



SINCE 1977



2023.09

UFO MILL®

Simple _ Speed _ Smart



Design of UFO Mill

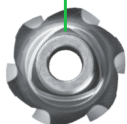
Taper polygon + Centralizing cylinder



Taper Polygon



▶ Taper polygon



▶ Centra cylinder concentricity:
 $\pm 0.005\text{mm}$



● All grinded milling head



The UFO MILL patented taper polygon design enhances the tight fit of insert joint.

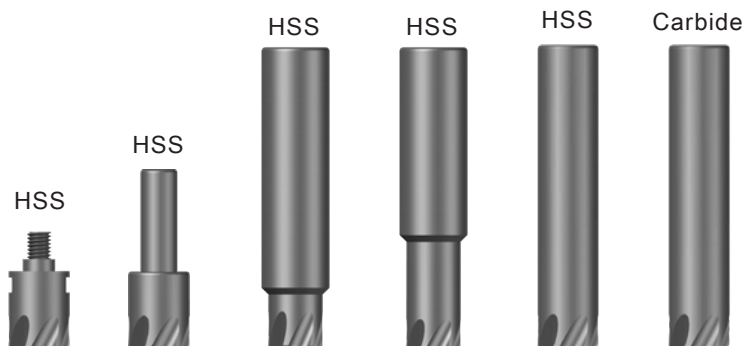
It gives a better resistance to the impacts from prolonged machining and solves the cutter slippery issue.

The robust tri-face contact design makes the machining stable and durable.

Tri-face contact design



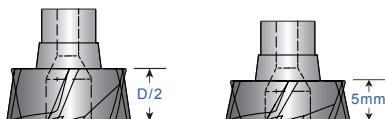
Design of UFO Mill



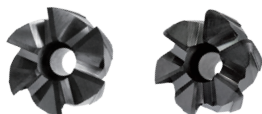
288 different carbide heads
48 different patented shanks
1938 different combinations

Square Milling Heads

3B (M/ME/E)



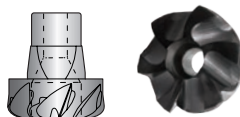
Ø10 - 25



R0 / R0.5 / R1.0 / R1.5 / R2.0

High Feed Milling Heads

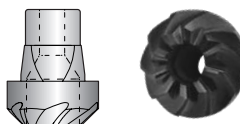
3BH Ø10 - 25



R0.6 / R0.8

High Feed Chamfer Milling Heads

3BC Ø10,13,16

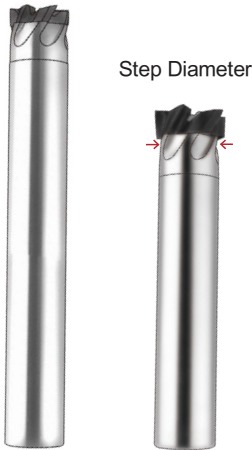


30° / 45° / 60°

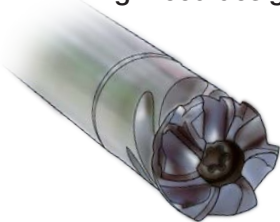
Product competitive advantages

- The best cost - saving solution
- High feed design

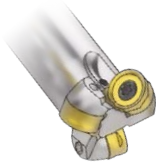
Optional length



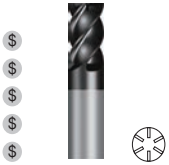
Customized Size



(Y.T. Design) Ø20 - 6 flutes
Single head with multi - flutes



(Other brand) Ø16 - 3 flutes

Tools comparison				
Productivity (Ø16)	6 teeth+patented geometry achieves high metal removal 😊	2-6 teeth	2-3 teeth 😞	2-6 teeth
Accuracy	Concentricity ± 0.005mm 😊		😞	
Accuracy on the corner radius	😊		😞	
Regrinding	Not necessary, less tool inventory and management cost	could be regrind but quality might not be equal	not necessary	not necessary
Tool length resetting	not necessary, can be changed directly from M/C	necessary, shrink fit arbor takes longer time to reset	re-setup is necessary in finishing process	not necessary
Price	😊	high quality end mill is very expensive	😊	😞
Flexibility	😊	😞		
Disadvantage	not economical for the user who only make side milling	1.long shank and big dia. end mill is expensive 2.poor flexibility, one size-one tool	less no. of teeth	1. expensive 2. thread breaks sometimes inside the shank



Applications of UFO Mill

Applicable industries

1 Difficult material : hardened steel / stainless steel / inconel/titanium



Aerospace parts

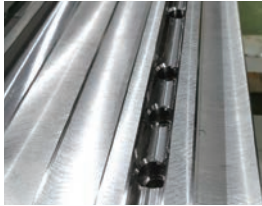


Mould & Die



Medical parts

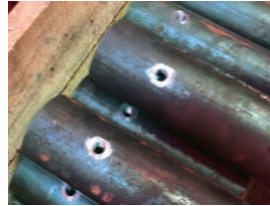
2 General machining



Milling



Flat surface



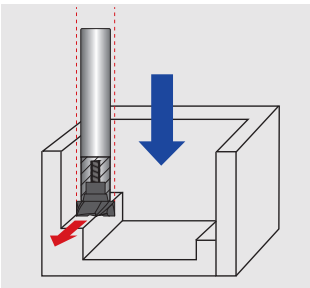
Screw hole plane

3 Casting / forging parts by mass production

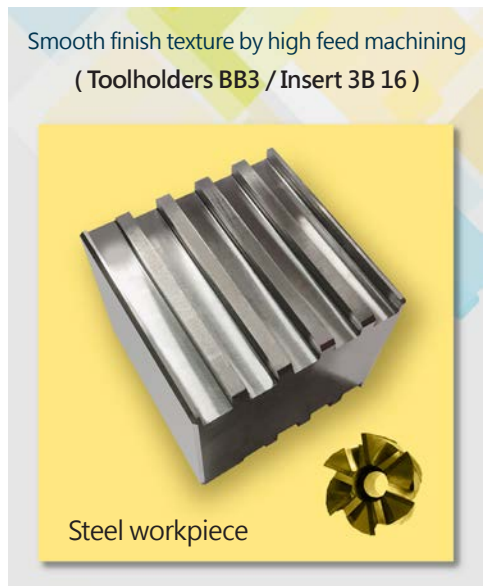


Smooth finish texture by high feed machining
(Toolholders BB3 / Insert 3B 16)

4 Deep Cavity Milling



Step diameter avoids body interference



Common Holders



D:10~15 D:16~25

Taper Polygon

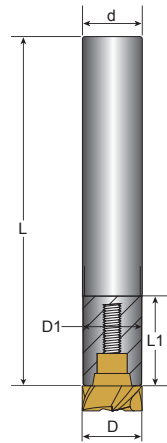
Concentricity: $\pm 0.005\text{mm}$

BB3

• HSS



Tolerances (mm)
 $D: \begin{matrix} +0.0 \\ -0.01 \sim -0.02 \end{matrix}$ $d: h6$



Part No.	Dimensions (mm)					KG	Carbide Head	Screw	Key
	D	D1	d	L	L1				
BB3-1010-60	10	9.7	10	60	23	0.11	$\varnothing 10$	C03016	T09P
BB3-1010-90	11			90		0.13	$\varnothing 11$		
BB3-1212-70	12	11.5	12	70	100	0.13	$\varnothing 12$	C03517	T10P
BB3-1212-100	13			100		0.15	$\varnothing 13$		
BB3-1414-80	14	13.5	14	80	25	0.14	$\varnothing 14$		
BB3-1414-110	15			110		0.16	$\varnothing 15$		
BB3-1616-80	16 17	15.5	16	80	29	0.15	$\varnothing 16$ $\varnothing 17$	C04020	T15P
BB3-1616-110				110		0.18			
BB3-1616-160				160		0.2			
BB3-1818-80	18	17.5	18	80	32	0.16	$\varnothing 18$		
BB3-1818-120				120		0.18			
BB3-2020-90	20 21	19.5	20	90	35	0.17	$\varnothing 20$ $\varnothing 21$	C05021	T20P
BB3-2020-120				120		0.2			
BB3-2020-180				180		0.23			
BB3-2525-100	25	24.5	25	100	43	0.4	$\varnothing 25$		
BB3-2525-130				130		0.5			
BB3-2525-180				180		0.7			

