

SOEW

HiFEED

06410 | 06690 | 06815

*New high feed solution
for high productivity milling*



Cutters

- Excellent solution for roughing operations.
- Improved cutters for reduced vibration & maximum process reliability.
- High volume of metal removal.
- Very high productivity machining and modern machining technique.

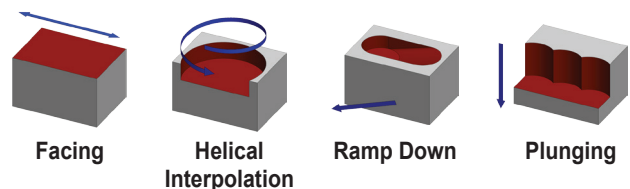
Inserts

- New insert geometry for high feed applications.
- Positive inserts with 4 cutting edges with superior chip evacuation.
- Available 3 insert dimensions (08, 13 & 16).
- Precise position and cutting edge quality.
- Improved possibility of ramping down applications.

Specifications

- Geometry: 10/15° roughing operations.
- Cutter diameters:
 - Weldon Shank (W): Ø20 till Ø32.
 - Arbor Mounting (A): Ø50 till Ø160.
 - Threaded Coupling (R): Ø20 till Ø42.
- Workpiece materials: Steels, stainless steel, cast iron & HRSA.

Applications



Facing

Helical Interpolation

Ramp Down

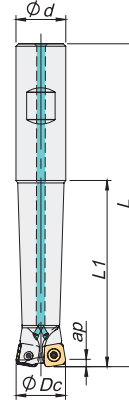
Plunging

06410 Cutters

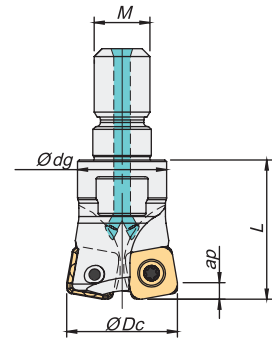


$K_r = 10^\circ$ | $\gamma_p = +2^\circ$ | $\gamma_f = +2^\circ$ | $R_p = 2,0$

Weldon Shank



Threaded Coupling

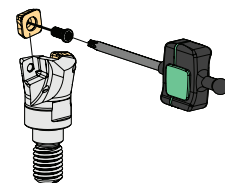
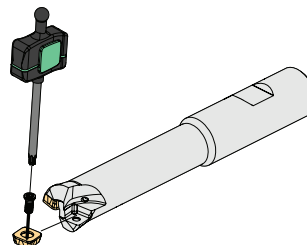


	Order Code	Reference	⊕	Dimensions (mm)					Kg	Specifications		Insert	Stock
				ØDc	Ød/M	Ødg	L	L1		a _p (mm)	α		
Weldon	181076300	020W06410-02-02-020130	2	20	20	-	130	75	0,360	1,0	17,5	SOEW 080310	⊕
	181080900	020W06410-02-02-020190	2	20	20	-	190	110	0,340	1,0	17,5	SOEW 080310	⊕
	181076400	025W06410-03-02-025140	3	25	25	-	140	80	0,410	1,0	9,5	SOEW 080310	⊕
	181081100	025W06410-03-02-025200	3	25	25	-	200	130	0,570	1,0	9,5	SOEW 080310	⊕
	181076500	032W06410-04-02-032150	4	32	32	-	150	90	0,760	1,0	5,5	SOEW 080310	⊕
	181081300	032W06410-04-02-032200	4	32	32	-	200	130	1,010	1,0	5,5	SOEW 080310	⊕
Threaded	181071900	020R06410-02-02-M10025	2	20	M10	16	25	-	0,040	1,0	17,5	SOEW 080310	⊕
	181076600	025R06410-03-02-M12028	3	25	M12	21	28	-	0,070	1,0	9,5	SOEW 080310	⊕
	181076700	032R06410-04-02-M16035	4	32	M16	29	35	-	0,160	1,0	5,5	SOEW 080310	⊕
	181076800	035R06410-04-02-M16035	4	35	M16	29	35	-	0,180	1,0	4,5	SOEW 080310	⊕
	181076900	042R06410-05-02-M16035	5	42	M16	29	35	-	0,220	1,0	3,5	SOEW 080310	⊕

