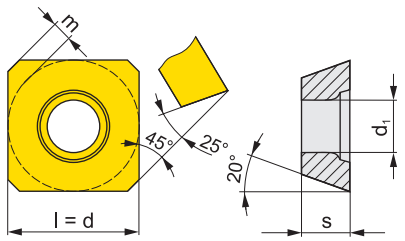


Dimensioni Dimensions	l	d	s	d_1		
12T3	13,400	13,400	3,97	4,20		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade				Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	M9340	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SEET 12T3M-PM	●	●	●	●		0,20	0,35	1,0	6,5

SEEW 12



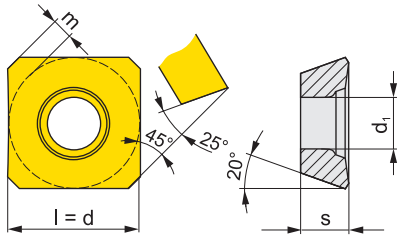
Dimensioni Dimensions	l	d	s	d_1	m	
1204	12,700	12,700	4,76	5,50	1,60	

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade				Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SEEW 1204AFEN			●	●		0,10	0,40	0,5	6,5
	SEEW 1204AFSN	●	○	●	●		0,15	0,40	1,0	6,5

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SEMT 09



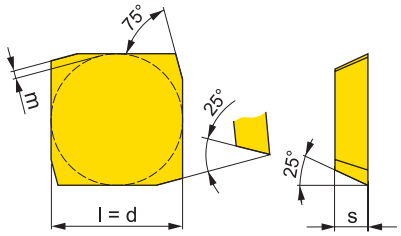
Dimensioni Dimensions	l	d	s	m	d_1	
09T3	9,525	9,525	3,97	1,21	3,50	

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 26, 28

Geometria Geometry	ISO	Qualità / Grade					Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SEMT 09T3AFSN**	●	●	●	●	●		0,12	0,35	0,5	4,5

SFCN 12



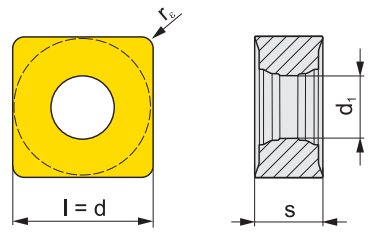
Dimensioni Dimensions	l	d	s	m		
1203	12,700	12,700	3,18	0,80		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M0315	H10	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SFCN 1203EFFR**	■	●		0,05	0,30	0,5	9,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SNGX 13



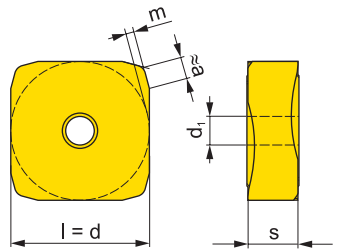
Dimensioni Dimensions	l	d	s	d_1		
1305	13,200	13,200	6,36	5,90		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 98

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNGX 130512SN-M	●	●															1,20	0,15	0,35	-	-
	SNGX 130512PN-R	●	●															1,20	0,15	0,40	-	-

SNHF-M



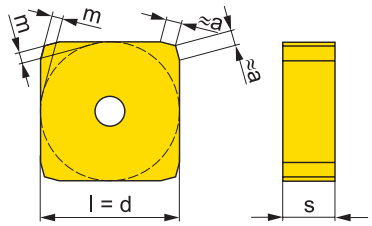
Dimensioni Dimensions	l	d	s	m	a	
1204	12,700	12,700	4,76	0,50	2,00	
1504	15,875	15,875	4,76	1,10	1,40	

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	8230	8240														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNHF 1204ENSR-M	●	●	●															0,15	0,40	1,0	6,0
	SNHF 1504ENSR-M		●	●															0,15	0,40	1,0	9,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SNHN



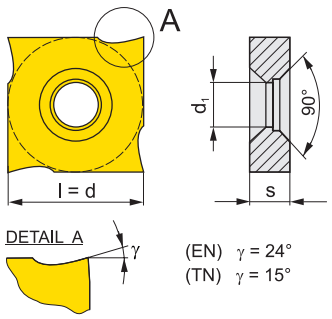
Dimensioni Dimensions	l	d	s	m	a	
1204	12,700	12,700	4,76	0,95	1,40	
1504	15,875	15,875	4,76	1,30	1,40	

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade							Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9315	M9325	8215	8230	8240	H10	S26	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SNHN 1204ENEN**	●	●	●	●	●		●		0,10	0,40	0,5	9,0
	SNHN 1504ENEN			●	●	●	○	●		0,10	0,40	0,5	13,5

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SNHQ AZ



Dimensioni Dimensions	l	d	s	d_1		
1102	11,000	11,000	2,30	4,30		
1103	11,000	11,000	2,70	4,30		
1203	12,700	12,700	3,20	5,00		
1204	12,700	12,700	4,50	5,00		
1205	12,700	12,700	5,40	5,00		
1207	12,700	12,700	7,00	5,00		

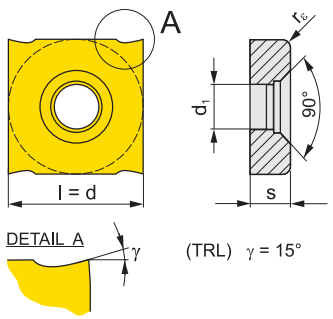
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 106, 110

Geometria Geometry	ISO	Qualità / Grade			Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNHQ 1102AZTN		●	●		0,20	0,50	-	-
	SNHQ 1103AZTN		●	○		0,20	0,50	-	-
	SNHQ 1203AZEN	●		○		0,20	0,40	-	-
	SNHQ 1203AZTN		●	●		0,20	0,40	-	-
	SNHQ 1204AZEN	○		○		0,20	0,40	-	-
	SNHQ 1204AZTN		●	●		0,20	0,40	-	-
	SNHQ 1205AZEN	○		○		0,20	0,50	-	-
	SNHQ 1205AZTN		●	●		0,20	0,50	-	-
	SNHQ 1207AZEN	○		○		0,10	0,50	-	-
	SNHQ 1207AZTN		●	●		0,20	0,50	-	-

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SNHQ 12 TRL



Dimensioni Dimensions	l	d	s	d_1	g	
1203	12,700	12,700	3,20	5,00	15	
1204	12,700	12,700	4,50	5,00	15	
1205	12,700	12,700	5,40	5,00	15	
1207	12,700	12,700	7,00	5,00	15	

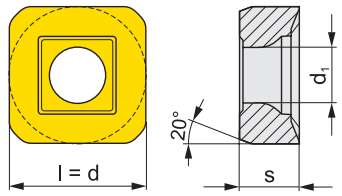
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 106, 110

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8240															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNHQ 120305TRL	●															0,50	0,20	0,40	-	-
	SNHQ 120310TRL	●															1,00	0,20	0,40	-	-
	SNHQ 120315TRL	○															1,50	0,20	0,40	-	-
	SNHQ 120405TRL	●															0,50	0,20	0,40	-	-
	SNHQ 120410TRL	○															1,00	0,20	0,40	-	-
	SNHQ 120415TRL	○															1,50	0,20	0,40	-	-
	SNHQ 120505TRL	●															0,50	0,20	0,50	-	-
	SNHQ 120510TRL	○															1,00	0,20	0,50	-	-
	SNHQ 120515TRL	○															1,50	0,20	0,50	-	-
	SNHQ 120705TRL	○															0,50	0,20	0,50	-	-
	SNHQ 120710TRL	●															1,00	0,20	0,50	-	-
	SNHQ 120715TRL	○															1,50	0,20	0,50	-	-

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SNKT 12-M



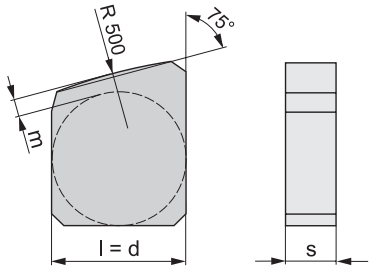
Dimensioni Dimensions	l	d	s	d_1		
1205	12,700	12,700	5,56	5,20		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 30

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	8230	8240														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNKT 1205AZSR-M	●	●	○															0,15	0,50	1,0	6,5

SNKX



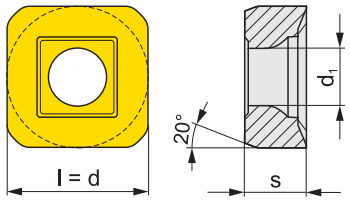
Dimensioni Dimensions	l	d	s	m		
1204	12,700	12,700	4,76	1,00		
1504	15,875	15,875	4,76	1,35		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		H10																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNKX 1204ENFN	○																	0,05	0,40	0,5	9,0
	SNKX 1504ENFN	○																	0,05	0,40	0,5	13,5

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SNMT 12



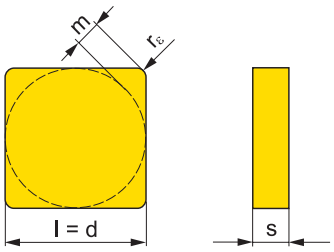
Dimensioni Dimensions	l	d	s	d_1		
1205	12,700	12,700	5,56	5,20		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 30

Geometria Geometry	ISO	Qualità / Grade							Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	M9315	M9325	M9340	8215	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNMT 1205AZSR-M		●	●	●	●	●	●		0,15	0,50	1,0	6,5
	SNMT 1205AZSR-R	●	●	●		●	●	●		0,18	0,50	1,0	6,5

SNUN



Dimensioni Dimensions	l	d	s	m		r_e
1204	12,700	12,700	4,76	2,30		0,8
1504	15,875	15,875	4,76	2,80		1,2

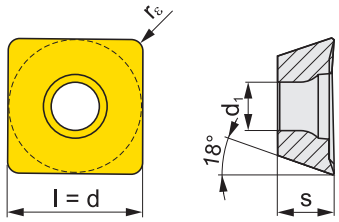
Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade			Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	S26		r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SNUN 120408	●			0,80	0,10	0,40	1,0	9,0
	SNUN 120412	●	●		1,20	0,10	0,40	1,2	9,0
	SNUN 150412	●	●		1,20	0,10	0,40	1,2	13,5

IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SOMT 09



Dimensioni Dimensions	l	d	s	d_1		
09T3	9,550	9,550	3,97	3,50		

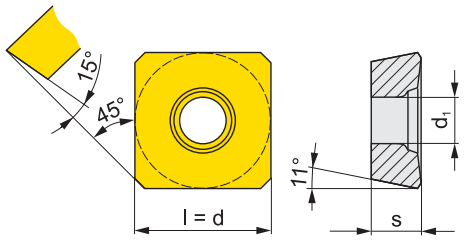
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 78, 80

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	M9315	M9325	M9340	M8310	8215	8230	8240	7010	7025						r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SOMT 09T308-M**	●	●				●	●	●								0,80	0,12	0,40	1,0	8,0
	**SOMT 09T304-MI**		●		●	■	●	●	●	○							0,40	0,08	0,35	0,5	8,0
	**SOMT 09T304-P**			●				●	●	○	○						0,40	0,08	0,35	0,5	8,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SPET 12 AD



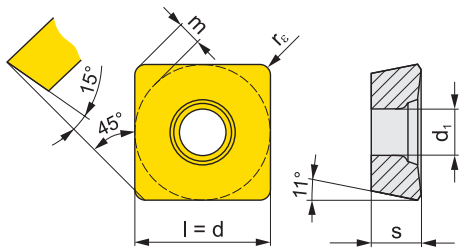
Dimensioni Dimensions	l	d	s	d_1	m	
1204	12,700	12,700	4,76	5,50	1,90	

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 100, 102

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SPET 1204ADEN**	●	●															0,12	0,40	1,0	12,0
	SPET 1204ADSN	●	●															0,12	0,40	1,0	12,0

SPET 12 S



Dimensioni Dimensions	l	d	s	d_1		
1204	12,700	12,700	4,76	5,50		

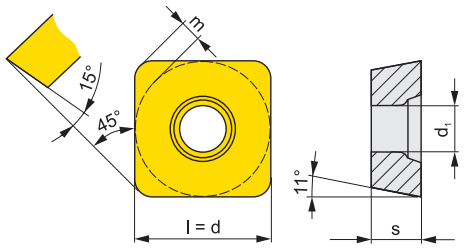
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 100, 102

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SPET 120408S**	●	●														0,8	0,17	0,40	1,0	12,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SPEW 12 AD



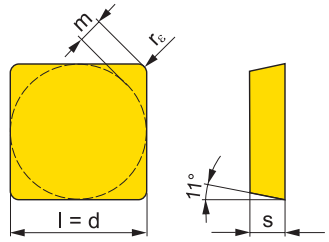
Dimensioni Dimensions	l	d	s	d_1	m	
1204	12,700	12,700	4,76	5,50	1,92	

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 100, 102

Geometria Geometry	ISO	Qualità / Grade 8230	8240	Raggio Radius r_ε	Avanzamento al dente Feed per tooth f_{min}	f_{max}	Profondità di taglio Cutting depth $a_{p\,min}$	$a_{p\,max}$
	SPEW 1204ADEN	●	○		0,10	0,40	1,0	12,0
	SPEW 1204ADSN	●	●		0,12	0,40	1,0	12,0

SPGN



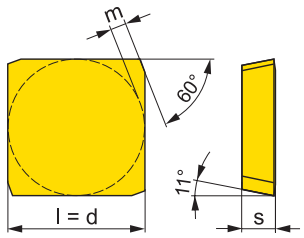
Dimensioni Dimensions	l	d	s	m		
0903	9,525	9,525	3,18	1,64		
1203	12,700	12,700	3,18	2,47		
1504	15,875	15,875	4,76	2,96		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade 8230	8240	Raggio Radius r_ε	Avanzamento al dente Feed per tooth f_{min}	f_{max}	Profondità di taglio Cutting depth $a_{p\,min}$	$a_{p\,max}$
	SPGN 090308		●	0,8	0,10	0,25	1,0	6,0
	SPGN 120304	○	○	0,4	0,10	0,25	0,5	9,0
	SPGN 120308	●		0,8	0,10	0,25	1,0	9,0
	SPGN 150408	○		0,8	0,10	0,35	1,0	13,5
	SPGN 150412	●	○	1,2	0,10	0,35	1,2	13,5

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SPGN 25 DZSR



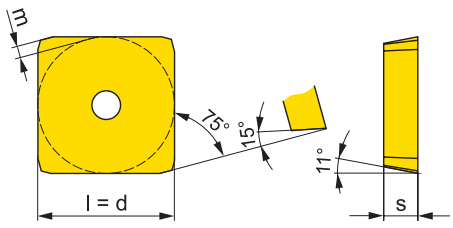
Dimensioni Dimensions	l	d	s	m		
2506	25,000	25,000	6,35	3,54		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 38

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8240	8026T	5040														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SPGN 2506DZSR	●	●	○															0,45	0,60	2,0	18,0

SPKN EDE



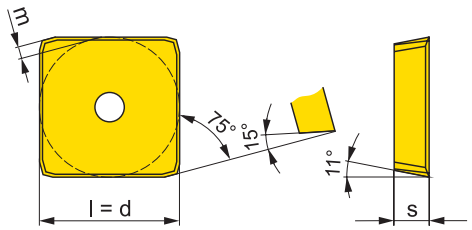
Dimensioni Dimensions	l	d	s	m		
1203	12,700	12,700	3,18	0,88		
1504	15,875	15,875	4,76	1,26		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240	H10	S26													r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SPKN 1203EDER	●	●	○	●														0,10	0,25	1,0	9,0
	SPKN 1504EDER	●	●	●															0,10	0,35	1,0	13,0
	SPKN 1504EDEL	○																	0,10	0,35	1,0	13,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SPKN EDS

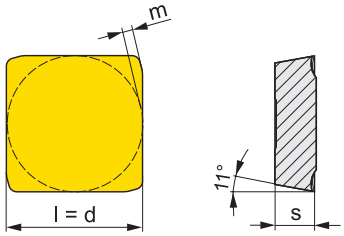


Dimensioni Dimensions	l	d	s	m		
1203	12,700	12,700	3,18	0,88		
1504	15,875	15,875	4,76	1,26		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade							Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9315	M9325	8215	8230	8240	H10	S26	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SPKN 1203EDSR	●	●	●	●	●	●	●		0,15	0,30	1,0	9,0
	SPKN 1203EDSL				○					0,15	0,30	1,0	9,0
	SPKN 1504EDSR	●	●	●	●	●	●	●		0,20	0,40	1,0	13,0
	SPKN 1504EDSL					○				0,20	0,40	1,0	13,0

SPKR



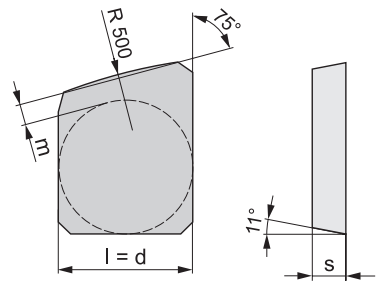
Dimensioni Dimensions	l	d	s	m		
1203	12,700	12,700	3,18	0,90		
1504	15,875	15,875	4,76	1,22		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade				Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	M9340	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SPKR 1203EDSR	●	●	●	●		0,15	0,30	1,0	9,0
	SPKR 1504EDSR		●	●	●		0,25	0,45	1,0	12,0

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SPKX

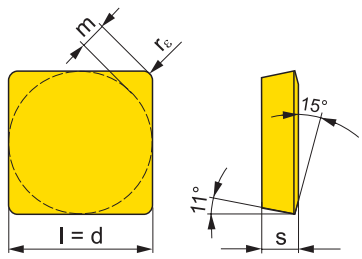


Dimensioni Dimensions	l	d	s	m		
1203	12,700	12,700	3,18	1,00		
1504	15,875	15,875	4,76	1,00		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		H10																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SPKX 1203EDFR**	○																	0,05	0,30	0,5	9,0
	SPKX 1504EDFR	○																	0,05	0,40	0,5	13,0

SPUN



Dimensioni Dimensions	l	d	s	m		
1203	12,700	12,700	3,18	2,47		
1504	15,875	15,875	4,76	2,80		
1904	19,050	19,050	4,76	3,45		

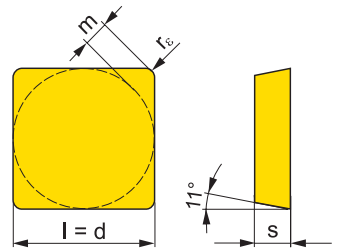
Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	H10	S26														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**SPUN 120304**	●																0,4	0,10	0,30	0,5	9,0
	SPUN 120308	●	●	●														0,8	0,10	0,30	1,0	9,0
	SPUN 120312	●																1,2	0,10	0,30	1,2	9,0
	SPUN 150412	●		●														1,2	0,10	0,40	1,2	13,0
	SPUN 190408	●																0,8	0,10	0,35	1,0	16,0
	SPUN 190412	●		○														1,2	0,10	0,35	1,2	16,0

IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

SPUN S



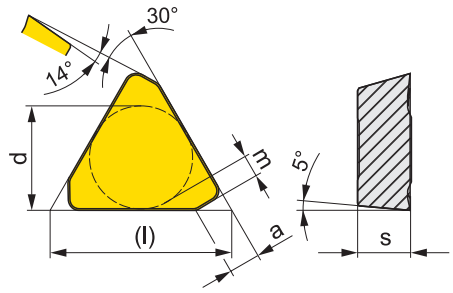
Dimensioni Dimensions	l	d	s	m		
2506	25,400	25,400	6,35	4,43		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 38, 36

Geometria Geometry	ISO	Qualità / Grade			Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8240	8026T	S26	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	SPUN 250616S		●		1,6	0,40	0,60	1,6	18,0
	SPUN 250620S	●	●	●	2,0	0,40	0,60	2,0	18,0

TBMR 27



Dimensioni Dimensions	l	d	s	m	a	
2707	27,496	15,875	7,94	3,20	4,61	

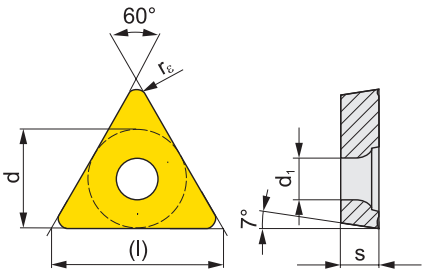
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 84

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8240	8026T	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TBMR 2707PZSR	●	●		0,20	0,60	1,5	18,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

TCMT 16-FM



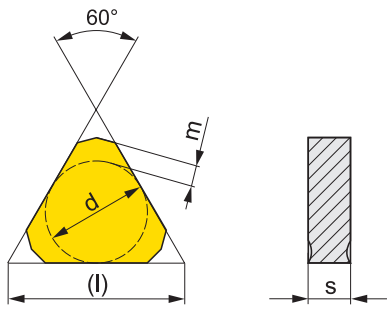
Dimensioni Dimensions	l	d	d_1	s		
16T3	16,500	9,525	4,40	3,97		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 154, 156

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		T8315	T8330	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TCMT 16T304E-FM	●	●	0,4	0,10	0,25	-	-
	TCMT 16T308E-FM	●	●	0,8	0,10	0,25	-	-

TNJF 12



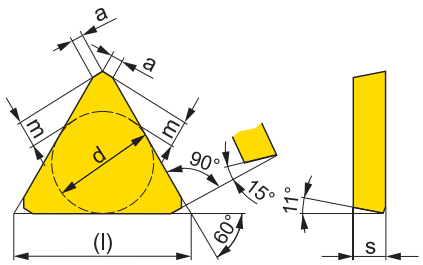
Dimensioni Dimensions	(l)	d	s	m		
1204	22,000	12,700	4,76	2,41		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M5315	8230	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TNJF 1204ANEN	●	●		0,10	0,40	2,0	6,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

TPCN 16

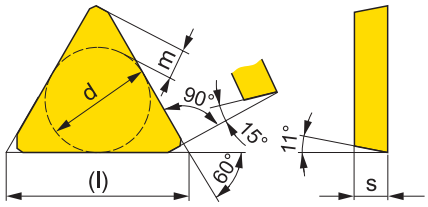


Dimensioni Dimensions	(l)	d	s	m	a	
1603	16,100	9,530	3,18	2,45	1,2	

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TPCN 1603PDSN	●	●																0,12	0,25	16,0	16,0

TPKN ER



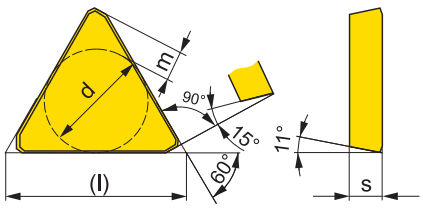
Dimensioni Dimensions	(l)	d	s	m		
1603	16,500	9,530	3,18	2,45		
2204	22,000	12,700	4,76	3,55		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8215	8230	8240														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TPKN 1603PDER		●	○															0,10	0,20	1,0	16,0
	TPKN 2204PDER	●	●	●															0,10	0,25	1,0	22,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

TPKN SR

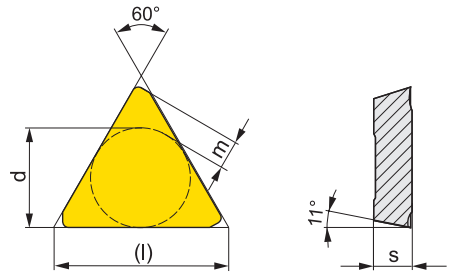


Dimensioni Dimensions	(l)	d	s	m		
1603	16,500	9,530	3,18	2,45		
2204	22,000	12,700	4,76	3,55		

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade						Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	8230	8240	H10	S26	S45	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TPKN 1603PDSR		●	●		●			0,20	0,25	1,0	16,0
	TPKN 2204PDSR	●	●	●	●	●	○		0,20	0,30	1,0	22,0

TPKR



Dimensioni Dimensions	(l)	d	s	m		
1603	16,500	9,530	3,18	2,45		
2204	22,000	12,700	4,76	3,55		

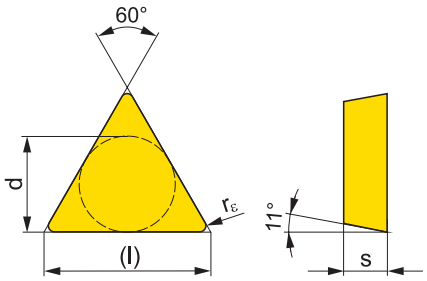
Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade				Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	M9340	8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TPKR 1603PDSR		●	●	●		0,10	0,30	1,0	16,0
	TPKR 2204PDSR	●	●	●	●		0,10	0,40	1,0	22,0

IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

TPUN



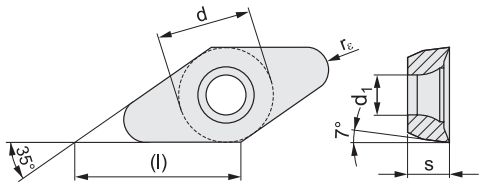
Dimensioni Dimensions	(l)	d	s			
1103	11,000	6,350	3,18			
1603	16,500	9,530	3,18			
2204	22,000	12,700	4,76			

Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade				Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8215	8230	H10	S26	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	TPUN 110304		●	○		0,40	0,10	0,15	0,5	11,0
	TPUN 110308		○			0,80	0,10	0,15	1,0	11,0
	TPUN 160304	○	●	○	●	0,40	0,10	0,20	0,5	16,0
	TPUN 160308	○	●	●	●	0,80	0,10	0,20	1,0	16,0
	TPUN 160312		●	○	○	1,20	0,10	0,20	1,2	16,0
	TPUN 220408	○	●	●	●	0,80	0,10	0,25	1,0	22,0
	TPUN 220412		●	○	○	1,20	0,10	0,25	1,2	22,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
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VCGT 22-FA



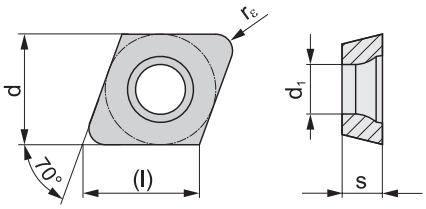
Dimensioni Dimensions	(l)	d	s	d_1		
2205	22,000	12,700	5,50	5,20		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 144, 146, 148

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		HF7															r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**VCGT 220515F-FA**	○															1,5	0,05	1,00	0,5	20,0
	VCGT 220520F-FA	○															2,0	0,05	1,50	0,5	18,0
	VCGT 220530F-FA	●															3,0	0,05	2,50	0,5	16,0

XDHW



Dimensioni Dimensions	(l)	d	d_1	s		
0702	6,900	6,500	2,95	2,38		
10T3	10,600	10,000	3,95	3,97		

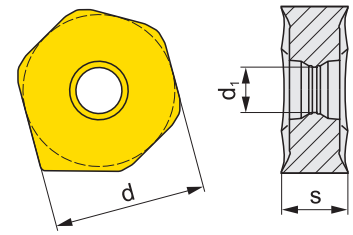
Dimensioni [mm]. / Dimensions [mm].

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8310	M8325	7010	7025												r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**XDHW 070210EN**	■	■	○	○												1,0	0,05	0,22	0,2	1,0
	XDHW 070210SN	■	■	○	○												1,0	0,05	0,22	0,2	1,0
	XDHW 10T310SN	■	■	○	○												1,0	0,05	0,35	0,2	1,0

IMPERO PRAMET

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

XNGX



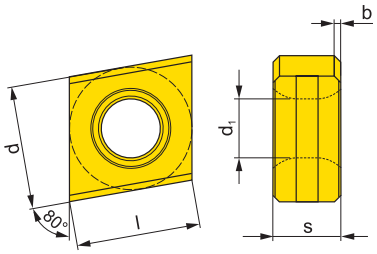
Dimensioni Dimensions	d	s	d_1			
0604	10,500	5,260	3,70			
0906	16,500	6,350	4,90			

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 14, 16, 18, 20

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8215	8230	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**XNGX 0604ANSN**	●			0,13	0,25	0,7	3,0
	XNGX 0906ANSN	●	○		0,17	0,50	0,8	5,0

XNHQ



Dimensioni Dimensions	(l)	d	s	d_1	b	
1205	12,700	10,000	5,40	4,70	0,5 x 45°	
1606	16,000	12,000	6,40	5,90	0,5 x 45°	

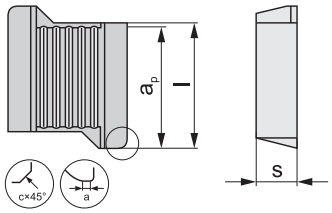
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 112, 114

Geometria Geometry	ISO	Qualità / Grade		Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		8230	8240	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**XNHQ 1205AZTN**	●	●		0,10	0,50	-	-
	XNHQ 1606AZTN	○	●		0,10	0,60	-	-

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

XOEN 12



Dimensioni Dimensions	l	s	c × 45°	a	$a_{p\,max}$	
12T304LF	12,000	4,000	-	(5°)	3,3	
12T304RF	12,000	4,000	-	(5°)	3,3	
12T308LF	12,000	4,000	-	1,20	3,3	
12T308RF	12,000	4,000	-	1,20	3,3	
12T308RH	12,000	4,000	-	1,00	10	
12T3AZ08	12,000	4,000	0,80	1,20	3,3	

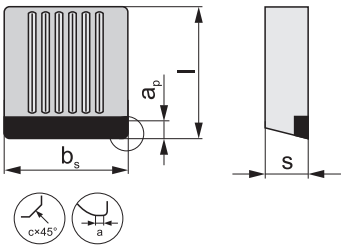
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 88

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		D720																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	XOEN 12T304LF	□																0,4	0,05	0,25	0,1	3,3
	XOEN 12T304RF	■																0,4	0,05	0,25	0,1	3,3
	XOEN 12T308LF	□																0,8	0,05	0,25	0,1	3,3
	XOEN 12T308RF	■																0,8	0,05	0,25	0,1	3,3
	XOEN 12T3AZ08RF	■																	0,05	0,25	0,1	3,3
	XOEN 12T308RH	■																0,8	0,05	0,25	0,1	10,0
	XOEN 12T3AZ08RH	■																	0,05	0,25	0,1	10,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1.4.2014 / □ not stocked as standard from 1.4.2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

XOEN 12 NH



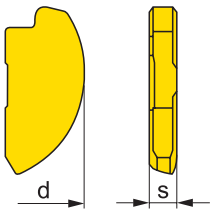
Dimensioni Dimensions	l	s	c × 45°	a	$a_{p\,max}$	
12T304ZZ	12,000	4,000	-	10,80	0,76	
12T308ZZ	12,000	4,000	-	10,10	0,76	
12T3AZZ0	12,000	4,000	0,80	10,00	0,76	

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 88

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		D720																r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	XOEN 12T304ZZNH	■																0,4	0,05	0,25	0,1	0,8
	XOEN 12T308ZZNH	■																0,8	0,05	0,25	0,1	0,8
	XOEN 12T3AZZ08NH	□																	0,05	0,25	0,1	0,8

XP-FM



Dimensioni Dimensions	d	s				
16	16,000	2,000				
20	20,000	2,500				
25	25,000	3,170				
32	32,000	4,000				

Dimensioni [mm]. / Dimensions [mm].

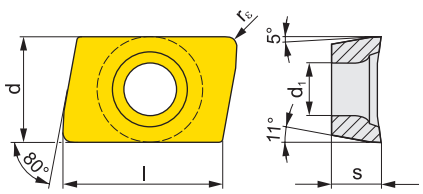
Frese vedi pagine / See tools on pages: 140, 142

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8310	M8345	8230														r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	XP 16ER-FM	■	■	■															0,05	0,10	0,5	8,0
	XP 20ER-FM	■	■	■															0,07	0,12	0,5	10,0
	XP 25ER-FM	■	■	■															0,07	0,12	0,3	12,5
	XP 32ER-FM	■	■	■															0,10	0,18	0,5	16,0

IMPERO PRAMET

● standard in stock /○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard /○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

XPHT 16



Dimensioni Dimensions	l	d	d_1	s		
1604	15,875	9,525	4,40	4,76		

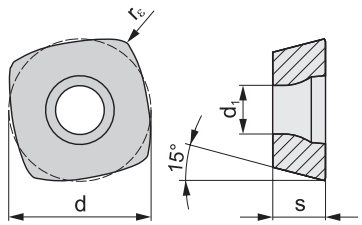
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 158

Geometria Geometry	ISO	Qualità / Grade						Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M9325	M9340	8215	8230	8240	HF7	r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**XPHT 160412E**			●	●			1,20	0,05	0,30	1,2	15,0
	XPHT 160412S	●	●	●	●	●		1,20	0,10	0,30	1,2	15,0
	**XPHT 160408F-FA**						●	0,80	0,05	0,30	0,8	15,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
Vedere il listino prezzi per l'assortimento degli standard effettivamente in stock. / See price list for current availability.

ZDCW



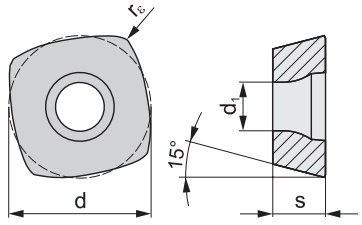
Dimensioni Dimensions	l	d	s	d_1		
0703	6,800	6,800	3,18	2,40		
09T3	9,525	9,525	3,97	3,40		

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 128, 130, 132

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8310	M8325	M8345	7205	7215	7230	7010	7025	7040							r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**ZDCW 070304**		■	■		●	●		○	○							0,4	0,15	1,50	0,3	1,0
	ZDCW 09T304	■	■	■	○	●	●	○	○	○							0,4	0,30	2,00	0,3	1,0

ZDEW 12



Dimensioni Dimensions	l	d	s	d_1		
1204	12,700	12,700	4,76	4,40		

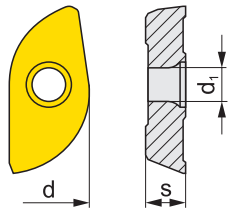
Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 128, 130, 132

Geometria Geometry	ISO	Qualità / Grade															Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8310	M8325	M8345	7205	7010	7025	7040									r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**ZDEW 120408**	■	■	■	●	○	○	○									0,8	0,20	1,50	0,3	1,0

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
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ZP



Dimensioni Dimensions	d	s	d_1			
10	10,000	1,70	2,20			
12	12,000	2,38	2,90			
16	16,000	3,18	2,90			
20	20,000	3,97	4,00			
25	25,000	4,76	4,70			
32	32,000	6,35	5,90			
40	40,000	7,94	7,00			
50	50,000	7,94	9,60			

Dimensioni [mm]. / Dimensions [mm].

Frese vedi pagine / See tools on pages: 134, 138

Geometria Geometry	ISO	Qualità / Grade																Raggio Radius	Avanzamento al dente Feed per tooth		Profondità di taglio Cutting depth	
		M8310	M8345	8230	8240													r_ε	f_{min}	f_{max}	$a_{p\,min}$	$a_{p\,max}$
	**ZP 20ER-F**	■																	0,04	0,07	0,3	17,9
	ZP 50ER-F	□																	0,07	0,13	0,3	44,7
	**ZP 10ER-FM**	■	■																0,05	0,08	0,3	8,9
	ZP 12ER-FM	■	■																0,05	0,08	0,3	10,7
	ZP 16ER-FM	■	■																0,06	0,10	0,3	14,4
	ZP 20ER-FM	■	□																0,06	0,10	0,3	17,9
	ZP 25ER-FM	■	□																0,08	0,13	0,3	22,3
	ZP 32ER-FM	■	□																0,08	0,14	0,3	28,6
	**ZP 12ER-M**		■	■	■														0,06	0,10	0,3	10,7
	ZP 16ER-M		■	■	■														0,07	0,12	0,3	14,4
	ZP 20ER-M		■	■															0,07	0,12	0,3	17,9
	ZP 25ER-M		■	■															0,08	0,15	0,3	22,3
	ZP 32ER-M		■	■															0,10	0,18	0,3	28,6
	**ZP 16ER-R**		■																0,09	0,15	0,3	14,4
	ZP 20ER-R		■																0,09	0,15	0,3	17,9
	ZP 25ER-R		■																0,12	0,21	0,3	22,3
	ZP 32ER-R		■	■															0,12	0,20	0,3	28,6
	ZP 40ER-R		■																0,12	0,24	0,3	35,7
	ZP 50ER-R		□																0,15	0,25	0,3	44,7

● standard in stock / ○ standard non in stock, ■ standard in stock dal 01/04/2014 / □ standard non in stock dal 01/04/2014
● stocked as standard / ○ not stocked as standard, ■ stocked as standard from 1. 4. 2014 / □ not stocked as standard from 1. 4. 2014
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UP! GRADE®

PARTE TECNICA

TECHNICAL INFORMATION

SUDDIVISIONE DEI MATERIALI LAVORATI
CLASSIFICATION OF MACHINED MATERIALS

La corretta identificazione del materiale lavorato è uno dei fattori più importanti quando si scelgono l'utensile e le condizioni di lavorazione iniziali. Al fine di semplificare questo compito, i materiali lavorati sono suddivisi in sei gruppi di base, o in ventiquattro sottogruppi, in cui sono raggruppati materiali che, dal punto di vista qualitativo, generano lo stesso tipo di carico (deformazione) sul tagliente, provocando quindi un tipo di usura simile.

Pertanto, il primo passo è assegnare il materiale del pezzo a uno dei (sotto)gruppi (vedi tabella 1 seguente).

Correctly identifying the machined material is one of the most important factors when choosing the tool and the initial machining conditions. To facilitate this, the machined materials are divided into six basic groups, or into twenty-four subgroups, combining materials that qualitatively cause the same type of loading (straining) on the cutting edge and therefore a similar type of wear.

Thus the first step is to assign the workpiece material to one of the (sub)groups - see table 1. below.

Tabella 1

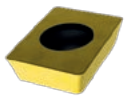
Table 1

Gruppo Group	Sottogruppo Subgroup	Definizione di sottogruppi	Subgroup definition	Esempio Example	Correzione lo standard Correction to standard
P	P1	Acciaio e acciaio fuso con lavorabilità molto buona (potenziata); acciaio automatico e a basso contenuto di carbonio	Steel and cast steel with very good (enhanced) machinability; automatic steel and low-carbon steel	ČSN 11 109	1,33
	P2	Acciaio fuso e acciaio non legati e debolmente legati con un contenuto di carbonio medio (0,25<C<0,55); rigidità fino a 900 MPa e durezza di 160-255 HB	Non-alloy and low-alloy cast steel and steel with a medium carbon content (0.25<C<0.55); rigidity of up to 900 MPa and hardness of 160-255 HB	ČSN 12 050	1,00
	P3	Acciaio fuso e acciaio non legati e debolmente legati con un contenuto di carbonio medio meno lavorabili; rigidità fino a 1.000 MPa e durezza fino a 300 HB	Less machinable non-alloy and low-alloy cast steel and steel with a medium carbon content; rigidity of up to 1000 MPa and hardness of up to 300 HB	ČSN 15 340	0,80
	P4	Acciaio fuso e acciaio altamente e mediamente legati (generalmente con un contenuto di carbonio di 0,55 <C); rigidità fino a 1.270 MPa e durezza fino a 375 HB (rispettivamente 40 HRC)	Medium- to high-alloy cast steel and steel (usually with a carbon content of 0.55 <C); rigidity of up to 1270 MPa and hardness of up to 375HB (resp. 40 HRC)	ČSN 19 436	0,60
M	M1	Acciaio ferritico resistente alla corrosione	Ferritic corrosion-resistant steel	ČSN 17041	1,09
	M2	Acciaio martensitico resistente alla corrosione	Martensitic corrosion-resistant steel	ČSN 17042	1,06
	M3	Acciaio austenitico resistente alla corrosione	Austenitic corrosion-resistant steel	ČSN 17 247	1,00
	M4	Acciaio ferritico-austenitico (duplex) e super austenitico resistente alla corrosione	Ferritic-austenitic (duplex) and super-austenitic corrosion-resistant steel	ČSN 17 465	0,93
K	K1	Ghisa grigia	Grey cast iron	ČSN 42 2425	1,00
	K2	Ghisa temperata	Tempered cast iron	ČSN 42 2545	0,95
	K3	Ghisa duttile, ferritica e ferrito-perlitica	Ductile cast iron ferritic and ferrite-pearlite	ČSN 42 2304	0,90
	K4	Ghisa duttile ferrito-perlitica, perlito-sorbitica e perlitica	Ductile cast iron pearlite-ferritic, pearlite-sorbitic and pearlite	ČSN 42 2307	0,85
N	N1	Alluminio e rispettive leghe morbide (a basso contenuto di Si), formati in modo particolare e fusi (non temprati); durezza fino a 100 HB	Aluminium and its soft alloys (with a low Si content), particularly formed and cast (non-hardened); hardness of up to 100 HB	ČSN 42 4400	1,00
	N2	Leghe di Al duro, particolarmente fuse e temprate (ad alto contenuto di Si)	Hard Al alloys, particularly cast and hardened (with a high Si content)	ČSN 42 4330	0,65
	N3	Leghe di Cu morbide, ottone automatico e altri tipi di ottone e bronzo morbidi	Soft Cu alloys, automatic brass and other types of soft brass and bronze	ČSN 42 3135	0,60
	N4	Leghe di Cu dure e meno lavorabili	Less machinable and hard Cu alloys	ČSN 42 3145	0,40
S	S1	Titanio puro, leghe α , $\alpha+\beta$ e β, leghe affinate e invecchiate	Technically pure Ti, alloys α , $\alpha+\beta$ and β, refined and aged alloys	TiAl6V4	1,75
	S2	Leghe a base di Fe	Fe-based alloys	INCOLOY 800	1,20
	S3	Leghe a base di Ni	Ni-based alloys	INCONEL 718	1,00
	S4	Leghe a base di Co	Co-based alloys	Haynes 25	0,75
H	H1	Acciaio per utensili duri e altamente rigidi e acciaio temprato e affinato con una durezza di 40-50 HRC	Highly rigid and hard tool steel and hardened and refined steel with a hardness of 40-50 HRC	ČSN 19 854	1,15
	H2	Ghisa bianca e temprata 350-600 HV	Hardened and white cast iron 350-600 HV	ČSN 42 2483	1,10
	H3	Acciaio temprato e affinato con durezza compresa nell'intervallo di 50-55 HRC	Hardened and refined steel with hardness in the 50-55 HRC range	ČSN 19 552.4	1,00
	H4	Acciaio temprato e affinato (principalmente per utensili) con durezza superiore a 55 HRC	Hardened and refined (mostly tool) steel with hardness of more than 55 HRC	ČSN 19 436.4	0,95

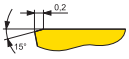
TIPO DI INSERTO
TYPE OF CUTTING INSERTS

ADEW

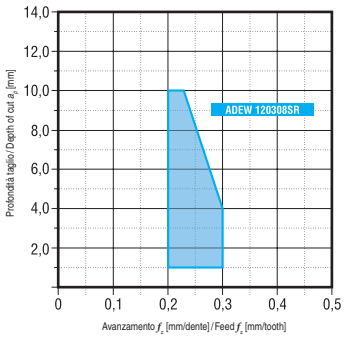
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	◥	□	■			■
Media Medium	◥	□	■			■
Sgrossatura Roughing	◥	□	■			■



Descrizione Description: ADEW 120308SR

Utilizzo inserto / Applies to inserts:

- geometria con angolo neutro dell'inserto
- adatto per la fresatura di materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P e, in determinate condizioni, anche per il gruppo M

- geometry with zero rake
- suitable for machining material groups K and H; can also be used with material group P and potentially group M

Utilizzo inserto / Range of cutting conditions:

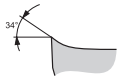
f_z	0,20 ÷ 0,30 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 10,0 [mm]

ADEX11-FA

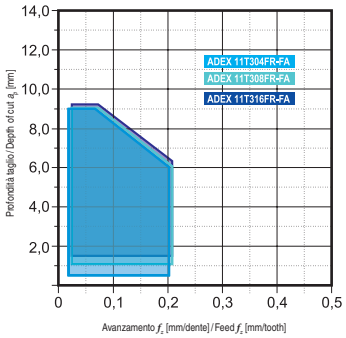
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing				■		
Media Medium				■		
Sgrossatura Roughing				■		



Descrizione Description: ADEX 11T304FR-FA, ADEX 11T308FR-FA, ADEX 11T316FR-FA

Utilizzo inserto / Applies to inserts:

- geometria altamente positiva con un tagliente affilato
- l'applicazione principale è la lavorazione dei materiali del gruppo N
- piano dell'inserto lucidato per ridurre l'adesione del materiale lavorato

- high positive geometry with a sharp cutting edge
- main application is machining materials in group N
- polished insert face to reduce sticking of the machined material

Utilizzo inserto / Range of cutting conditions:

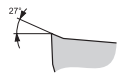
f_z	0,03 ÷ 0,20 [mm/dente] / [mm/tooth]
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

ADEX16-FA

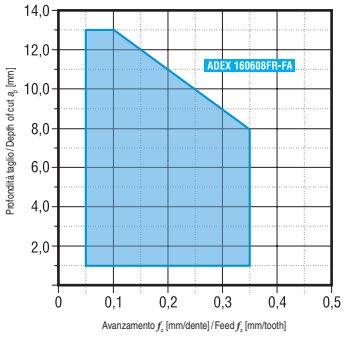
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing				■		
Media Medium				■		
Sgrossatura Roughing				■		



Descrizione Description: ADEX 160608FR-FA

Utilizzo inserto / Applies to inserts:

- geometria altamente positiva con un tagliente affilato
- l'applicazione principale è la lavorazione dei materiali del gruppo N
- piano dell'inserto lucidato per ridurre l'adesione del materiale lavorato

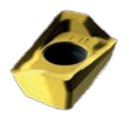
- high positive geometry with a sharp cutting edge
- main application is machining materials in group N
- polished insert face to reduce sticking of the machined material

Utilizzo inserto / Range of cutting conditions:

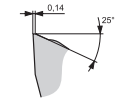
f_z	0,05 ÷ 0,35 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 13,0 [mm]

ADEX16-FM

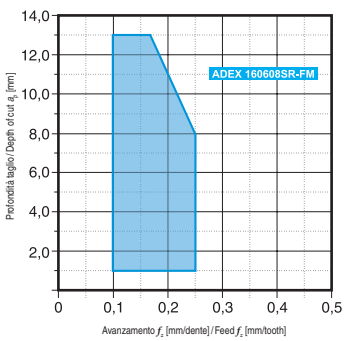
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	■	■		◥	
Media Medium	■	■	■		□	
Sgrossatura Roughing	◥	◥	◥		□	



Descrizione Description: ADEX 160608SR-FM

Utilizzo inserto / Applies to inserts:

- geometria fortemente positiva con rinforzo del tagliente medio
- adatta per lavorazione di materiali gruppi P, M, K and S
- per condizioni di lavoro medie
- accorgimenti speciali per il miglioramento della qualità della superficie

- high positive geometry with medium T-land
- suitable for machining material groups P, M, K, and S
- for medium machining conditions
- special adjustment for better surface quality

Utilizzo inserto / Range of cutting conditions:

f_z	0,10 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 13,0 [mm]

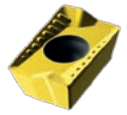
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

TIPO DI INSERTO
TYPE OF CUTTING INSERTS

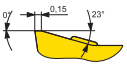
ADKT

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

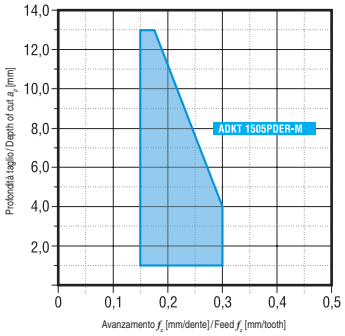
ADKT 1505PDER-M



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing: ■ ■ ■ ◥
Media / Medium: ■ ■ ■ □
Sgrossatura / Roughing: ◥ ◥ ◥ □



- geometria con un angolo del piano altamente positivo e nervature per ridurre il contatto tra il truciolo e il piano
- idonea per la lavorazione dei gruppi di materiali P, M e K; può essere usato anche con il gruppo di materiali S

- geometry with a high positive face angle and ribs to reduce contact between the chip and the face
- suitable for machining material groups P, M, and K; can also be used with material group S

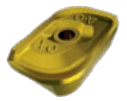
Utilizzo inserto / Range of cutting conditions:

f_z	0,15 ÷ 0,30 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 13,0 [mm]

ADKX

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

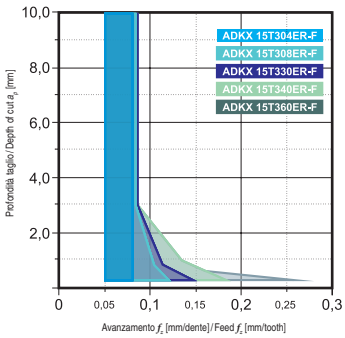
ADKX 15T3..ER-F



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing: ■ ■ □ □ ■
Media / Medium: ■ ■ □ □ ◥
Sgrossatura / Roughing: ◥ ◥ ◥ □



- geometria di taglio altamente positiva e affilata
- idonea per la lavorazione dei gruppi di materiali P, M ed S, potenzialmente, per i gruppi di materiali K ed N
- particolarmente adatta alla lavorazione leggera e media

- very positive and sharp cutting geometry
- suitable for machining material groups P, M, and S; potentially for material groups K and N
- particularly suited to light and medium machining

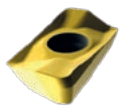
Utilizzo inserto / Range of cutting conditions:

f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

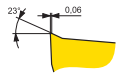
ADMX11-F

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

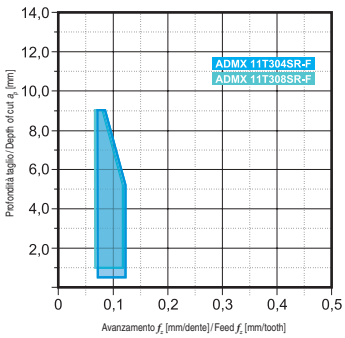
ADMX 11T308SR-F, ADMX 11T304SR-F



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing: ■ ■ ◥ ■ ◥
Media / Medium: ■ ■ □ ◥ □
Sgrossatura / Roughing: □ □ □ ◥ □



- geometria altamente positiva con un piccolo rinforzo sul tagliente
- adatta per lavorazione di materiali gruppi P, M ed N
- geometria indicata per lavorazioni leggere

- very positive geometry with a narrow peripheral chamfered edge
- suitable for machining material groups P, M, and N; also for groups K and S
- particularly suited to light machining

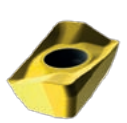
Utilizzo inserto / Range of cutting conditions:

f_z	0,07 ÷ 0,12 [mm/dente] / [mm/tooth]
a_p	(0,5) 1,0 ÷ 9,0 [mm]

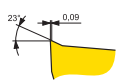
ADMX11-M

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

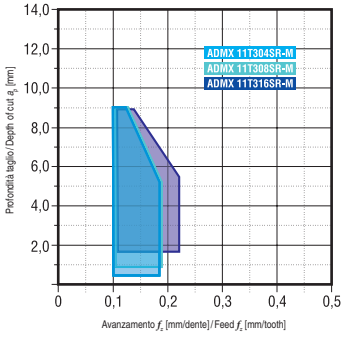
ADMX 11T308SR-M, ADMX 11T304SR-M
ADMX 11T316SR-M



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing: ■ ■ ■ □ ◥
Media / Medium: ■ ■ ■ ◥ □
Sgrossatura / Roughing: ◥ ◥ ◥ ◥ □



- geometria altamente positiva con medio rinforzo T
- adatta per i materiali dei gruppi P, M, K, ed S
- per condizioni di lavoro medie
- disponibile anche con raggi 0,4 ed 1,6

- very positive geometry with a medium peripheral chamfered edge
- suitable for machining material groups P, M, K, and S; potentially also group N
- particularly suited to light and medium machining
- offered with radii of 0.4, 0.8 and 1.6

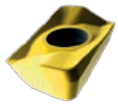
Utilizzo inserto / Range of cutting conditions:

f_z	0,1 ÷ 0,18 (0,22) [mm/dente] / [mm/tooth]
a_p	(0,5) 1,0 (1,8) ÷ 9,0 [mm]

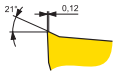
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

ADMX11-R

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H)

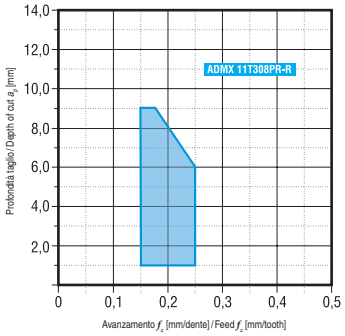


Profilo del tagliente / Profile of cutting edge



Leggera / Finishing	■ ◪ ■ ◪ ◪
Media / Medium	■ ◪ ■ □ □
Sgrossatura / Roughing	■ ◪ ■ □ □

Diagramma di applicazione / Diagram of application



Descrizione / Description: ADMX 11T308PR-R

Utilizzo inserto / Applies to inserts: ADMX 11T308PR-R

- geometria positiva con doppio rinforzo T
- adatta per lavorazione di materiali gruppi P, M, K, ed S
- geometria adattabile anche a condizioni di lavoro meno stabili

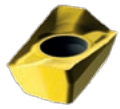
- positive geometry with a double T-land
- suitable for machining material groups P, M, K, and S
- geometry also suited to less stable working conditions

Utilizzo inserto / Range of cutting conditions:

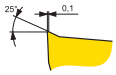
f_z	0,15 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 9,0 [mm]

ADMX16-F

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H)

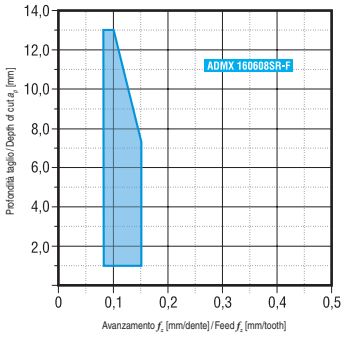


Profilo del tagliente / Profile of cutting edge



Leggera / Finishing	■ ■ ◪ ■ ◪
Media / Medium	■ ■ ◪ ◪ □
Sgrossatura / Roughing	□ □ □ ◪ □

Diagramma di applicazione / Diagram of application



Descrizione / Description: ADMX 160608SR-F

Utilizzo inserto / Applies to inserts: ADMX 160608SR-F

- geometria altamente positiva con rinforzo minimo sul tagliente
- adatta per tutti i gruppi di materiale eccetto il gruppo H
- adatta per lavorazioni leggere e per lavorazioni medie

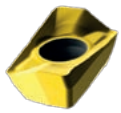
- high positive geometry with a narrow T-land
- suitable for machining materials in all groups except for group H
- particularly suited to light and medium machining conditions

Utilizzo inserto / Range of cutting conditions:

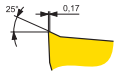
f_z	0,07 ÷ 0,15 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 13,0 [mm]

ADMX16-M

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H)

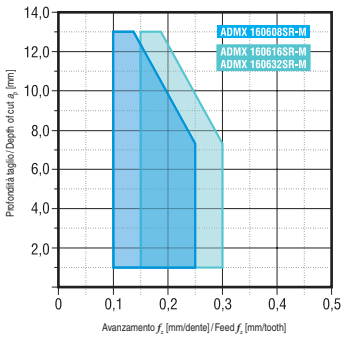


Profilo del tagliente / Profile of cutting edge



Leggera / Finishing	■ ■ ■ ◪
Media / Medium	■ ■ ■ □
Sgrossatura / Roughing	◪ ◪ ◪ □

Diagramma di applicazione / Diagram of application



Descrizione / Description: ADMX 160608SR-M, ADMX 160616SR-M ADMX 160632SR-M

Utilizzo inserto / Applies to inserts: ADMX 160608SR-M, ADMX 160616SR-M ADMX 160632SR-M

- geometria altamente positiva con medio rinforzo sul tagliente
- adatta per i gruppi di materiale P, M, K ed S
- per condizioni di lavoro medie
- disponibile anche con raggi 1,6 e 3,2

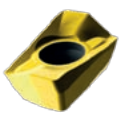
- high positive geometry with a medium T-land
- suitable for machining material groups p, M, K, and S
- suited to medium machining conditions
- also available with corner radii of 1.6 and 3.2

Utilizzo inserto / Range of cutting conditions:

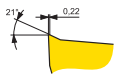
f_z	0,1 (0,15) ÷ 0,25 (0,3) [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 13,0 [mm]

ADMX16-R

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H)

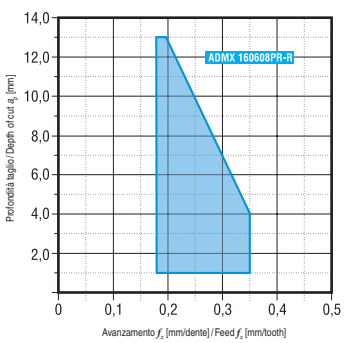


Profilo del tagliente / Profile of cutting edge



Leggera / Finishing	■ ◪ ■ ◪ ◪
Media / Medium	■ ◪ ■ □ ◪
Sgrossatura / Roughing	■ ◪ ■ □ □

Diagramma di applicazione / Diagram of application



Descrizione / Description: ADMX 160608PR-R

Utilizzo inserto / Applies to inserts: ADMX 160608PR-R

- geometria positiva con doppio rinforzo sul tagliente
- adatta per i gruppi materiale P, M, K ed S
- per condizioni di lavoro medie e medio-alte

- positive geometry with a double peripheral chamfered edge
- suitable for machining material groups P, M, K, and also S and H
- geometry also suited to medium and heavier machining conditions

Utilizzo inserto / Range of cutting conditions:

f_z	0,17 ÷ 0,35 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 13,0 [mm]

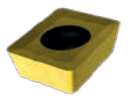
■ Applicazione principale ◪ Applicazione secondaria □ Applicazione possibile
■ Main application ◪ Secondary application □ Supplementary application

TIPO DI INSERTO
TYPE OF CUTTING INSERTS

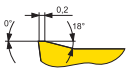
APET

Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

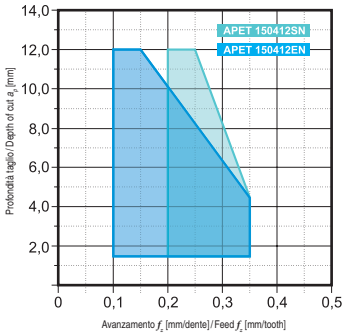
APET 150412EN, APET 150412SN



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	■	◥		◥	□
Media Medium	■	■	◥		◥	□
Sgrossatura Roughing	■	■	◥		◥	□



- geometria con angolo positivo dell'inserto
- adatto per la fresatura dei materiali dei gruppi P, M
- utilizzabile anche per materiali dei gruppi K e S e, a certe condizioni, anche H
- disponibile la realizzazione dei taglienti „E" e „S"

- geometry with a positive rake angle
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H
- available with „E" and „S" cutting edge designs

Utilizzo inserto / Range of cutting conditions:

f_z	(0,10) 0,20 ÷ 0,35 [mm/dente] / [mm/tooth]
a_p	1,5 ÷ 12,0 [mm]

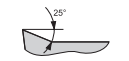
APET-FA

Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

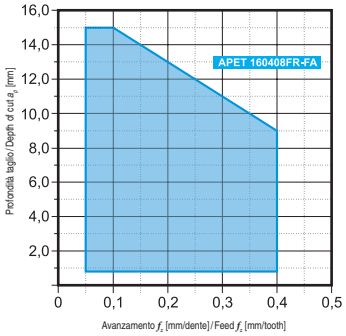
APET 160408FR-FA



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing				■		
Media Medium				■		
Sgrossatura Roughing				■		



- geometria con angolo positivo dell'inserto e tagliente affilato
- adatto per la fresatura di metalli non ferrosi – materiali del gruppo N

- geometry with a positive face angle and a sharp cutting edge
- suitable for machining non-iron metals, i.e. in material group N

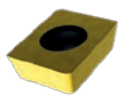
Utilizzo inserto / Range of cutting conditions:

f_z	0,05 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	0,8 ÷ 15,0 [mm]

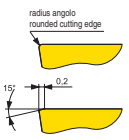
APEW

Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

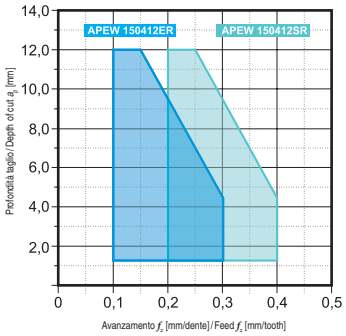
APEW 150412ER, APEW 150412SR



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	◥	□	■			■
Media Medium	◥	□	■			■
Sgrossatura Roughing	◥	□	■			■



- geometria con angolo neutro dell'inserto
- adatta per la fresatura dei materiali dei gruppi K e H
- inoltre utilizzabile per materiali del gruppo P e, a certe condizioni, anche per il gruppo M
- disponibile la realizzazione dei taglienti „E" e „S"

- geometry with a zero face angle
- suitable for machining material groups K and H
- can also be used with materials in group P and potentially group M
- available with „E" and „S" cutting edge designs

Utilizzo inserto / Range of cutting conditions:

f_z	(0,10) 0,20 ÷ (0,30) 0,40 [mm/dente] / [mm/tooth]
a_p	1,2 ÷ 12,0 [mm]

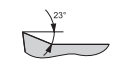
APKT 10-FA

Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

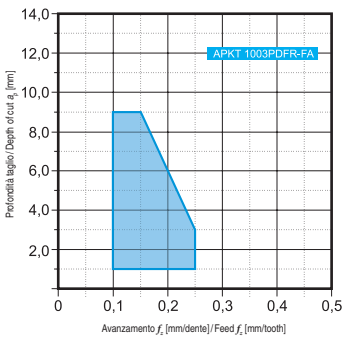
APKT 1003PDFR-FA



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing				■		
Media Medium				■		
Sgrossatura Roughing						



- geometria molto positiva con tagliente affilato
- idonea per la lavorazione di metalli non ferrosi, ovvero del gruppo di materiali N
- condizioni di lavorazione da leggere a medie

- geometry with a positive face angle and minimum cutting edge roundness
- suitable for machining non-iron metals, i.e. in material group N
- light to medium machining conditions

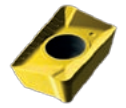
Utilizzo inserto / Range of cutting conditions:

f_z	0,10 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 9,0 [mm]

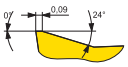
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

APKT 10..-M

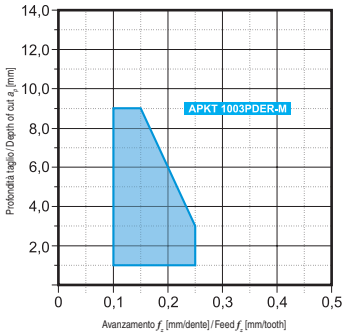
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: APKT 1003PDER-M



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	■		◥	
Media Medium	■	■	■		◥	
Sgrossatura Roughing	◥	◥	◥		□	



- geometria molto positiva con rinforzo medio del tagliente
- idonea per la lavorazione dei gruppi di materiali P, M e K; può essere utilizzata anche per il gruppo di materiali S
- condizioni di lavorazione da leggere a più pesanti

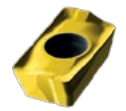
- geometry with a high positive face angle and a narrow peripheral chamfered edge
- suitable for machining material groups P, M, and K; can also be used for material group S
- light to heavier machining conditions

Utilizzo inserto / Range of cutting conditions:

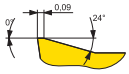
f_z	0,10 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 9,0 [mm]

APKT-GM

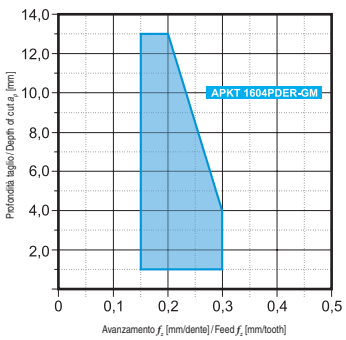
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: APKT 1604PDER-GM



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	■		◥	
Media Medium	■	■	■		◥	
Sgrossatura Roughing	◥	◥	◥		□	



- geometria molto positiva con rinforzo medio del tagliente
- idonea per la lavorazione dei gruppi di materiali P, M e K; può essere utilizzata anche per il gruppo di materiali S
- condizioni di lavorazione da leggere a più pesanti

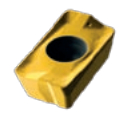
- geometry with a high positive face angle and a narrow peripheral chamfered edge
- suitable for machining material groups P, M, and K; can also be used for material group S
- light to heavier machining conditions

Utilizzo inserto / Range of cutting conditions:

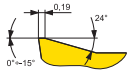
f_z	0,15 ÷ 0,30 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 13,0 [mm]

APKT-HM

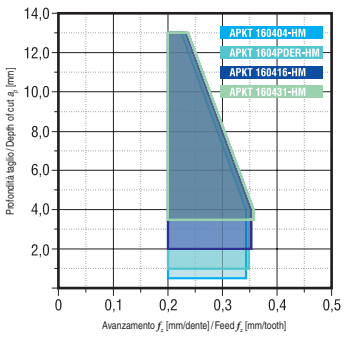
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: APKT 1604PDER-HM, APKT 160404-HM APKT 160416-HM, APKT 160431-HM



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	■		□	
Media Medium	■	■	■		◥	
Sgrossatura Roughing	■	■	■		◥	



- geometria molto positiva con rinforzo medio del tagliente
- idonea per la lavorazione dei gruppi di materiali P, M e K; può essere utilizzata anche per il gruppo di materiali S
- disponibile con raggi da 0,4, 1,6 3,1
- condizioni di lavorazione da leggere a più pesanti

- geometry with a high positive face angle and a medium peripheral chamfered edge
- suitable for machining material groups P, M, and K; can also be used for material group S
- offered with radii of 0.4, 1.6, 3.1
- light to heavier machining conditions

Utilizzo inserto / Range of cutting conditions:

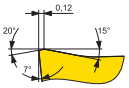
f_z	0,20 ÷ 0,35 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 13,0 [mm]

CCMX TS1

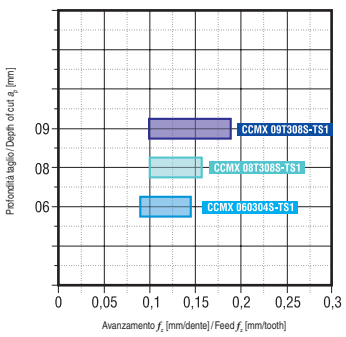
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: CCMX 060304S-TS1, CCMX 08T308S-TS1 CCMX 09T308S-TS1



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	■	□	◥	□
Media Medium	■	■	■	□	◥	□
Sgrossatura Roughing						



- geometria speciale per frese progettate per la lavorazione di scanalature a T
- idonea per la lavorazione dei gruppi di materiali P, M, K ed S, potenzialmente, dei gruppi N ed H
- condizioni di lavorazione da leggere a medie

- special geometry for milling cutters designed for machining T-grooves
- suitable for machining material groups P, M, K, and S; potentially groups N and H
- light to medium machining conditions