- Not available in shrink fit arbor



Common Holders



D:10~15 D:16~25

Taper Polygon

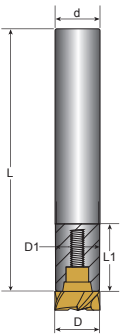
Concentricity: $\pm 0.005\text{mm}$

BB3W • Carbide



Tolerances (mm)

D : $+0.0$ d : h6
 $-0.01 \sim -0.02$



Part No.	Dimensions (mm)					KG	Carbide Head	Screw	Key
	D	D1	d	L	L1				
BB3W-1010-60	10 11	9.7	10	60	25	0.20	$\varnothing 10$ $\varnothing 11$	C03016	T09P
BB3W-1010-90				90		0.25			
BB3W-1010-120				120		0.35			
BB3W-1212-70	12 13	11.5	12	70	27	0.26	$\varnothing 12$ $\varnothing 13$	C03517	T10P
BB3W-1212-100				100		0.30			
BB3W-1212-140				140		0.40			
BB3W-1414-80	14 15	13.5	14	80	28	0.30	$\varnothing 14$ $\varnothing 15$		
BB3W-1414-110				110		0.40			
BB3W-1616-80	16 17	15.5	16	80	31	0.40	$\varnothing 16$ $\varnothing 17$	C04020	T15P
BB3W-1616-110				110		0.50			
BB3W-1616-170				170		0.70			



D:10~15

D:16~25

Taper Polygon

Concentricity: $\pm 0.005\text{mm}$

BB3

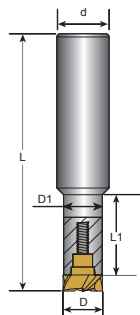
• HSS



Tolerances (mm)

D : $+0.0$
 $-0.01 \sim -0.02$

d : h6



Part No.	Dimensions (mm)					KG	Carbide Head	Screw	Key
	D	D1	d	L	L1				
BB3-1610-70	10 11	9.7	16	70	20	0.20	$\phi 10-11$	C03016	T09P
BB3-1612-80	12 13	11.5		80	25	0.25	$\phi 12-13$	C03517	T10P
BB3-2014-90	14 15	13.5	20	90	28	0.50	$\phi 14-15$		
BB3-2016-90	16 17	15.5			32	0.70	$\phi 16-17$	C04020	T15P

- Not available in shrink fit arbor



D:10~15

D:16~25

Taper Polygon

Concentricity: $\pm 0.005\text{mm}$

BB3

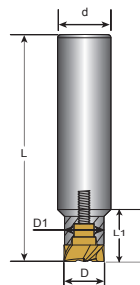
• HSS



公差 (mm)

D : $+0.0$
 $-0.01 \sim -0.02$

d : h6



訂購編號	規 格 (mm)						鎢鋼 刀頭	螺絲	板手
	D	D1	d	L	L1				
BB3-1610-70S	10 11	9.7	16	70	12	0.09	Ø10-11	C03016	T09P
BB3-1612-80S	12 13	11.5		80		0.12	Ø12-13	C03517	T10P
BB3-2014-90S	14 15	13.5	20	90		0.21	Ø14-15		
BB3-2016-90S	16 17	15.5					Ø16-17		
BB3-2518-90S	18	17.5	25			0.32	Ø18	C05021	T20P
BB3-2520-90S	20	19.5					Ø20		
BB3-3225-100S	25	24.5	32	100		0.59	Ø25		

- Not available in shrink fit arbor



UFO MILL 9

Common Holders



D:10~15



D:16~25

Taper Polygon

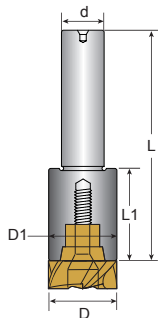
Concentricity: $\pm 0.005\text{mm}$

BB3

• HSS



Tolerances (mm)
D: $+0.0$
 $-0.01 \sim -0.02$ d: h6



Part No.	Dimensions (mm)					KG	Carbide Head	Screw	Key
	D	D1	d	L	L1				
BB3-1012	12 13	11.5	10	55	25	0.09	$\phi 12$ $\phi 13$	C03517	T10P
BB3-1016	16 17	15.5	10		27	0.10	$\phi 16$ $\phi 17$	C04020	T15P
BB3-1220	20 21	19.5	12		31	0.11	$\phi 20$ $\phi 21$	C05021	T20P
BB3-1225	25	24.5	12		31	0.12	$\phi 25$	C05021	T20P

- Not available in shrink fit arbor



D:10~15



D:16~25

Taper Polygon

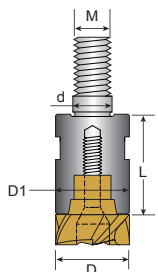
Concentricity: $\pm 0.005\text{mm}$

BB3

• HSS

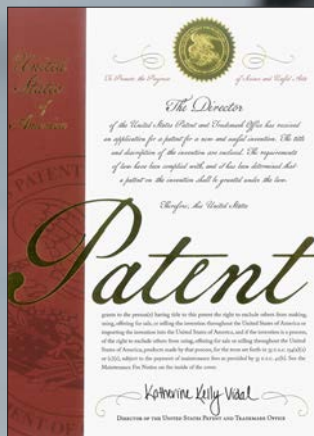


Tolerances (mm)
D: $+0.0$
 $-0.01 \sim -0.02$



Part No.	Dimensions (mm)					KG	Carbide Head	Screw	Key
	D	D1	d	L	M				
BB3-10	10 11	9.7	6.5	22	6	0.05	$\phi 10$ $\phi 11$	C03016	T09P
BB3-12	12 13	11.5	6.5	24	6	0.06	$\phi 12$ $\phi 13$	C03517	T10P
BB3-16	16 17	15.5	8.5	26	8	0.08	$\phi 16$ $\phi 17$	C04020	T15P
BB3-20	20 21	19.5	10.5	26	10	0.09	$\phi 20$ $\phi 21$	C05021	T20P
BB3-25	25	24.5	12.5	26	12	0.10	$\phi 25$	C05021	T20P

- Not available in shrink fit arbor



Patent pending

Taiwan invention patent (Authorized)

No. I647036

Chinese invention patent (Authorized)

No. ZL 2018 1 0214725.9

EPC EU invention patent (Authorized)

EPC EP18174847.6

PCT International Patent Priority (Authorized)

International patent priority PCT/CN2019/076867

Canadian patent (Authorized)

No. 3,095,794

U.S. Patent (Authorized)

11,453,067 B2

Japanese patent (Authorized)

77224364

Korean Patent (Authorized)

10-2332216

Indian patent

2020470 43994

Russian patent (Authorized)

2749504

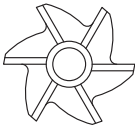
Milling Heads - M

Flute length : D/2

Applicable to Steel / Hardened steel / Cast iron



4 flutes
D:10-15mm

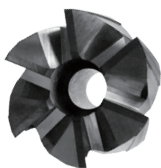


6 flutes
D:16-25mm



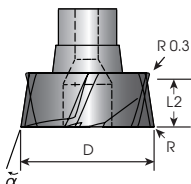
Taper Polygon
Concentricity: ± 0.005mm

3B

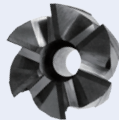


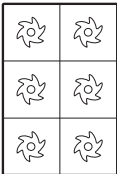
Tolerances (mm)

