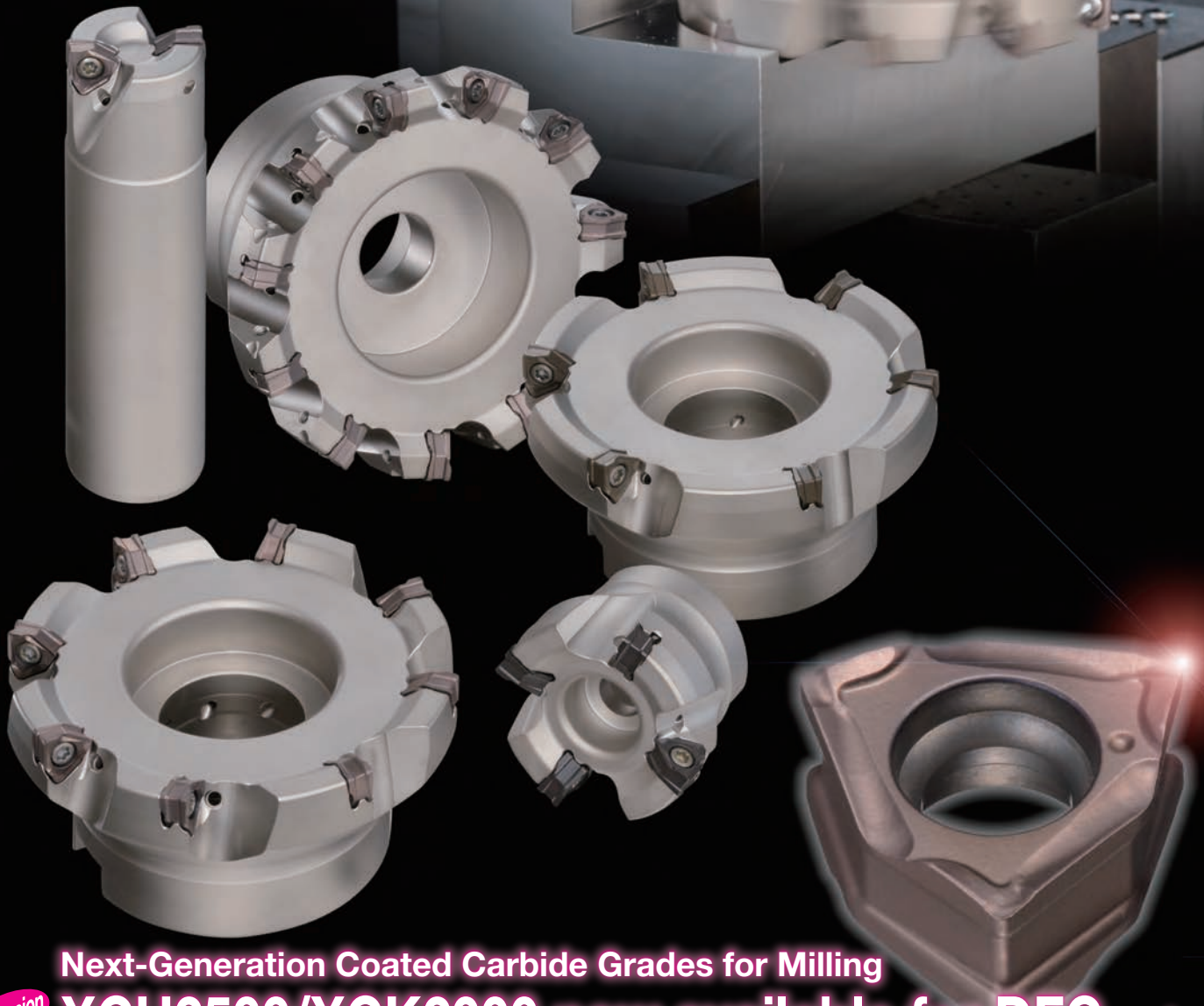


Milling Cutter for High-Efficiency General-purpose and Shoulder Milling

SEC-Sumi Dual Mill **DFC** Series

Rev. 8

Highly economical double-sided unique shaped insert balances cutting edge sharpness and cutting edge strength



Next-Generation Coated Carbide Grades for Milling

Expansion

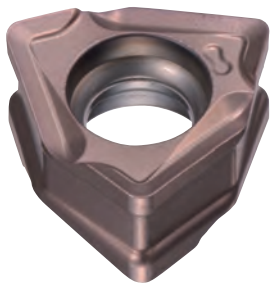
XCU2500/XCK2000 now available for DFC series



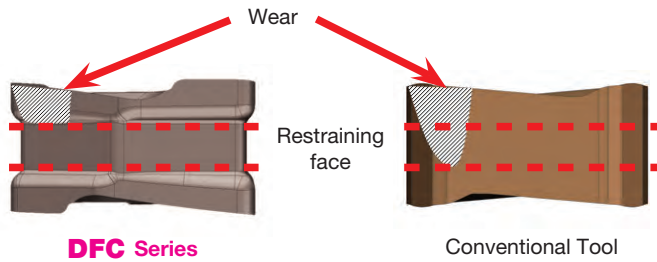
General Features

- The high-efficiency general-purpose/shoulder milling SEC-Sumi Dual Mill DFC series cutter has a unique insert shape with both excellent sharpness and cutting edge strength, enabling it to be used for a wider range of applications from high-efficiency machining through to finishing. Further expansion of the shoulder milling GS Type chipbreaker, suitable for a wide range of applications.
- Applicable to various work materials
In addition to the general-purpose grade ACU2500, the new-generation coated carbide grades XCU2500/XCK2000 are now available. Applicable to various work materials such as steel, stainless steel, cast iron, exotic alloys, and more.