Utilizzo inserto / Range of cutting conditions:

f_z	0,08 (0,10) ÷ 0,14 (0,16) (0,18) [mm/dente] / [mm/tooth]
a_p	-

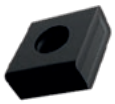
IMPERO PRAMET

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

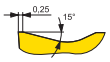
TIPO DI INSERTO
TYPE OF CUTTING INSERTS

CNM

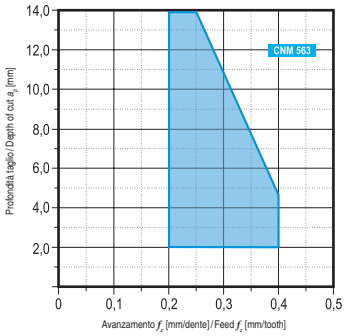
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts: CNM 563



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing: P ◥, K ◥
Media / Medium: P ■, K ■
Sgrossatura / Roughing: P ■, K ■



- geometria di taglio stabile con leggera positività all'inserto
- adatto per la fresatura dei materiali dei gruppi P e K
- per lavorazioni a penetrazione assiale

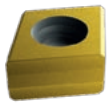
- stable cutting geometry with a positive rake angle
- suitable for machining material groups P and K
- for plunge milling

Utilizzo inserto / Range of cutting conditions:

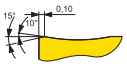
f_z	0,20 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	2,0 ÷ 14,0 [mm]

CNHQ

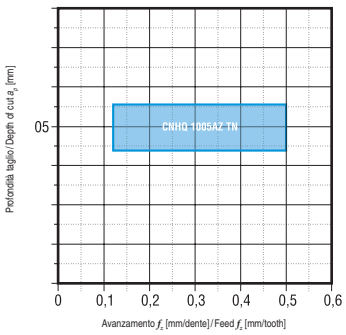
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts: CNHQ 1005AZ TN



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing: P ■, K ■, N □, S ◥, H □
Media / Medium: P ■, K ■, N □, S ◥, H □
Sgrossatura / Roughing: P ■, K ■, N □, S ◥, H □



- geometria di taglio universale
- adatta per lavorazione di materiali gruppi P,M,K ed S
- destinata soprattutto per lavorazioni leggere, medie o pesante

- universal cutting geometry for inserts on disc milling cutters
- suitable for machining material groups P, M, K and S; potentially groups N and H
- suitable for light, medium and heavy milling conditions

Utilizzo inserto / Range of cutting conditions:

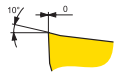
f_z	0,10 ÷ 0,50 [mm/dente] / [mm/tooth]
a_p	-

HNEF-F

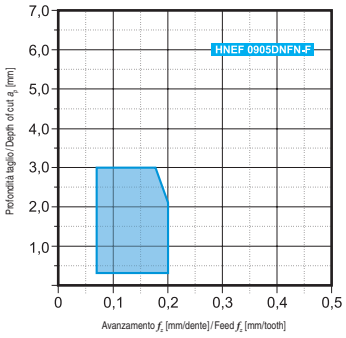
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts: HNEF 0905DNFN-F



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing: P ◥, K ■, N ◥, S ◥, H □
Media / Medium: P □, K ◥, N □, S □, H □
Sgrossatura / Roughing: P □, K □, N □, S □, H □



- geometria positiva senza rinforzo sul tagliente
- appositamente progettata per la lavorazione del gruppo di materiali K e, potenzialmente, per i gruppi di materiali P, N ed S il tipo di bloccaggio potrebbe limitare l'evacuazione del truciolo
- particolarmente adatta alla lavorazione leggera

- positive geometry without chamfered edge
- specially designed for machining material group K and potentially for material groups P, N, and S (due to the high level of serration on the milling cutters, there is a danger of the chip space being clogged by a continuous chip)
- particularly suited to light machining

Utilizzo inserto / Range of cutting conditions:

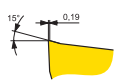
f_z	0,07 ÷ 0,2 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 3,0 [mm]

HNEF-M

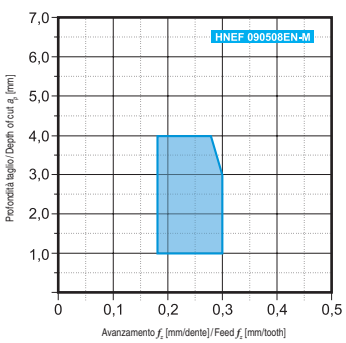
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts: HNEF 0905DNFN-M



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing: P ◥, K ■
Media / Medium: P □, K ■
Sgrossatura / Roughing: P □, K □, N □, S □, H □



- geometria positiva con un tagliente periferico con rinforzo medio
- appositamente progettata per la lavorazione del gruppo di materiali K e, potenzialmente, del gruppo di materiali P il tipo di bloccaggio potrebbe limitare l'evacuazione del truciolo
- particolarmente adatta alla lavorazione leggera e media

- positive geometry with a medium peripheral chamfered edge
- specially designed for machining material group K and potentially material group P (due to the high level of serration on the milling cutters, there is a danger of the chip space being clogged by a continuous chip)
- particularly suited to light and medium machining

Utilizzo inserto / Range of cutting conditions:

f_z	0,18 ÷ 0,3 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 4,0 [mm]

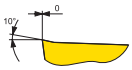
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

HNEF-W

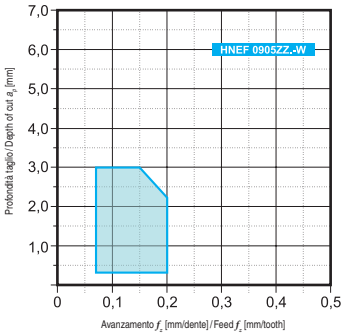
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: HNEF 0905ZZL-W, HNEF 0905ZZR-W



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	◥		■	◥	◥	
Media Medium	□		◥	□	□	
Sgrossatura Roughing						



- geometria di finitura raschiante
- appositamente progettata per la lavorazione del gruppo di materiali K e, potenzialmente, dei gruppi di materiali P, N ed S il tipo di bloccaggio potrebbe limitare l'evacuazione del truciolo
- 1-2 inserti montati insiemi agli altri inserti standard
- particolarmente adatta alla lavorazione leggera

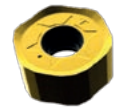
- finishing geometry
- specially designed for machining material group K and potentially material groups P, N, and S (due to the high level of serration on the milling cutters, there is a danger of the chip space being clogged by a continuous chip)
- two inserts are fixed to a milling cutter (normal inserts are to be attached to the remaining positions)
- particularly suited to light machining

Utilizzo inserto / Range of cutting conditions:

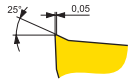
f_z	0,07 ÷ 0,20 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 3,0 [mm]

HNGX 06-F

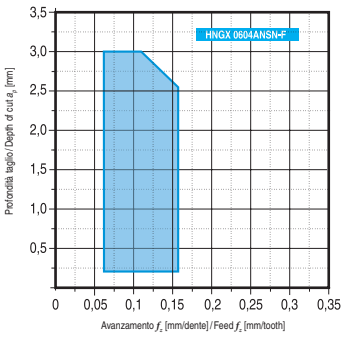
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: HNGX 0604ANSN-F



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	◥	□	□	□	
Media Medium	■	◥	□	□	□	
Sgrossatura Roughing	◥	□				



- geometria altamente positiva con piccolo rinforzo del tagliente
- adatta per la lavorazione dei materiali gruppo P, condizionatamente per gruppi K, M, N e S
- specialmente adatta per lavorazioni leggere

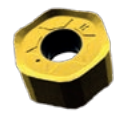
- high positive geometry with a narrow peripheral chamfered edge
- suitable for machining material group P and potentially material groups M, K, N, and S
- particularly suited to light machining and stable machining conditions

Utilizzo inserto / Range of cutting conditions:

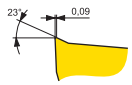
f_z	0,08 ÷ 0,17 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 3,0 [mm]

HNGX 06-M

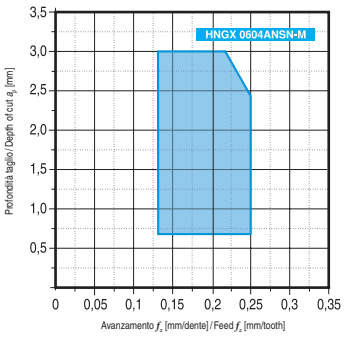
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: HNGX 0604ANSN-M



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	◥	■		□	
Media Medium	■	◥	■	□	□	
Sgrossatura Roughing	◥	◥	◥		□	



- geometria altamente positiva con rinforzo medio del tagliente
- adatta per la lavorazione dei materiali gruppi P e K, condizionatamente per i gruppi M, N e S
- adatta per lavorazioni medie

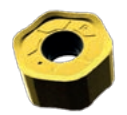
- high positive geometry with medium T-land
- suitable for machining material groups P and K, potentially groups M, N, and S
- particularly suited to medium machining

Utilizzo inserto / Range of cutting conditions:

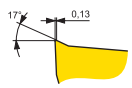
f_z	0,13 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	0,7 ÷ 3,0 [mm]

HNGX 06-R

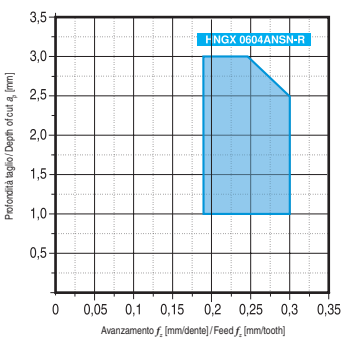
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: HNGX 0604ANSN-R



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	□	■		□	◥
Media Medium	■	◥	■		◥	◥
Sgrossatura Roughing	■	◥	■		□	□



- geometria altamente positiva con elevato rinforzo del tagliente
- adatta per la lavorazione dei materiali gurppi P e K, condizionatamente per i gruppi M, S e H
- adatta per lavorazioni medio - pesanti

- high positive geometry with medium T-land
- suitable for machining material groups P and K, potentially groups M, S, and H
- particularly suited to medium to heavy machining

Utilizzo inserto / Range of cutting conditions:

f_z	0,13 ÷ 0,3 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 3,0 [mm]

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

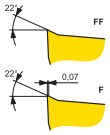
TIPO DI INSERTO
TYPE OF CUTTING INSERTS

HNGX 09 -FF/-F

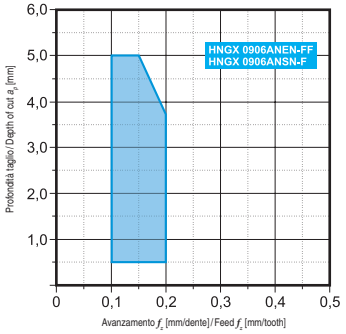
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: HNGX 0906ANEN-FF, HNGX 0906ANSN-F



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	□	□	□	
Media Medium	■	■	□	□	□	
Sgrossatura Roughing	◥	□				



- geometria altamente positiva con rinforzo minimo (F) o nullo (FF) del tagliente
- idonea per la lavorazione dei gruppi di materiali P ed M; potenzialmente anche dei gruppi di materiali K, N ed S
- particolarmente adatta a lavorzioni leggere e medio-leggere

- high positive geometry with a narrow peripheral chamfered edge (geometry F) or without peripheral chamfered edge (geometry FF)
- suitable for machining material groups P and M; potentially also material groups K, N, and S
- particularly suited to light and medium machining

Utilizzo inserto / Range of cutting conditions:

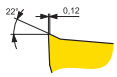
f_z	0,1 ÷ 0,2 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 5,0 [mm]

HNGX 09 -M

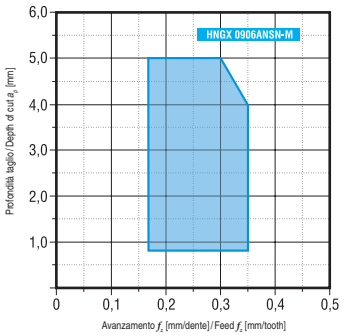
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: HNGX 0906ANSN-M



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	■		□	
Media Medium	■	■	■	□	□	
Sgrossatura Roughing	◥	◥	◥		□	



- geometria altamente positiva con rinforzo medio del tagliente
- adatta per la lavorazione dei materiali gruppi P, M, K e condizionatamente per gruppi N ed S
- specialmente adatta per lavorazioni medie

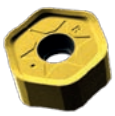
- high positive geometry with a medium T-land
- suitable for machining material groups P, M, and K; potentially groups N and S
- particularly suited to medium machining

Utilizzo inserto / Range of cutting conditions:

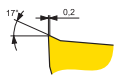
f_z	0,17 ÷ 0,35 [mm/dente] / [mm/tooth]
a_p	0,8 ÷ 5,0 [mm]

HNGX 09 -R

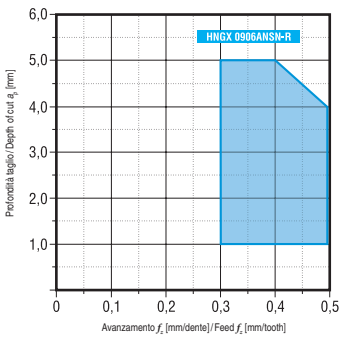
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: HNGX 0906ANSN-R



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	□	■		□	◥
Media Medium	■	◥	■		◥	◥
Sgrossatura Roughing	■	◥	■		□	□



- geometria positiva con rinforzo elevato del tagliente
- adatta per la lavorazione dei materiali gruppi P, K, e anche gruppi M, S e H
- specialmente adatta per lavorazioni medio-pesanti

- positive geometry with a medium T-land
- suitable for machining material groups P and K, and also groups M, S, and H
- particularly suited to medium and heavy machining

Utilizzo inserto / Range of cutting conditions:

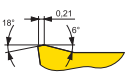
f_z	0,3 ÷ 0,5 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 5,0 [mm]

HNMF-R

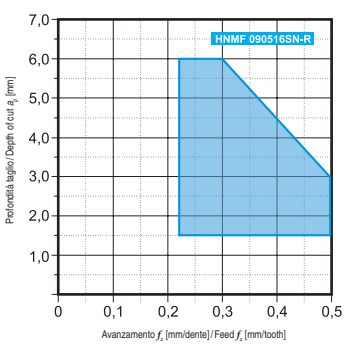
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: HNMF 090516SN-R



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing			◥		◥	
Media Medium	□		■		□	
Sgrossatura Roughing			■			



- geometria di taglio positiva, ma stabile con un tagliente smussato leggermente negativo
- appositamente progettata per la lavorazione del gruppo di materiali K e, potenzialmente, dei gruppi di materiali P ed H il tipo di bloccaggio potrebbe limitare l'evacuazione del truciolo
- particolarmente adatta alla lavorazione media e pesante

- positive but stable cutting geometry with a little negative chamfered edge
- specially designed for machining material group K and potentially material groups P and H (due to the high level of serration on the milling cutters, there is a danger of the chip space being clogged by a continuous chip)
- particularly suited to light and heavy machining

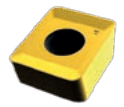
Utilizzo inserto / Range of cutting conditions:

f_z	0,22 ÷ 0,5 [mm/dente] / [mm/tooth]
a_p	1,5 ÷ 6,0 [mm]

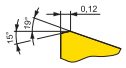
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

LNET

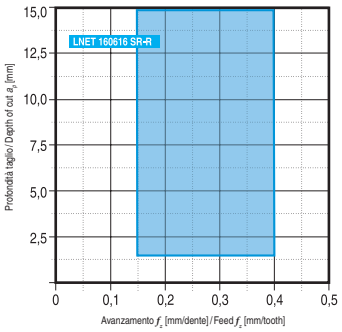
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: LNET 160616 SR-R



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■		■			
Media Medium	■		■			
Sgrossatura Roughing	■		■			



- geometria altamente positiva
- idonea per la lavorazione dei gruppi di materiali P e K
- per lavorazione media
- geometria adatta a condizioni di lavorazione meno stabili

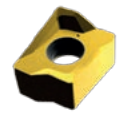
- high positive geometry
- suitable for machining material groups P and K
- for medium machining
- geometry suited to less stable machining conditions

Utilizzo inserto / Range of cutting conditions:

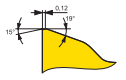
f_z	0,15 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	1,6 ÷ 15,0 [mm]

LNGU 16-M

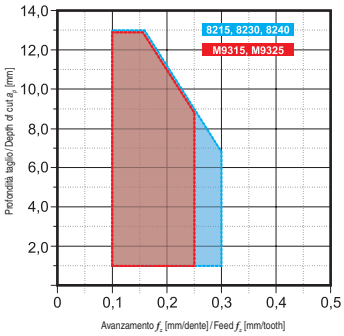
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: LNGU 160708SR-M



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	□	■			◥
Media Medium	■	□	■			□
Sgrossatura Roughing	◥	□	■			



- geometria altamente positiva
- adatta pere lavorare materiali dei gruppi P e K
- idonea per lavorazioni medie
- geometira adatta per condizioni di lavoro instabili

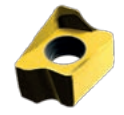
- high positive geometry
- suitable for machining material groups P and K, potentially group H
- for medium machining
- geometry suited to less stable machining conditions

Utilizzo inserto / Range of cutting conditions:

f_z	0,1 ÷ 0,3 [mm/dente] / [mm/tooth] (0,1 ÷ 0,25 pro / pre MT-CVD)
a_p	1,0 ÷ 13,0 [mm]

LNGX 12-M

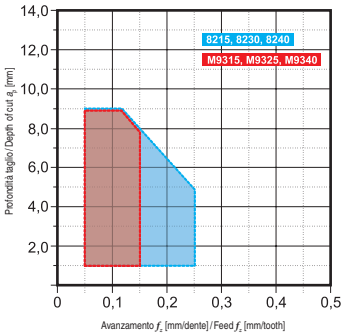
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: LNGX 120508ER-M



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	□	■			
Media Medium	■	□	■			
Sgrossatura Roughing						



- geometria positivasenza rinforzo periferico del tagliente
- adatta alla lavorazione dei materiali gruppi P, K ed alcuni gruppo M
- idonea per lavorazioni medio - leggere

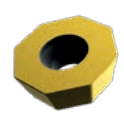
- high positive geometry without a peripheral stabilizing chamfered edge
- suitable for machining material groups P and K, and some materials in group M
- suited to light and medium machining conditions

Utilizzo inserto / Range of cutting conditions:

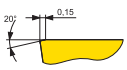
f_z	0,05 ÷ 0,25 [mm/dente] / [mm/tooth] (0,05 ÷ 0,15 pro / pre MT-CVD)
a_p	1,0 ÷ 9,0 [mm]

ODEW ZZN

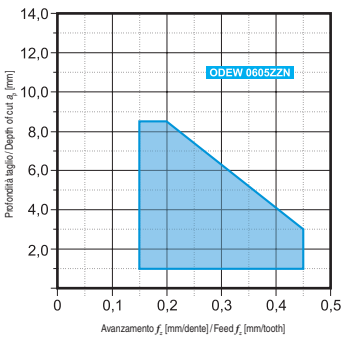
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: ODEW 0605ZZN



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	◥		■			■
Media Medium	◥		■			■
Sgrossatura Roughing	◥		■			■



- geometria piatta con rinforzo negativo medio del tagliente
- idonea per la lavorazione dei gruppi di materiali K ed H, può anche essere usata per il gruppo di materiali P
- fino ad otto taglienti, in funzione della profondità massima del taglio
- adatta a condizioni di lavorazione leggere e medie

- geometry with a zero face angle and a medium peripheral chamfered edge
- suitable for machining material groups K and H, can also be used for material group P
- up to eight inserts can be used depending on the maximum depth of the cut
- suited to light and medium machining conditions

Utilizzo inserto / Range of cutting conditions:

f_z	0,15 ÷ 0,45 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 8,6 [mm]

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

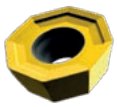
TIPO DI INSERTO
TYPE OF CUTTING INSERTS

ODMT

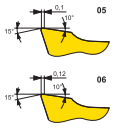
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

Fresatura Milling: P M K N S H

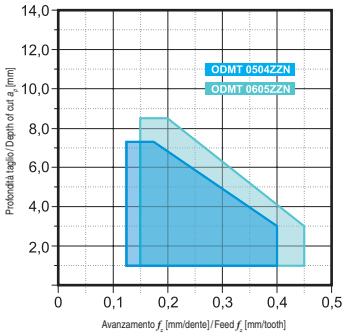
ODMT 0504ZZN, ODMT 0605ZZN



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	◥	■		□	□
Media Medium	■	◥	■		□	□
Sgrossatura Roughing	■	◥	■			



- geometria con angolo superiore leggermente positiva con piccolo rinforzo del tagliente
- idonea per la lavorazione dei gruppi di materiali P e K, può essere utilizzata anche per il gruppo di materiali M e, potenzialmente, per i gruppi di materiali S ed H
- fino ad otto taglienti, in funzione della profondità massima di taglio
- adatta a condizioni di lavorazione leggere

- geometry with a slightly positive face angle and a narrow peripheral chamfered edge
- suitable for machining of material groups P and K, can also be used for material group M and potentially for material groups S and H
- up to eight inserts can be used depending on the maximum depth of the cut
- suited to light machining conditions

Utilizzo inserto / Range of cutting conditions:

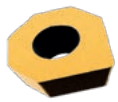
f_z	0,12(0,15) ÷ 0,40(0,45) [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 8,6 [mm]

ODMX

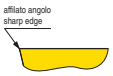
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

Fresatura Milling: P M K N S H

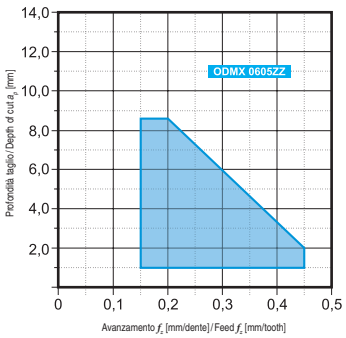
ODMX 0605ZZN



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	◥		■			■
Media Medium						
Sgrossatura Roughing						



- geometria raschiante con angolo neutro dell'inserto
- complementare agli inserti ODMT, ODMW
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P

- wiper geometry with zero rake
- accessory for ODMT and ODMW indexable cutting inserts
- suitable for machining material groups K and H, can also be used for material group P

Utilizzo inserto / Range of cutting conditions:

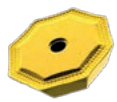
f_z	0,15 ÷ 0,45 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 8,6 [mm]

OFKR-M

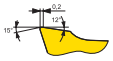
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

Fresatura Milling: P M K N S H

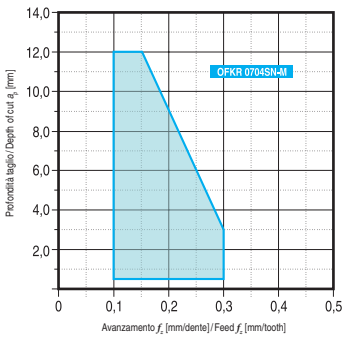
OFKR 0704SN-M



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	■	◥			
Media Medium	■	■	◥			
Sgrossatura Roughing						



- geometria con angolo superiore leggermente positiva con piccolo rinforzo del tagliente
- idonea per la lavorazione dei gruppi di materiali P ed M, può essere utilizzata anche per il gruppo di materiali K
- fino ad otto taglienti,, in funzione della profondità massima di taglio
- adatta ad applicazioni leggere e leggermente instabili

- geometry with a slightly positive face angle and a narrow peripheral chamfered edge
- suitable for machining material groups P and M, can also be used for material group K
- up to eight inserts can be used depending on the maximum depth of the cut
- suited to light to slightly impaired machining conditions

Utilizzo inserto / Range of cutting conditions:

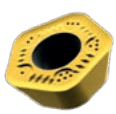
f_z	0,1 ÷ 0,3 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 12,0 [mm]

PDKT-FM

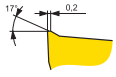
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

Fresatura Milling: P M K N S H

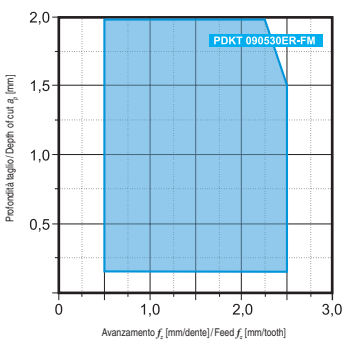
PDKT 090530ER-FM



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	■	◥	□	□	
Media Medium	■	■	□	□	□	
Sgrossatura Roughing	□	□				



- geometria positiva con rinforzo medio del tagliente e raggio inserto = 3 mm
- idonea per la lavorazione dei gruppi di materiali P ed M, potenzialmente, per i gruppi di materiali K, N ed S
- particolarmente adatta alla lavorazione leggera e media

- high positive geometry with a medium peripheral chamfered edge with an insert corner radius of r = 3 mm
- suitable for machining material groups P and M, potentially for material groups K, N, and S
- particularly suited to light and medium machining

Utilizzo inserto / Range of cutting conditions:

f_z	0,50 ÷ 2,50 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 2,0 [mm]

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

PDKX-FM

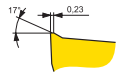
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

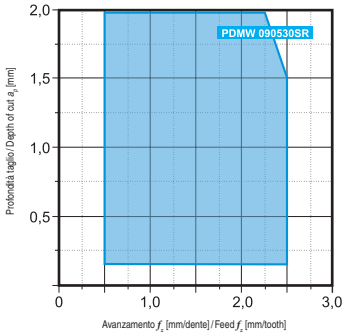
Fresatura Milling: **P** **M** **K** **N** **S** **H**

	P	M	K	N	S	H
Leggera Finishing	■	■	■	□	□	
Media Medium	■	■	■	□	□	
Sgrossatura Roughing	■	◪	■			



Profilo del tagliente
Profile of cutting edge





PDKX 0905ZEER-FM

- geometria positiva con tratto piano di 2 mm per buona finitura
- idonea per la lavorazione dei gruppi di materiali P, M e K, potenzialmente, per i gruppi di materiali N ed S
- particolarmente adatta alla lavorazione media

- high positive geometry with a finishing auxiliary chamfered edge with a length of 2 mm
- suitable for machining material groups P, M, and K, potentially for material groups N and S
- particularly suited to medium machining

Utilizzo inserto / Range of cutting conditions:

f_z	0,5 ÷ 2,50 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 2,0 [mm]

PDMW

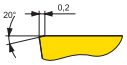
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

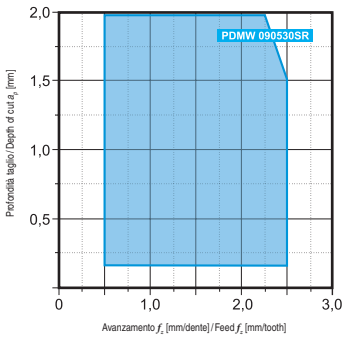
Fresatura Milling: **P** **M** **K** **N** **S** **H**

	P	M	K	N	S	H
Leggera Finishing	□		■			■
Media Medium	◪	□	■			◪
Sgrossatura Roughing	◪	□	■			



Profilo del tagliente
Profile of cutting edge





PDMW 090530SR

- geometria positiva a petto piano e raggio inserto = 3 mm
- idonea per la lavorazione dei gruppi di materiali K ed H, potenzialmente, per i gruppi di materiali P ed M
- particolarmente adatta a condizioni di lavorazione da medie a pesanti

- high positive geometry with a zero face angle and a large negative chamfered edge with an insert corner radius of r = 3 mm
- suitable for machining material groups K and H, potentially for material groups P and M
- particularly suited to medium to heavy machining conditions

Utilizzo inserto / Range of cutting conditions:

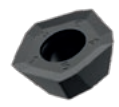
f_z	0,50 ÷ 2,50 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 2,0 [mm]

PDMX-M

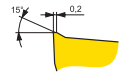
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

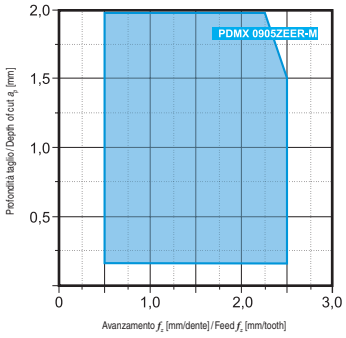
Fresatura Milling: **P** **M** **K** **N** **S** **H**

	P	M	K	N	S	H
Leggera Finishing	□		■			◪
Media Medium	◪	□	■		□	□
Sgrossatura Roughing	◪	□	■		□	



Profilo del tagliente
Profile of cutting edge





PDMX 0905ZEER-M

- geometria positiva con tratto piano di 2 mm per una buona finitura
- idonea per la lavorazione del gruppo di materiali K, potenzialmente, per i gruppi di materiali P, H, M ed S
- particolarmente adatta a condizioni di lavorazione da medie a pesanti

- geometry with a negative peripheral chamfered edge with a finishing cutting edge with a length of 2 mm
- suitable for machining material group K, potentially for material groups P, H, M, and S
- particularly suited to medium to heavy machining conditions

Utilizzo inserto / Range of cutting conditions:

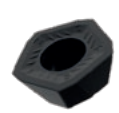
f_z	0,50 ÷ 2,50 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 2,0 [mm]

PDMX-R

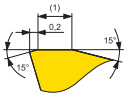
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

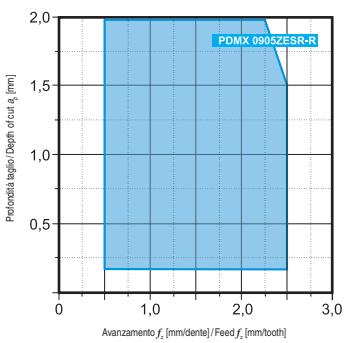
Fresatura Milling: **P** **M** **K** **N** **S** **H**

	P	M	K	N	S	H
Leggera Finishing	□		■			◪
Media Medium	◪	□	■		□	□
Sgrossatura Roughing	◪	□	■		□	



Profilo del tagliente
Profile of cutting edge





PDMX 0905ZESR-R

- geometria positiva rinforzata con tratto piano di 2 mm per una buona finitura
- idonea per la lavorazione del gruppo di materiali K, potenzialmente, per i gruppi di materiali P, H, M ed S
- particolarmente adatta a condizioni di lavorazione da medie a pesanti

- geometry with a negative peripheral chamfered edge with a finishing cutting edge with a length of 2 mm
- suitable for machining material group K, potentially for material groups P, H, M, and S
- particularly suited to medium to heavy machining conditions

Utilizzo inserto / Range of cutting conditions:

f_z	0,50 ÷ 2,50 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 2,0 [mm]

■ Applicazione principale ◪ Applicazione secondaria □ Applicazione possibile
■ Main application ◪ Secondary application □ Supplementary application

TIPO DI INSERTO
TYPE OF CUTTING INSERTS

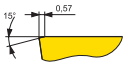
PNMQ

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

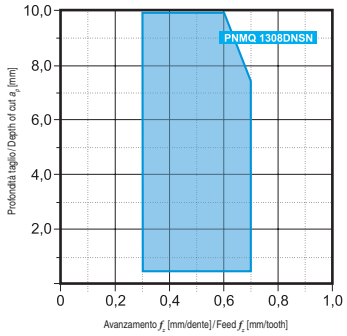
PNMQ 1308DNSN



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing			◥			◥
Media / Medium	□		■			□
Sgrossatura / Roughing	◥		■			



- geometria stabile a petto piano con ampio smusso di rinforzo negativo
- idonea per la lavorazione del gruppo di materiali K, potenzialmente, per i gruppi di materiali P ed H
- particolarmente adatta alla sgrossatura

- highly stable cutting geometry with a zero face angle with a very large negative chamfered edge
- suitable for machining material group K, potentially for material groups P and H
- particularly suited to roughing

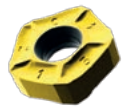
Utilizzo inserto / Range of cutting conditions:

f_z	0,30 ÷ 0,70 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 10 [mm]

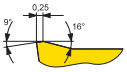
PNMU-M

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

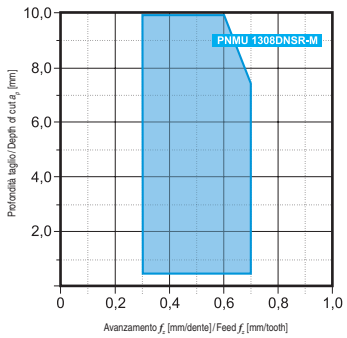
PNMU 1308DNSR-M



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	■	◥			◥
Media / Medium	■	□	■		□	
Sgrossatura / Roughing	■	◥	■		◥	



- geometria di taglio positiva, ma stabile con un tagliente smussato lievemente negativo
- idonea per la lavorazione dei gruppi di materiali P e K, potenzialmente, per i gruppi di materiali M, S ed H
- particolarmente adatta alla sgrossatura

- positive but stable cutting geometry with a slightly negative chamfered edge
- suitable for machining material groups P and K, potentially for material groups M, S, and H
- particularly suited to roughing

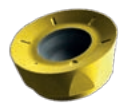
Utilizzo inserto / Range of cutting conditions:

f_z	0,25 ÷ 0,70 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 10 [mm]

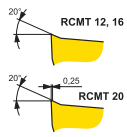
RCMT-F

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

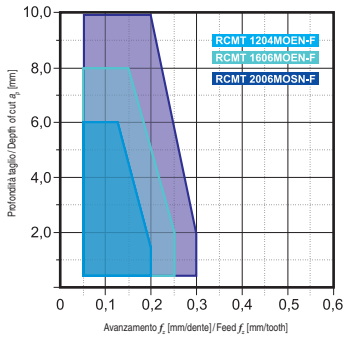
RCMT (12..-F, 16..-F, 20..-F)



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	■	◥	◥	■	
Media / Medium	■	■	◥	◥	■	
Sgrossatura / Roughing	◥	◥	□	◥	◥	



- geometria altamente positiva
- idonea per la lavorazione dei gruppi di materiali P ed M, potenzialmente, per i gruppi di materiali K, N ed S
- particolarmente adatta alla lavorazione leggera

- high positive geometry
- suitable for machining material groups P and M, potentially for material groups K, N, and S
- particularly suited to light machining

Utilizzo inserto / Range of cutting conditions:

f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

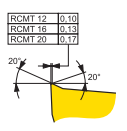
RCMT-M

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

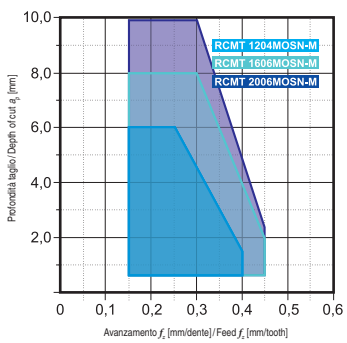
RCMT (12..-M, 16..-M, 20..-M)



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	■	■	□	■	□
Media / Medium	■	■	■	□	■	□
Sgrossatura / Roughing	■	■	■	□	■	□



- geometria positiva con rinforzo medio sul tagliente
- idonea per la lavorazione dei gruppi di materiali P, M e K, potenzialmente, per i gruppi di materiali N ed S
- particolarmente adatta alla lavorazione media

- high positive geometry with a medium peripheral chamfered edge
- suitable for machining material groups P, M, and K, potentially for material groups N and S
- particularly suited to medium machining

Utilizzo inserto / Range of cutting conditions:

f_z	0,15 ÷ 0,30 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 6,0 (8,0) (10,0) [mm]

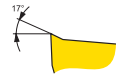
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

RCMT.. EN-R

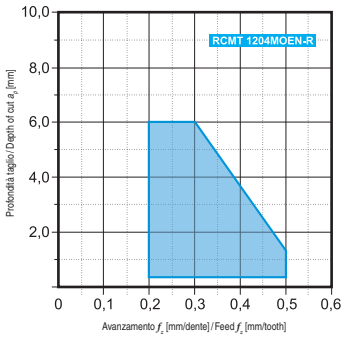
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing ■ ◥ ■ ◥ ■
Media Medium ■ ◥ ■ ◥ ■
Sgrossatura Roughing ■ ◥ ■ ◥ ■



Descrizione Description: RCMT 1204MOEN-R

- geometria positiva con rinforzo medio-elevato sul tagliente
- idonea per la lavorazione dei gruppi di materiali P e K, anche per i gruppi di materiali M, S ed H
- particolarmente adatta a condizioni di lavorazione da medie a pesanti

- positive geometry with a medium peripheral chamfered edge
- suitable for machining material groups P and K, also for material groups M, S, and H
- particularly suited to medium to heavy machining conditions

Utilizzo inserto / Range of cutting conditions:

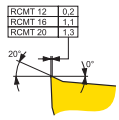
f_z	0,20 ÷ 0,50 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 6,0 [mm]

RCMT.. SN-R

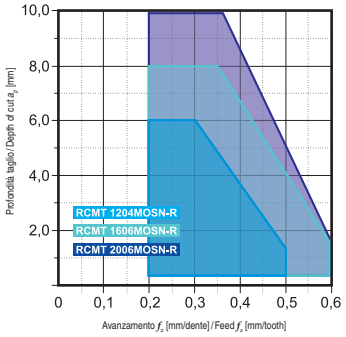
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing ■ ◥ ■ ◥ ■
Media Medium ■ ◥ ■ ◥ ■
Sgrossatura Roughing ■ ◥ ■ ◥ ■



Descrizione Description: RCMT 1204MOSN-R, RCMT 1606MOSN-R, RCMT 2006MOSN-R

- geometria a petto piano
- idonea per la lavorazione dei gruppi di materiali P, K e H, anche per i gruppi di materiali M e S
- particolarmente adatta a condizioni di lavorazione da medie a pesanti

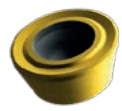
- geometry with zero rake
- suitable for machining material groups P, K and H, also for material groups M and S
- particularly suited to medium to heavy machining conditions

Utilizzo inserto / Range of cutting conditions:

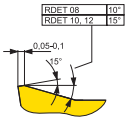
f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

RDET

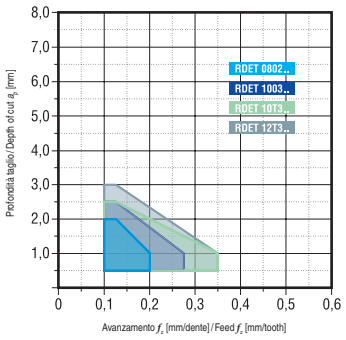
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing ■ ■ ◥ ◥ □
Media Medium ■ ■ ◥ ◥ □
Sgrossatura Roughing ■ ■ ◥ ◥ □



Descrizione Description: RDET 08.., 10.., 12..

- geometria di taglio positiva
- adatto per la fresatura dei materiali dei gruppi P,M, utilizzabile anche per materiali dei gruppi K e S e, a determinate condizioni, anche materiali del gruppo H
- diametri 8 e 10 offerti in due spessori

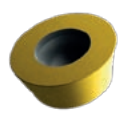
- cutting geometry with a positive rake angle
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H
- diameters 8 and 10 supplied in two different thicknesses

Utilizzo inserto / Range of cutting conditions:

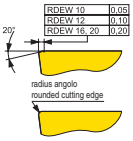
f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

RDEW

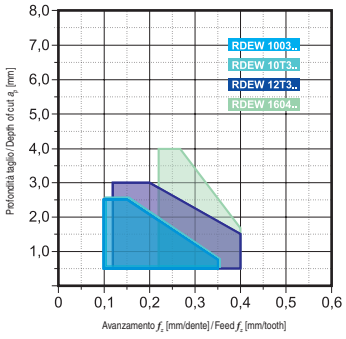
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing ◥ □ ■ ■
Media Medium ◥ □ ■ ■
Sgrossatura Roughing ◥ □ ■ ■



Descrizione Description: RDEW 10.., 12.., 16..

- geometria a petto piano
- adatta ai materiali gruppi K, H, anche P e condizionatamente M
- diametri 8 e 10 diaponibili in 2 spessori differenti

- geometry with zero rake
- suitable for machining material groups K and H; can also be used with group P and potentially group M
- diameters 8 and 10 supplied in two different thicknesses

Utilizzo inserto / Range of cutting conditions:

f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

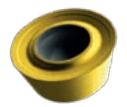
IMPERO PRAMET

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

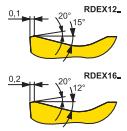
TIPO DI INSERTO
TYPE OF CUTTING INSERTS

RDEX-12

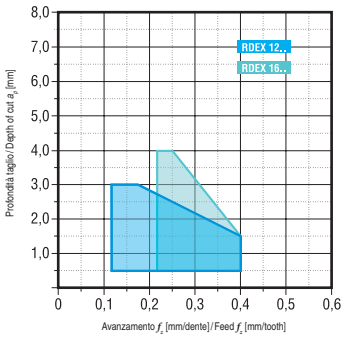
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	■	◥		◥	□
Media / Medium	■	■	◥		◥	□
Sgrossatura / Roughing	■	■	◥		◥	□



Descrizione / Description: RDEX 12.., 16..

Utilizzo inserto / Applies to inserts: RDEX 12.., 16..

- geometria positiva con rinforzo negativo dell'inserto
- adatto per la fresatura dei materiali dei gruppi P, M, utilizzabile anche per materiali dei gruppi K e S e, a determinate condizioni, anche materiali del gruppo H

- cutting geometry with a positive rake angle and a negative T-land
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H

Utilizzo inserto / Range of cutting conditions:

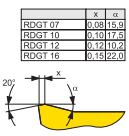
f_z	(0,12) 0,22 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ (3,0) 4,0 [mm]

RDGT

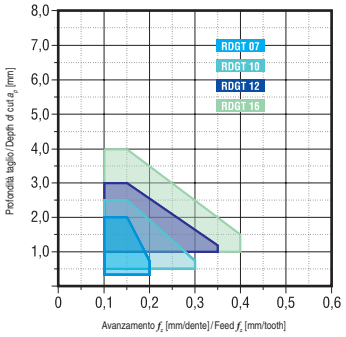
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	■	◥		◥	□
Media / Medium	■	■	◥		◥	□
Sgrossatura / Roughing	■	■	◥		◥	□



Descrizione / Description: RDGT 07.. (10.., 12.., 16..) MOT

Utilizzo inserto / Applies to inserts: RDGT 07.. (10.., 12.., 16..) MOT

- geometria positiva con rinforzo negativo dell'inserto
- adatto per la fresatura dei materiali dei gruppi P, M, utilizzabile anche per materiali dei gruppi K e S e, a certe condizioni, anche H
- diametro 7 offerto alternativamente in due spessori

- cutting geometry with a positive rake angle and a negative T-land
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H
- diameter 7 supplied in two different thicknesses

Utilizzo inserto / Range of cutting conditions:

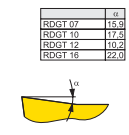
f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

RDHT-FA

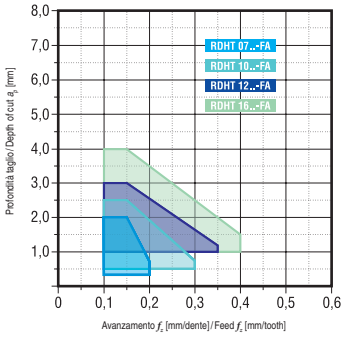
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing				■		
Media / Medium				■		
Sgrossatura / Roughing				■		



Descrizione / Description: RDHT 07.. (10.., 12.., 16..) MO-FA

Utilizzo inserto / Applies to inserts: RDHT 07.. (10.., 12.., 16..) MO-FA

- geometria positiva a tagliente affilato
- adatto per la fresatura di metalli non ferrosi – materiali del gruppo N

- geometry with a positive rake angle and sharp geometry
- suitable for machining non-iron materials in group N

Utilizzo inserto / Range of cutting conditions:

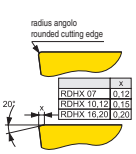
f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

RDHX

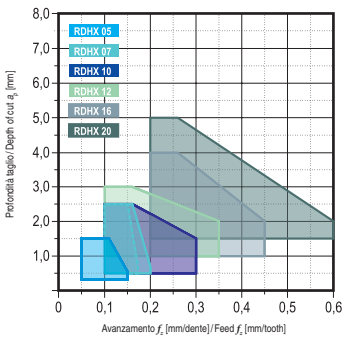
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	◥	□	■			■
Media / Medium	◥	□	■			■
Sgrossatura / Roughing	◥	□	■			■



Descrizione / Description: RDHX 05..-MOE; RDHX (07.., 10.., 12.., 16.., 20..) MOT

Utilizzo inserto / Applies to inserts: RDHX 05..-MOE; RDHX (07.., 10.., 12.., 16.., 20..) MOT

- geometria a petto piano
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P e, a certe condizioni, anche per M
- diametro 5 offerto con la realizzazione del tagliente „E"
- diametro 7 offerto alternativamente in due spessori

- geometry with zero rake
- suitable for machining material groups K and H; can also be used with group P and potentially group M
- diameter 7 supplied in two different thicknesses
- diameter 5 supplied in „E" cutting edge design

Utilizzo inserto / Range of cutting conditions:

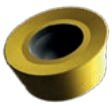
f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

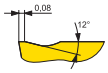
TIPO DI INSERTO
TYPE OF CUTTING INSERTS

RPET

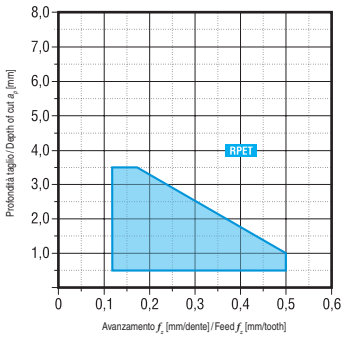
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	■	◥		◥	□
Media Medium	■	■	◥		◥	□
Sgrossatura Roughing	■	■	◥		◥	□



Descrizione Description: RPET 1505MOSM
Utilizzo inserto / Applies to inserts:

- geometria positiva con rinforzo neutro del tagliente
- adatto per la fresatura dei materiali dei gruppi P,M, utilizzabile anche per materiali dei gruppi K e S e, a determinate condizioni, anche per materiali del gruppo H
- questi inserti sono destinati alle frese S450D06D

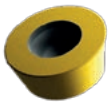
- geometry with a positive rake angle and zero T-land rake
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H
- inserts are manufactured for milling cutters S450D06D

Utilizzo inserto / Range of cutting conditions:

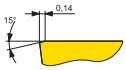
f_z	0,12 ÷ 0,50 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 3,5 [mm]

RPEW

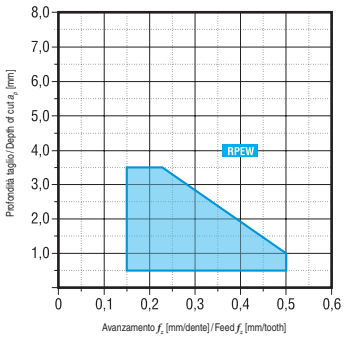
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	◥	□	■			■
Media Medium	◥	□	■			■
Sgrossatura Roughing	◥	□	■			■



Descrizione Description: RPEW 1505MOS
Utilizzo inserto / Applies to inserts:

- geometria a petto piano
- adatto per la fresatura dei materiali dei gruppi K e H inoltre utilizzabile per materiali del gruppo P e, a certe condizioni, anche per M
- questi inserti sono destinati alle frese S450D06D

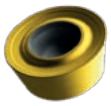
- geometry with zero rake
- suitable for machining material groups K and H; can also be used with group P and potentially group M
- inserts are manufactured for milling cutters S450D06D

Utilizzo inserto / Range of cutting conditions:

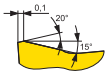
f_z	0,15 ÷ 0,50 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 3,5 [mm]

RPEX

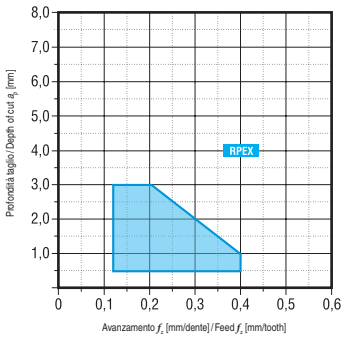
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	■	◥		◥	□
Media Medium	■	■	◥		◥	□
Sgrossatura Roughing	■	■	◥		◥	□



Descrizione Description: RPEX 1204MOSN-12
Utilizzo inserto / Applies to inserts:

- geometria positiva con rinforzo neutro del tagliente
- adatto per la fresatura dei materiali dei gruppi P, M, utilizzabile anche per materiali dei gruppi K e S e, a certe condizioni, anche H

- cutting geometry with a positive rake angle and a negative T-land
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H

Utilizzo inserto / Range of cutting conditions:

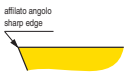
f_z	0,12 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 3,0 [mm]

SBKX

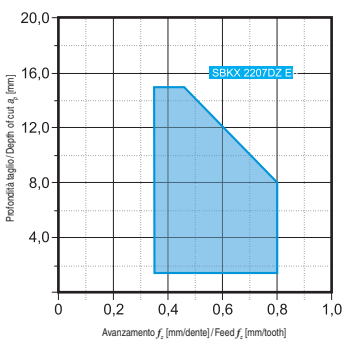
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	□	■			
Media Medium	■	□	■			
Sgrossatura Roughing	■	□	■			



Descrizione Description: SBKX 2207DZER
Utilizzo inserto / Applies to inserts:

- geometria raschiante a petto piano
- costituisce un'estensione di programma agli inserti SBMR
- adatto per la fresatura dei materiali dei gruppi P, K e M

- wiper geometry with zero rake
- accessory for SBMR indexable cutting inserts
- suitable for machining material groups P, K, and M

Utilizzo inserto / Range of cutting conditions:

f_z	0,35 ÷ 0,80 [mm/dente] / [mm/tooth]
a_p	1,5 ÷ 15,0 [mm]

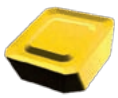
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

TIPO DI INSERTO
TYPE OF CUTTING INSERTS

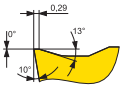
SBMR

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

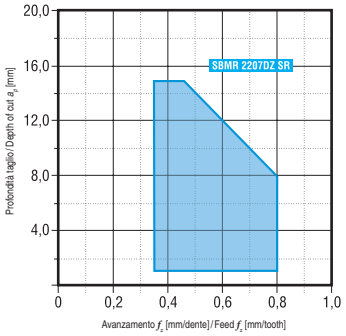
SBMR 2207DZ SR



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	■	■		◥	
Media / Medium	■	■	■		■	
Sgrossatura / Roughing	■	■	■		■	



- geometria stabile
- adatta per la fresatura dei materiali dei gruppi P, M, K e S
- adatta sia per finitura che per sgrossatura

- stable cutting geometry
- suitable for machining material groups P, M, K, and S
- suited to roughing and finishing

Utilizzo inserto / Range of cutting conditions:

f_z	0,35 ÷ 0,80 [mm/dente] / [mm/tooth]
a_p	1,5 ÷ 15,0 [mm]

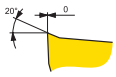
SCKR

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

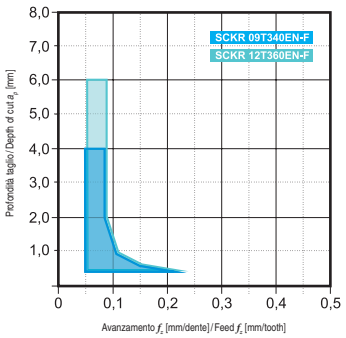
SCKR 09T340, SCKR 12T360



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	■	◥		■	
Media / Medium	◥	■	◥		■	
Sgrossatura / Roughing	◥	◥	□		◥	



- geometria affilata altamente positiva
- idonea per la lavorazione dei gruppi di materiali M ed S
- può anche essere utilizzata per i gruppi di materiali P e K
- adatta per applicazionimedio- leggere

- high positive sharp geometry
- suitable for machining material groups M and S
- can also be used for material groups P and K
- particularly suited to light to medium-heavy machining conditions

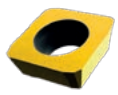
Utilizzo inserto / Range of cutting conditions:

f_z	0,05 ÷ 0,08 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 4,0 (6,0) [mm]

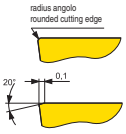
SDEW

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

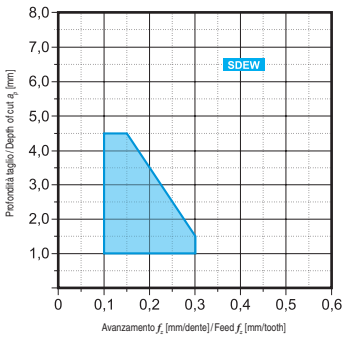
SDEW 090308 (E)SN



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	◥	□	■			■
Media / Medium	◥	□	■			■
Sgrossatura / Roughing	◥	□	■			■



- geometria a petto piano
- adatta per la fresatura dei materiali dei gruppi K a H, inoltre utilizzabile per materiali dei gruppi P e, a certe condizioni, anche per M
- per frese a candele con angolo a 45°
- disponibile nelle versioni di tagliente „E“ e „S“

- geometry with zero rake
- suitable for machining material groups K and H; can also be used with group P and potentially group M
- inserts are manufactured for end milling cutters with a setting angle of 45°
- supplied with „E“ and „S“ cutting edge designs

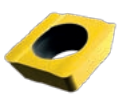
Utilizzo inserto / Range of cutting conditions:

f_z	0,10 ÷ 0,30 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 4,5 [mm]

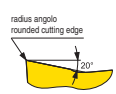
SDEX-74

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

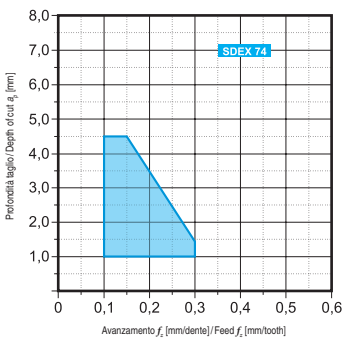
SDEX 090308FN-74



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	■	◥	■	◥	
Media / Medium	■	■	◥	■	◥	
Sgrossatura / Roughing	■	■	◥	■	◥	



- geometria positiva
- geometria con formatruciolo rettificato
- adatto per la fresatura dei materiali dei gruppi P, M e N, inoltre utilizzabile per materiali dei gruppi K e S
- per frese a candela con angolo a 45°

- geometry with a positive rake angle
- ground chip-forming geometry
- suitable for machining material groups P, M, and N; can also be used for groups K and S
- inserts are manufactured for end milling cutters with a setting angle of 45°

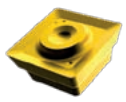
Utilizzo inserto / Range of cutting conditions:

f_z	0,10 ÷ 0,30 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 4,5 [mm]

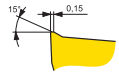
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

SDGX

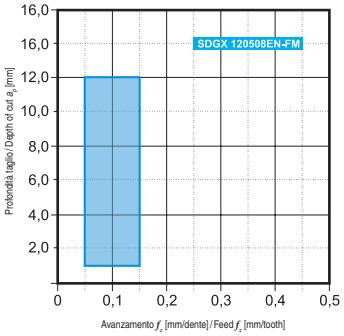
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SDGX 120508EN-FM



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	◥	■	□		■	
Media Medium	◥	■	■	□		■
Sgrossatura Roughing						



- geometria positiva con piccolo rinforzo sul tagliente
- idonea per la lavorazione dei gruppi di materiali M ed S
- può essere utilizzata anche per il gruppo di materiali P
- potenzialmente, anche per il gruppo di materiali K
- particolarmente adatta a condizioni di lavorazione da leggere a medio-pesanti

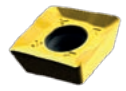
- positive geometry with a narrow peripheral chamfered edge
- suitable for machining material groups M and S
- can also be used for material group P
- potentially also for material group K
- particularly suited to light to medium-heavy machining conditions

Utilizzo inserto / Range of cutting conditions:

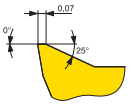
f_z	0,05 ÷ 0,15 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 12,0 [mm]

SDMT-F

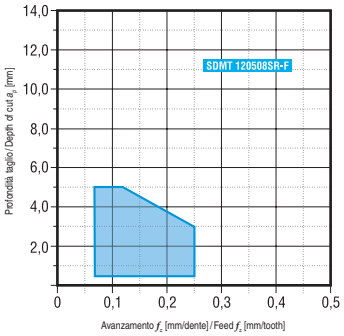
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SDMT 120508SR-F



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	◥	■	◥	
Media Medium	■	■	◥	◥	◥	
Sgrossatura Roughing				◥		



- geometria con spoglia superiore positiva per un minimo sforzo di taglio
- per condizioni di taglio medie e leggere
- adatta per i gruppi materiale P, M, K ed S in certe condizione anche N
- condizioni di lavoro stabili

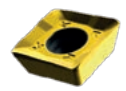
- geometry with a positive rake angle, which ensures minimum cutting resistance
- for light to medium cutting conditions
- suitable for machining material groups P, M, K, and S, and potentially group N
- stable working conditions

Utilizzo inserto / Range of cutting conditions:

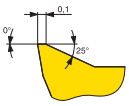
f_z	0,07 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 5,0 [mm]

SDMT-M

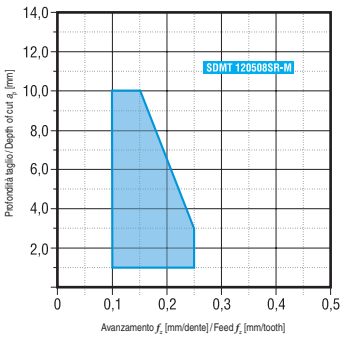
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SDMT 120508SR-M



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	◥	◥	◥	
Media Medium	■	■	◥	◥	◥	
Sgrossatura Roughing	□	□	◥		◥	



- geometria con spoglia superiore positiva per un minimo sforzo di taglio
- per condizioni di taglio medie e leggere
- adatta per i gruppi materiale P, M, K ed S in certe condizione anche N

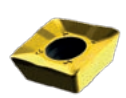
- geometry with a positive rake angle, which ensures minimum cutting resistance
- for light to medium cutting conditions
- suitable for machining material groups P, M, K, and S, and potentially group N

Utilizzo inserto / Range of cutting conditions:

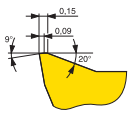
f_z	0,1 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 10,0 [mm]

SDMT-R

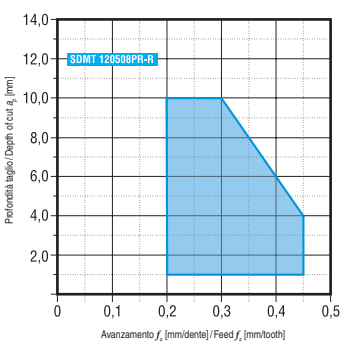
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SDMT 120508PR-R



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	◥		◥	
Media Medium	■	■	◥		◥	
Sgrossatura Roughing	■	■	◥		◥	



- geometria positiva con buona stabilità del tagliente
- adatta per i gruppi materiale P, M, K ed S
- geometria adatta anche per condizioni meno stabili

- positive cutting geometry with very stable cutting edge
- suitable for machining material groups P, M, K, and S, and potentially group N
- geometry suited to less stable working conditions

Utilizzo inserto / Range of cutting conditions:

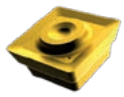
f_z	0,2 ÷ 0,45 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 10,0 [mm]

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

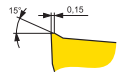
TIPO DI INSERTO
TYPE OF CUTTING INSERTS

SDMX-M

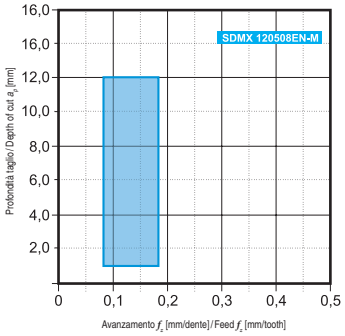
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing: ■ ■
Media Medium: ■ ■
Sgrossatura Roughing:



Descrizione Description: SDMX 120508EN-M

- geometria positiva con piccolo rinforzo del tagliente
- idonea per la lavorazione dei gruppi di materiali P e K
- particolarmente adatta a condizioni di lavorazione da leggere a medio-pesanti

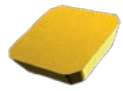
- positive geometry with a narrow peripheral chamfered edge
- suitable for machining material groups P and K
- particularly suited to light to medium-heavy machining conditions

Utilizzo inserto / Range of cutting conditions:

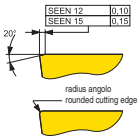
f_z	0,08 ÷ 0,18 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 12,0 [mm]

SEEN

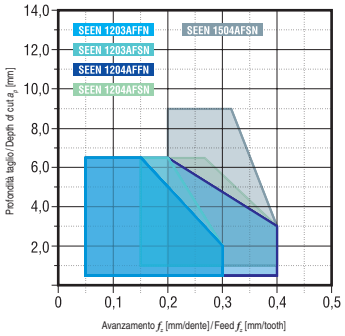
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing: ◥ □ ■ ■
Media Medium: ◥ □ ■ ■
Sgrossatura Roughing: ◥ □ ■ ■



Descrizione Description: SEEN 1203AFFN, SEEN 1203AFSN, SEEN 1204AFFN, SEEN 1204AFSN, SEEN 1504AF SN

- geometria con angolo neutro
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P e, a certe condizioni, anche per M
- disponibile la realizzazione dei taglienti „E" e „S" e per la grandezza 12 sono disponibili due spessori

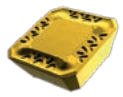
- geometry with zero rake
- suitable for machining material groups K and H; can also be used with group P and potentially group M
- supplied with „E" and „S" cutting edge designs
- size 12 supplied in two different thicknesses

Utilizzo inserto / Range of cutting conditions:

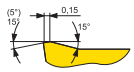
f_z	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert
a_p	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert

SEER

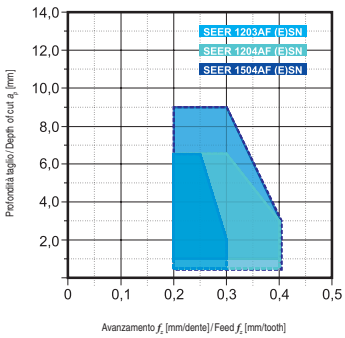
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing: ■ ■ ◥ ◥ □
Media Medium: ■ ■ ◥ ◥ □
Sgrossatura Roughing: ■ ■ ◥ ◥ □



Descrizione Description: SEER 1203AFEN, SEER 1203AFSN, SEER 1204AFEN, SEER 1204AFSN, SEER 1504AFEN, SEER 1504AFSN

- geometria con angolo positivo
- adatto per la fresatura dei materiali dei gruppi P e M, inoltre utilizzabile per materiali dei gruppi K e S e, a certe condizioni, anche per H.
- la grandezza 12 è disponibile in due spessori

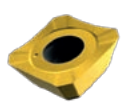
- geometry with a positive rake angle
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H
- size 12 supplied in two different thicknesses

Utilizzo inserto / Range of cutting conditions:

f_z	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert
a_p	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert

SEET 09

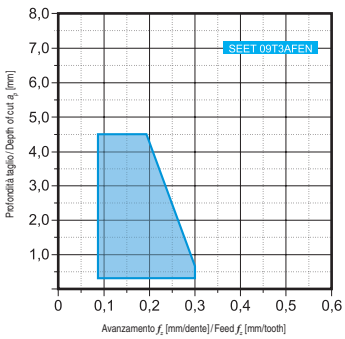
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing: ■ ■ □ ■
Media Medium: ■ ■ □ ■
Sgrossatura Roughing:



Descrizione Description: SEET 09T3AFEN

- geometria con un angolo del petto positivo
- idonea per la fresatura dei gruppi di materiali P, M ed S
- particolarmente adatta alla fresatura da leggera a media

- geometry with a positive face angle
- suitable for milling material groups P, M, and S
- particularly suited to light to medium milling

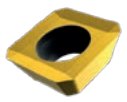
Utilizzo inserto / Range of cutting conditions:

f_z	0,08 ÷ 0,30 [mm/dente] / [mm/tooth]
a_p	0,3 ÷ 4,5 [mm]

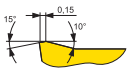
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

SEET 12

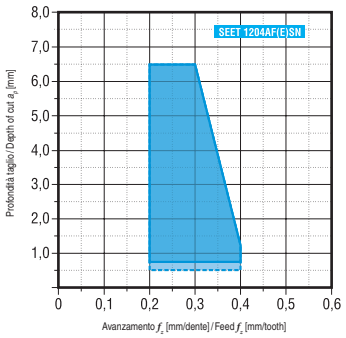
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SEET 1204AFEN, SEET 1204AFSN



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	◥		◥	□
Media Medium	■	■	◥		◥	□
Sgrossatura Roughing	■	■	◥		◥	□



- geometria universale con angolo positivo
- adatto per la fresatura dei materiali dei gruppi P e M, inoltre utilizzabile per materiali dei gruppi K e S e, a certe condizioni, anche per H
- disponibile la realizzazione dei taglienti „E" e „S"

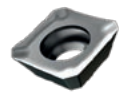
- all-purpose geometry with a positive rake angle
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H
- supplied with „E" and „S" cutting edge designs

Utilizzo inserto / Range of cutting conditions:

f_z	0,20 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	(0,5) 1,0 ÷ 6,5 [mm]

SEET-FA

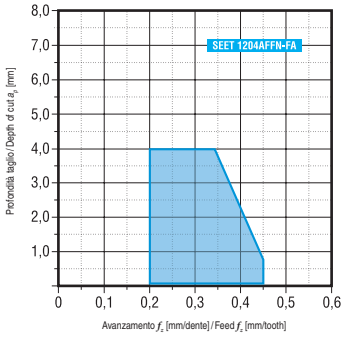
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SEET 1204AFFN-FA



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing				■		
Media Medium				■		
Sgrossatura Roughing				■		



- geometria positiva con tagliente affilato
- adatto per la fresatura di metalli non ferrosi - materiali del gruppo N

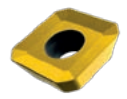
- geometry with a positive rake angle and sharp geometry
- suitable for machining non-iron materials in group N

Utilizzo inserto / Range of cutting conditions:

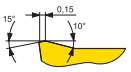
f_z	0,05 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	0,2 ÷ 4,5 [mm]

SEET-PM

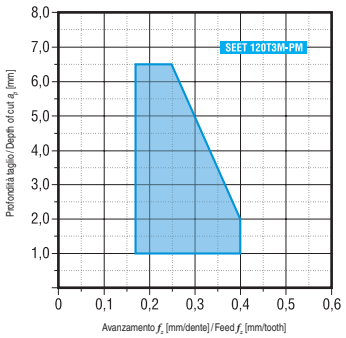
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SEET 12T3M-PM



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	◥		◥	□
Media Medium	■	■	◥		◥	□
Sgrossatura Roughing	■	■	◥		◥	□



- geometria universale con angolo positivo
- adatto per la fresatura dei materiali dei gruppi P e M, inoltre utilizzabile per materiali dei gruppi K e S e, a certe condizioni, anche per H

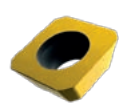
- all-purpose geometry with a positive rake angle
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H

Utilizzo inserto / Range of cutting conditions:

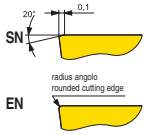
f_z	0,17 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 6,5 [mm]

SEEW

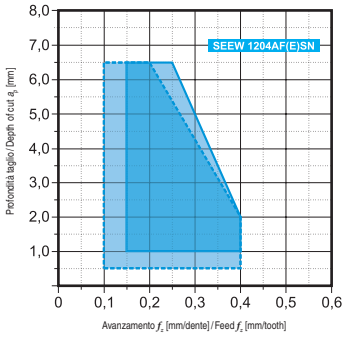
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SEEW 1204AFEN, SEEW 1204AFSN



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	◥	□	■			■
Media Medium	◥	□	■			■
Sgrossatura Roughing	◥	□	■			■



- geometria con angolo neutro
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P e, a certe condizioni, anche per M
- disponibile la realizzazione dei taglienti „E" e „S"

- geometry with zero rake
- suitable for machining material groups K and H; can also be used with group P and potentially group M
- supplied with „E" and „S" cutting edge designs

Utilizzo inserto / Range of cutting conditions:

f_z	(0,10) 0,15 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	(0,5) 1,0 ÷ 6,5 [mm]

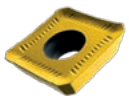
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

TIPO DI INSERTO
TYPE OF CUTTING INSERTS

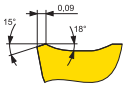
SEMT

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

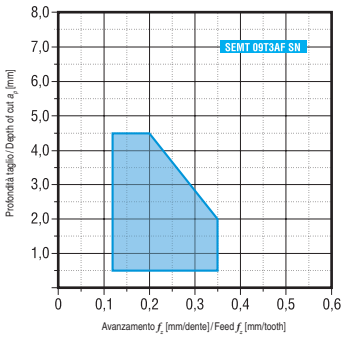
SEMT 09T3AFSN



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	■	■	□	◥	
Media / Medium	■	■	■	□	◥	
Sgrossatura / Roughing	◥	◥	◥		□	



- geometria con angolo positivo
- adatto per la fresatura dei materiali dei gruppi P, M e K, inoltre utilizzabile per materiali del gruppo S e, a certe condizioni, anche per N
- destinata soprattutto per lavorazioni leggere o medie

- geometry with a positive rake angle
- suitable for machining material groups P, M, and K; can also be used with group S and potentially group N
- particularly suited to light and medium machining conditions

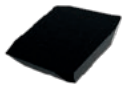
Utilizzo inserto / Range of cutting conditions:

f_z	0,12 ÷ 0,35 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 4,5 [mm]

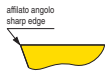
SFCN

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

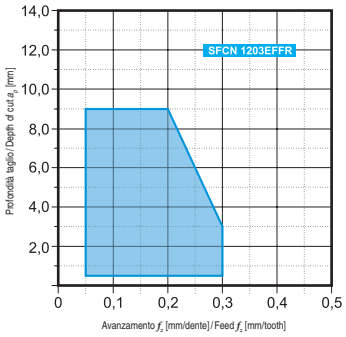
SFCN 1203EFFR



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing				■		
Media / Medium				■		
Sgrossatura / Roughing				■		



- geometria con angolo neutro dell'inserto e tagliente vivo
- adatto per la fresatura di metalli non ferrosi – materiali del gruppo N

- geometry with a positive rake angle and sharp geometry
- suitable for machining non-iron materials in group N

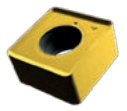
Utilizzo inserto / Range of cutting conditions:

f_z	0,05 ÷ 0,30 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 9,0 [mm]

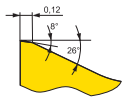
SNGX-M

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

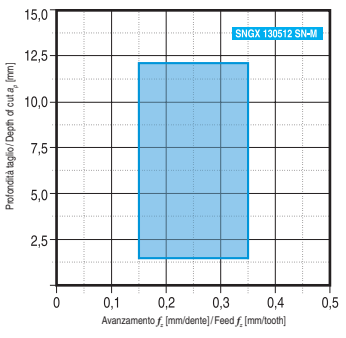
SNGX 130512SN-M



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■		■			
Media / Medium	■		■			
Sgrossatura / Roughing	◥		◥			



- geometria positivizzata e rinforzo sul tagliente
- idonea per la lavorazione dei gruppi di materiali P e K
- geometria con una resistenza di taglio bassa, idonea per macchine a minore potenza

- geometry with a positive face angle and a narrow positive peripheral chamfered edge
- suitable for machining material groups P and K
- geometry with a low cutting resistance, suitable for machines with lower power

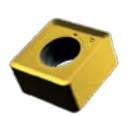
Utilizzo inserto / Range of cutting conditions:

f_z	0,15 ÷ 0,35 [mm/dente] / [mm/tooth]
a_p	1,2 ÷ 12,0 [mm]

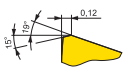
SNGX-R

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

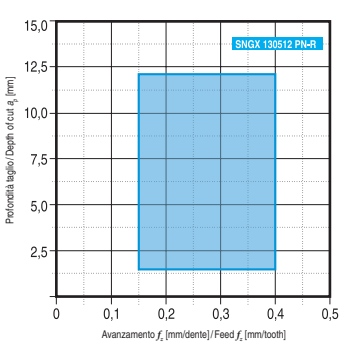
SNGX 130512 PN-R



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■		■			
Media / Medium	■		■			
Sgrossatura / Roughing	■		■			



- geometria positivizzata e rinforzo negativo sul tagliente
- idonea per la lavorazione dei gruppi di materiali P e K
- adatta alla sgrossatura e condizioni instabili

- geometry with a positive face angle and a negative peripheral chamfered edge
- suitable for machining material groups P and K
- suited to roughing and unstable conditions

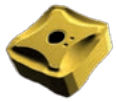
Utilizzo inserto / Range of cutting conditions:

f_z	0,15 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	1,2 ÷ 12,0 [mm]

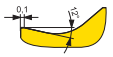
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

SNHF-M

Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group — Fresatura Milling: P M K N S H

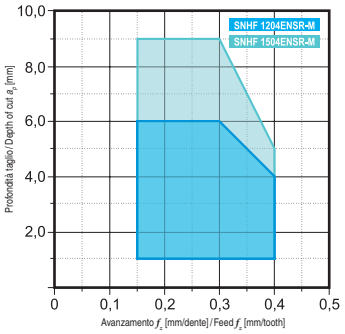


Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	□	■			
Media Medium	■	□	■			
Sgrossatura Roughing	■	□	■			

Diagramma di applicazione / Diagram of application



Descrizione Description: SNHF 1204ENSR-M, SNHF 1504ENSR-M

- geometria con un angolo del petto positivo
- idonea per la lavorazione dei gruppi di materiali P e K
- particolarmente adatta alla fresatura leggera e media

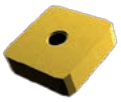
- geometry with a positive face angle
- suitable for machining material groups P and K
- particularly suited to light and medium milling

Utilizzo inserto / Range of cutting conditions:

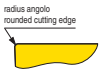
f_z	0,15 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ (6,0) 9,0 [mm]

SNHN

Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group — Fresatura Milling: P M K N S H

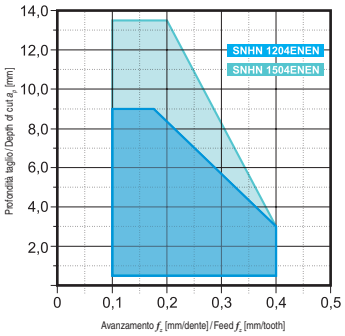


Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	◥		■			■
Media Medium	◥		■			■
Sgrossatura Roughing	◥		■			■

Diagramma di applicazione / Diagram of application



Descrizione Description: SNHN 1204ENEN, SNHN 1504ENEN

- geometria di taglio standard negativa
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P
- per frese a 75°

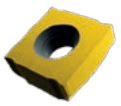
- standard negative milling geometry
- suitable for machining material groups K and H; can also be used for group P
- inserts are manufactured for milling cutters with a setting angle of 75°

Utilizzo inserto / Range of cutting conditions:

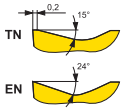
f_z	(0,10) ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ (9,0) 13,5 [mm]

SNHQ

Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group — Fresatura Milling: P M K N S H

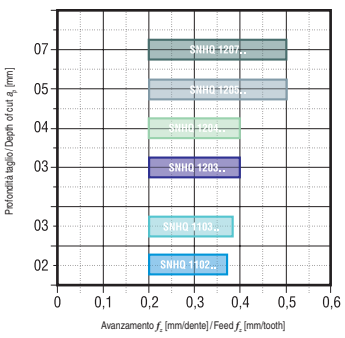


Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	■	■	◥	◥	□
Media Medium	■	■	■	◥	◥	□
Sgrossatura Roughing	■	■	■	□	◥	□

Diagramma di applicazione / Diagram of application



Descrizione Description: SNHQ 11.., SNHQ 12..