D : +0.0
-0.01~-0.02 L2 : ± 0.03

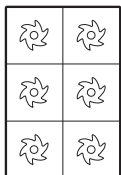


Dimensions (mm)			
D	L2	R	α
10	5	0	48°
		0.5	
		1	
		1.5	
		2	
11	5.5	0	
		0.5	
		1	
		1.5	
		2	
12	6	0	
		0.5	
		1	
		1.5	
		2	
13	6.5	0	
		0.5	
		1	
		1.5	
		2	

Milling Heads	Part No.	Grades									
		Carbide					Metal cermet	Uncoated			
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE	
	3B1005-M										
	3B1005R0.5-M										
	3B1005R1.0-M										
	3B1005R1.5-M										
	3B1005R2.0-M										
	3B1105-M										
	3B1105R0.5-M										
	3B1105R1.0-M										
	3B1105R1.5-M										
	3B1105R2.0-M										
	3B1206-M										
	3B1206R0.5-M										
	3B1206R1.0-M										
	3B1206R1.5-M										
	3B1206R2.0-M										
	3B1306-M										
	3B1306R0.5-M										
3B1306R1.0-M											
3B1306R1.5-M											
3B1306R2.0-M											



Inserts 6 PCS / Box



Inserts 6 PCS / Box

- Ⓢ Steel / Hardened steel / Cast iron Ⓢ Ⓢ Ⓢ
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1005R0.5-M, B100

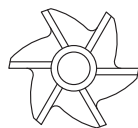
Milling Heads - M

Flute length : D/2

Applicable to Steel / Hardened steel / Cast iron



4 flutes
D:10-15mm



6 flutes
D:16-25mm



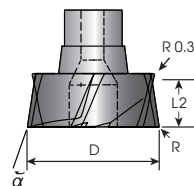
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

3B



Tolerances (mm)

D : $+0.0$
 $-0.01 \sim -0.02$ L2 : ± 0.03



Dimensions (mm)			
D	L2	R	α
14	7	0	48°
		0.5	
		1	
		1.5	
		2	
15	7.5	0	
		0.5	
		1	
		1.5	
		2	
16	8	0	
		0.5	
		1	
		1.5	
		2	
17	8.5	0	
		0.5	
		1	
		1.5	
		2	

Milling Heads	Part No.	Grades										
		Carbide					Metal cermet	Uncoated				
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE		
	3B1407-M											
	3B1407R0.5-M											
	3B1407R1.0-M											
	3B1407R1.5-M											
	3B1407R2.0-M											
	3B1507-M											
	3B1507R0.5-M											
	3B1507R1.0-M											
	3B1507R1.5-M											
	3B1507R2.0-M											
	3B1608-M											
	3B1608R0.5-M											
	3B1608R1.0-M											
	3B1608R1.5-M											
	3B1608R2.0-M											
	3B1708-M											
	3B1708R0.5-M											
	3B1708R1.0-M											
	3B1708R1.5-M											
	3B1708R2.0-M											





Inserts 6 PCS / Box

-  Steel / Hardened steel / Cast iron   
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1407R0.5-M, B100



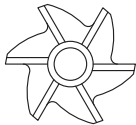
Milling Heads - M

Flute length : D/2

Applicable to Steel / Hardened steel / Cast iron



4 flutes
D:10-15mm



6 flutes
D:16-25mm



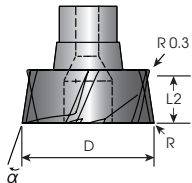
Taper Polygon
Concentricity: ± 0.005mm

3B



Tolerances (mm)

D : +0.0
-0.01~-0.02 L2 : ± 0.03



Dimensions (mm)			
D	L2	R	α
18	9	0	48°
		0.5	
		1	
		1.5	
		2	
20	10	0	
		0.5	
		1	
		1.5	
		2	
21	10.5	0	
		0.5	
		1	
		1.5	
		2	
25	12.5	0	
		0.5	
		1	
		1.5	
		2	

Milling Heads	Part No.	Grades									
		Carbide					Metal cermet	Uncoated			
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE	
	3B1809-M										
	3B1809R0.5-M										
	3B1809R1.0-M										
	3B1809R1.5-M										
	3B1809R2.0-M										
	3B2010-M										
	3B2010R0.5-M										
	3B2010R1.0-M										
	3B2010R1.5-M										
	3B2010R2.0-M										
	3B2110-M										
	3B2110-R0.5-M										
	3B2110R1.0-M										
	3B2110R1.5-M										
	3B2110R2.0-M										
	3B2512-M										
	3B2512R0.5-M										
	3B2512R1.0-M										
3B2512R1.5-M											
3B2512R2.0-M											



Inserts 4 PCS / Box

- Ⓢ Steel / Hardened steel / Cast iron Ⓜ Ⓟ Ⓡ
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1809R0.5-M, B100

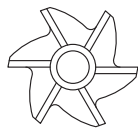
Milling Heads - M E

Flute length : D/2

Applicable to Stainless steel / Titanium alloy
/ Cast iron



4 flutes
D:10-15mm



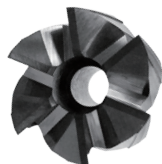
6 flutes
D:16-25mm

Dimensions (mm)			
D	L2	R	α
10	5	0	48°
		0.5	
		1	
		1.5	
		2	
11	5.5	0	
		0.5	
		1	
		1.5	
		2	
12	6	0	
		0.5	
		1	
		1.5	
		2	
13	6.5	0	
		0.5	
		1	
		1.5	
		2	



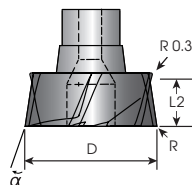
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

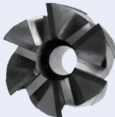
3B

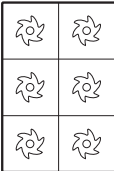


Tolerances (mm)

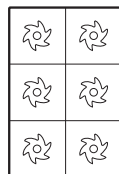
D : $+0.0$
 $-0.01 \sim -0.02$ L2 : ± 0.03



Milling Heads	Part No.	Grades								
		Carbide					Metal cermet	Uncoated		
		B100	C200	C250	F20	F30	CE25	CE60	K10	
	3B1005-ME	⊙								
	3B1005R0.5-ME	⊙								
	3B1005R1.0-ME	⊙								
	3B1005R1.5-ME	⊙								
	3B1005R2.0-ME	⊙								
	3B1105-ME	⊙								
	3B1105R0.5-ME	⊙								
	3B1105R1.0-ME	⊙								
	3B1105R1.5-ME	⊙								
	3B1105R2.0-ME	⊙								
	3B1206-ME	⊙								
	3B1206R0.5-ME	⊙								
	3B1206R1.0-ME	⊙								
	3B1206R1.5-ME	⊙								
	3B1206R2.0-ME	⊙								
	3B1306-ME	⊙								
	3B1306R0.5-ME	⊙								
	3B1306R1.0-ME	⊙								
	3B1306R1.5-ME	⊙								
	3B1306R2.0-ME	⊙								



Inserts 6 PCS / Box



Inserts 6 PCS / Box

- ⊙ Stainless steel / Titanium alloy / Cast iron
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1005R0.5-ME, B100



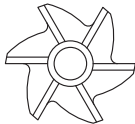
Milling Heads - M E

Flute length : D/2

Applicable to Stainless steel / Titanium alloy
/ Cast iron



4 flutes
D:10-15mm

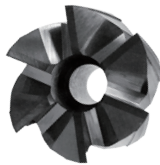


6 flutes
D:16-25mm



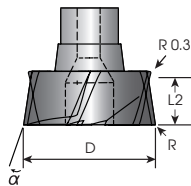
Taper Polygon
Concentricity: ± 0.005mm

3B

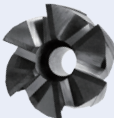


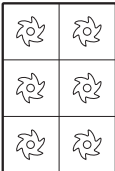
Tolerances (mm)

