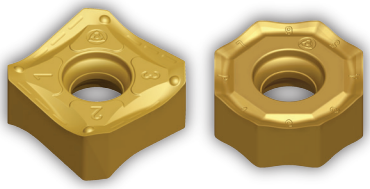
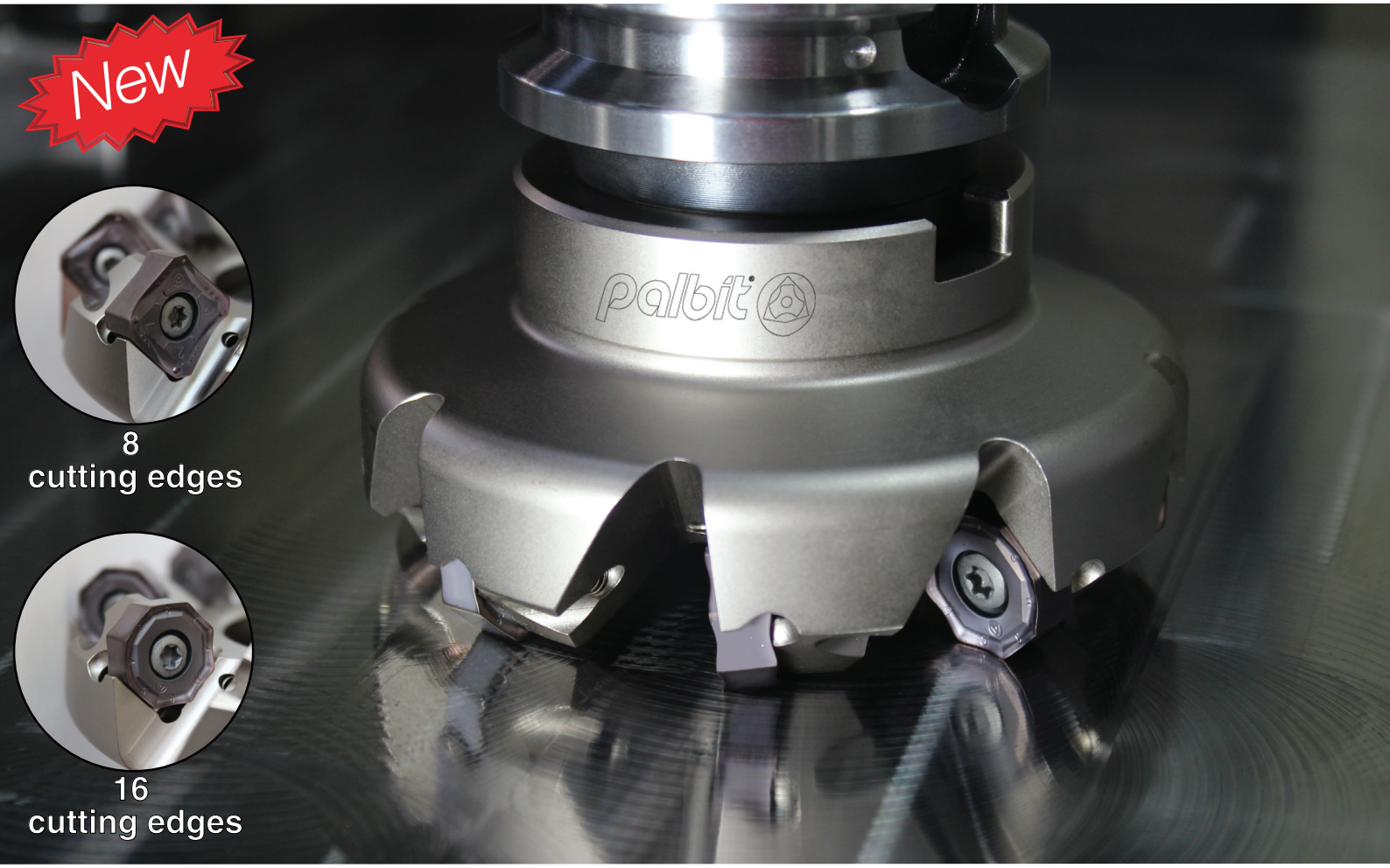


PLUS

91245 | SNHX 1606.. & ONHX 0606..