Features



Unique insert shape provides both sharpness and cutting edge strength



Flank wear of inserts for DFC series does not reach the restraining face and thus mounting accuracy does not suffer

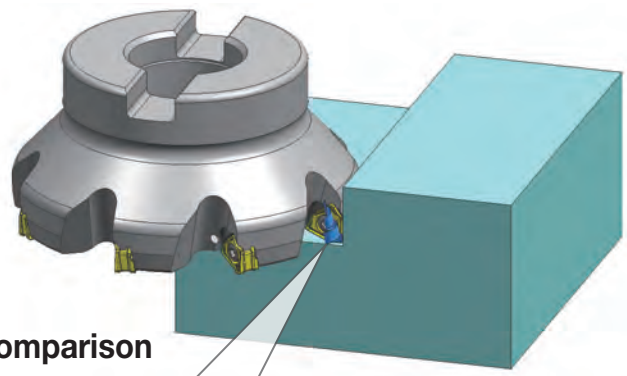


The 90° cutting angle is suitable for both face milling and shoulder milling

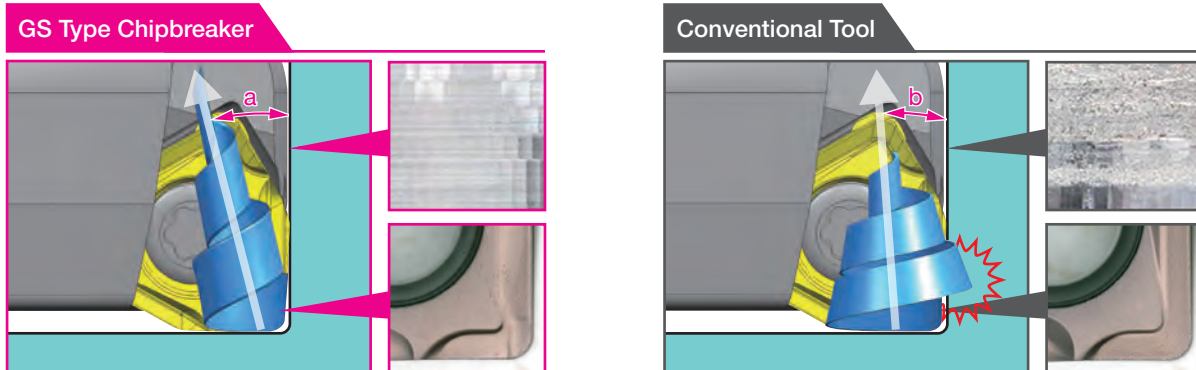
GS Type Chipbreaker for Shoulder Milling

- Excellent chip control
- Suppresses machined surface deterioration due to chip biting

Work Material: S50C Tool: $\phi 100\text{mm}$
Cutting Conditions: $v_c = 200\text{m/min}$, $f_z = 0.2\text{mm/t}$, $a_e = 50\text{mm}$, $a_p = 3\text{mm}$ x 6 Passes, Dry



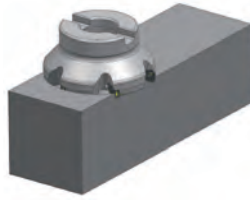
Chip generation image and machined surface comparison



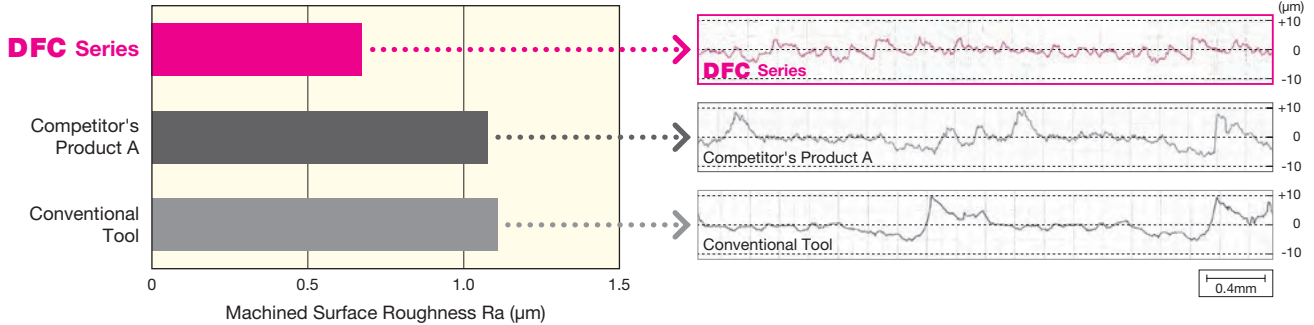
Chip flow direction control ($a > b$) \Rightarrow chip biting suppressed

■ Cutting Performance

Face Milling



(1) Machined surface roughness:
Better than competitors' products



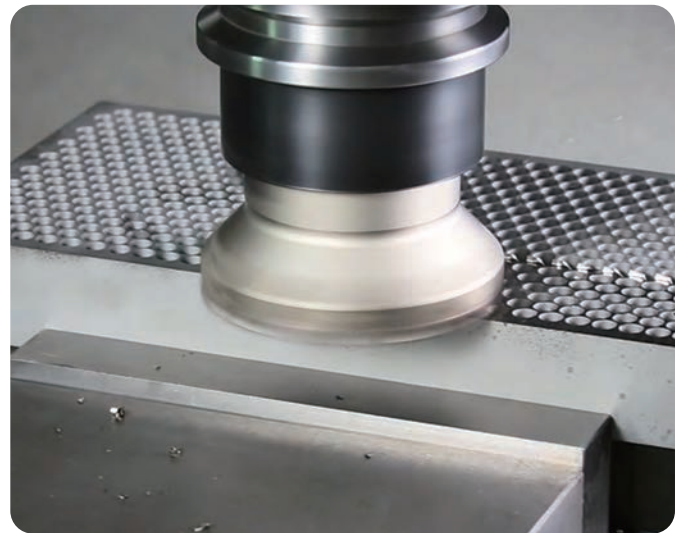
Work Material: S50C Tool: DFC 09100RS Insert: XNMU 060608PNER-G Grade: ACP200 Cutting Conditions: $v_c = 200\text{m/min}$, $f_z = 0.2\text{mm/t}$, $a_p = 3\text{mm}$, $a_e = 85\text{mm}$, Dry

(2) Cutting edge strength / Cutting edge damage during heavy interrupted cutting:
Cutting edge strength surpassing competitors' double-sided cutters

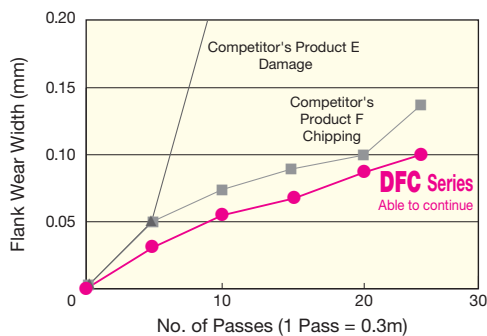
	f_z (mm/t)		
	0.3	0.4	0.5
DFC Series	○	○	○
Competitor's Product B (Double-sided, 6 Corners)	○	Damage (Midway through 2 passes)	
Competitor's Product C (Double-sided, 6 Corners)	Damage (Midway through 3 passes)		
Competitor's Product D (Double-sided vertical)	Damage (Midway through 3 passes)		