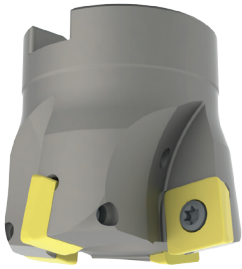
⊕ Stock items / Itens de stock ○ Available under request / Disponibilidade sob consulta / Disponible bajo consulta

Screws & Keys

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value
W06410 – 20-32	P0300800	XT09	1,4
R06410 – 20-42	P0300800	XT09	1,4

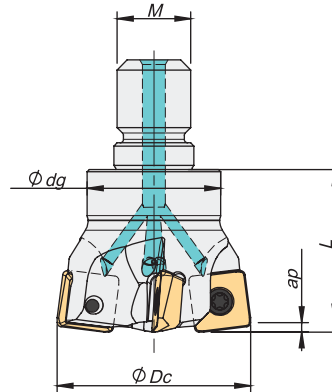


06690 Cutters

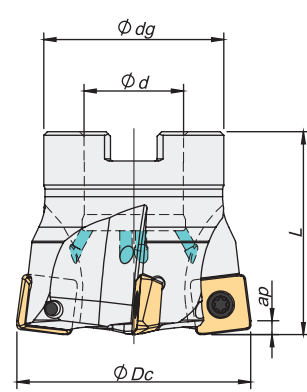


$K_r = 15^\circ$ | $\gamma_p = +5^\circ$ | $R_p = 2,5$

Threaded Coupling



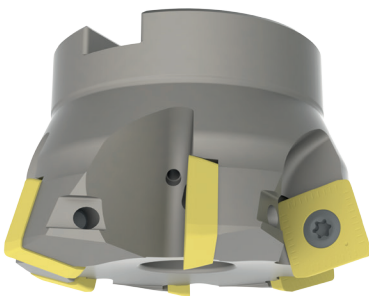
Arbor Mounting



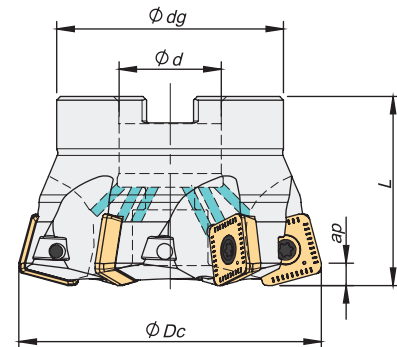
	Order Code	Reference	⊕	Dimensions (mm)				Kg	Specifications		Insert	Stock
				ϕ_{Dc}	$\phi_{d/M}$	ϕ_{dg}	L		Arbor Type	a_p (mm)		
Threaded	181038700	032R06690-03-05-M16035	3	32	M16	29	35	0,160	-	2,0 / 1,5	SP... 13... / SO... 13...	⊕
	181064600	035R06690-03-05-M16035	3	35	M16	29	35	0,180	-	2,0 / 1,5	SP... 13... / SO... 13...	⊕
	181038800	042R06690-04-05-M16035	4	42	M16	29	35	0,210	-	2,0 / 1,5	SP... 13... / SO... 13...	⊕
Arbor	181069100	050A06690-04-05-022045	4	50	22	40	45	0,290	A	2,0 / 1,5	SP... 13... / SO... 13...	⊕
	181029800	052A06690-04-05-022045	4	52	22	40	45	0,300	A	2,0 / 1,5	SP... 13... / SO... 13...	⊕
	181033500	063A06690-05-05-027050	5	63	27	48	50	0,520	A	2,0 / 1,5	SP... 13... / SO... 13...	⊕
	181029900	066A06690-05-05-027050	5	66	27	48	50	0,570	A	2,0 / 1,5	SP... 13... / SO... 13...	⊕
	181030000	080A06690-06-05-027050	6	80	27	60	50	0,970	A	2,0 / 1,5	SP... 13... / SO... 13...	⊕

* Note: These type of cutters can be used for SPKW & SPKT inserts.