General purpose solution for face milling



Cutters

- Cutters designed to use SNHX 1606.. & ONHX 0606.. inserts.
- Maximum depth of cut 8,5mm with 45º entering angle.
- Excellent surface finishing.
- High productivity & cost-efficiency.
- Available in different pitch cutters.

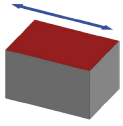
Inserts

- Insert with high rake angle allows a positive setting on the tool for lower cutting forces.
- Innovative chip breaker design for improved tool life and better chip evacuation.
- Positive helical cutting edge for smooth cutting and low power consumption.

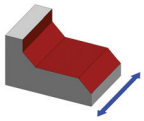
Specifications

- Geometry: 45º face milling.
- Cutter diameters:
  - Arbor Mounting (A): Ø63 till Ø250
- Workpiece materials: Steel, stainless steel, cast iron & HRSA.

Applications

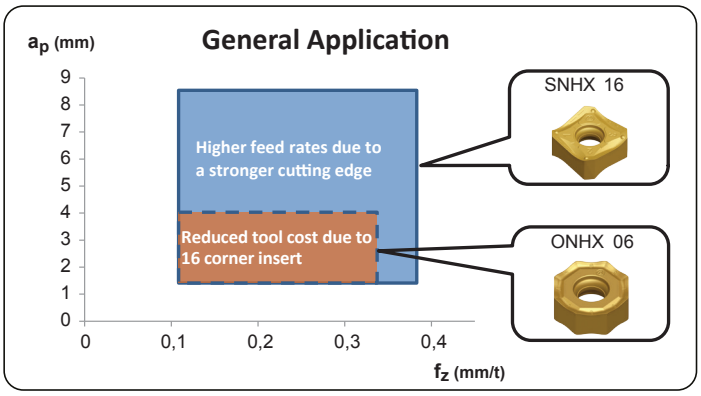


Facing

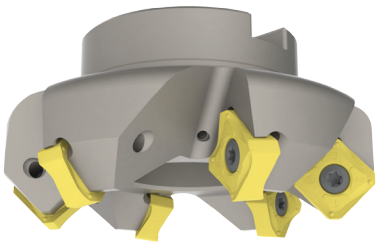


Slanted Shoulder & Chamfer

General Field Application

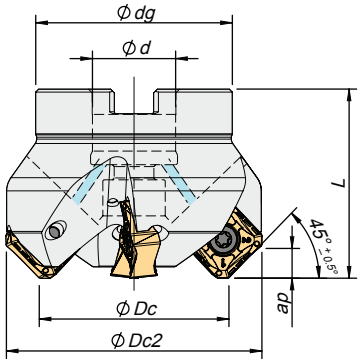


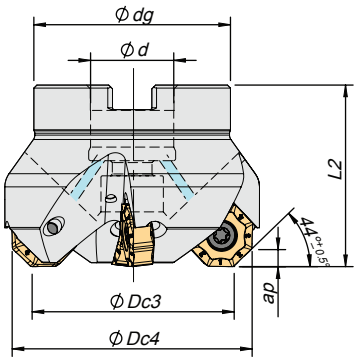
91245 Cutters



$K_r = 45°$
$\gamma_p = -6°$

Arbor Mounting



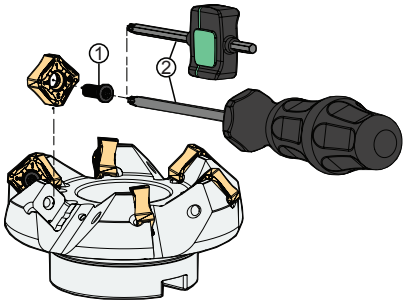


Order Code	Reference		Dimensions (mm)								Kg	Specifications		Stock
			ØDc	ØDc2	ØDc3	ØDc4	Ød	Ødg	L	L2		Style	Max. a_p (mm)	
