

Sumi Dual Mill Series

# DFC-Cutter

New Design for Reliable Results  
Insert with 6 Corners Offers Economic Machining



- Stable and reliable tool life
- Wide milling cutter range to cover various applications
- 6 corner/insert for high cost efficiency
- Unique, precise insert design for superior accuracy
- High toughness and secure productivity

 **SUMITOMO**

CARBIDE - CBN - DIAMOND

# Sumi Dual Mill DFC Type

## General Features

The SEC-Sumi Dual Mill DFC type employs cost effective double-sided inserts for high toughness and enhanced accuracy.  
The double-side inserts are flexible and reduces costs.



## Large Line-up

- Diameter from Ø25mm to Ø160mm
- Available as standard, fine and extra-fine pitch
- Bore diameter: metric
- Insert geometry: L, G, H

## Cutter Body

Type		Cat. No.	Diameter (mm)	No. of Teeth	Image
Shank	Standard Pitch	DFC 09000 E	Ø25~Ø63mm	2~5	
	Fine Pitch	DFC M 09000 E	Ø25~Ø63mm	3~7	
Shell	Standard Pitch	DFC 09000 RS	Ø50~Ø160mm	4~8	
	Fine Pitch	DFC M 09000 RS	Ø50~Ø160mm	5~12	
	Extra-Fine Pitch	DFC F 09000 RS	Ø50~Ø160mm	6~16	

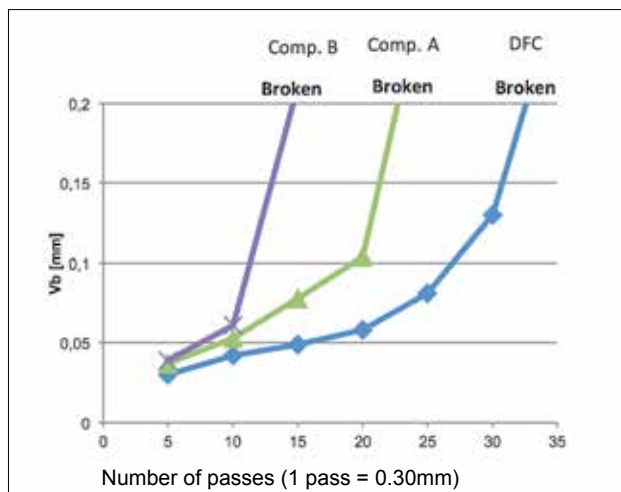
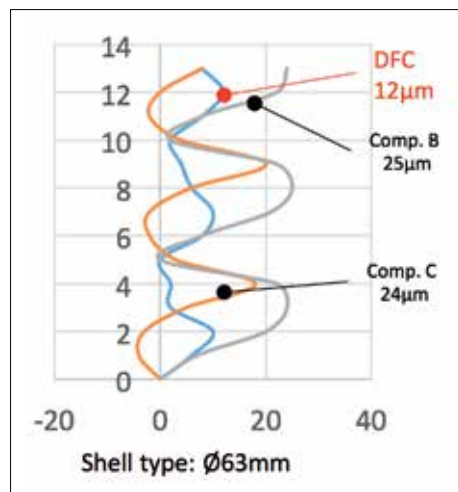
## 90 Degree Accuracy

Work material: Carbon steel

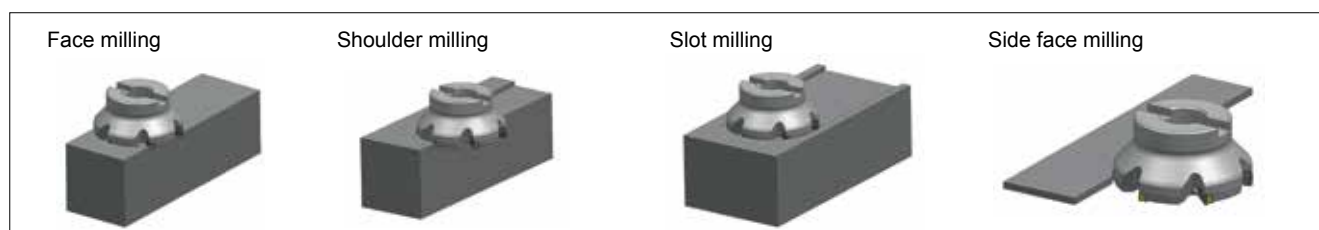
Cutting conditions:

$v_c=200\text{m/min}$ ,  $f_t=0.1\text{mm/t}$

$a_e=5.0\text{mm}$ ,  $a_p=5.0\text{mm} \times 3 \text{ pass}$



## Suitable Applications



# Sumi Dual Mill DFC(M/F) 09000RS Type

## Body – Shell type

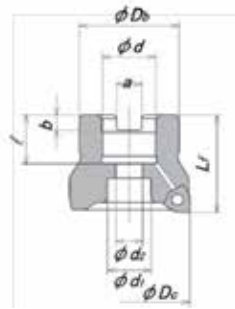


Fig.1

Rake Angle	Radial	-9°
	Axial	-5°

Max.  $a_p$ : 6mm

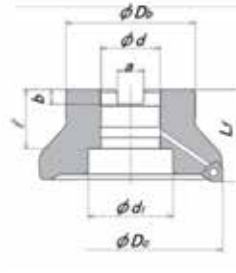


Fig.2

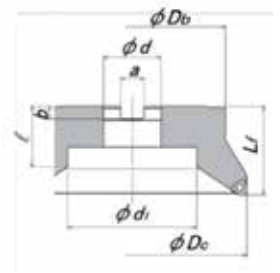


Fig.3

## Body – Dimensions

### Sumi Dual Mill DFC type, Standard Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Fig.
		Dc	Db	Lf	d	a	b	ℓ	d1	d2			
DFC09050RS	●	50	41	40	22	10.4	6.3	20	18	11	4	0.3	1
DFC09063RS	●	63	50	40	22	10.4	6.3	20	18	11	4	0.5	1
DFC09080RS	●	80	55	50	27	12.4	7	22	20	14	5	1.0	1
DFC09100RS	●	100	70	50	32	14.4	8	26	46	32	6	1.4	2
DFC09125RS	●	125	80	63	40	16.4	9	29	52	29	7	2.8	1
DFC09160RS	●	160	100	63	40	16.4	9	29	90	-	8	4.6	3

### Sumi Dual Mill DFC type, Medium Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Fig.
		Dc	Db	Lf	d	a	b	ℓ	d1	d2			
DFCM09050RS	●	50	41	40	22	10.4	6.3	20	18	11	5	0.3	1
DFCM09063RS	●	63	50	40	22	10.4	6.3	20	18	11	6	0.5	1
DFCM09080RS	●	80	55	50	27	12.4	7	22	20	14	7	0.9	1
DFCM09100RS	●	100	70	50	32	14.4	8	26	46	32	8	1.4	2
DFCM09125RS	●	125	80	63	40	16.4	9	29	52	29	11	2.7	1
DFCM09160RS	●	160	100	63	40	16.4	9	29	90	-	12	4.5	3

### Sumi Dual Mill DFC type, Fine Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Fig.
		Dc	Db	Lf	d	a	b	ℓ	d1	d2			
DFCF09050RS	●	50	41	40	22	10.4	6.3	20	18	11	6	0.3	1
DFCF09063RS	●	63	50	40	22	10.4	6.3	20	18	11	7	0.5	1
DFCF09080RS	●	80	55	50	27	12.4	7	22	20	14	9	0.9	1
DFCF09100RS	●	100	70	50	32	14.4	8	26	46	32	11	1.3	2
DFCF09125RS	●	125	80	63	40	16.4	9	29	52	29	14	2.6	1
DFCF09160RS	●	160	100	63	40	16.4	9	29	90	-	16	4.6	3