06815 Cutters



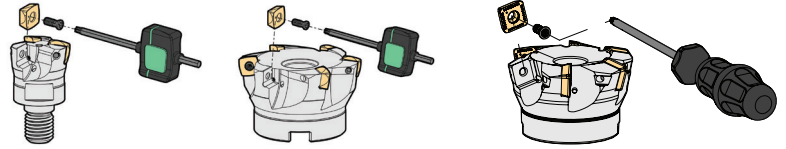
$K_r = 15^\circ$ | $\gamma_p = +2^\circ$ | $R_p = 4,5$



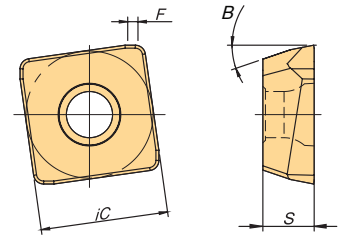
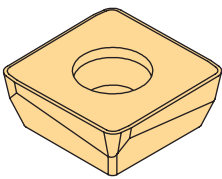
	Order Code	Reference	⊕	Dimensions (mm)				Kg	Specifications			Insert	Stock
				ϕ_{Dc}	ϕ_d	ϕ_{dg}	L		Arbor Type	a_p (mm)	α		
	181081900	066A06815-05-02-027050	5	66	27	48	50	0,500	A	3,5	3,0	SOEW 160512	⊕
	181082000	080A06815-06-02-027050	6	80	27	60	50	0,900	A	3,5	2,0	SOEW 160512	⊕
	181082100	100A06815-08-02-032050	8	100	32	80	50	1,600	B	3,5	1,5	SOEW 160512	⊕
	181082200	125A06815-10-02-040063	10	125	40	90	63	2,900	B	3,5	1,0	SOEW 160512	⊕
	181082300	160A06815-12-02-U040063	12	160	40	110	63	4,400	C	3,5	0,5	SOEW 160512	⊕

Screws & Keys

Cutter ØDc	Insert Screw	Key (Torx)	Torque Value Nm
R06690 – 32-42	P0401200	XT15	3,0
A06690 – 50-80	P0401200	XT15	3,0
A06815 – 66-160	P0501200	PT20	5,0



SOEW 080310, 13M510 & 160512 Inserts



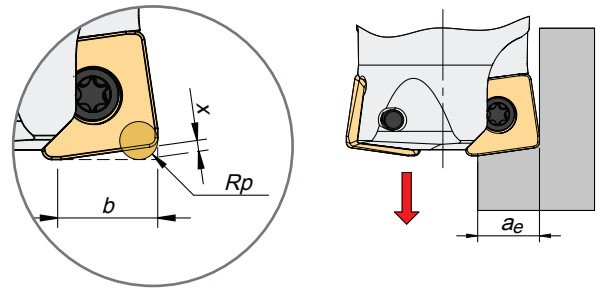
(1) Geometry Code	(2) Grade Code	Grades																				Dimensions (mm)						
		P						M				K					N			S						H		
		64	54	68	66	I5	78	86	68	66	I5	54	68	66	I5	D2	67	10	10	D6	54	68	78	64	D4	iC	S	F
1111884	SOEW 080310 S	⊗	⊗	⊗				⊗			⊗	⊗								⊗	⊗				8,60	3,47	1,0	13°
1111906	SOEW 13M510 S	○	⊗				⊗				○	⊗								○	⊗				12,43	5,00	1,0	17°
1111907	SOEW 160512 S		⊗	⊗	⊗	⊗	⊗			⊗	⊗														16,40	5,26	1,5	13°

⊗ Stock items / Itens de stock ○ Available under request / Disponibilidade sob consulta / Disponible bajo consulta

Insert Order Code = (1) Geometry Code + (2) Grade Code

Programing Data

Insert	Programing Data			
	R_p	x	b	a_e
8	2,0	0,8	6,8	6,3
13	2,5	1,1	10,5	10,0
16	4,5	2,3	13,5	12,8