181088900	063A91245-05-06-022050	5	63	80,1	66,6	76	22	52	50	48	0,81	A		◎
181089000	080A91245-06-06-027050	6	80	97,1	83,6	93	27	60	50	48	1,06	B		◎
181089100	080A91245-08-06-027050	8	80	97,1	83,6	93	27	60	50	48	1,09	B	SNHX 8,5	◎
181089200	100A91245-07-06-032063	7	100	117,1	103,6	113	32	80	63	61	2,24	B		◎
181089300	100A91245-10-06-032063	10	100	117,1	103,6	113	32	80	63	61	2,28	B		◎
181089400	125A91245-08-06-040063	8	125	142,1	128,6	138	40	90	63	61	3,04	B	ONHX 3,8	◎
181089500	160A91245-10-06-U040063*	10	160	177,1	163,6	173	40	110	63	61	4,40	C		◎
181089600	200A91245-12-06-U060063*	12	200	217,1	203,6	213	60	172	63	61	9,12	C		◎
181089700	250A91245-14-06-U080063*	14	250	267,1	253,6	263	60	172	63	61	11,93	C		◎

◎ Stock itens / Itens de stock ○ Available under request / Disponibilidade sob consulta / Disponible bajo consulta

* Cutters without internal coolant supply

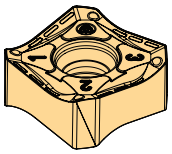
Screws & Keys



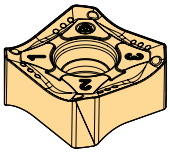
Item	1	2		Order Separately	
Cutter ØDc	Insert Screw	Key (Torx)	Torque Value	Screw	DIN 6368 Wrench
A91245 – 63	P0451400	XT20	5,0	-	-
A91245 – 80	P0451400	XT20	5,0	J0123510	SD6368-12
A91245 – 100	P0451400	PT20	5,0	J0164110	SD6368-16
A91245 – 125	P0451400	PT20	5,0	J0204610	SD6368-20
A91245 – 160 - 250	P0451400	PT20	5,0	-	-