- inserti fissati tangenzialmente per frese a disco
- tale geometria è applicabile a tutti i tipi di materiali
- i valori raccomandati degli avanzamenti sono da considerarsi orientativi (per determinare l'avanzamento è molto importante il rapporto a_z/D)

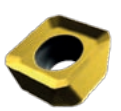
- on-edge inserts for disc milling cutters with ground chip-forming geometry
- this geometry can be used with all types of materials
- the recommended feed range is for information only: a_z/D ratio is very important

Utilizzo inserto / Range of cutting conditions:

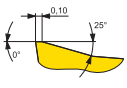
f_z	0,20 ÷ (0,40) 0,50 [mm/dente] / [mm/tooth]
a_p	-

SNMT-M / SNKT-M

Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group — Fresatura Milling: P M K N S H

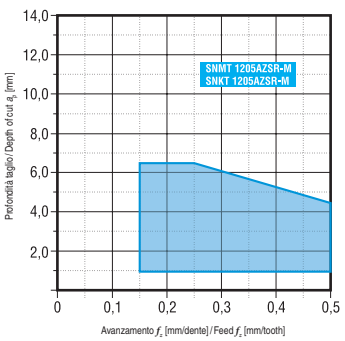


Profilo del tagliente
Profile of cutting edge



	P	M	K	N	S	H
Leggera Finishing	■	■	◥		◥	□
Media Medium	■	■	◥		◥	□
Sgrossatura Roughing	■	■	◥			

Diagramma di applicazione / Diagram of application



Descrizione Description: SNMT 1205AZSR-M, SNKT 1205AZSR-M

- geometria altamente positiva
- adatto per la fresatura dei materiali dei gruppi P e M, inoltre utilizzabile per materiali dei gruppi K e S e, a certe condizioni, anche per H
- particolarmente adatta per lavorazioni medie

- high positive geometry
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H
- particularly suited to medium machining conditions

Utilizzo inserto / Range of cutting conditions:

f_z	0,15 ÷ 0,50 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 6,5 [mm]

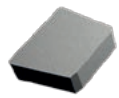
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

TIPO DI INSERTO
TYPE OF CUTTING INSERTS

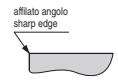
SNKX

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

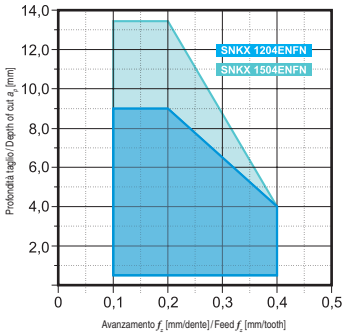
SNKX 1204ENFN, SNKX 1504ENFN



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■		■			■
Media / Medium						
Sgrossatura / Roughing						



- geometria raschiante a petto piano
- costituisce un'estensione di programma agli inserti SNHN o SNUN
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P

- wiper geometry with zero rake
- accessory for SHHN and SNUN indexable cutting inserts
- suitable for machining material groups K and H; can also be used with group P

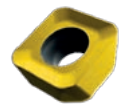
Utilizzo inserto / Range of cutting conditions:

f_z	0,15 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 6,0 [mm]

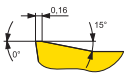
SNMT-R

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

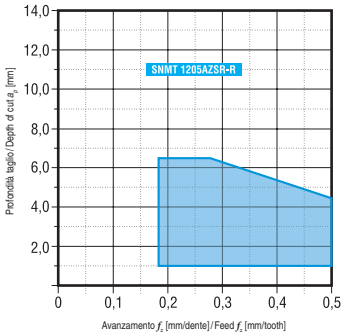
SNMT 1205AZSR-R



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	◥	■		□	■
Media / Medium	■	◥	■		□	■
Sgrossatura / Roughing	■	◥	■		□	■



- geometria positiva
- adatta per la fresatura dei materiali dei gruppi P, K e M
- per condizioni di lavoro medie e medio-alte

- positive geometry
- suitable for machining material groups P, K, and H; can also be used with group M and potentially group S
- particularly suited to medium and heavier machining conditions

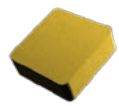
Utilizzo inserto / Range of cutting conditions:

f_z	0,18 ÷ 0,50 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 6,5 [mm]

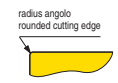
SNUN

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

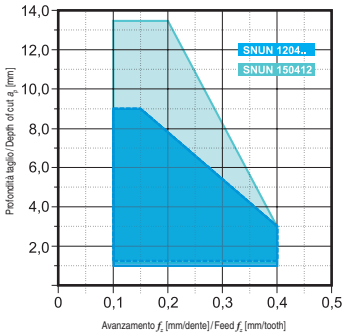
SNUN 120408, SNUN 120412, SNUN 150412



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	◥		■			■
Media / Medium	◥		■			■
Sgrossatura / Roughing	◥		■			■



- geometria di taglio standard negativa
- tali inserti sono destinati prevalentemente alla tornitura
- adatta per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P
- per frese a 75°
- per la grandezza 12 sono a disposizione i raggi 0,8 e 1,2

- standard negative cutting geometry
- primarily used for turning
- suitable for machining material groups K and H; can also be used with group P
- for milling cutters with a setting angle of 75°
- size 12 supplied with corner radii of 0.8 and 1.2 mm

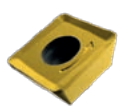
Utilizzo inserto / Range of cutting conditions:

f_z	(0,10) ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ (9,0) 13,5 [mm]

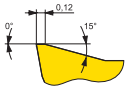
SOMT-M

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

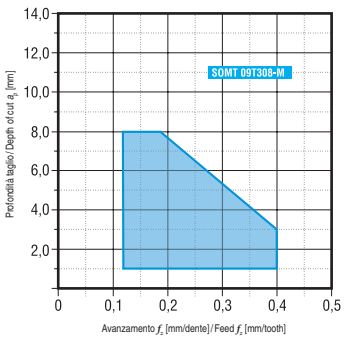
SOMT 09T308-M



Profilo del tagliente / Profile of cutting edge



	P	M	K	N	S	H
Leggera / Finishing	■	◥	■		□	□
Media / Medium	■	◥	■		□	□
Sgrossatura / Roughing	■	◥	■		□	□



- geometria positiva con rinforzo medio
- adatta per lavorazione di materiali gruppi P e K, applicabile anche ai gruppi M e a condizioni S e H
- per condizioni di lavoro medie su materiali duri
- per condizioni di instabilità

- positive geometry with a medium T-land
- suitable for machining material groups P and K; can also be used with group M and potentially groups S and H
- for medium machining conditions on hard materials
- for unstable machining conditions

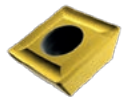
Utilizzo inserto / Range of cutting conditions:

f_z	0,12 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 8,0 [mm]

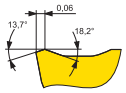
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

SOMT-MI

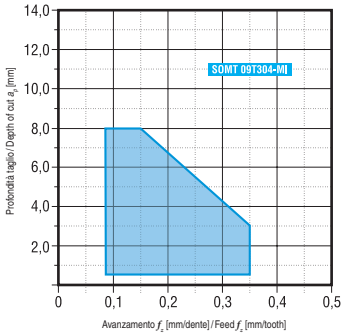
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SOMT 09T304-MI



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	◥	■	■	□	◥	
Media Medium	■	■	■	□	◥	
Sgrossatura Roughing	■	■	■		□	



- geometria stabile positiva con rinforzo negativo del tagliente
- adatta per la fresatura dei materiali dei gruppi P, M e K, utilizzabile anche per materiali del gruppo S e, a determinate condizioni, anche materiali del gruppo N

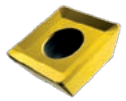
- stable cutting geometry with a positive rake angle and a negative T-land
- suitable for machining material groups P, M, and K; can also be used with group S and potentially group N

Utilizzo inserto / Range of cutting conditions:

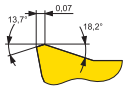
f_z	0,08 ÷ 0,35 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 8,0 [mm]

SOMT-P

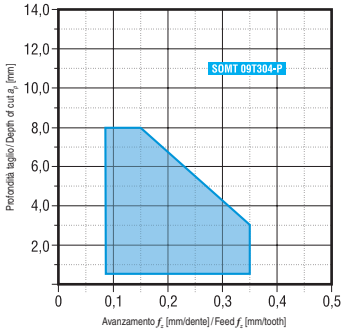
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SOMT 09T304-P



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	◥	□	◥	
Media Medium	■	■	◥	□	◥	
Sgrossatura Roughing	■	■	□		□	



- geometria altamente positiva con rinforzo negativo del tagliente
- adatta per la fresatura dei materiali dei gruppi P, M e K, utilizzabile anche per materiali S e, a determinate condizioni, anche materiali del gruppo N

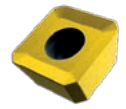
- high positive milling geometry with a negative T-land
- suitable for machining material groups P, M, and K; can also be used with group S and potentially group N

Utilizzo inserto / Range of cutting conditions:

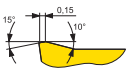
f_z	0,08 ÷ 0,35 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ 8,0 [mm]

SPET

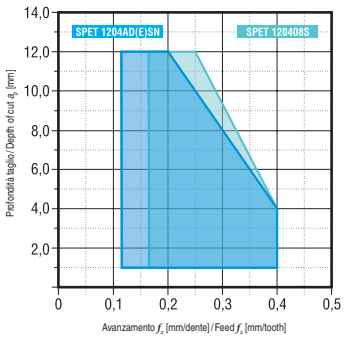
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SPET 1204AD(E)SN, SPET 120408S



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	◥		◥	□
Media Medium	■	■	◥		◥	□
Sgrossatura Roughing	■	■	◥		◥	□



- geometria positiva
- adatto per la fresatura dei materiali dei gruppi P, M, utilizzabile anche per materiali dei gruppi K e S e, a determinate condizioni, anche materiali gruppo H
- disponibile la realizzazione dei taglienti „E“ e „S“

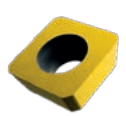
- geometry with a positive rake angle
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H
- supplied with „E“ and „S“ cutting edge designs, style with chamfered corner and corner radius

Utilizzo inserto / Range of cutting conditions:

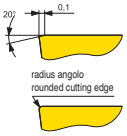
f_z	(0,12) 0,17 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 12,0 [mm]

SPEW

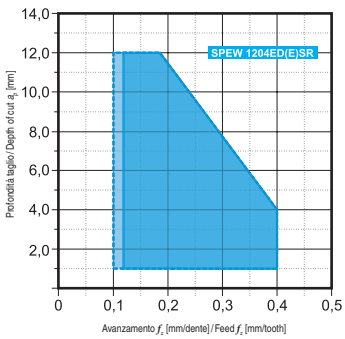
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SPEW 1204ED(E)SR



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	◥	□	■			■
Media Medium	◥	□	■			■
Sgrossatura Roughing	◥	□	■			■



- geometria con angolo neutro
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P e, a certe condizioni, anche per M
- disponibile la realizzazione dei taglienti „E“ e „S“

- geometry with zero rake
- suitable for machining material groups K and H; can also be used with group P and potentially group M
- supplied with „E“ and „S“ cutting edge designs

Utilizzo inserto / Range of cutting conditions:

f_z	(0,10) 0,12 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ 12,0 [mm]

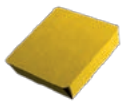
IMPERO PRAMET

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

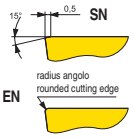
TIPO DI INSERTO
TYPE OF CUTTING INSERTS

SPGN

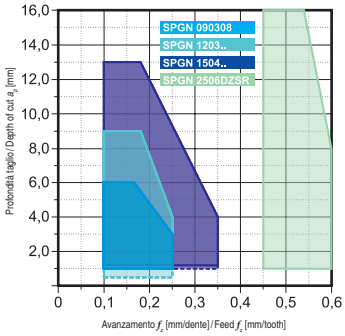
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing	■ ■ ■
Media Medium	■ ■ ■
Sgrossatura Roughing	■ ■ ■



Descrizione Description

Utilizzo inserto / Applies to inserts:
SPGN 090308, SPGN 1203(04,08), SPGN 1504(08,12), SPGN 2506DZSR

- geometria a petto piano
- tali inserti sono destinati prevalentemente alla tornitura
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P
- per le dimensioni 12 e 15 sono a disposizione i raggi 0,8 e 1,2; é disponibile anche la dimensione 25 con rinforzo del tagliente

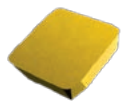
- geometry with zero rake
- primarily used for turning
- suitable for machining material groups K and H; can also be used with group P
- sizes 12 and 15 supplied with corner radii of 0.8 and 1.2 mm; size 25 also supplied with chamfered corner and T-land

Utilizzo inserto / Range of cutting conditions:

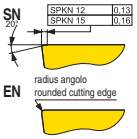
f_z	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert
a_p	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert

SPKN

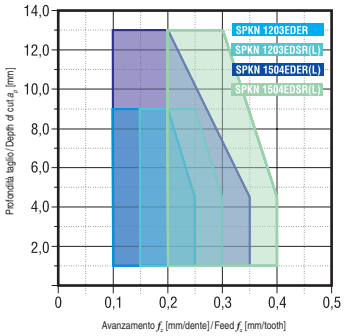
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing	■ □ ■
Media Medium	■ □ ■
Sgrossatura Roughing	■ □ ■



Descrizione Description

Utilizzo inserto / Applies to inserts:
SPKN 1203ED(E)S R(L), SPKN 1504ED(E)S R(L)

- geometria a petto piano
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali dei gruppi P e, a certe condizioni, anche per M
- per frese a 75°
- disponibile la realizzazione del tagliente „E“ e „S“ destro e sinistro

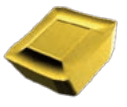
- geometry with zero rake
- suitable for machining material groups K and H; can also be used with group P and potentially group M
- for milling cutters with a setting angle of 75°
- supplied with „E“ and „S“ cutting edge designs, for left and right feed directions

Utilizzo inserto / Range of cutting conditions:

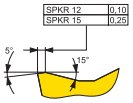
f_z	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert
a_p	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert

SPKR

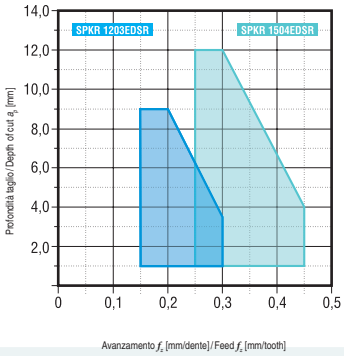
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing	■ ■ ■ ◥ □
Media Medium	■ ■ ■ ◥ □
Sgrossatura Roughing	■ ■ ■ ◥ □



Descrizione Description

Utilizzo inserto / Applies to inserts:
SPKR 1203EDSR, SPKR 1504EDSR

- geometria positiva
- adatta per la fresatura dei materiali dei gruppi P e M, inoltre utilizzabile per materiali del gruppo K e S, a determinate condizioni anche per materiali del gruppo H.
- per frese a 75°
- disponibile la realizzazione del tagliente “S“ destro

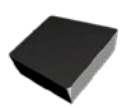
- geometry with a positive rake angle
- suitable for machining material groups P and M; can also be used with groups K and S, and potentially group H
- for milling cutters with a setting angle of 75°
- supplied with „S“ cutting edge design for right feed direction

Utilizzo inserto / Range of cutting conditions:

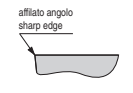
f_z	(0,15) 0,25 ÷ (0,30) 0,45 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ (9,0) 12,0 [mm]

SPKX

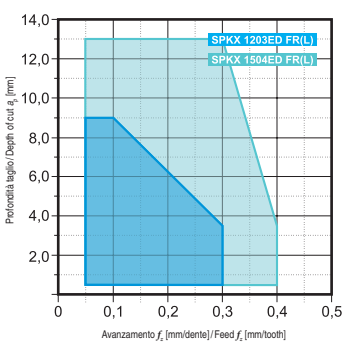
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



Leggera Finishing	■ ■
Media Medium	
Sgrossatura Roughing	



Descrizione Description

Utilizzo inserto / Applies to inserts:
SPKX 1203EDFR(L), SPKX 1504EDFR(L)

- geometria raschiante a petto piano
- costituisce un’estensione del programma agli inserti SPKR, SPKN, SPGN
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P
- per frese a 75°
- disponibilità inserti destri e sinistri

- wiper geometry with zero rake
- accessory to SPKR, SPKN, SPGN indexable cutting inserts
- suitable for machining material groups K and H; can also be used with group P
- for milling cutters with a setting angle of 75°
- for left and right feed directions

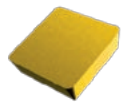
Utilizzo inserto / Range of cutting conditions:

f_z	0,05 ÷ (0,30) 0,40 [mm/dente] / [mm/tooth]
a_p	0,5 ÷ (9,0) 13,5 [mm]

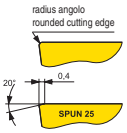
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

SPUN

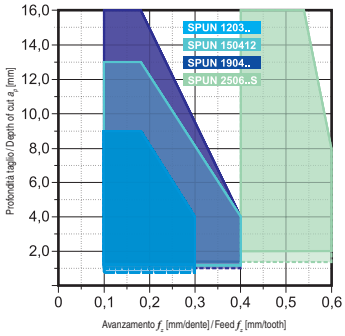
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: SPUN 12.., 15.., 25..



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	◥		■			■
Media Medium	◥		■			■
Sgrossatura Roughing	◥		■			■



- geometria di taglio a petto piano
- tali inserti sono destinati prevalentemente alla tornitura
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P
- la dimensione 25 è a disposizione anche nella versione con fascetta perimetrale

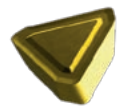
- geometry with zero rake
- primarily used for turning
- suitable for machining of materials groups K and H, applicable also for group P
- different corner radiuses available for each dimension, dimension 25 available also with T-land

Utilizzo inserto / Range of cutting conditions:

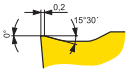
f_z	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert
a_p	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert

TBMR

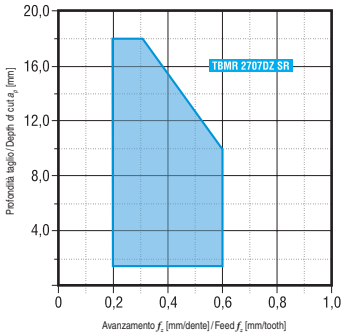
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: TBMR 2707PZSR



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	■		◥	
Media Medium	■	■	■		■	
Sgrossatura Roughing	■	■	■		■	



- geometria di taglio indicata soprattutto per sgrossature (ma può essere usata anche per finiture medie) per fresature di acciai al carbonio e legati (incluso acciai inossidabili), ghise e leghe speciali

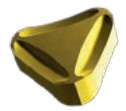
- cutting geometry is primarily suited to heavy roughing (but can also be used for finishing) during milling of carbon-alloyed steels and carbon steels (including stainless steels), cast iron and special alloys

Utilizzo inserto / Range of cutting conditions:

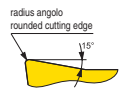
f_z	0,20 ÷ 0,60 [mm/dente] / [mm/tooth]
a_p	1,5 ÷ 18,0 [mm]

TNJF

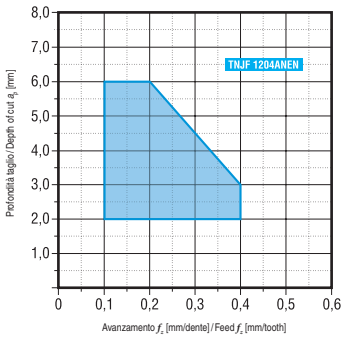
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: TNJF 1204ANEN



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	◥	■		□	
Media Medium	■	◥	■		□	
Sgrossatura Roughing	◥	□	◥			



- geometria con formatruciolo positivo
- adatto per la fresatura dei materiali dei gruppi P, K, utilizzabile anche per materiali del gruppo M e, a certe condizioni, anche S

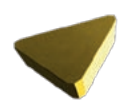
- positive rake angle and chip-forming geometry
- suitable for machining material groups P and K; can also be used with group M and potentially group S

Utilizzo inserto / Range of cutting conditions:

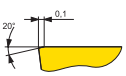
f_z	0,10 ÷ 0,40 [mm/dente] / [mm/tooth]
a_p	2,0 ÷ 6,0 [mm]

TPCN

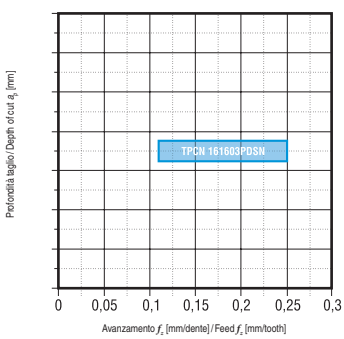
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts: TPCN 1603PDSN



Profilo del tagliente
Profile of cutting edge



Fresatura Milling	P	M	K	N	S	H
Leggera Finishing	■	■	■	□	◥	□
Media Medium	■	■	■	□	◥	□
Sgrossatura Roughing	■	■	■	□	◥	□



- inserto a petto piano per frese a disco
- tali inserti sono utilizzabili per tutti i gruppi di materiali
- i valori raccomandati di avanzamenti sono da considerarsi orientativi (per la scelta dell'avanzamento è molto importante il rapporto a_e/D)

- geometry with flat face for disc milling cutters
- this geometry can be used with all types of materials
- the recommended feed range is for information only: a_e/D ratio is very important

Utilizzo inserto / Range of cutting conditions:

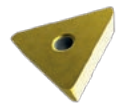
f_z	0,12 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	-

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

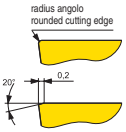
TIPO DI INSERTO
TYPE OF CUTTING INSERTS

TPKN

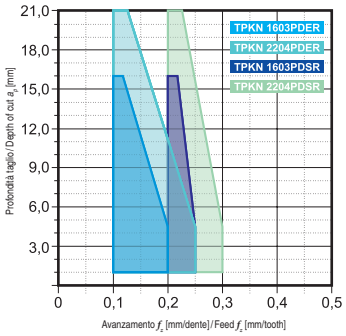
Geometria / Geometry — Inserti / Insert — Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) — Diagramma di applicazione / Diagram of application



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing	■ □ ■ ■
Media / Medium	■ □ ■ ■
Sgrossatura / Roughing	



Descrizione / Description — Utilizzo inserto / Applies to inserts:
TPKN 1603PD(E)SR, TPKN 2204PD(E)SR

- geometria a petto piano
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali dei gruppi P e, a determinate condizioni, anche per materiali del gruppo M
- per frese a 90°
- disponibile la realizzazione dei taglienti „E" e „S", versione destra, per inserti di dimensione 16 e 22

- geometry with zero rake
- suitable for machining material groups K and H; can also be used with group P and potentially group M
- for milling cutters with a setting angle of 90°
- supplied with „E" and „S" cutting edge designs, for right feed direction on dimensions 16 and 22

Utilizzo inserto / Range of cutting conditions:

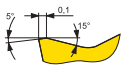
f_z	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert
a_p	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert

TPKR

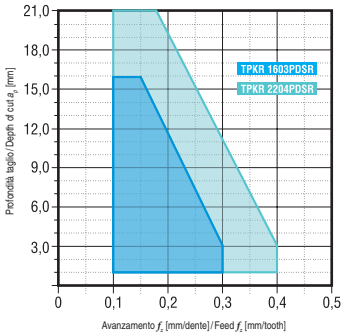
Geometria / Geometry — Inserti / Insert — Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) — Diagramma di applicazione / Diagram of application



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing	■ ◪ ■
Media / Medium	■ ◪ ■
Sgrossatura / Roughing	



Descrizione / Description — Utilizzo inserto / Applies to inserts:
TPKR 1603PDSR, TPKR 2204PDSR

- geometria positiva
- adatto per la fresatura dei materiali dei gruppi P e K, utilizzabile a certe condizioni per il gruppo M
- per frese a 90 gradi
- disponibile la realizzazione del tagliente „S", destra, per inserti di grandezza 16 e 22

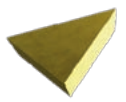
- geometry with a positive rake angle
- suitable for machining material groups P, K, and potentially group M
- for milling cutters with a setting angle of 90°
- supplied with „E" and „S" cutting edge designs, for right feed direction on dimensions 16 and 22

Utilizzo inserto / Range of cutting conditions:

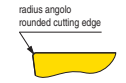
f_z	0,10 ÷ (0,30) 0,40 [mm/dente] / [mm/tooth]
a_p	1,0 ÷ (16,0) 22,0 [mm]

TPUN

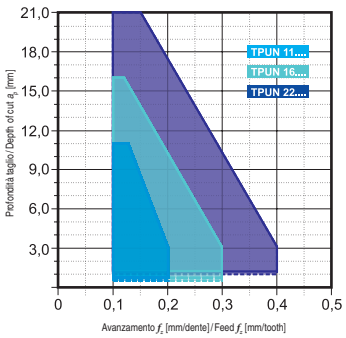
Geometria / Geometry — Inserti / Insert — Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) — Diagramma di applicazione / Diagram of application



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing	■ □ ■ ■
Media / Medium	■ □ ■ ■
Sgrossatura / Roughing	



Descrizione / Description — Utilizzo inserto / Applies to inserts:
TPUN 11.., 16.., 22..

- geometria di taglio neutra
- tali inserti sono destinati prevalentemente alla tornitura
- adatto per la fresatura dei materiali dei gruppi K e H, inoltre utilizzabile per materiali del gruppo P e, a determinate condizioni, anche per materiali del gruppo M
- per le singole dimensioni sono a disposizione diversi raggi

- geometry with zero rake
- primarily used for turning
- suitable for machining material groups K and H; can also be used with group P and potentially group M
- various corner radii are available for all dimensions

Utilizzo inserto / Range of cutting conditions:

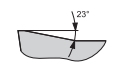
f_z	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert
a_p	secondo il raggio di punta e le dimensioni inserto according to cutting edge condition and dimension of cutting insert

VCGT-FA

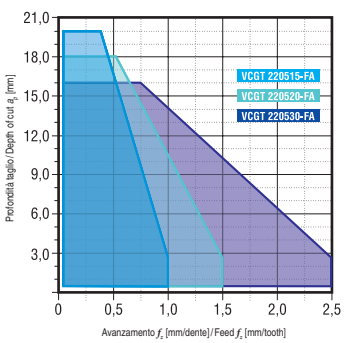
Geometria / Geometry — Inserti / Insert — Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) — Diagramma di applicazione / Diagram of application



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing	■
Media / Medium	■
Sgrossatura / Roughing	■



Descrizione / Description — Utilizzo inserto / Applies to inserts:
VCGT 220515(20, 30)-FA

- geometria positiva con minimo arrotondamento del tagliente
- adatta per la fresatura di metalli non ferrosi – materiali del gruppo N

- geometry with a positive rake angle and sharp geometry
- suitable for machining non-iron materials in group N

Utilizzo inserto / Range of cutting conditions:

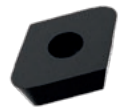
f_z	0,05 ÷ (0,2; 0,25; 0,35) [mm/dente] / [mm/tooth]
a_p	0,5 ÷ (16,0; 18,0; 20,0) [mm]

■ Applicazione principale ◪ Applicazione secondaria □ Applicazione possibile
■ Main application ◪ Secondary application □ Supplementary application

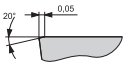
XDHW

Geometria / Geometry: XDHW

Inserti / Insert



Profilo del tagliente / Profile of cutting edge

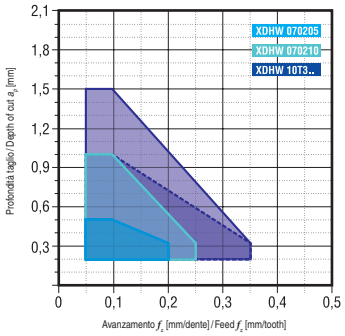


Gruppo del materiale / Workpiece material group

Fresatura / Milling: P M K N S H

	P	M	K	N	S	H
Leggera / Finishing	◥	□	■			■
Media / Medium	◥	□	■			■
Sgrossatura / Roughing						

Diagramma di applicazione / Diagram of application



Descrizione / Description

Utilizzo inserto / Applies to inserts:
XDHW 0702.., XDHW 10T3..

- geometria neutra
- idonea per la lavorazione dei gruppi di materiali K e H; può essere usata anche con il gruppo di materiali P e potenzialmente con il gruppo M
- dimensione 07 con raggi di 0,5, 1 e 2 mm
- dimensione 10 (con tagliente smussato) con raggi 1,0 e 1,5 mm

- geometry with a zero face angle
- suitable for machining material groups K and H; can also be used with material group P and potentially group M
- size 07 with radii of 0.5, 1 and 2 mm
- size 10 (with chamfered edge) with radii 1.0 and 1.5 mm

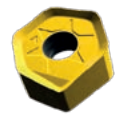
Utilizzo inserto / Range of cutting conditions:

f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

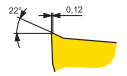
XNGX 06

Geometria / Geometry: XNGX 06

Inserti / Insert



Profilo del tagliente / Profile of cutting edge

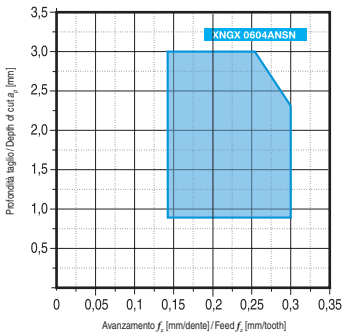


Gruppo del materiale / Workpiece material group

Fresatura / Milling: P M K N S H

	P	M	K	N	S	H
Lehké / Finishing	■		■			
Střední / Medium	■		■			
Těžké / Roughing	□		□			

Diagramma di applicazione / Diagram of application



Descrizione / Description

Použité u VBD / Applies to inserts:
XNGX 0604ANSN

- geometria Wiper
- adatta per la lavorazione dei materiali dei gruppi P e K
- specialmente adatta per lavorazioni di finitura medio - leggere

- smooth geometry
- suitable for machining material groups P and K
- particularly suited to finishing and medium machining

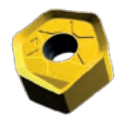
Utilizzo inserto / Range of cutting conditions:

f_z	0,13 ÷ 0,3 [mm/dente] / [mm/tooth]
a_p	0,7 ÷ 3,0 [mm]

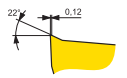
XNGX 09

Geometria / Geometry: XNGX 09

Inserti / Insert



Profilo del tagliente / Profile of cutting edge

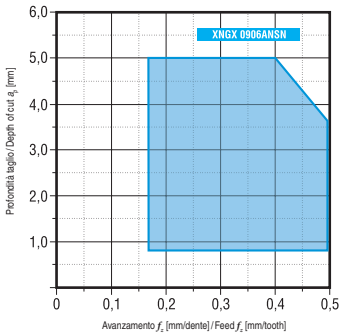


Gruppo del materiale / Workpiece material group

Fresatura / Milling: P M K N S H

	P	M	K	N	S	H
Leggera / Finishing	■		■			
Media / Medium	■		■			
Sgrossatura / Roughing	□		□			

Diagramma di applicazione / Diagram of application



Descrizione / Description

Utilizzo inserto / Applies to inserts:
XNGX 0906ANSN

- geometria Wiper
- adatta per la lavorazione dei materiali gruppi P e K
- specialmente adatta per lavorazioni medio - leggere

- smoothing geometry
- suitable for machining material groups P and K
- suited to light and medium milling

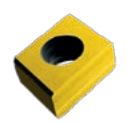
Utilizzo inserto / Range of cutting conditions:

f_z	0,17 ÷ 0,5 [mm/dente] / [mm/tooth]
a_p	0,8 ÷ 5,0 [mm]

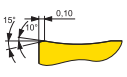
XNHQ

Geometria / Geometry: XNHQ

Inserti / Insert



Profilo del tagliente / Profile of cutting edge

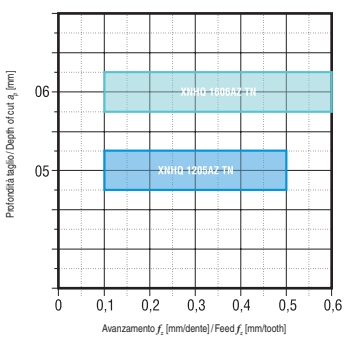


Gruppo del materiale / Workpiece material group

Fresatura / Milling: P M K N S H

	P	M	K	N	S	H
Leggera / Finishing	■	■	■	□	◥	□
Media / Medium	■	■	■	□	◥	□
Sgrossatura / Roughing	■	■	■	□	◥	□

Diagramma di applicazione / Diagram of application



Descrizione / Description

Utilizzo inserto / Applies to inserts:
XNHQ 1205AZ TN, XNHQ 1606AZ TN

- geometria di taglio universale
- adatta per la fresatura dei materiali dei gruppi P, M, K e S
- destinata per lavorazioni leggere, medie o pesante

- universal cutting geometry
- suitable for machining material groups P, M, K, and S
- suited to light, medium and heavy milling

Utilizzo inserto / Range of cutting conditions:

f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	-

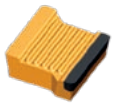
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

TIPO DI INSERTO
TYPE OF CUTTING INSERTS

XOEN RH

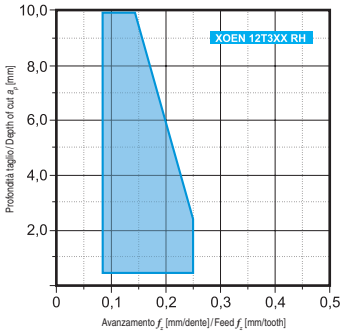
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

XOEN 12T3XX RH



Profilo del tagliente / Profile of cutting edge

Leggera / Finishing — ■ P M K N S H
Media / Medium — ■ P M K N S H
Sgrossatura / Roughing — □ P M K N S H



- geometria neutra senza rinforzo, monotagliente
- specialmente progettata per la lavorazione dei materiali del gruppo N
- geometria destinata alla sgrossatura e alla finitura delle leghe di Al
- particolarmente adatta a condizioni di lavorazione da leggere a medie
- la concezione del tagliente consente di usare la massima profondità di taglio

- neutral geometry without chamfered edge, single cutting edge design
- specially designed for machining materials in group N
- geometry intended for roughing or finishing milling of Al alloys
- particularly suited to light to medium machining conditions
- cutting edge concept enables the maximum depth of cut to be used

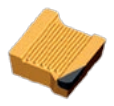
Utilizzo inserto / Range of cutting conditions:

f_z	0,08 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	0,4 ÷ 10 [mm]

XOEN RF

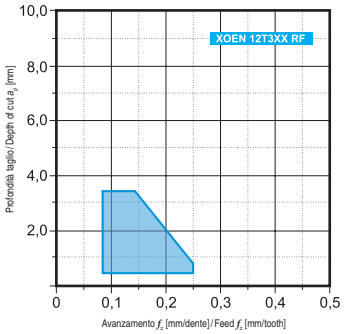
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

XOEN 12T3XX RF



Profilo del tagliente / Profile of cutting edge

Leggera / Finishing — ■ P M K N S H
Media / Medium — ■ P M K N S H
Sgrossatura / Roughing — □ P M K N S H



- geometria neutra senza rinforzo, monotagliente
- specialmente progettata per la lavorazione dei materiali del gruppo N
- geometria destinata specialmente alla fresatura delle leghe di Al
- adatta a condizioni di lavorazione da leggere a medie
- la concezione del tagliente limita la massima profondità di taglio

- neutral geometry without chamfered edge, single cutting edge design
- specially designed for machining materials in group N
- geometry intended especially for finishing milling of Al alloys
- suited to light to medium machining conditions
- cutting edge concept limits the maximum depth of cut

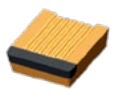
Utilizzo inserto / Range of cutting conditions:

f_z	0,08 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	0,4 ÷ 3,3 [mm]

XOEN NH

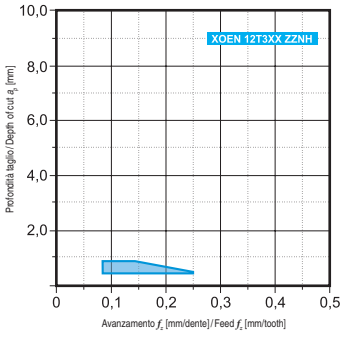
Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

XOEN 12T3XX ZZNH



Profilo del tagliente / Profile of cutting edge

Leggera / Finishing — ■ P M K N S H
Media / Medium — ■ P M K N S H
Sgrossatura / Roughing — □ P M K N S H



- geometria raschiante per finitura
- specialmente progettata per la lavorazione dei materiali del gruppo N
- geometria destinata alla fresatura di finitura delle leghe di Al
- adatta a condizioni di lavorazione da leggere a medie
- la profondità massima di taglio è limitata da un valore di 0,8 mm

- single cutting edge design (finishing geometry)
- specially designed for machining materials in group N
- geometry intended especially for finishing milling of Al alloys
- suited to light to medium machining conditions
- maximum depth of cut is limited by a value of 0.8 mm

Utilizzo inserto / Range of cutting conditions:

f_z	0,08 ÷ 0,25 [mm/dente] / [mm/tooth]
a_p	0,4 ÷ 0,76 [mm]

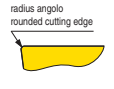
XP-FM

Geometria / Geometry | Inserti / Insert | Gruppo del materiale / Workpiece material group (Fresatura / Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione / Description | Utilizzo inserto / Applies to inserts:

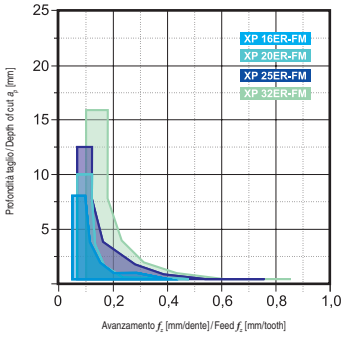
XP (16..-FM, 20..-FM, 25..-FM, 32..-FM)



Profilo del tagliente / Profile of cutting edge



Leggera / Finishing — ■ □ ■ □ ◪
Media / Medium — ■ ◪ ■ ◪ ◪
Sgrossatura / Roughing — ■ ◪ ■ ◪ □



- geometria di taglio affilata, neutra
- idonea per la lavorazione praticamente di tutti i gruppi di materiali ad eccezione delle leghe morbide di metalli non ferrosi
- per fresatura leggera di materiali del gruppo H e operazioni complesse con altri gruppi di materiali

- neutral sharp cutting geometry
- suitable for machining practically all material groups with the exception of soft alloys of non-iron metals
- for light milling of materials in group H and complex operations with other material groups

Utilizzo inserto / Range of cutting conditions:

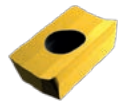
f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

■ Applicazione principale ◪ Applicazione secondaria □ Applicazione possibile
■ Main application ◪ Secondary application □ Supplementary application

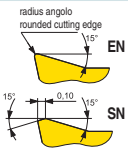
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application | Descrizione Description | Utilizzo inserto / Applies to inserts:

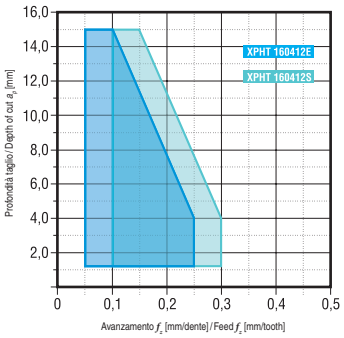
XPHT

Leggera Finishing ■ ■ ◥ □
Media Medium ■ ■ ◥ □
Sgrossatura Roughing ■ ■ ◥ □



Profilo del tagliente
Profile of cutting edge





Descrizione Description: XPHT 160412, XPHT 160412S

- geometria altamente positiva
- disponibile con finitura del tagliente EN ed SN
- adatto per la fresatura dei materiali dei gruppi P, M e inoltre utilizzabile per materiali del gruppo K e, a determinate condizioni anche per materiali del gruppo S

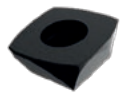
- high positive milling geometry
- supplied with „EN“ and „SN“ cutting edge designs
- suitable for machining material groups P and M; can also be used with group K and potentially group S

Utilizzo inserto / Range of cutting conditions:

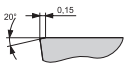
f_z	0,05(0,10) ÷ 0,30 [mm/dente] / [mm/tooth]
a_p	1,2 ÷ 15,0 [mm]

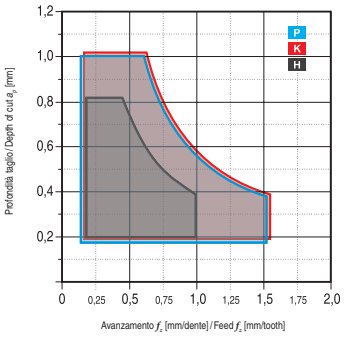
ZDCW 07

Leggera Finishing ■ □ ■ ■
Media Medium ■ □ ■ ■
Sgrossatura Roughing ■ □ ■ ◥



Profilo del tagliente
Profile of cutting edge





Descrizione Description: ZDCW 070304

- geometria per alto avanzamento
- adatta alla lavorazione di materiali gruppi P, K e H
- adatta per condizionioni leggere e medio leggere a piccole profondità di taglio

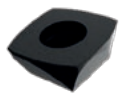
- special geometry for HFC technology
- suitable for machining material groups P, K, and H
- suitable for finishing and medium milling at low depths of cut

Utilizzo inserto / Range of cutting conditions:

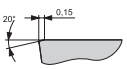
f_z	0,15 ÷ 1,5 [mm/dente] / [mm/tooth]
$a_{p\,max}$	0,3 ÷ 1,0 [mm]

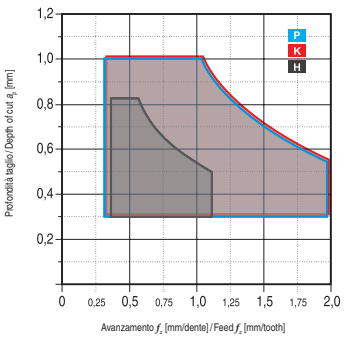
ZDCW 09

Leggera Finishing ■ □ ■ ■
Media Medium ■ □ ■ ■
Sgrossatura Roughing ■ □ ■ ◥



Profilo del tagliente
Profile of cutting edge





Descrizione Description: ZDCW 09T304

- geometria per alto avanzamento
- adatto per la lavorazione di materiali gruppi P,K e H
- adatto per lavorazioni di sgrossatura
- adatto per lavorazioni di copiatura ed applicazioni generali

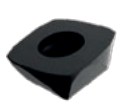
- special geometry for HFC technology
- suitable for machining material groups P, K, and H
- suitable for finishing and medium milling
- suitable for copy and general machining

Utilizzo inserto / Range of cutting conditions:

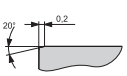
f_z	0,3 ÷ 2,0 [mm/dente] / [mm/tooth]
$a_{p\,max}$	1,0 [mm]

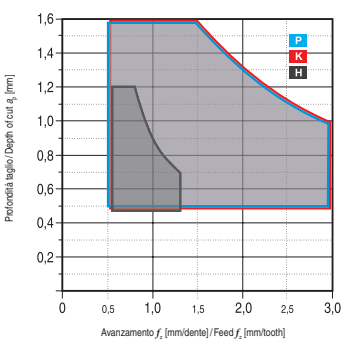
ZDEW

Leggera Finishing ■ □ ■ ■
Media Medium ■ □ ■ ■
Sgrossatura Roughing ■ □ ■ ◥



Profilo del tagliente
Profile of cutting edge





Descrizione Description: ZDEW 120408

- geometria per alto avanzamento
- adatto per la lavorazione di materiali gruppi P,K e H
- adatto per e lavorazioni di sgrossatura
- adatto per lavorazioni di copiatura ed applicazioni generali

- special geometry for HFC technology
- suitable for machining material groups P, K, and H
- suitable for finishing and medium milling
- suitable for copy milling and general applications

Utilizzo inserto / Range of cutting conditions:

f_z	0,5 ÷ 3,0 [mm/dente] / [mm/tooth]
$a_{p\,max}$	1,6 [mm]

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

TIPO DI INSERTO
TYPE OF CUTTING INSERTS

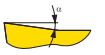
ZP-F

Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application

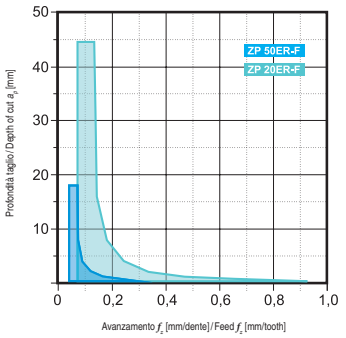


Profilo del tagliente
Profile of cutting edge

	α
ZP 50..-F	15
ZP 20..-F	20



	Leggera Finishing	Media Medium	Sgrossatura Roughing
P	◪		
M	◪		
K			
N	■	■	■
S	□		
H			



Descrizione Description | Utilizzo inserto / Applies to inserts:
ZP (20..-F, 50..-F)

- geometria di taglio affilata ed estremamente positiva
- progettata principalmente per la lavorazione di leghe metalliche non ferrose; tale geometria può essere utilizzata, potenzialmente, per la finitura (lavorazione leggera) di materiali collanti

- very positive and sharp cutting geometry
- primarily designed for machining non-iron metal alloys; this geometry can potentially be used for finishing (light machining) „sticky“ materials

Utilizzo inserto / Range of cutting conditions:

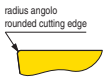
f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

ZP-FM

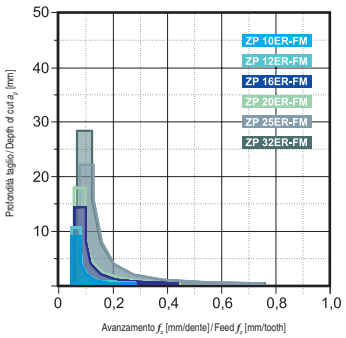
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	Leggera Finishing	Media Medium	Sgrossatura Roughing
P	■	■	■
M	□	□	
K	■	■	■
N			
S	□		
H	□		



Descrizione Description | Utilizzo inserto / Applies to inserts:
ZP (10..-FM, 12..-FM, 16..-FM, 20..-FM, 25..-FM, 32..-FM)

- geometria neutra affilata idonea per la finitura
- idonea per la lavorazione dei gruppi di materiali P e K, potenzialmente, per i gruppi di materiali M, S ed H
- adatta a condizioni di lavorazione leggere e medie

- sharp neutral geometry suitable for finishing
- suitable for machining material groups P and K, potentially for material groups M, S, and H
- suited to light and medium machining conditions

Utilizzo inserto / Range of cutting conditions:

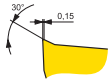
f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

ZP-M

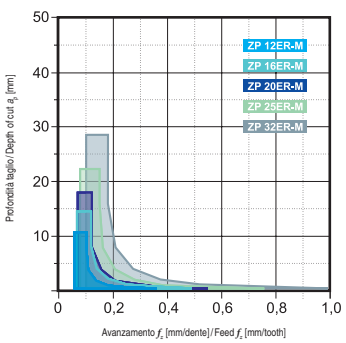
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	Leggera Finishing	Media Medium	Sgrossatura Roughing
P	■	■	■
M	■	■	■
K	◪	◪	□
N		□	◪
S	■	◪	□
H	□	□	□



Descrizione Description | Utilizzo inserto / Applies to inserts:
ZP (12..-M, 16..-M, 20..-M, 25..-M, 32..-M)

- geometria altamente positiva con un tagliente rinforzato
- idonea per un'ampia gamma di applicazioni, può essere utilizzata (in combinazione con un materiale di taglio adeguato) per quasi tutti i gruppi di materiali lavorati
- particolarmente adatta alla lavorazione media

- very positive geometry with a peripheral chamfered edge
- suitable for a wide range of applications, can be used (in combination with a suitable cutting material) with almost all machined material groups
- particularly suited to medium machining

Utilizzo inserto / Range of cutting conditions:

f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

ZP-R

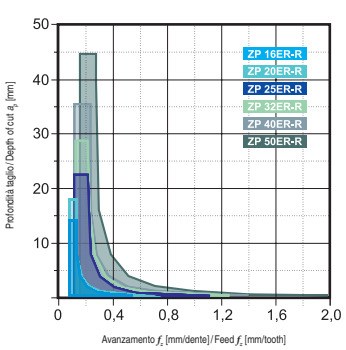
Geometria Geometry | Inserti Insert | Gruppo del materiale Workpiece material group (Fresatura Milling: P M K N S H) | Diagramma di applicazione / Diagram of application



Profilo del tagliente
Profile of cutting edge



	Leggera Finishing	Media Medium	Sgrossatura Roughing
P	■	■	■
M	■	■	■
K	■	◪	□
N		□	◪
S	■	◪	□
H	□	□	□



Descrizione Description | Utilizzo inserto / Applies to inserts:
ZP (16..-R, 20..-R, 25..-R, 32..-R)

- geometria affilata, leggermente positiva
- idonea per la lavorazione dei gruppi di materiali P, M, K, ed S
- potenzialmente, può essere utilizzata per leghe di metalli non ferrosi e per il gruppo di materiali H
- geometria utilizzabile per la lavorazione leggera, media e più pesante

- sharp, slightly positive geometry
- suitable for machining material groups P, M, K and S
- can also be used for machining alloys
- can potentially be used for alloys of non-iron metals and for material group H
- geometry usable for light, medium, and heavier machining

Utilizzo inserto / Range of cutting conditions:

f_z	secondo le dimensioni dell'inserto / according to dimension of cutting insert
a_p	secondo le dimensioni dell'inserto / according to dimension of cutting insert

■ Applicazione principale ◪ Applicazione secondaria □ Applicazione possibile
■ Main application ◪ Secondary application □ Supplementary application

Designazione microstruttura Designation and microstructure	ISO 513	Gruppo materiali lavorati Workpiece material group	Descrizione dei gradi ed uso consigliato Grade description and recommended application

M0315



10 20 30 40
05 15 25 35 45

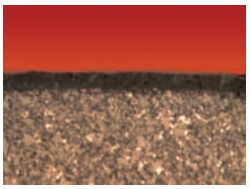
P M K N S H

UP! GRADE®

- substrato submicron con un contenuto di agente legante relativamente basso
- rivestimento con un coefficiente di frizione molto basso, applicato con il metodo PVD
- finitura specifica del tagliente
- materiale speciale per la lavorazione di metalli non ferrosi
- lavoro di semi sgrossatura, finitura
- adatto a condizioni di lavorazione stabili

- sub-micron substrate with a relatively low bonding agent content
- coating with a very small friction coefficient, applied by PVD method
- specific cutting edge finish
- special material for machining non-iron metals
- finishing, half-roughing work
- suited to stable machining conditions

M5315



10 20 30 40
05 15 25 35 45

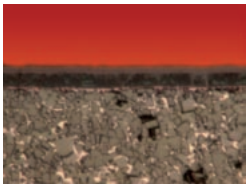
P M K N S H

UP! GRADE®

- substrato di tipo H con un contenuto di cobalto relativamente basso
- rivestimento MT-CVD sottile con uno strato Al_2O_3 unico
- prima scelta per la fresatura di ghisa duttile e grigia e di materiali trattati e temprati; può anche essere utilizzato per la fresatura di materiali più duri nel gruppo P
- elevata resistenza all'usura
- adatto a condizioni di lavorazione stabili
- adatto a velocità di taglio da medie a elevate
- può essere utilizzato con la lavorazione a secco, tuttavia, quando le condizioni di taglio sono ideali, può anche essere utilizzato il refrigerante

- type H substrate with a relatively low cobalt content
- thin MT-CVD coating with a unique Al_2O_3 layer
- first choice for milling grey and ductile cast iron and hardened and heat-treated materials; can also be used for milling harder materials in group P
- high wear resistance
- suited to stable machining conditions
- suited to medium to high cutting speeds
- can be used with dry machining; however, when the cutting conditions are ideal, coolant can also be used

M9315



10 20 30 40
05 15 25 35 45

P M K N S H

UP! GRADE®

- substrato a grana fine con un minore contenuto di fase di cobalto legante
- rivestimento MT-CVD sottile con uno strato Al_2O_3 unico
- idoneo per la lavorazione del gruppo di materiali P, potenzialmente, per i gruppi K ed H
- adatto a velocità di taglio da medie a elevate
- elevata resistenza all'abrasione, pur conservando un buon livello di resistenza
- può essere utilizzato con la lavorazione a secco, tuttavia, quando le condizioni di taglio sono ideali, può anche essere utilizzato il refrigerante

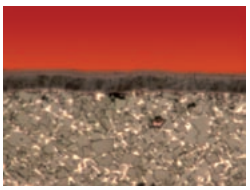
- fine-grained substrate with a lower content of bonding cobalt phase
- thin MT-CVD coating with a unique Al_2O_3 layer
- suitable for machining material group P, potentially for groups K and H
- suited to medium to high cutting speeds
- high abrasion resistance while retaining a good level of strength
- can be used with dry machining; however, when the cutting conditions are ideal, coolant can also be used

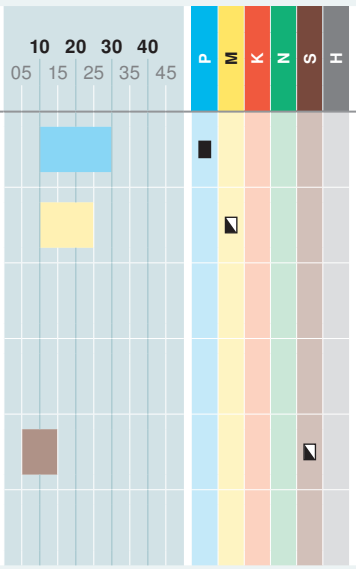
■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

QUALITÀ RIVESTITE PER FRESATURA
COATED GRADES FOR MILLING

Designazione microstruttura Designation and microstructure	ISO 513	Gruppo materiali lavorati Workpiece material group	Descrizione dei gradi ed uso consigliato Grade description and recommended application

M9325



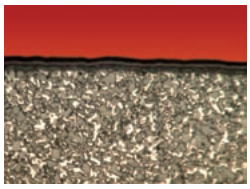


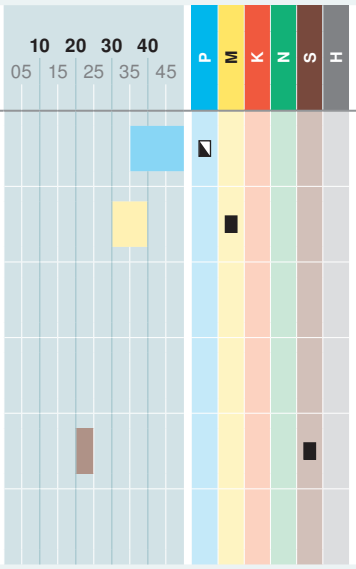
UP! GRADE®

- substrato a grana fine con un maggiore contenuto di fase di cobalto legante
- rivestimento MT-CVD sottile con uno strato Al_2O_3 unico
- idoneo per la lavorazione del gruppo di materiali P, potenzialmente, anche per i gruppi M ed S
- adatto a velocità di taglio da medie a più elevate
- elevata resistenza ed affidabilità operativa
- buona resistenza all'usura
- può essere utilizzato con la lavorazione a secco, tuttavia, quando le condizioni di taglio sono ideali, può anche essere utilizzato il refrigerante

- fine-grained substrate with a higher content of bonding cobalt phase
- thin MT-CVD coating with a unique Al_2O_3 layer
- suitable for machining material group P, potentially also groups M and S
- suited to medium to higher cutting speeds
- high strength and operational reliability
- good wear resistance
- can be used with dry machining; however, when the cutting conditions are ideal, coolant can also be used

M9340





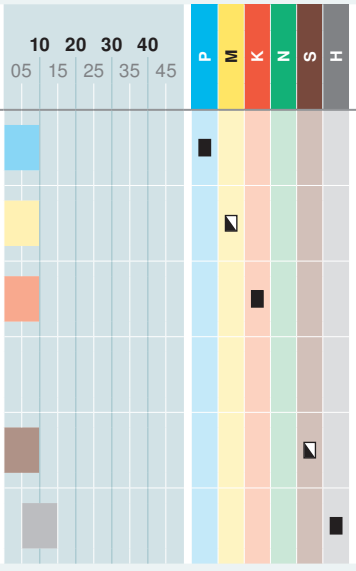
UP! GRADE®

- substrato con una dimensione della grana media e un elevato contenuto di fase di cobalto legante
- rivestimento sottile applicato con il metodo MT-CVD con uno strato Al_2O_3 unico
- idoneo per la lavorazione dei gruppi di materiali M, S e, potenzialmente, anche del gruppo P
- adatto alle velocità di taglio da basse a medie
- materiale della serie M9300 con la massima resistenza
- per lavorazione con o senza refrigerante

- substrate with a medium grain size and a high content of bonding cobalt phase
- thin coating applied by the MT-CVD method with a unique Al_2O_3 layer
- suitable for machining material groups M, S, and potentially also group P
- suited to low to medium cutting speeds
- M9300 series material with the highest strength
- for machining with or without a coolant

M8310





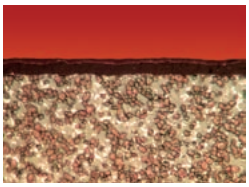
UP! GRADE®

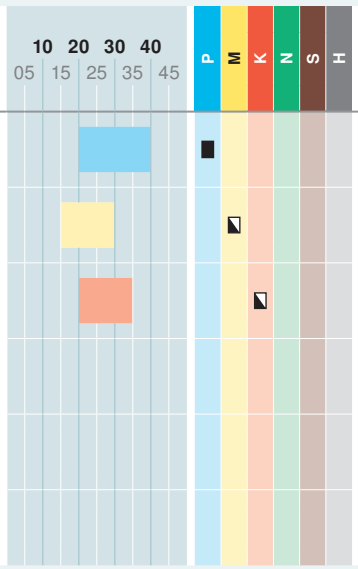
- materiale altamente resistente all'abrasione della serie M8300
- substrato ultra submicron con un contenuto di agente legante relativamente basso
- nuovo rivestimento PVD su base AlTiN e TiAlSiN multistrato
- speciale finitura del rivestimento
- idoneo per la lavorazione dei gruppi di materiali P, K, H e, potenzialmente, dei gruppi M ed S
- adatto a condizioni di lavorazione stabili
- per operazioni di finitura e semi-finitura

- highly abrasion-resistant material of the M8300 series
- ultra sub-micron substrate with a relatively low bonding agent content
- new multi layer AlTiN and TiAlSiN based PVD coating
- special final coating finish
- suitable for machining material groups P, K, H, and potentially groups M and S
- suited to stable machining conditions
- for finishing and semi-finishing operations