D : +0.0
-0.01~-0.02 L2 : ± 0.03



Dimensions (mm)			
D	L2	R	α
14	7	0	48°
		0.5	
		1	
		1.5	
		2	
15	7.5	0	
		0.5	
		1	
		1.5	
		2	
16	8	0	
		0.5	
		1	
		1.5	
		2	
17	8.5	0	
		0.5	
		1	
		1.5	
		2	

Milling Heads	Part No.	Grades									
		Carbide					Metal cermet		Uncoated		
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE	
	3B1407-ME	⊙									
	3B1407R0.5-ME	⊙									
	3B1407R1.0-ME	⊙									
	3B1407R1.5-ME	⊙									
	3B1407R2.0-ME	⊙									
	3B1507-ME	⊙									
	3B1507R0.5-ME	⊙									
	3B1507R1.0-ME	⊙									
	3B1507R1.5-ME	⊙									
	3B1507R2.0-ME	⊙									
	3B1608-ME	⊙									
	3B1608R0.5-ME	⊙									
	3B1608R1.0-ME	⊙									
	3B1608R1.5-ME	⊙									
	3B1608R2.0-ME	⊙									
	3B1708-ME	⊙									
	3B1708R0.5-ME	⊙									
	3B1708R1.0-ME	⊙									
	3B1708R1.5-ME	⊙									
	3B1708R2.0-ME	⊙									



Inserts 6 PCS / Box

Inserts 6 PCS / Box

- ⊙ Stainless steel / Titanium alloy / Cast iron
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1407R0.5-ME, B100

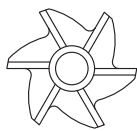
Milling Heads - M E

Flute length : D/2

Applicable to Stainless steel / Titanium alloy
/ Cast iron



4 flutes
D:10-15mm

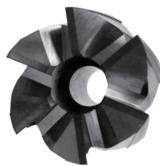


6 flutes
D:16-25mm



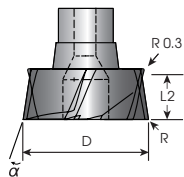
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

3B

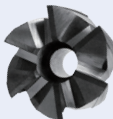


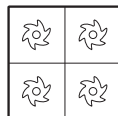
Tolerances (mm)

D : $+0.0$
 $-0.01 \sim -0.02$ L2 : ± 0.03



Dimensions (mm)			
D	L2	R	α
18	9	0	48°
		0.5	
		1	
		1.5	
		2	
20	10	0	
		0.5	
		1	
		1.5	
		2	
21	10.5	0	
		0.5	
		1	
		1.5	
		2	
25	12.5	0	
		0.5	
		1	
		1.5	
		2	

Milling Heads	Part No.	Grades								
		Carbide					Metal cermet		Uncoated	
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE
	3B1809-ME	⊙								
	3B1809R0.5-ME	⊙								
	3B1809R1.0-ME	⊙								
	3B1809R1.5-ME	⊙								
	3B1809R2.0-ME	⊙								
	3B2010-ME	⊙								
	3B2010R0.5-ME	⊙								
	3B2010R1.0-ME	⊙								
	3B2010R1.5-ME	⊙								
	3B2010R2.0-ME	⊙								
	3B2110-ME	⊙								
	3B2110R0.5-ME	⊙								
	3B2110R1.0-ME	⊙								
	3B2110R1.5-ME	⊙								
	3B2110R2.0-ME	⊙								
	3B2512-ME	⊙								
	3B2512R0.5-ME	⊙								
	3B2512R1.0-ME	⊙								
	3B2512R1.5-ME	⊙								
	3B2512R2.0-ME	⊙								



Inserts 4 PCS / Box

- ⊙ Stainless steel / Titanium alloy / Cast iron (M S K)
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1809R0.5-ME, B100



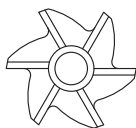
Milling Heads - E

Flute length : D/2

Applicable to Aluminum / Copper



4 flutes
D:10-15mm

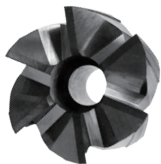


6 flutes
D:16-25mm



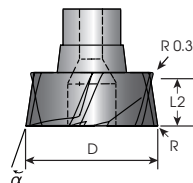
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

3B

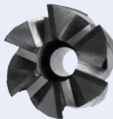


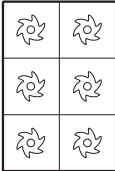
Tolerances (mm)

D : $+0.0$
 $-0.01 \sim -0.02$ L2 : ± 0.03



Dimensions (mm)			
D	L2	R	α
10	5	0	48°
		0.5	
		1	
		1.5	
		2	
11	5.5	0	
		0.5	
		1	
		1.5	
		2	
12	6	0	
		0.5	
		1	
		1.5	
		2	
13	6.5	0	
		0.5	
		1	
		1.5	
		2	

Milling Heads	Part No.	Grades									
		Carbide					Metal cermet	Uncoated			
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE	
	3B1005-E										
	3B1005R0.5-E										
	3B1005R1.0-E										
	3B1005R1.5-E										
	3B1005R2.0-E										
	3B1105-E										
	3B1105R0.5-E										
	3B1105R1.0-E										
	3B1105R1.5-E										
	3B1105R2.0-E										
	3B1206-E										
	3B1206R0.5-E										
	3B1206R1.0-E										
	3B1206R1.5-E										
	3B1206R2.0-E										
	3B1306-E										
	3B1306R0.5-E										
	3B1306R1.0-E										
	3B1306R1.5-E										
	3B1306R2.0-E										



Inserts 6 PCS / Box

Inserts 6 PCS / Box

- Aluminum / Copper
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1005R0.5-E, K10

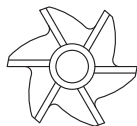
Milling Heads - E

Flute length : D/2

Applicable to Aluminum / Copper



4 flutes
D:10-15mm



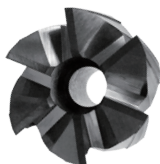
6 flutes
D:16-25mm

Dimensions (mm)			
D	L2	R	α
14	7	0	48°
		0.5	
		1	
		1.5	
		2	
15	7.5	0	
		0.5	
		1	
		1.5	
		2	
16	8	0	
		0.5	
		1	
		1.5	
		2	
17	8.5	0	
		0.5	
		1	
		1.5	
		2	



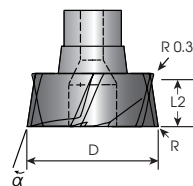
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

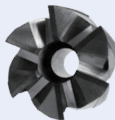
3B

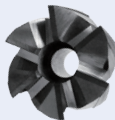


Tolerances (mm)

D : $+0.0$
 $-0.01 \sim -0.02$ L2 : ± 0.03



Milling Heads	Part No.	Grades									
		Carbide					Metal cermet	Uncoated			
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE	
	3B1407-E										
	3B1407R0.5-E										
	3B1407R1.0-E										
	3B1407R1.5-E										
	3B1407R2.0-E										
	3B1507-E										
	3B1507R0.5-E										
	3B1507R1.0-E										
	3B1507R1.5-E										
	3B1507R2.0-E										
	3B1608-E										
	3B1608R0.5-E										
	3B1608R1.0-E										
	3B1608R1.5-E										
	3B1608R2.0-E										
	3B1708-E										
	3B1708R0.5-E										
	3B1708R1.0-E										
	3B1708R1.5-E										
	3B1708R2.0-E										



Inserts 6 PCS / Box

Inserts 6 PCS / Box

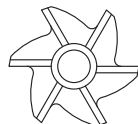
- Aluminum / Copper 
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1407R0.5-E, K10



Milling Heads - E

Flute length : D/2

Applicable to Aluminum / Copper



6 flutes
D:16-25mm



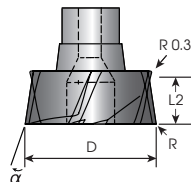
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