SNHX 1606.. & ONHX 0606.. Inserts

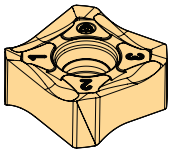
SNHX - LP



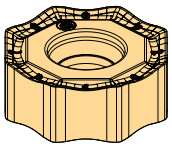
SNHX - MP



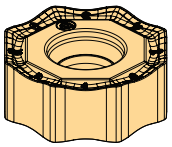
SNHX - MK



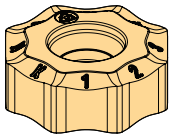
ONHX - LP



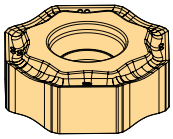
ONHX - MP



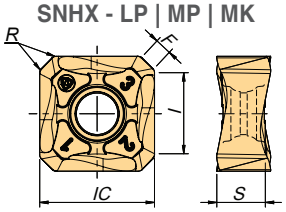
ONHX - MK



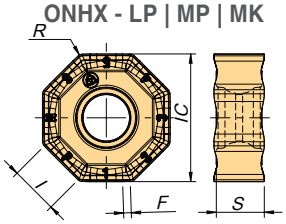
ONHX - W



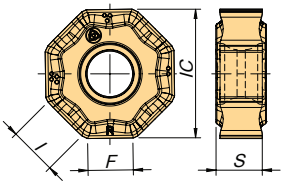
SNHX - LP | MP | MK



ONHX - LP | MP | MK



ONHX - W



		P						M		K					S			Dimensions (mm)				
	(2) Grade Code	54	68	66	78	86	I5	68	I5	L5	L9	68	D2	I5	54	68	I5					
(1) Geometry Code	ISO	PH6910	PH6920	PH6930	PH6125	PH6135	PH6740	PH6920	PH6740	PH5705	PH5740	PH6920	PH6705	PH6740	PH6910	PH6920	PH6740	IC	S	I	F	R
1111951	SNHX 1606 ANER-LP		◉				◎	◎	◉			◎		◎		◎	◉	16,5	6,35	12,5	2,2	0,8
1111952	SNHX 1606 ANER-MP		◉				◎					◎		◎				16,5	6,35	12,5	2,2	0,8
1111953	SNHX 1606 ANER-MK										◉							16,5	6,35	12,5	2,2	0,8
1111954	ONHX 0606 ANEN-LP		◉				◎	◎	◉			◎		◎		◎	◉	16,5	6,35	6,2	1,0	0,8
1111955	ONHX 0606 ANEN-MP		◉				◎					◎		◎				16,5	6,35	6,2	1,0	0,8
1111956	ONHX 0606 ANEN-MK									◉	◎							16,5	6,35	6,2	1,0	0,8
1112053	ONHX 0606 ANEN-W*		◉							◉		◎						16,5	6,35	6,2	6,0	-

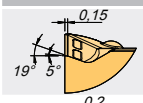
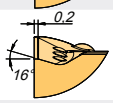
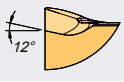
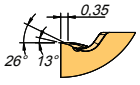
*Wiper insert with 4 rights and 4 left-hand cutting edges

◉ First choice / 1ª escolha / 1ª opción

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

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

Chip Breakers

Chip Breaker	Cutting Edges	Features
Geometry **LP** Light machining of steels		Positive top rake angle to promote a good chip flow and reduce power consumption on low alloy steels.
Geometry **MP** General machining of steels		Chip-breaker with a reinforced chanfer for general applications on steels.
Geometry **MK** General machining of cast irons		Angles optimized for greater stability and durability of the edge in the machining of cast irons.
Geometry **W** Wiper		Chip-breaker wiper for the best finishing solutions.

Grades Selection Guide

ISO		HB (Brinell)	Grades (Wear Resistance ← → Toughness)			
			PH5705	PH6920	PH5740	PH6740
P	Unalloyed Steel	125 - 220		✓		✓
	Low-Alloyed Steel	220 - 280		✓		✓
	High-Alloyed Steel	280 - 380		✓		✓
M	Ferritic / Martensitic	200 - 330		✓		✓
	Austenitic / Duplex	200 - 330		✓		✓
	Duplex	230 - 260		✓		✓
K	Malleable Cast Iron	130 - 230	✓		✓	
	Grey Cast Iron	180 - 245	✓		✓	
	Nodular Cast Iron	160 - 250	✓		✓	
S	Heat Resistant Super Alloys	200 - 320		✓		✓

Rec. Cutting Conditions

ISO		HB (Brinell)	Feed f_z (mm/t)		Chip Breaker
			SNHX 16..	ONHX 06..	
P	Unalloyed Steel	125 - 220	0,20 - 0,40	0,15 - 0,30	LP
	Low-Alloyed Steel	220 - 280	0,20 - 0,40	0,15 - 0,30	LP | MP
	High-Alloyed Steel	280 - 380	0,20 - 0,35	0,15 - 0,25	MP
M	Ferritic / Martensitic	200 - 330	0,15 - 0,30	0,15 - 0,30	LP
	Austenitic / Duplex	200 - 330	0,15 - 0,30	0,15 - 0,25	LP
	Duplex	230 - 260	0,10 - 0,25	0,10 - 0,20	LP
K	Malleable Cast Iron	130 - 230	0,20 - 0,45	0,15 - 0,30	MK
	Grey Cast Iron	180 - 245	0,20 - 0,40	0,15 - 0,30	MK
	Nodular Cast Iron	160 - 250	0,20 - 0,35	0,10 - 0,25	MK
S	Heat Resistant Super Alloys	200 - 320	0,10 - 0,18	0,10 - 0,18	LP

The table above indicates the Feed range (Min | Max) per tooth. For apply these values you must decrease or increase the Vc.