Designazione microstruttura Designation and microstructure	ISO 513	Gruppo materiali lavorati Workpiece material group	Descrizione dei gradi ed uso consigliato Grade description and recommended application

M8325



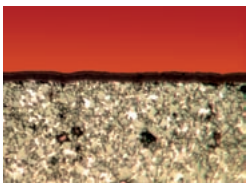


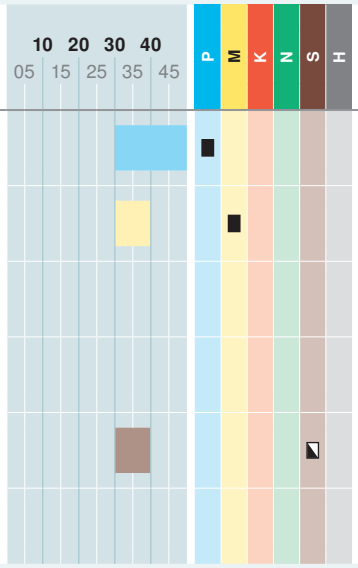
UP! GRADE®

- substrato di tipo S con un elevato contenuto di carburi cubici
- elevato limite di stabilità termica
- nuovo rivestimento PVD su base AlTiN e TiAlSiN multistrato
- speciale finitura del rivestimento
- idoneo per la lavorazione del gruppo di materiali P e, potenzialmente, dei gruppi M e K
- adatto a condizioni di lavorazione stabili
- adatto a velocità di taglio e avanzamenti da medi a elevati

- type S substrate with a high cubic carbide content
- high level of thermal stability
- new multi layer AlTiN and TiAlSiN based PVD coating
- special final coating finish
- suitable for machining material group P, and potentially groups M and K
- suited to stable machining conditions
- suited to medium to high cutting speeds and feeds

M8345



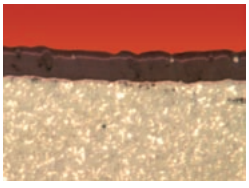


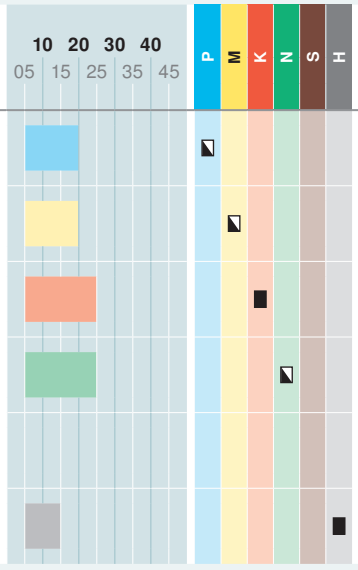
UP! GRADE®

- substrato a grana fine con un elevato contenuto di fase di cobalto legante
- elevata affidabilità operativa (la massima tenacità della serie 83xx)
- nuovo rivestimento PVD su base AlTiN e TiAlSiN multistrato
- speciale finitura del rivestimento
- idoneo per la lavorazione dei gruppi di materiali P ed M e, potenzialmente, del gruppo S
- adatto a condizioni di lavorazione instabili
- per applicazioni di sgrossatura

- fine-grained substrate with a high content of bonding cobalt phase
- high operational reliability (the highest toughness of the 83xx series)
- new multi layer AlTiN and TiAlSiN based PVD coating
- special final coating finish
- suitable for machining material groups P and M, and potentially group S
- suited to unstable machining conditions
- for roughing applications

8215





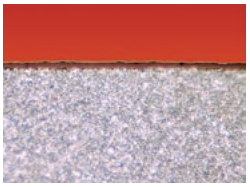
- substrato submicron di tipo H con un contenuto di cobalto relativamente basso
- elevata resistenza all'abrasione
- nuovo rivestimento PVD su base AlTiN e TiAlSiN multistrato
- resistenza molto buona alla diffusione delle microfessure
- idoneo per un'ampia gamma di applicazioni, può essere utilizzato con quasi tutti i gruppi di materiali lavorati
- idoneo per operazioni con un elevato carico termico
- adatto a elevate velocità di taglio
- adatto a condizioni di lavorazione stabili

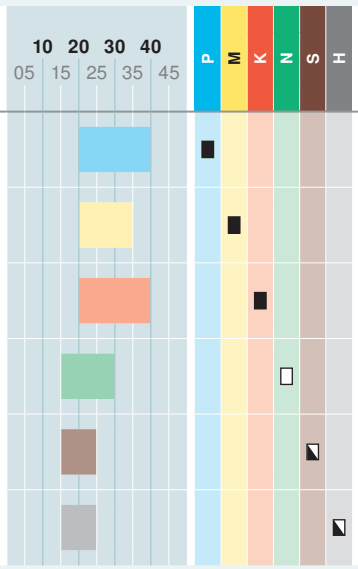
- type H sub-micron substrate with a relatively low cobalt content
- high abrasion resistance
- new multi layer AlTiN and TiAlSiN based PVD coating
- very good resistance to spreading micro fissures
- suitable for a wide range of applications, can be used with almost all machined material groups
- suitable for operations with a high thermal load
- suited to high cutting speeds
- suited to stable machining conditions

QUALITÀ RIVESTITE PER FRESATURA
COATED GRADES FOR MILLING

Designazione microstruttura Designation and microstructure	ISO 513	Gruppo materiali lavorati Workpiece material group	Descrizione dei gradi ed uso consigliato Grade description and recommended application

8230

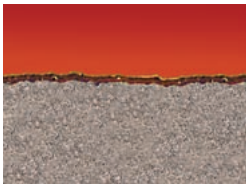


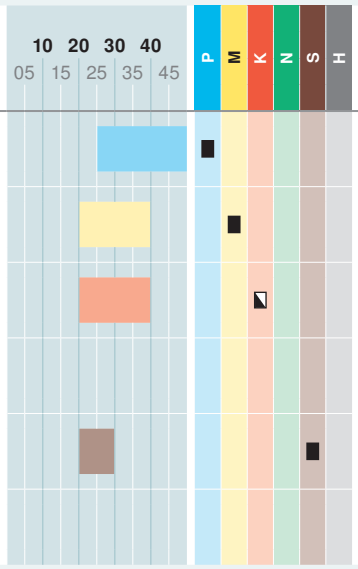


- substrato submicron di tipo H
- rivestimento sottile a nanostruttura con un alto contenuto di Al, applicato con metodo PVD
- materiale di taglio altamente versatile
- combina buona resistenza all'abrasione con buona affidabilità operativa
- può essere usato con tutti i gruppi di materiali lavorati
- velocità di taglio medie
- adatto anche a condizioni di lavorazione instabili

- type H sub-micron substrate
- nano-structure thin coating with a high content of Al, applied by PVD method
- highly versatile cutting material
- combines good abrasion resistance with good operative reliability
- can be used with all groups of machined materials
- medium cutting speeds
- also suited to unstable machining conditions

8240

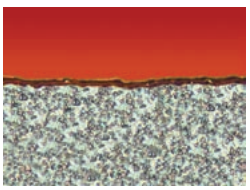


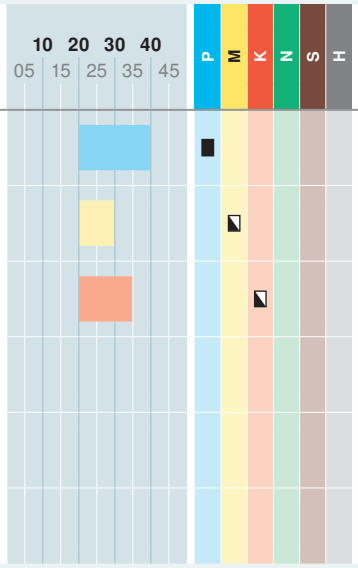


- substrato submicron di tipo H con un alto contenuto di cobalto
- rivestimento sottile a nanostruttura con un alto contenuto di Al, applicato con metodo PVD
- l'elemento più tenace della serie 8200
- per operazioni con un alto carico meccanico sul tagliente
- idoneo per la lavorazione dei gruppi di materiali P, M, S e K
- velocità di taglio da basse a medie
- adatto a condizioni di lavorazione instabili

- type H sub-micron substrate with a high cobalt content
- nano-structure thin coating with a high Al content, applied by PVD method
- the toughest member of the 8200 series
- for operations with a high mechanical load on the cutting edge
- suitable for machining material groups P, M, S, and K
- low to medium cutting speeds
- suited to unstable machining conditions

8026T





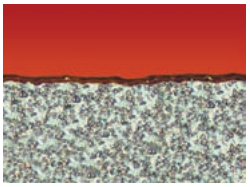
- substrato con un alto contenuto di carburi cubici (tipo S)
- rivestimento a nanostruttura applicato con il metodo PVD
- idoneo per la lavorazione dei gruppi di materiali P ed M e, potenzialmente, anche del gruppo K
- avanzamenti da medi a elevati
- velocità di taglio da medie a elevate
- adatto a condizioni di lavorazione stabili

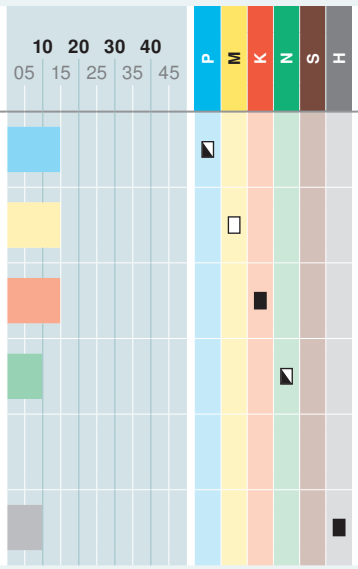
- substrate with a high content of cubic carbides (type S)
- nano-structure coating applied with the PVD method
- suitable for machining material groups P and M, and potentially also group K
- medium and higher feeds
- medium to high cutting speeds
- suited to stable machining conditions

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

Designazione microstruttura Designation and microstructure	ISO 513	Gruppo materiali lavorati Workpiece material group	Descrizione dei gradi ed uso consigliato Grade description and recommended application

7205

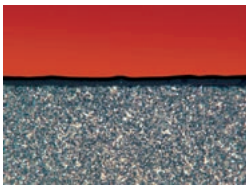


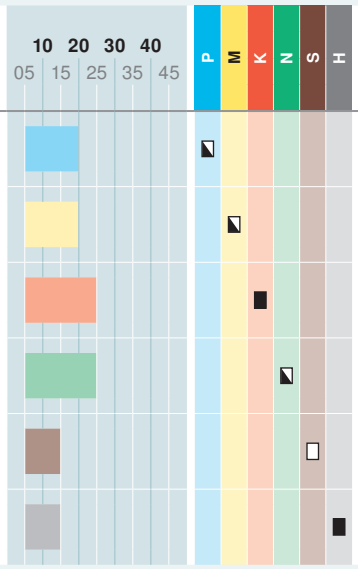


- substrato ultra sub-micro grano senza carburi cubici,tipo H, a basso contenuto di cobalto
- elevata durezza e resistenza a flessione
- ottima resistenza all'usura meccanica
- nuovo rivestimento PVD resistente all'ossidazione con proprietà antifrizione uniche.
- elevata velocità e medio bassa sezione di truciolo
- adatto a condizioni stabili
- può essere usato su tutti i tipi di materiali, escluso il gruppo S

- ultra sub-micron substrate without cubic carbides (type H) and with a very low cobalt content
- high hardness while maintaining flexural strength
- very good resistance to mechanical wear
- new type of PVD coating with enhanced resistance to oxidation and unique friction properties
- high speeds and lower to medium chip cross-sections
- suited to stable machining conditions
- can be used with practically all groups of machined materials, with the exception of super-alloys (group S)

7215

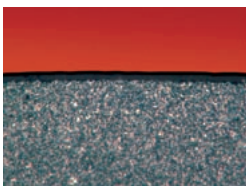


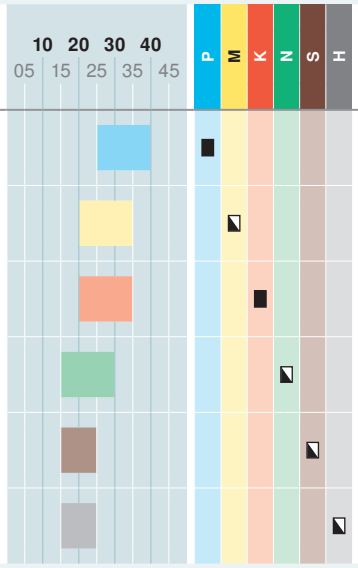


- substrato submicron senza carburi cubici (tipo H) e con un basso contenuto di cobalto
- nuovo rivestimento gradiente applicato con il metodo PVD
- velocità di taglio da medie a più elevate e sezioni trasversali del truciolo da piccole a medie
- migliorata resistenza all'ossidazione
- proprietà antifrizione uniche
- adatto a condizioni di lavorazione stabili
- può essere usato praticamente con tutti i gruppi di materiali lavorati

- sub-micron substrate without cubic carbides (type H) and with a low cobalt content
- new gradient coating applied with the PVD method
- medium to higher cutting speeds and small to medium chip cross-sections
- enhanced oxidation resistance
- unique friction properties
- suited to stable machining conditions
- can be used with practically all groups of machined materials

7230





- substrato submicron senza carburi cubici (tipo H) e con un maggiore contenuto di cobalto
- nuovo rivestimento gradiente con potenziata resistenza all'ossidazione applicato con il metodo PVD
- proprietà antifrizione uniche
- velocità di taglio medie e spessore del truciolo medio basso
- adatto a condizioni di lavorazione meno favorevoli
- può essere usato praticamente con tutti i gruppi di materiali lavorati

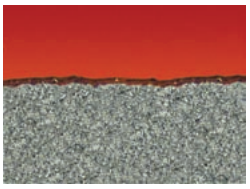
- sub-micron substrate without cubic carbides (type H) and with a higher cobalt content
- new gradient coating with enhanced resistance to oxidation applied with the PVD method
- unique friction properties
- medium cutting speeds and smaller to medium chip cross-sections
- suited to less favourable machining conditions
- can be used with practically all groups of machined materials

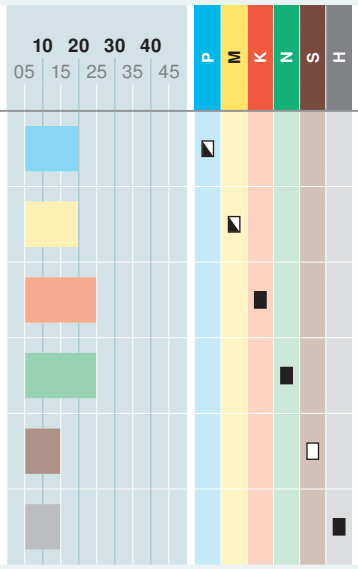
■ Applicazione principale ◪ Applicazione secondaria □ Applicazione possibile
■ Main application ◪ Secondary application □ Supplementary application

QUALITÀ RIVESTITE PER FRESATURA
COATED GRADES FOR MILLING

Designazione microstruttura Designation and microstructure	ISO 513	Gruppo materiali lavorati Workpiece material group	Descrizione dei gradi ed uso consigliato Grade description and recommended application

7010

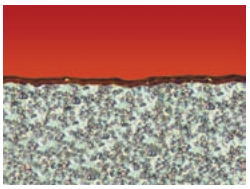


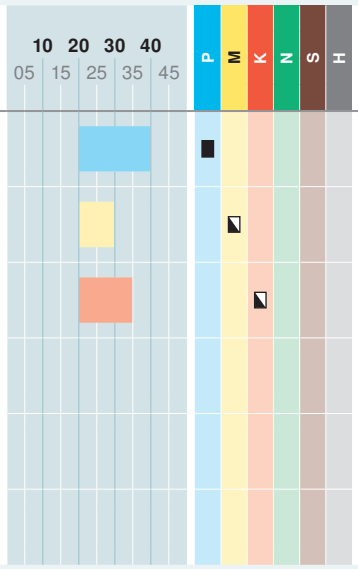


- substrato a grana fine senza carburi cubici (tipo H) e con un contenuto di cobalto molto basso
- rivestimento a nanostruttura multistrato con alto contenuto di Al applicato con il metodo PVD
- per operazioni con un alto carico termico
- estremamente versatile in termini di materiali lavorati (può essere usato con tutti i gruppi)
- spessore truciolo da piccolo a medio
- velocità di taglio elevate
- adatto a condizioni di lavorazione stabili

- fine-grained substrate without cubic carbides (type H) and with a very low cobalt content
- multi-layer nano-structure coating with a high Al content applied with the PVD method
- for operations with a high thermal load
- very versatile in terms of machined materials (can be used with all groups)
- small to medium chip cross-sections
- high cutting speeds
- suited to stable machining conditions

7025

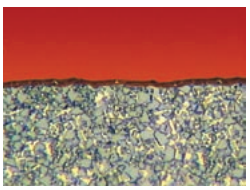


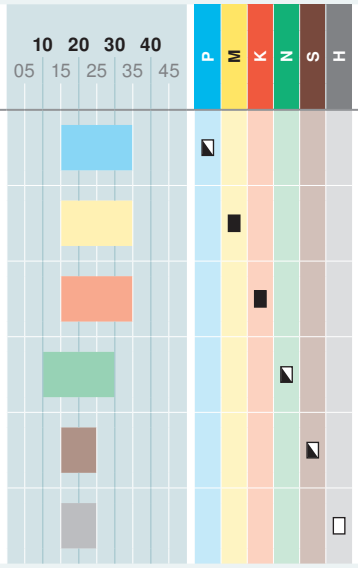


- substrato con un elevato contenuto di carburi cubici (tipo S)
- rivestimento a nanostruttura multistrato con un elevato contenuto di Al applicato con il metodo PVD
- idoneo per la lavorazione dei gruppi di materiali P ed M e, potenzialmente, anche del gruppo K
- avanzamenti da medi a superiori
- velocità di taglio da medie a elevate
- adatto a condizioni di lavorazione stabili

- substrate with a high content of cubic carbides (type S)
- multi-layer nano-structure coating with high Al content applied with the PVD method
- suitable for machining material groups P and M, and potentially also group K
- medium and higher feeds
- medium to high cutting speeds
- suited to stable machining conditions

7040





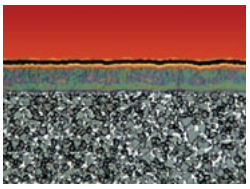
- substrato senza carburi cubici (tipo H)
- rivestimento a nanostruttura multistrato con un elevato contenuto di Al applicato con il metodo PVD
- combina buona resistenza all'abrasione con buona affidabilità operativa
- estremamente versatile in termini di materiali lavorati (può essere usato con tutti i gruppi)
- velocità di taglio medie
- adatto a condizioni di lavorazione meno favorevoli

- substrate without cubic carbides (type H)
- multi-layer nano-structure coating with high Al content applied with the PVD method
- combines good abrasion resistance with good operative reliability
- very versatile in terms of machined materials (can be used with all groups)
- medium cutting speeds
- suited to less favourable machining conditions

■ Applicazione principale ◪ Applicazione secondaria □ Applicazione possibile
■ Main application ◪ Secondary application □ Supplementary application

Designazione microstruttura Designation and microstructure	ISO 513	Gruppo materiali lavorati Workpiece material group	Descrizione dei gradi ed uso consigliato Grade description and recommended application

5040

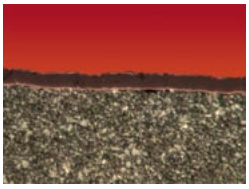


- substrato con carburi cubici (tipo S)
- rivestimento sottile applicato con il metodo MT-CVD
- idoneo per la lavorazione dei gruppi di materiali P e K e, potenzialmente, anche del gruppo M
- destinato alla fresatura a copiare
- spessore truciolo da piccolo a medio
- velocità di taglio da minori a medie
- adatto a condizioni di lavorazione meno favorevoli

- substrate with cubic carbides (type S)
- thin coating applied with the MT-CVD method
- suitable for machining material groups P and K, and potentially also group M
- intended for copy-milling
- medium chip cross-sections
- lower to medium cutting speeds
- suited to less favourable machining conditions

T8315

UP! GRADE®

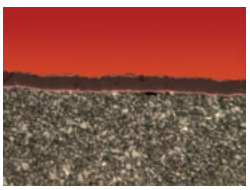


- materiale altamente resistente all'abrasione della serie T8300 con resistenza garantita
- substrato submicron con un contenuto relativamente basso di cobalto
- rivestimento PVD nanostratificato con transizioni gradienti
- tensione del rivestimento interno minore con durezza maggiore
- minore usura ad intaglio sul tagliente principale
- velocità di taglio maggiori
- spessore medio del truciolo
- idoneo per la lavorazione dei gruppi di materiali M, K, N ed H; potenzialmente anche P ed S
- condizioni di lavorazione stabili

- highly abrasion resistant material of the T8300 series with guaranteed strength
- sub-micron substrate with a relatively low cobalt content
- nano-layered PVD coating with gradient transitions
- lower internal coating tension with higher hardness
- lower notch wear on the main cutting edge
- higher cutting speeds
- medium chip cross-sections
- suitable for machining material groups M, K, N, and H; potentially also P and S
- stable machining conditions

T8330

UP! GRADE®



- il membro più versatile della serie T83000
- substrato submicron con un contenuto relativamente alto di cobalto
- rivestimento PVD nanostratificato con transizioni gradienti
- tensione del rivestimento interno minore con durezza maggiore
- minore usura ad intaglio sul tagliente principale
- velocità di taglio medie
- idoneo per la lavorazione dei gruppi di materiali M, P e K; potenzialmente anche N, S ed H
- buona affidabilità operativa
- condizioni di lavorazione ridotte

- the most versatile member of the T8300 series
- sub-micron substrate with a relatively high cobalt content
- nano-layered PVD coating with gradient transitions
- lower internal coating tension with higher hardness
- lower notch wear on the main cutting edge
- medium cutting speeds
- suitable for machining material groups M, P, and K; potentially also N, S, and H
- good operative reliability
- impaired machining conditions

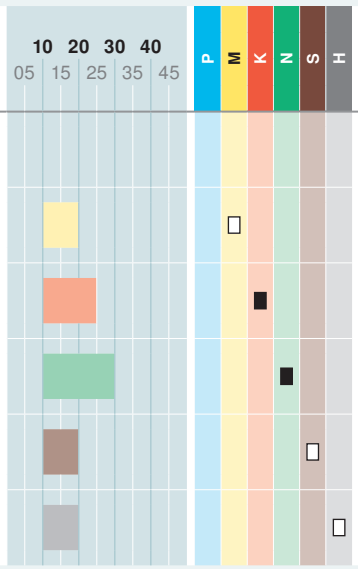
■ Applicazione principale ◪ Applicazione secondaria □ Applicazione possibile
■ Main application ◪ Secondary application □ Supplementary application

QUALITÀ NON RIVESTITE PER FRESATURA
UNCOATED GRADES FOR MILLING

Designazione microstruttura Designation and microstructure	ISO 513	Gruppo materiali lavorati Workpiece material group	Descrizione dei gradi ed uso consigliato Grade description and recommended application

HF7

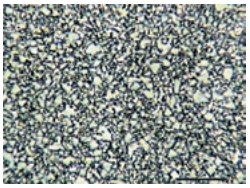


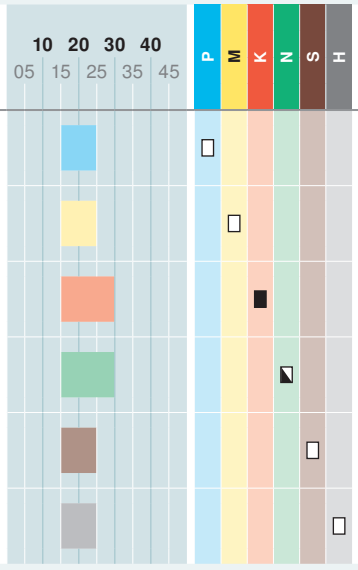


- materiale submicron senza carburi cubici (tipo H) e con un basso contenuto di cobalto
- estremamente versatile in termini di materiali lavorati
  (raccomandato per tutti i gruppi di materiali, ad eccezione del gruppo P)
- spessore truciolo medio-basso
- adatto a condizioni di lavorazione stabili

- sub-micron material without cubic carbides (type H) and with a low cobalt content
- very versatile in terms of machined materials
  (recommended for all material groups with the exception of group P)
- small to medium chip cross-sections
- suited to stable machining conditions

H10

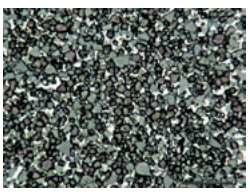


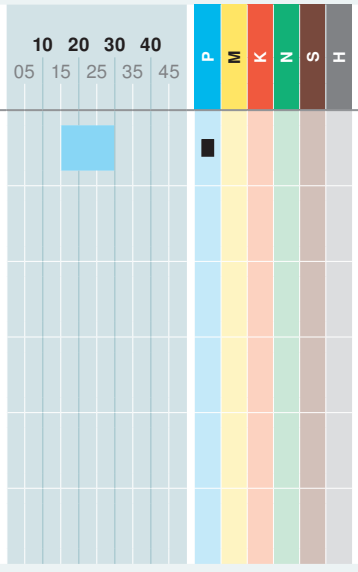


- materiale senza carburi cubici (tipo H) e con un basso contenuto di cobalto
- estremamente versatile in termini di materiali lavorati
  (raccomandato per tutti i gruppi di materiali)
- spessore truciolo medio-basso
- adatto a condizioni di lavorazione stabili

- material without cubic carbides (type H) and with a low cobalt content
- very versatile in terms of machined materials
  (recommended for all material groups)
- small to medium chip cross-sections
- suited to stable machining conditions

S26





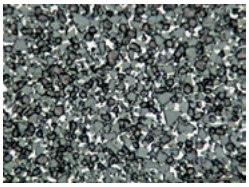
- materiale con un elevato contenuto di carburi cubici (tipo S)
- idoneo per la lavorazione di materiali del gruppo P
- avanzamenti da medi a superiori
- velocità di taglio medie
- adatto a condizioni di lavorazione stabili

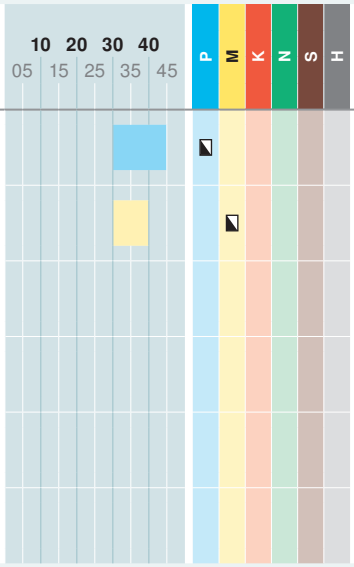
- material with a high content of cubic carbides (type S)
- suitable for machining materials in group P
- medium and higher feeds
- medium cutting speeds
- suited to stable machining conditions

■ Applicazione principale ◥ Applicazione secondaria □ Applicazione possibile
■ Main application ◥ Secondary application □ Supplementary application

Designazione microstruttura Designation and microstructure	ISO 513	Gruppo materiali lavorati Workpiece material group	Descrizione dei gradi ed uso consigliato Grade description and recommended application

S45

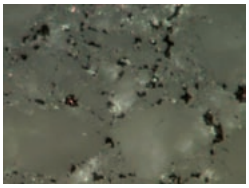


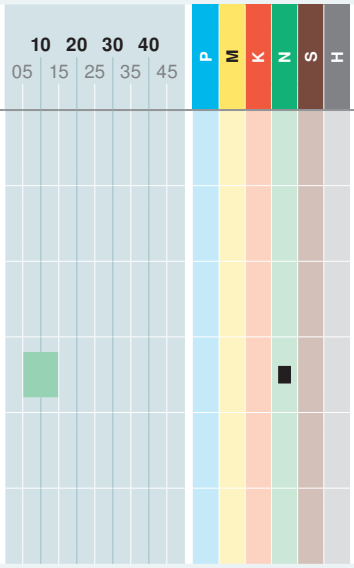


- materiale con un elevato contenuto di cobalto e con carburi cubici (tipo S)
- idoneo per la lavorazione del gruppo di materiali P e, potenzialmente, anche del gruppo M
- avanzamenti da medi ad elevati
- velocità di taglio basse
- adatto a condizioni di lavorazione instabili

- material with a high cobalt content and with cubic carbides (type S)
- suitable for machining material group P and potentially also group M
- medium and higher feeds
- low cutting speeds
- suited to unstable machining conditions

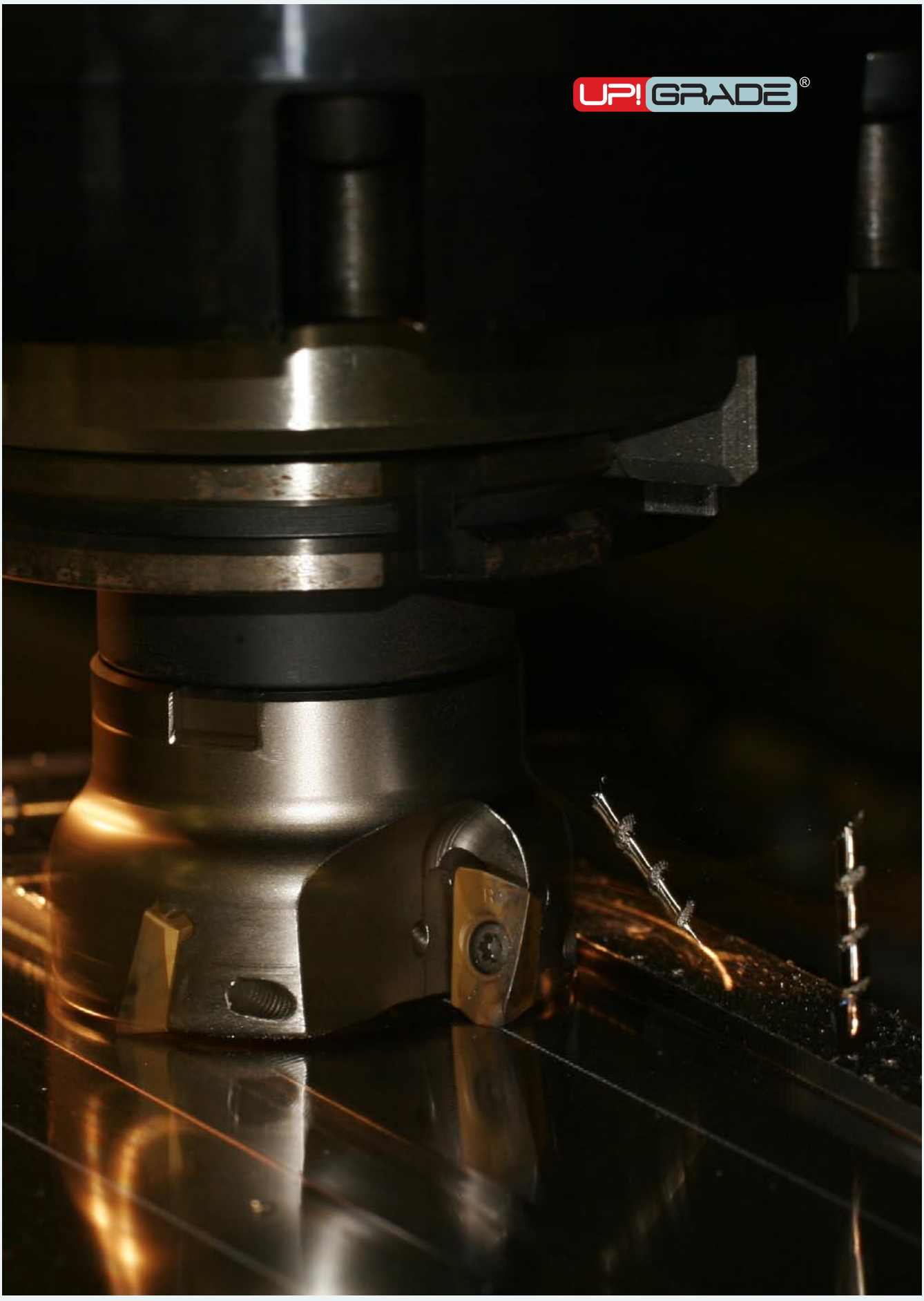
D720





- diamante policristallino, dimensioni della grana media
- materiale per velocità di taglio elevate
- eccellente resistenza all'usura
- resistenza alla deformazione del tagliente
- dalla finitura alla leggera sgrossatura di leghe di alluminio e altri materiali non ferrosi come leghe di magnesio e di zinco
- condizioni di lavorazione stabili

- polycristalline diamond, medium grain size
- material for high cutting speeds
- excellent wear resistance
- resistance to cutting edge crushing
- finishing to light roughing of aluminum alloys and other non-iron materials, such as magnesium and zinc alloys
- stable machining conditions


UP! GRADE®

1. Prima di tutto occorre individuare il materiale da fresare in uno dei sei gruppi (vedi tab 1 pagina 226).
2. Si classifica quindi l'operazione nel gruppo secondo il tipo di lavoro: fresatura leggera, media o pesante.

   Fresatura leggera - Taglio continuo, buone condizioni di taglio, superficie del pezzo prelavorata oppure superficie di laminati e di fucinati senza grandi difetti e con sovrametallo regolare. Profondità di taglio $a_p \leq 2$ mm.

   Fresatura media - Taglio leggermente interrotto, con impossibilità di scegliere le condizioni ottimali, superficie del pezzo con leggere irregolarità di fucinatura o fusione ma con sovrametallo abbastanza regolare. Profondità di taglio $a_p = 2 \div 4$ mm.

   Fresatura pesante - Taglio molto interrotto, cattive condizioni di taglio (angolo di taglio negativo), superficie dei pezzi con pesanti croste di fucinatura e fusione e/o sovrametalli molto irregolari. Profondità taglio $a_p = 3 \div 10$ mm.

   Avanzamento per ogni gruppo in base alle condizioni di taglio. In caso di condizioni in peggioramento è necessario ridurre il limite massimo di avanzamento.
3. Nelle tabelle 2a ÷ 7a (per il dato gruppo di materiali fresati) scegliamo (per l'inserto o fresa scelta precedentemente) la combinazione materiale + preparazione tagliente. tre possibili soluzioni sono indicate per ogni gruppo di materiali.
4. Nelle tabelle 2b ÷ 7b pag. 269 ÷ 279 scegliamo quindi la velocità di taglio iniziale, il materiale rispetto al tipo di fresa o inserto, il tipo di operazione e la qualità.
5. Le tabelle 2b ÷ 7b pag. 269 ÷ 279 sono inoltre integrate dai coefficienti di correzione per la verifica delle velocità di taglio durante la fresatura riguardo allo stato dell'utensile, la durata richiesta dei taglienti ed eventualmente anche al materiale ed alla durezza del pezzo. In caso di necessità perciò utilizziamo tali coefficienti di correzione per calcolare le velocità reale:

1. The first step is to assign the material to be machined into one of six groups according the ISO 513 standard – see table 1. on page 226.
2. Specify the cutting conditions (light-, medium-, or heavy-duty milling).

   Light-duty milling – one interruption per revolution, good cutting conditions, workpiece with pre-machined surface or surface of rolled blanks and forgings without major defects or roughness in depth of cut $a_p \leq 2$ mm.

   Medium-duty milling – one or two interruptions per revolution. Not possible to choose the optimal cutting conditions. Surface of workpiece with skin of rolled blanks, forgings and castings or with minor defects in depth of cut $a_p = 2 \div 4$ mm.

   Heavy-duty milling – multiple interruptions per revolution. Unfavourable cutting conditions (negative rake of working angle). Surface of work piece with rough skin of castings, forgings and burnt parts. Variable depth of cut $a_p = 3 \div 10$ mm.

   Feed range for each group dependent on cutting conditions. At the worsening of cutting conditions, it is necessary to reduce the upper limit of feed.
3. In accordance with tables 2a ÷ 7a, choose the suitable combination of grade and cutting edge with regard to the machined material and the pre-chosen cutting insert and tool. There are three possible solutions for each group of machined materials.
4. Use tables 2b ÷ 7b on pages 269 ÷ 279 to choose the initial cutting speed with regard to type of tool or cutting insert, cutting conditions and milling grade.
5. In tables 2b ÷ 7b on pages 269 ÷ 279 are the speed factors for recalculating the cutting speed with regard to the machine's condition, the tool and cutting edge service life, and the hardness of the workpiece material. If needed, however, the following can be used to calculate the actual speed:

$$v_c = v_{30} \cdot k_{VX} \cdot k_{VT} \cdot k_{VHB} \cdot (k_{VM})$$

Attenzione: la velocità di taglio definita in questo modo è il valore iniziale (default), che stabilisce il livello base delle velocità di taglio per una data operazione.

La diversa lavorabilità di un materiale è il motivo per cui i parametri di taglio devono essere corretti.

Note: The cutting speed calculated in this way is the initial value (default), which is used to establish the basic cutting speed for a given operation.

Variations in the machinability of the workpiece material are the main reason for needing to adjust the cutting speed.

IMPERO PRAMET

Tabella 2a
Table 2a

SCELTA DELLA FRESA E DEI DATI DI TAGLIO INIZIALI
CHOICE OF MILLING CUTTER AND INITIAL CUTTING CONDITIONS

Gruppo/Group	P												Forma dell'inserto Type of insert	Condizioni di lavoro della fresatura / Cutting conditions					
	Tipo di fresa / Type of tool													Leggera / Finishing		Media / Medium		Pesante / Roughing	
1													HNGX 06 HNGX 09 HNEF 0905..... SNMT SNKT 1205AZ	I	M9315 M5315 S (E)	I	M9325 S	I	M9340 S
	S45HN06C S45HN09C	SNH06	SNH06	C60HN09	S45SN12Z									II	8215 M8310	II	8215 M8310 S	II	8230 S
														III	8230 S (E)	III	8230 S	III	8240 S
2													ODMT(W) 05 ODMT(W) 06 SEMT 09 SDEW, SDEX 09.. SOMT 09T3:: TCMT 16T3 XPHT 1604..	I	8215 M9315 S (E)	I	8230 M9325 S	I	8240 M9340 S
	S45OD05D S45OD06D	S45SE09F	SSE09	SSD09	N-SSO09	2516-45		SXP16						II	8230 S (E)	II	8230 S	II	8240 S
														III	8230 S (E)	III	8240 S	III	8240 S
3													ADMX ,ADEX 11T3.. ADMX ,ADEX 1606.. APKT 1003PD APET, APKT 1604.. LNGX 12..., LNGU 16... SOMT 09T30.., SDMT 120508SR.. ADKX 15T3...., XOEN 12 T3...	I	8215 M9315 S (E)	I	8230 M9325 S	I	8240 M9340 S, P
	S90AD11E, S90AD16E S90AP10D, S90AP16D	SAD11E SAD16E	SAD11E, SAD16E SAP10D, SAP16D	S90LN12 S90LN16	SLN12	SLN12	S90SO09 S90SD12	SSO09	C90AD15	CAD15	CAD15	W90XO12		II	8215 S (E)	II	8230 S	II	8240 S, P
														III	8230 S (E)	III	8240 S	III	8240 S, P
4													SCKR 09T3.., SCKR 12T3..., RDHX 0501.. RDHX, RDGT, RDHT 07T1..,0702.. RDHX, RDGT, RDHT 1003.. RDHX, RDGT, RDHT 12T3.. RDHX, RDGT, RDHT 1604.. RCMT 1204, RCMT1606, RCMT2006, ZDCW 07, ZDCW 09, ZDEW 12 PD.. 0905...	I	7010 7205 E (S)	I	7025 7215 S (E)	I	7040 7230 S
	C90SC09, 12	CSC09, 12	SCRD12, 16	SRD05, 07, 10, 12, 16	B-SRD07, 10	SMORC12,16,20	SMOZD09, 12	SZD07, 09, 12	SZD07 SZD09 SZD12	S19SPD09	SPD09			II	M8310 8215 E (S)	II	M8325 8230 S (E)	II	M8345 8240 S
														III	8215 E (S)	III	8230 S (E)	III	8240 S
5													XP xxER-FM ZPxxER-xx VCGT 220530	I	M8310	I	8230 M8325	I	M8345 8240
	CXP16, 20, 25, 32	CXP16, 20, 25, 32	SZP10,12,16,20, 25	SZP10, 12, 16, 20, 25, 32, 40, 50	S90VC22C	SVC22C	A-SVC22C							II	–	II	–	II	–
														III	–	III	–	III	–
6													SN.. 11 (12) CN XN.. 1205	I	8215 E (S)	I	8230 S (E)	I	8240 S
	S90SN	S90SN-R	S90CN S90XN	S90CN-R S90XN-R										II	8230 S (E)	II	8230 S (E)	II	8230 S (E)
														III	–	III	–	III	–
7													LNET 160616SR ,SNGX 1305 SNGX 130512PN APET(W) 150412 SPET(W) 1204AD ADMX ,ADEX 11T3.. SDMX 1205 CCMX 0603.. CCMX 08T3.. CCMX 09T3..	I	8230 M9315 S (E)	I	8230 M9325 S (E)	I	8240 M9340 S
	SLSN	SSAP	SSAP-A	S90AD11E	SAD11E	C90SD12X	CSD12X		SCC06, SSC08 SSC09					II	8230 S	II	8230 S	II	8240 S
														III	–	III	–	III	–
8													SPUN,SPGN 2506.. SBMR 22 PNMU 1308..	I	8026T S	I	8240 S	I	8240 S
	W60SP25P	F60SB22	S57PN13											II	8230 8215 S	II	8230 S	II	M8345 S
														III	–	III	–	III	–
9													SPUN 2506.. TBMR 27....	I	8026T S	I	8240 S	I	8240 S
	W90SP25P	F90TB27X												II	–	II	–	II	–
														III	–	III	–	III	–

SCELTA DELLA FRESA E DEI DATI DI TAGLIO INIZIALI
CHOICE OF MILLING CUTTER AND INITIAL CUTTING CONDITIONS

Gruppo/Group	P																				
	Avanzamento in base alle condizioni di taglio Feed range according to the cutting conditions			M5315	M9315	M9325	M9340	5040	M8310	M8325	M8345	8215	8230	8240	8026T	7010	7025	7040	7205	7215	7230
1	Leggera / Finishing	0,10	0,30	435	425	410	270	-	300	-	-	365	320	295	-	-	-	-	-	-	-
	Media / Medium	0,10	0,25	405	390	370	260	-	270	-	-	310	280	250	-	-	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	370	350	325	255	-	235	-	-	260	240	210	-	-	-	-	-	-	-
2	Leggera / Finishing	0,10	0,35	405	400	395	240	-	290	-	-	360	310	290	-	260	250	-	-	-	-
	Media / Medium	0,10	0,30	370	360	350	230	-	255	-	-	305	270	250	-	230	220	-	-	-	-
	Pesante / Roughing	0,10	0,20	355	335	310	245	-	225	-	-	245	230	200	-	205	200	-	-	-	-
3	Leggera / Finishing	0,10	0,30	380	370	360	235	-	260	-	225	315	280	255	-	235	225	-	-	-	-
	Media / Medium	0,10	0,25	365	350	330	235	-	245	-	210	280	255	225	-	220	210	-	-	-	-
	Pesante / Roughing	0,10	0,15	345	325	300	235	-	220	-	190	240	225	195	-	200	190	-	-	-	-
4	Leggera / Finishing	-	-	-	-	420	300	260	310	265	265	355	320	290	-	280	265	255	315	290	245
	Media / Medium	-	-	-	-	385	275	240	285	245	245	325	295	265	-	255	245	235	290	265	225
	Pesante / Roughing	-	-	-	-	350	230	215	260	220	220	310	270	250	-	230	220	210	260	240	205
5	Leggera / Finishing	-	-	-	-	-	-	-	285	-	245	-	295	-	-	-	-	-	-	-	-
	Media / Medium	-	-	-	-	-	-	-	260	-	220	-	270	-	-	-	-	-	-	-	-
	Pesante / Roughing	-	-	-	-	-	-	-	230	-	200	-	245	-	-	-	-	-	-	-	-
6	Leggera / Finishing	0,10	0,50	-	-	-	-	-	-	-	-	295	270	240	-	-	-	-	-	-	-
	Media / Medium	0,10	0,30	-	-	-	-	-	-	-	-	270	245	215	-	-	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	-	-	-	-	-	-	-	-	245	220	200	-	-	-	-	-	-	-
7	Leggera / Finishing	0,10	0,25	250	235	220	165	-	165	140	140	185	170	150	-	145	-	-	-	-	-
	Media / Medium	0,10	0,20	220	205	185	150	-	140	120	120	145	140	120	-	125	-	-	-	-	-
	Pesante / Roughing	0,08	0,15	-	-	150	140	-	-	-	95	-	110	90	-	-	-	-	-	-	-
8	Leggera / Finishing	0,25	0,60	-	-	-	-	170	-	-	190	270	250	250	215	-	-	-	-	-	-
	Media / Medium	0,25	0,50	-	-	-	-	140	-	-	155	210	195	195	180	-	-	-	-	-	-
	Pesante / Roughing	0,25	0,40	-	-	-	-	120	-	-	135	-	170	165	155	-	-	-	-	-	-
9	Leggera / Finishing	0,20	0,60	-	-	-	-	-	-	-	-	-	-	210	180	-	-	-	-	-	-
	Media / Medium	0,20	0,50	-	-	-	-	-	-	-	-	-	-	160	145	-	-	-	-	-	-
	Pesante / Roughing	0,20	0,40	-	-	-	-	-	-	-	-	-	-	135	130	-	-	-	-	-	-

P

COEFFICIENTE DI CORREZIONE / CORRECTION v_c

Sottogruppo Subgroup	P1	P2	P3	P4
Fattore durezza del pezzo Workpiece hardness factor				
Durezza Hardness	kv_{HBP1}	kv_{HBP2}	kv_{HBP3}	kv_{HBP4}
120	**1,53**	1,18	0,94	0,71
140	**1,46**	1,12	0,90	0,67
160	**1,37**	1,05	0,84	0,63
180	**1,30**	**1,00**	0,80	0,60
200	**1,24**	**0,95**	0,76	0,57
220	**1,17**	**0,90**	**0,72**	0,54
240	**1,12**	**0,86**	**0,69**	0,52
260	**1,07**	**0,82**	**0,66**	**0,49**
280	1,04	**0,80**	**0,64**	**0,48**
300	1,00	**0,77**	**0,62**	**0,46**
320	0,96	0,74	**0,59**	**0,44**
340	0,92	0,71	**0,57**	**0,43**
360	0,88	0,68	0,54	**0,41**
375	0,85	0,65	0,52	**0,39**

Correzione per durata (lavorazione generale) Correction for durability (general machining)	
Trvanlivost / Durata [min]	k_{vT}
15	1,23
20	1,13
30	1,00
45	0,89
60	0,81
90	0,72

Correzione per durata (sgrossatura pesante) Correction for durability (heavy roughing)	
Trvanlivost / Durata [min]	k_{vT}
30	1,23
60	1,00
90	0,89
120	0,81

Fattore correzione velocità k_{vx} Speed factor k_{vx}	
Crosta del pezzo fucinato e fuso / Forged and cast piece skin	0,70 - 0,90
Buono stato della fresa / Good machine conditions	1,05 - 1,20
Cattivo stato della fresa / Bad machine conditions	0,85 - 0,95

IMPERO PRAMET

Tabella 3a
Table 3a

SCELTA DELLA FRESA E DEI DATI DI TAGLIO INIZIALI
CHOICE OF MILLING CUTTER AND INITIAL CUTTING CONDITIONS

M

Gruppo/Group	Tipo di fresa / Type of tool	Forma dell'inserto Type of insert	Condizioni di lavoro della fresatura / Cutting conditions					
			Leggera / Finishing		Media / Medium		Pesante / Roughing	
1	    	HNGX 06 HNGX 09 HNEF 0905..... SNMT SNKT 1205AZ	I	M9325 S (E)	I	8215 S	I	M9340 S
	S45HN06C S45HN09C | SNH06 | SNH06 | C60HN09 | S45SN12Z		II	8215 (M8310) S (E)	II	8230 S	II	8230 S
			III	M9340 S (E)	III	8230 S	III	8240 S
2	      	ODMT(W) 05 ODMT(W) 06 SEMT 09 SDEW, SDEX 09.. SOMT 09T3::: TCMT 16T3 XPHT 1604..	I	8215 S (E)	I	8230 M9325 S	I	8240 M9340 S
	S45OD05D S45OD06D | S45SE09F | SSE09 | SSD09 | N-SSO09 | 2516-45 | SXP16		II	8230 S (E)	II	8230 S	II	8240 S
			III	8230 S (E)	III	8240 S	III	8240 S
3	           	ADMX ,ADEX 11T3.. ADMX ,ADEX 1606.. APKT 1003PD APET, APKT 1604.. LNGX 12..., LNGU 16... SOMT 09T30.., SDMT 120508SR.. ADKX 15T3...., XOEN 12 T3...	I	8215 7010 S (E)	I	8230 M9325 S	I	8240 M9340 S, P
	S90AD11E, S90AD16E S90AP10D, S90AP16D | SAD11E SAD16E | SAD11E, SAD16E SAP10D, SAP16D | S90LN12 S90LN16 | SLN12 | SLN12 | S90SO09 S90SD12 | SSO09 | C90AD15 | CAD15 | CAD15 | W90XO12		II	8215 7010 S (E)	II	8230 S	II	8240 S, P
			III	8230 7025 S (E)	III	8240 S	III	8240 S, P
4	          	SCKR 09T3.., SCKR 12T3..., RDHX 0501.. RDHX, RDGT, RDHT 07T1..,0702.. RDHX, RDGT, RDHT 1003.. RDHX, RDGT, RDHT 12T3.. RDHX, RDGT, RDHT 1604.. RCMT 1204, RCMT1606, RCMT2006, ZDCW 07, ZDCW 09, ZDEW 12 PD.. 0905...	I	7010 7205 E (S)	I	7025 7215 S (E)	I	7040 7230 S
	C90SC09, 12 | CSC09, 12 | SCRD12, 16 | SRD05, 07, 10, 12, 16 | B-SRD07, 10 | SMORC12,16,20 | SMOZD09, 12 | SZD07, 09, 12 | SZD07 SZD09 SZD12 | S19SPD09 | SPD09		II	M8310 8215 E (S)	II	M8325 8230 S (E)	II	M8345 8240 S
			III	8215 E (S)	III	8230 S (E)	III	8240 S
5	    	XP xxER-FM ZPxxER-xx VCGT 220530	I	M8310	I	8230 M8325	I	M8345 8240
	CXP16, 20, 25, 32 | CXP16, 20, 25, 32 | SZP10,12,16,20, 25 | SZP10, 12, 16, 20, 25, 32, 40, 50 | S90VC22C | SVC22C | A-SVC22C		II	–	II	–	II	–
			III	–	III	–	III	–
6		SN.. 11 (12) CN XN.. 1205	I	8215 E (S)	I	8230 S (E)	I	8240 S
	S90SN | S90SN-R | S90CN S90XN | S90CN-R S90XN-R		II	8230 S (E)	II	8240 S	II	8240 S
			III	–	III	–	III	–
7		LNET 160616SR ,SNGX 1305 SNGX 130512PN APET(W) 150412 SPET(W) 1204AD ADMX ,ADEX 11T3.. SDMX 1205 CCMX 0603.. CCMX 08T3.. CCMX 09T3..	I	8230 M9325 S (E)	I	8230 M9325 S (E)	I	8240 M9340 S
	SLSN | SSAP | SSAP-A | S90AD11E | SAD11E | C90SD12X | CSD12X | SCC06, SSC08 SSC09		II	8230 S	II	8230 S	II	8240 S
			III	–	III	–	III	–
8		SPUN,SPGN 2506.. SBMR 22 PNMU 1308..	I	8026T S	I	8240 S	I	8240 S
	W60SP25P | F60SB22 | C60HN09		II	8230 8215 S	II	8230 S	II	M8345 S
			III	–	III	–	III	–
9		SPUN 2506.. TBMR 27....	I	8026T S	I	8240 S	I	8240 S
	W90SP25P | F90TB27X		II	–	II	–	II	–
			III	–	III	–	III	–

SCELTA DELLA FRESA E DEI DATI DI TAGLIO INIZIALI
CHOICE OF MILLING CUTTER AND INITIAL CUTTING CONDITIONS

M

Gruppo/Group	Avanzamento in base alle condizioni di taglio / Feed range according to the cutting conditions			M9325	M9340	5040	M8310	M8325	M8345	8215	8230	8240	8026T	7010	7025	7040	7205	7215	7230	HF7
1	Leggera / Finishing	0,10	0,30	245	160	-	180	-	-	215	190	175	-	-	-	-	-	-	-	-
	Media / Medium	0,10	0,25	220	155	-	160	-	-	185	165	150	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	195	150	-	140	-	-	155	140	125	-	-	-	-	-	-	-	-
2	Leggera / Finishing	0,10	0,35	235	140	-	170	-	-	215	185	170	-	155	150	-	-	-	-	75
	Media / Medium	0,10	0,30	210	135	-	150	-	-	180	160	150	-	135	130	-	-	-	-	65
	Pesante / Roughing	0,10	0,20	185	145	-	135	-	-	145	135	120	-	120	120	-	-	-	-	-
3	Leggera / Finishing	0,10	0,30	215	140	-	155	-	135	185	165	150	-	140	135	-	-	-	-	65
	Media / Medium	0,10	0,25	195	140	-	145	-	125	165	150	135	-	130	125	-	-	-	-	65
	Pesante / Roughing	0,10	0,15	180	140	-	130	-	110	140	135	115	-	120	110	-	-	-	-	-
4	Leggera / Finishing	-	-	250	180	155	185	155	155	210	190	170	-	165	155	150	185	170	145	80
	Media / Medium	-	-	230	165	140	170	145	145	195	175	155	-	150	145	140	170	155	135	75
	Pesante / Roughing	-	-	210	135	125	155	130	130	185	160	150	-	135	130	125	155	140	120	-
5	Leggera / Finishing	-	-	-	-	-	170	-	145	-	175	-	-	-	-	-	-	-	-	-
	Media / Medium	-	-	-	-	-	155	-	130	-	160	-	-	-	-	-	-	-	-	-
	Pesante / Roughing	-	-	-	-	-	135	-	120	-	145	-	-	-	-	-	-	-	-	-
6	Leggera / Finishing	0,10	0,50	-	-	-	-	-	-	175	160	140	-	-	-	-	-	-	-	-
	Media / Medium	0,10	0,30	-	-	-	-	-	-	160	145	125	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	-	-	-	-	-	-	145	130	120	-	-	-	-	-	-	-	-
7	Leggera / Finishing	0,10	0,25	130	95	-	95	80	80	110	100	90	-	85	-	-	-	-	-	40
	Media / Medium	0,10	0,20	110	90	-	80	70	70	85	80	70	-	75	-	-	-	-	-	35
	Pesante / Roughing	0,08	0,15	90	80	-	-	-	55	-	65	50	-	-	-	-	-	-	-	-
8	Leggera / Finishing	0,25	0,60	-	-	100	-	-	110	160	150	150	125	-	-	-	-	-	-	-
	Media / Medium	0,25	0,50	-	-	80	-	-	90	125	115	115	105	-	-	-	-	-	-	-
	Pesante / Roughing	0,25	0,40	-	-	70	-	-	80	-	100	95	90	-	-	-	-	-	-	-
9	Leggera / Finishing	0,20	0,60	-	-	-	-	-	-	-	-	125	105	-	-	-	-	-	-	-
	Media / Medium	0,20	0,50	-	-	-	-	-	-	-	-	95	85	-	-	-	-	-	-	-
	Pesante / Roughing	0,20	0,40	-	-	-	-	-	-	-	-	80	75	-	-	-	-	-	-	-

M

COEFFICIENTE DI CORREZIONE / CORRECTION v_c

Sottogruppo / Subgroup	M1	M2	M3	M4
Fattore durezza del pezzo / Workpiece hardness factor				
Durezza / Hardness	kv_{HBP1}	kv_{HBP2}	kv_{HBP3}	kv_{HBP4}
120	**1,35**	1,31	1,24	1,15
140	**1,28**	**1,24**	1,18	1,10
160	**1,22**	**1,18**	**1,12**	1,04
180	**1,14**	**1,11**	**1,05**	0,98
200	**1,09**	**1,06**	**1,00**	0,93
220	**1,03**	**1,00**	**0,95**	0,88
240	0,98	**0,95**	**0,90**	**0,84**
260	0,93	**0,91**	**0,86**	**0,80**
280	0,89	**0,87**	**0,82**	**0,76**
300	0,87	**0,84**	**0,80**	**0,74**
320	0,84	**0,81**	0,77	**0,72**
340	0,80	0,78	0,74	**0,69**
360	0,77	0,75	0,71	**0,66**
375	0,74	0,72	0,68	**0,63**

Correzione per durata (lavorazione generale) / Correction for durability (general machining)

Trvanlivost / Durata [min]	k_{vT}
15	1,23
20	1,13
30	1,00
45	0,89
60	0,81
90	0,72

Correzione per durata (sgrossatura pesante) / Correction for durability (heavy roughing)

Trvanlivost / Durata [min]	k_{vT}
30	1,23
60	1,00
90	0,89
120	0,81

Fattore correzione velocità k_{vx} / Speed factor k_{vx}

Crosta del pezzo fucinato e fuso / Forged and cast piece skin	0,70 - 0,90
Buono stato della fresa / Good machine conditions	1,05 - 1,20
Cattivo stato della fresa / Bad machine conditions	0,85 - 0,95

IMPERO PRAMET

Tabella 4a
Table 4a

SCELTA DELLA FRESA E DEI DATI DI TAGLIO INIZIALI
CHOICE OF MILLING CUTTER AND INITIAL CUTTING CONDITIONS

K

Gruppo/Group	Tipo di fresa / Type of tool												Forma dell'inserto Type of insert	Condizioni di lavoro della fresatura / Cutting conditions					
														Leggera / Finishing		Media / Medium		Pesante / Roughing	
1													HNGX 06 HNGX 09 HNEF 0905..... SNMT SNKT 1205AZ	I	M5315 S (E)	I	M9315 S	I	M9325 S
	S45HN06C S45HN09C	SNH06	SNH06	C60HN09	S45SN12Z									II	8215 M8310	II	8215 M8310 S	II	8230 S
														III	8230 S (E)	III	8230 S	III	8240 S
2													ODMT(W) 05 ODMT(W) 06 SEMT 09 SDEW, SDEX 09.. SOMT 09T3::: TCMT 16T3 XPHT 1604..	I	8215 M5315 S (E)	I	8230 M9315 S	I	8240 M9325 S
	S45OD05D S45OD06D	S45SE09F	SSE09	SSD09	N-SSO09	2516-45		SXP16						II	8230 S (E)	II	8230 S	II	8240 S
														III	8230 S (E)	III	8240 S	III	8240 S
3													ADMX ,ADEX 11T3.. ADMX ,ADEX 1606.. APKT 1003PD APET, APKT 1604.. LNGX 12..., LNGU 16... SOMT 09T30.., SDMT 120508SR.. ADKX 15T3...., XOEN 12 T3...	I	8215 M5315 S (E)	I	8230 M9315 S	I	8240 M9325 S, P
														II	8215 S (E)	II	8230 S	II	8240 S, P
	S90AD11E, S90AD16E S90AP10D, S90AP16D	SAD11E SAD16E	SAD11E, SAD16E SAP10D, SAP16D	S90LN12 S90LN16	SLN12	SLN12	S90SO09 S90SD12	SSO09	C90AD15	CAD15	CAD15	W90XO12		III	8230 S (E)	III	8230 S	III	8240 S, P
4													SCKR 09T3.., SCKR 12T3..., RDHX 0501.. RDHX, RDGT, RDHT 07T1..,0702.. RDHX, RDGT, RDHT 1003.. RDHX, RDGT, RDHT 12T3.. RDHX, RDGT, RDHT 1604.. RCMT 1204, RCMT1606, RCMT2006, ZDCW 07, ZDCW 09, ZDEW 12 PD.. 0905...	I	7010 7205 E (S)	I	7025 7215 S (E)	I	7040 7230 S
														II	M8310 8215 E (S)	II	M8325 8230 S (E)	II	M8325 8240 S
	C90SC09, 12	CSC09, 12	SCRD12, 16	SRD05, 07, 10, 12, 16	B-SRD07, 10	SMORC12,16,20	SMQZD09,12	SZD07, 09, 12	SZD07 SZD09 SZD12	S19SPD09	SPD09			III	8215 E (S)	III	8230 S (E)	III	8240 S
5													XP xxER-FM ZPxxER-xx VCGT 220530	I	M8310	I	M8325 8230	I	M8325
														II	–	II	–	II	–
	CXP16, 20, 25, 32	CXP16, 20, 25, 32	SZP10,12,16,20, 25	SZP10, 12, 16, 20, 25, 32, 40, 50	S90VC22C	SVC22C	A-SVC22C							III	–	III		III	–
6													SN.. 11 (12) CN XN.. 1205	I	8215 E (S)	I	8230 S (E)	I	8240 S
														II	–	II	–	II	–
	S90SN	S90SN-R	S90CN S90XN	S90CN-R S90XN-R										III	–	III	–	III	–
7													LNET 160616SR ,SNGX 1305 SNGX 130512PN APET(W) 150412 SPET(W) 1204AD ADMX ,ADEX 11T3.. SDMX 1205 CCMX 0603.. CCMX 08T3.. CCMX 09T3..	I	8230 M9315 S (E)	I	8230 M9325 S (E)	I	8240 M9325 S
														II	8230 S	II	8230 S	II	8240 S
	SLSN	SSAP	SSAP-A	S90AD11E	SAD11E	C90SD12X	CSD12X		SCC06, SSC08 SSC09					III	–	III	–	III	–
8													SPUN,SPGN 2506.. SBMR 22 PNMU 1308..	I	8026T S	I	8026T S	I	8240 S
														II	8230 8215 S	II	8230 S	II	M8345 S
	W60SP25P	F60SB22	C60HN09											III	–	III	–	III	–
9													SPUN 2506.. TBMR 27....	I	8026T S	I	8026T S	I	8240 S
														II	–	II	–	II	–
	W90SP25P	F90TB27X												III	–	III	–	III	–

K

Gruppo/Group	Avanzamento in base alle condizioni di taglio / Feed range according to the cutting conditions			M5315	M9315	M9325	5040	M8310	M8325	8215	8230	8240	8026T	7010	7025	7040	7205	7215	7230	HF7
1	Leggera / Finishing	0,10	0,30	410	400	385	-	285	-	345	300	280	-	-	-	-	-	-	-	-
	Media / Medium	0,10	0,25	380	370	350	-	255	-	290	265	235	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	350	330	305	-	220	-	245	225	195	-	-	-	-	-	-	-	-
2	Leggera / Finishing	0,10	0,35	380	380	375	-	275	-	340	290	275	-	245	235	-	-	-	-	120
	Media / Medium	0,10	0,30	350	340	330	-	240	-	285	255	235	-	215	205	-	-	-	-	105
	Pesante / Roughing	0,10	0,20	335	315	290	-	210	-	230	215	190	-	190	190	-	-	-	-	-
3	Leggera / Finishing	0,10	0,30	360	350	340	-	245	-	295	265	240	-	220	210	-	-	-	-	105
	Media / Medium	0,10	0,25	345	330	310	-	230	-	265	240	210	-	205	195	-	-	-	-	100
	Pesante / Roughing	0,10	0,15	325	305	285	-	205	-	225	210	185	-	190	180	-	-	-	-	-
4	Leggera / Finishing	-	-	-	-	395	245	290	250	335	300	275	-	265	250	240	295	275	230	125
	Media / Medium	-	-	-	-	365	225	270	230	305	280	250	-	240	230	220	275	250	210	115
	Pesante / Roughing	-	-	-	-	330	200	245	205	290	255	235	-	215	205	195	245	225	190	-
5	Leggera / Finishing	-	-	-	-	-	-	270	-	-	280	-	-	-	-	-	-	-	-	-
	Media / Medium	-	-	-	-	-	-	245	-	-	255	-	-	-	-	-	-	-	-	-
	Pesante / Roughing	-	-	-	-	-	-	215	-	-	230	-	-	-	-	-	-	-	-	-
6	Leggera / Finishing	0,10	0,50	-	-	-	-	-	-	280	255	225	-	-	-	-	-	-	-	-
	Media / Medium	0,10	0,30	-	-	-	-	-	-	255	230	200	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	-	-	-	-	-	-	230	205	190	-	-	-	-	-	-	-	-
7	Leggera / Finishing	0,10	0,25	235	220	205	-	155	130	175	160	140	-	135	-	-	-	-	-	65
	Media / Medium	0,10	0,20	205	190	175	-	130	110	135	130	110	-	115	-	-	-	-	-	55
	Pesante / Roughing	0,08	0,15	-	-	140	-	-	-	-	100	85	-	-	-	-	-	-	-	-
8	Leggera / Finishing	0,25	0,60	-	-	-	160	-	-	255	235	235	200	-	-	-	-	-	-	-
	Media / Medium	0,25	0,50	-	-	-	130	-	-	195	185	185	170	-	-	-	-	-	-	-
	Pesante / Roughing	0,25	0,40	-	-	-	110	-	-	-	160	155	145	-	-	-	-	-	-	-
9	Leggera / Finishing	0,20	0,60	-	-	-	-	-	-	-	-	195	170	-	-	-	-	-	-	-
	Media / Medium	0,20	0,50	-	-	-	-	-	-	-	-	150	135	-	-	-	-	-	-	-
	Pesante / Roughing	0,20	0,40	-	-	-	-	-	-	-	-	125	120	-	-	-	-	-	-	-

K

COEFFICIENTE DI CORREZIONE / CORRECTION v_c

Sottogruppo / Subgroup	K1	K2	K3	K4

Fattore durezza del pezzo / Workpiece hardness factor

Durezza / Hardness	kv_{HBP1}	kv_{HBP2}	kv_{HBP3}	kv_{HBP4}
120	1,60	1,52	1,44	1,36
140	1,45	1,38	1,31	1,23
160	1,35	**1,28**	1,22	1,15
180	1,25	**1,19**	**1,13**	1,06
200	**1,10**	**1,05**	**0,99**	0,94
220	**1,00**	**0,95**	**0,90**	0,85
240	**0,90**	**0,86**	**0,81**	0,77
260	**0,80**	0,76	0,72	0,68
280	**0,70**	0,67	0,63	**0,60**
300	0,65	0,62	0,59	**0,55**
320	0,60	0,57	0,54	**0,51**
340	0,55	0,52	0,50	**0,47**
360	0,50	0,48	0,45	0,43
380	0,40	0,38	0,36	0,34

Correzione per durata (lavorazione generale) / Correction for durability (general machining)

Trvanlivost / Durata [min]	k_{vT}
15	1,23
20	1,13
30	1,00
45	0,89
60	0,81
90	0,72

Correzione per durata (sgrossatura pesante) / Correction for durability (heavy roughing)