3B

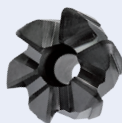


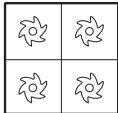
Tolerances (mm)

D : $+0.0$
 $-0.01 \sim -0.02$ L2 : ± 0.03

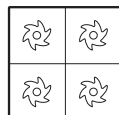


Dimensions (mm)			
D	L2	R	α
18	9	0	48°
		0.5	
		1	
		1.5	
		2	
20	10	0	
		0.5	
		1	
		1.5	
		2	
21	10.5	0	
		0.5	
		1	
		1.5	
		2	
25	12.5	0	
		0.5	
		1	
		1.5	
		2	

Milling Heads	Part No.	Grades									
		Carbide					Metal cermet	Uncoated			
		B100	C200	C250	F20	F30	CE2/5	CE60	K10	CE	
	3B1809-E										
	3B1809R0.5-E										
	3B1809R1.0-E										
	3B1809R1.5-E										
	3B1809R2.0-E										
	3B2010-E										
	3B2010R0.5-E										
	3B2010R1.0-E										
	3B2010R1.5-E										
	3B2010R2.0-E										
	3B2110-E										
	3B2110R0.5-E										
	3B2110R1.0-E										
	3B2110R1.5-E										
	3B2110R2.0-E										
	3B2512-E										
	3B2512R0.5-E										
	3B2512R1.0-E										
	3B2512R1.5-E										
	3B2512R2.0-E										



Inserts 4 PCS / Box



Inserts 4 PCS / Box

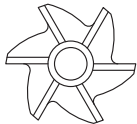
- Aluminum / Copper
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1809R0.5-E, K10

Milling Heads - M

Flute length : 5mm

Applicable to Steel / Hardened steel / Cast iron

Dimensions (mm)			
D	L2	R	α
16	5	0	48°
		0.5	
		1	
		1.5	
		2	
17	5	0	
		0.5	
		1	
		1.5	
		2	

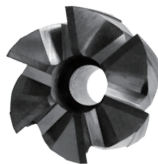


6 flutes
D:16-25mm



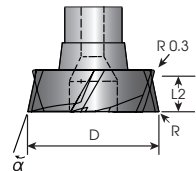
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

3B



Tolerances (mm)

D : $+0.0$
 $-0.01 \sim -0.02$ L2 : ± 0.03



Milling Heads	Part No.	Grades									
		Carbide					Metal cermet	Uncoated			
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE	
	3B1605-M										
	3B1605R0.5-M										
	3B1605R1.0-M										
	3B1605R1.5-M										
	3B1605R2.0-M										
	3B1705-M										
	3B1705R0.5-M										
	3B1705R1.0-M										
	3B1705R1.5-M										
	3B1705R2.0-M										

Inserts 6 PCS / Box

Inserts 6 PCS / Box

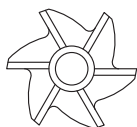
- Steel / Hardened steel / Cast iron
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1605R0.5-M,B100



Milling Heads - M

Flute length : 5mm

Applicable to Steel / Hardened steel / Cast iron



6 flutes
D:16-25mm



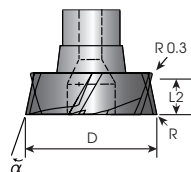
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

3B



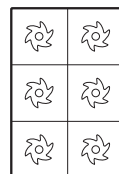
Tolerances (mm)

D : $+0.0$
 $-0.01 \sim -0.02$ L2 : ± 0.03



Dimensions (mm)				
D	L2	R	α	
18	5	0	48°	
		0.5		
		1		
		1.5		
		2		
20	5	0		
		0.5		
		1		
		1.5		
		2		
21	5	0		
		0.5		
		1		
		1.5		
		2		
25	5	0		
		0.5		
		1		
		1.5		
		2		

Milling Heads	Part No.	Grades								
		Carbide					Metal cermet		Uncoated	
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE
	3B1805-M									
	3B1805R0.5-M									
	3B1805R1.0-M									
	3B1805R1.5-M									
	3B1805R2.0-M									
	3B2005-M									
	3B2005R0.5-M									
	3B2005R1.0-M									
	3B2005R1.5-M									
	3B2005R2.0-M									
	3B2105-M									
	3B2105R0.5-M									
	3B2105R1.0-M									
	3B2105R1.5-M									
	3B2105R2.0-M									
	3B2505-M									
	3B2505R0.5-M									
	3B2505R1.0-M									
	3B2505R1.5-M									
	3B2505R2.0-M									



Inserts 6 PCS / Box

-  Steel / Hardened steel / Cast iron   
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1805R0.5-M,B100

Milling Heads - M E

Flute length : 5mm

Applicable to Stainless steel / Titanium alloy
/ Cast iron

Dimensions (mm)			
D	L2	R	α
16	5	0	48°
		0.5	
		1	
		1.5	
		2	
17	5	0	48°
		0.5	
		1	
		1.5	
		2	

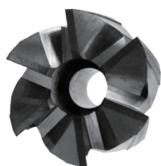


6 flutes
D:16-25mm



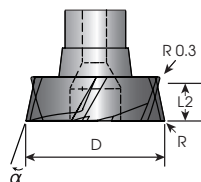
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

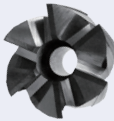
3B

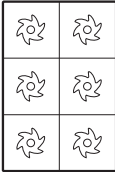


Tolerances (mm)

D : $+0.0$
-0.01~-0.02 L2 : ± 0.03



Milling Heads	Part No.	Grades									
		Carbide					Metal cermet	Uncoated			
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE	
	3B1605-ME										
	3B1605R0.5-ME										
	3B1605R1.0-ME										
	3B1605R1.5-ME										
	3B1605R2.0-ME										
	3B1705-ME										
	3B1705R0.5-ME										
	3B1705R1.0-ME										
	3B1705R1.5-ME										
	3B1705R2.0-ME										



Inserts 6 PCS / Box

Inserts 6 PCS / Box

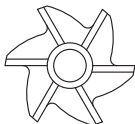
- ⊙ Stainless steel / Titanium alloy / Cast iron
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1605R0.5-ME, B100



Milling Heads - M E

Flute length : 5mm

Applicable to Stainless steel / Titanium alloy
/ Cast iron



6 flutes
D:16-25mm



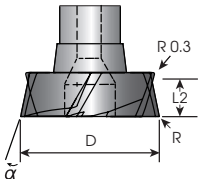
Taper Polygon
Concentricity: ± 0.005mm

3B



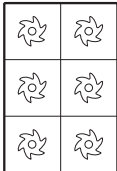
Tolerances (mm)

D : +0.0
- 0.01~-0.02 L2 : ± 0.03

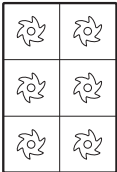


Dimensions (mm)			
D	L2	R	α
18	5	0	48°
		0.5	
		1	
		1.5	
		2	
20	5	0	
		0.5	
		1	
		1.5	
		2	
21	5	0	
		0.5	
		1	
		1.5	
		2	
25	5	0	
		0.5	
		1	
		1.5	
		2	

Milling Heads	Part No.	Grades										
		Carbide					Metal cermet	Uncoated				
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE		
	3B1805-ME											
	3B1805R0.5-ME											
	3B1805R1.0-ME											
	3B1805R1.5-ME											
	3B1805R2.0-ME											
	3B2005-ME											
	3B2005R0.5-ME											
	3B2005R1.0-ME											
	3B2005R1.5-ME											
	3B2005R2.0-ME											
	3B2105-ME											
	3B2105R0.5-ME											
	3B2105R1.0-ME											
	3B2105R1.5-ME											
	3B2105R2.0-ME											
	3B2505-ME											
	3B2505R0.5-ME											
	3B2505R1.0-ME											
	3B2505R1.5-ME											
	3B2505R2.0-ME											