ISO		HB (Brinell)	Vc (m/min)				Feed f_z (mm/t)
			PH5705	PH6920	PH5740	PH6740	
P	Unalloyed Steel	125 - 220	-	180 **(250)** 300	-	150 **(180)** 200	0,40 **(0,25)** 0,15
	Low-Alloyed Steel	220 - 280	-	140 **(180)** 220	-	130 **(150)** 180	0,40 **(0,25)** 0,15
	High-Alloyed Steel	280 - 380	-	130 **(150)** 180	-	100 **(130)** 160	0,40 **(0,25)** 0,15
M	Ferritic / Martensitic	200 - 330	-	100 **(140)** 180	-	100 **(120)** 150	0,30 **(0,20)** 0,10
	Austenitic / Duplex	200 - 330	-	-	-	80 **(100)** 120	0,30 **(0,20)** 0,10
	Duplex	230 - 260	-	-	-	70 **(90)** 110	0,30 **(0,20)** 0,10
K	Malleable Cast Iron	130 - 230	170 **(190)** 305	-	150 **(170)** 260	-	0,40 **(0,25)** 0,15
	Grey Cast Iron	180 - 245	180 **(280)** 350	-	155 **(190)** 290	-	0,40 **(0,25)** 0,14
	Nodular Cast Iron	160 - 250	130 **(160)** 210	-	115 **(140)** 180	-	0,40 **(0,25)** 0,14
S	Heat Resistant Super Alloys	200 - 320	-	30 **(40)** 75	-	20 **(35)** 50	0,10 **(0,15)** 0,17

(1) The above table indicates the cutting conditions of 70% of the tool engagement.
(2) With low worpiece clamping rigidity or long overhang of the tool, adjust cutting speed and feed to 70 or 80% of the recommended conditions above.
(3) Wet cutting using internal coolant is recommended for heat resistant alloys.
(4) Surface finishing is determined by speed/feed used.

Selection example:

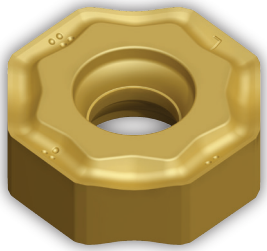
ISO		HB (Brinell)	Vc (m/min)				Feed f_z (mm/t)
			PH5705	PH6920	PH5740	PH6740	
K	Malleable Cast Iron	130 - 230	170 **(190)** 305	-	150 **(170)** 260	-	0,40 **(0,25)** 0,15
	Grey Cast Iron	180 - 245	180 **(280)** 350	-	155 **(190)** 290	-	0,40 **(0,25)** 0,14
	Nodular Cast Iron	160 - 250	130 **(160)** 210	-	115 **(140)** 180	-	0,40 **(0,25)** 0,14

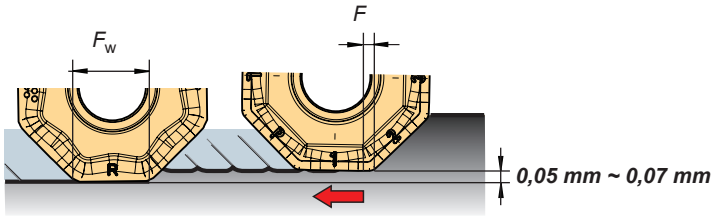
This example shows the recommended starting cutting conditions, indicated in **Bold type**.

Grades

Grades	Information
New PH5705	MT-CVD coated carbide grade with a hard substrate and very smooth surface. Ideal for high speed cutting of cast irons.
PH6920	Coated carbide grade for high cutting speed applications, excellent solution to massive production with stable conditions.
New PH5740	Substrate grade binary (Wc & Co) with medium grain size combined with the medium temperature coating. Suitable for heavy roughing to roughing operations of cast irons with interruped cut at medium to low cutting speeds.
PH6740	PVD coated carbide grade with large thickness coated grade for heavy roughing applications. Can work in all type of materials and endures a lot of vibration.