(Cutting Distance: 0.9m)

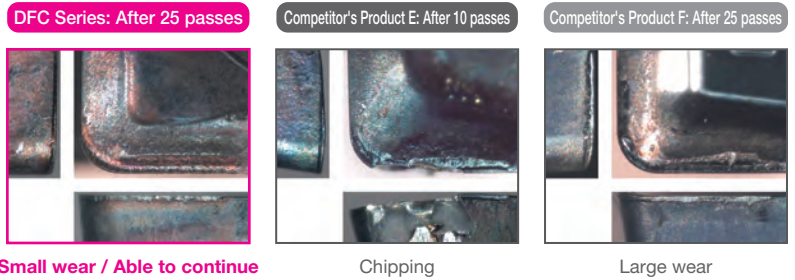
Work Material: S50C (With Holes)
 Tool: DFC 09100RS
 Insert: XNMU 060608PNER-G Grade: ACP300
 Cutting Conditions: $v_c = 150\text{m/min}$, $a_p = 3\text{mm}$, $a_e = 50\text{mm}$, Dry



(3) Wear resistance: **Achieves long tool life thanks to excellent wear resistance**



Comparison of cutting edge damage



Work Material: S50C Tool: DFC 09100RS Insert: XNMU 060608PNER-G Grade: ACP200 Cutting Conditions: $v_c = 200\text{m/min}$, $f_z = 0.2\text{mm/t}$, $a_p = 3\text{mm}$, $a_e = 85\text{mm}$, Dry

Applications and Recommended Chipbreakers

Face Milling G	Shoulder Milling GS	Side Milling G/GS	Helical Milling	Ramping

Guidelines for Shoulder Milling Conditions

Maximum Radial Depth of Cut
 G Type: $a_r \leq 10\%$ of cutter diameter
 GS Type: $a_r \leq 50\%$ of cutter diameter

Recommended Axial Depth of Cut
 $a_p = 3\text{mm}$

Recommended Feed Rate
 $f_z \leq 0.2\text{mm/t}$

(for general steel)

Applications which are not applicable

Product Range

Type	Cat. No.	Description	Dia. (mm)										Shape
			ø25	ø32	ø40	ø50	ø63	ø80	ø100	ø125	ø160	ø200	
Shell	DFC 09000R <small>Inch</small>	Standard Pitch						5	6	7	8	10	
	DFC 09000RS	Standard Pitch				4	4	5	6	7	8	10	
	DFCM 09000R <small>Inch</small>	Fine Pitch						7	8	11	12	16	
	DFCM 09000RS	Fine Pitch				5	6	7	8	11	12	16	
	DFCF 09000R <small>Inch</small>	Extra Fine Pitch						9	11	14	16	20	
	DFCF 09000RS	Extra Fine Pitch				6	7	9	11	14	16	20	
Shank	DFC 09000E	Standard Pitch	2	2	3	3*	4*	5*					
	DFCM 09000E	Fine Pitch		3	4	5*	6*	7*					

Number in ● shows the number of teeth Inch Inch Bore *mark: Different-diameter shanks in stock

Insert Grades

The newly developed general-purpose ACU2500 grade suitable for various work materials has now been released.

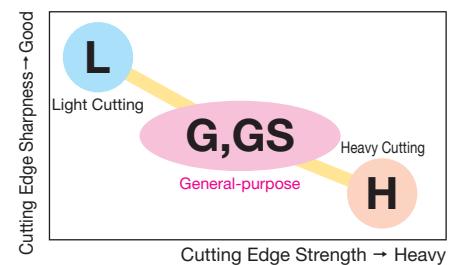
Lineup of Steel Milling Grades ACP100/ACP200/ACP300, Stainless Steel Milling Grades ACM200/ACM300, Cast Iron Milling Grades ACK200/ACK300 and more to suit a wide range of work materials.



Chipbreaker Selection

Work Material	P M K S			
Applications	Light Cutting	General-purpose to Interrupted Milling	Shoulder Milling	Heavy Cutting
Features	Low Rigidity Milling, Reduction of Burrs	Face Milling	Shoulder Milling	Heavy Cross Section Cutting, Hardened Steel
Chipbreaker	L Type	G Type	GS Type	H Type
Cutting Edge Cross Section				

Chipbreaker Selection Guide



Insert Mounting Precautions



No Gap

Make sure there is no gap



Gap

Place the insert face flat onto the cutter's insert pocket and tighten the flat insert screw with the recommended torque.

Grade Application Range

New-generation coated carbide grades **XCU2500/XCK2000** now available!
 Lineup includes coated grades applicable to various work materials such as steel, stainless steel, and cast iron.

Work Material	Finishing to Light Cutting	Medium Cutting	Rough to Heavy Cutting
P Steel	Coated Carbide		
	ACU2500 XCU2500 ACP100	ACP200	ACP300
	Coated Carbide		
	ACU2500 XCU2500 ACM200	ACM300	
M Stainless Steel	Coated Carbide		
	ACU2500 XCU2500 ACM200	ACM300	
	Coated Carbide		
	ACU2500 XCU2500 XCK2000 ACK200	ACK300	
K Cast Iron	Coated Carbide		
	ACU2500 XCU2500 XCK2000 ACK200	ACK300	
	Coated Carbide		
	ACU2500 ACM200	ACM300	
S Exotic Alloy	Coated Carbide		
	ACU2500 ACM200	ACM300	

The letters "C" and "P" at the end of each grade indicate the coating type. ▽: CVD ▲: PVD

Grade Features

New coating technology that realises absolute stability ABSOTECH™ (Absolute Technology)

ABSOTECH
PVD

New Super Multi-Layered Structure
 Higher hardness and twice the conventional wear resistance due to a fine crystal structure AlTiCrBN-based nano-layered coating

High Adhesion Strength
 Coating adhesion significantly increased for twice or more the conventional chipping resistance

Applicable Grades: **ACU2500**

ABSOTECH
CVD

Pure Cubic Crystal AlTiN with High Al Content
 With proprietary structural control technology, differently composed layers of AlTiN are stacked at the nanometre level. With a high-Al composition containing over 80% Al on average, it also maintains a cubic crystalline structure to achieve excellent thermal resistance and high hardness. Vastly improved wear resistance.

Special Surface Treatment
 Proprietary surface treatment introduces high compression stress to the coating, suppressing the development of cracks. Greatly improved fracture and thermal crack resistance.