Inserts 6 PCS / Box



Inserts 6 PCS / Box

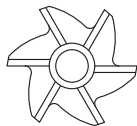
- Stainless steel / Titanium alloy / Cast iron
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1805R0.5-ME, B100

Milling Heads - E

Flute length : 5mm

Applicable to Aluminum / Copper

Dimensions (mm)			
D	L2	R	α
16	5	0	48°
		0.5	
		1	
		1.5	
		2	
17	5	0	
		0.5	
		1	
		1.5	
		2	

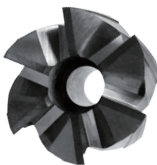


6 flutes
D:16-25mm



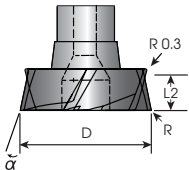
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

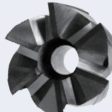
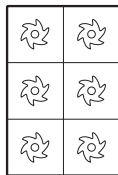
3B



Tolerances (mm)

D : $+0.0$
 $-0.01 \sim -0.02$ L2 : ± 0.03



Milling Heads	Part No.	Grades									
		Carbide					Metal cermet	Uncoated			
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE	
	3B1605-E										
	3B1605R0.5-E										
	3B1605R1.0-E										
	3B1605R1.5-E										
	3B1605R2.0-E										
	3B1705-E										
	3B1705R0.5-E										
	3B1705R1.0-E										
	3B1705R1.5-E										
	3B1705R2.0-E										

Inserts 6 PCS / Box

Inserts 6 PCS / Box

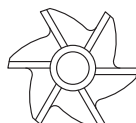
- Aluminum / Copper
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1605R0.5-E, K10



Milling Heads - E

Flute length : 5mm

Applicable to Aluminum / Copper



6 flutes
D:16-25mm



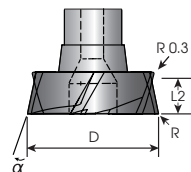
Taper Polygon
Concentricity: ± 0.005mm

3B



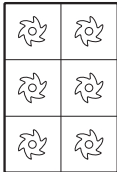
Tolerances (mm)

D : +0.0
-0.01~-0.02 L2 : ± 0.03



Dimensions (mm)			
D	L2	R	α
18	5	0	48°
		0.5	
		1	
		1.5	
		2	
		0	
20	5	0.5	
		1	
		1.5	
		2	
		0	
		0.5	
21	5	1	
		1.5	
		2	
		0	
		0.5	
		1	
25	5	1.5	
		2	
		0	
		0.5	
		1	
		1.5	

Milling Heads	Part No.	Grades									
		Carbide					Metal cermet		Uncoated		
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE	
	3B1805-E										
	3B1805R0.5-E										
	3B1805R1.0-E										
	3B1805R1.5-E										
	3B1805R2.0-E										
	3B2005-E										
	3B2005R0.5-E										
	3B2005R1.0-E										
	3B2005R1.5-E										
	3B2005R2.0-E										
	3B2105-E										
	3B2105R0.5-E										
	3B2105R1.0-E										
	3B2105R1.5-E										
	3B2105R2.0-E										
	3B2505-E										
	3B2505R0.5-E										
	3B2505R1.0-E										
	3B2505R1.5-E										
	3B2505R2.0-E										



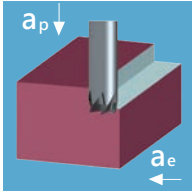
Inserts 6 PCS / Box

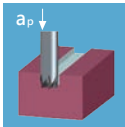
- Aluminum / Copper (N)
- Price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3B1805R0.5-E, K10

Cutting Parameter 3B-M

Applicable to Steel / Hardened steel / Cast iron

- Keep $F_z \geq 0.03\text{mm}$

3B-M	Materials	D (mm)	Z	Vc (m/min)	fz (mm/tooth)	a _p (mm)	a _e (mm)	S (rev/min)	F (mm/min)
	Steel 24-32 HRC 	10	4	140	0.035	2	7	4500	630
		12	4	180	0.06	2	8	4850	1160
		16	6	180	0.06	2	11	3600	1300
		20	6	180	0.07	2	14	2900	1200
		25	6	180	0.07	2	17	2300	960
	Steel 32-42 HRC 	10	4	100	0.035	2	7	3200	450
		12	4	150	0.05	2	8	4000	800
		16	6	150	0.06	2	11	3000	1080
		20	6	150	0.06	2	14	2400	840
		25	6	150	0.06	2	17	1900	680
	Hardened steel 50-58 HRC 	10	4	70	0.06	0.1	7	2250	540
		12	4	70	0.06	0.1	8	1840	440
		16	6	70	0.06	0.1	11	1370	490
		20	6	70	0.06	0.1	14	1130	400
		25	6	70	0.06	0.1	17	890	320
	Cast Iron 	10	4	75	0.08	4	7	2400	770
		12	4	75	0.1	4	8	2000	800
		16	6	75	0.1	4	11	1550	930
		20	6	75	0.1	4	14	1200	720
		25	6	75	0.1	4	17	950	570



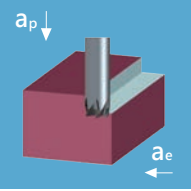
- Set RPM 30% lower for slot milling, except for cast iron materials.



Cutting Parameter 3B-ME

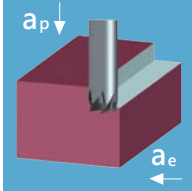
Applicable to Stainless steel / Titanium alloy / Cast iron

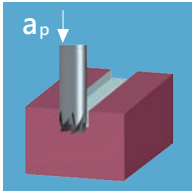
- Keep $Fz \geq 0.025\text{mm}$

3B-ME	Materials	D (mm)	Z	Vc (m/min)	fz (mm/tooth)	a _p (mm)	a _e (mm)	S (rev/min)	F (mm/min)
	Stainless steel 	10	4	55	0.04	2	7	1770	283
		12	4	75	0.06	2	8	1950	468
		16	6	75	0.07	2	11	1500	630
		20	6	75	0.07	2	14	1200	500
		25	6	75	0.07	2	17	960	400
	Titanium alloy 	10	4	45	0.06	1.5	7	1450	350
		12	4	45	0.06	1.5	8	1180	280
		16	6	45	0.07	1.5	11	900	380
		20	6	45	0.07	1.5	14	720	300
		25	6	45	0.07	1.5	17	570	235
	Cast iron 	10	4	75	0.08	4	7	2400	770
		12	4	75	0.1	4	8	2000	800
		16	6	75	0.1	4	11	1550	930
		20	6	75	0.1	4	14	1200	720
		25	6	75	0.1	4	17	950	570

Cutting Parameter 3B-E

Applicable to Aluminum / Copper

3B-E	Materials	D (mm)	Z	Vc (m/min)	fz (mm/tooth)	a _p (mm)	a _e (mm)	S (rev/min)	F (mm/min)
	Aluminum	10	4	800	0.13	4	7	25800	13400
		12	4	800	0.13	4	8	21000	10900
		16	6	800	0.16	4	11	16000	15300
		20	6	800	0.16	4	14	13000	12500
		25	6	800	0.16	4	17	10000	9600
	Copper	10	4	280	0.10	4	7	9000	3600
		12	4	280	0.10	4	8	7500	3000
		16	6	280	0.10	4	11	5700	3400
		20	6	280	0.10	4	14	4500	2700
		25	6	280	0.10	4	17	3600	2160

3B-E	Materials	D (mm)	Z	Vc (m/min)	fz (mm/tooth)	a _p (mm)	a _e (mm)	S (rev/min)	F (mm/min)
	Aluminum	10	4	700	0.12	4	10	22500	10800
		12	4	700	0.12	4	12	18500	8880
		16	6	700	0.15	4	16	14000	12600
		20	6	700	0.15	4	20	11000	9900
		25	6	700	0.15	4	25	9000	8100
	Copper	10	4	250	0.08	2.5	10	8000	2500
		12	4	250	0.08	2.5	12	6700	2150
		16	6	250	0.08	2.5	16	5100	2400
		20	6	250	0.08	2.5	20	4000	1900
		25	6	250	0.08	2.5	25	3160	1500

Screw & Key & Torque Values

Screw Code	Key Code	Torque Value(Nm)
C03016	T9P	2.0
C03517	T10P	3.0
C04020	T15P	4.0
C05021	T20P	6.0





UFO High-Feed Cutter

Cutting force vs. Tool life

The direction of cutting force influences directly and significantly on the machining life and efficiency. The following are three different types of cutting force commonly seen in milling cutters:

(Cutter 1) Radial force = Axial force

There are limitations inherent in milling cutters designed with round insert; to apply it on deep Ap milling or a cavity corner milling, the radial force is nearly same as the axial force, it produces great vibrations and performs in low feed. The next, round inserts take up big space and cause the cutter carries lesser flutes.