Rec. Cutting Conditions

ISO	HB (Brinell)	V_c (m/min)				f_z (mm/t)			
		PH6910	PH6920	PH6125	PH6740	Size 8	Size 13	Size 16	
P	Unalloyed Steel	125 - 220	160 - 280	150 - 230	140 - 220	100 - 170	0,4 - 1,8	0,5 - 2,2	0,6 - 2,5
	Low-Alloyed Steel	220 - 280	150 - 230	140 - 220	130 - 180	90 - 160	0,4 - 1,8	0,5 - 2,2	0,5 - 2,5
	High-Alloyed Steel	280 - 380	140 - 190	130 - 180	100 - 170	80 - 140	0,3 - 1,5	0,4 - 2,0	0,5 - 2,0
M	Stainless Steel	200 - 330	-	100 - 190	-	70 - 140	0,4 - 1,3	0,5 - 1,8	0,5 - 1,8
K	Cast Iron	130 - 250	160 - 350	150 - 310	-	120 - 250	0,5 - 1,8	0,5 - 2,2	0,5 - 2,5
S	Heat Resistant Super Alloys	200 - 320	20 - 90	20 - 80	-	-	0,4 - 1,0	0,5 - 1,5	0,5 - 1,5

Note: The cutting speed and feed should be set up to 70% to 80% of the value shown in the above table when overhang length of the tools exceeds 3D.

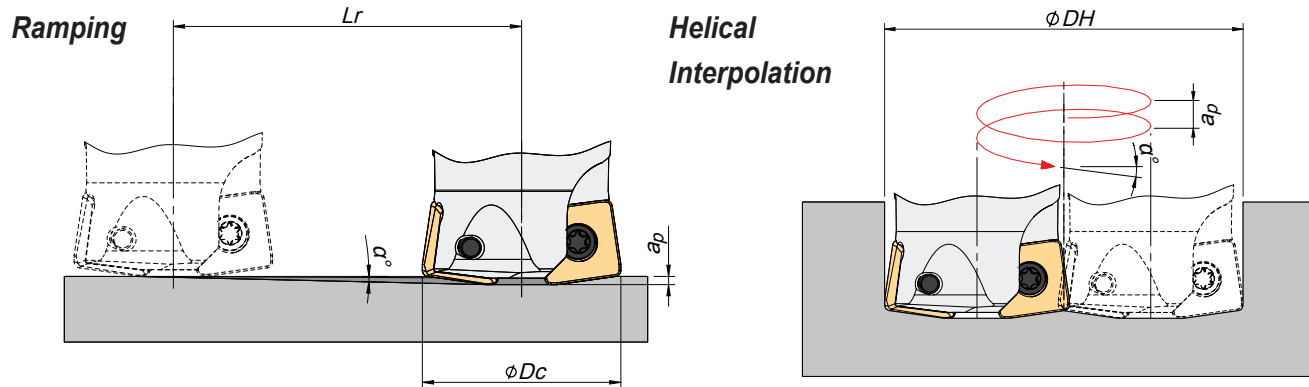
Grades Selection Guide

ISO	HB (Brinell)	PH6910	PH6920	PH6125	PH6740	
		●	●	●	●	
P	Unalloyed Steel	★	☆	☆		★ : 1° Choice ☆ : 2° Choice ● : Good Conditions ● : Average Conditions ● : Difficult Conditions
	Low-Alloyed Steel	☆	★	☆		
	High-Alloyed Steel	☆	★			
M	Stainless Steel		☆		★	
K	Cast Iron	★	☆			
S	Heat Resistant Super Alloys	☆	★			

Grades Specifications

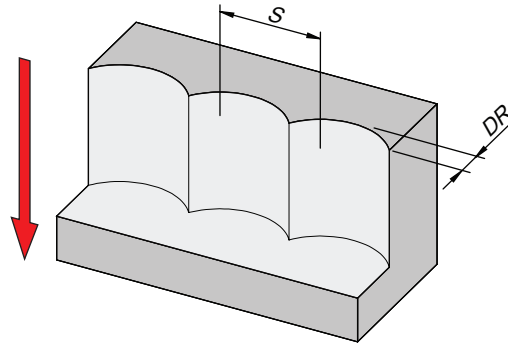
Grades	Information
PH6910	PVD coated carbide with micro-grain substrate for light milling of steels or for hardened steels. Excellent for cast iron and high temperature alloys.
PH6920	Coated carbide grade for high cutting speed applications, excellent solution for massive production with stable conditions.
PH6125	PVD coated carbide for light to heavy milling (wet and dry) in steel. Endures high temperature applications. Excellent grade for milling mould steels at high productivity.
PH6740	PVD (TiAlN SN) large thickness coated grade for heavy roughing applications. Can work on all type of materials and endures a lot of vibration.