Applicable Grades: **XCU2500, XCK2000**

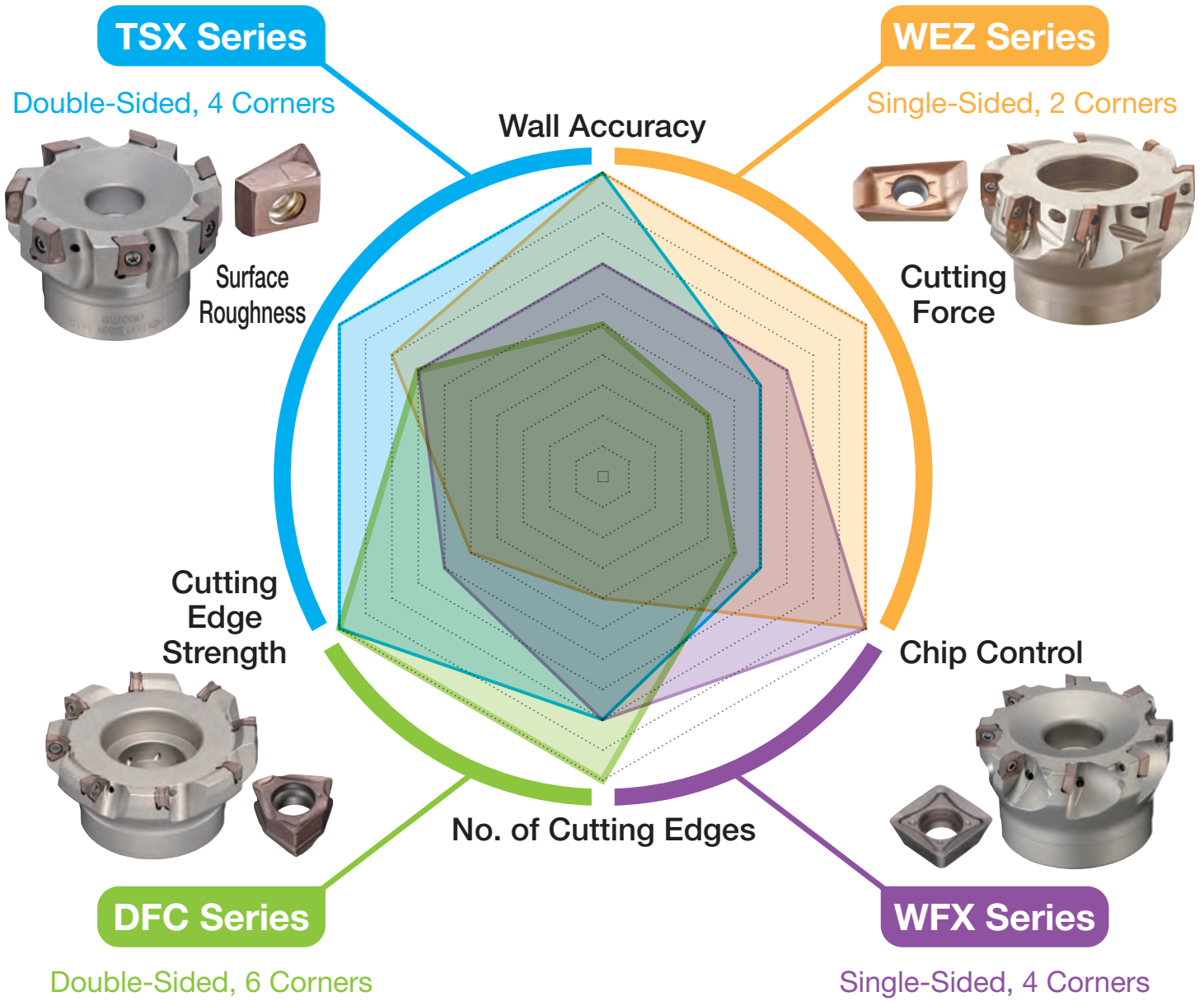
ACP200/ACP300/ACK300/ACM300 NEW SUPER ZX COAT

Realises superb stability due to a carbide substrate optimised for steel, cast iron, and stainless steel with a highly chipping-resistant coating.

ACP100/ACK200/ACM200 SUPER FF COAT

Realises superb stability in high-efficiency machining due to a carbide substrate optimised for steel, cast iron, and stainless steel with a highly wear-resistant coating.

Shoulder Milling Selection Guide



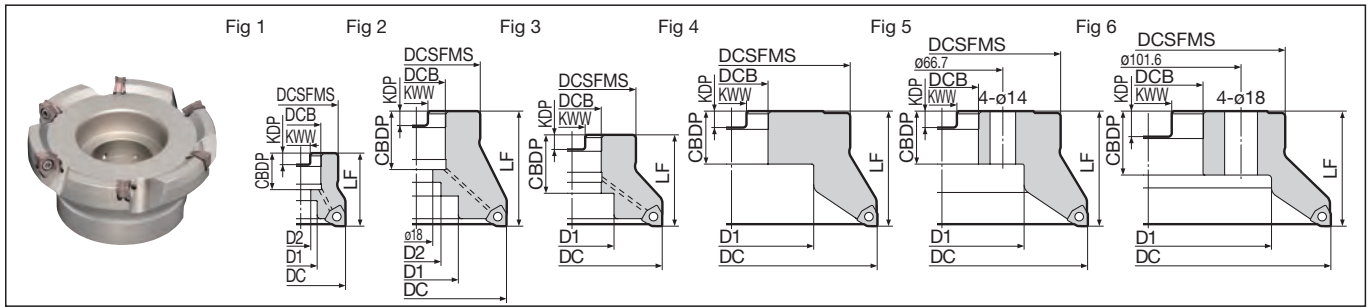
★★★: 1st Recommendation

	Surface Roughness	Wall Accuracy	Cutting Force	Chip Control	No. of Cutting Edges	Cutting Edge Strength
WEZ Series	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	★	★ ★ ★
TSX Series	★ ★ ★	★ ★ ★	★ ★	★ ★ ★	★ ★	★ ★ ★
DFC Series	★ ★ ★	★	★	★ ★ ★	★ ★ ★	★ ★ ★
WFX Series	★ ★ ★	★ ★	★ ★	★ ★ ★	★ ★	★ ★

*For the details of each product, see the WEZ series (brochure No. 528), TSX series (brochure No. 523), and WFX series (brochure No. 491).