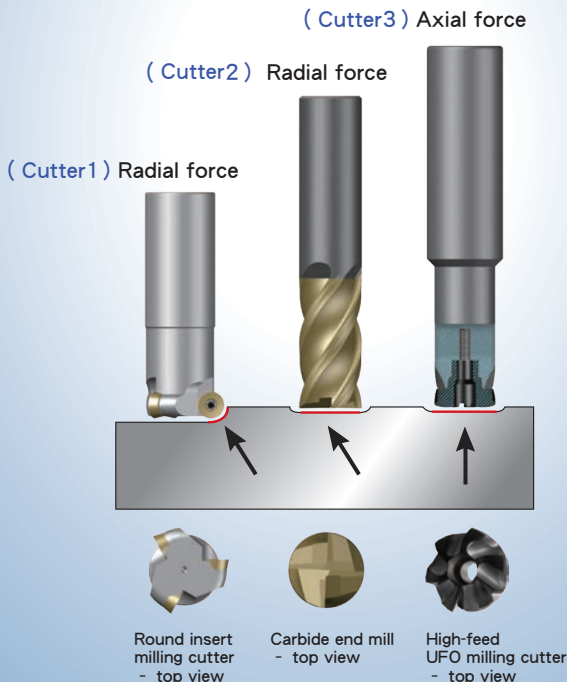
(Cutter 2) Radial force > Axial force

The carbide end mill cutter which is mostly used for finishing and semi-finishing machining. The large helix angle satisfies small cutting area and surface roughness. However, it is not cost-effective to have it removing a large amount of materials.

(Cutter 3) Radial force < Axial force

Y.T. high-feed UFO milling cutter has unique design of curvature and point contact, it is effective in keeping the radial force lesser than axial force.

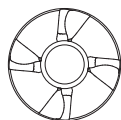
The cutting force is transferred to the spindle, it brings machining process in stable conditions and carries out a high removal rate.



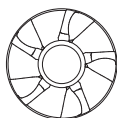
High Feed Milling Heads

- 3BH

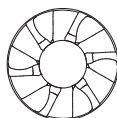
Applicable to Steel / Stainless steel /
Titanium alloy



4 flutes
D: 10-11mm



5 flutes
D: 12-13mm

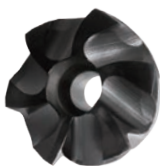


6 flutes
D: 16-25mm



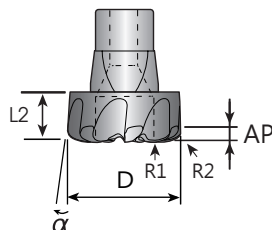
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

3BH

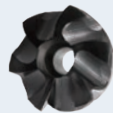


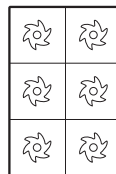
Tolerances (mm)

D : $+0.0$
 $-0.01 \sim -0.02$ L2 : ± 0.03



Dimensions (mm)						
D	L2	R1	R2	AP	α	
10	5	4	0.6	0.8	3°	
11						
12		5		0.9		
13						
16		6	0.8			
17						
20		8		1.2		
21						
25		12				

Milling Heads	Part No.	Grades								
		Carbide					Metal cermet		Uncoated	
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE
	3BH1005-M									
	3BH1105-M									
	3BH1205-M									
	3BH1305-M									
	3BH1605-M									
	3BH1705-M									
	3BH2005-M									
	3BH2105-M									
	3BH2505-M									



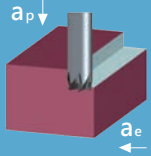
Inserts 6 PCS / Box

-  Steel / Stainless steel / Titanium alloy   
- Correct price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3BH1005-M, B100



Cutting Parameter - 3BH

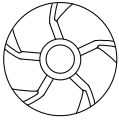
• Keep $Fz \geq 0.02\text{mm}$

3BH	Materials	D (mm)	Z	Vc (m/min)	fz (mm/tooth)	a_p (mm)	a_e (mm)	S (rev/min)	F (mm/min)
	Steel 24-32 HRC 	10	4	200	0.25	0.3	6	6450	6400
		12	5	300	0.25	0.3	7	7900	9800
		16	6	300	0.25	0.3	10	6000	9000
		20	7	300	0.25	0.3	13	4800	8400
		25	7	300	0.25	0.3	16	3850	6700
	Steel 32-42 HRC 	10	4	100	0.25	0.3	6	3200	3200
		12	5	130	0.25	0.3	7	3400	4200
		16	6	130	0.25	0.3	10	2600	3900
		20	7	130	0.25	0.3	13	2100	3700
		25	7	130	0.25	0.3	16	1650	1900
	Stainless steel 	10	4	160	0.25	0.3	6	5160	5160
		12	5	180	0.25	0.3	7	4700	5800
		16	6	180	0.25	0.3	10	3600	5400
		20	7	180	0.25	0.3	13	2900	5000
		25	7	180	0.25	0.3	16	2300	4000
	Titanium alloy 	10	4	60	0.3	0.3	6	1900	2280
		12	5	60	0.3	0.3	7	1600	2400
		16	6	60	0.3	0.3	10	1200	2160
		20	7	60	0.3	0.3	13	950	2000
		25	7	60	0.3	0.3	16	770	1600

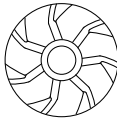
High Feed Chamfer Milling Heads - 3BC

Applicable to all Materials

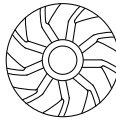
Dimensions (mm)					
D	L2	d	AP	C	Angle Chamfer
10	5	6	3.4	4.0	30°
			2.0	2.7	45°
			1.15	2.3	60°
13		9	3.4	4.0	30°
			2.0	2.7	45°
			1.15	2.3	60°
16		11	4.3	5.0	30°
			2.5	3.5	45°
			1.4	2.8	60°



5 flutes
D: 10mm



7 flutes
D: 13mm



9 flutes
D: 16mm



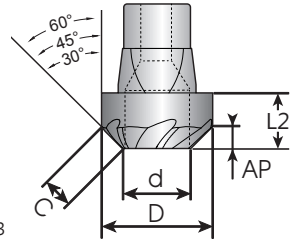
Taper Polygon
Concentricity: $\pm 0.005\text{mm}$

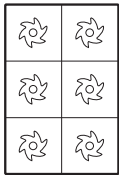
3BC



Tolerances (mm)

D: $+0.0$
 $-0.01 \sim -0.02$ L2: ± 0.03



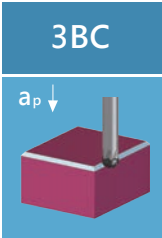
Milling Heads	Part No.	Grades								
		Carbide					Metal cermet		Uncoated	
		B100	C200	C250	F20	F30	CE25	CE60	K10	CE
	3BC1005-30°-ME	★								
	3BC1005-45°-ME	★								
	3BC1005-60°-ME	★								
	3BC1305-30°-ME	★								
	3BC1305-45°-ME	★								
	3BC1305-60°-ME	★								
	3BC1605-30°-ME	★								
	3BC1605-45°-ME	★								
	3BC1605-60°-ME	★								
										 Inserts 6 PCS / Box