Trvanlivost / Durata [min]	k_{vT}
30	1,23
60	1,00
90	0,89
120	0,81

Fattore correzione velocità k_{vx} / Speed factor k_{vx}

Crosta del pezzo fucinato e fuso / Forged and cast piece skin	0,70 - 0,90
Buono stato della fresa / Good machine conditions	1,05 - 1,20
Cattivo stato della fresa / Bad machine conditions	0,85 - 0,95

IMPERO PRAMET

Tabella 5a
Table 5a

SCELTA DELLA FRESA E DEI DATI DI TAGLIO INIZIALI
CHOICE OF MILLING CUTTER AND INITIAL CUTTING CONDITIONS

N

Gruppo/Group	Tipo di fresa / Type of tool												Forma dell'inserto Type of insert	Condizioni di lavoro della fresatura / Cutting conditions					
														Leggera / Finishing		Media / Medium		Pesante / Roughing	
1													HNGX 06 HNGX 09 HNEF 0905..... SNMT SNKT 1205AZ	I	8215 (M8310) F (E)	I	8215 (M8310) F (E)	I	8215 (M8310) E (F)
														II	–	II	–	II	–
	S45HN06C S45HN09C	SNH06	SNH06	C60HN09	S45SN12Z									III	–	III	–	III	–
2													ODMT(W) 05 ODMT(W) 06 SEMT 09 SDEW, SDEX 09.. SOMT 09T3:: TCMT 16T3 XPHT 1604..	I	8215 (M8310) F (E)	I	8215 (M8310) F (E)	I	8215 (M8310) E (F)
														II	HF7 F (E)	II	HF7 F (E)	II	HF7 F (E)
	S45OD05D S45OD06D	S45SE09F	SSE09	SSD09	N-SSO09	2516-45		SXP16						III	–	III	–	III	–
3													ADMX ,ADEX 11T3.. ADMX ,ADEX 1606.. APKT 1003PD APET, APKT 1604.. LNGX 12..., LNGU 16... SOMT 09T30.., SDMT 120508SR.. ADKX 15T3...., XOEN 12 T3...	I	8215 7010 F (E)	I	8215 7010 F (E)	I	8215 7010 F (E)
														II	–	II	–	II	–
	S90AD11E, S90AD16E S90AP10D, S90AP16D	SAD11E SAD16E	SAD11E, SAD16E SAP10D, SAP16D	S90LN12 S90LN16	SLN12	SLN12	S90SO09 S90SD12	SSO09	C90AD15	CAD15	CAD15	W90XO12		III	–	III	–	III	–
4													SCKR 09T3.., SCKR 12T3..., RDHX 0501.. RDHX, RDGT, RDHT 07T1..,0702.. RDHX, RDGT, RDHT 1003.. RDHX, RDGT, RDHT 12T3.. RDHX, RDGT, RDHT 1604.. RCMT 1204, RCMT1606, RCMT2006, ZDCW 07, ZDCW 09, ZDEW 12 PD.. 0905...	I	HF7 F (E)	I	HF7 F (E)	I	HF7 F (E)
														II	7010 F (E)	II	7010 F (E)	II	7010 F (E)
	C90SC09, 12	CSC09, 12	SCRD12, 16	SRD05, 07, 10, 12, 16	B-SRD07, 10	SMORC12,16,20	SMOZD09, 12	SZD07, 09, 12	SZD07 SZD09 SZD12	S19SPD09	SPD09			III	–	III	–	III	–
5													XP xxER-FM ZPxxER-xx VCGT 220530	I	HF7 F	I	HF7 F	I	HF7 F
														II	M8310 E	II	M8310 E	II	M8310 E
	CXP16, 20, 25, 32	CXP16, 20, 25, 32	SZP10,12,16,20,25	SZP10, 12, 16, 20, 25, 32, 40, 50	S90VC22C	SVC22C	A-SVC22C							III	–	III	–	III	–
6													SN.. 11 (12) CN XN.. 1205	I	8215 8230 E	I	8215 8230 E	I	8215 8230 E
														II	–	II	–	II	–
	S90SN	S90SN-R	S90CN S90XN	S90CN-R S90XN-R										III	–	III	–	III	–
7													LNET 160616SR ,SNGX 1305 SNGX 130512PN APET(W) 150412 SPET(W) 1204AD ADMX ,ADEX 11T3.. SDMX 1205 CCMX 0603.. CCMX 08T3.. CCMX 09T3..	I	–	I	–	I	–
														II	–	II	–	II	–
	SLSN	SSAP	SSAP-A	S90AD11E	SAD11E	C90SD12X	CSD12X		SCC06, SSC08 SSC09					III	–	III	–	III	–
8													SPUN,SPGN 2506.. SBMR 22 PNMU 1308..	I	–	I	–	I	–
														II	–	II	–	II	–
	W60SP25P	F60SB22	C60HN09											III	–	III	–	III	–
9													SPUN 2506.. TBMR 27....	I	–	I	–	I	–
														II	–	II	–	II	–
	W90SP25P	F90TB27X												III	–	III	–	III	–

Gruppo/Group	N										
	Avanzamento in base alle condizioni di taglio Feed range according to the cutting conditions			8215	8230	7010	7040	7205	7215	7230	HF7
1	Leggera / Finishing	0,10	0,30	910	800	-	-	-	-	-	-
	Media / Medium	0,10	0,25	775	700	-	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	650	600	-	-	-	-	-	-
2	Leggera / Finishing	0,10	0,35	900	775	650	-	-	-	-	325
	Media / Medium	0,10	0,30	760	675	575	-	-	-	-	285
	Pesante / Roughing	0,10	0,20	610	575	510	-	-	-	-	-
3	Leggera / Finishing	0,10	0,30	785	700	585	-	-	-	-	285
	Media / Medium	0,10	0,25	700	635	550	-	-	-	-	275
	Pesante / Roughing	0,10	0,15	600	560	500	-	-	-	-	-
4	Leggera / Finishing	-	-	885	800	700	635	785	725	610	335
	Media / Medium	-	-	810	735	635	585	725	660	560	310
	Pesante / Roughing	-	-	775	675	575	525	650	600	510	-
5	Leggera / Finishing	-	-	-	735	-	-	-	-	-	-
	Media / Medium	-	-	-	675	-	-	-	-	-	-
	Pesante / Roughing	-	-	-	610	-	-	-	-	-	-
6	Leggera / Finishing	0,10	0,50	735	675	-	-	-	-	-	-
	Media / Medium	0,10	0,30	675	610	-	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	610	550	-	-	-	-	-	-
7	Leggera / Finishing	0,10	0,25	-	-	-	-	-	-	-	-
	Media / Medium	0,10	0,20	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,08	0,15	-	-	-	-	-	-	-	-
8	Leggera / Finishing	0,25	0,60	-	-	-	-	-	-	-	-
	Media / Medium	0,25	0,50	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,25	0,40	-	-	-	-	-	-	-	-
9	Leggera / Finishing	0,20	0,60	-	-	-	-	-	-	-	-
	Media / Medium	0,20	0,50	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,20	0,40	-	-	-	-	-	-	-	-

N

COEFFICIENTE DI CORREZIONE / CORRECTION v_c

Sottogruppo Subgroup	N1	N2	N3	N4

Fattore durezza del pezzo
Workpiece hardness factor

Tipo di lega / Alloy type	k_{vx}	Sottogruppo Subgroup
Alluminio elettrotecnico Electrotechnical aluminium	2,00	N1
Leghe di Al forgiate, non temprate HB 60 Al alloys formed, unhardened HB 60	1,50	
Leghe di Al forgiate, temprate HB100 Al alloys formed, hardened HB100	**1,00**	
Leghe di Al fuse, non temprate HB75 Al alloys cast, unhardened HB75	0,90	N2
Leghe di Al fuse, temprate HB90 Al alloys cast, hardened HB90	0,65	
Leghe di Al fuse, non temprate HB 130 >12% Si Al alloys cast, unhardened HB 130 >12% Si	1,0 PKD / 0,20	
Leghe altamente lavorabili (>1%Pb) Highly machinable alloys (>1%Pb)	0,90	N3
Ottone e metallo rosa (<1%Pb) Brass and lead bronze (<1%Pb)	0,75	
Altro ottone HB <90 Other brass HB <90	0,60	
Altro ottone HB >90 Other brass HB >90	0,54	N4
Cu elettrolitico di bronzo Bronze electrolytic Cu	0,40	
Bronzo duro e molto duro Hard and very hard bronze	0,6 PKD / 0,20	

Correzione per durata (lavorazione generale)
Correction for durability (general machining)

Trvanlivost / Durata [min]	k_{vT}
15	1,23
20	1,13
30	1,00
45	0,89
60	0,81
90	0,72

Fattore correzione velocità k_{vx}
Speed factor k_{vx}

Crosta del pezzo fucinato e fuso / Forged and cast piece skin	0,70 - 0,90
Buono stato della fresa / Good machine conditions	1,05 - 1,20
Cattivo stato della fresa / Bad machine conditions	0,85 - 0,95

IMPERO PRAMET

Tabella 6a
Table 6a

SCELTA DELLA FRESA E DEI DATI DI TAGLIO INIZIALI
CHOICE OF MILLING CUTTER AND INITIAL CUTTING CONDITIONS

S

Gruppo/Group	Tipo di fresa / Type of tool												Forma dell'inserto Type of insert	Condizioni di lavoro della fresatura / Cutting conditions					
														Leggera / Finishing		Media / Medium		Pesante / Roughing	
1													HNGX 06 HNGX 09 HNEF 0905..... SNMT SNKT 1205AZ	I	M9325 S (E)	I	8215 S	I	–
	S45HN06C S45HN09C	SNH06	SNH06	C60HN09	S45SN12Z									II	8215 (M8310) S (E)	II	8230 S	II	–
														III	M9340 S (E)	III	8230 S	III	–
2													ODMT(W) 05 ODMT(W) 06 SEMT 09 SDEW, SDEX 09.. SOMT 09T3:: TCMT 16T3 XPHT 1604..	I	8215 S (E)	I	8230 M9325 S	I	–
	S45OD05D S45OD06D	S45SE09F	SSE09	SSD09	N-SSO09	2516-45		SXP16						II	8230 S (E)	II	8230 S	II	–
														III	8230 S (E)	III	8240 S	III	–
3													ADMX ,ADEX 11T3.. ADMX ,ADEX 1606.. APKT 1003PD APET, APKT 1604.. LNGX 12..., LNGU 16... SOMT 09T30.., SDMT 120508SR.. ADKX 15T3...., XOEN 12 T3...	I	8215 7010 S (E)	I	8230 M9325 S	I	–
	S90AD11E, S90AD16E S90AP10D, S90AP16D	SAD11E SAD16E	SAD11E, SAD16E SAP10D, SAP16D	S90LN12 S90LN16	SLN12	SLN12	S90SO09 S90SD12	SSO09	C90AD15	CAD15	CAD15	W90XO12		II	8215 7010 S (E)	II	8230 S	II	–
														III	8230 7025 S (E)	III	8240 S	III	–
4													SCKR 09T3.., SCKR 12T3..., RDHX 0501.. RDHX, RDGT, RDHT 07T1..,0702.. RDHX, RDGT, RDHT 1003.. RDHX, RDGT, RDHT 12T3.. RDHX, RDGT, RDHT 1604.. RCMT 1204, RCMT1606, RCMT2006, ZDCW 07, ZDCW 09, ZDEW 12 PD.. 0905...	I	7010 7205 E (S)	I	7025 7215 S (E)	I	–
	C90SC09, 12	CSC09, 12	SCRD12, 16	SRD05, 07, 10, 12, 16	B-SRD07, 10	SMORC12,16,20	SMOZD09, 12	SZD07, 09, 12	SZD07 SZD09 SZD12	S19SPD09	SPD09			II	M8310 8215 E (S)	II	M8325 8230 S (E)	II	–
														III	8215 E (S)	III	8230 S (E)	III	–
5													XP xxER-FM ZPxxER-xx VCGT 220530	I	M8310	I	8230 M8325	I	–
	CXP16, 20, 25, 32	CXP16, 20, 25, 32	SZP10,12,16,20, 25	SZP10, 12, 16, 20, 25, 32, 40, 50	S90VC22C	SVC22C	A-SVC22C							II	–	II	–	II	–
														III	–	III	–	III	–
6													SN.. 11 (12) CN XN.. 1205	I	8215 E (S)	I	8230 S (E)	I	–
	S90SN	S90SN-R	S90CN S90XN	S90CN-R S90XN-R										II	8230 S (E)	II	8240 S	II	–
														III	–	III	–	III	–
7													LNET 160616SR ,SNGX 1305 SNGX 130512PN APET(W) 150412 SPET(W) 1204AD ADMX ,ADEX 11T3.. SDMX 1205 CCMX 0603.. CCMX 08T3.. CCMX 09T3..	I	–	I	–	I	–
	SLSN	SSAP	SSAP-A	S90AD11E	SAD11E	C90SD12X	CSD12X		SCC06, SSC08 SSC09					II	–	II	–	II	–
														III	–	III	–	III	–
8													SPUN, SPGN 2506.. SBMR 22 PNMU 1308..	I	–	I	–	I	–
	W60SP25P	F60SB22	C60HN09											II	–	II	–	II	–
														III	–	III	–	III	–
9													SPUN 2506.. TBMR 27....	I	–	I	–	I	–
	W90SP25P	F90TB27X												II	–	II	–	II	–
														III	–	III	–	III	–

S

Gruppo/Group	Avanzamento in base alle condizioni di taglio Feed range according to the cutting conditions			M9325	M9340	M8310	M8345	8215	8230	8240	7010	7040	7215	7230	HF7
1	Leggera / Finishing	0,10	0,30	120	80	90	-	105	95	85	-	-	-	-	-
	Media / Medium	0,10	0,25	110	75	80	-	90	80	75	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	-	-	-	-	-	-	-	-	-	-	-	-
2	Leggera / Finishing	0,10	0,35	115	70	85	-	105	90	85	75	-	-	-	35
	Media / Medium	0,10	0,30	105	65	75	-	90	80	75	65	-	-	-	30
	Pesante / Roughing	0,10	0,20	-	-	-	-	-	-	-	-	-	-	-	-
3	Leggera / Finishing	0,10	0,30	105	70	75	65	90	80	75	70	-	-	-	30
	Media / Medium	0,10	0,25	95	70	70	60	80	75	65	65	-	-	-	30
	Pesante / Roughing	0,10	0,15	-	-	-	-	-	-	-	-	-	-	-	-
4	Leggera / Finishing	-	-	125	90	90	75	105	95	85	80	75	85	70	40
	Media / Medium	-	-	115	80	85	70	95	85	75	75	70	75	65	35
	Pesante / Roughing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Leggera / Finishing	-	-	-	-	85	70	-	85	-	-	-	-	-	-
	Media / Medium	-	-	-	-	75	65	-	80	-	-	-	-	-	-
	Pesante / Roughing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Leggera / Finishing	0,10	0,50	-	-	-	-	85	80	70	-	-	-	-	-
	Media / Medium	0,10	0,30	-	-	-	-	80	70	60	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	-	-	-	-	-	-	-	-	-	-	-	-
7	Leggera / Finishing	0,10	0,25	-	-	-	-	-	-	-	-	-	-	-	-
	Media / Medium	0,10	0,20	-	-	-	-	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,08	0,15	-	-	-	-	-	-	-	-	-	-	-	-
8	Leggera / Finishing	0,25	0,60	-	-	-	-	-	-	-	-	-	-	-	-
	Media / Medium	0,25	0,50	-	-	-	-	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,25	0,40	-	-	-	-	-	-	-	-	-	-	-	-
9	Leggera / Finishing	0,20	0,60	-	-	-	-	-	-	-	-	-	-	-	-
	Media / Medium	0,20	0,50	-	-	-	-	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,20	0,40	-	-	-	-	-	-	-	-	-	-	-	-

S

COEFFICIENTE DI CORREZIONE / CORRECTION v_c

Sottogruppo Subgroup	S1	S2	S3	S4
Fattore durezza del pezzo Workpiece hardness factor				
Durezza Hardness	kv_{HBP1}	kv_{HBP2}	kv_{HBP3}	kv_{HBP4}
180	**2,14**	**1,46**	1,22	0,92
200	**2,01**	**1,38**	1,15	**0,93**
210	**1,93**	**1,32**	1,10	**0,83**
220	**1,89**	**1,30**	1,08	**0,81**
230	**1,84**	**1,26**	**1,05**	**0,79**
240	**1,80**	**1,24**	**1,03**	**0,77**
250	**1,75**	**1,20**	**1,00**	**0,75**
260	**1,70**	**1,16**	**0,97**	**0,73**
280	**1,61**	**1,10**	**0,92**	**0,69**
300	**1,54**	1,06	**0,88**	**0,66**
320	**1,47**	1,01	**0,84**	**0,63**
340	**1,40**	0,96	**0,80**	0,60
350	**1,37**	0,94	**0,78**	0,59
360	**1,30**	0,89	0,74	0,56

Correzione per durata (lavorazione generale)
Correction for durability (general machining)

Trvanlivost / Durata [min]	k_{vT}
15	1,23
20	1,13
30	1,00
45	0,89
60	0,81
90	0,72

Fattore correzione velocità k_{vx}
Speed factor k_{vx}

Crosta del pezzo fucinato e fuso / Forged and cast piece skin	0,70 - 0,90
Buono stato della fresa / Good machine conditions	1,05 - 1,20
Cattivo stato della fresa/Bad machine conditions	0,85 - 0,95

IMPERO PRAMET

Tabella 7a
Table 7a

SCELTA DELLA FRESA E DEI DATI DI TAGLIO INIZIALI
CHOICE OF MILLING CUTTER AND INITIAL CUTTING CONDITIONS

H

Gruppo/Group	Tipo di fresa / Type of tool	Forma dell'inserto Type of insert	Condizioni di lavoro della fresatura / Cutting conditions					
			Leggera / Finishing		Media / Medium		Pesante / Roughing	
1	S45HN06C S45HN09C	HNGX 06 HNGX 09 HNEF 0905..... SNMT SNKT 1205AZ	I	M5315 S (E)	I	M9315 S	I	–
	SNH06		II	8215 M8310	II	8215 M8310 S	II	–
	SNH06		III	8230 S (E)	III	8230 S	III	–
	C60HN09							
	S45SN12Z							
2	S45OD05D S45OD06D	ODMT(W) 05 ODMT(W) 06 SEMT 09 SDEW, SDEX 09.. SOMT 09T3::: TCMT 16T3 XPHT 1604..	I	8215 M5315 S (E)	I	8230 M9315 S	I	–
	S45SE09F		II	8230 S (E)	II	8230 S	II	–
	SSE09		III	8230 S (E)	III	8240 S	III	–
	SSD09							
	N-SSO09							
	2516-45							
	SXP16							
3	S90AD11E, S90AD16E S90AP10D, S90AP16D	ADMX ,ADEX 11T3.. ADMX ,ADEX 1606.. APKT 1003PD APET, APKT 1604.. LNGX 12..., LNGU 16... SOMT 09T30.., SDMT 120508SR.. ADKX 15T3...., XOEN 12 T3...	I	8215 M5315 S (E)	I	8230 M9315 S	I	–
	SAD11E SAD16E		II	8215 S (E)	II	8230 S	II	–
	SAD11E, SAD16E SAP10D, SAP16D		III	8230 S (E)	III	8230 S	III	–
	S90LN12 S90LN16							
	SLN12							
	SLN12							
	S90SO09 S90SD12							
	SSO09							
	C90AD15							
	CAD15							
	CAD15							
	W90XO12							
4	C90SC09, 12	SCKR 09T3.., SCKR 12T3..., RDHX 0501.. RDHX, RDGT, RDHT 07T1..,0702.. RDHX, RDGT, RDHT 1003.. RDHX, RDGT, RDHT 12T3.. RDHX, RDGT, RDHT 1604.. RCMT 1204, RCMT1606, RCMT2006, ZDCW 07, ZDCW 09, ZDEW 12 PD.. 0905...	I	7010 7205 E (S)	I	7025 7215 S (E)	I	–
	CSC09, 12		II	M8310 8215 E (S)	II	M8325 8230 S (E)	II	–
	SCRD12, 16		III	8215 E (S)	III	8230 S (E)	III	–
	SRD05, 07, 10, 12, 16							
	B-SRD07, 10							
	SMORC12,16,20							
	SMQZD09, 12							
	SZD07, 09, 12							
	SZD07 SZD09 SZD12							
	S19SPD09							
	SPD09							
5	CXP16, 20, 25, 32	XP xxER-FM ZPxxER-xx VCGT 220530	I	M8310	I	M8325 8230	I	–
	CXP16, 20, 25, 32		II	–	II	–	II	–
	SZP10,12,16,20, 25		III	–	III	–	III	–
	SZP10, 12, 16, 20, 25, 32, 40, 50							
	S90VC22C							
	SVC22C							
	A-SVC22C							
6	S90SN	SN.. 11 (12) CN XN.. 1205	I	8215 E (S)	I	8230 S (E)	I	–
	S90SN-R		II	–	II	–	II	–
	S90CN S90XN		III	–	III	–	III	–
	S90CN-R S90XN-R							
7	SLSN	LNET 160616SR ,SNGX 1305 SNGX 130512PN APET(W) 150412 SPET(W) 1204AD ADMX ,ADEX 11T3.. SDMX 1205 CCMX 0603.. CCMX 08T3.. CCMX 09T3..	I	–	I	–	I	–
	SSAP		II	–	II	–	II	–
	SSAP-A		III	–	III	–	III	–
	S90AD11E							
	SAD11E							
	C90SD12X							
	CSD12X							
	SCC06, SSC08 SSC09							
8	W60SP25P	SPUN,SPGN 2506.. SBMR 22 PNMU 1308..	I	–	I	–	I	–
	F60SB22		II	–	II	–	II	–
	C60HN09		III	–	III	–	III	–
9	W90SP25P	SPUN 2506.. TBMR 27....	I	–	I	–	I	–
	F90TB27X		II	–	II	–	II	–
			III	–	III	–	III	–

Tabella 7b
Table 7b

SCELTA DELLA FRESA E DEI DATI DI TAGLIO INIZIALI
CHOICE OF MILLING CUTTER AND INITIAL CUTTING CONDITIONS

Gruppo/Group	H														
	Avanzamento in base alle condizioni di taglio Feed range according to the cutting conditions			M5315	M9315	M9325	5040	M8310	8215	8230	7010	7040	7205	7215	7230	HF7
1	Leggera / Finishing	0,10	0,30	85	85	80	-	60	70	60	-	-	-	-	-	-
	Media / Medium	0,10	0,25	80	75	70	-	50	60	55	-	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Leggera / Finishing	0,10	0,35	80	80	75	-	55	70	60	50	-	-	-	-	25
	Media / Medium	0,10	0,30	70	70	70	-	50	60	50	45	-	-	-	-	20
	Pesante / Roughing	0,10	0,20	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Leggera / Finishing	0,10	0,30	75	70	70	-	50	60	55	45	-	-	-	-	20
	Media / Medium	0,10	0,25	70	70	65	-	45	55	50	40	-	-	-	-	20
	Pesante / Roughing	0,10	0,15	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Leggera / Finishing	-	-	-	-	80	50	60	70	60	55	50	60	55	45	25
	Media / Medium	-	-	-	-	75	45	55	65	55	50	45	55	50	45	25
	Pesante / Roughing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Leggera / Finishing	-	-	-	-	-	-	55	-	55	-	-	-	-	-	-
	Media / Medium	-	-	-	-	-	-	50	-	50	-	-	-	-	-	-
	Pesante / Roughing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Leggera / Finishing	0,10	0,50	-	-	-	-	-	55	50	-	-	-	-	-	-
	Media / Medium	0,10	0,30	-	-	-	-	-	50	45	-	-	-	-	-	-
	Pesante / Roughing	0,10	0,20	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Leggera / Finishing	0,10	0,25	-	-	-	-	-	-	-	-	-	-	-	-	-
	Media / Medium	0,10	0,20	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,08	0,15	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Leggera / Finishing	0,25	0,60	-	-	-	-	-	-	-	-	-	-	-	-	-
	Media / Medium	0,25	0,50	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,25	0,40	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Leggera / Finishing	0,20	0,60	-	-	-	-	-	-	-	-	-	-	-	-	-
	Media / Medium	0,20	0,50	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pesante / Roughing	0,20	0,40	-	-	-	-	-	-	-	-	-	-	-	-	-

H

COEFFICIENTE DI CORREZIONE / CORRECTION k_c

Sottogruppo / Subgroup	H1	H2	H3	H4
Fattore durezza del pezzo Workpiece hardness factor				
Durezza Hardness	kv_{HBP1}	kv_{HBP2}	kv_{HBP3}	kv_{HBP4}
380 / 40,8	**1,84**	**1,76**	1,60	1,52
400 / 42,7	**1,73**	**1,65**	1,50	1,43
420 / 44,6	**1,61**	**1,54**	1,40	1,33
440 / 46,5	**1,50**	**1,43**	1,30	1,24
460 / 48,1	**1,38**	**1,32**	1,20	1,14
500 / 50,8	**1,15**	**1,10**	**1,00**	0,95
520 / 52,0	1,09	1,05	**0,95**	0,90
540 / 53,5	1,04	0,99	**0,90**	0,96
560 / 54,7	0,98	0,94	**0,85**	0,81
580 / 55,7	0,92	0,88	**0,80**	**0,76**
600 / 56,8	0,86	0,93	0,75	**0,71**
620 / 57,9	0,81	0,77	0,70	**0,67**
640 / 59,0	0,75	0,72	0,65	**0,62**
>640 / >59	0,69	0,66	0,60	**0,57**

Correzione per durata (lavorazione generale)
Correction for durability (general machining)

Trvanlivost / Durata [min]	k_{vT}
15	1,23
20	1,13
30	1,00
45	0,89
60	0,81
90	0,72

Fattore correzione velocità k_{vx}
Speed factor k_{vx}

Crosta del pezzo fucinato e fuso / Forged and cast piece skin	0,70 - 0,90
Buono stato della fresa / Good machine conditions	1,05 - 1,20
Cattivo stato della fresa/Bad machine conditions	0,85 - 0,95

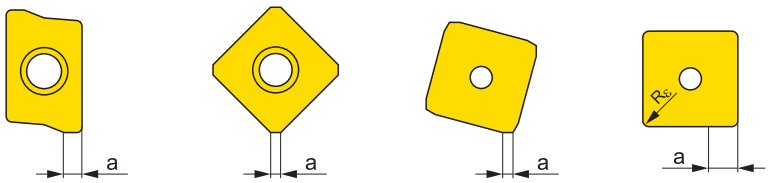
QUALITÀ DELLA SUPERFICIE IN FRESATURA
SURFACE QUALITY

Per raggiungere la minima rugosità della superficie lavorata occorre utilizzare, se possibile, un tagliente raschiante. Si tratta di un tagliente avente un tratto piano con una determinanta ampiezza e angolo di registro κ_r = 0° vedi illustrazione n° 1.

Illustrazione N° 1

Most milling inserts are produced with a wiper edge as a part of the minor cutting edge (with a specific width and setting angle κ_r = 0°) to achieve optimum roughness on the machined surface – see picture 1.

Picture 1



Il tagliente raschiante non deve essere di per se stesso garanzia del raggiungimento di una bassa rugosità della superficie del pezzo. Durante la fresatura la superficie viene lavorata da più taglienti e perciò la condizione della superfice ottenuta dipende dalla differenza di sporgenza assiale dei singoli taglienti della fresa. La superficie lavorata è generata dai taglienti più sporgenti in senso assiale vedi illustrazione 2.

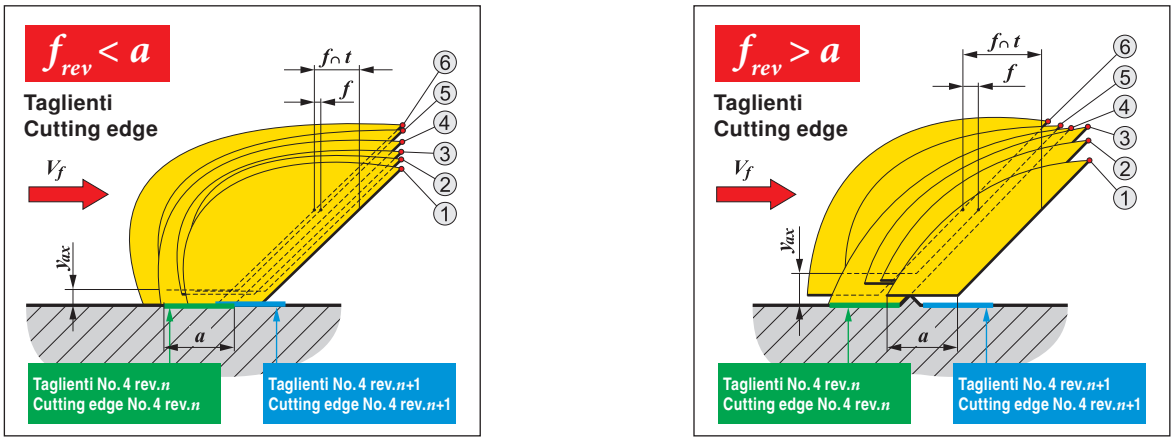
Nel caso in cui l'avanzamento al giro f_{rev} sia minore dell'ampiezza del tratto piano a, prevale il tratto piano dell'inserto più sporgente e la qualità della superficie lavorata è comunque buona.

However, the wiper edge alone cannot guarantee good surface quality. During milling the surface is machined by several cutting edges, which is why its quality depends on the axial run-out of the individual cutting edges. The surface is machined by the cutting edges that protrude the most axially (see picture 2.).

When the feed per revolution f_{rev} is lower than the width of the wiper edge a, the surface is machined by the most axially protruding cutting edge and the surface quality is good.

Illustrazione N° 2

Picture 2



Per raggiungere valori bassi di rugosità della superficie lavorata è necessario quindi diminuire l'avanzamento sotto il livello $f_z \leq 0,8.a$ (dove a l'ampiezza del tratto piano). Se l'ampiezza del tratto piano è a = 2 mm, allora mantenere tali condizioni non è un problema per frese con un numero di denti fra Z = 2 ÷ 14, cioè per frese di diametro medio e piccolo fra D = 10 ÷ 160 mm.

Per le frese più grandi mantenere tali condizioni in alcuni casi è problematico, perché il valore massimo di avanzamento $f_z \leq 0,8.a/dente$ da luogo ad avanzamenti al giro troppo bassi. Sotto tale limite non si manifestano più i vantaggi di alcune geometrie speciali dell'inserto.

Nella seguente tabella N° 8 sono indicati i valori massimi tollerati di avanzamento al dente f_z in dipendenza del numero di denti della fresa e dell'ampiezza del tratto piano a, per raggiungere una buona qualità della superficie lavorata o il mantenimento delle condizioni $f_{rev} < 0,8.a$ per diversi tipi di inserto.

To achieve the low levels of roughness on the machined surface, it is necessary to reduce the feed below $f_z \leq 0,8.a$ (where a is the width of the wiper edge) during finishing. If a = 2 mm, milling cutters with a number of teeth Z = 2 ÷ 14 (milling cutters with D = 10 ÷ 160 mm) have no problems maintaining these conditions.

Sometimes it can be difficult to maintain these conditions when using larger milling cutters because the maximum feed $f_z \leq 0,8.a/tooth$ causes feeds per revolution that are too low for the specific indexable cutting insert. Some of the special geometries of the insert are no longer present below this limit.

In table 8. on the next page are the maximum values of feed per tooth f_z with regard to the number of teeth of the milling cutter and the width of the wiper edge a needed to achieve a good quality machined surface or to maintain the conditions $f_{rev} < 0,8.a$ for different types of cutting inserts.

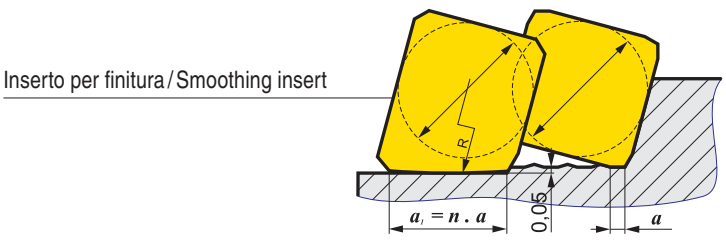
Tabella N° 8 *Table 8*

FORMA DELL'INSERTO TYPE OF INSERT	ADMX 16 LNGU 16 TBMR 27	PNMQ 13 PNMU 13	LNET 16 SBMR 22 SEEN 15 SEER 15 SPGN 25	ADKX 15 APKT 16 SDMT 12	ADKX 15 LNGX 12 ODMT 06 ODMW 06 PDKT 09 PDMT 09 PDMW 09 SEEN 12 SEER 12 SEET 12 SEEW 12 SNMT 12	ODMT 05 OFKR 07 SOMT09-M SOMT09-MI SOMT09-P SPKN 12 SPKN 15 SPKR 12 SPKR 15	ADMX 11 HNEF 09-F HNGX 09 SEMT 09 SNHF 12 SNHF 15 SNHN 12 TPKN 16 TPKN 22 TPKR 16 TPKR 22
Ampiezza del tratto raschiante a [mm] Width of wiper edge (segment) a [mm]	3,2	2,8	2,5	2,2	2,0	1,6	1,4
Numero di denti della fresa Number of teeth	max f_z						
1	2,56	2,24	2,00	1,76	1,60	1,28	1,12
2	1,28	1,12	1,00	0,88	0,80	0,64	0,56
3	0,85	0,75	0,67	0,59	0,53	0,43	0,37
4	0,64	0,56	0,50	0,44	0,40	0,32	0,28
5	0,51	0,45	0,40	0,35	0,32	0,26	0,22
6	0,43	0,37	0,33	0,29	0,27	0,21	0,19
7	0,37	0,32	0,29	0,25	0,23	0,18	0,16
8	0,32	0,28	0,25	0,22	0,20	0,16	0,14
9	0,28	0,25	0,22	0,20	0,18	0,14	0,12
10	0,26	0,22	0,20	0,18	0,16	0,13	0,11
11	0,23	0,20	0,18	0,16	0,15	0,12	0,10
12	0,21	0,19	0,17	0,15	0,13	0,11	0,09
13	0,20	0,17	0,15	0,14	0,12	0,10	0,09
14	0,18	0,16	0,14	0,13	0,11	0,09	0,08
15	0,17	0,15	0,13	0,12	0,11	0,09	0,07
16	0,16	0,14	0,13	0,11	0,10	0,08	0,07
17	0,15	0,13	0,12	0,10	0,09	0,08	0,07
18	0,14	0,12	0,11	0,10	0,09	0,07	0,06

Un modo molto efficace per migliorare notevolmente la qualità della superficie lavorata in fresatura è l'uso di taglienti raschianti ampi, che si fissano in una sede della fresa al posto di un inserto. Lo schema della funzione dell'inserto raschiante è sull'illustrazione seguente.

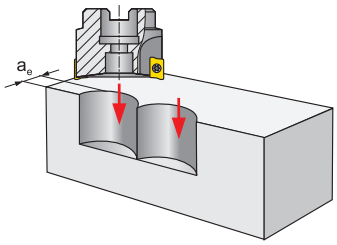
Using a special wiper insert is an effective way of improving the quality of the machined surface – simply fit a wiper insert into the milling cutter instead of an indexable cutting insert. See picture 3.

Illustrazione N° 3 *Picture 3*



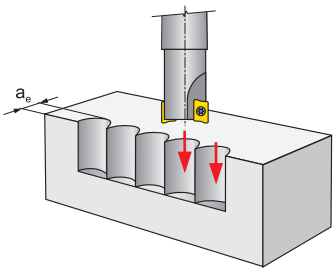
LAVORAZIONE A TUFFO
PLUNGE MILLING

FRESA A MANICOTTO / SHELL CUTTER BODIES



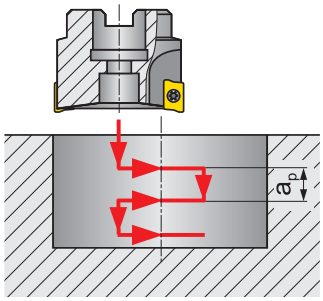
UTENSILE TOOL		Inserti Inserts	Diametro fresa Diameter of cutter [mm]	a_{emax}
	S90AD11E	ADMX 11....	40 ÷ 80	4,5
	S90AD16E	ADMX 16....	40 ÷ 80	7,5
	S90LN12	LN.. 12....	40 - 110	3,5
	S90LN16	LN.. 16....	63 ÷ 175	7,0
	S90SO09	SOMT 09....	40 ÷ 80	6,0
	S90SD12	SDMT 12....	50 ÷ 80	8,0
	S19PD09	PD.. 0905..	42	5,0
			50 ÷ 52	6,0
			63 ÷ 66	7,0
			80 ÷ 100	8,0
	SMOZD09	ZDCW 09....	40	6,0
	SMOZD12	ZDEW 12....	50 ÷ 80	9,0

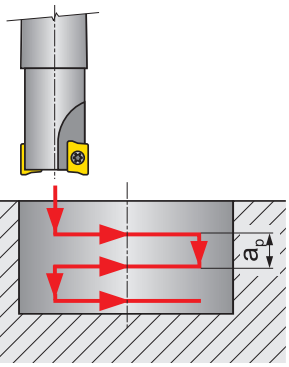
FRESA A CANDELA / END MILLING CUTTERS



	SAD11E	ADMX 11....	16 ÷ 40	4,5
	SAD16E	ADMX 16....	25 ÷ 40	7,5
	SLN12	LN.. 12....	25 ÷ 40	3,5
	SSO09	SOMT 09....	20 ÷ 32	6,0
	SPD09	PD.. 0905..	32 ÷ 40	4,0
	SZD09	ZDCW 09....	25, 32	6,0
	SZD12	ZDEW 12....	32, 40	9,0

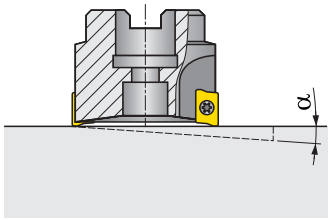
LAVORAZIONE A TUFFO PROGRESSIVA
PROGRESSIVE PLUNGING

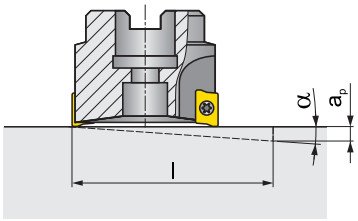


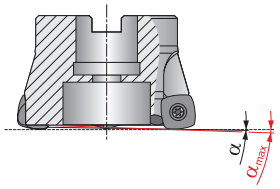


UTENSILE TOOL		Inserti Inserts	Diametro fresa Diameter of cutter [mm]	$a_{p\,max}$
FRESA A MANICOTTO / SHELL CUTTER BODIES				
	**S90AD11E**	**ADMX 16....**	40 ÷ 80	1,7
	S90AD16E	**ADMX 16....**	40 ÷ 80	2,5
	**S90LN12**	**LN.. 12....**	40 ÷ 110	0,4
	**S19PD09**	**PD.. 09....**	42 ÷ 100	2,0
	**SCMORD**	**RD.. 12....**	52 ÷ 80	2,8
		RD.. 16....	52 ÷ 100	4,2
	**S45HN06C**	**HNGX 06....**	40 ÷ 125	0,9
	S45HN09C	**HNGX 09....**	50 ÷ 100	1,9
FRESA A CANDELA / END MILLING CUTTERS				
	**SAD11E**	**ADMX 11....**	16 ÷ 40	1,7
	SAD16E	**ADMX 16....**	25 ÷ 40	2,5
	**SLN12**	**LN.. 12...**	25 ÷ 40	0,4
	**SPD09**	**PD.. 09....**	32 ÷ 40	1,8
	**S(C)RD**	**RDHX 05....**	10 ÷ 15	1,0
		**RD.. 07....**	15 ÷ 25	1,2
		RD.. 10....	20 ÷ 35	2,5
		RD.. 12....	24 ÷ 42	3,0
		RD.. 16....	32, 35	4,0
	**SHN06**	**HNGX 06....**	25 ÷ 40	0,9

LAVORAZIONE IN RAMPA
RAMPING



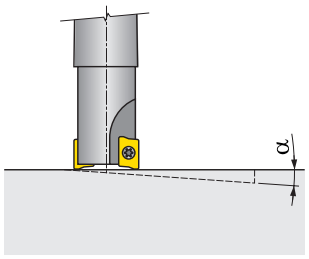


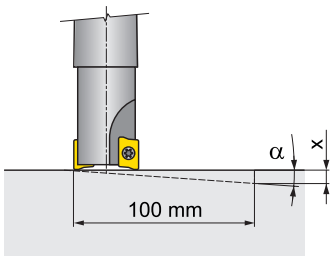


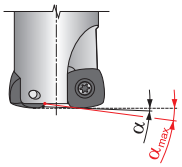
UTENSILE TOOL		Inserti Inserts	Diametro fresa Diameter of cutter [mm]	α_{max} [°]	a_p/l [mm]
FRESA A MANICOTTO / SHELL CUTTER BODIES					
	**S90AD11E**	**ADMX 11....**	40	3,8	6,5/100
			50	2,8	4,8/100
			63	1,8	3,0/100
			80	1,6	2,7/100
			100	1,2	2,0/100
	S90AD16E	**ADMX 16....**	40	5,0	8,6/100
			50	3,5	6,0/100
			63	2,5	4,3/100
			80	2,0	3,4/100
	**C90AD15**	**AD.. 15T3..**	40	0,83	1,3/100
			50	0,66	1,1/100
			63	0,50	0,8/100
			80	0,33	0,5/100
	**S90LN12**	**LNGX 12....**	40	0,85	1,4/100
			50	0,65	1,0/100
			63	0,45	0,7/100
			80	0,35	0,5/100
			100	0,25	0,3/100
			110	0,2	0,2/100
	**SMORC**	**RC.. 12....**	40	9,0	6,0/40
			50	7,0	6,0/51
			63	5,0	6,0/70
			80	3,0	5,1/100
			100	2,0	3,4/100
		RC.. 16....	63	7,0	8,0/67
			80	5,0	8,0/93
			100	4,0	6,9/100
		RC.. 20....	80	7,0	10/83
			100	5,0	8,6/100
	**SCMORD**	**RD.. 12....**	52	4,0	6,0/87
			66	3,0	5,1/100
			80	2,2	3,7/100
		RD.. 16....	52	8,0	8,0/59
			66	6,0	8,0/78
			80	4,0	6,9/100
			100	3,0	5,1/100
	**S19PD09**	**PD.. 0905..**	42 ÷ 52	8,0	2,0/16
			63	7,0	2,0/18
			66	6,0	2,0/21
			80	5,0	2,0/24
			100	3,0	2,0/40
	**SMOZD09**	**ZDCW 09....**	40	0,35** (2,7)*	0,5/100
	SMOZD12	**ZDEW 12....**	50	0,50** (2,6)*	0,8/100
			63	0,35** (1,8)*	0,5/100
			80	0,29** (1,3)*	0,4/100
	**S45HN06C**	**HNGX 06....**	40	1,5	2,5/100
			50	1,15	1,9/100
			63	0,89	1,5/100
			80	0,68	1,1/100
			100	0,54	0,8/100
			125	0,42	0,6/100
	**S45HN09C**	**HNGX 09....**	50	2,1	3,6/100
			63	1,5	2,5/100
			80	1,1	1,8/100
			100	0,9	1,5/100
			125	0,7	1,1/100
			160	0,5	0,8/100
	**CSC09-12**	**SC.. 09T340**	40	1,0	1,6/100
			50	0,75	1,2/100
			63	0,5	0,8/100
		SC.. 12T360	50	0,75	1,2/100
			63	0,5	0,8/100
			80	0,25	0,3/100

*) Valido per fresature convenzionali. / Valid for conventional milling.
**) Può essere usato per frese HFC. / Can be used for HFC cutters.

LAVORAZIONE IN RAMPA
RAMPING





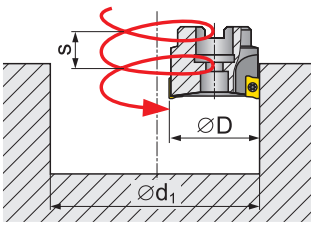


UTENSILE TOOL		Inserti Inserts	Diametro fresa Diameter of cutter [mm]	α_{max} [°]	a_p/l [mm]
FRESA A CANDELA / END MILLING CUTTERS					
	SAD11E	ADMX 11....	16	13,5	9,0/40
			20	9,0	9,0/59
			25	6,0	9,0/87
			32	5,3	9,0/99
			40	3,8	6,5/100
	SAD16E	ADMX 16....	25	12,5	13,0/61
			32	7,5	13,0/101
			40	5,0	8,6/100
	CAD15	AD.. 15T3..	25	1,75	3,0/100
			32	1,25	2,1/100
			40	0,83	1,3/100
	SLN12	LNGX 12....	25	2,2	3,7/100
			32	1,2	2,0/100
			40	0,85	1,4/100
	S(C)RD	RDHX 05....	10	15,0	1,5/7
			12	11,0	1,5/9
			15	7,0	1,5/14
		RD.. 07....	15	11,0	2,0/12
			20	7,0	2,0/18
			25	6,0	2,0/21
		RD.. 10....	20	20,0	2,52/9
			25	12,0	2,5/9
			30	8,0	2,5/19
			35	7,0	2,5/22
		RD.. 12....	24	25,0	3,0/8
			35	9,0	3,0/21
			42	8,0	3,0/23
		RD.. 16....	32	25,0	4,0/11
	SPD09	PD.. 0905..	32	0	–
			40	8,0	–
	SZD07	ZDCW 07....	16	0,5** (7,8)*	0,8/100
			20	0,3** (10,2)*	0,4/100
			25	0,2** (5,4)*	0,2/100
			32	0,1** (3,3)*	0,1/100
	SZD09	ZDCW 09....	25	0,9** (6,5)*	1,5/100
			32	0,5** (4,0)*	0,8/100
	SZD12	ZDEW 12....	32	1,2** (4,0)*	1,6/78
			40	0,7** (3,7)*	1,6/100
	SHN06	HNGX 06....	25	2,69	3,0/65
			32	1,96	3,0/89
			40	1,5	3/100
	CSC	SC.. 09....	32	1,5	2,5/100
		SC.. 12....	32	1,5	2,5/100
			40	1,0	1,6/100

*) Valido per fresature convenzionali. / Valid for conventional milling.
**) Può essere usato per frese HFC. / Can be used for HFC cutters.

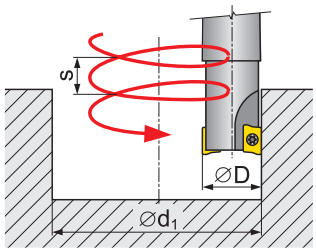
FRESATURA ELICOIDALE PER INTERPOLAZIONE
MILLING BY HELICAL INTERPOLATION

FRESA A MANICOTTO / SHELL CUTTER BODIES

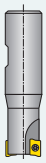


UTENSILE TOOL		Inserti Inserts	Diametro fresa Diameter of cutter	d_{min}	d_{max}	s_{max}
			[mm]			
	S90AD11E	ADMX 11....	40	75	–	1,5
				–	78	2,0
	S90AD16E	ADMX 16....	40	72	–	5,0
				–	78	8,0
			50	92	–	4,5
				–	98	6,0
			63	118	–	4,0
				–	124	5,0
			80	136	–	1,5
				–	158	2,0
	S90LN12	LNGX 12....	40	73	78	1,75
			50	93	98	1,7
			63	119	124	1,5
	SCMORD	RD.. 12....	52	82	102	2,8
			66	110	132	2,8
			80	136	160	2,8
		RD.. 16....	52	74	104	4,0
			66	102	132	4,0
			80	130	160	4,0
			100	170	200	4,0
	S19PD09	PD.. 0905..	42	67,5	81,7	2,0
			50	83,3	91,7	2,0
			52	87,3	101,7	2,0
			63	109,2	123,7	2,0
			66	115,2	129,7	2,0
			80	143,3	157,7	2,0
			100	183,3	197,7	2,0
	SMOZD09	ZDCW 09....	40	64	76	0,4
	SMOZD12	ZDEW 12....	50	79	96	0,7
			63	105	122	0,75
			80	139	156	0,8

FRESATURA ELICOIDALE PER INTERPOLAZIONE
MILLING BY HELICAL INTERPOLATION



FRESA A CANDELA / END MILLING CUTTERS

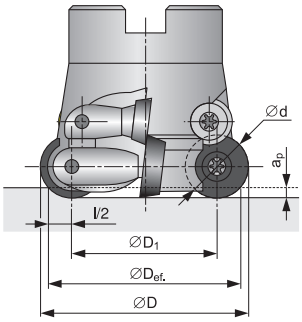
UTENSILE TOOL		Inserti Inserts	Diametro fresa Diameter of cutter	d_{min}	d_{max}	s_{max}
			[mm]			
	SAD11E	ADMX 11....	16	27	–	8,3
				–	30	9,0
			20	35	–	7,5
				–	38	9,0
			25	45	–	6,5
				–	48	7,5
			32	59	–	4,0
				–	62	4,5
			40	75	–	1,5
				–	78	2,0
	SAD16E	ADMX 16....	25	42	–	10,0
				–	48	12,5
			32	55	–	6,5
				–	62	9,0
			40	72	–	5,0
				–	78	8,0
	SLN12	LNGX 12....	25	43	48	2,8
			32	57	62	2,0
			40	73	78	1,75
 	S(C)RD	RDHX 05....	10	12	20	1,0
			12	16	24	1,0
			15	22	30	1,0
		RD.. 07....	15	17	30	1,4
			20	28	40	1,4
			25	38	50	1,5
		RD.. 10....	20	22	40	2,5
			25	32	50	2,5
			30	42	60	2,3
			35	52	70	2,5
		RD.. 12....	24	26	48	3,0
			35	46	70	3,0
			42	62	82	3,5
		RD.. 16....	32	34	64	4,0
	SPD09	PD.. 0905..	40	63,7	77,7	2,0
	SZD07	ZDCW 07....	16	20,5	30	0,4
			20	28,5	38	0,4
			25	38,5	48	0,4
			32	52,5	62	0,4
	SZD09	ZDCW 09....	25	34	48	0,4
			32	48	60	0,4
	SZD12	ZDEW 12....	32	43	62	0,65
			40	59	78	0,65

FRESA TORICA

è necessario considerare il diametro effettivo per il calcolo della velocità di taglio.

TOROIDAL MILLING CUTTER

It is necessary to take the effective diameter into account when calculating the cutting speed.



$$v_c = \frac{\pi \cdot D_{ef} \cdot n}{1000} \quad [m/min]$$

$$D_{ef.} = D_1 + l \quad [mm]$$

Valore di „*l*" [mm] per differenti valori di a_p [mm]:

Values of „*l*" [mm] for different values of a_p [mm]:

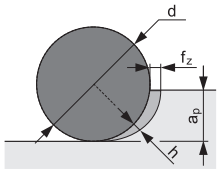
d [mm]	a_p [mm]									
	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0
5	3,0	4,0	4,6	–	–	–	–	–	–	–
7	3,6	4,9	5,7	6,3	–	–	–	–	–	–
8	3,9	5,3	6,2	6,9	–	–	–	–	–	–
10	4,4	6,0	7,1	8,0	8,7	–	–	–	–	–
12	4,8	6,6	7,9	8,9	9,7	10,4	–	–	–	–
16	5,6	7,7	9,3	10,6	11,6	12,5	13,2	13,9	–	–
20	6,2	8,7	10,5	12,0	13,2	14,3	15,2	16,0	16,7	17,3

Troviamo l'avanzamento ottimale dallo spessore truciolo* raccomandato in funzione del materiale lavorato.

*) Per profondità di taglio consigliata vedere nella parte prodotti del catalogo.

The optimum feed from the recommended chip thickness depends on the machined material and the depth of cut.*

*) The recommended cutting depths can be found in the product part of this catalogue.



$$f_z = h_m \sqrt{\frac{d}{a_p}} \quad \begin{matrix}[mm/dente] \\ [mm/tooth]\end{matrix}$$

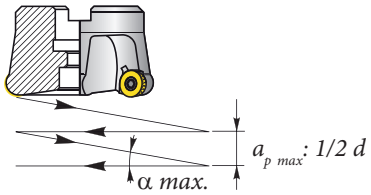
Tipo di inserti Marking of inserts	a_{pmax}	Spessore medio truciolo consigliato in base al materiale lavorato Recommended chip thicknesses for the machined material groups					
	[mm]	P	M	K	N	S	H
RD.. 0501	1,5	0,03 ÷ 0,08	0,05 ÷ 0,07	0,03 ÷ 0,08	0,05 ÷ 0,10	0,05 ÷ 0,07	0,02 ÷ 0,07
RD.. 07T1	2,0	0,03 ÷ 0,09	0,05 ÷ 0,07	0,03 ÷ 0,09	0,05 ÷ 0,11	0,05 ÷ 0,07	0,02 ÷ 0,07
RD ..0702	2,0	0,03 ÷ 0,11	0,05 ÷ 0,08	0,03 ÷ 0,11	0,05 ÷ 0,13	0,05 ÷ 0,08	0,02 ÷ 0,08
RD.. 0802	2,0	0,03 ÷ 0,15	0,05 ÷ 0,10	0,03 ÷ 0,15	0,05 ÷ 0,18	0,05 ÷ 0,10	0,03 ÷ 0,10
RD.. 1003	2,5	0,03 ÷ 0,15	0,05 ÷ 0,10	0,03 ÷ 0,15	0,05 ÷ 0,18	0,05 ÷ 0,10	0,03 ÷ 0,10
RD.. 12T3	3,0	0,04 ÷ 0,18	0,07 ÷ 0,13	0,04 ÷ 0,18	0,07 ÷ 0,20	0,07 ÷ 0,13	0,03 ÷ 0,13
RD(P).. 1204	3,0	0,04 ÷ 0,20	0,07 ÷ 0,15	0,04 ÷ 0,20	0,07 ÷ 0,25	0,07 ÷ 0,15	0,03 ÷ 0,15
RC.. 1204	6,0	0,05 ÷ 0,20	0,07 ÷ 0,15	0,05 ÷ 0,20	0,07 ÷ 0,25	0,07 ÷ 0,15	0,03 ÷ 0,15
RD.. 1604	4,0	0,05 ÷ 0,20	0,10 ÷ 0,15	0,05 ÷ 0,20	0,10 ÷ 0,25	0,10 ÷ 0,15	0,04 ÷ 0,15
RC.. 1606	8,0	0,05 ÷ 0,30	0,10 ÷ 0,20	0,05 ÷ 0,30	0,10 ÷ 0,40	0,10 ÷ 0,20	0,04 ÷ 0,20
RD.. 2006	5,0	0,05 ÷ 0,30	0,10 ÷ 0,20	0,05 ÷ 0,30	0,10 ÷ 0,40	0,10 ÷ 0,20	0,04 ÷ 0,20
RC.. 2006	10,0	0,05 ÷ 0,35	0,10 ÷ 0,25	0,05 ÷ 0,35	0,10 ÷ 0,40	0,10 ÷ 0,20	0,04 ÷ 0,20

FRESE TIPO SMORC

Condizioni consigliate per fresare le cavità:

CUTTERS TYPE SMORC

Recommended conditions for milling pockets:

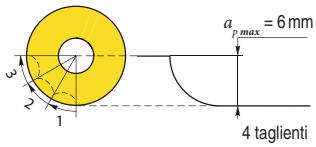


Il n° di taglienti è pari al n° di faccette, veriabile secondo le dimensioni inserto

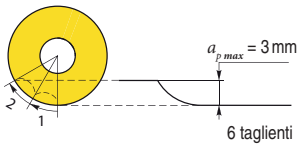
The number of rotations depends on the number of bearing surfaces, which is different for individual insert sizes (see figure).

RCMT 12

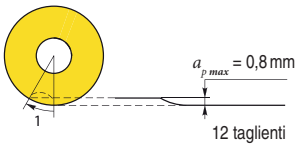
12 faccette
12 bearing surfaces



4 taglienti
4 cutting edges



6 taglienti
6 cutting edges

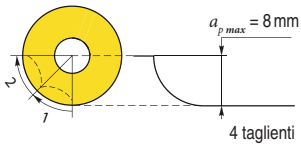


12 taglienti
12 cutting edges

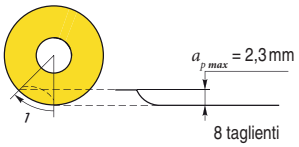
RCMT 16

8 faccette
8 bearing surfaces





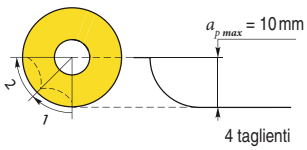
4 taglienti
4 cutting edges



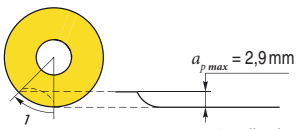
8 taglienti
8 cutting edges

RCMT 20

8 faccette
8 bearing surfaces



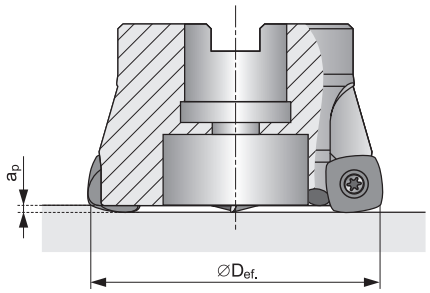
4 taglienti
4 cutting edges



8 taglienti
8 cutting edges

FRESA PER ALTO AVANZAMENTO

HIGH FEED CUTTERS (HF CUTTERS)



Formula per il calcolo della velocità di taglio:

Formula for calculating cutting speed:

$$v_c = \frac{\pi \cdot D_{ef} \cdot n}{1000} \quad [m/min]$$

Diametro effettivo della fresa per spianatura.

Effective diameter of cutter for face milling:

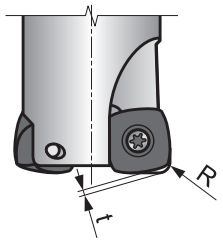
Fresa Ø Cutter Ø [mm]	Inserti Insert	Diametro D_{ef} effettivo in relazione con a_p [mm] Effective diameter D_{ef} in relation to a_p [mm]		
		a_p = 0	a_p = 0,5	a_p = 1,0
16	ZDCW 070304	6,0	12,2	15,3
20		10,0	16,2	19,3
25		15,0	21,2	24,3
32		22,0	28,2	31,3
25	ZDCW 09T304	11,6	21,0	23,7
32		18,7	27,9	30,7
40		27,7	35,9	38,7

Fresa Ø Cutter Ø [mm]	Inserti Insert	Diametro D_{ef} effettivo in relazione con a_p [mm] Effective diameter D_{ef} in relation to a_p [mm]			
		a_p = 0	a_p = 0,5	a_p = 1,0	a_p = 1,5
32	ZDEW 120408	14,5	24,7	28,0	30,1
40	ZDEW 120408	22,5	32,8	36,1	38,2
50	ZDEW 120408	32,5	42,9	46,1	48,3
63	ZDEW 120408	45,5	56,0	59,2	61,3
80	ZDEW 120408	62,5	73,0	76,2	78,3

Fresa Ø Cutter Ø [mm]	Inserti Insert	Diametro D_{ef} effettivo in relazione con a_p [mm] Effective diameter D_{ef} in relation to a_p [mm]				
		a_p = 0	a_p = 0,5	a_p = 1,0	a_p = 1,5	a_p = 2,0
32	PD .. 0905	18,6	21,3	24,0	26,7	29,5
40		25,8	28,7	31,6	34,5	37,3
42		27,8	30,6	33,5	36,4	39,3
50		35,6	38,5	41,4	44,3	47,2
52		37,6	40,5	43,4	46,3	43,4
63		48,6	51,5	54,4	57,4	60,3
66		51,6	54,5	57,4	60,3	63,2
80		65,6	68,5	71,4	74,4	77,3
100		85,6	88,5	91,4	94,3	97,2

Informazioni per programmazione CNC:

Information for CNC programming:



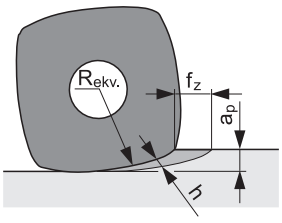
Inserti Insert	R [mm]	t [mm]
ZDCW 070304	1,70	0,60
ZDCW 09T304	2,27	0,52
ZDEW 120408	3,52	0,64
PD.. 0905..	4,50	1,10

Troviamo l'avanzamento ottimale dallo spessore truciolo* raccomandato in funzione del materiale lavorato.

*) Per profondità di taglio consigliata vedere nella parte prodotti del catalogo.

The optimum feed from the recommended chip thickness depends on the machined material and the depth of cut.*

*) The recommended cutting depths can be found in the product part of this catalogue.



$$f_z = h_m \sqrt{\frac{2R_{ekv.}}{a_{p\,max}}}$$ [mm/dente] [mm/tooth]

FRESE SFERICHE DI TIPO L2-SZP

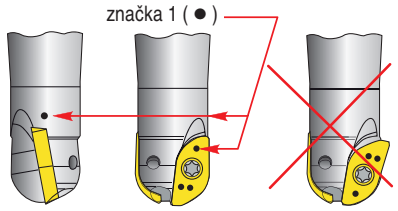
Bloccaggio degli inserti

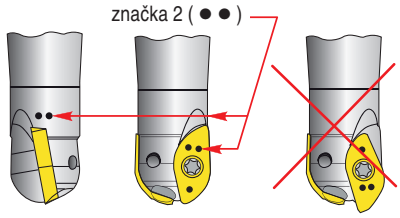
Corretto montaggio degli inserti:
i segni sul corpo della fresa e sull'inserto devono corrispondere.
(● con ●) e (●● con ●●)

SPHERICAL MILLING CUTTERS OF TYPE L2-SZP

Clamping of inserts

Correct mounting of inserts:
the markings on the cutter body and the insert must be identical.
(● with ●) and (●● with ●●)



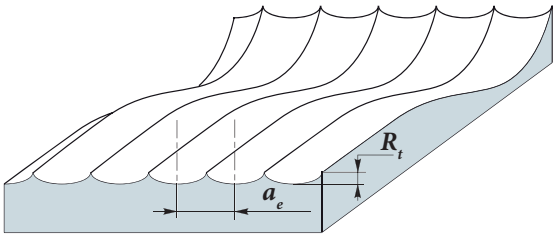


Lavorazione con uno sbalzo dell'utensile alto

Quando si lavora con utensili lunghi, è consigliabile ridurre la velocità di taglio del 30 - 50% al fine di eliminare le vibrazioni.

Machining with a high tool overhang

When machining with long tools, it is advisable to reduce the cutting speed by 30 to 50 % in order to eliminate vibrations.



$$R_t = \frac{a_e^2}{8R}$$

Rugosità R_t:

Valore di R_t in funzione di a_e

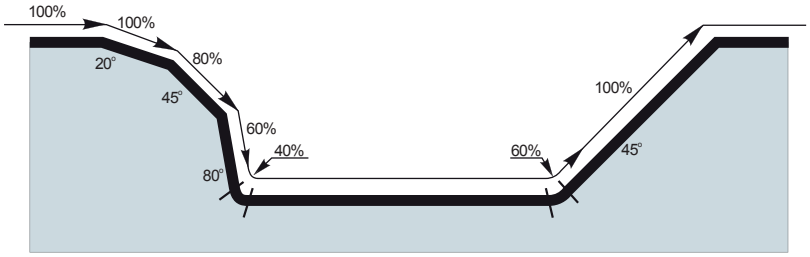
Roughness R_t:

Value of R_t depending on a_e

Diametro della fresa Diameter of cutter	10			12			16			20			25			32			40			50		
a_e	0,7	1,0	1,5	1,0	1,5	2,0	1,0	2,0	3,0	2,0	3,0	4,0	3,0	4,0	5,0	3,0	4,0	5,0	4,0	6,0	8,0	4,0	6,0	8,0
R_t	0,01	0,02	0,03	0,02	0,05	0,08	0,02	0,06	0,14	0,05	0,11	0,20	0,09	0,16	0,25	0,07	0,13	0,20	0,10	0,23	0,40	0,08	0,18	0,32

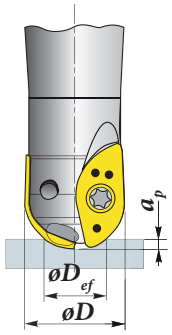
Correzione dell'avanzamento in funzione del profilo lavorato:

Correction of feed depending on machined profile:



v_c	Velocità di taglio [m/min]	Cutting speed [m/min]
n	Numero di giri [giri/min]	Number of revolutions [RPM]
D	Diametro della fresa [mm]	Diameter of cutter [mm]
D_{ef}	Diametro di taglio effettivo [mm]	Effective cutting diameter [mm]
a_p	Profondità di taglio [mm]	Depth of cut [mm]

$$D_{ef} = 2 \cdot \sqrt{a_p \cdot (D - a_p)} \quad [mm]$$



Diametro di taglio effettivo D_{ef} in funzione di a_p

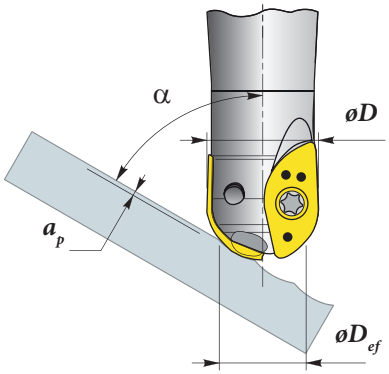
Effective cutting diameter D_{ef} depending on a_p

	a_p																
Ø D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
10	6,0	8,0	9,2	9,8	10,0	-	-	-	-	-	-	-	-	-	-	-	-
12	6,6	8,9	10,4	11,3	11,8	12,0	-	-	-	-	-	-	-	-	-	-	-
16	7,7	10,6	12,5	13,9	14,8	15,5	15,9	16,0	-	-	-	-	-	-	-	-	-
20	8,7	12,0	14,3	16,0	17,3	18,3	19,1	19,6	19,9	20,0	-	-	-	-	-	-	-
25	9,8	13,6	16,2	18,3	20,0	21,4	22,4	23,3	24,0	24,5	24,8	25,0	-	-	-	-	-
30	10,8	15,0	18,0	20,4	22,4	24,0	25,4	26,5	27,5	28,3	28,9	29,4	29,7	29,9	30,0	-	-
32	11,1	15,5	18,7	21,2	23,2	25,0	26,5	27,7	28,8	29,7	30,4	31,0	31,4	31,7	31,9	32,0	-
40	12,5	17,4	21,1	24,0	26,5	28,6	30,4	32,0	33,4	34,6	35,7	36,7	37,5	38,2	38,7	39,2	39,5
50	14,0	19,6	23,7	27,1	30,0	32,5	34,7	36,7	38,4	40,0	41,4	42,7	43,9	44,9	45,8	46,6	47,4

Esempio: per una fresa di Ø 20 mm e profondità di taglio a_p = 3 mm, il Ø effettivo D_{ef} = 14,3 mm.