Rake Angle	Radial	-9°
	Axial	-5°

6mm **90°**



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDR	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	DFC 09050RS	●	50	41	40	22	10.4	6.3	20	18	11	4	0.3	1
	09063RS	●	63	50	40	22	10.4	6.3	20	18	11	4	0.5	1
	09080RS	●	80	55	50	27	12.4	7	22	20	14	5	1.0	1
	09100RS	●	100	70	50	32	14.4	8	32	46	—	6	1.4	3
	09125RS	●	125	80	63	40	16.4	9	29	52	29	7	2.8	1
	09160RS	●	160	130	63	40	16.4	9	29	90	—	8	4.6	5
	09200RS	●	200	150	63	60	25.7	14	35	135	—	10	5.7	6
Inch	DFC 09080R	●	80	55	50	25.4	9.5	6	25	20	14	5	1.0	1
	09100R	●	100	70	63	31.75	12.7	8	32	46	27	6	2.0	2
	09125R	●	125	80	63	38.1	15.9	10	35.5	55	30	7	2.8	1
	09160R	●	160	100	63	50.8	19.1	11	38	72	—	8	3.6	4
	09200R	●	200	150	63	47.625	25.4	14	35	135	—	10	6.0	6

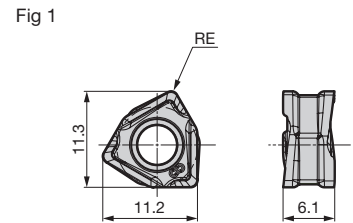
Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

For mounting the ø80 and ø100mm sized cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

Dimensions (mm)

Grade Classification	Coated Carbide										Corner Radius RE	Fig
	High-speed/Light	K	K	M	P	P	K	K	M	S		
	Medium Cutting	K	K	M	P	P	K	K	M	S		
Process	Roughing	K <td>K <td>M <td>P <td>P <td>K <td>K <td>M <td>S <td></td> <td></td> </td></td></td></td></td></td></td></td>	K <td>M <td>P <td>P <td>K <td>K <td>M <td>S <td></td> <td></td> </td></td></td></td></td></td></td>	M <td>P <td>P <td>K <td>K <td>M <td>S <td></td> <td></td> </td></td></td></td></td></td>	P <td>P <td>K <td>K <td>M <td>S <td></td> <td></td> </td></td></td></td></td>	P <td>K <td>K <td>M <td>S <td></td> <td></td> </td></td></td></td>	K <td>K <td>M <td>S <td></td> <td></td> </td></td></td>	K <td>M <td>S <td></td> <td></td> </td></td>	M <td>S <td></td> <td></td> </td>	S <td></td> <td></td>		
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300		
XNMU 060604PNER-L	●	●	—	●	●	●	—	●	—	●	0.4	1
060608PNER-L	●	●	—	●	●	●	—	●	—	●	0.8	1
XNMU 060604PNER-G	●	●	●	●	●	●	●	●	●	●	0.4	1
060608PNER-G	●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-G	●	—	●	●	●	—	●	●	●	●	1.2	1
060616PNER-G	●	—	●	●	●	—	●	●	●	●	1.6	1
XNMU 060604PNER-GS	●	—	●	●	●	—	●	●	●	●	0.4	1
060608PNER-GS	●	●	●	●	●	●	—	●	●	●	0.8	1
060612PNER-GS	●	—	●	●	●	—	●	●	●	●	1.2	1
060616PNER-GS	●	—	●	●	●	—	●	●	●	●	1.6	1
XNMU 060608PNER-H	●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-H	●	—	●	●	●	—	●	●	●	●	1.2	1
060616PNER-H	●	—	●	●	●	—	●	●	●	●	1.6	1



Identification Code

DFC 09 050 R S

Series Insert Size Cutter Dia. Feed Direction Metric Bore

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Depth of Cut a_p (mm)	Insert Grade
P	General Steel	180 to 280 HB	150 - 200 - 250	0.10 - 0.20 - 0.30	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180 - 250 - 350	0.15 - 0.25 - 0.35	< 6	
	Die Steel	200 to 220 HB	100 - 150 - 200	0.10 - 0.18 - 0.25	< 4	
M	Stainless Steel	—	160 - 205 - 250	0.12 - 0.18 - 0.25	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100 - 175 - 250	0.10 - 0.20 - 0.30	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - 50 - 80	0.10 - 0.20 - 0.30	< 6	ACU2500 ACM200 ACM300

For shoulder milling, the GS Type breaker is recommended. Use at $a_p \leq 50\%$ of cutter diameter and $f_z \leq 0.2\text{mm/t}$.

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

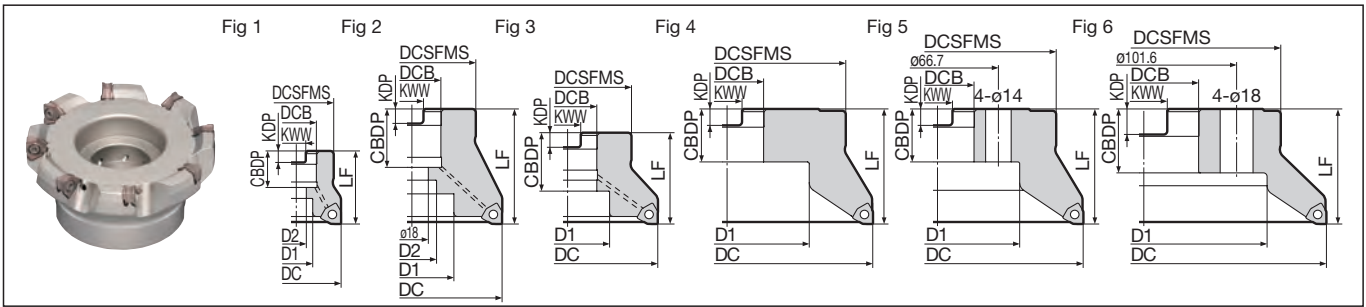
Parts

Applicable Cutter	Flat Insert Screw	Integrated Wrench	Detachable Wrench		Anti-seizure Cream
			Handle Grip	Bit	
DC ø50 to 125	BFTX03512IP	—	HPS1015	TRB15IP	SUMI-P
Other than above	—	TRDR15IP	—	—	

Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (expanded item) Blank: Made-to-order item —mark: Not available