★ Applicable to all Materials

- Correct price and stock are based on current situation
- Please specify model number and grade of insert, ie.: 3BC1005-30°-ME,B100



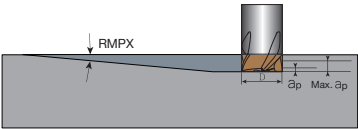
Cutting Parameter **3BC**



3BC	Materials	D (mm)	Z	Vc (m/min)	fz (mm/tooth)	a _p (mm)	S (rev/min)	F (mm/min)
	Steel 24-32 HRC	10	5	230	0.07	1C	7400	2600
		13	7	230	0.07	1C	5700	2800
		16	9	230	0.07	1C	4600	2900
	Steel 32-42 HRC	10	5	130	0.06	1C	4200	1260
		13	7	130	0.06	1C	3250	1360
		16	9	130	0.06	1C	2650	1460
	Stainless steel	10	5	180	0.06	1C	5800	1740
		13	7	180	0.06	1C	4500	1800
		16	9	180	0.06	1C	3600	1950
	Titanium alloy	10	5	70	0.06	1C	2250	670
		13	7	70	0.06	1C	1750	730
		16	9	70	0.06	1C	1400	750
	Aluminum	10	5	500	0.07	1C	16000	5600
		13	7	500	0.07	1C	12500	6100
		16	9	500	0.07	1C	10200	6400
	Cast iron	10	5	75	0.07	1C	2400	840
		13	7	75	0.07	1C	1900	920
		16	9	75	0.07	1C	1500	950

Technical Data

•Ramping

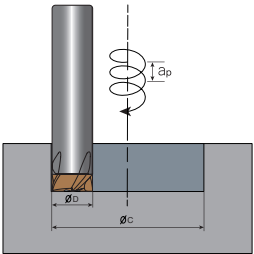


Unit : mm

$\varnothing D$	RMPX	Max. a_p
10	1.5°	1
12	1.5°	1
16	1.5°	1
20	1.5°	1
25	1.5°	1

• It's calculated with exchangeable milling head R0.

•Helical milling



Unit : mm

$\varnothing D$	Min. $\varnothing C$ / Max. a_p			
	Min. $\varnothing C$	Max. a_p mm	Max. $\varnothing C$	Max. a_p mm
10	15	0.4	19	0.7
12	17	0.4	23	0.7
16	25	0.7	31	1.2
20	33	1.0	39	1.5
25	43	1.4	49	1.9

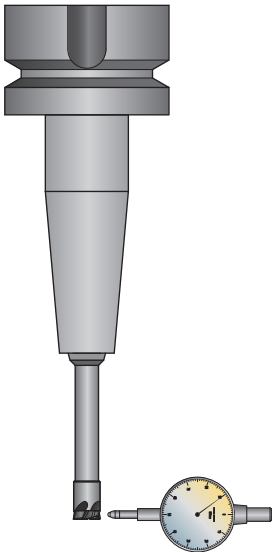
• It's calculated with exchangeable milling head R0.

Arbor and chuck

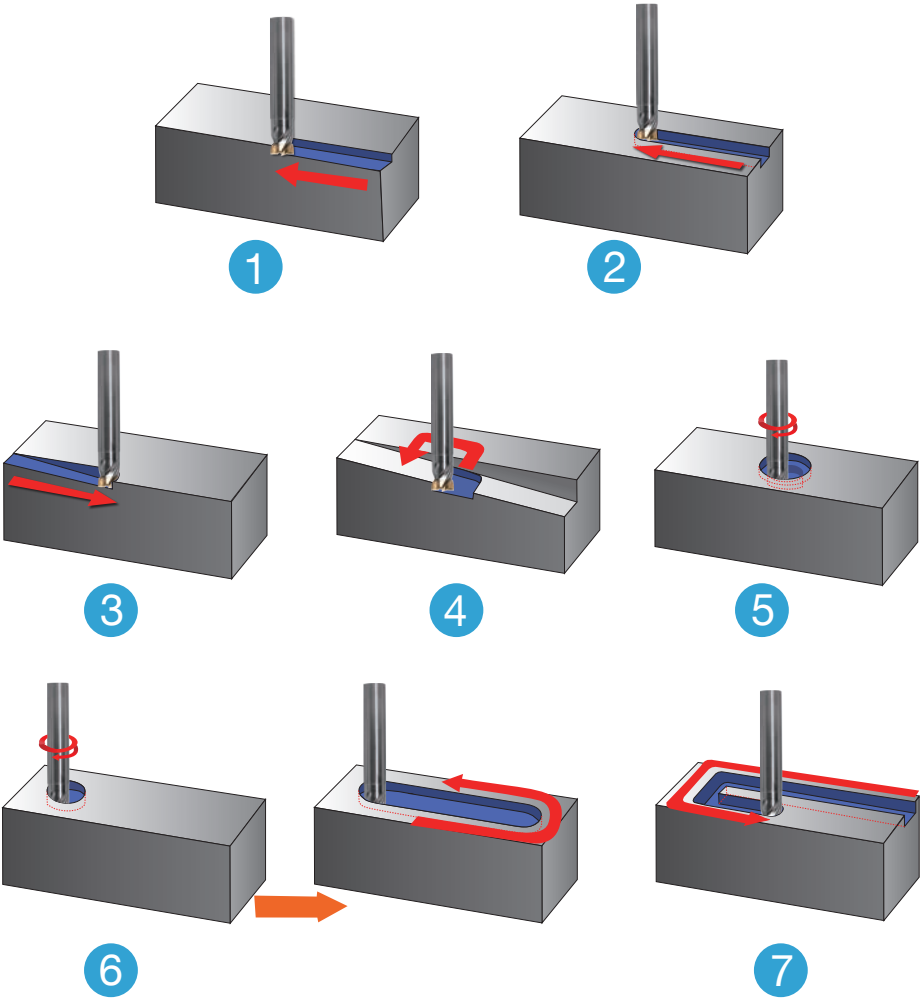
Precise arbor and chuck will improve the toollife in high speed machining.

Arbor recommendation:

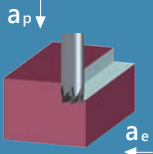
Hydraulic chuck, shrink fit chuck or highly precision chuck.



Different Applications

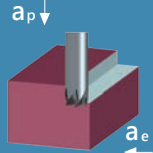


Test Report

3B	Material	D (mm)	Z	Vc (m/min)	f _z (mm/tooth)	a _p (mm)	a _e (mm)	S (rev/min)	F (mm/min)
	Stainless steel 	12	4	60	0.06	4.5	4.5	1600	400

- Life time: 240 minutes
- 200 x magnification
- Tested tool:
Milling head (3B1206R0.5-ME, B100)
HSS shank (BB3-1212-70)



3B	Material	D (mm)	Z	Vc (m/min)	f _z (mm/tooth)	a _p (mm)	a _e (mm)	S (rev/min)	F (mm/min)
	Steel 24-32 HRC 	12	4	120	0.06	4.5	4.5	3200	770

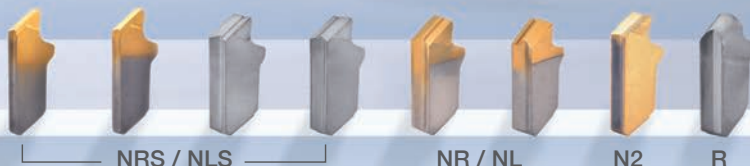
- Life time: 80 minutes
- 200 x magnification
- Tested tool:
Milling head (3B1206R0.5-M, B100)
HSS shank (BB3-1212-70)



Multifunctional Saw Blade



Whole range from dia 32mm~300mm,
thickness 1.4~8mm. Available in all
materials and different clamping systems.



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