Example: For a cutter of Ø 20 mm and depth of cut a_p = 3 mm, the effective Ø D_{ef} = 14.3 mm.

$$D_{ef} = 2 \cdot \sqrt{a_p \cdot (D - a_p)} \cdot \cos \alpha \quad [mm]$$

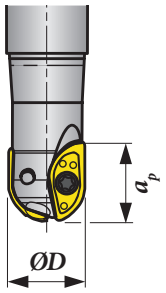


La velocità di taglio deve sempre essere calcolata per il diametro effettivo.

The cutting speed must always be calculated for the effective diameter.

$$v_c = \frac{\pi \cdot D_{ef} \cdot n}{1000} \quad [m/min]$$

Intervalli di avanzamento: **Feed ranges:**



$$f_z = \frac{h_m}{sin\left[arc\,cos.\left(\frac{D/2 - a_p}{D/2}\right)\right]}$$ [mm/dente] [mm/tooth]

Tipo di inserti Marking of inserts	$D/2$	$a_{p\,max}$	Spessore medio truciolo consigliato in base al materiale lavorato Recommended chip thicknesses for the machined material groups					
	[mm]		P	M	K	N	S	H
ZP 10ER-FM	5,0	8,9	0,05 ÷ 0,08	0,05 ÷ 0,08	0,05 ÷ 0,10	–	0,04 ÷ 0,06	0,04 ÷ 0,06
ZP 12ER-FM	6,0	10,7	0,05 ÷ 0,08	0,05 ÷ 0,08	0,05 ÷ 0,10	–	0,04 ÷ 0,06	0,04 ÷ 0,06
ZP 12ER-M	6,0	10,7	0,06 ÷ 0,10	0,06 ÷ 0,10	0,06 ÷ 0,12	–	–	–
ZP 16ER-FM	8,0	14,4	0,06 ÷ 0,10	0,06 ÷ 0,10	0,06 ÷ 0,13	–	0,04 ÷ 0,07	0,04 ÷ 0,07
ZP 16ER-M	8,0	14,4	0,07 ÷ 0,12	0,07 ÷ 0,12	0,07 ÷ 0,15	–	–	–
ZP 16ER-R	8,0	14,4	0,09 ÷ 0,15	0,09 ÷ 0,15	0,09 ÷ 0,19	–	–	–
ZP 20ER-F	10,0	17,9	0,04 ÷ 0,07	0,04 ÷ 0,07	–	–	0,03 ÷ 0,05	0,03 ÷ 0,05
ZP 20ER-FM	10,0	17,9	0,06 ÷ 0,10	0,06 ÷ 0,10	0,06 ÷ 0,13	–	0,04 ÷ 0,07	0,04 ÷ 0,07
ZP 20ER-M	10,0	17,9	0,07 ÷ 0,12	0,07 ÷ 0,12	0,07 ÷ 0,15	–	–	–
ZP 20ER-R	10,0	17,9	0,09 ÷ 0,15	0,09 ÷ 0,15	0,09 ÷ 0,19	–	–	–
ZP 25ER-FM	12,5	22,3	0,08 ÷ 0,15	0,08 ÷ 0,15	0,08 ÷ 0,17	–	0,05 ÷ 0,08	0,05 ÷ 0,08
ZP 25ER-M	12,5	22,3	0,10 ÷ 0,18	0,10 ÷ 0,18	0,10 ÷ 0,20	–	–	–
ZP 25ER-R	12,5	22,3	0,12 ÷ 0,22	0,12 ÷ 0,22	0,12 ÷ 0,25	–	–	–
ZP 32ER-FM	16,0	28,6	0,08 ÷ 0,15	0,08 ÷ 0,15	0,08 ÷ 0,17	–	0,05 ÷ 0,08	0,05 ÷ 0,08
ZP 32ER-M	16,0	28,6	0,10 ÷ 0,18	0,10 ÷ 0,18	0,10 ÷ 0,20	–	–	–
ZP 32ER-R	16,0	28,6	0,12 ÷ 0,22	0,12 ÷ 0,22	0,12 ÷ 0,25	–	–	–
ZP 40ER-R	20,0	35,7	0,12 ÷ 0,22	0,12 ÷ 0,22	0,12 ÷ 0,25	–	–	–
ZP 50ER-F	25,0	44,7	0,07 ÷ 0,13	0,07 ÷ 0,13	–	–	–	–
ZP 50ER-R	25,0	44,7	0,15 ÷ 0,25	0,15 ÷ 0,25	0,15 ÷ 0,3	–	–	–

FRESE SFERICHE TIPO K3-CXP

TYPE K3-CXP SPHERICAL CUTTERS

Calcolo dell'avanzamento:

Feed calculation:

$$f_z = h_{max} \cdot k_a \cdot k_{L2}$$ [mm/dente] [mm/tooth]

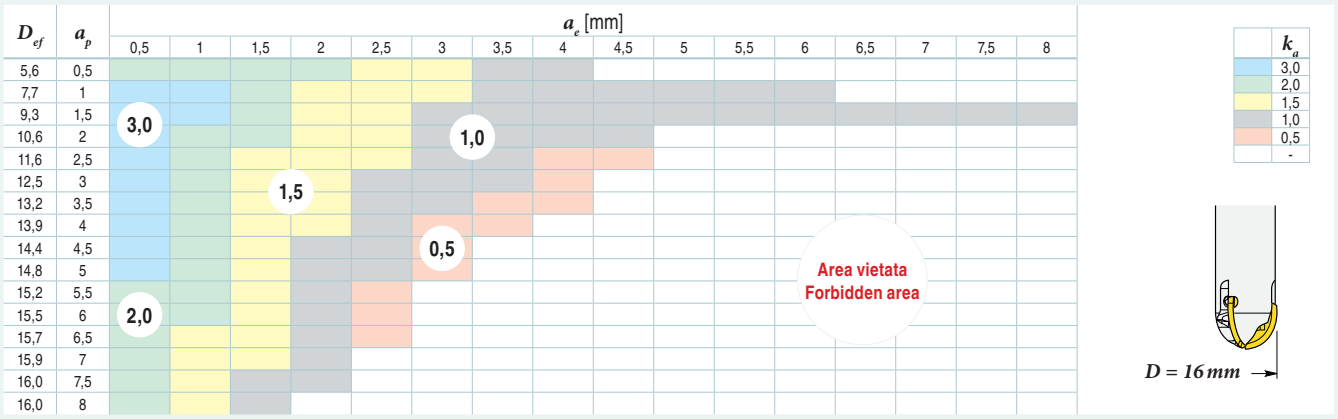
Spessore del truciolo consigliato h_{max} :

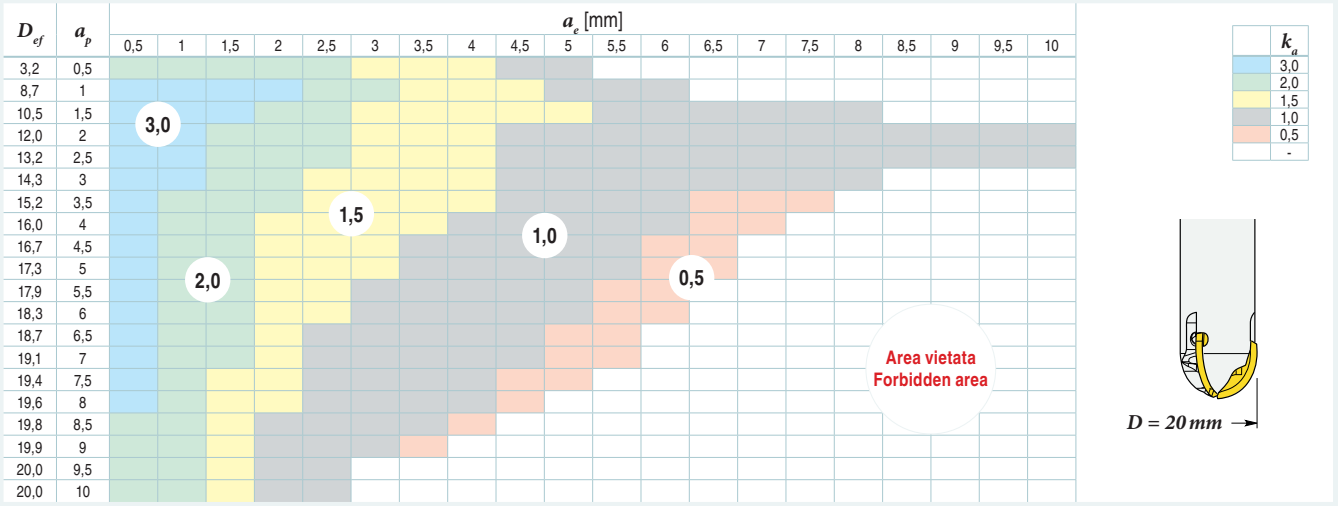
Recommended chip thickness h_{max} :

Ø fresa Ø cutter	Inserti Inserts	P	M	K	N	S	H
		Spessore truciolo / Chip thickness h_{max} [mm]					
16	XP16ER-FM	0,05 - 0,10	0,05 - 0,08	0,06 - 0,12	–	0,03 - 0,05	0,03 - 0,05
20	XP20ER-FM	0,07 - 0,12	0,07 - 0,10	0,09 - 0,15	–	0,05 - 0,07	0,05 - 0,07
25	XP25ER-FM	0,07 - 0,12	0,07 - 0,10	0,09 - 0,15	–	0,05 - 0,07	0,05 - 0,07
32	XP32ER-FM	0,10 - 0,18	0,10 - 0,16	0,10 - 0,20	–	0,06 - 0,09	0,06 - 0,09

Fattore di correzione dell'avanzamento k_a in relazione ad a_p e a_e:

Feed correction factor k_a in relation to a_p and a_e:





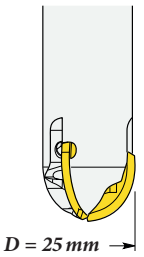
POSSIBILITÀ TECNOLOGICHE DELL'UTENSILE
TECHNOLOGICAL POSSIBILITIES OF THE TOOLS

D_{ef}	a_p	a_e [mm] 0,5	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6	6,5	7	7,5	8	8,5	9	9,5	10	10,5	11	11,5	12	12,5
7,0	0,5																									
9,8	1																									
11,9	1,5																									
13,6	2																									
15,	2,5																									
16,2	3																									
17,3	3,5																									
18,3	4																									
19,2	4,5																									
20	5																									
20,7	5,5																									
21,4	6																									
21,9	6,5																									
22,4	7																									
22,9	7,5																									
23,3	8																									
23,7	8,5																									
24,0	9																									
24,3	9,5																									
24,5	10																									
24,7	10,5																									
24,8	11																									
24,9	11,5																									
25,0	12																									
25,0	12,5																									

3,0 2,0 1,5 1,0 0,5

Area vietata
Forbidden area

k_a
3,0
2,0
1,5
1,0
0,5
-

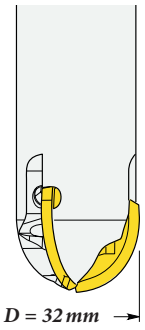


D_{ef}	a_p	a_e [mm] 0,5	1	1,5	2	2,5	3	3,5	4	4,5	5	5,5	6	6,5	7	7,5	8	8,5	9	9,5	10	10,5	11	11,5	12	12,5	13	13,5	14	14,5	15	15,5	16
7,9	0,5																																
11,1	1																																
13,5	1,5																																
15,5	2																																
17,2	2,5																																
18,7	3																																
20,0	3,5																																
21,2	4																																
22,2	4,5																																
23,2	5																																
24,1	5,5																																
25,0	6																																
25,7	6,5																																
26,5	7																																
27,1	7,5																																
27,7	8																																
28,3	8,5																																
28,8	9																																
39,2	9,5																																
29,7	10																																
30,0	10,5																																
30,4	11																																
30,7	11,5																																
31,0	12																																
32,1	12,5																																
31,4	13																																
31,6	13,5																																
31,7	14																																
31,9	14,5																																
31,9	15																																
32,0	15,5																																
32,0	16																																

3,0 2,0 1,5 1,0 0,5

Area vietata
Forbidden area

k_a
3,0
2,0
1,5
1,0
0,5
-



Fattore di correzione dell'avanzamento k_{L2} in relazione allo sbalzo dell'utensile:

Feed correction factor k_{L2} in relation to tool overhang:

L_1 (mm)	k_{L2}
$D \le L_2 \le 3D$	1,0
$3,1D \le L_2 \le 4D$	0,9
$4,1D \le L_2 \le 6D$	0,7
$6D \le L_2$	0,5

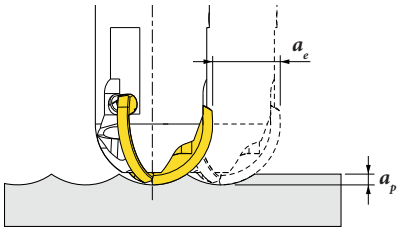
Calcolo dell'avanzamento:

$$v_f = 3 \cdot f_z \cdot n \quad [\text{mm/min}]$$

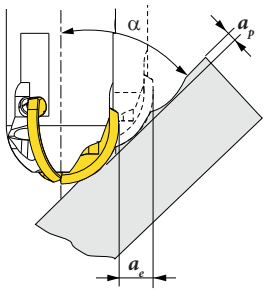
Feed calculation:

$$n = \frac{1000 \cdot v_c}{\pi \cdot D_{ef}} \quad [\text{giro/min}] \; [\text{RPM}]$$

$$D_{ef} = \sqrt{D^2 - (D - 2a_p)^2}$$



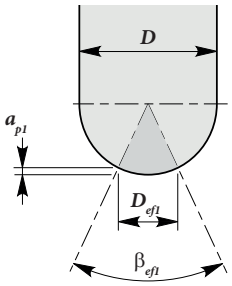
$$D_{ef} = \sqrt{D^2 - (D - 2a_p)^2} \cdot \sin\gamma + (D - 2a_p) \cdot \cos\gamma \quad [\text{mm}]$$



Area effettiva di contatto utensile:

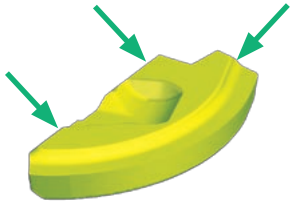
Effective area for 1 tool cutting edge:

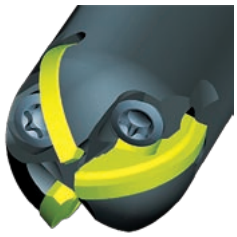
D [mm]	β_{ef1}	D_{ef1} [mm]	a_{p1} [mm]
16	41°	5,568	0,51
20	37°	6,314	0,52
25	37°	7,901	0,65
32	37°	10,122	0,83



Bloccaggio degli inserti:

Clamping of inserts:





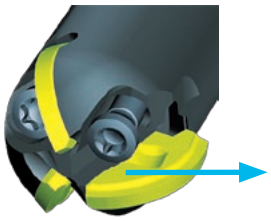
Metodo di fissaggio e regolazione dell'inserto nella sede.
Method of fixing and adjusting the insert in the seat.

1



Allentare semplicemente la vite (5-6 giri)
Only loosen the screw (5-6 turns)

2



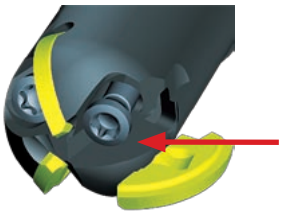
Rimuovere l'inserto dalla sede in direzione della freccia.
Remove the insert from the seat in the direction of the arrow.

3



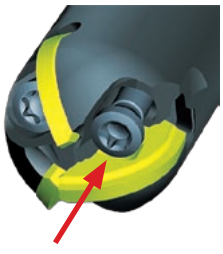
Soffiare e pulire la sede dell'utensile.
Blow out and clean the tool seat.

4



Inserire la punta nella sede in direzione della freccia.
Place the insert into the seat in the direction of the arrow.

5



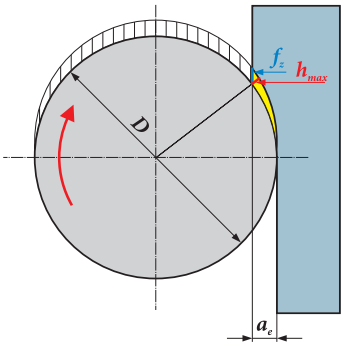
Serrare la vite.
Tighten the screw.

FRESATURA IN CONTORNATURA DI SPALLAMENTO

MILLING DEEP SHOULDERS

Intervallo di spessore del truciolo / avanzamento consigliato:

Recommended feed/chip thickness range:



Frese a disco:

Disc cutters:

Ø fresa Ø cutter	Spes. del truciolo medio consigliato Rec. medium chip thickness	a_e = 2		a_e = 5		a_e = 10		a_e = 20		a_e = 40		a_e = 80	
		$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$
[mm]	h_m [mm]	[mm/dente] / [mm/tooth]											
63	0,07 ÷ 0,09	0,39	0,51	0,25	0,32	–	–	–	–	–	–	–	–
80	0,07 ÷ 0,09	0,44	0,57	0,28	0,36	0,20	0,26	–	–	–	–	–	–
100	0,07 ÷ 0,09	0,50	0,64	0,32	0,41	0,23	0,29	0,16	0,21	–	–	–	–
125	0,07 ÷ 0,09	0,55	0,71	0,35	0,45	0,25	0,32	0,18	0,23	–	–	–	–
160	0,07 ÷ 0,09	0,63	0,81	0,40	0,51	0,28	0,36	0,20	0,26	0,15	0,19	–	–
200	0,07 ÷ 0,09	0,70	0,90	0,44	0,57	0,32	0,41	0,23	0,29	0,16	0,21	–	–
250	0,07 ÷ 0,09	0,78	1,01	0,50	0,64	0,35	0,45	0,25	0,32	0,18	0,23	0,13	0,17
315	0,07 ÷ 0,09	0,88	1,13	0,56	0,72	0,39	0,51	0,28	0,36	0,20	0,26	0,15	0,19

Frese cilindriche tipo J-CSD12X / C90SP12X:

Type J-CSD12X / C90SP12X cylindrical cutters:

Ø fresa Ø cutter	Spes. del truciolo medio consigliato Rec. medium chip thickness	a_e = 2		a_e = 4		a_e = 8		a_e = 12		a_e = 16	
		$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$
[mm]	h_m [mm]	[mm/dente] / [mm/tooth]									
40	0,025 ÷ 0,09	0,11	0,41	0,08	0,29	0,06	0,21	0,05	0,17	0,04	0,15
50	0,025 ÷ 0,09	0,13	0,45	0,09	0,32	0,06	0,23	0,05	0,19	0,05	0,17
63	0,025 ÷ 0,09	0,14	0,51	0,10	0,36	0,07	0,26	0,06	0,21	0,05	0,19
80	0,025 ÷ 0,09	0,16	0,57	0,11	0,41	0,08	0,29	0,07	0,24	0,06	0,21

Frese cilindriche tipo J-SAD11E / T-S90AD11E:

Type J-SAD11E / T-S90AD11E cylindrical cutters:

Ø fresa Ø cutter	Spes. del truciolo medio consigliato Rec. medium chip thickness	a_e = 2		a_e = 4		a_e = 8		a_e = 12		a_e = 16	
		$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$
[mm]	h_m [mm]	[mm/dente] / [mm/tooth]									
25	0,05 ÷ 0,08	0,18	0,29	0,13	0,21	0,09	0,15				
32	0,05 ÷ 0,08	0,20	0,32	0,14	0,23	0,10	0,17				
40	0,05 ÷ 0,08	0,23	0,36	0,16	0,26	0,12	0,19	0,10	0,15		
50	0,05 ÷ 0,08	0,25	0,40	0,18	0,29	0,13	0,21	0,11	0,17	0,09	0,15

Frese cilindriche tipo J-SLSN1XX:

Type J-SLSN1XX cylindrical cutters:

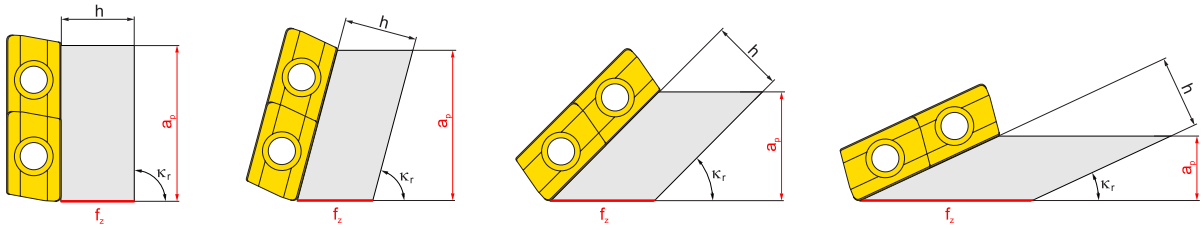
Ø fresa Ø cutter	Spes. del truciolo medio consigliato Rec. medium chip thickness	a_e = 2		a_e = 4		a_e = 8		a_e = 12		a_e = 16	
		$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$	$f_{z\,min}$	$f_{z\,max}$
[mm]	h_m [mm]	[mm/dente] / [mm/tooth]									
63	0,08 ÷ 0,22	0,45	1,24	0,32	0,88	0,23	0,63	0,19	0,52	0,17	0,46
80	0,08 ÷ 0,22	0,51	1,40	0,36	0,99	0,26	0,71	0,21	0,58	0,19	0,51

UTENSILI PER ESECUZIONE SMUSSI SxxXP16

Relazione fra avanzamento spessore truciolo ed angolo:

MILLING CUTTER FOR CHAMFERING SxxXP16

Influence of feed on chip thickness and setting angle:



$\kappa_r = 90°$ $\kappa_r = 75°$ $\kappa_r = 45°$ $\kappa_r = 25°$

Tipi di tagliente:

Cutting edge design:



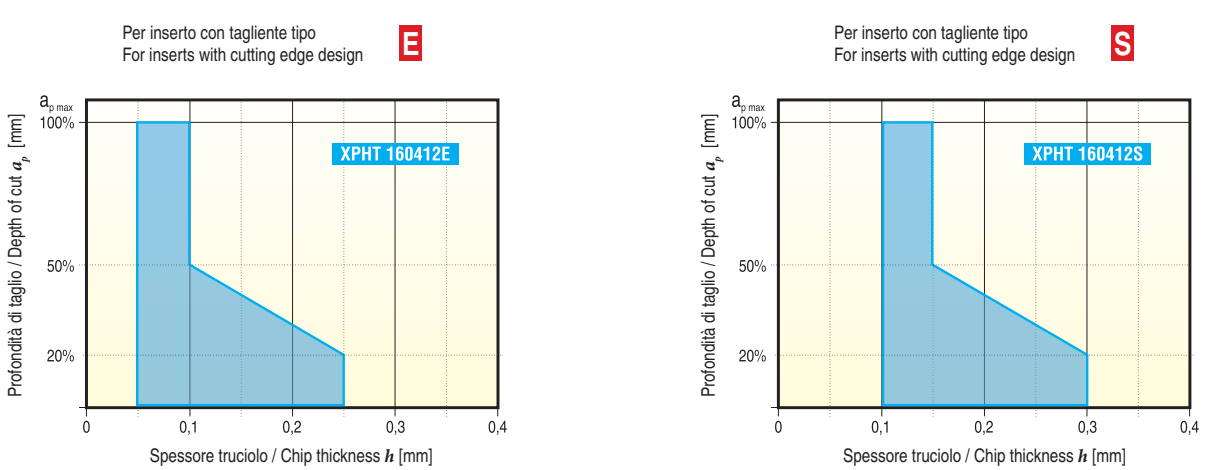
Relazione tra massima profondit à ed angolo:

Influence of max. depth on setting angle:

κ_r	*sin* κ_r	*tg* κ_r	$a_{p\ max}$ [mm]	Spessore truciolo / Chip thickness *h* [mm]	
				Tipo / Type E	Tipo / Type S
15°	0,259	0,268	7	0,05 - **0,07** - 0,10	0,10 - **0,12** - 0,15
25°	0,423	0,466	12		
30°	0,500	0,577	14		
35°	0,574	0,700	16		
40°	0,643	0,839	18		
45°	0,707	1,000	20		
50°	0,766	1,192	22		
55°	0,819	1,428	23		
60°	0,866	1,732	25		
75°	0,966	3,732	28		

Diagramma applicazioni per fresa SxxXP16

Application diagram for SxxXP16

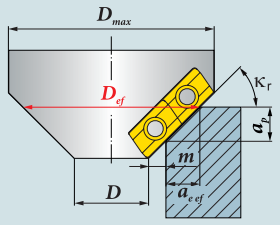
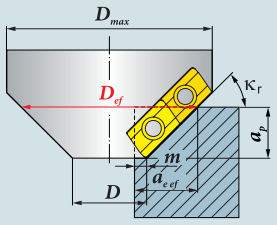
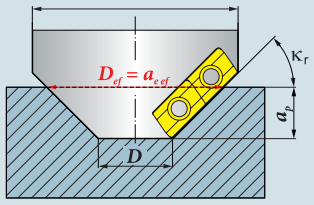


Parametri iniziali: **Initial cutting conditions:**

κ_r	a_{ef}/D_{ef}							
	0,10	0,15	0,20	0,25	0,30	0,35	0,40	1,00
15°	0,61 - 0,86 - 1,22	0,50 - 0,70 - 1,00	0,43 - 0,60 - 0,86	0,39 - 0,54 - 0,77	0,35 - 0,49 - 0,71	0,33 - 0,46 - 0,65	0,31 - 0,43 - 0,61	0,19 - 0,27 - 0,39
25°	0,37 - 0,52 - 0,75	0,31 - 0,43 - 0,61	0,26 - 0,37 - 0,53	0,24 - 0,33 - 0,47	0,22 - 0,30 - 0,43	0,20 - 0,28 - 0,40	0,19 - 0,26 - 0,37	0,24 - 0,28 - 0,35
30°	0,32 - 0,44 - 0,63	0,26 - 0,36 - 0,52	0,22 - 0,31 - 0,45	0,20 - 0,28 - 0,40	0,18 - 0,26 - 0,37	0,17 - 0,24 - 0,34	0,16 - 0,22 - 0,32	0,20 - 0,24 - 0,30
35°	0,28 - 0,39 - 0,55	0,23 - 0,32 - 0,45	0,19 - 0,27 - 0,39	0,17 - 0,24 - 0,35	0,16 - 0,22 - 0,32	0,15 - 0,21 - 0,29	0,28 - 0,33 - 0,41	0,17 - 0,21 - 0,26
40°	0,25 - 0,34 - 0,49	0,20 - 0,28 - 0,40	0,17 - 0,24 - 0,35	0,16 - 0,22 - 0,31	0,28 - 0,34 - 0,43	0,26 - 0,32 - 0,39	0,25 - 0,30 - 0,37	0,16 - 0,19 - 0,23
45°	0,22 - 0,31 - 0,45	0,18 - 0,26 - 0,37	0,16 - 0,22 - 0,32	0,28 - 0,34 - 0,42	0,26 - 0,31 - 0,39	0,24 - 0,29 - 0,36	0,22 - 0,27 - 0,34	0,14 - 0,17 - 0,21
50°	0,21 - 0,29 - 0,41	0,17 - 0,24 - 0,34	0,29 - 0,35 - 0,44	0,26 - 0,31 - 0,39	0,24 - 0,29 - 0,36	0,22 - 0,26 - 0,33	0,21 - 0,25 - 0,31	0,13 - 0,16 - 0,20
55°	0,19 - 0,27 - 0,39	0,16 - 0,22 - 0,32	0,27 - 0,33 - 0,41	0,24 - 0,29 - 0,37	0,22 - 0,27 - 0,33	0,21 - 0,25 - 0,31	0,19 - 0,23 - 0,29	0,12 - 0,15 - 0,18
60°	0,18 - 0,26 - 0,37	0,30 - 0,36 - 0,45	0,26 - 0,31 - 0,39	0,23 - 0,28 - 0,35	0,21 - 0,25 - 0,32	0,20 - 0,23 - 0,29	0,18 - 0,22 - 0,27	0,12 - 0,14 - 0,17
75°	0,16 - 0,23 - 0,33	0,27 - 0,32 - 0,40	0,23 - 0,28 - 0,35	0,21 - 0,25 - 0,31	0,19 - 0,23 - 0,28	0,17 - 0,21 - 0,26	0,16 - 0,20 - 0,25	0,10 - 0,12 - 0,16
v_c	280	255	235	225	215	205	200	160

Tipo/Type E: XPHT 160412E — Tipo/Type S: XPHT 160412S

Formule per condizioni di taglio delle frese a smussare: **Relations for calculating cutting conditions with chamfering cutters:**

SMUSSO CHAMFER	SMUSSO CON SPALLAMENTO CHAMFER WITH SHOULDER	CAVA SLOT
		
Relazione a_p ed $a_{e\,ef}$ / Relation a_p and $a_{e\,ef}$ $a_p = a_{e\,ef} \cdot tg\,\kappa_r$ [mm] $a_{e\,ef} = \frac{a_p}{tg\,\kappa_r}$ [mm]	Relazione a_p ed $a_{e\,ef}$ / Relation a_p and $a_{e\,ef}$ $a_p = (a_{e\,ef} - m) \cdot tg\,\kappa_r$ [mm] $a_{e\,ef} = m + \frac{a_p}{tg\,\kappa_r}$ [mm]	Relazione a_p ed $a_{e\,ef}$ / Relation a_p and $a_{e\,ef}$ $a_p = \frac{a_{e\,ef} - D}{2} \cdot tg\,\kappa_r$ [mm] $a_{e\,ef} = D + \frac{2 \cdot a_p}{tg\,\kappa_r}$ [mm]
Diametro effettivo / Effective diameter D_{ef} $D_{ef} = D + 2 \cdot (a_{e\,ef} + m)$ [mm]	Diametro effettivo / Effective diameter D_{ef} $D_{ef} = D + 2 \cdot (a_{e\,ef} - m)$ [mm]	Diametro effettivo / Effective diameter D_{ef} $D_{ef} = a_{e\,ef}$ [mm]
Avanzamento al dente / Feed per tooth f_z $f_z = \frac{h}{sin\,\kappa_r} \cdot \sqrt{\frac{D_{ef}}{a_{e\,ef}}}$ [mm/dente] [mm/tooth]		Avanzamento al dente / Feed per tooth f_z $f_z = \frac{h}{sin\,\kappa_r}$ [mm/dente] [mm/tooth]
Rivoluzione / Revolutions n $n = \frac{v_c \cdot 1000}{D_{ef} \cdot \pi}$ [giro/min] [rev./min]		
Avanzamento tavola / Table feed f_{min} $f_{min} = f_z \cdot z \cdot n$ [mm/min]		

FRESE PER SPIANATURA TIPO C90SC

Spessori del truciolo consigliati:

TYPE C90SC FACE CUTTERS

Recommended chip thicknesses:

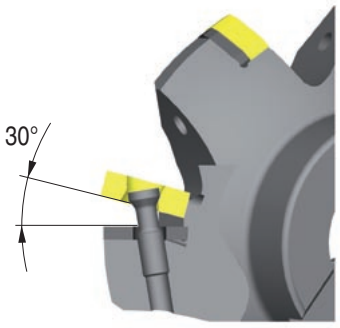
Inserti Inserts	$D/2$	$a_{p\,max}$	Spessore medio truciolo consigliato in base al materiale lavorato Recommended chip thicknesses for the machined material groups					
	[mm]		P	M	K	N	S	H
SCKR 09T340EN-F	4,0	4,0	0,05 ÷ 0,08	0,05 ÷ 0,08	0,05 ÷ 0,10	–	0,04 ÷ 0,06	–
SCKR 12T360EN-F	5,8	6,0	0,05 ÷ 0,08	0,05 ÷ 0,08	0,05 ÷ 0,10	–	0,04 ÷ 0,06	–

FRESE PER SPIANATURA TIPO S57PN13

Sostituzione degli inserti senza che occorra rimuovere la vite di fissaggio:

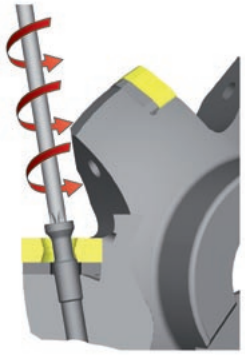
1 Inserire la punta nella sede con un angolo di 30°.

Place the insert into the seat at a 30° angle.



3 Serrare la vite.

Tighten the screw.

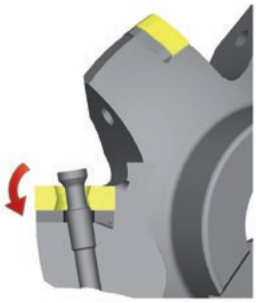


TYPE S57PN13 FACE CUTTERS

Replacing the cutting inserts without the need to remove the fixing screw:

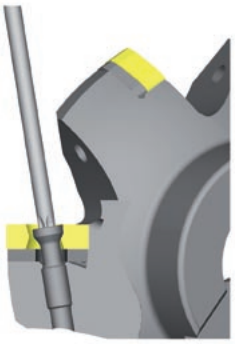
2 Posizionare l'inserto su una sottoplacchetta nella posizione prevista nella sede della fresa.

Position the insert on a shim in the required position in the milling cutter seat.



4 Coppia 15 Nm.

Torque 15 Nm.



TIPI DI USURA DEGLI INSERTI IN FRESATURA
TYPES OF WEAR ON MILLING INSERTS

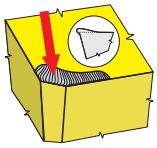
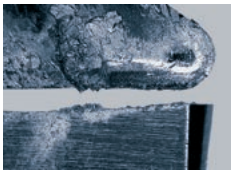
Illustrazione / Picture	TAGLIENTE DI RIPORTO	BUILT -UP EDGE
	**Descrizione e cause:** Si tratta dell'incollamento di materiale lavorato sul tagliente dell'inserto. Il riporto ha il carattere di scheggia incandescente sul tagliente. Rimuovendola si può avere un danneggiamento lieve del tagliente. Questo fenomeno può causare una diminuzione della qualità della superficie lavorata.	**Description and cause:** The machined material gets stuck to the cutting edge of the insert. The build-up has the properties of weld deposits on the cutting edge. Removing it can damage the cutting edge, which has a negative effect on the quality of the machined surface.
	**Accorgimenti:** - modificare (aumentare) la velocità di taglio - modificare (aumentare) l'avanzamento - applicare qualità rivestite di metallo duro - utilizzare una geometria di taglio diversa - utilizzare un refrigerante con maggiore efficacia antiincollamento (se non è a disposizione, desistere dal raffreddamento)	**Corrective measures:** - increase the cutting speed - increase the feed rate - use a coated grade - use a different milling geometry - use a coolant with more effective anti-sticking properties (or no coolant at all)

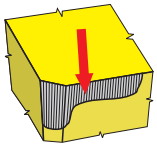
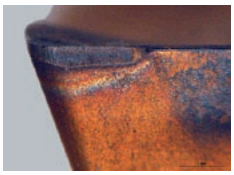
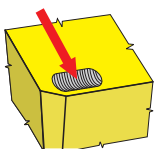
Illustrazione / Picture	USURA SUL FIANCO	FLANK WEAR
	**Descrizione e cause:** L'usura sul fianco è uno dei criteri principali che caratterizzano la durata dell'inserto. Sorge in conseguenza del contatto dell'inserto con il materiale lavorato. La sua grandezza (intensità) si può solo diminuire ma non si può annullare.	**Description and cause:** Flank wear is one of the main factors that affects the service life of the insert. It is caused by friction between the insert and the machined material. It cannot be fully eliminated, but it can be reduced.
	**Accorgimenti:** - utilizzare una qualità più resistente all'usura - ridurre la velocità di taglio - aumentare il tasso di avanzamento (se inferiore a 0,1 mm per dente) - utilizzare refrigerante o aumentare il raffreddamento	**Corrective measures:** - use a more wear-resistant grade - reduce the cutting speed - increase the feed rate (if it is under 0.1 mm per tooth) - use coolant or increase cooling

Illustrazione / Picture	CRATERIZZAZIONE	CRATERING
	**Descrizione e cause:** La craterizzazione è un fenomeno che si manifesta solitamente su inserti a petto piano, non è però limitato a questo tipo di inserto. Lavorando materiali pastosi l'azione del truciolo forma un cratere ampio e poco profondo; lavorando materiali duri al contrario si forma un cratere stretto e profondo.	**Description and cause:** Cratering usually appears on inserts with a plain face.
	**Accorgimenti:** - utilizzare un tipo di carburo più resistente all'usura - utilizzare un tipo rivestito, in particolare (MT) CVD - diminuire la velocità di taglio - utilizzare una geometria di taglio più positiva - utilizzare un refrigerante o aumentarne la portata.	**Corrective measures:** - use more wear resistant grade - use coated grade, primarily (MT) CVD - reduce the cutting speed - use different milling geometry - more positive - use coolant or increase the intensity of cooling

TIPI DI USURA DEGLI INSERTI IN FRESATURA
TYPES OF WEAR ON MILLING INSERTS

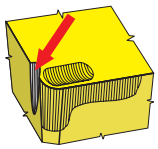
Illustrazione / Picture	USURA PER OSSIDAZIONE SUL TAGLIENTE SECONDARIO	OXIDATION GROOVE ON THE MINOR EDGE
	**Descrizione e cause:** Questo tipo di usura si verifica soprattutto in tornitura. Anche in questo caso è dovuto al contatto dell'inserto con il pezzo lavorato. Questo fenomeno genera il progressivo deterioramento delle condizioni della superficie lavorata.	**Description and cause:** The main factor that limits the service life of the tool. It usually occurs during turning, where a combination of oxidation on the groove and cratering roughens the machined surface.
	**Accorgimenti:** - utilizzare un tipo di carburo rivestito o più resistente all'usura. - utilizzare un inserto con rivestimento contenente Al_2O_3 - utilizzare un refrigerante o aumentarne la portata. - diminuire la velocità di taglio	**Corrective measures:** - use a coated or more wear-resistant grade - if possible use Al_2O_3 coated inserts - use coolant or increase the intensity of cooling - reduce the cutting speed

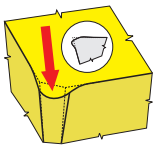
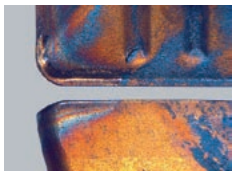
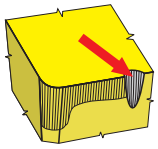
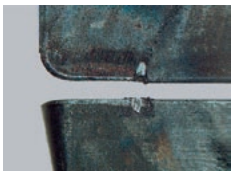
Illustrazione / Picture	DEFORMAZIONE PLASTICA DEL TAGLIENTE	PLASTIC DEFORMATION
	**Descrizione e cause:** Il motivo per questo tipo di usura è il sovraccarico termico del tagliente in conseguenza di alte temperature che si sviluppano con il taglio (alte velocità e avanzamenti).	**Description and cause:** This is caused by high thermal stress on the cutting edge (high feed rate and cutting speed).
	**Accorgimenti:** - utilizzare un tipo di carburo più resistente all'usura - diminuire la velocità di taglio - diminuire l'avanzamento - utilizzare un refrigerante o aumentarne la portata. - utilizzare un inserto con maggiore raggio di punta - utilizzare un inserto con un angolo di punta più robusto	**Corrective measures:** - use a more wear-resistant grade - reduce the cutting speed - reduce the feed rate - use a coolant or increase cooling - use a cutting insert with a larger corner radius - use a cutting insert with a larger corner angle

Illustrazione / Picture	USURA PER INTAGLIO	NOTCH WEAR
	**Descrizione e cause:** L'intaglio sorge nella zona di contatto del tagliente dell'inserto con la parte più esterna della superficie lavorata. È causata soprattutto dall'indurimento degli strati superficiali del pezzo lavorato. Questo tipo di usura si incontra soprattutto lavorando acciai anticorrosivi austenitici.	**Description and cause:** This occurs where the cutting edge of the insert comes into contact with the surface of the machined material. It is caused by the hardening of the surface layer of the material and by burrs. It usually appears on stainless austenitic steels.
	**Accorgimenti:** - utilizzare un tipo di carburo rivestito o più resistente all'usura, - utilizzare un inserto con rivestimento contenente Al_2O_3 - scegliere uno utensile con minore angolo di registrazione - suddividere in modo diverso le profondità di passata	**Corrective measures:** - use a coated or more abrasion-resistant type of cemented carbide (if conditions allow) - use an insert with a coating containing Al_2O_3 - choose a tool with a smaller setting angle

TIPI DI USURA DEGLI INSERTI IN FRESATURA
TYPES OF WEAR ON MILLING INSERTS

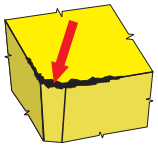
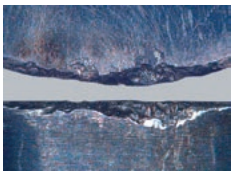
Illustrazione / Picture	MICROSCHEGGIATURE SUL TAGLIENTE	CHIPPING OF CUTTING EDGE
	**Descrizione e cause:** La mcroscheggiatura – nella maggior parte dei casi si combina con altri tipi di usura, è difficilmente identificabile di per sé. La sua causa è soprattutto da ricercarsi nella bassa rigidità del sistema macchina-utensile-pezzo lavorato.	**Description and cause:** Brittle chipping (micro-chipping) usually occurs in combination with other types of wear and is difficult to identify separately. It is caused by low rigidity of the machine-tool-workpiece assembly or by “hard forming“.
	**Accorgimenti:** - utilizzare una qualità più tenace - scegliere condizioni di lavorazione meno intense - utilizzare una geometria di taglio differente - ridurre l‘avanzamento all‘entrata del taglio	**Corrective measures:** - use a more rigid type of cemented carbide - choose less intensive machining conditions - use a different cutting geometry - reduce the feed at entering the cut

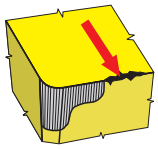
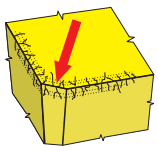
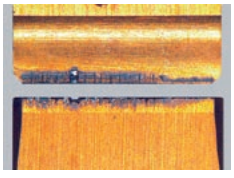
Illustrazione / Picture	AZIONE DI MARTELLAMENTO DEL TRUCIOLO SUL TAGLIENTE NON IMPEGNATO	CHIPPING OF CUTTING EDGE (OUT OF CUT)
	**Descrizione e cause:** La sua causa di questo fenomeno può essere l´inadeguata consistenza del truciolo, che formandosi colpisce il tagliente e lo danneggia meccanicamente.	**Description and cause:** This is caused by inadequate chip forming, which causes mechanical damage to the cutting edge.
	**Accorgimenti:** - modificare l‘avanzamento - scegliere un utensile con diverso angolo di registrazione - utilizzare una diversa geometria di taglio - utilizzare un tipo più tenace di metallo duro	**Corrective measures:** - change the feed rate - choose a tool with a different setting angle - use an insert with a different geometry - use a tougher grade

Illustrazione / Picture	SCHEGGIATURA DEL TAGLIENTE	COMB CRACKS
	**Descrizione e cause:** Tale fenomeno è la conseguenza del sovraccarico meccanico-termico durante il taglio interrotto.	**Description and cause:** This is caused by high thermal stress on the cutting edge during interrupted cut.
	**Accorgimenti:** - evitare il liquido refrigerante (è possibile utilizzare l'aria per eliminare i trucioli dalla zona di taglio) - scegliere un metallo duro più tenace - diminuire la velocità di taglio	**Corrective measures:** - use plenty of coolant or stop using coolant (air can be used to eliminate burrs on the cutting area) - reduce the cutting speed - reduce the feed rate - use a tougher grade

TIPI DI USURA DEGLI INSERTI IN FRESATURA
TYPES OF WEAR ON MILLING INSERTS

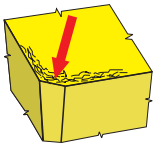
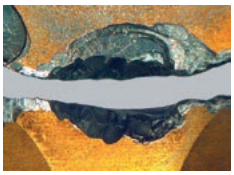
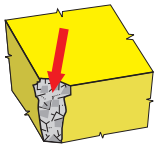
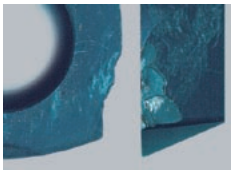
Illustrazione / Picture	SCHEGGIATURE NELLA ZONA POST TAGLIENTE	CRACKS ALONG THE FLANK
	**Descrizione e cause:** Sorgono in conseguenza del sovraccarico meccanico nell'area appena dietro il tagliente.	**Description and cause:** This is caused by high dynamic stress on the area behind the cutting edge.
	**Accorgimenti:** - utilizzare un tipo più tenace di metallo duro - modificare il modo di ingresso ed uscita della fresa dal pezzo in lavorazione - modificare le condizioni di taglio - utilizzare un altro tipo di geometria di taglio o un inserto con un altro tipo di angolo di taglio (...T, ...S, ...K, ...P) - diminuire l'avanzamento	**Corrective measures:** - use a tougher grade - change the cutting conditions - use a milling insert with a different geometry or an insert with a different cutting edge condition (...T, ...S, ...K, ...P) - change the feed rate - change the position of the cutter

Illustrazione / Picture	ROTTURA DELL'INSERTO	INSERT FRACTURE
	**Descrizione e cause:** Le cause di questo fenomeno possono essere diverse e dipendono sia dal tipo di metallo duro usato sia dal materiale del pezzo in lavorazione, dallo stato ed in particolare dalla solidità del sistema macchina-utensile-pezzo, influiscono anche la grandezza ed il tipo di usura e le condizioni di staffaggio.	**Description and cause:** The cutting edge or tip of the tool is destroyed - this has numerous causes and depends on the tool material, the workpiece material and condition, and the rigidity of the machine-tool-workpiece assembly in particular; the amount of wear, its type, and the machining conditions also have a certain influence.
	**Accorgimenti:** - utilizzare una qualità più tenace - ridurre il tasso di avanzamento e la profondità di taglio - utilizzare un inserto con un raggio di punta più ampio - utilizzare un inserto di taglio con un angolo di punta più ampio - utilizzare un inserto di fresatura con una geometria differente - aumentare la stabilità - modificare la posizione della fresa (ridurre il tasso di avanzamento)	**Corrective measures:** - use a tougher grade - reduce the feed rate and depth of cut - use an insert with a larger corner radius - use a cutting insert with a larger corner angle - use a milling insert with a different geometry - improve stability - change the position of the cutter (reduce the feed rate)

FENOMENI INDESIDERATI
UNDESIRABLE PHENOMENA

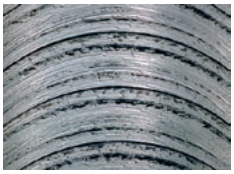
Illustrazione / Picture	CATTIVA FINITURA SUPERFICIALE	POOR SURFACE QUALITY
	**Descrizione e cause:** Svariate cause che dipendono dal materiale del pezzo, dalle condizioni di taglio (tasso di avanzamento e velocità di taglio), dalla condizione del tagliente, dalla misura e dalla tipologia di usura nonché dalla condizione e dalla rigidità del sistema macchina-utensile-pezzo. - utensile scelto non corretto - spessore del truciolo non corretto - velocità di taglio non corretta - refrigerante necessario - tasso di avanzamento elevato	**Description and cause:** Numerous causes depending on the workpiece material, cutting conditions (feed rate and cutting speed), the condition of the cutting edge, the extent and type of wear, and the condition and rigidity of the machine-tool--workpiece assembly. - incorrect tool chosen - incorrect chip thickness - incorrect cutting speed - coolant is needed - high feed rate
	Accorgimenti: - utilizzare un inserto di finitura, oppure un inserto con raschiante di finitura - utilizzare un inserto con geometria di taglio idonea - ridurre il tasso di avanzamento - regolare (normalmente aumentare) la velocità di taglio - utilizzare refrigerante o lubrificazione (MQL) - eliminare le vibrazioni - utilizzare un utensile con cui la posizione dei singoli inserti può essere regolata più accuratamente - modificare lo spessore del truciolo (modificare le condizioni di lavorazione)	**Corrective measures:** - use a finishing insert, or an insert with finishing segment - use an insert with suitable cutting geometry - reduce the feed rate - adjust (usually increase) the cutting speed - use coolant or lubrication (MQL) - eliminate vibrations - use a tool with which the position of the individual inserts can be adjusted more accurately - change the chip thickness (modify the machining conditions)

Illustrazione / Picture	SUPERFICIE VIBRATA	VIBRATIONS
	**Descrizione e cause:** È un fenomeno molto frequente, cause principali sono lo squilibrio del pezzo o della fresa, il fissaggio instabile del pezzo e il valore troppo alto delle forze di taglio. - rigidità bassa del sistema macchina-utensile-pezzo - profondità di taglio troppo alta (sia assiale che radiale) - cattivo staffaggio del pezzo - usura utensile	**Description and cause:** This is a very common problem, which is mainly caused by an unbalanced workpiece or tool, unstable fixing of the machined part and high cutting forces. - low rigidity of machine-tool-workpiece assembly - excessive chip depth (both axial and radial) - run-out - poor workpiece or tool balance - large tool overhang
	Accorgimenti: - verificare la stabilità del fissaggio del pezzo - verificare la stabilità del fissaggio dell'utensile - ridurre la profondità di taglio - utilizzare un utensile con uno sbalzo più piccolo - modificare la velocità di taglio - ridurre lo spessore del truciolo (modificare le condizioni di taglio o di lavorazione) - scegliere una geometria di taglio idonea e un materiale dell'utensile che riducano al minimo l'equilibrio di forza del processo di taglio (il più affilato e positivo possibile), ovvero utilizzare un utensile con una resistenza di taglio minore - durante la fresatura, utilizzare un utensile con un angolo di registrazione più piccolo	**Corrective measures:** - check the stability of the workpiece fixing - check the stability of the tool fixing - reduce the cutting depth - use a tool with smaller overhang - modify the cutting speed - reduce the chip thickness (change the cutting or machining conditions) - choose a suitable cutting geometry and tool material to minimize the cutting process force balance (as sharp and as positive as possible), i.e. use a tool with a lower cutting resistance - when milling, use a tool with a smaller setting angle

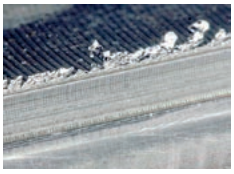
Illustrazione / Picture	CREAZIONE DI BAVE	BURRS
	**Descrizione e cause:** Questo fenomeno è molto frequente, non si può evitare sempre. La bava sorge soprattutto fresando acciaio pastosi e materiali plastici.	**Description and cause:** This usually occurs on soft steels and plastic materials.
	Accorgimenti: - utilizzare un inserto con tagliente affilato - utilizzare un inserto con geometria positiva - utilizzare una fresa con angolo di impostazione minore	**Corrective measures:** - use a cutting insert with a sharp cutting edge - use a cutting insert with positive geometry - use a tool with a smaller setting angle

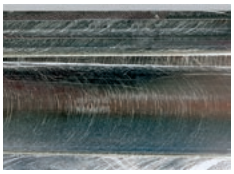
Illustrazione / Picture	ERRORI DIMENSIONALI E DI FORMA	ERRORS IN DIMENSIONS AND SHAPE OF WORKPIECE
	Descrizione e cause: Questi errori sono dovuti a molti fattori o proprietà del sistema macchina-utensile-pezzo.	**Description and cause:** Depends on a number of factors.
	Accorgimenti: - scegliere un inserto con resistenza sufficiente all'usura - riesaminare la stabilità del fissaggio del pezzo - riesaminare la stabilità del fissaggio della fresa	**Corrective measures:** - use a wear-resistant cutting insert - improve the stability of the cutter and workpiece - minimize tool overhang - use a workpiece with a suitable machining allowance

Illustrazione / Picture	FORMA INADATTA DEL TRUCIOLO	INADEQUATE CHIP FORMATION
	**Descrizione e cause:** Forma adatta del truciolo – è in realtà un criterio ugualmente importante come la durata. La formazione inadatta è influenzata soprattutto dal materiale del pezzo, dall'avanzamento, dalla profondità di taglio e naturalmente dalla scelta opportuna della geometria di taglio. Il truciolo lungo è per molti motivi inaccettabile, ma anche una truciolo troppo corto e forzato e può essere indesiderato (testimonia un sovraccarico del tagliente e porta al sorgere di vibrazioni).	**Description and cause:** Using a chip with a suitable shape is as important as its durability (service life of the tool). The workpiece material, the feed rate, the depth of cut and the cutting geometry all have an effect on chip forming. A chip that is too long is unacceptable for various reasons, while a chip that is too short is undesirable as it overloads the cutting edge and causes vibrations.
	Accorgimenti: - modificare il tasso di avanzamento e la profondità di taglio - utilizzare una geometria di taglio più idonea - modificare le condizioni di taglio	**Corrective measures:** - change the fee rate and depth of cut - use a more suitable cutting geometry - change the cutting conditions

PRINCIPI GENERALI	GENERAL PRINCIPLES
Controllo dello stato della sede dell'inserto: Prima di impiegare un nuovo inserto o di cambiare il tagliente girando l'inserto è necessario pulire la sede, controllare lo stato della sede stessa e di tutto il sistema di bloccaggio inserto.	**Check the seat condition of the cutting insert:** Before clamping a new cutting insert or changing the edge, it is necessary to clean the seat and check its condition or the condition of the anvil and wedge (especially the damage under the corner of the cutting insert).
Controllo e manutenzione delle parti di ricambio: Non meno importante è anche il controllo dei singoli elementi di fissaggio (leve angolari, viti,o cunei di bloccaggio. Per il fissaggio utilizzare parti non danneggiate, in caso di loro sostituzione utilizzare solo i pezzi di ricambio indicati nel catalogo per il dato utensile. Lubrificare regolarmente i vani e le superfici coniche di posizionamento delle viti – ad es. con lubrificante resistente alle alte temperature (Molyko G). Per il montaggio e lo smontaggio utilizzare esclusivamente cacciaviti e chiavi indicate nel catalogo o raccomandate dal produttore dell utensile, inoltre è necessario badare al giusto tiraggio delle viti (tiraggio proporzionale!) – meglio utilizzare la chiave dinamometrica.	**Check and service the clamping parts:** It is also important to check the clamping parts, including lamping levers, screws, wedges and clamps. Only use original, undamaged parts (found in the catalogue). Regularly lubricate the threads and the binding surface of screws, for example using heat-resistant lubricant (Molyko G.). For assembly and disassembly, only use screwdrivers and wrenches specified in our catalogue or recommended by the tool manufacturer. Pay attention to the correct tightening (proportional) - it is advisable to use a torque wrench.
Controllo del fissaggio: E' necessario prima di tutto controllare la posizione dell'inserto per tutta la superficie di posizionamento quindi l'appoggio dell'inserto sia in direzione radiale che in direzione assiale. Procedere al bloccaggio dell'inserto.	**Check the tightening:** Before tightening, check the fit of the cutting insert on the whole of the binding surface and in the radial and axial directions. Cutting inserts and tools must always be clean and undamaged.

FORMULE PER IL CALCOLO DEI PARAMETRI
FORMULAE FOR CALCULATING CUTTING PARAMETERS

Costante Quantity	Formula per il calcolo Formula	Unità Unit	Nota Note
Numero di giri **Number of revolutions**	$n = \frac{v_c \cdot 1000}{D \cdot \pi}$	[giri/min] [rev/min]	
Velocità di taglio **Cutting speed**	$v_c = \frac{\pi \cdot D \cdot n}{1000}$	[m/min]	
Avanzamento al giro **Feed per revolution**	$f_{rev} = \frac{f_{min}}{n} = f_z \cdot z$	[mm/giro] [mm/rev.]	
Avanzamento al minuto (velocità di avanzamento) **Feed per minute** (rýchlosť posuvu)	$f_{min} = v_f = f_{rev} \cdot n = f_z \cdot z \cdot n$	[mm/min]	
Avanzamento al dente **Feed per tooth**	$f_z = \frac{f_{rev.}}{z} = \frac{f_{min}}{n \cdot z}$	[mm/dente] [mm/tooth]	
Sezione del truciolo **Chip cross section**	$A = f_z \cdot a_p$	[mm²]	
Spessore del truciolo (per inserto con tagliente piano) **Chip thickness** (For insert with straight edge)	$h = f_z \cdot \sin \kappa_r$	[mm]	
Spessore del truciolo (per inserto con tagliente circolare) **Chip thickness** (For round cutting insert)	$h = f_z \cdot \sqrt{\frac{a_p}{D}}$	[mm]	
Volume di asportazione truciolo **Metal removal rate**	$Q = \frac{a_p \cdot a_e \cdot f_{min}}{1000}$	[cm³/min]	
Potenza necessaria **Power demand**	$P_c = \frac{a_p \cdot a_e \cdot f_{min}}{60 \cdot 10^6 \cdot \eta} \cdot k_c \cdot k_\gamma$	[kW]	
Potenza richiesta approssimata **Approximate power demand**	$P_c = \frac{a_p \cdot a_e \cdot f}{x}$	[kW]	

n	Numero di giri Number of revolutions	[giri/min] [rev/min]
D	Diametro (dell'utensile) Diameter (of tool or work piece)	[mm]
v_c	Velocità di taglio Cutting speed	[m/min]
f_{ot}	Avanzamento al giro Feed per revolution	[mm/giro] [mm/rev]
f_{min}	Avanzamento al minuto (può essere indicato anche come velocità di avanzamento) Feed per minute (sometimes called speed of feed)	[mm/min]
f_z	Avanzamento al dente Feed per tooth	[mm/dente] [mm/tooth]
z	Numero di denti Number of teeth	[dente] [tooth]

A	Sezione del truciolo Chip cross section	[mm²]
f_{ot}	Avanzamento al giro Feed per revolution	[mm/giro] [mm/rev]
a_p	Profondità di taglio assiale Axial depth of cut (depth of cut)	[mm]
a_e	Profondità di taglio radiale Radial depth of cut (width of cut)	[mm]
k_r	Angolo di impostaz. del tagliente principale Major edge setting angle	[°]
h	Spessore del truciolo Chip thickness	[mm]
v_c	Velocità di taglio Cutting speed	[m/min]
f_{min}	Avanzamento al minuto (velocità di avanzamento) Feed per minute (sometimes called speed of feed)	[mm/min]
f_z	Avanzamento Feed per tooth	[mm/dente] [mm/tooth]
Q	Volume di asportazione truciolo Material removal rate per minute	[cm³/min]

P_c	Potenza richiesta Power demand	[kW]
a_p	Profondità di taglio assiale Axial depth of cut (depth of cut)	[mm]
a_e	Profondità di taglio radiale Radial depth of cut (width of cut)	[mm]
f	Avanzamento Feed	[mm/giro] [mm/rev]
k_c	forza di taglio per mm² Cutting force per mm²	[MPa]
$k\gamma$	Coeffic. influenza complessiva dell'angolo γ_0 Coefficient of influence of angle γ_0	[°]
η	Rendimento fresa, solitamente η = 0,75 Efficiency of mill. machine, usually η = 0,75	[-]
x	Coefficiente del materiale lavorato Coeff. of influence of work piece material	[-]

Material	Ferro Steel	Ghisa Cast iron	Al
Coefficiente x Coefficient x	24 000	30 000	120 000

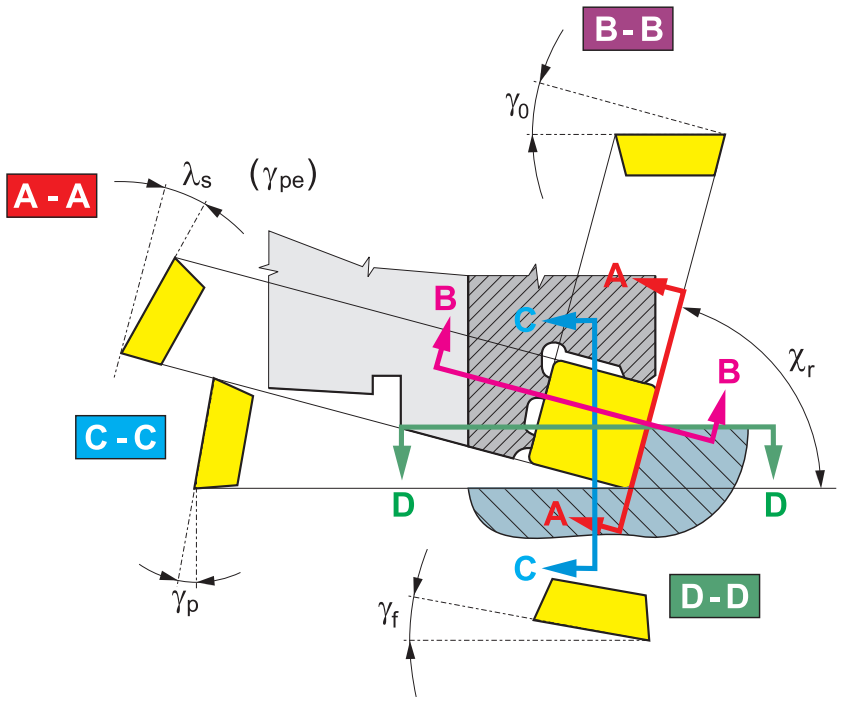
ANGOLI DI LAVORO (FUNZIONALI) E COSTRUTTIVI DELLA FRESA CON INSERTO
WORKING AND CONSTRUCTIONAL ANGLES OF MILLING CUTTER

La posizione dell'inserto fissato sull'utensile è definita da diversi angoli - vedi illustrazione 4.

Illustrazione 4

The position of the cutting insert clamped in the tool is determined by several angles - see picture 4.

Picture 4



Angoli costruktivi (angoli caratteristici della fresa) definscono l'orientamento di base della posizione del vano, nel quale è bloccato l'inserto, determinano la struttura della fresa. Si tratta di due angoli base: quello assiale γ_p e quello radiale γ_f .

Gli angoli di lavoro (funzionali) sono l'angolo di registrazione χ_r, l'angolo di spoglia effettiva dell'inserto γ_o, l'angolo di inclinazione λ_s.

- **Angolo ortogonale dell'inserto** γ_o – ha influenza sullo sforzo necessario per ottenere la deformazione plastica del truciolo e quindi sul valore della forza di taglio e sul livello della temperatura di taglio. Più grande è l'angolo γ_o, minore sono le forze di taglio e la potenza necessaria della della macchina e viceversa. L'angolo minore γ_o ha per conseguenza la crescita della forza di taglio necessaria e quindi della temperatura di taglio.
- **Angolo di registrazione** χ_r – determina, ad un certo valore di avanzamento al dente f_z e profondità assiale a_p, lo spessore e l'ampiezza del truciolo (la lunghezza del tagliente impegnata). In tal modo influenza le forze di taglio, i sovraccarichi specifici, l'usura e la durata del tagliente. Se l'angolo di impostazione χ_r diminuisce, ad avanzamento costante f_z, si ha per conseguenza la diminuzione dello spessore del truciolo h.
- **Angolo di inclinazione** λ_s – insieme all'angolo di registrazione χ_r e all'angolo di spoglia effettiva dell'inserto γ_o determina il luogo del primo contatto del tagliente con il pezzo al momento della penetrazione. Perciò ha influenza sulla resistenza del tagliente rispetto al primo impatto fresando con taglio ad intervalli normali. Nello stesso tempo ha influenza anche sulla direzione dell'uscita del truciolo dal vano inserto.

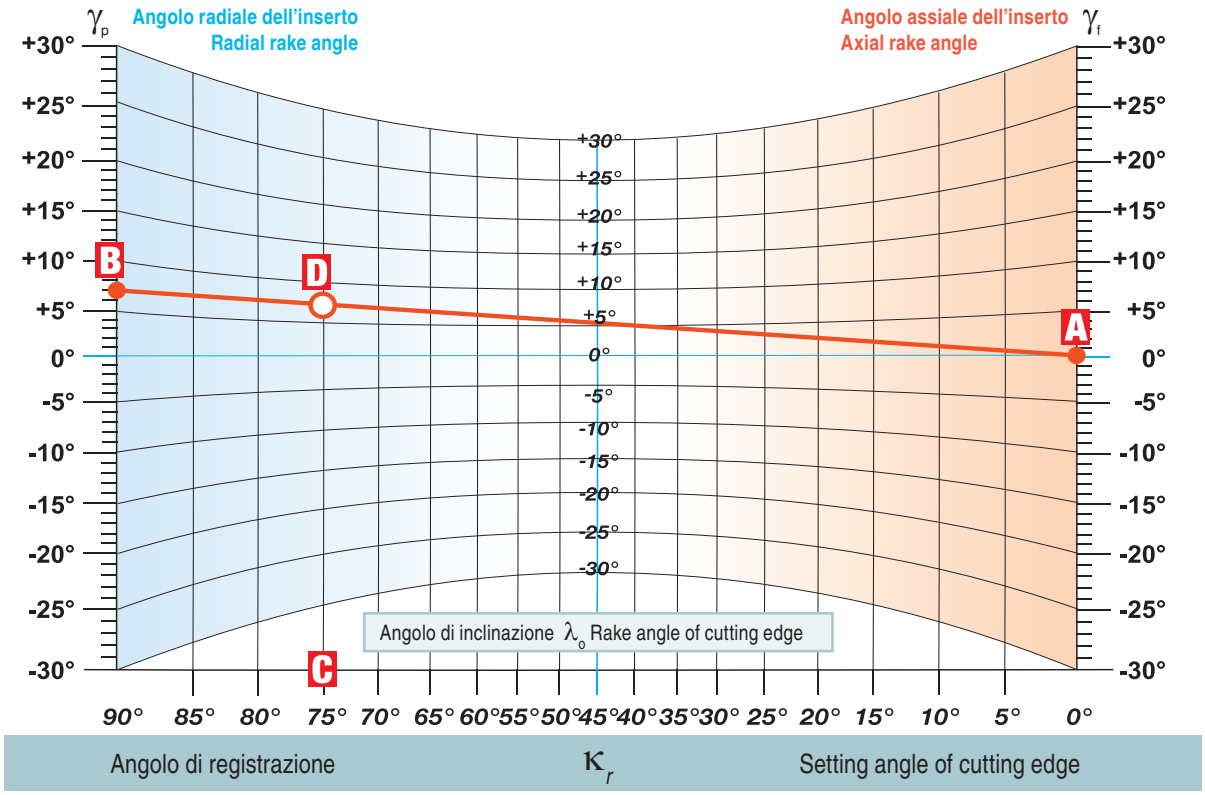
Constructional angles determine the basic orientation of the seat position that the cutting insert is clamped in and are therefore important for the design of the milling cutter body. There are two angles: axial face angle γ_p (tool back rake) and radial face angle γ_f (tool side rake) - see picture 5.

Working angles are the setting angle χ_r, the orthogonal face angle γ_o and the rake angle of the cutting edge λ_s.