Rake Angle	Radial	-9°
	Axial	-5°

6mm 90°



Body (Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	DFCM 09050RS	●	50	41	40	22	10.4	6.3	20	18	11	5	0.3	1
	09063RS	●	63	50	40	22	10.4	6.3	20	18	11	6	0.5	1
	09080RS	●	80	55	50	27	12.4	7	22	20	14	7	0.9	1
	09100RS	●	100	70	50	32	14.4	8	32	46	—	8	1.4	3
	09125RS	●	125	80	63	40	16.4	9	29	52	29	11	2.7	1
	09160RS	●	160	130	63	40	16.4	9	29	90	—	12	4.5	5
	09200RS	●	200	150	63	60	25.7	14	35	135	—	16	5.6	6
Inch	DFCM 09080R	●	80	55	50	25.4	9.5	6	25	20	14	7	0.9	1
	09100R	●	100	70	63	31.75	12.7	8	32	46	27	8	1.9	2
	09125R	●	125	80	63	38.1	15.9	10	35.5	55	30	11	2.7	1
	09160R	●	160	100	63	50.8	19.1	11	38	72	—	12	3.5	4
	09200R	●	200	150	63	47.625	25.4	14	35	135	—	16	5.9	6

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

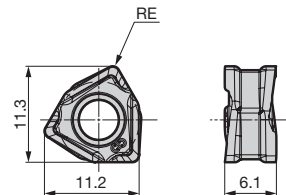
For mounting the ø80 and ø100mm sized cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Corner Radius RE	Fig
Process	High-speed/Light Medium Cutting Roughing	KM	PM	PM	PM	PM	K	K	K	MS	MS		
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300			
XNMU 060604PNER-L	●	●	—	●	●	●	—	—	—	●	0.4	1	
060608PNER-L	●	●	—	●	●	●	—	—	—	●	0.8	1	
XNMU 060604PNER-G	●	●	●	●	●	●	●	●	●	●	0.4	1	
060608PNER-G	●	●	●	●	●	●	●	●	●	●	0.8	1	
060612PNER-G	●	●	●	●	●	●	●	●	●	●	1.2	1	
060616PNER-G	●	●	●	●	●	●	●	●	●	●	1.6	1	
XNMU 060604PNER-GS	●	●	●	●	●	●	●	●	●	●	0.4	1	
060608PNER-GS	●	●	●	●	●	●	●	●	●	●	0.8	1	
060612PNER-GS	●	●	●	●	●	●	●	●	●	●	1.2	1	
060616PNER-GS	●	●	●	●	●	●	●	●	●	●	1.6	1	
XNMU 060608PNER-H	●	●	●	●	●	●	●	●	●	●	0.8	1	
060612PNER-H	●	●	●	●	●	●	●	●	●	●	1.2	1	
060616PNER-H	●	●	●	●	●	●	●	●	●	●	1.6	1	

Fig 1



XNMU060608PNER-■

Identification Code

DFC Series **M** Fine Pitch **09** Insert Size **050** Cutter Dia. **R** Feed Direction **S** Metric Bore

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Depth of Cut a_p (mm)	Insert Grade
P	General Steel	180 to 280 HB	150 - 200 - 250	0.10 - 0.20 - 0.30	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180 - 250 - 350	0.15 - 0.25 - 0.35	< 6	
	Die Steel	200 to 220 HB	100 - 150 - 200	0.10 - 0.18 - 0.25	< 4	
M	Stainless Steel	—	160 - 205 - 250	0.12 - 0.18 - 0.25	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100 - 175 - 250	0.10 - 0.20 - 0.30	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - 50 - 80	0.10 - 0.20 - 0.30	< 6	ACU2500 ACM200 ACM300

For shoulder milling, the GS Type breaker is recommended. Use at $a_e \leq 50\%$ of cutter diameter and $f_z \leq 0.2\text{mm/t}$.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

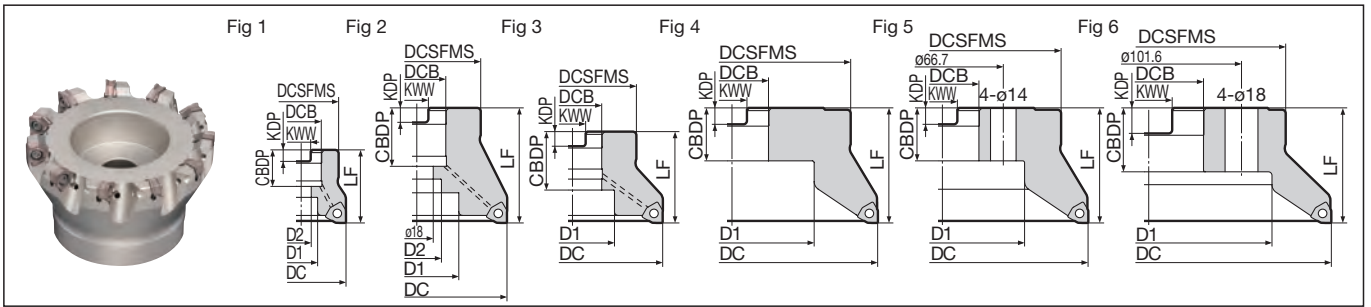
Parts

Applicable Cutter	Flat Insert Screw	Integrated Wrench	Detachable Wrench		Anti-seizure Cream
			Handle Grip	Bit	
DC ø50 to 125	BFTX03512IP	—	HPS1015	TRB15IP	SUMI-P
Other than above	—	TRDR15IP	—	—	—

Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (expanded item) Blank: Made-to-order item —mark: Not available

Rake Angle	Radial	-9°
	Axial	-5°

6mm 90°



Body (Extra Fine Pitch)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig	
Metric	DFCF 09050RS	●	50	41	40	22	10.4	6.3	20	18	11	6	0.3	1
	09063RS	●	63	50	40	22	10.4	6.3	20	18	11	7	0.5	1
	09080RS	●	80	55	50	27	12.4	7	22	20	14	9	0.9	1
	09100RS	●	100	70	50	32	14.4	8	32	46	—	11	1.3	3
	09125RS	●	125	80	63	40	16.4	9	29	52	29	14	2.6	1
	09160RS	●	160	130	63	40	16.4	9	29	90	—	16	4.5	5
	09200RS	●	200	150	63	60	25.7	14	35	135	—	20	5.5	6
Inch	DFCF 09080R	●	80	55	50	25.4	9.5	6	25	20	14	9	0.9	1
	09100R	●	100	70	63	31.75	12.7	8	32	46	27	11	1.9	2
	09125R	●	125	80	63	38.1	15.9	10	35.5	55	30	14	2.7	1
	09160R	●	160	100	63	50.8	19.1	11	38	72	—	16	3.5	4
	09200R	●	200	150	63	47.625	25.4	14	35	135	—	20	5.8	6

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

For mounting the ø80 and ø100mm sized cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