Ramping & Helical Interpolation



Insert Size	Ø Dc	Ramping			Helical Interpolation		
		Max. Ramp α°	Max. a_p	Min. Lr	Ø DH (min)	Ø DH (max)	Max. Pitch/Rev.
8	20	17,5	1,0	3,,2	26,4	-	6
					-	38	17
	25	9,5	1,0	6,0	36,4	-	5
					-	48	12
	32	5,5	1,0	10,4	50,4	-	5
					-	62	9
35	4,5	1,0	12,7	56,4	-	5	
				-	68	8	
42	3,5	1,0	16,3	70,4	-	5	
				-	82	7	
13	32	14,0	1,5	6,0	43	-	8
					-	62	23
	35	9,0	1,5	9,5	49	-	6
					-	68	16
	42	6,4	1,5	13,4	63	-	7
					-	82	14
	50	4,3	1,5	19,9	79	-	6
					-	98	11
52	4,0	1,5	21,5	83	-	6	
				-	102	10	
63	3,0	1,5	28,6	105	-	6	
				-	124	10	
66	2,6	1,5	33,0	111	-	6	
				-	130	9	
80	2,0	1,5	43,0	139	-	6	
				-	158	8	
16	66	3,0	3,5	66,8	105	-	6
					-	129,6	10
	80	2,0	3,5	100,2	133	-	5
					-	157,5	8
	100	1,5	3,5	133,7	173	-	6
					-	197,5	8
125	1,0	3,5	200,5	223	-	5	
				-	247,5	6	
160	0,5	3,5	401,1	293	-	3	
				-	317,5	4	

Plunging



L ≤ 3 D _C			L > 3 D _C			S Max.
Feed f_z (mm/t)			Feed f_z (mm/t)			
Insert Size 8	Insert Size 13	Insert Size 16	Insert Size 8	Insert Size 13	Insert Size 16	$S_{max.} = \sqrt{D_c \cdot a_e - a_e^2}$
0,08 - 0,15	0,10 - 0,20	0,10 - 0,20	0,05 - 0,10	0,07 - 0,14	0,07 - 0,14	

S Máx. and DR corresponding Cutting Diameter D _C (mm)																	
DR (mm)	D _C (mm)																
	Insert Size 8					Insert Size 13						Insert Size 16					
	20	25	32	35	42	32	35	42	50	52	63	66	80	66	80		
1,0	4,4	4,9	5,6	5,8	6,4	5,6	5,8	6,4	7,0	7,1	7,9	8,1	8,9	8,1	8,9		
2,0	6,0	6,8	7,7	8,1	8,9	7,7	8,1	8,9	9,8	10,0	11,0	11,3	12,5	11,3	12,5		
3,0	7,1	8,1	9,3	9,8	10,8	9,3	9,8	10,8	11,9	12,1	13,4	13,7	15,2	13,7	15,2		
4,0	8,0	9,2	10,6	11,1	12,3	10,6	11,1	12,3	13,6	13,9	15,4	15,7	17,4	15,7	17,4		
5,0	8,7	10,0	11,6	12,2	13,6	11,6	12,2	13,6	15,0	15,3	17,0	17,5	19,4	17,5	19,4		
6,0	9,2	10,7	12,5	13,2	14,7	12,5	13,2	14,7	16,2	16,6	18,5	19,0	21,1	19,0	21,1		
7,0						13,2	14,0	15,7	17,3	17,7	19,8	20,3	22,6	20,3	22,6		
8,0						13,9	14,7	16,5	18,3	18,8	21,0	21,5	24,0	21,5	24,0		
9,0						14,4	15,3	17,2	19,2	19,7	22,0	22,6	25,3	22,6	25,3		
10,0						14,8	15,8	17,9	20,2	20,5	23,0	23,7	26,5	23,7	26,5		
11,0														24,6	27,5		
12,0														25,5	28,6		