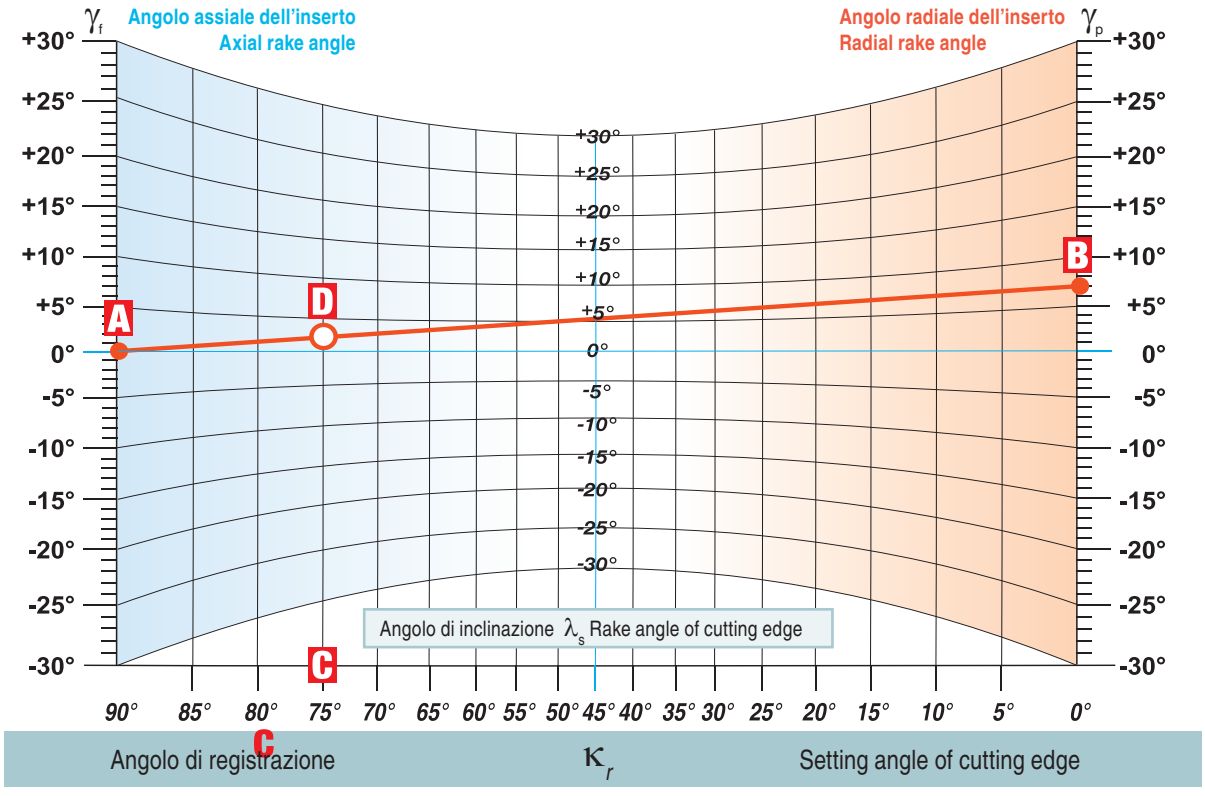
- **Orthogonal face angle** γ_o - affects not only the extent of plastic deformation of the cut chip but also the cutting force and temperature. The bigger the rake angle γ_o, the lower the cutting force and power demand of the milling machine engine (and vice versa).
- **Setting angle** χ_r - determines the thickness of the chip at a specific feed per tooth f_z and axial depth of cut a_p. It therefore affects cutting forces, specifically load, wear and tool service life. Reducing the setting angle χ_r at a constant feed f_z causes a decrease in the chip thickness h.
- **Rake angle of cutting edge** λ_s - together with setting angle χ_r and face angle γ_o, this determines the point of first contact between the edge and work piece. That is why it affects the resistance of the edge to chipping during interrupted cut. At the same time, it affects the direction of chip evacuation.

Illustrazione 5 *Picture 5*

$$\tan \gamma_o = \tan \gamma_p \cdot \sin \kappa_o + \tan \gamma_f \cdot \cos \kappa_r$$



$$\tan \lambda_s = \tan \gamma_f \cdot \sin \kappa_r - \tan \gamma_p \cdot \cos \kappa_r$$



CONDIZIONI DI TAGLIO IN FRESATURA
CUTTING CONDITIONS WHEN MILLING

Il modo di entrata ed uscita dal pezzo sono decisive per la durata dell'inserto. La corretta scelta di tali condizioni influenza la fresatura sulla qualità della superficie e su tutto il risultato.

Quando entra nel pezzo, il tagliente è sottoposto ad intenso shock meccanico che causa usura (scheggiatura o altro), soprattutto in condizioni di taglio non corrette.

Si raccomanda quindi l'uso degli inserti in modo che lo spessore del truciolo sia il massimo possibile. Inoltre il primo punto di contatto non deve essere sulla punta dell'inserto.

Questo dipende dalla geometria del tagliente, dagli angoli di taglio,e dalla posizione relativa tra asse fresa e bordo pezzo.

Anche all'uscita del tagliente dal pezzo si ha stress termico, causato da una rapida riduzione della temperatura e dello sforzo di taglio.

Lo spessore del truciolo varia durante un giro in funzione dell'angolo φ secondo la formula $h\varphi = f_z \times sin\varphi$.

Per questo si usa lo spessore medio del truciolo h_m per i calcoli.

Lo spessore massimo pari a f_z è raggiunto in corrispondenza dell'asse della fresa. Lo spessore medio h_m generato da un tagliente è pari all'altezza del rettangolo di pari area sotteso dalla curva sinusoidale in relazione alla profondità a_e.

Lo spessore medio del truciolo h_m dipende dal tipo di fresa e dalle condizioni di taglio, dal rapporto a_e/D, dall'avanzamento al dente e dall'angolo di registrazione. Vedere figura 6. pagina seguente per un esempio.

The entering and exiting conditions are decisive for tool service life. Choosing these conditions correctly has an influence on milling - the quality of the surface and the cutting output.

When entering the workpiece, the cutting edge is exposed to intense mechanical shock, which causes mechanical stress on the cutting edge. This shock can cause chipping on the cutting edge (fracture or abrasion) under incorrect cutting conditions.

In spite of this, we recommend using tools with indexable cutting inserts at down cut (the maximum chip thickness to be cut). Furthermore, the point of first contact between the cutting edge and the workpiece should not be on the corner of the cutting edge. This depends partly on the basic geometry of the cutting edge - angles γ_o, λ_s, χ_r - and partly on the relative position of the axis of the milling cutter and the entering edge of the workpiece.

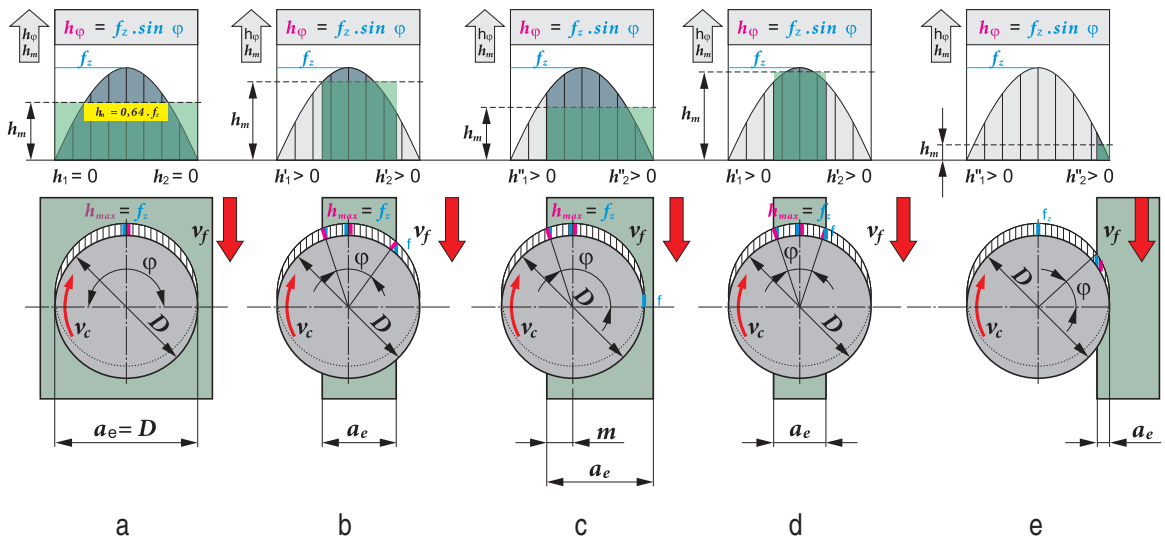
The exiting of the cutting edge from the cut is also accompanied by thermal stress, caused by a rapid reduction in temperature of the surface layer of the cutting edge and mechanical stress caused by elastic deformation relief of the surface layer of workpiece at a rapid drop in cutting force.

That is why we use the average value of chip thickness h_m for any calculations.

The chip thickness h fluctuates during one revolution depending on angle φ in accordance with formulae $h\varphi = f_z \times sin\varphi$.

The maximum chip thickness equal to f_z is reached at the axis of the milling cutter. The average chip thickness h_m cut by one tooth during one revolution is equal to the height of the rectangle of the same area as the area under the sine curve relates to the radial depth of cut a_e. The average chip thickness h_m depends on the type of milling cutter and the cutting conditions, especially on the relation a_e/D, feed per tooth fz and the setting angle χ_r. See picture 6. on the next page for an illustrative example.

Illustrazione n 6 *Picture 6*



La formula seguente calcola lo spessore medio h_m (fig. 6a, b, c, d):

The following formula can be used to calculate h_m (picture 6a, b, c, d):

$$h_m = f_z \cdot \sin \kappa_r \cdot 114{,}6 \cdot \left(\frac{a_e}{D \cdot \arccos \cdot \left(1 - \frac{2a_e}{D} \right)} \right)$$

La formula seguente calcola l'avanzamento al dente f_z per un dato valore di h_m:

The following formula can be used to calculate the feed f_z for the given value of h_m:

$$f_z = \frac{h_m}{\sin \kappa_r} \cdot \left(\frac{D \cdot \arccos \cdot \left(1 - \frac{2a_e}{D} \right)}{114{,}6 \cdot a_e} \right)$$

dove	h_m - spessore medio del truciolo	[mm]	where h_m - average chip thickness	[mm]
	f_z - avanzamento al dente	[mm/dente]	f_z - feed per tooth	[mm/tooth]
	a_e - profondità radiale	[mm]	a_e - radial depth of cut	[mm]
	D - diametro	[mm]	D - diameter	[mm]
	χ_r - angolo di reg. del tagliente principale	[°]	χ_r - setting angle of major edge	[°]

Per la fresatura secondo l'illustrazione 6e, dove il rapporto a_e/D è molto basso < 0,2, si raccomanda di utilizzare, per il calcolo dello spessore medio del truciolo h_m a formula:

The following formula can be used to calculate h_m (picture 6e) if a_e/D < 0,2:

$$h_m = f_z \sin \kappa_r \sqrt{\frac{a_e}{D}}$$

Calcolo dell'avanzamento dente f_z in base a h_m:

The following formula can be used to calculate the feed f_z for the given value of h_m:

$$f_z = \frac{h_m}{\sin \kappa_r} \sqrt{\frac{D}{a_e}}$$

CAMPO DEI VALORI DI SPESSORE MEDIO DEL TRUCIOLO

Esiste un intervallo di spessore del truciolo medio ottimale per ciascun tipo di utensile presente in questo catalogo. Quando si utilizzano valori inferiori all'intervallo specificato, vi è il rischio che l'utensile "non tagli", che vi sia un'usura eccessiva o addirittura che l'inserto sia gravemente danneggiato durante il processo. Anche il superamento del valore consigliato comporta il rischio di danneggiamento dell'inserto a causa del sovraccarico dell'utensile. La tabella seguente fornisce i tipi di fresa insieme agli intervalli di spessore del truciolo medi consigliati.

CALCULATING THE AVERAGE CHIP THICKNESS RANGES

There is an optimum average chip thickness range for each type of tool included in this catalogue. When using values lower than the stated range, there is a risk that the tool "will not cut", that there will be excessive wear, or even that the the insert will be severely damaged in the process. Exceeding the recommended value also risks damaging the insert due to tool overloading. The following table provides the cutter types together with the recommended average chip thickness ranges.

FRESE A SPIANARE FACE MILLING CUTTERS				
$\kappa_r = 60°$	$\kappa_r = 75°$	$\kappa_r = 75°$	$\kappa_r = 45°$	con inserti tondi with round inserts
-	negativo / negative	pozitivo / positive	-	negativo / negative
ø 125 ÷ 315 mm	ø 80 ÷ 315 mm	ø 63 ÷ 250 mm	ø 50 ÷ 315 mm	ø 40 ÷ 100 mm
h_m 0,08 ÷ 0,50 mm	h_m 0,08 ÷ 0,40 mm	h_m 0,07 ÷ 0,35 mm	h_m 0,15 ÷ 0,40 mm	h_m 0,08 ÷ 0,40 mm

FRESE A SPALLAMENTO RETTO SHOULDER MILLING CUTTERS	FRESE AD ELICA HELICAL CUTTERS		FRESE A DISCO DISC CUTTERS
$\kappa_r = 90°$	-	-	-
-	-	-	-
ø 40 ÷ 160 mm	ø 50 ÷ 80 mm	ø 25 ÷ 40 mm	larghezza / width 4 ÷ 14 mm
h_m 0,06 ÷ 0,25 mm	h_m 0,10 ÷ 0,15 mm	h_m 0,06 ÷ 0,08 mm	h_m 0,07 ÷ 0,09 mm

FRESE A CANDELA END MILLING CUTTERS		
$\kappa_r = 90°$	$\kappa_r = 45°$	con inserti arrotondati with round inserts
-	-	-
ø 16 ÷ 40 mm	ø 10 ÷ 32 mm	ø 8 ÷ 25 mm
h_m 0,06 ÷ 0,13 mm	h_m 0,07 ÷ 0,25 mm	h_m 0,06 ÷ 0,18 mm

CAMPO DEI VALORI DI SPESSORE MEDIO DEL TRUCIOLO
CALCULATING THE AVERAGE CHIP THICKNESS RANGES

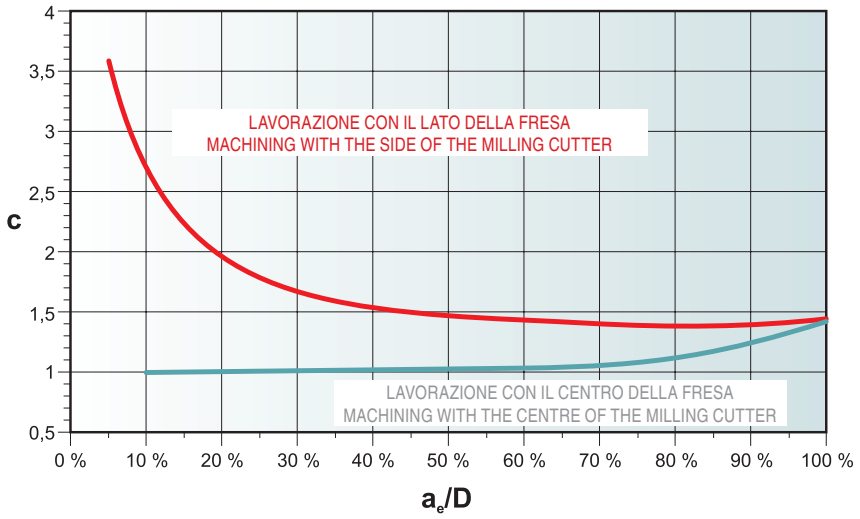
Al fine di ottenere un'applicazione ottimale di qualsiasi utensile di fresatura, è dunque raccomandabile controllare lo spessore del truciolo, oppure scegliere (calcolare) un avanzamento idoneo sulla base dell'intervallo di h_m raccomandato. Inoltre, è necessario tenere conto della geometria dell'inserto. Per calcolare f_z si può utilizzare la formula indicata sopra, oppure la formula indicata di seguito.

Il valore del coefficiente c può essere rilevato dalla tabella seguente:

To achieve optimum application of any milling tool, it is therefore recommended to check the chip thickness or choose (calculate) a suitable feed based on the recommended range of h_m. It is also necessary to take the geometry of the insert into account. The formula above can be used to calculate f_z, or the following formula can be used instead.

The value of coefficent c can be read from the following chart:

$$f_z = \frac{h_m}{sin \, . \, \kappa_r} \, . \, c$$



COPPIE DI SERRAGGIO RACCOMANDATE
RECOMMENDED SCREW TORQUES

FRESE A SPIANARE / FACE MILLING CUTTERS

Codifica fresa Marking of cutter	Vite di bloccaggio Clamping screw	Coppia di serraggio Torque [Nm]	Cacciavite Shank	Impugnatura Handle	Cacciavite Screwdriver	Cacciavite Screwdriver	Chiave Key	Vite di bloccaggio Clamping screw Filetto Thread	Vite di bloccaggio Clamping screw Lunghezza Length [mm]
SHN06	US 3007-T09P	2,0	–	–	–	FLAG T09P	–	M 3	7
S45HN06C	US3007-T09P	2,0	D-T07P/T09P	FG-15	–	–	–	M 3	7
S45HN09C	US 3512-T15P	3,0	D-T08P/T15P	FG-15	–	–	–	M 3,5	12
S45OD05D	US 3509-T15	3,0	–	–	SDR T15	–	–	M 3,5	9
S45OD06D	US 4511-T20	5,0	–	–	SDR T20	–	–	M 4,5	11
SSE09	US 3007-T09P	2,0	–	–	SDR T09P	–	–	M 3	7
S45SE09F	US 3007-T09P	2,0	–	–	SDR T09P	–	–	M 3	7
S45SN12Z	US 4511-T20	5,0	–	–	SDR T20-T	–	–	M 4,5	11
S57PN13	US 68026-T30P	15,0	–	–	SDR T30P-T	–	–	M 8	26
C60HN09	US 74016-T15P	3,5	D-T08P/T15P	FG-15	–	–	–	M 4	16
F60SB22X	DS 01Z	6,0	–	–	–	–	KL 04	M 8	20
W60SP25P	DS 02	8,0	–	–	–	–	HXK 5	M 10	28
CSC09	US 63513-T15P	3,0	–	–	–	FLAG T15P	–	M 3,5	12
CSC12	US 63513-T15P	3,0	–	–	–	FLAG T15P	–	M 3,5	12
C90SC09	US 63511D-T15P	3,0	D-T08P/T15P	FG-15	–	–	–	M 3,5	11
C90SC12	US 63511D-T15P	3,0	D-T08P/T15P	FG-15	–	–	–	M 3,5	11

FRESE A SPALLAMENTO / SHOULDER MILLING CUTTERS

Codifica fresa Marking of cutter	Vite di bloccaggio Clamping screw	Coppia di serraggio Torque [Nm]	Cacciavite Shank	Impugnatura Handle	Cacciavite Screwdriver	Cacciavite Screwdriver	Chiave Key	Vite di bloccaggio Clamping screw Filetto Thread	Vite di bloccaggio Clamping screw Lunghezza Length [mm]
SAD11E	US 2505-T08P	1,2	–	–	–	FLAG T08P	–	M 2,5	5
S90AD11E	US 2505-T08P	1,2	D-T08P/T15P	FG-15	–		–	M 2,5	5
SAD16E	US 4008-T15P	3,5	–	–	–	FLAG T15P	–	M 4	8
S90AD16E	US 4011-T15P	3,5	D-T08P/T15P	FG-15	–	–	–	M 4	11
S90AD16E	US 4008-T15P	3,5	D-T08P/T15P	FG-15	–	–	–	M 4	8
CAD15	US 63511D-T15P	3,0	–	–	–	FLAG T15P	–	M 3,5	11
C90AD15	US 63511D-T15P	3,0	D-T08P/T15P	FG-15	–	–	–	M 3,5	11
SAP10D	US 2506-T07P	1,2		–	SDR T07P	–	–	M 2,5	6
S90AP10D	US 2506-T07P	1,2	–	–	SDR T07P	–	–	M 2,5	6
SAP16D	US 4008-T15P	3,5		–	SDR T15P	–	–	M 4	8
SAP16D	US 4011-T15P	3,5		–	SDR T15P	–	–	M 4	11
S90AP16D	US 4011-T15P	3,5	–	–	SDR T15P	–	–	M 4	11
SLN12	US 44012-T15P	3,5	–	–	–	FLAG T15P	–	M 4	12
S90LN12	US 44012-T15P	3,5	D-T08P/T15P	FG-15	–	–	–	M 4	12
S90LN16	US 45012-T20P	5,0	–	–	SDR T20P-T	–	–	M 5	12
SSO09	US 3006-T09P	2,0	–	–	SDR T09P	–	–	M 3	6
S90SO09	US 3006-T09P	2,0	–	–	SDR T09P	–	–	M 3	6
S90SD12	US 3511-T15	3,0	–	–	SDR T15	–	–	M 3,5	11
F90TB27X	DS 01Z	6,0	–	–	–	–	KL 04	M 8	20
W90SP25P	DS 02	8,0	–	–	–	–	HXK 5	M 10	28
W90XO12	DS 0420	3,0	–	–	–	–	HXK 2	M 4	20

FRESE A CANDELA / HELICAL CUTTERS

Codifica fresa Marking of cutter	Vite di bloccaggio Clamping screw	Coppia di serraggio Torque [Nm]	Cacciavite Shank	Impugnatura Handle	Cacciavite Screwdriver	Cacciavite Screwdriver	Vite di bloccaggio Clamping screw Filetto Thread	Vite di bloccaggio Clamping screw Lunghezza Length [mm]
J-SAD11E	US 2506-T07P	**1,2**	–	–	–	FLAG T07P	**M 2,5**	**6**
T-S90AD11E	US 2506-T07P	**1,2**	D-T07P/T09P	FG-15	–	–	**M 2,5**	**6**
SSAP	US 4511-T20	**5,0**	–	–	SDR T20	–	**M 4,5**	**11**
SSAP-A	US 4511-T20	**5,0**	–	–	SDR T20	–	**M 4,5**	**11**
J-CSD12X	US 63511D-T15P	**3,0**	D-T08P/T15P	FG-15	–	–	**M 3,5**	**11**
T-C90SD12X	US 63511D-T15P	**3,0**	D-T08P/T15P	FG-15	–	–	**M 3,5**	**11**
SLSN	US 45012-T20P	**5,0**	–	–	SDR T20P-T	–	**M 5**	**12**
2416E	–	**–**	–	–	–	–	**–**	**–**

FRESE A DISCO / DISC CUTTERS

Codifica fresa Marking of cutter	Vite di bloccaggio Clamping screw	Coppia di serraggio Torque [Nm]	Cacciavite Screwdriver	Vite di bloccaggio Clamping screw Filetto Thread	Vite di bloccaggio Clamping screw Lunghezza Length [mm]
S90SN11N4	US 3504-T09P	**3,0**	SDR T09P	**M 3,5**	**4**
S90SN11N5	US 3504-T09P	**3,0**	SDR T09P	**M 3,5**	**4**
S90SN12N6	US 70	**5,0**	SDR T15	**M 4**	**5**
S90SN12N8	US 71	**5,0**	SDR T15	**M 4**	**7**
S90SN12N10	US 72	**5,0**	SDR T15	**M 4**	**9**
S90SN12N12	US 73	**5,0**	SDR T15	**M 4**	**11**
S90SN12N14	US 73	**5,0**	SDR T15	**M 4**	**11**
S90SN11N4-R	US 3504-T09P	**3,0**	SDR T09P	**M 3,5**	**4**
S90SN11N5-R	US 3504-T09P	**3,0**	SDR T09P	**M 3,5**	**4**
S90SN12N6-R	US 70	**5,0**	SDR T15	**M 4**	**5**
S90SN12N10-R	US 72	**5,0**	SDR T15	**M 4**	**9**
S90CN10	US 4011-T15P	**3,5**	SDR T15P	**M 4**	**11**
S90XN12	US 4011-T15P	**3,5**	SDR T15P	**M 4**	**11**
S90XN16	US 5012-T15P	**5,0**	SDR T15P	**M 5**	**12**
S90CN10-R	US 4011-T15P	**3,5**	SDR T15P	**M 4**	**11**
S90XN12-R	US 4011-T15P	**3,5**	SDR T15P	**M 4**	**11**
S90XN16-R	US 5012-T15P	**5,0**	SDR T15P	**M 5**	**12**

FRESE PER COPIATURA / COPY MILLING CUTTERS

Codifica fresa Marking of cutter	Vite di bloccaggio Clamping screw	Coppia di serraggio Torque [Nm]	Cacciavite Shank	Impugnatura Handle	Cacciavite Shank	Chiave dinamometrica Torque handle	Cacciavite Screwdriver	Cacciavite Screwdriver	Vite di bloccaggio Clamping screw Filetto Thread	Vite di bloccaggio Clamping screw Lunghezza Length [mm]
SMORC12	US 63509-T15P	**3,0**	D-T08P/T15P	FG-15	–	–	–	–	**M 3,5**	**10**
SMORC16	US 65014-T20P	**5,0**	–	–	–	–	SDR T20P-T	–	**M 5**	**14**
SMORC20	US 66015-T25P	**7,5**	–	–	–	–	SDR T25P-T	–	**M 6**	**15**
B.-SRD07	US 25	**1,2**	–	–	–	–	SDR T07	–	**M 2,5**	**5**
B.-SRD10	US 3507-T15	**3,0**	–	–	–	–	SDR T15	–	**M 3,5**	**7**
SRD05	US 20	**0,9**	–	–	–	–	SDR T06	–	**M 2**	**3**
SRD07	US 25	**1,2**	–	–	–	–	SDR T07	–	**M 2,5**	**5**
SRD10	US 3507-T15	**3,0**	–	–	–	–	SDR T15	–	**M 3,5**	**7**
SCRD12	US 3507-T15	**3,0**	–	–	–	–	SDR T15	–	**M 3,5**	**7**
SRD12	US 3507-T15	**3,0**	–	–	–	–	SDR T15	–	**M 3,5**	**7**
SCRD16	US 4511-T20	**5,0**	–	–	–	–	SDR T20	–	**M 4,5**	**11**
SCMORD12	US 3507-T15	**3,0**	–	–	–	–	SDR T15	–	**M 3,5**	**7**
SCMORD16	US 4511-T20	**5,0**	–	–	–	–	SDR T20	–	**M 4,5**	**11**
SPD09	US 45011-T20P	**5,0**	–	–	–	–	–	FLAG T20P	**M 5**	**11**
S19PD09	US 45011-T20P	**5,0**	–	–	–	–	SDR T20P-T	–	**M 5**	**11**
A-SZD07	US 2205-T07P	**0,9**	–	–	–	–	–	FLAG T07P	**M 2,2**	**5**
B-SZD09	US 3006-T09P	**2,0**	–	–	–	–	–	FLAG T09P	**M 3**	**6**
B-SZD12	US 4011-T15P	**3,5**	–	–	–	–	–	FLAG T15P	**M 4**	**11**
SZD07	US 2205-T07P	**0,9**	–	–	–	–	–	FLAG T07P	**M 2,2**	**5**
SZD09	US 3006-T09P	**2,0**	–	–	–	–	–	FLAG T09P	**M 3**	**6**
SZD12	US 4011-T15P	**3,5**	–	–	–	–	–	FLAG T15P	**M 4**	**11**
SMOZD09	US 3006-T09P	**2,0**	D-T07P/T09P	FG-15	–	–	–	–	**M 3**	**6**
SMOZD12	US 4011-T15P	**3,5**	D-T08P/T15P	FG-15	–	–	–	–	**M 4**	**11**
L2-SZP10	US 62004-T06P	**0,6**	–	–	–	–	–	FLAG T06P	**M 2**	**4**
L2-SZP12	US 62506-T08P	**1,2**	–	–	–	–	–	FLAG T08P	**M 2,5**	**6**
L2-SZP16	US 62508-T08P	**1,2**	–	–	–	–	–	FLAG T08P	**M 2,5**	**7**
L2-SZP20	US 63510-T10P	**2,0**	–	–	–	–	–	FLAG T10P	**M 3,5**	**9**
L2-SZP25	US 4011A-T15P	**3,5**	–	–	–	–	–	FLAG T15P	**M 4**	**11**
L2-SZP32	US 65013-T20	**5,0**	–	–	–	–	SDR T20	–	**M 5**	**13**
L2-SZP40	US 66015-T25P	**7,5**	–	–	–	–	SDR T25P	–	**M 6**	**15**
L2-SZP50	US 68020-T30P	**15,0**	–	–	–	–	SDR T30	–	**M 8**	**20**
K3-CXP16	US 63009-T09P	**1,2**	–	–	–	–	–	FLAG T09P	**M 3**	**9**
K3-CXP20	US 63513-T15P	**3,0**	–	–	–	–	–	FLAG T15P	**M 3,5**	**12**
K3-CXP25	US 64014-T15P	**3,5**	–	–	–	–	–	FLAG T15P	**M 4**	**14**
K3-CXP32	US 65017-T20P	**5,0**	–	–	–	–	–	FLAG T20P	**M 5**	**17**
A-SVC22C	US 4511-T20	**3,5**	–	–	D-T20	MR-5,0	–	–	**M 4,5**	**11**
SVC22C	US 4511-T20	**3,5**	–	–	D-T20	MR-5,0	–	–	**M 4,5**	**11**
S90VC22C	US 4511-T20	**3,5**	–	–	D-T20	MR-5,0	–	–	**M 4,5**	**11**

FRESE PER APPLICAZIONI SPECIALI / CUTTERS FOR SPECIAL APPLICATIONS

Codifica fresa Marking of cutter	Vite di bloccaggio Clamping screw	Coppia di serraggio Torque [Nm]	Cacciavite Shank	Impugnatura Handle	Cacciavite Screwdriver	Vite di bloccaggio Clamping screw Filetto Thread	Vite di bloccaggio Clamping screw Lunghezza Length [mm]
SSD09	US 3509-T15	**3,0**	–	–	SDR T15	**M 3,5**	**9**
SSD09	US 3507-T15	**3,0**	–	–	SDR T15	**M 3,5**	**7**
N-SSO09	US 3006-T09P	**2,0**	–	–	SDR T09P	**M 3**	**6**
2516	US 4011-T15P	**3,5**	–	–	SDR T15P	**M 4**	**11**
2636	US 4011-T15P	**3,5**	–	–	SDR T15P	**M 4**	**11**
SxxXP16	US 3509-T15	**3,0**	D-T07/T15	FG-15		**M 3,5**	**9**
SCC	US 3007-T09P	**2,0**	–	–	SDR T09P	**M 3**	**7**
SCC	US 2506-T07P	**1,2**	–	–	SDR T07P	**M 2,5**	**6**

IMPUGNATURA INTERCAMBIABILE / TORQUE HANDLE

Impugnatura intercambiabile Torque handle	Coppia di serraggio Torque [Nm]	Filetto della vite di bloccaggio Thread of clamping screw
MR-0,8-2,0 vario	0,8 - 2,0	M 2 - M 3
MR-1,0-5,0 vario	1,0 - 5,0	M 2,5 - M 5
MR-0,9 fix	0,9	M 2
MR-2,0 fix	2,0	M 3
MR-3,0 fix	3,0	M 3,5
MR-3,5 fix	3,5	M 4
MR-5,0 fix	5,0	M 5

CACCIAVITE / SHANKS

Cacciavite intercambiabile Exchangeable shanks
D-T6
D-T6P
D-T7
D-T7P
D-T8
D-T8P
D-T9
D-T9P
D-T15
D-T15P
D-T20
D-T20P

LUBRIFICAZIONE DELLE VITI

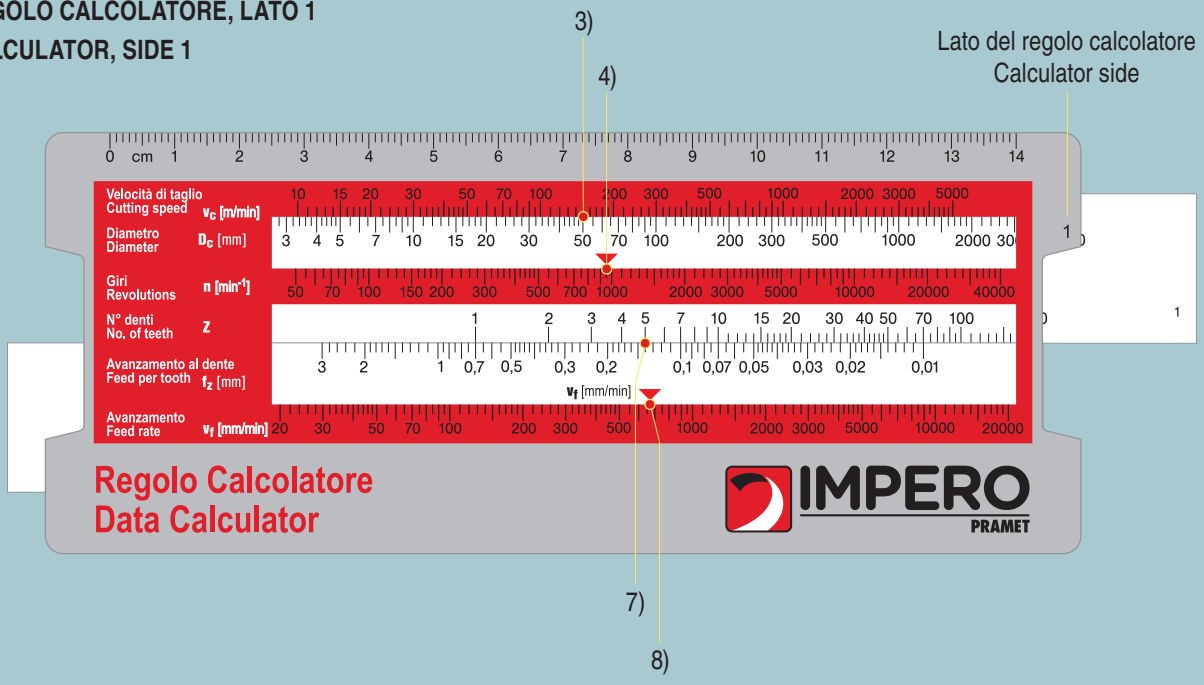
In considerazione degli alti stress termici é raccomandata una lubrificazione con un grasso resistente alle alte temperature quale il MOLYKOTE 1000. Questo prodotto puó essere fornito dalla Impero (Vedere listino prezzi alla sezione Parti di ricambio).

SCREW LUBRICATION

Owing to the high thermal stress on the clamping screws, it is advisable to lubricate them with a high-quality paste such as MOLYKOTE 1000. This paste can be ordered in the same way as spare parts.

ESEMPI PER UTILIZZARE IL REGOLO CALCOLATORE DELLA VELOCITÀ DI TAGLIO
EXAMPLES FOR USING THE CUTTING SPEED CALCULATOR

REGOLO CALCOLATORE, LATO 1
CALCULATOR, SIDE 1



FRESATURA

Calcolo della velocità e dell'avanzamento minuto – lato del regolo calcolatore **1**

Esempio di utilizzo:

1) Diametro della fresa 50 mm con 5 denti;
2) La velocità di taglio vc è calcolata mediante l'uso del catalogo o della specifica sulla scatola dell'inserto, ad esempio v_c = 150 m/min e avanzamento al dente f_z = 0,14 mm;
3) Sul lato del regolo calcolatore **1**, specificare il diametro dell'utensile sulla scala contrassegnata con D_c [mm] e riportare questo valore sotto la scala superiore v_c [m/min.], appena otto il valore di 150;
4) La freccia rossa sulla scala della velocità n [giri/min] indica la velocità dell'utensile n = 950 giri/min;
5) **Mantenere il righello superiore nella stessa posizione;**
6) La parte scorrevole inferiore viene utilizzata per calcolare l'avanzamento minuto v_f [mm/min.];
7) Nella parte contrassegnata con f_z [mm] è indicato il valore dell'avanzamento al dente selezionato (f = 0,14 mm); riportare questo valore sotto la scala contrassegnata con Z che specifica il numero di denti nell'utensile (5);
8) La freccia rossa sulla scala dell'avanzamento minuto v_f [mm/min.] indica l'avanzamento minuto, ovvero v_f = 660 mm/min.

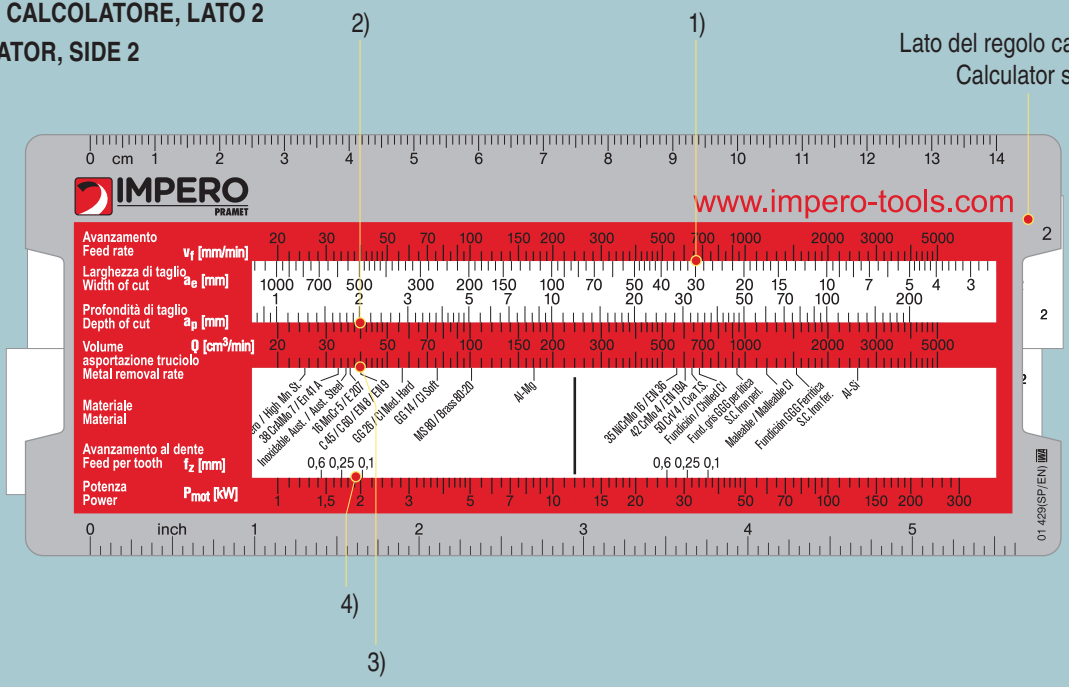
MILLING

Calculating the speed and minute feed - calculator side **1**

Example usage:

1) Milling cutter diameter 50 mm with 5 teeth;
2) Cutting speed v_c is calculated using the catalogue or the specification on the insert box, e.g. v_c = 150 m/min, and feed per tooth f_z = 0.14 mm;
3) On calculator side **1**, specify the tool diameter on the scale marked D_c [mm] and move this value under the upper scale v_c [m/min], just below the value of 150;
4) The red arrow on the speed scale n [rev/min] indicates the tool speed n = 950 rev/min;
5) **Keep the upper ruler in the same position;**
6) The lower sliding part is used to calculate the minute feed v_f [mm/min];
7) In the part marked f_z [mm] is the value of the selected feed per tooth (f = 0.14 mm); move this value under the scale marked Z, which states the number of teeth in the tool (5);
8) The red arrow on the scale of the minute feed v_f [mm/min] indicates the minute feed, i.e. v_f = 660 mm/min.

REGOLO CALCOLATORE, LATO 2
CALCULATOR, SIDE 2



FRESATURA

calcolo del volume di truciolo – lato del regolo calcolatore **2**

Esempio di utilizzo:

1) Riportare la larghezza lavorata, ad esempio a_e = 30 mm, sotto il valore di v_f = 660 mm/min;
2) Se a_p = 2 mm, per esempio, il valore sulla scala Q [cm³/min] è 40 che significa che il volume di truciolo è Q = 40 cm³/min.

Calcolo della potenza richiesta – lato del regolo calcolatore **2**

Esempio di utilizzo:

3) Riportare il materiale lavorato 12050 sotto il materiale di taglio di Q = 40 cm3/min;
4) Sulla scala della potenza richiesta P_{mot} si può leggere il valore della potenza richiesta in relazione all'avanzamento al dente (f = 0,14 mm), ovvero la potenza richiesta sarà circa 1,8 kW; tale valore sarà utilizzato come valore di riferimento.

MILLING

Calculating the volume of cut chips – calculator side 2

Example usage:

1) Move the machined width, e.g. a_e = 30 mm, under the value of v_f = 660 mm/min;
2) If a_p = 2 mm for example, the value on the Q [cm³/min] scale is 40, which means that the volume of cut chips is Q = 40 cm³/min.

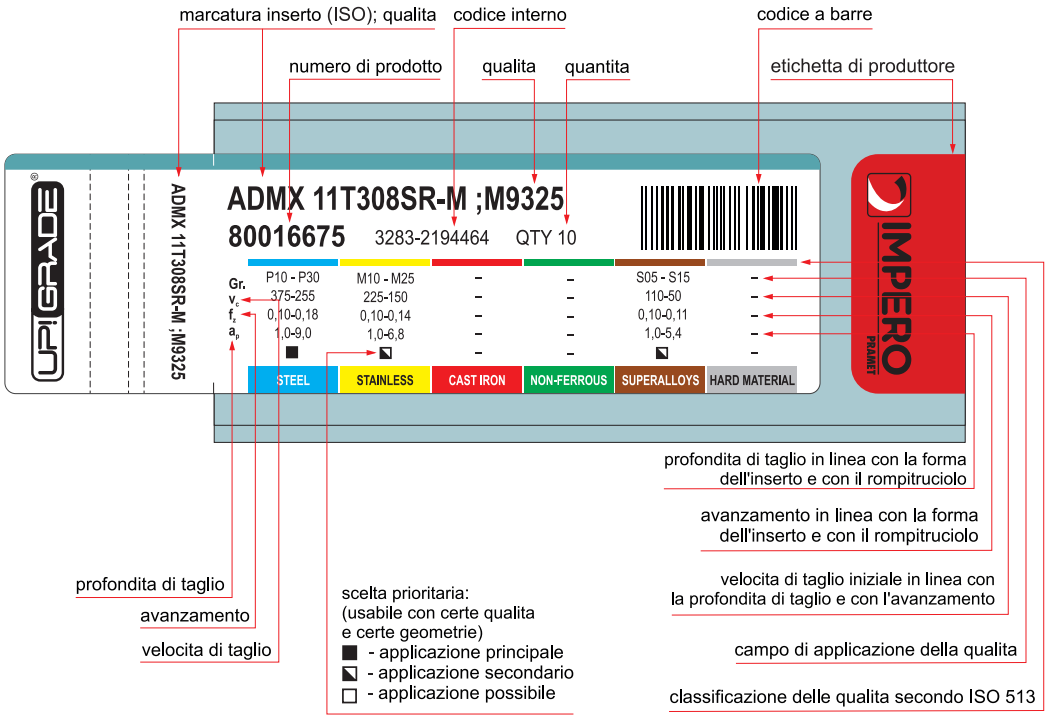
Calculating the motor power input - calculator side **2**

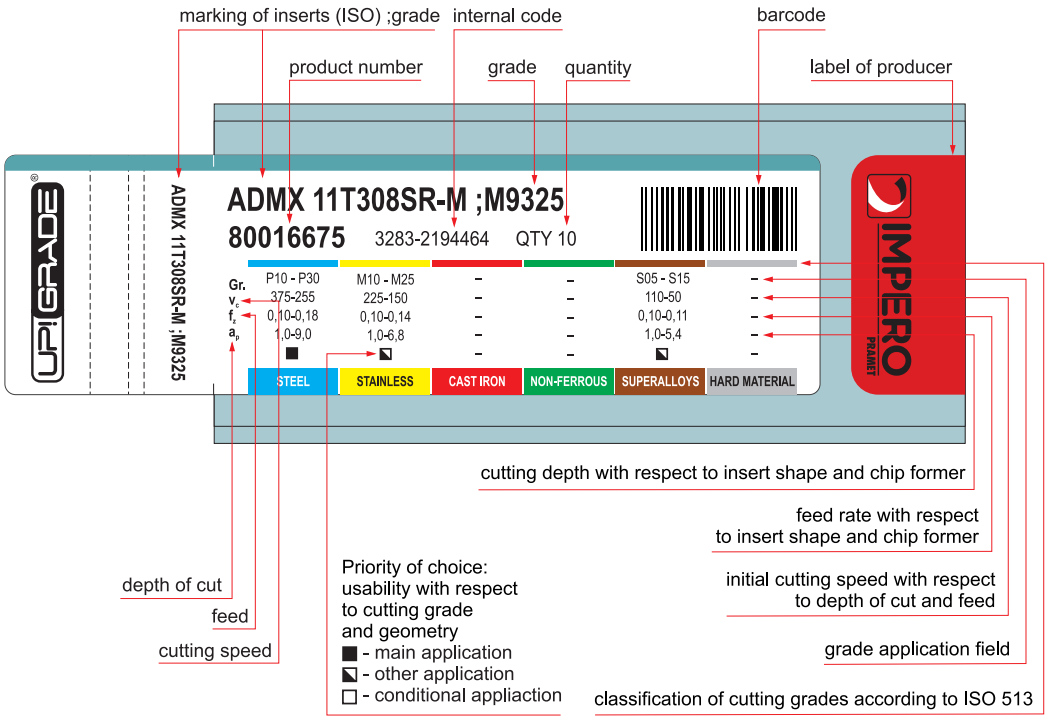
Example usage:

3) Move the machined material 12050 under the cut material of Q = 40 cm³/min;
4) The motor power input scale P_{mot} shows the value of motor power input in relation to the feed per tooth (f = 0.14 mm), i.e. the motor power input will be about 1.8 kW; this value shall be used as a reference value.

INFORMAZIONI STAMPATE SULLA SCATOLA DELL'INSERTO
INFORNATION PRINTED ON INSERT BOX

Illustrazione 7 *Picture 7*





CONFRONTO DI MATERIALI LAVORATI - GRUPPO P
COMPARISON OF MACHINED MATERIALS - GROUP P

ISO 513	Sottogruppo/Subgroup	Equivalenti esteri / International equivalents																
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E	
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE		
P	1	10 000		S 185	Fe 310	A 33	Fe 320		ST 33.1			ST 00H	St 0	1300-00	S 185	Gr.A	S 185	
	1	10 004	Q 195	S 185	Fe 310-0	A 33	Fe 320		St 33-2	1.0035	St 0 S	St 00 H	St 0	1300	15 HR, HS	Gr.A	AE 235 B	
	1	10 216		Fe B22		Fe E24			IG				A I					
	1	11 109		11SMn28	Type 2	S 250	CF 9 SMn 28	SUM 22	9SMn28	1.0715	A 10X			1912-04	230M07	1213	11SMn28	
	1	11 110	Y12	10S20		10F1	CF10S20		10S20	1.0721	A11		A12	1912	210M15	Gr.1108	10S20	
	1	11 120	Y20			20F2			22S20	1.0724								
	2	11 140	Y35	35S20	35S20	35 MF 6	CF 35 Smn 10		35S20		A 35		A 30	1957-03	212M36	1140	35 MnS 6	
	1	11 300					3CD5	SWRM6	D6-2	1.0314		UC6	05kp			Gr.1005		
	1	11 301		FeP 02	Cr 04			SPCD	USt 13	1.0333		St 03F		1146	2HR,HS,CR,CS	1008		
	1	11 304	08 F	FeP 03						USt 14	1.0336							
	1	11 305		FeP04	Cr 04	ES		SPCE	St14	1.0338	08J		08Ju	1147	1 HR,HS,CR,CS	A619	DC04	
	1	11 320			Cr 03	Fd 4			St 14	1.0322	08X		08kp	1144				
	1	11 321		DC 01	Cr 01	FeP 01	DC 01/FeP 01	SPCC	St 12			St 02F	08Ju	1142	DC 01/FeP 01	1008	DC 01	
	1	11 325						SPCE									AP 04	
	1	11 330			Cr 0			SPC Cl.2	St 3				08J		Cr 2			
	1	11 331		FeP01/DC01	CR1	DC01/FeP01	FeP01/DC01	SPCC	St2	1.0330		St02F		1142	3CR	366	FeP01/DC01	
	1	11 343	A3	S235JRG1		A34-2	Fe330	SS 330	St34-2	1.0028	St3SX	St34RG	16D	1312	CEW2BK	Gr.C	S235JRG1	
	1	11 353					Fe360	STKM12A	St35	1.0308	R35		10	1233	CFS3	1120		
	1	11 364		P235GH		A 37 AP,CP	FeE235	SPV 450	H 1	1.0345	St 36 K	St 35 KW	12K	1330	141-360	Gr.55	F.6304	
	1	11 366		P235GH	P 3	A 37 AP	Fe 360-1KG,KW	SGV 410	H I	1.0345	St 36K	St 35KW	12K	1330	141-360	Gr. A	A 37RCI	
	1	11 368			P 5	A 37 AP	Fe 360-1 KG	SGV 410	ASt 35			St 35 KW	15 K	1330			A 37 RBII	
	1	11 369				A37FP	Fe 360-2KG	STPL380	ASt35				15K	1332		Gr.1	A37RBII	
	1	11 373		S235JRG1	Fe360 B	S235JRG1	Fe360BFU	STKM12A	USt37-2	1.0036	St3SX	St37F	St3kp	1311	Fe360B	Gr.C	S235JRG1	
	1	11 375	Q235C	S235JRG2	Fe360B	E24-2NE	S235JRG2	SS330	S235JRG2		St3S	RSt360B	St3sp	1312	S235JRG-2	Gr.36	S235JRG2	
	1	11 378		Fe37B1, FN, FU	Fe 360C	E 24-3	Fe 360C		St 37-3		St 3W	St 37TK	16D	1312	40 D	Gr.58	AE 235D	
	1	11 379		S235JRG2Cu					RSt 37-2 Cu3	1.0167	St 3 SCu							
	1	11 381				A37FP	Fe360-2KG		ASt35							Gr.55	A37RBII	
	1	11 416		P265GH	F 5	A 42 AP	Fe 410KG,KT,KW	SG 295	H II	1.0425	St 41K	St 41KW	16K	1430	151-400	Gr.A	A 42RCII	
	1	11 418		P265GH	F7	A 42F	P 265 GH	SG 295	St 45.8			St 41KW	20K	1430	161-430	Gr.60	A 42RBII	
	1	11 419		P310NB		A 42 FP1	Fe 410-2KG		ASt 41	1.0437					224-400	Gr.60	A 42 RBII	
	1	11 423				E 28-2		SS 41	USt 42.2		St 3 SX	St 42 RG,RGT	VSt 4 kp,ps		43/25 HR,HS	1020		
	1	11 425	Q225A	S275JR		E28-2	Fe430B	SS400	RSt42-2		St4V	St42F	St4	1411	161-430	Gr.D	AE275B	
	1	11 428				E 28-3	Fe 430 C	SM 400 C	St 42-3		St 4 W	St 44 T	VSt 4 sp	1411	43 C	Gr.70	AE 275 D	
	1	11 431				A 42 F	Fe 410-2 KG,KW	SLA 2	ASt 41	1.0426	St 3M		20K		400-22	X 42	F.6310	
	1	11 443		Fe 42B	Fe 430B	E 28-2			St 44-2	1.0044			St 4sp		43B,C			
	1	11 453						STKM 13B	St 45		R 45				430	1035		
	1	11 474		P 295 NH	P 11	A 48 CP	Fe 460-1 KG		H IV	1.0445			16 GS		223-490	Gr.F		
	1	11 478		P 295 GH	P 11	A 48 FP	Fe 460-1 KG,KW	SG 365	ASt 45				14G2		224-460 B	Gr.B, C	P 295 GH	
	1	11 481		P295GH		A 48 AP,FP	Fe 510-1 KG,KW	SPV 315	ASt 45	1.0436		17Mn4KW	18K	2103	430 LT	X 46	A 47 RCI	
	1	11 483	16Mn	S355J2G3	Fe510D	E36-3	Fe 510	SM490	ST52-3	1.0570	G355	St52F	S345	2132	50C	Gr.50 type1 až 4	S355J2G3	
	1	11 484				A 48FP1												
	2	11 500	Q275	E295	Fe490	A50	Fe490	SS490	St50-2	1.0050	St5	St50F	S285	2172	43/35HS	Gr.50	A490-2	
	1	11 523	16Mn	Fe510	Fe510	E36-3	Fe510	SM520C	St52-3	1.0570	16G2	St510D	17GS	2132	50/35HR	Gr.15180	S355J2G3	
	1	11 529		S355J2G3Cu					St 52-3 Cu3	1.0585	1862 A-Cu		1062 BD					
	1	11 531		Fe 510 D2		A 52 FP	S355J2G4		ASt 52	1.0577					224-460	Gr.A	AE 355 D	
	2	11 550		S355JOCu	R50-NBK		Fe 540	STKM 16 A	ST 55	1.0507	R 55		BSt 5 ps		CDS 7	1050		
	2	11 600		E355	Fe590	E335	E335	SM570	E335	1.0060	MSt6	St60F	St6sp	1650	E335	Gr.65	Fe590-2FN	
	3	11 700		E360	Fe690	A70	Fe690		St70-2	1.0070	St7	St70F	S375	1655	E360		E360	
	1	12 010	10	2C10	C10	XC10	C10	S9CK	C10	1.1121	10	RC12	08	1265	045A10	Gr. 1010,1011,M1010	C10k	
	1	12 011											08					
	1	12 014									E2		10880					
	1	12 014									E2		10880					
	1	12 020	15	C15E	C15E4	C18RR	C15		C15	1.1141				1370-40	080M15	Gr.1016	C16k	
	1	12 021			TS 5		C 14	STB 340	St 35.8	1.0305	K 10		10			Gr.A		

IMPERO PRAMET

CONFRONTO DI MATERIALI LAVORATI - GRUPPO P
COMPARISON OF MACHINED MATERIALS - GROUP P

ISO 513	Sottogruppo / Subgroup	Equivalenti esteri / International equivalents																
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE	
P	1	12 022			TS 14		C 18	STB 410	St 45.8	1.0405	K 18		20		430	Gr.B	
	1	12 023	15	C15E	C15E4	XC15	C15	S15C	C15	1.1141	15	RC15	15		040A15	Gr.1015	
	1	12 024	20	C 22	C 25	XC 18	C 21	S 22C	C 22	1.0402	20		20	1450	070M20	1020	
	3	12 030	25	2C25	C25E4	XC25	C25	S28C	C25	1.0406	25		25		070M26	Gr.1025	C25k
	1	12 031	30	C 30	C 30 E4	XC 32	C 30	S 30 C	Ck 30	1.0528			30		080M32	1030	
	3	12 040	35	C35	C35E4	C35	C35	S35C	C35	1.0501	35	C35	35	1550	40HS	Gr.1035	C35
	3	12 041	40	C 40	C 40E4	XC 42 HI	C 40	S 40C	Ck 40	1.0511	40		40		080M40	1040	C 40
	1	12 042	35 B	C 35 BKD		38 B3	C 35 BKB	SWRCHB 234	35 B2								F.1295
	2	12 050	45	C45	C60E4	C45	C45	S45C	C45	1.0503	45	C45SW	45	1650	50HS	Gr.1043	C45k
	2	12 051	50	C 50	C50E4	XC 48 H1	C 50	S 50 C	Ck 50	1.1206			50	1674	080M50	1050	1 C 50
	3	12 060	55	C55	C55E4	C54	C55	S55C	C55	1.0535	55		50	1655	50	Gr.1055	C55
	4	12 061	60	2 C 60	C 60 E4	C 60	C 60	S 58 C	Ck 60	1.0601	60		60	1665	60 HS,CS	1060	C60
	2	12 071		1 CS67		C 68	C 67	S 70C-CSP	Ck 67				65		080A67	Gr.1070	
	2	12 081	75	1CS75	CS75	XC75	C75		Ck75	1.1248	75		75	1774	80HS	Gr.1078	
	3	12 090	85	2 CS 85	CS 85	C 90RR	C 85	SK 5-CSP	C 85E	1.1269	85		85		80HS,CS	1086	
	2	13 141	30Mn2	28Mn6	28Mn6	35M5	C28Mn	SCMn2	28Mn6	1.1165	30G2		30G2		120M36	Gr.1330	30Mn5
	2	13 151				45 S 7			46 Si 7	1.5024	45 S					9250	46 Si 7
	4	13 180							80Mn4		65G		70G				
	3	13 240	35SiMn			38MS5			37MnSi5	1.5122	35SG		35SG				
	3	13 242							42MnV7	1.5223							
	4	13 251		45Si7	Type 3	45S7			46Si7	1.5024	45S		50S2		250A53	9250	F.1451
	4	13 270	60Si2Mn	60Si7		60S7	60Si7	SUP6	60Si7	1.5028	60S2		60S2		251A58	Gr.9260H	60Si7
	3	14 100	G Cr15	100Cr6	Type 1-0	100C6	100Cr6	SUJ 2	100Cr6		LH 15		Šch 15	2258	534A99	52100	F.1310
	2	14 109	GCr 15	100Cr6	Type 1-0	100Cr6	100Cr6	SUJ 2	100Cr6	1.3505	LH 15		ŠCh15	2258	535 A99	52100	100Cr6
	1	14 120	15Cr	15Cr2	37Cr4	12C8		SCr 415	15Cr3	1.7015	15 H		15Ch		523M15	5015	
	2	14 140	35Cr	37Cr4	TYPE 2	37Cr4	38Cr4	SCr435H	37Cr4	1.7034	40H	41Cr4SP	38ChA	2245	530A36	Gr.5135	37Cr4
	3	14 160				55 C 3							50ChG				
	3	14 209	Cr9SiMn	100CrMn6	TYPE 3	100CM6		SUJ3	100CrMn6	1.3520	LH15SG		ŠCh15SG		535A99	Gr.2	100CrMn6
	1	14 220	15CrMn	16MnCr5	TYPE 5	16MC5	16MnCr5		16MnCr5	1.7131	15HG		18ChG	2127	527M17	No.5115	16MnCr5
	1	14 221	20CrMn	20MnCr5	Type 7	20MC5	20MnCr5	SMnC 420 H	20MnCr5	1.7147	18HGT		18ChG			5120	F.150.D
	1	14 223											18ChGT				
	3	14 230											27ChGR				
	3	14 231											30ChGT				
	3	14 240	35Mn2					SMn438	36Mn5	1.5067			35G2			Gr.1340H	
	3	14 260	60Si2CrA			54SiCr6	48Si7	SUP7	54SiCr6	1.7102	60S2		60S2ChA	2090	250A61	9260	
	3	14 331									30HGS		30ChGSA				
	3	14 340							34CrAl6	1.8504			38Ch2Ju				
	3	14 341									37HS		38ChS				
	1	15 020		16Mo3	F26,P26,TS26	15D3	15Mo3	STBA12	15Mo3	1.5415	16M	15Mo3KW		2912	240	Gr.A	16Mo3
	1	15 121	12CrMo	13CrMo4-5	F32,P32,TS26	15CD4-5	14CrMo3	SFVAF12	13CrMo4-4	1.7335	15HM	13CrMo44KW	12ChM	2216	620-440	Gr.P12	14CrMo45
	1	15 124		18CrMo4	18CrMo4	18CrMo4	18CrMo4	SCM418	18CrMo4		18HGM		20ChM		708H20		18CrMo4-1
	1	15 128		13MoCrV6	TS33,P33,F33				14MoV6-3	1.7715	13HMF				660-460	Gr.P24	13MoCrV6
	2	15 130	30CrMo	25CrMo4	25CrMo4	25CD4	25CrMo4	SCM 430	25CrMo4		25 HM	24CrMo5 S	20ChM	2225	708A25	4130	25CrMo4
	3	15 131	30CrMo	34CrMo4KD		25CD4	30CrMo4	SCM 420	34CrMo4	1.7220	26HM		30ChM	2225	708A25	4130	AM 34CrMo4
	2	15 142	42CrMo	41CrMo4	TYPE 3	42CD4	38CrMo4KB	SCM440	41CrMo4	1.7225	40HM	42CrMo4SP	38ChM	2244	708M40	Gr.4140	42CrMo4
	1	15 217	09CuPCrNi-A	S355JOWP	Fe 355W-1A	E 36W-A3	S355JOWP	SPA-H	9CrNiCuP 324	1.8962	10 H				WR 50A,B,C	Gr.1	
	1	15 221											15ChF			Gr.6118	
	1	15 223													CDS 109	Gr.B	
	2	15 230								1.7361							
	3	15 231							27MnCrV4	1.8162							
	2	15 236	25Cr2MoVA						24CrMoV55	1.7733			25Ch1MF				
	2	15 240											40ChFA			6135	
	2	15 241							42CrV6								
	2	15 260	50CrVA	51CrV4	TYPE 13	51CrV4	50CrV4	SUP 10	50CrV4	1.8159	50HF		50ChFA	2230	735A50	Gr.6150	51CrV4

ISO 513	Sottogruppo / Subgroup	Equivalenti esteri / International equivalents																
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E	
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE		
P	3	15 261							58CrV4	1.8159								
	1	15 313	12CrMo	10CrMo9-10	P34, TS34,F34	10CD9.10	12CrMo910	SCMV4	10CrMo9-10	1.7380	10H2M	10CrMo910KW		2218	622	Gr.P22	12CrMo910	
	3	15 320					24CrMoV55		24CrMoV55	1.7733		24CrMoV55	20ChMFL		671-850			
	1	15 323							17CrMoV10	1.7766								
	2	15 330					31CrMoV10		30CrMoV9	1.7707	30H2MF		30Ch3MF				31CrMoV10	
	3	15 340	38CrMoAl			40CAD 6.12	41CrAlMo7	SACM 645	41CrAlMo7	1.8509	38HMJ		38Ch2MJuA		905M39	Cl. A	41CrAlMo7	
	3	15 341			42CrMo4			SCM 4	42CrMo4									
	1	15 412							10CrMo11	1.7276								
	1	15 423							20CrMoV 1 3 5	1.7779								
	1	16 220	12CrNi2	15NiCr6		16NC6	16CrNi4		15CrNi6	1.5713	15HN		12ChN2	2512	815M17	Gr.4320	16NiCr4	
	1	16 222				1,5 Ni												
	1	16 231				20NC6	20CrNi4		19CrNi8				20Ch2N4A		822M17	3120		
	3	16 240				35NC6		SNC 236	36NiCr6	1.5710			40ChN			3135		
	1	16 320					18Ni14						12ChN3		En 33			
	3	16 341		36CrNiMo4		40NCD3	38NiCrMo4KB	SCNM439	36CrNiMo4		36HNM		40ChN2MA		817A37	Gr.9840	35NiCrMo4	
	3	16 342		34CrNiMo6	36CrNiMo6	35NCD6	35NiCrMo6 KB	SNCM 447	34CrNiMo6				40ChNMA		817M40	4340		
	3	16 343		34CrNiMo6	Type 3	35NCD6	35CrNiMo6	SNCM 447	34CrNiMo6	1.6582	34 HNM		38Ch2N2MA	2541	817M40	4340	34CrNiMo6	
	1	16 420				13NiCr14		SNC815	14NiCr14	1.5752			12Ch2N4A		655H13	E3310X		
	3	16 431							26NiCrMo8-5	1.6931								
	3	16 440				30NC12		SNC 836	31NiCr14	1.5755	37HN3A		30ChN3A					
	3	16 444		34CrNiMo6	Type 3	35NCD6	35NiCrMo6 KB	SNCM 447	34CrNiMo6		34HNM		36Ch2N2MFA	2541	817M40	4340	34CrNiMo6	
	3	16 532									30HGSNA		30ChGSN2A					
	3	16 540											34ChN3MA					
	3	16 640				40NC17			35NiCr18						835M30			
	1	16 720									18H2N4WA		18Ch2N4MA					
	1	19 065							C35W3									
	2	19 083				Y342			C45W3	1.1730		K945					F5131	
	2	19 103				Y355		SK7	C60W3	1.1740	N5	K960						
	2	19 125				Y3 65		SK 7	C67W	1.1744	N6							
	2	19 132	T 7	CT 70	C 70 U	C70 E2U	C 70 KU	SK 6	C 70 W2		N7	K 970	U7-1			W 1-7	F.5103	
	2	19 133	T7	CT70	C70U	Y170	C70KU	SK6	C70W	1.1620	N7	K970	U7				C70U	
	2	19 152	T8	CT80	C80U	Y180	C80KU	SK5	C80W2	1.1625	N8	K980	U8-1		BW1A	W1Gr.A	C80U	
	2	19 191	T10A	CT105	C105U	C105E2U	C100KU	SK3	C105W1	1.1645	N10E	K990	U101	1880	BW1B	W5	C102U	
	2	19 192	T 10	CT 105	C 90 U	C 105 E2U	C 100 KU	SK 3	C 105 W2		N 10	K990	U 10-1			W 110	F.5117	
	3	19 221	T11	CT120	C120U	Y2120	C120KU		C110W2	1.1654	N12	K990	U12-1		BW1C		F-5123	
	4	19 255		CT 120	TC 120	C120 E3U	C120 KU	SK 2	C125 W	1.1663	N 12	K 995	U 13-1			W 112	C120 U	
	3	19 312		90MnV8	90MnCrV8	90MnV8	90MnVCr8KU		90MnCrV8	1.2842	NMV	K720	9G2V		B02	02	90 MnCrV 8	
	3	19 313		90MnV8	90MnCrV8	90MnV8	90MnVCr8 KU		90MnCrV8		NMV	K 720	9GF2		BO 2	02	90MnCrV8	
	3	19 340		60SiMn7		60Si8	56SiMn7 KU		70SI7					No 22				
	2	19 356		100 V2	TCV 105	C 105 E2 UV1	102 V2 KU	SKS 43	100 V1	1.2833	NV	K 760			BW 2	W 210	100 V2	
	3	19 418							80CrV5		NCV 1		8Ch				80CrV2	
	3	19 419							80CrV2		NCV 1		8Ch				80CrV2	
	4	19 420	Cr 06			Y2 140 C		SKS 8	140Cr2	1.2008	NC 5	K 205	13Ch				140Cr2	
	3	19 421		107CrV3			107CrV3KU		115CrV3	1.2210		K510				L2	120CrV2	
	3	19 422							145Cr6		NC 6	K 505						
	2	19 423						SKC 11	90Cr3	1.2056			9ChF			L 2		
	2	19 426	9CV2						85Cr7			K 201	9Ch1					
	3	19 434		X21Cr13		X20Cr13	X21Cr13KU		X20Cr13 1.2082	1.2082							X20Cr13 F5261	
	3	19 435		X41Cr13	X40Cr14	X40Cr14	X41Cr13KU	SUS 420 J2	X42Cr13		4H13		40Ch13	2314	420S45		F.5263	
	4	19 436		X210Cr12	C210Cr12	Z200C12	X205Cr12KU	SKD1	X210Cr12	1.2080	NC11	K100	Ch12		BD3	D3	X210Cr12	
	4	19 437		X210CrW 12-1	X210CrW12	X210CrW 12-1	215CrW 12-1 KU		X210CrW12					2313			2313	
	3	19 452				Y60SC7			58SiCr8	1.2103		K244						
	1	19 487							21MnCr5	1.2162								
	4	19 512				45CDV6	35CrMo8 KU		48CrMoV 6 7									