Dimensions (mm)

Grade Classification	Coated Carbide										Corner Radius RE	Fig
	High-speed/Light	KM	PM	PM	PM	K	K	MS	MS	MS		
Process	Medium Cutting	KM	PM	PM	PM	K	K	MS	MS	MS		
	Roughing	MS	MS	MS	MS	K		MS	MS	MS		
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300		
XNMU 060604PNER-L	●	●	—	●	●	●	—	—	—	—	0.4	1
060608PNER-L	●	●	—	●	●	●	—	—	—	—	0.8	1
XNMU 060604PNER-G	●	●	●	●	●	●	●	●	●	●	0.4	1
060608PNER-G	●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-G	●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-G	●	●	●	●	●	●	●	●	●	●	1.6	1
XNMU 060604PNER-GS	●	●	●	●	●	●	●	●	●	●	0.4	1
060608PNER-GS	●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-GS	●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-GS	●	●	●	●	●	●	●	●	●	●	1.6	1
XNMU 060608PNER-H	●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-H	●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-H	●	●	●	●	●	●	●	●	●	●	1.6	1

XNMU060608PNER- ■

Identification Code

DFC Series **F** Extra Fine Pitch **09** Insert Size **050** Cutter Dia. **R** Feed Direction **S** Metric Bore

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Depth of Cut a_p (mm)	Insert Grade
P	General Steel	180 to 280 HB	150 - 200 - 250	0.10 - 0.20 - 0.30	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180 - 250 - 350	0.15 - 0.25 - 0.35	< 6	
	Die Steel	200 to 220 HB	100 - 150 - 200	0.10 - 0.18 - 0.25	< 4	
M	Stainless Steel	—	160 - 205 - 250	0.12 - 0.18 - 0.25	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100 - 175 - 250	0.10 - 0.20 - 0.30	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - 50 - 80	0.10 - 0.20 - 0.30	< 6	ACU2500 ACM200 ACM300

For shoulder milling, the GS Type breaker is recommended. Use at $a_s \leq 50\%$ of cutter diameter and $f_z \leq 0.2$ mm/t.

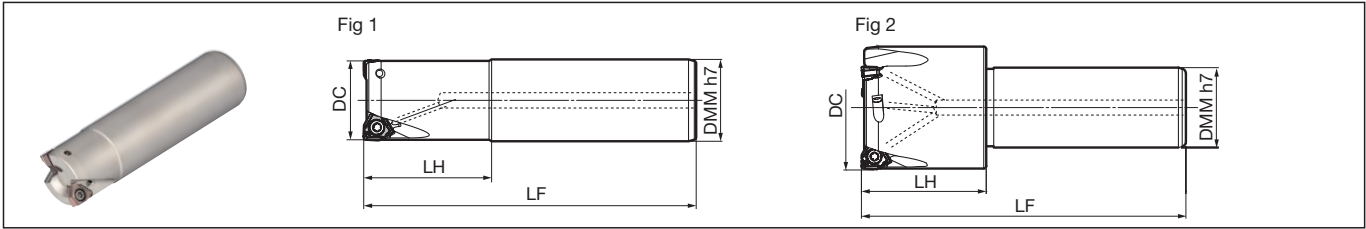
Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Flat Insert Screw	Integrated Wrench	Detachable Wrench		Anti-seizure Cream
			Handle Grip	Bit	
DC ø50 to 125	BFTX03512IP	—	HPS1015	TRB15IP	SUMI-P
Other than above	—	TRDR15IP	—	—	

Recommended Tightening Torque (N·m) ● mark: Standard stocked item ● mark: Standard stocked item (expanded item) Blank: Made-to-order item —mark: Not available

Rake Angle	Radial	-9°	
	Axial	-5°	



Body (Standard Pitch)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Fig
DFC 09025E	●	25	25	40	120	2	1
09032E	●	32	32	50	130	2	1
09040E	●	40	32	50	130	3	2
09050E	●	50	32	50	130	3	2
09050E-42	●	50	42	50	150	3	2
09063E	●	63	32	50	130	4	2
09063E-42	●	63	42	50	150	4	2
09080E	●	80	32	50	130	5	2
09080E-42	●	80	42	50	150	5	2

Body (Fine Pitch)

Dimensions (mm)

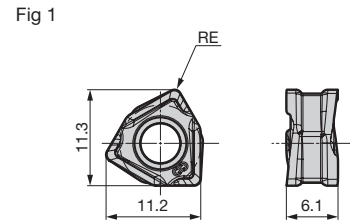
Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Fig
DFCM 09032E	●	32	32	50	130	3	1
09040E	●	40	32	50	130	4	2
09050E	●	50	32	50	130	5	2
09050E-42	●	50	42	50	150	5	2
09063E	●	63	32	50	130	6	2
09063E-42	●	63	42	50	150	6	2
09080E	●	80	32	50	130	7	2
09080E-42	●	80	42	50	150	7	2

Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification	Coated Carbide										Corner Radius RE	Fig
	Process											
	High-speed/Light	P	M	K	S	P	M	K	S	P		
Process	Medium Cutting	●	●	●	●	●	●	●	●	●	●	●
	Roughing	●	●	●	●	●	●	●	●	●	●	●
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300		
XNMU 060604PNER-L	●	●	—	●	●	●	—	●	—	●	0.4	1
060608PNER-L	●	●	—	●	●	●	—	●	—	●	0.8	1
XNMU 060604PNER-G	●	●	●	●	●	●	●	●	●	●	0.4	1
060608PNER-G	●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-G	●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-G	●	●	●	●	●	●	●	●	●	●	1.6	1
XNMU 060604PNER-GS	●	●	●	●	●	●	●	●	●	●	0.4	1
060608PNER-GS	●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-GS	●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-GS	●	●	●	●	●	●	●	●	●	●	1.6	1
XNMU 060608PNER-H	●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-H	●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-H	●	●	●	●	●	●	●	●	●	●	1.6	1



XNMU060608PNER-■

Identification Code

DFC Series **M** Fine Pitch **09** Insert Size **025** Cutter Dia. **E** Shank Type

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Depth of Cut a_p (mm)	Insert Grade
P	General Steel	180 to 280 HB	150 - 200 - 250	0.10 - 0.20 - 0.30	< 6	ACU2500
	Mild Steel	≤ 180HB	180 - 250 - 350	0.15 - 0.25 - 0.35	< 6	ACP200
	Die Steel	200 to 220 HB	100 - 150 - 200	0.10 - 0.18 - 0.25	< 4	ACU2500
M	Stainless Steel	—	160 - 205 - 250	0.12 - 0.18 - 0.25	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100 - 175 - 250	0.10 - 0.20 - 0.30	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - 50 - 80	0.10 - 0.20 - 0.30	< 6	ACU2500 ACM200 ACM300