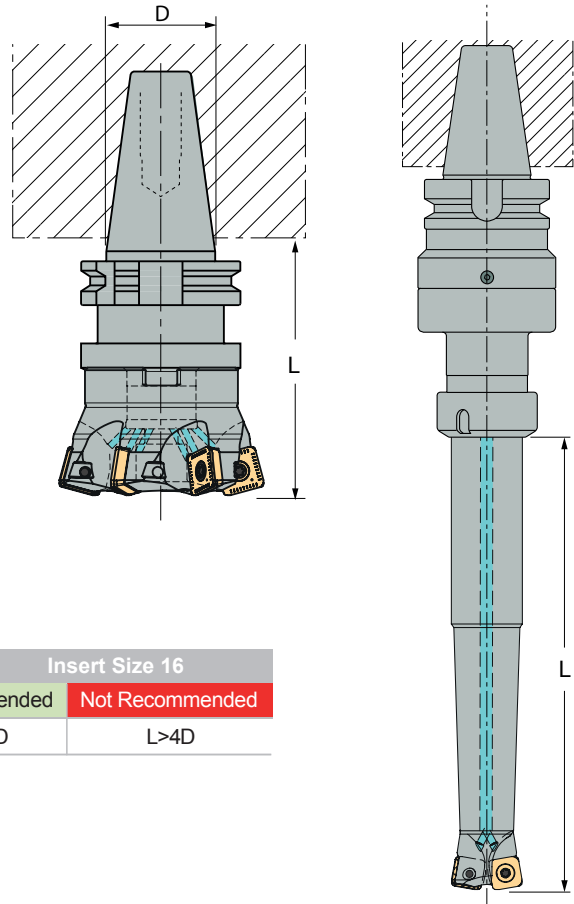
Note: Recommended for L<4 D_C for extra long tool this step and side cut must be reduced.

Tool Overhang

The overhang of a milling tool is an important factor of the tool stiffness and machining stability. The tool overhang being 5% less reduces the tool deflection by 15%, 10% less – by 27% and 20% less – already by 50%. Minimizing the overhang substantially improves operational efficiency, allowing for increased cutting conditions and good surface finish.

Generally, in case of the milling cutters mounted on arbors, the correct way is to measure the overhang for the whole assembly, which is to say from the gauge line (D) of the arbor shank (Figure on the left).

For the weldon shanks that are clamped into holders with spring collets or adapter-style holders with side screws, the overhang is measured from the holder (Figure on the right). Please check the table below to see our recommendations.



Insert Size 8		Insert Size 13		Insert Size 16	
Recommended	Recommended	Recommended	Recommended	Recommended	Not Recommended
L < 4D	L > 4D	L < 4D	L > 4D	L < 4D	L > 4D

* for L => 4D a_p must be less than 2 mm.

Case Studies

40CrMnNiMo6 (1.2738)		40CrMnNiMo6 (1.2738)	
Mould Cavity $D_c = 80$ 6 Flutes $V_c = 180$ m/min ($n=721$ min ⁻¹) $f_z = 1$ mm/t ($V_f=4300$ mm/min) $a_p \times a_e = 2,5 \times 56$ mm Dry SOEW 160512 S PH6920 Tool Overhang: L = 300 mm Tool Life Time: 120 min		Mould Cavity $D_c = 80$ 6 Flutes $V_c = 150$ m/min ($n=597$ min ⁻¹) $f_z = 1,7$ mm/t ($V_f=6100$ mm/min) $a_p \times a_e = 1,0 \times 56$ mm Dry SOEW 13M510 S PH6920 Tool Overhang: L = 350 mm	
HiFEED 068	Metal removal rate 602cm ³ /min	HiFEED 066	Tool life time 90 min per edge
Competitor A	Metal removal rate 240cm ³ /min	Competitor B	Tool life time 55 min per edge
[Competitor A] $D_c = 8$ 6 Flutes $V_c = 180$ m/min ($n=721$ min ⁻¹) $f_z = 1$ mm/t ($V_f=4300$ mm/min) $a_p \times a_e = 2,5 \times 56$ mm	[User Comments] Before the a_p could not be increased due to limit geometry, but with HiFEED 068 can be increased and the productivity improved by 3 times.	[Competitor B] $D_c = 8$ 6 Flutes $V_c = 180$ m/min ($n=597$ min ⁻¹) $f_z = 1,7$ mm/t ($V_f=6100$ mm/min) $a_p \times a_e = 1,0 \times 56$ mm	[User Comments] This solution allow us to increase the time per edge and reduce machining costs.