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Sottogruppo / Subgroup	Equivalenti esteri / International equivalents															
	CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E
	ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE	
P 4	19 520		35CrMo8	35CrMo7	40CrMnMo8	35CrMo8KU		40CrMnMo7		WLB						40CrMnMo7
P 2	19 541		30CrMoV12-11	32CrMoV12-28	32CDV12-28	30CrMoV12-27KU	SKD7	X32CrMoV33	1.2365	WLV	W320	3Ch3M3F		BH10	H10	30CrMoV12
P 3	19 552	4Cr5MoSiV	X37CrMoV5-1	X37CrMoV5 1	Z38CDV5	X37CrMoV51KU	SKD6	X38CrMoV5.1	1.2343	WCL	W300	4Ch5MFS		BH11	H11	X37CrMoSiV5
P 3	19 553	4Cr5MoSiV	X37CrMoV5-1	X37CrMoV5 1	Z38CDV5	X37CrMoV51KU	SKD6	X38CrMoV5.1	1.2343	WCL	W300	4Ch5MFS		BH11	H11	
P 3	19 554	4Cr5MoSiV1	X40CrMoV511	40CrMoV5 1	X40CrMoV5	X40CrMoV511KU	SKF61	X40CrMoV51	1.2344	WCLV	W302	4Ch5MF1S	2214	BH 13	H13	X37CrMoSiV5
P 3	19 561														H 42	
P 3	19 571	Cr5Mo1V	X100CrMoV 5 1	X100CrMoV5	Z100CDV5	X100CrMOV51KU	SKD 12	X100CrMoV 5 1		NCLV	K 305	9Ch5VF	2260	BA 2	A 2	F.5227
P 3	19 572		X160CrMoV 12 1		Z160CDV12	C165CrMoV12KU	SKD 11	x165cRmOv 12			k 105	Ch12 MF	2310		D 2	F.5211
P 4	19 581														A7	
P 3	19 614							55NiCr10	1.2718		K 605		2550			F.5224
P 3	19 642		40NiCrMoV16			40NiCrMoV16 KU		35NiMo16			W 502			BP 30		35NiCrMo16
P 3	19 655		40NiCrMo16	45NiCrMo16	40NCDV16	40NiCrMoV16KU		X45NiMo4II1.2	1.2767		K 600					
P 3	19 662	5CrNiMo	55NiCrMoV7		55NCDV7	44NiCrMoV7 KU	SKT 4	55NiCrMoV6	1.2711	WNL	W 502	5ChNM		BH 224/5	L 6	F.520.S
P 3	19 663		55NiCrMoV7	55NiCrMoV7	55NCDV7	56NiCrMoV7KU	SKT4	56NiCrMoV7	1.2714	WNLV	W501	5ChNV		BH224/5	L6	55NiCrMoV7
P 4	19 675							28NiCrMoV10	1.2740							
P 4	19 680							X50NiCrWV 13-13								
P 3	19 710	W					SKS 7M	120 W 4	1.2414	NW 1	K 405				F 1	F.5238
P 3	19 711					110W4 KU	SKS 2	120 WV 4	1.2516			ChV 1		BF 1		F.520C
P 3	19 712							110WCrV5				ChV6				
P 3	19 714						SKS 11	X 130W5			K 400	ChV 4F			F 2	
P 2	19 720	30W4Cr2VA	X30WCrV 5 3	30WCrV5	X32WCrV5	X30WCrV 5 3KU	SKD 4	30WCrV 5.3			W 105					
P 3	19 721	3Cr2W8V	X30WCrV93	X30WCrV9-3	Z30WCV9	X30WCrV93KU	SKD5	X30WCrV9.3	1.2581	WWW	W100	3Ch2V8F		BH21	H21	X30WCrV9
P 3	19 723									WWN 1	W-103			BH 21A		
P 3	19 732		45WCrSiV8	50WCrV8	45WCV20	45WCrV8KU		45WCrV7	1.2542	NZ2	K450	50ChV2SF	2710	BS1	S1	45 WCrSiV8
P 3	19 733		55WCrV8	60WCrV8	55WC20	55WCrV8 KU		60WCrV7		NZ 3	K 455	5ChV2S		BS 1	S 1	60WCrSiV8
P 3	19 740							30 WCrV 151	1.2564	WWS 1	W 106					F.527
P 3	19 802						SKH6	S 12-1-2	1.3318	SW12		R12F3				
P 4	19 810				Z130WV 13.4			S 12-1-4	1.3302	SW12		R9F5				
P 3	19 824	W18Cr4V	HSv18-0-1	HS 18-0-1	Z80WCV18-04-01	HS 18-0-1	SKH 2	HS 18-0-1	1.3355	SW18	S 200	R18	2750	BT1	T1	HS 18-0-1
P 4	19 830	W6Mo5Cr4V2	HS 6-5-2	HS 6-5-2	Z85WDCV06-05-04-02	HS 6-5-2	SKH51	HS 6-5-2	1.3343	SW7M	S600	R6M5	2722	BM2	M2	HS 6-5-2
P 4	19 852	W6Mo5Cr4V2Co5	HS 6-5-2-5	HS 6-5-2-5	Z85WDKCV06-05-04-02	HS 6-5-2-5	SKH55	HS 6-5-2-5	1.3243	SK5M	S705	R6M5K5	2723	BM35		HS 6-5-2-5
P 4	19 855	W18Cr4VCo4	HS18-1-1-5		Z 80WKCV 18-05-04-01	HS 18-1-1-5	SKH 3	HS 18-1-2-5			S 305	R18k5F2		BT 4	T 4	F.5530
P 4	19 856											R9K5				
P 4	19 858	W12Cr4V5Co5	HS12-1-5-5	HS12-1-5-5	HS 12-1-5-5	HS12-1-5-5	SKH 10	HS 12-1-4-5	1.3202	SK 5V	S 308	R13F4K5		BT 15	T 15	HS12-1-5-5
P 4	19 861		HS 10-4-3-10		Z130WKCDV	HS 10-4-3-10	SKH57	HS 10-4-3-10	1.3207	SK10V	S700	R12F3K10M3-Š	2736	BT42		HS 10-4-3-10
P 1	422630		C18D	20-40	20-40M	FeG400	SC37	GS38	1.0416	LII400	GS38	15L-I		AM1	Gr.N1	
P 1	422633				A 42 C-M	FeG38VR	SC 360	GS-38.3	1.0416	L II 400	GS-38	15 L-III	1306	AM 1	Gr.N 1	
P 1	422640			23-45	A 48 M1	FeG 45	SC 46	GS-45	1.0443	LII 400	GS-45	25 L	1305	161-430 A	N 1	
P 1	422643			33-45	FB-M	GC20	SC450	GS-45	1.0443	L20	GS45	20L		430A	Gr.WCA	
P 1	422650			26-52	E26-52-M	FeG49-1	SC480	GS-52	1.0551	LII500	GS52	30L		161Gr400A	Gr.N-2	
P 2	422653															
P 2	422660	ZG 310-570		30-57	30M6M	FeG 570	SCC 3	GS-60	1.0553	LII 600	GS-60	45L2	1606	A 3	Gr.80-40	
P 2	422670				E26-52-M		SCC5	GS-62	1.0554			55L		AW3	Gr.105-85	
P 2	422709				35M5		SCMn2	GS-20Mn5		L20G		35G		Gr.A	Gr.80-40	AM30Mn5
P 1	422712				20 M 6 M	FeG 49-2	SCW 480	GS-20Mn5		L 20G		20 GL	2172	161-540 A	Gr.A	F.8310
P 1	422713		G17Mn5		20 M5M			GS-16Mn5						G17Mn5	WCC	G17Mn5
P 1	422714		G-21 Mn5			G 22mN3	SCA 1	GS-20Mn5	1.1133	L20G	GS-21Mn5	20GL		Gr.A	LCB	AM 22Mn5
P 3	422715	Z640Mn			35M5		SCMn3	GS-36Mn5	1.1167			35G2				36Mn5
P 3	422719													Gr.A		
P 3	422724											30ChGSFL				
P 3	422726									L35HGS		35ChGSL				
P 1	422733							GS 24CrV42								
P 1	422744		GS-17CrMo55		15CD5-05M	G 15CrMo55	SCPH 21	GS-17CrMo55		L18HM	GS-17CrMo55	20ChMFL		621	Gr.WC6	AM-18CrMo05-05
P 1	422745		G17CrMoV511		15CDV4-10M		SCPH23	GS-17CrMo511		L15HMF	GS-17CrMoV511				Gr.9	

CONFRONTO DI MATERIALI LAVORATI - GRUPPO P
COMPARISON OF MACHINED MATERIALS - GROUP P

ISO 513	Sottogruppo / Subgroup	Equivalenti esteri / International equivalents															
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE	
P	3	422750											40 ChNL				
	1	422771				Z15CD 505-M	GX15CrMo5	SCPH 61					20Ch5ML		625	C 5	AM-X18CrMo5
	4	422992											R9				

IMPERO PRAMET

CONFRONTO DI MATERIALI LAVORATI - GRUPPO M
COMPARISON OF MACHINED MATERIALS - GROUP M

ISO 513	Sottogruppo / Subgroup	Equivalenti esteri / International equivalents																
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E	
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE		
M	1	17 020	0Cr13	X6Cr13	TYPE 1	Z6C13	X6Cr13	SUS410S	X7Cr14	1.4000	0H13		08Ch13	2301	403S17	Type 403	X6Cr13	
	1	17 021	1Cr12	X10Cr13	Type3	Z12C13	X12Cr13	SUS 410	X10Cr13	1.4006	1H13		12Ch13	2302	410S2	Type 410	X12Cr13	
	2	17 022	2Cr13	X20Cr13	Type 4	X20Cr13	X20Cr13	SUS420J1	X20Cr13	1.4021	2H13		12Ch13	2302	420S37	Type 420	X20Cr13	
	2	17 023	3Cr13	X30Cr13	Type 5	Z30Cr13	X30Cr13	SUS420J2	X30Cr13	1.4028	3H13		30Ch13	2304-03	420S45	Type 420	2304-03	
	2	17 024	4C13	X39Cr13	Type 6	Z40C13	X40Cr14		X39Cr13	1.4031	4H13		40Ch13		X39Cr13	Type 420	X39Cr13	
	2	17 029								1.4034								
	1	17 040	1Cr15	X6Cr17	Type 8	Z8C17	X8Cr17	SUS 430	X6Cr17	1.4016	H17		12Ch17	2320	430S18	Type 430	X6Cr17	
	1	17 041	1Cr15	X8Cr17	TYPE 8	Z8C17	X8Cr17	SUS430	X6Cr17	1.4016	H17		12Ch17	2320	430S15	Type 430	X6Cr17	
	2	17 042									H18		95Ch18			440 C		
	1	17 102	10MoCr50	5CrMo16	TS 37	Z10CD5-05	A16CrMo 25 5 KG, KW	SFVAB 5 A,B	12CrMo1 9 5	1.7362	H5M		15Ch5M		625	Type 501, 502	F.240B	
	1	17 113		X10CrAlSi7		Z8CA7	X7AL		X10CrAlSi7	1.4713			15Ch6SJu				X10CrAl7	
	2	17 115	4Cr9Si2	X 45CrSi8	TYPE 1	Z 45CS9	X 45CrSi8	SUH 1	X 45CrSi 9.3	1.4718	H9S2		40Ch9S2		401S45	HNV 3	F.3220	
	2	17 116			TS38		X12Cr9KG	SFVAF9	X12CrMo9-1					2203	629-470	Gr.F9		
	2	17 125	OCr13Al	X10CrAl13	TYPE H3	Z 13C13	X 10CrAl12		X10CrAl13	1.4724	H13JS		10Ch13SJu			TYPE 405	F.3152	
	2	17 134			TS40	Z21CDV12	X20CrMoNi201KG,KW		X20CrMoV121		23H11MNF	X22CrMoV121S		2317				
	2	17 153	1Cr25Ti			Z10C24	X16Cr26	SUH446	X8CrTi25				15Ch25T	2322		446		
	3	17 240	OCr18Ni9	X5CrNi18-10	Type11	X5CrNi18-10	X5CrNi18-10	SUS304	X5CrNi18-10	1.4301	OH18N9	X5CrNi18-10S	08Ch18N10	2333-02	304S31	Type 304	X5CrNi1810	
	3	17 241					X10CrNi18 09	SUS 302	X12CrNi 18 8	1.4300	1H18N9					302		
	3	17 242				Z10CN1809	X15CrNi1809		X12CrNi188		1H18N9		17Ch18N9		302S25	Gr.302		
	3	17 246	1Cr18Ni9Ti	X10CrNiTi18-10	TYPE 15	Z6CNT18-10	X8CrNiTi1811	SUS321	X12CrNiTi189	1.4878	1H18N9T	X6CrNiTi1810KKW	08Ch18N10T	2337-02	321S12	321	X6CrNiTi1810	
	3	17 247	0Cr18Ni10Ti	X 6CrNiTi 18-10	TYPE 15	Z 6CNT 18-10	X 6CrNiTi 18 11	SUS 321	X 6CrNiTi 18 10	1.4541		X 6CrNiTi 18 10 S	08Ch18N10T	2337	321S31	Type 321	F.3523	
	3	17 248	0Cr18Ni10Ti	X6CrNiTi18-10	Type 15	Z6CNT18-10	X6CrNiTi1811	SUS321	X6CrNiTi1810	1.4541	0H18N10T	X6CrNiTi1810KKW	08Ch18N10T	2337	321S31	Type 321	X6CrNiTi18-10	
	3	17 249	00Cr19Ni10	X2CrNi 18 10	Type 15	Z3CN 18-11	X2CrNi 18.11	SUS 304	X2CrNi 19 11	1.4306		X2CrNi19 11 KKW	03Ch18N11	2352	304S11	304 L	X2CrNi 18 10	
	3	17 251	1Cr20Ni14Si2	X 15CrNiSi 20 12	TYPE H13	Z 17CNS 20 12	X 16CrNi 23 14	SUH 309	X 15CrNiSi 20 12	1.4828	H20N12S2		20Ch20N14S2		309S24	TYPE 309	F.3312	
	3	17 253	1Cr16Ni35	X12NiCrSi35-16	H17	Z12NCS37.18		SUH330	X12NiCrSi36-16		H16N36S2					330	X12CrNiSi36-16	
	4	17 254											12Ch21N5T					
	3	17 255	1Cr25Ni20Si2	X8CrNi25-21	H16	Z8CN25-20	X6CrNi2520	SUS310S	X8CrNi25-21	1.4845	H25N20S2		20Ch23N18	2361	310S31	310S	X15CrNiSi25-20	
	3	17 322											4Cr14Ni14W2Mo		331S42	Ev9		
	3	17 335											ChN35 VT					
	3	17 341			TS 63	Z6CND17-13B	X5CrNiMo1712		X6CrNiMo1713	1.4919		X5CrNiMo17122S			316S51	TP316H	X5CrNiMo17122	
	3	17 346	0Cr17Ni12Mo2	X 5CrNiMo 17 12 2	TYPE 20	Z 6CND 17.11	X 5CrNiMo 17 12	SUS 316	X 5CrNiMo 17 12 2	1.4401		X 5CrNiMo 17 12 2 KW		2347	316S31	TYPE 316	X 5CrNiMo 17 12 2	
	3	17 347																
	3	17 348	0Cr18Ni12Mo2Ti	X6CrNiMoTi17-12-2	21	Z6CNDT17-12	X6CrNiMoTi17-12	SUS316Ti	X6CrNiMoTi17-12-2		H17N13M2T	X6CrNiMoTi17122S	10Ch17N13M2T	2350-02	321S12	316Ti	X6CrNiMoTi17122	
	3	17 349	00Cr17Ni14Mo2	X2CrNiMo 17-12-2	Type 19	Z3CND 18-12-02	X2CrNiMo 17 12	SUS 316	X2CrNiMo 17 13 2	1.4404	00H17N14M2	X2CrNiMo 17 13 2KKW	03Ch17N14M2	2348	316S11	316 L	X2CrNiMo 17 13 2	
	3	17 350	00Cr17Ni14Mo2	X2CrNiMo18-14-3	TYPE 19a	Z3CND 17-12-03	X2CrNiMo1713	SUS 316L	X2CrNiMo18-14-3	1.4435		X2CrNiMo18143KW	03Ch17N14M2	2353	316S14	TP316L	X2CrNiMo18143	
	4	17 351			TYPE 7											TYPE 635		
	4	17 351.9			TYPE 7											TYPE 635		
	3	17 352	0Cr17Ni12Mo2	X3CrNiMo 17-13-3	Type 20a	Z7CND 18-12-3	X5CrNiMo 17 13	SUS 316	X5CrNiMo 17 13 3	1.4436		X5CrNiMo 17 13 3 KW		2343	316S31	316	X5CrNiMo 17 13 3	
	3	17 356	1Cr18Ni12Mo3Ti				X6CrNiMoTi17-13	316Ti	X10CrNiMoT18-12		H17N13M2T		08Ch17N13M2T		320S33	316Ti		
	3	17 436							X40MnCr18	1.3817								
	3	17 460								1.3965	1H17N4G9		12Ch17G9AN4			Gr.202		
	4	17 465	5Cr21Mn9Ni4N	X 53 CrMnNiN21 9	Type 9	Z 52 CMN 21.09	X 53CrMnNiN 21 9	SUH 35	X 53 CrMnNiN21 9	1.4871	50 H21G9N4		55Ch20G9AN4		349S54	EV 12	F.3217	
	3	17 536							Ni 36	1.3912	FeNi36Pr		36N		NILO 36	NILO 36		
	4	17 618.4				Z120M12			X120Mn12	1.3401			110G13L	2183				
	1	422904	ZG1Cr13			Z6CN12-1M	GX12Cr13	SCS1	GX8CrNi13	1.4008			10Ch12NPL		410C21			
	1	422905	ZG1Cr13			Z12C13-M	G X12Cr13	SCS 1	G-X12Cr13		LOH 13		15 Ch13L		410C21	Gr.CA-15	F.8401	
	2	422906	Z G2Cr13			Z20C13-M	G X30Cr13	SCS 2	G-X20Cr14	1.4027	LH 14		20Ch13 1		420C24	Gr.CA-40	F.8387	
	2	422911	ZG1Cr17			Z20CN17-2	GX35Cr17		G-X22CrNi17						ANC 2	Gr.CB30		
	2	422912							G-X40CrSi17									
	2	422913				Z40C28 M		SCH 2	G-X40CrSi23		LH 26				452C11	Gr.HC		
	2	422914	Z GCr28			Z40C28-M	G X35Cr28	SCH 2	G-X70Cr29		LH 26		75Ch28L		452C11	Gr.HC		
	2	422916		G-X22CrMoV12-1					G-X22CrMoV12-1	1.4922		G-X22CrMoV12-1	20Ch12WNMFL			Gr.CA28MnV		

ISO 513	Sottogruppo/Subgroup	Equivalenti esteri / International equivalents																
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E	
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE		
M	2	422917		GX8CrNi12		Z6CN12-1M			GX8CrNi12			G-X8CrNi12	20Ch12WNMFL					
	4	422920	ZGMn13-1-4			Z120M12M	XG120Mn12	SCHMnH1 až 3	G-X120Mn13	1.3802	C120G13	Aõ Mn10	110G13L		BW 10	B-1 až 4	AM-X120Mn12	
	4	422921				Z120M12-M	G X120MnCr 12 02	SCMnH 11			L120G13H					Gr.C		
	3	422931	ZG1Cr18Ni9			Z6CN 18-10M	G X6CrNi 20 10	SCS 12	G-X10CrNi 18 8	1.4312	LH18N9		10Ch18N9L	2333	302C25	CF-16F		
	3	422932				Z 25CN 20-10 M	G X30CrNi 20 10		G X25CrNiSi 18 9	1.4825					302C35	CF 20		
	3	422933				Z6CNNb1810-M	GX8CrNiNb2011	SCS21	G-X7CrNiNb189		LH18N9T	G-X5CrNiNb189	10Ch18N9TL		347C17	CF-8C	AM-X7CrNiNb2010	
	3	422934						SCH 12	G X40CrNiSi 22 9	1.4826	LH23N18C		40Ch24N12SL		309C30	HF		
	3	422936				Z40CN 25-12 M	G X35CrNi 25 12	SCH 13A	G-X40CrNiSi 25 12	1.4837			40Ch24N12SL		309C35	HH		
	2	422938											12Ch21N5G2STL					
	3	422941				Z 6CNDNb 18 12-M	G X6CrNiMoNb 20 11	SCS 22			LH18N10M2T	G-X5CrNiMoNb 18 10	10Ch18N12M3T		318C17	CF 3 MN		
	3	422942				Z6CND 18-12 M	G X6CrNiMo 20 11	SCS 14	G-X10CrNiMo 18 9	1.4410	LH18N10M2			2243	315C16	CF-8M		
	3	422944					G X35CrNi 28 09	SCH 17							309C40	HE		
	3	422952				Z40CN 25-20 M	G X40CrNi 26 20	SCH 22	G-X40CrNiSi 25 20	1.4848	LH25N19S2		20Ch25N19S2L		310C40	HK	F.8452	
	3	422953									LH21N5		12Ch21N5G2SL					
	3	422955					G X50NiCr 39 19	SCH 20	G-X40NiCrSi 35 25						331C40	HU		
	3	422958				Z 6NCDV 25-20-04 M	G X5NiCrCuMo 29 21	SCS 15	G X7CrNiMoCuNb 18 18					2564		CN-7M		

ISO 513	Sottogruppo/Subgroup	Equivalenti esteri / International equivalents																
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E	
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE		
K	3	422303				FGS 370-71	GS 370-17	FCD 370	GGG-35.3		Zs 35022		VČ 38-17	0717-15	Gr.350/22		FGE 38-17	
	3	422304			400-12	FGS400-12	GS400-12	FCD40	GGG40		Zs40015		VČ40	0717-00	Gr.420-12	Gr.60-40-18	FGE 42-12	
	3	422305		GJS 500-7	500-7	FGS 500-7	GS 500-7	FCD 500	GGG-50		Zs 50007	GGG 500	VČ 50-2	0727-02	500/7	65-45-12	FGE 50-7	
	4	422306			600-3	FGS600-3	GS600-3	FCD60	GGG60		Zs60003	GGG600	VČ60	0732-03	Gr.600/3	Gr.80-55-06	FGE60-2	
	4	422307		GJS-700-2	700-2	FGS 700-2	GS 700-2	FCD 700	GGG-70		Zs70002	GGG-700	VČ 70-3	0737-01	Gr.700/2	100-70-03	FGE 70-2	
	4	422308			800-2	FGS800-2	GS800-2	FCD80	GGG80		ZS80002		VČ80		Gr.800/2	Gr.120-90-02	FGE 80-2	
	1	422410			Gr.100	Ft10	G10	FC-100	GG10		Zl100	GG100	SČ10	0110-00		Class 20B	FG10	
	1	422415				FGL 150	G 15	FC 150	GG-15		Zl 150	GG 150	SČ 15	0115-00	Gr.150	C1.25B	FG 15	
	1	422420		FG20	Gr.200	Ft20	G20	FC-20	GG20		Zl200	GG200	SČ20	0120-00	Gr.220	Class 30B	FG20	
	1	422425				FGL 250	G 25	FC 250	GG-25		Zl 250	GG-250	SČ 25	0125-00		C1.35B	FG 26	
	1	422430			Gr.300	Ft 30	G 30	FC 300	GG-30		Z1 300	GG-300	SČ 30	0130-00	Gr. 300	No. 45	FG 30	
	1	422435				Ft35	G35	FC35	GG35		Zl350	GG-350	SČ35	0135-00	Gr.350	Class50B	FGG35	
	1	422456				FBO							AČS-15		1C			
	1	422465									ZlSi5		ŽČS5					
	1	422472											ŽČCh 2			Type D, C1.III		
	1	422481									ZlAL7Cr		ŽČJu7Ch2					
	2	422532				MN 32-8	B 32-12	FCMB 310			Zcc 32000		KČ 33-8	0815-00	B 310/10		Type B	
	2	422533			B-35-10	MN35-10	B35-10	FCMB35	GTS35-10		Zcc35010	GTS-350	KČ35-10	0815-00	B35-12	Gr.32510	Type A	
	2	422534																
	2	422536			W35-04	MB35-7	GMN35	FCMN34	GTW35-04		Zcb 35004	GTW-350			W35-04		Type B	
	2	422540			W 40-05	MB 400-5	GMN 40	FCMW 370	GTW 40-05		Zcb 40005	GTW 400			W 40-05		42 2540	
	2	422545			P45-06	MN 450-6	P45-06	FCMP 440	GTS 45-06		Zcp 45006	GTS-450	KČ 45-7	0854-00	P45-06	Gr.45006	Type E	
	2	422555			P55-04	MN 550-4	P55-04	FCMP 540	GTS 55-04		Zcp55004		KČ 55-4		P55-04	6004	Type C	

IMPERO PRAMET

CONFRONTO DI MATERIALI LAVORATI - GRUPPO N
COMPARISON OF MACHINED MATERIALS - GROUP N

ISO 513	Sottogruppo/ Subgroup	Equivalenti esteri / International equivalents															
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE	
N	4	423001		Cu-ETP	Cu-ETP	Cu-a1	Cu9	C1100	E2-Cu58		Cu99,9E	Cu-E	Cu99,9	5010	C101	C110000	
N	4	423001		Cu-ETP	Cu-ETP	Cu-a1	Cu9	C1100	E2-Cu58		Cu99,9E	Cu-E	Cu99,9	5010	C101	C110000	
N	4	423001		Cu-ETP	Cu-ETP	Cu-a1	Cu9	C1100	E2-Cu58		Cu99,9E	Cu-E	Cu99,9	5010	C101	C110000	
N	4	423001		Cu-ETP	Cu-ETP	Cu-a1	Cu9	C1100	E2-Cu58		Cu99,9E	Cu-E	Cu99,9	5010	C101	C110000	
N	4	423001		Cu-ETP	Cu-ETP	Cu-a1	Cu9	C1100	E2-Cu58		Cu99,9E	Cu-E	Cu99,9	5010	C101	C110000	
N	4	423001		Cu-ETP	Cu-ETP	Cu-a1	Cu9	C1100	E2-Cu58		Cu99,9E	Cu-E	Cu99,9	5010	C101	C110000	
N	4	423001		Cu-ETP	Cu-ETP	Cu-a1	Cu9	C1100	E2-Cu58		Cu99,9E	Cu-E	Cu99,9	5010	C101	C110000	
N	4	423001		Cu-ETP	Cu-ETP	Cu-a1	Cu9	C1100	E2-Cu58		Cu99,9E	Cu-E	Cu99,9	5010	C101	C110000	
N	4	423001		Cu-ETP	Cu-ETP	Cu-a1	Cu9	C1100	E2-Cu58		Cu99,9E	Cu-E	Cu99,9	5010	C101	C110000	
N	4	423004						C1821			Cu99,7G	Cu-C	M2				
N	4	423005							C-Cu		Cu 99,56		M3		C107	C 14200	
N	4	423016		CuSn6	CuSn6	CuSn6P		C5191	CuSn6		CuSn6	CuSn6	BrOF6,5-0,15	CuSn6	PB102	C51900	
N	4	423018		CuSn8	CuSn8	CuSn9P	P-CuSn8	C5212	CuSn8		CuSn8	CuSn8	BrOF-0,2		PB104	C52100	CuSn8P
N	4	423042		CuAl5As	CuAl5	CuAl6	P-CuAl5		CuAl5As		CuAl5As	CuAl5As	BrA5			C60800	CuAl5
N	4	423044			CuAl9Mn2				CuAl9Mn2				BrAMc9-2				CuAl9Mn2
N	4	423045			CuAl8Fe3								BrAZ9-4			C61900	
N	4	423046		CuAl10Fe3Mn2	CuAl10Fe3				CuAl10Fe3Mn2		CuAl10Fe3Mn2	CuAl10Fe3Mn2	BrZMc10-3-1,5				CuAl10Fe3Mn2
N	4	423047		CuAl10Ni5Fe4	CuAl10Ni5Fe4	CuAl9Ni5Fe3	P-CuAl10Fe5Ni5	C6301	CuAl10Ni5Fe4		CuAl10Ni5Fe4	CuAl10Ni5Fe4	BrAZN10-4-4		CA104	C63000	CuAl10Fe5Ni5
N	4	423048															
N	4	423053		CuSi3Mn1	CuSi3Mn1		P-CuSi3Mn1				CuSi3Mn1	CuSi3Mn	BrKMc3-1		CS101	C65500	CuSi3Mn1
N	3	423058			CuCd1						CuCd1		BrKd1		C108	C16200	
N	3	423064							CuNi30Mn								
N	4	423065			CuNi44Mn1	CuNi44Mn	P-CuNi44Mn1		CuNi44Mn1		CuNi44Mn1	CuNi44Mn1	MNMc43-0,5				CuNi44Mn1
N	3	423115			CuSn5												
N	3	423119		CuSn10-C	CuSn10	CuSn8	G-CuSn10		G-CuSn10		CuSn10			CuSn10	CT1	C90700	CuSn10
N	4	423120		CuSn11P-C	CuSn10P				CuSn10P		CuSn10P		Br O10F1		PB1		
N	4	423120		CuSn11P-C	CuSn10P				CuSn10P		CuSn10P		Br O10F1		PB1		
N	3	423121						C2	G-CuPb5Sn							C92700	
N	3	423122		CuSn10Pb10-C	CuPb10Sn10	CuSn10Pb10	G CuPb10Sn10	LBC3	G-CuPb10Sn		CuPb10Sn10		BrO10S10	CuPb10Sn10	LB2	C93700	CuPb10Sn10
N	4	423123		CuSn12-C	CuSn12	CuSn12	G-CuSn12		G-CuSn12					CuSn12	PB2	C91700	CuSn12
N	4	423123		CuSn12-C	CuSn12	CuSn12	G-CuSn12		G-CuSn12					CuSn12	PB2	C91700	CuSn12
N	4	423123		CuSn12-C	CuSn12	CuSn12	G-CuSn12		G-CuSn12					CuSn12	PB2	C91700	CuSn12
N	3	423135		CuSn5Zn5Pb5-C	CuPb5Sn5Zn5	CuSn5Pb5Zn5	G-CuSn5Zn5Pb5	BC6	G-CuSn5Zn5Pb		CuSn5Zn5Pb5		BrO5C5S5	CuSn5Pb5Zn5	LG2	C83600	CuSn5Zn5Pb5
N	3	423135		CuSn5Zn5Pb5-C	CuPb5Sn5Zn5	CuSn5Pb5Zn5	G-CuSn5Zn5Pb5	BC6	G-CuSn5Zn5Pb		CuSn5Zn5Pb5		BrO5C5S5	CuSn5Pb5Zn5	LG2	C83600	CuSn5Zn5Pb5
N	3	423135		CuSn5Zn5Pb5-C	CuPb5Sn5Zn5	CuSn5Pb5Zn5	G-CuSn5Zn5Pb5	BC6	G-CuSn5Zn5Pb		CuSn5Zn5Pb5		BrO5C5S5	CuSn5Pb5Zn5	LG2	C83600	CuSn5Zn5Pb5
N	3	423138			CuSn10Zn2		G-CuSn10Zn2	BC3	G-CuSn10Zn		CuSn10Zn2		BrO10C2	CuSn10Zn2	B1	C90500	CuSn10Zn2
N	3	423138			CuSn10Zn2		G-CuSn10Zn2	BC3	G-CuSn10Zn		CuSn10Zn2		BrO10C2	CuSn10Zn2	B1	C90500	CuSn10Zn2
N	4	423144											BrA9Mc2L				
N	4	423144											BrA9Mc2L				
N	4	423145		CuAl10Fe2-C	CuAl10Fe3	CuAl10Fe3	G-CuAl10Fe3	AlBC1	G-CuAl10Fe		CuAl10Fe3		BrA9Z3L	CuAl10Fe3	AB1	C95200	CuAl10Fe3
N	4	423145		CuAl10Fe2-C	CuAl10Fe3	CuAl10Fe3	G-CuAl10Fe3	AlBC1	G-CuAl10Fe		CuAl10Fe3		BrA9Z3L	CuAl10Fe3	AB1	C95200	CuAl10Fe3
N	4	423146									CuAl10Fe3Mn2		BrA10Zn3Mc2				
N	4	423146									CuAl10Fe3Mn2		BrA10Zn3Mc2				
N	4	423147		CuAl10Fe5Ni5-C	CuAl10Fe5Ni5	CuAl10Fe5Ni5		AlBC3	G-CuAl10Ni		CuAl10Fe4Ni4		BrAl10Z4N4L	CuAl10Fe5Ni5	AB2	C95500	CuAl10Fe4Ni5
N	4	423147		CuAl10Fe5Ni5-C	CuAl10Fe5Ni5	CuAl10Fe5Ni5		AlBC3	G-CuAl10Ni		CuAl10Fe4Ni4		BrAl10Z4N4L	CuAl10Fe5Ni5	AB2	C95500	CuAl10Fe4Ni5
N	3	423183							G-CuPb22Sn								
N	3	423184			CuPb30			KJ3	CuPb30				BrS30				
N	3	423200		CuZn5	Cu-Zn5	CuZn5		C21000	CuZn5		CuZn5		L 96		CZ125	Cu-5Zn	CuZn5
N	3	423201		CuZn10	CuZn10	CuZn10	P-CuZn10	C2200	CuZn10		CuZn10	CuZn10	L90		CZ101	C22000	CuZn10
N	3	423202		CuZn15	CuZn15	CuZn15	P-CuZn15	C2300	CuZn15		CuZn15	CuZn15	L85	CuZn15	CZ102	C23000	CuZn15
N	3	423203		CuZn20	CuZn20	CuZn20		C2400	CuZn20		CuZn20	CuZn20	L80	CuZn20	CZ103	C24000	CuZn20
N	3	423210		CuZn30	CuZn30	CuZn30	P-CuZn30	C2600	CuZn30		CuZn30	CuZn30	L70	CuZn30	CZ106	C26000	CuZn30
N	4	423212		CuZn33		CuZn33	P-CuZn33	C2680	CuZn33		CuZn33	CuZn33	L68				CuZn33
N	3	423213		CuZn36	CuZn37	CuZn36	P-CuZn37	C2720	CuZn37		CuZn37	CuZn37	L63	CuZn37	CZ108	C27400	CuZn37

ISO 513	Sottogruppo / Subgroup	Equivalenti esteri / International equivalents																
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E	
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE		
N	4	423214		CuZn35Pb1	CuZn35Pb1	CuZn35Pb2	P-CuZn35Pb2	C3501	CuZn36Pb1,5		CuZn36Pb1,5	CuZn36Pb1,5	LS63-2		CZ 118	C34000	CuZn35Pb2	
	4	423220		CuZn40	CuZn40	CuZn40	P-CuZn40	C2801	CuZn40		CuZn40	CuZn40	L60		CZ109	C28000	CuZn40	
	4	423221		CuZn37Pb1	CuZn37Pb1	CuZn39Pb0,8	P-CuZn39Pb1	C3501	CuZn39Pb0,5				LS60-1	CuZn40Pb	CZ123	C36500	CuZn40Pb	
	4	423222		CuZn38Pb1	CuZn39Pb1			C3710	CuZn38Pb1,5		CuZn38Pb1,5	CuZn38Pb1	LS 59-1	CUZN38Pb1	CZ129	C37000	CuZn39Pb1	
	4	423223		CuZn39Pb2	CuZn40Pb2	CuZn39Pb2	P-CuZn40Pb2	C3771	CuZn40Pb2		CuZn40Pb2		LS 60-2	CuZn40Pb2	CZ 120	C37700	CuZn39Pb2	
	4	423231			CuZn39AlFeMn		CuZn39Al1FeMn1	C6782	CuZn40Al1		CuZn39Al1Fe1Mn1	CuZn37Al					CuZn39Al1FeMn	
	4	423234		CuZn40Mn2Fe1					CuZn40Mn2		CuZn40Mn1,5		Lmc58-2		CZ136			
	4	423237		CuZn38Sn1AS	CuZn38Sn1	CuZn38Sn1	P-CuZn39Sn1	C4640	CuZn38Sn1		CuZn38Sn1	CuZn39Sn	LO60-1		CZ 112	C46400	CuZn38Sn1	
	4	423256			CuNi15Zn21	CuNi15Zn22					CuNi15Zn21		MNC15-20		NS105		CuNi15Zn21	
	4	423303		CuZn16Si4-C				SzBC2	G-CuZn15Si4		CuZn16Si3,5		LC15K4			C87500		
	4	423311		CuZn25Al5Mn4Fe3-C	CuZn25Al6Fe3Mn3	CuZn19Al6 Y20		HBsC4	G-CuZn25Al5				LC23AŹ3Mc			C86200	CuZn25Al6FeMn3	
	3	423313		CuZn33Pb2-C	CuZn33Pb2	CuZn33Pb-Y20	G-CuZn34Pb2	YBsC2	G-CuZn33Pb					CuZn33Pb2	SCB3		CuZn33Pb	
	3	423319					G-CuZn40											
	4	423320														C86500		
	4	423321		CuZn37Al1-C		CuZn40 Y40	G-CuZn38Pb2	YBsC3	G-CuZn37Al1				LC40S	CuZn39Pb2Al	DCB1	C85800	CuZn40Pb	
	4	423322		CuZn32Al2Mn2Fe1-C	CuZn35AlFeMn	CuZn30AlFeMn	G-CuZn38Al1Fe1Mn1	HBsC1	G-CuZn34Al2		CuZn38Al2Mn1Fe			CuZn35AlFeMn	HTB1	C86400	CuZn35AlFeMn	
	1	424002		AW-Al99,8 (A)	Al99,8 (A)	1080A	P-Al99,8	1080A	Al99,8		Al99,8	Al99,8	AD000		1080A		Al-99,8 (A)	
	1	424003		AW-Al99,7	Al99,7	1070A	P-Al99,7	1070	Al99,7		Al99,7	Al99,7	AD00	Al99,7			Al-99,7	
	1	424004		AW-EAl99,5	E-Al99,5				E-Al		Al99,5E	E-Al	ADOE	EAl99,5	1350	1350	Al 99,5E	
	1	424005		AW-Al99,5	Al99,5	1050A	P-Al99,5	1050	Al99,5		Al99,5	Al99,5	ADO	Al99,5	1050A	A91060	Al-99,5	
	2	424201		AW-AlCu4MgSi	AlCuMgSi	2017A	P-AlCu4MgMnSi	2017	AlCuMg1		AlCuMg1	AlCuMg1	D1			A92017	Al-4CuMg	
	2	424203		Al-P2024	AlCu4Mg1	2024	P-AlCu4,4MgMn	2024	AlCuMg2		AlCu4Mg2	AlCuMg2	D16		2024	2024	Al-4Cu1Mg	
	2	424206									AlCu2SiMn		AK6					
	2	424218		AW-AlCu2Mg1,5Ni		2618A		2618			AlCu2Mg2Ni1		AK-1		2618A	A92618	Al-2CuMgNi	
	2	424222		Al-P7075	AlZn6MgCu	7075	P-AlZn5,8MgCuCr	7075	AlZnMgCu1,5		AlZn6Mg2Cu	AlZnMgCu1,5	V95		7075	A97075	Al-6ZnMgCu	
	2	424237		AW-AlSi12,2MgCuNi		4032	P-AlSi12MgCuNi	4032								A94032	Al-12SiNi	
	2	424253				2024-F	P-AlCu4,5MgMnplacc.		AlCuMg2pl				D16P			AlcladA9024		
	2	424254		AW-AlCu4PbMg	AlCu4PbMg	2030			AlCuMgPb									
	2	424315			Al-Cu4Ni2Mg2	A-U4NT	G-AlCu4NiMg	AC5A	G-AlCu4NiMg				AL1		AlCu4Ni2Mg2	A02420	Al-4Cu2NiMg	
	2	424330		AC-AlSi12(a)	Al-Si12	A-S12U	G-AlSi13CuMn	AC3A	G-AlSi11		AlSi11	GAlSi12	AK12	AlSi12Cu	LM20	A04130	Al-12Si1Cu	
	2	424331		AC-AlSi10Mg (A)	Al-Si10Mg	A-S10G	G-AlSi9Mg	ADC3	G-AlSi10Mg		AlSi9Mg	G AlSi10Mg	AK9	AlSi10Mg		A-0359.0		
	2	424332		AC-AlSi7Mg	Al-Si7Mg(FE)	A-S7G	G-AlSi7Mg				AlSi7Mg		AK7	AlSi7MgFe	LM25	A03560	Al-7SiMg	
	2	424336		AC-AlSi12CuNiMg		A-S11UNG		AC8A			AlSi13Mg1CuNi		AK12M2MgN		LM13		Al-12SiNi	
	2	424337				A-S9GU												
	2	424357			Al-SiCu3	A-S5U3G	G-Al5,5Cu	AC2A	G-AlSiCu4		AlSiCu4	GAlSi6Cu4	AK5M4	AlSi6Cu4	LM21	A03080	Al-6Si4Cu	
	2	424361				A-U8S										A02130	Al-7CuSi	
	2	424380											Al 5					
	2	424386				A-S18UNG		AC9A							LM28			
	1	ONZ 424400		Al-P6082	AlSi1MgMn	6082	P-AlSi1MgMn	6061	AlMgSi1		AlSi1MgMn	AlMgSi1	AD35	AlSi1MgMn	6082	A96061	Al-1SiMgMn	
	1	ON 424406		AW-Al99,98Mg0,5					AlRMg0,5									
	1	424412		AW-AlMg2	AlMg2	5052	P-AlMg2,5	5052	AlMg2,5		AlMg2	AlMg2,5	AlMg2	AlMg2,5	5251	A95052	Al-2,5Mg	
	1	424413		AW-AlMg3	AlMg3	5154 A	P-AlMg3,5	5154	AlMg2,7Mn		AlMg3	AlMg3	AMg3	AlMg3	5454	A95154	Al-3Mg	
	2	424415		AW-AlMg4	AlMg4,5Mn0,7	5183	P-AlMg4,4	5082	AlMg4,5		AlMg4,5Mn	AlMg4,5Mn	AMg4,5	AlMg4,5Mn	5083	A95083	Al-5Mg	
	1	ONZ 424432		AW-AlMn1	AlMn1	3103	P-AlMn1,2Cu	3003	AlMn1		AlMn1	AlMn	Amc	AlMn	3103	A93003	Al-1Mn	
	2	424515		AC-AlMg5Si	AlMg5Si1	A-G6			G-AlMg5Si		AlMg5Si1		AMg5K	AlMg5Si	LM5			
	2	424518																
	2	424519		AC-AlMg9	AlMg10	A-G10SY4		ADC5	GD-AlMg9				AMg10		LM10	A05200		

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CONFRONTO DI MATERIALI LAVORATI - GRUPPO S
COMPARISON OF MACHINED MATERIALS - GROUP S

ISO 513	Subgroup	Equivalenti esteri / International equivalents																
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E	
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE		
S	2	Uranus B6				Z2NCDU25-20			X1NiCrMoCu25 20 5	1.4539				2562		904 L,UNSV0890A		
	2	Z8NCTV25-15BFF				E-Z 6 NCTDV 25.15			X5NiCrTi 2615	1.4980				2570		660		
	2	Incoloy 800 HT				Z10NC32-21			X10NiCrAlTi3221	1.4876						B 163		
	2	G-X40NiCrSi38 18					XG50NiCr39 19	SCH15	G-X40NiCrSi38 18	1.487					330C11			
	2	X5NiCrAlTi 31 20							X5NiCrAlTi 31 20	1.496						N 08330		
	2	X12NiCrSi 36 16				Z12NCS35-16	F-3313	SUH330	X12NiCrSi 36 16	1.4864						330		
	2	X2NiCrAlTi 32 20							X2NiCrAlTi 32 20	1.456					NA 15	N 08800		
	2	X1NiCrMoCu 32 28 7							X1NiCrMoCu 32 28 7	1,456						N 08831		
	2	X1NiCrMoCuN 31 27 4				Z1NCDU31-27-03			X1NiCrMoCuN 31 27 4	1.4563				2584		N08028		
	2	A -286							X 5 Ni CrTi 25 15							AMS 5732 - 5737		
	2	X40CoCrNi20 20				Z42CNKDWNb			X40CoCrNi20 20	1,498								
	3	Ni70Cu30			NiCu30	NiCu32Fe1,5Mn			NiCu30Fe		NiCu30		NMZMc28-2,5-1,5					
	3	NiFe17CuCr							NiFe16CuCr									
	3	NiFe48							NiFe47		NiFe49Pr							
	3	NiCr21Mo16Al														ALLOY 59		
	3	NiCr21Mo16W														INCONEL alloy 686		
	3	NiCrCo18Ti														NIMONIC alloy 90 (HEV6)		
	3	NiCo20Cr15MoAlTi														NIMONIC alloy 105		
	3	NiMoCr15W				NiMo16Cr16										UNS N10276		
	3	NiCr22Mo9Nb				NC22DNb												
	3	CoCr23Ni10W7Ta4														MAR-M509		
	3	Hastelloy C-4							NiMo16CrTi	2,461								
	3	Hastelloy X				NC22FeD				2.4603						AMS 5754		
	3	Hastelloy B				ND37FeV			S-NiMo30	2.4800						AMS 5396		
	3	Hastelloy C & C 276				ND16C15			G-NiMo30	2.481						AMS 5750		
	3	Nimonic C-263								2.4650								
	3	Nimonic 90				Nc20ATV			NiCr20Co18Ti	2.4632								
	3	Nimonic PE 13				NC22FeD			NiCr22Fe18Mo	2.4665						AMS 5754 E		
	3	Nimonic 115				NCK15ATD			NiCo15Cr15MoAlTi	2.4636								
	3	Nimonic 263/C263				NCK20D			NiCr15Co19MoTi	2.4650								
	3	Nimonic 105				NCKD20ATV			NiCo20C15MoAlTi	2.4634								
	3	Nimonic PK33				NC19KDUV			NiCr20Co16MoTi									
	3	Nimonic 80A_				NC20TA			NiCr20TiAk	2.4631			EI –437 B		HR401,601	UNS N07080		
	3	Nimonic 901				ZSNCDT42			NiCr15MoTi	LW2 4662						AMS 5661 A		
	3	Nimonic PK 25				NKOD20ATU			NiCr18CoMo	2.4666						AMS 5753		
	3	Nimonic PE 16				NW11AC			NiFe33Cr17Mo									
	3	Nimonic 75				NC20T			NiCr20Ti	2.4630					HR5,203-4			
	3	Nimocast 842				NC13AD			S-NiCr13Al6MoNb	LW2.4670						SAE 5391 A		
	3	Inconel 600				NC15Fe			NiCr15Fe	2.4816						AMS 5665		
	3	Inconel 601							NiCr23Fe	2.4851						AMS 5715		
	3	Inconel 617			-	-	-		-		-	-	-	-		N06617		
	3	Inconel 625				NC22FeDNB			NiCr22Mo9Nb	2.4856						5666		
	3	Inconel 690				NC 30 Fe			NiCr29Fe	2.464								
	3	Inconel 706				38C16NBT										AMS 5702		
	3	Inconel 713				NC12AD			S-NiCr13Al6MoNb	LW2.4670						AMS 5391		
	3	Inconel 718				NC19FeNB			NiCr19Fe19NbMo	LW2.4668					HR8	AMS 5589		
	3	Inconel 722				NC16FeTi			NiCr16FeTi							AMS5541		
	3	Inconel X-750				NC15FeTNbA										AMS 5667		
	3	Inconel X-750				NC16FeTNb			NiCr16FeTi	2.4669						AMS 5582		
	3	Inconel 751							NiCr16Fe7TiAl	2,469								
	3	Incoloy 825				NC21FeDU			NiCr21Mo	2.4858								
	3	Incoloy 901				ZSNCDT42			NiFe35Cr14MoTi	LW2.4662						AMS 5660		
	3	René 41				NC19KDT			NiCr19Co11MoTi	2.4973						AMS 5399		
	3	René 95				NC14K8												

ISO 513	Sottogruppo/Subgroup	Equivalenti esteri / International equivalents																
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E	
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE		
S	3	Monel 400				NU30			NiCu30Fe	2.4360								
	3	Monel K-500				NU 30 AT			NiCu30Al	2.438					NA 18	4676		
	3	Udimet 500				NCK19DAT			NiCr18Co18MoTi	2.4983						AMS 5751		
	3	Udimet 710				NCK18TDA												
	3	Udimet 700				NCK20AT			NiCo15CrMoAlTi	2.4636								
	3	Udimet 718				NC19FeN			NiCr19Fe19NbMo	LW2.4668						5383		
	3	Udimet 720				NC18K15TDA												
	3	Waspaloy				NC20K14			NiCr19Fe19NbMo	LW2.4668						AMS 5544		
	4	Haynes 25				KC20WN				LW2.4964						AMS 5759		
	4	Haynes 188				KC22WN										AMS 5772		
	4	Air Resist 213			-	KC20WN	-		CoCr20W15Ni		-	-	-	-		5537C		
	4	Jetalloy 209			-	KC22WN	-		CoCr22W14Ni		-	-	-	-		AMS 5772		
	1	Ti 1 Pd							Ti 1 Pd	3,723					TP 1	R 52250		
	1	TiAl 3 V 2.5							TiAl 3 V 2.5	3,720								
	1	TiAl6V4ELI							TiAl6V4ELI						TA11	AMS R56401		
	1	TiAl5Sn2.5				T-A5E			TiAl5Sn2.5	3.7115					TA14/17	AMS R54520		
	1	TiAl5Sn2							TiAl5Sn2	3,712								
	1	TiAl6Sn2Zr4Mo2Si							TiAl6Sn2Zr4Mo2Si	3,715						R 54620		
	1	TiAl6V4				T-A6V			TiAl6V4	3.7165					TA10-13/TA28	AMS R56400		
	1	TiAl6V6Sn2							TiAl6V6Sn2	3,718								
	1	TiAl4Mo4Sn2Si0,5				T-A4DE			TiAl4Mo4Sn2Si0,5	3,719					TA 45-51/TA 57			

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Sottogruppo / Subgroup	Equivalenti esteri / International equivalents															
	CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E
	ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE	
H 4	12 010.4	10	2C10	C10	XC10	C10	S9CK	C10	1.1121	10	RC12	08	1265	045A10	Gr. 1010,1011,M1010	C10k
4	12 020.4	15	C15E	C15E4	C18RR	C15		C15	1.1141				1370-40	080M15	Gr.1016	C16k
4	12 023.4	15	C15E	C15E4	XC15	C15	S15C	C15	1.1141	15	RC15	15		040A15	Gr.1015	
4	12 024.4	20	C 22	C 25	XC 18	C 21	S 22C	C 22	1.0402	20		20	1450	070M20	1020	
4	12 071.4		1 CS67		C 68	C 67	S 70C-CSP	Ck 67				65		080A67	Gr.1070	
4	14 100.4	G Cr15	100Cr6	Type 1-0	100C6	100Cr6	SUJ 2	100Cr6		LH 15		Šch 15	2258	534A99	52100	F.1311
4	14 109.4	GCr 15	100Cr6	Type 1-0	100Cr6	100Cr6	SUJ 2	100Cr6	1.3505	LH 15		ŠCh15	2258	535 A99	52100	100Cr6
4	14 120.4	15Cr	15Cr2	37Cr4	12C8		SCr 415	15Cr3	1.7015	15 H		15Ch		523M15	5015	
4	14 209.4	Cr9SiMn	100CrMn6	TYPE 3	100CM6		SUJ3	100CrMn6	1.3520	LH15SG		ŠCh15SG		535A99	Gr.2	100CrMn6
4	14 220.4	15CrMn	16MnCr5	TYPE 5	16MC5	16MnCr5		16MnCr5	1.7131	15HG		18ChG	2127	527M17	No.5115	16MnCr5
4	14 221.4	20CrMn	20MnCr5	Type 7	20MC5	20MnCr5	SMnC 420 H	20MnCr5	1.7147	18HGT		18ChG			5120	F.150.D
4	14 223.4											18ChGT				
4	14 231.4											30ChGT				
4	14 260	60Si2CrA			54SiCr6	48Si7	SUP7	54SiCr6	1.7102	60S2		60S2ChA	2090	250A61	9260	
4	15 340.4	38CrMoAl			40CAD 6.12	41CrAlMo7	SACM 645	41CrAlMo7	1.8509	38HMJ		38Ch2MJuA		905M39	Cl. A	41CrAlMo7
4	16 220.4	12CrNi2	15NiCr6		16NC6	16CrNi4		15CrNi6	1.5713	15HN		12ChN2	2512	815M17	Gr.4320	16NiCr4
4	16 231.4				20NC6	20CrNi4		19CrNi8				20Ch2N4A		822M17	3120	
4	16 420.4				13NiCr14		SNC815	14NiCr14	1.5752			12Ch2N4A		655H13	E3310X	
4	16 532.4									30HGSNA		30ChGSN2A				
4	16 720.4									18H2N4WA		18Ch2N4MA				
3	17 023.4	3Cr13	X30Cr13	Type 5	Z30Cr13	X30Cr13	SUS420J2	X30Cr13	1.4028	3H13		30Ch13	2304-03	420S45	Type 420	2304-03
3	17 024.4	4C13	X39Cr13	Type 6	Z40C13	X40Cr14		X39Cr13	1.4031	4H13		40Ch13		X39Cr13	Type 420	X39Cr13
3	17 029.4								1.4034							
4	17 042.4									H18		95Ch18			440 C	
4	19 083.4				Y342			C45W3	1.1730		K945					F5131
4	19 103.4				Y355		SK7	C60W3	1.1740	N5	K960					
4	19 125.9				Y3 65		SK 7	C67W	1.1744	N6						
4	19 132.4	T 7	CT 70	C 70 U	C70 E2U	C 70 KU	SK 6	C 70 W2		N7	K 970	U7-1			W 1-7	F.5103
4	19 133.4	T7	CT70	C70U	Y170	C70KU	SK6	C70W	1.1620	N7	K970	U7				C70U
4	19 152.4	T8	CT80	C80U	Y180	C80KU	SK5	C80W2	1.1625	N8	K980	U8-1		BW1A	W1Gr.A	C80U
4	19 191.4	T10A	CT105	C105U	C105E2U	C100KU	SK3	C105W1	1.1645	N10E	K990	U101	1880	BW1B	W5	C102U
4	19 192.4	T 10	CT 105	C 90 U	C 105 E2U	C 100 KU	SK 3	C 105 W2		N 10	K990	U 10-1			W 110	F.5117
4	19 221.4	T11	CT120	C120U	Y2120	C120KU		C110W2	1.1654	N12	K990	U12-1		BW1C		F-5123
4	19 255.4		CT 120	TC 120	C120 E3U	C120 KU	SK 2	C125 W	1.1663	N 12	K 995	U 13-1			W 112	C120 U
4	19 312.4		90MnV8	90MnCrV8	90MnV8	90MnVCr8KU		90MnCrV8	1.2842	NMV	K720	9G2V		B02	02	90 MnCrV 8
4	19 313.4		90MnV8	90MnCrV8	90MnV8	90MnVCr8 KU		90MnCrV8		NMV	K 720	9GF2		BO 2	02	90MnCrV8
4	19 340.4		60SiMn7		60Si8	56SiMn7 KU		70SI7					No 22			
4	19 356.4		100 V2	TCV 105	C 105 E2 UV1	102 V2 KU	SKS 43	100 V1	1.2833	NV	K 760			BW 2	W 210	100 V2
4	19 418.4							80CrV5		NCV 1		8Ch				80CrV2
4	19 419.4							80CrV2		NCV 1		8Ch				80CrV2
4	19 420.4	Cr 06			Y2 140 C		SKS 8	140Cr2	1.2008	NC 5	K 205	13Ch				140Cr2
4	19 421.4		107CrV3			107CrV3KU		115CrV3	1.2210		K510				L2	120CrV2
4	19 422.4							145Cr6		NC 6	K 505					
4	19 423.4						SKC 11	90Cr3	1.2056			9ChF			L 2	
4	19 426.4	9CV2						85Cr7			K 201	9Ch1				
1	19 434.4		X21Cr13		X20Cr13	X21Cr13KU		X20Cr13 1.2082	1.2082							X20Cr13 F5261
3	19 435.4		X41Cr13	X40Cr14	X40Cr14	X41Cr13KU	SUS 420 J2	X42Cr13		4H13		40Ch13	2314	420S45		F.5263
4	19 436.4		X210Cr12	C210Cr12	Z200C12	X205Cr12KU	SKD1	X210Cr12	1.2080	NC11	K100	Ch12		BD3	D3	X210Cr12
4	19 437.4		X210CrW 12-1	X210CrW12	X210CrW 12-1	215CrW 12-1 KU		X210CrW12					2313			2313
4	19 452.4				Y60SC7			58SiCr8	1.2103		K244					
4	19 487.4							21MnCr5	1.2162							
1	19 501		100CrMo7		100CD7	100CrMo7	SUJ4	100CrMo7	1.2303						L7	F.520.F
4	19 501.4		100CrMo7		100CD7	100CrMo7	SUJ4	100CrMo7	1.2303						L7	F.520.F
3	19 512.4				45CDV6	35CrMo8 KU		48CrMoV 6 7								

CONFRONTO DI MATERIALI LAVORATI - GRUPPO H
COMPARISON OF MACHINED MATERIALS - GROUP H

CONFRONTO DI MATERIALI LAVORATI - GRUPPO H
COMPARISON OF MACHINED MATERIALS - GROUP H

ISO 513	Subgroup	Equivalenti esteri / International equivalents															
		CZ	PRC	EU	ISO	F	I	J	D	D	PL	A	RUS	S	GB	USA	E
		ČSN	GB	EN	ISO	AFNOR	UNI	JIS	DIN	W.-nr	PN	ONORM	GOST	SS	BS	AISI/SAE	
H	3	19 520.4		35CrMo8	35CrMo7	40CrMnMo8	35CrMo8KU		40CrMnMo7		WLB						40CrMnMo7
	1	19 541.4		30CrMoV12-11	32CrMoV12-28	32CDV12-28	30CrMoV12-27KU	SKD7	X32CrMoV33	1.2365	WLV	W320	3Ch3M3F		BH10	H10	30CrMoV12
	3	19 552.4	4Cr5MoSiV	X37CrMoV5-1	X37CrMoV5 1	Z38CDV5	X37CrMoV51KU	SKD6	X38CrMoV5.1	1.2343	WCL	W300	4Ch5MFS		BH11	H11	X37CrMoSiV5
	3	19 553.9	4Cr5MoSiV	X37CrMoV5-1	X37CrMoV5 1	Z38CDV5	X37CrMoV51KU	SKD6	X38CrMoV5.1	1.2343	WCL	W300	4Ch5MFS		BH11	H11	
	3	19 554.4	4Cr5MoSiV1	X40CrMoV511	40CrMoV5 1	X40CrMoV5	X40CrMoV511KU	SKF61	X40CrMoV51	1.2344	WCLV	W302	4Ch5MF1S	2214	BH 13	H13	X37CrMoSiV5
	4	19 561.4														H 42	
	4	19 571.4	Cr5Mo1V	X100CrMoV 5 1	X100CrMoV5	Z100CDV5	X100CrMOV51KU	SKD 12	X100CrMoV 5 1		NCLV	K 305	9Ch5VF	2260	BA 2	A 2	F.5227
	4	19 581.4														A7	
	4	19 614.4							55NiCr11	1.2719		K 606		2551			F.5224
	1	19 642.4		40NiCrMoV16			40NiCrMoV16 KU		35NiMo16			W 502			BP 30		35NiCrMo16
	3	19 655.4		40NiCrMo16	45NiCrMo16	40NCDV16	40NiCrMoV16KU		X45NiMo4II1.2	1.2767		K 600					
	3	19 662.4	5CrNiMo	55NiCrMoV7		55NCDV7	44NiCrMoV7 KU	SKT 4	55NiCrMoV6	1.2711	WNL	W 502	5ChNM		BH 224/5	L 6	F.520.S
	1	19 675.4							28NiCrMoV10	1.2740							
	1	19 678							28NiMo17	1.2747							
	1	19 678.4							28NiMo17	1.2747							
	4	19 710.4	W					SKS 7M	120 W 4	1.2414	NW 1	K 405				F 1	F.5238
	4	19 712.4							110WCrV5				ChV6				
	4	19 714.4						SKS 11	X 130W5			K 400	ChV 4F			F 2	
	1	19 720.4	30W4Cr2VA	X30WCrV 5 3	30WCrV5	X32WCrV5	X30WCrV 5 3KU	SKD 4	30WCrV 5.3			W 105					
	1	19 721.4	3Cr2W8V	X30WCrV93	X30WCrV9-3	Z30WCV9	X30WCrV93KU	SKD5	X30WCrV9.3	1.2581	WWW	W100	3Ch2V8F		BH21	H21	X30WCrV9
	1	19 723.4									WWN 1	W-103			BH 21A		
	4	19 732.4		45WCrSiV8	50WCrV8	45WCV20	45WCrV8KU		45WCrV7	1.2542	NZ2	K450	50ChV2SF	2710	BS1	S1	45 WCrSiV8
	4	19 733.4		55WCrV8	60WCrV8	55WC20	55WCrV8 KU		60WCrV7		NZ 3	K 455	5ChV2S		BS 1	S 1	60WCrSiV8
	1	19 740.4							30 WCrV 151	1.2564	WWS 1	W 106					F.527
	4	19 802.4						SKH6	S 12-1-2	1.3318	SW12		R12F3				
	4	19 810.4				Z130WV 13.4			S 12-1-4	1.3302	SW12		R9F5				
	4	19 824.4	W18Cr4V	HSv18-0-1	HS 18-0-1	Z80WCV18-04-01	HS 18-0-1	SKH 2	HS 18-0-1	1.3355	SW18	S 200	R18	2750	BT1	T1	HS 18-0-1
	4	19 830.4	W6Mo5Cr4V2	HS 6-5-2	HS 6-5-2	Z85WDCV06-05-04-02	HS 6-5-2	SKH51	HS 6-5-2	1.3343	SW7M	S600	R6M5	2722	BM2	M2	HS 6-5-2
	4	19 852.4	W6Mo5Cr4V2Co5	HS 6-5-2-5	HS 6-5-2-5	Z85WDKCV06-05-04-02	HS 6-5-2-5	SKH55	HS 6-5-2-5	1.3243	SK5M	S705	R6M5K5	2723	BM35		HS 6-5-2-5
	4	19 855.4	W18Cr4VCo4	HS18-1-1-5		Z 80WKCV 18-05-04-01	HS 18-1-1-5	SKH 3	HS 18-1-2-5			S 305	R18k5F2		BT 4	T 4	F.5530
	4	19 856.4											R9K5				
	4	19 858.4	W12Cr4V5Co5	HS12-1-5-5	HS12-1-5-5	HS 12-1-5-5	HS12-1-5-5	SKH 10	HS 12-1-4-5	1.3202	SK 5V	S 308	R13F4K5		BT 15	T 15	HS12-1-5-5
	4	19 861.4		HS 10-4-3-10		Z130WKCDV	HS 10-4-3-10	SKH57	HS 10-4-3-10	1.3207	SK10V	S700	R12F3K10M3-Š	2736	BT42		HS 10-4-3-10
	4	42 2880.6											JuND4				
	4	42 2881.6											JuND8				
	4	42 2887.6							AlNiCo18/9								
	4	42 2891.6							AlNiCo 3515				JuN14DK25A				
	4	42 2893.6							AlNiCo 30/10								
	4	42 2895.6							AlNiCo44/5				JuN13DK24S				
	4	42 2992.4											R9				
	2	422478											ŽČCh3				
	2	422483									ZlSi15		ČS15		Si14	Gr.1	
	2	422484											ŽČJu30				
	2	422491											ŽČCh16				
	2	G-X 260 NiCr 4 2							G-X 260 NiCr 4 2	0,962				0512-00	Grade 2 A	Ni-Hard 2	
	2	G-X 330 NiCr 4 2							G-X 330 NiCr 4 2	0,963				0513-00	Grade 2 B	Ni-Hard 1	
	2	G-X 260 NiCr 4 2							G-X 260 NiCr 4 2	0,962				0512-00	Grade 2 A	Ni-Hard 2	
	2	G-X 330 NiCr 4 2							G-X 330 NiCr 4 2	0,963				0513-00	Grade 2 B	Ni-Hard 1	
	2	G-X 300 CrNiSi 9 5 2							G-X 300 CrNiSi 9 5 2	0,963						Ni-Hard 4	
	2	G-X 300 CrMo 15 3							G-X 300 CrMo 15 3	0,964							
	2	G-X 300 CrMoNi 15 2 1							G-X 300 CrMoNi 15 2 1	0,964							
	2	G-X 260 CrMoNi 20 2 1							G-X 260 CrMoNi 20 2 1	0,965							
	2	G-X 260 Cr 27							G-X 260 Cr 27	0,965				0466-00	Grade 3 D	A 532 III A 25% Cr	

NOTE
NOTES

TABELLA DI CONVERSIONE DELLE DUREZZE
HARDNESS CONVERSION TABLE

Carico di rottura Strength [MPa]	Durezza / Hardness			
	BRINELL	VICKERS	ROCKWELL	ROCKWELL
R_m	HB	HV	HRB	HRC
285	86	90	1190	-
320	95	100	56,2	-
350	105	110	62,3	-
385	114	120	66,7	-
415	124	130	71,2	-
450	133	140	75,0	-
480	143	150	78,7	-
510	152	160	81,7	-
545	162	170	85,8	-
575	171	180	87,1	-
610	181	190	89,5	-
640	190	200	91,5	-
675	199	210	93,5	-
705	209	220	95	-
740	219	230	96,7	-
770	228	240	98,1	-
800	238	250	99,5	-
820	242	255	-	23,1
850	252	265	-	24,8
880	261	275	-	26,4
900	266	280	-	27,1
930	276	290	-	28,5
950	280	295	-	29,2
995	295	310	-	31,0
1030	304	320	-	32,2
1060	314	330	-	33,3
1095	323	340	-	34,4
1125	333	350	-	35,5
1155	342	360	-	36,6

Carico di rottura Strength [MPa]	Durezza / Hardness			
	BRINELL	VICKERS	ROCKWELL	ROCKWELL
R_m	HB	HV	HRB	HRC
1190	352	370	-	37,7
1220	361	380	-	38,8
1255	371	390	-	39,8
1290	380	400	-	40,8
1320	390	410	-	41,8
1350	399	420	-	42,7
1385	409	430	-	43,6
1420	418	440	-	44,5
1455	428	450	-	45,3
1485	437	460	-	46,1
1520	447	470	-	46,9
1555	456	480	-	47,7
1595	466	490	-	48,4
1630	475	500	-	49,1
1665	485	510	-	49,8
1700	494	520	-	50,5
1740	504	530	-	51,1
1775	513	540	-	51,7
1810	523	550	-	52,3
1845	532	560	-	53,0
1880	542	570	-	53,6
1920	551	580	-	54,1
1955	561	590	-	54,7
1995	570	600	-	55,2
2030	580	610	-	55,7
2070	589	620	-	56,3
2105	599	630	-	56,8
2145	608	640	-	57,3
2180	618	650	-	57,8

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