Wiper Inserts Guide





Features

Excellent surface finishing can be achieved with the combination of standard inserts and one or more wiper inserts. Wiper inserts can be used in the most materials to produce a good surface finishing, even under unfavorable conditions. The feed per revolution can be increased four times the normal. When using larger cutter diameters with higher number of inserts, it becomes essential to use wiper inserts to obtain a good surface finish.

Rec. Cutting Conditions

- F_w at least 40% larger than f_n (f_n=f_z x Z);
- Axial depth of cut is 0,5 - 0,8 mm;

Example:

- The width of the parallel land (*F*) of the insert is 2 mm.
- With a cutter of 10 inserts and using a feed per tooth (f_z) of 0,3 mm, the feed per revolution (f_n) will be 3 mm, i.e. 33% bigger than the parallel land.
- To obtain a good surface finish, the feed per revolution should be a maximum of 80% of 2 mm = 1,6 mm.
- The wiper insert will have a parallel land (F_w) with a width of approximately 7,6 mm.
- Result: Feed per revolution (f_n) could be increased from 1,6 mm to 60% of 7,6 mm = 4,56 mm.

Note: Other limitations, such as machine power and clamping workpiece, must be taken into consideration.

How to use a wiper insert

- Since wiper is one corner use for standard cutters, please attach the insert with the parallel land down to the workpiece cutting surface;
- **The points and the letter (R or L) on the insert indicates the side that should be parallel to the workpiece material.**
- **The side work of the insert it's indicated by the letter (R - Right & L - Left).**

Case Studies - Improved productivity and Tool Life / Shortened Machining Time

C45W (1.1730)

Face Milling

D_c = 80 | 6 Flutes

V_c = 300 m/min (n=1194 min^{-1})

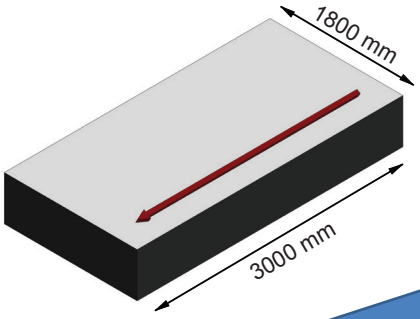
f_z = 0,25 mm/t (Vf=1791mm/min)

a_p x a_e = 3,0 x 56 mm

Dry

ONHX 0606 ANEN-LP PH6920

Tool Life Time: 80 min



Productivity improved 30%

PLUS 91245	1 workpiece done
Competitor A	3/4 of the workpiece

[Competitor A]

D_c = 80 | 6 Flutes

V_c = 160 m/min (n=637 min^{-1})

f_z = 0,2 mm/t (Vf=764mm/min)

a_p x a_e = 2,5 x 56 mm

[User Comments]

Reduction costs are now a reality with this solution and machining time per part was also reduced.

Grey Cast Iron ENGJL / 250

Face Milling

D_c = 80 | 6 Flutes

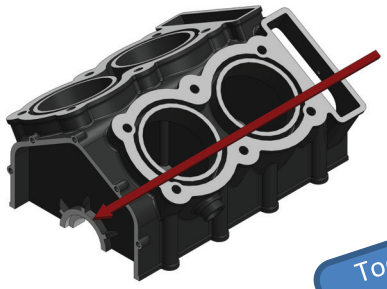
V_c = 300 m/min (n=1194 min^{-1})

f_z = 0,25 mm/t (Vf=1791mm/min)

a_p x a_e = 2,5 x 56 mm

Dry

ONHX 0606 ANEN-MK PH5705



Tool life time improved 300%

PLUS 91245	Tool life time 70 min per edge
Competitor B	17 min

[Competitor B]

D_c = 80 | 6 Flutes

V_c = 300 m/min (n=1194 min^{-1})

f_z = 0,25 mm/t (Vf=1791mm/min)

a_p x a_e = 2,5 x 56 mm

[User Comments]

This solution allow us to increase the time per edge and reduce machining costs.

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