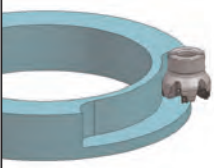
For shoulder milling, the GS Type breaker is recommended. Use at $a_n \leq 50\%$ of cutter diameter and $f_z \leq 0.2\text{mm/t}$.
 Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

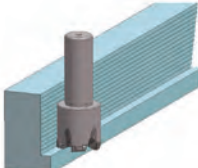
Parts

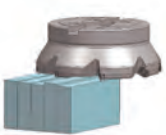
Flat Insert Screw	Wrench	Anti-seizure Cream
BFTX03512IP	3.0 TRDR15IP	SUMI-P


Recommended Tightening Torque (N-m) ● mark: Standard stocked item ● mark: Standard stocked item (expanded item) Blank: Made-to-order item —mark: Not available

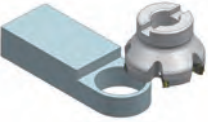
Application Examples

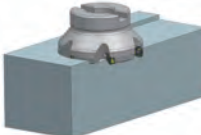
Ring Component (SCM440)		Sumitomo	Competitor's Product
	Tool	DFCM09050RS	Double-Sided, 6 Corners
	Grade	ACP200	—
	Chipbreaker	GS	—
	Diameter (mm)	50	50
	Number of Teeth	5	5
	V_c (m/min)	140	140
	V_f (mm/min)	1,113	1,113
	f_z (mm/t)	0.25	0.25
	a_p (mm)	2.5	2.5
	a_e (mm)	30	30
	Coolant	Dry	Dry
	Results	With no chip biting, tool life of 600%	

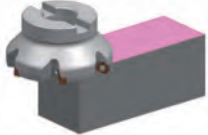
Machine Vise (S45C)		Sumitomo	Competitor's Product
	Tool	DFCM09050E	Single-Sided, 2 Corners
	Grade	ACP200	—
	Chipbreaker	GS	—
	Diameter (mm)	50	50
	Number of Teeth	5	5
	V_c (m/min)	188	188
	V_f (mm/min)	1,200	800
	f_z (mm/t)	0.20	0.13
	a_p (mm)	5	5
	a_e (mm)	13	13
	Coolant	Air Blow	Air Blow
	Results	150% Machining Efficiency	


Multiple Block Milling (SCMnH1)		Sumitomo	Competitor's Product
	Tool	DFC09160RS	Double-Sided, 8 Corners
	Grade	ACP300	—
	Chipbreaker	G	—
	Diameter (mm)	160	160
	Number of Teeth	8	12
	V_c (m/min)	150	150
	V_f (mm/min)	500	500
	f_z (mm/t)	0.21	0.14
	a_p (mm)	1.0	0.5
	a_e (mm)	100	100
	Coolant	Wet	Wet
	Results	200% Machining Efficiency Tool Life 300%	

Construction Machinery Component (S50C)		Sumitomo	Competitor's Product
	Tool	DFC09063RS	Single-Sided, 2 Corners
	Grade	ACP200	—
	Chipbreaker	G	—
	Diameter (mm)	63	63
	Number of Teeth	4	5
	V_c (m/min)	180	180
	V_f (mm/min)	1,092	910
	f_z (mm/t)	0.3	0.2
	a_p (mm)	2.0	2.0
	a_e (mm)	50	50
	Coolant	Dry	Dry
	Results	120% Machining Efficiency	

Automotive Component (S50C)		Sumitomo	Competitor's Product
	Tool	DFC09080RS	Single-Sided, 4 Corners
	Grade	ACP200	—
	Chipbreaker	G	—
	Diameter (mm)	80	80
	Number of Teeth	5	5
	V_c (m/min)	226	200
	V_f (mm/min)	1,260	800
	f_z (mm/t)	0.28	0.20
	a_p (mm)	2.0	2.0
	a_e (mm)	5.0	5.0
	Coolant	Wet	Wet
	Results	160% Machining Efficiency	

Pump Component (FCD400)		Sumitomo	Competitor's Product
	Tool	DFCF09100R	Double-Sided, 6 Corners
	Grade	ACK300	—
	Chipbreaker	G	—
	Diameter (mm)	100	100
	Number of Teeth	11	8
	V_c (m/min)	335	335
	V_f (mm/min)	1,825	1,825
	f_z (mm/t)	0.15	0.21
	a_p (mm)	2.0	2.0
	a_e (mm)	75	75
	Coolant	Dry	Dry
	Results	Tool Life Over 150%	

Bearing Cover (FC250/FCD450/SC450)		Sumitomo	Competitor's Product
	Tool	DFC09100RS	—
	Grade	XCU2500	—
	Chipbreaker	G	—
	Diameter (mm)	100	100
	Number of Teeth	4	4
	V_c (m/min)	236	236
	V_f (mm/min)	361	361
	f_z (mm/t)	0.12	0.12
	a_p (mm)	3.0	3.0
	a_e (mm)	80	80
	Coolant	Dry	Dry
	Results	Excellent wear resistance achieves 2 times longer tool life	

Housing Pilot (FCD450)		Sumitomo	Competitor's Product
	Tool	DFC09125RS	—
	Grade	XCK2000	—
	Chipbreaker	G	—
	Diameter (mm)	125	125
	Number of Teeth	7	7
	V_c (m/min)	163	163
	V_f (mm/min)	581	581
	f_z (mm/t)	0.2	0.2
	a_p (mm)	3.0	3.0
	a_e (mm)	125	125
	Coolant	Wet	Wet
	Results	Excellent wear resistance achieves 2 times longer tool life	

Sumitomo Electric Cutting Tools Official Apps for iOS/Android



Cutting calculation App

SumiTool Calculator



Grade & chipbreaker comparison App

SumiTool Converter



< SAFETY NOTES >



- Very hot or lengthy chips may be discharged while the machine is in operation. Therefore, machine guards, safety goggles or other protective covers must be used. Fire safety precautions must also be considered.

- Please handle with care as this product has sharp edges.
- Improper cutting conditions or mis-handling of the tool may result in breakages or projectiles. Therefore, please use the tool within its recommended conditions.

- When using non-water soluble cutting oil, precautions against fire must be taken and please ensure that a fire extinguisher is placed near the machine.

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