## Identification Details

**DFC**

Cutter Series

**M**

M: Medium  
F: Fine

**09**

Insert Size

**050**

Cutter Diameter

**R**

Direction

**S**

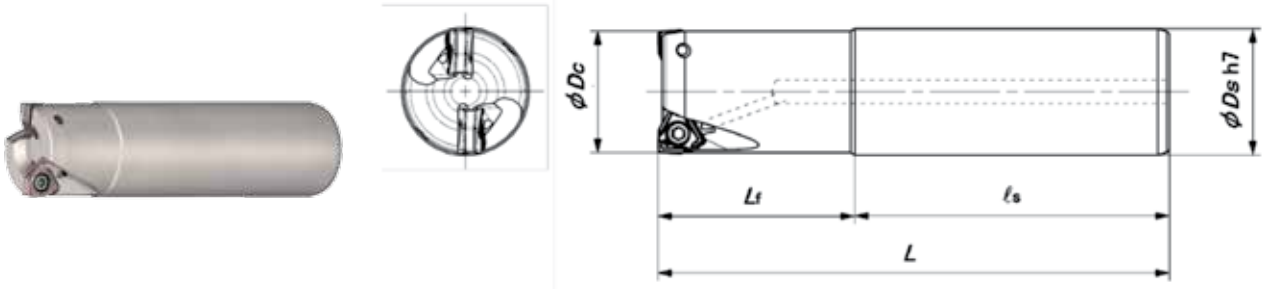
Metric

# Sumi Dual Mill DFC(M) 09000E Type

## ■ Body – Dimensions

## ● Body – Shank Type

Rake Angle	Radial	-9°	Max. $a_p$ : 6mm
	Axial	-5°	



## ● DFC type, Standard Pitch

Cat.No.	Stock	Dimensions (mm)					No. of Teeth
		Dc	Ds	Lf	ls	L	
DFC09025E	●	25	25	40	80	120	2
DFC09032E	●	32	32	50	80	130	2
DFC09040E	●	40	32	50	80	130	3
DFC09050E	●	50	32	50	80	130	3
DFC09050E-42	○	50	42	50	100	150	3
DFC09063E	●	63	32	50	80	130	4
DFC09063E-42	○	63	42	50	100	150	4
DFC09080E	●	80	32	50	80	130	5
DFC09080E-42	○	80	42	50	100	150	5

## ● DFC type, Medium Pitch

Cat.No.	Stock	Dimensions (mm)					No. of Teeth
		Dc	Ds	Lf	ls	L	
DFCM09032E	●	32	32	50	80	130	3
DFCM09040E	●	40	32	50	80	130	4
DFCM09050E	●	50	32	50	80	130	5
DFCM09050E-42	○	50	42	50	100	150	5
DFCM09063E	●	63	32	50	80	130	6
DFCM09063E-42	●	63	42	50	100	150	6
DFCM09080E	○	80	32	50	80	130	7
DFCM09080E-42	●	80	42	50	100	150	7

○ Japan stock

● Euro stock

<b>DFC</b>	<b>M</b>	<b>09</b>	<b>050</b>	<b>E</b>
Cutter Series	M: Medium F: Fine	Insert Size	Cutter Diameter	Shank Type

## ■ Recommended Cutting Conditions

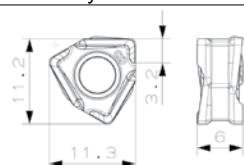
ISO	Work Material	Hardness	Cutting Speed (m/min)	Feed Rate (mm/t)	Depth of Cut (mm)	Grade
			Min. - <b>Optimum</b> - Max.	Min. - <b>Optimum</b> - Max.		
<b>P</b>	General Steel	180~280HB	150 - <b>200</b> - 250	0.10 - <b>0.20</b> - 0.30	< 6	ACP200 ACP300
	Soft Steel	≤ 180HB	180 - <b>250</b> - 350	0.15 - <b>0.25</b> - 0.35	< 6	ACP200 ACP300
	Die Steel	200~220HB	100 - <b>150</b> - 200	0.10 - <b>0.18</b> - 0.25	< 4	ACP200 ACP300
<b>M</b>	Stainless Steel	-	160 - <b>205</b> - 250	0.12 - <b>0.18</b> - 0.25	< 6	ACM200 ACM300
<b>K</b>	Cast Iron	250HB	100 - <b>175</b> - 250	0.10 - <b>0.20</b> - 0.30	< 6	ACK200 ACK300

## ■ Spare Parts

Screw	Wrench
BFTX03512IP	TRDR15IP Torque: 3.0 $\text{Nm}$

## ■ Insert

Grade		Coated Carbide						<b>P</b> Steel		
Application	High Speed / Light Cutting	<b>P</b>		<b>K</b>	<b>M</b>	<b>S</b>	<b>M</b> Stainless Steel			
	General Purpose Cutting		<b>P</b>	<b>K</b>	<b>M</b>	<b>S</b>	<b>K</b> Cast Iron			
	Rough Cutting		<b>P</b>	<b>P</b>	<b>K</b>	<b>M</b>	<b>S</b> Exotic Alloy			
Cat. No		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	Length rε	
XNMU060608PNER-L		-	●	●	-	●	-	●		0.8
XNMU060608PNER-G		●	●	●	●	●	●	●		0.8
XNMU060608PNER-H		●	●	●	●	●	●	●		0.8

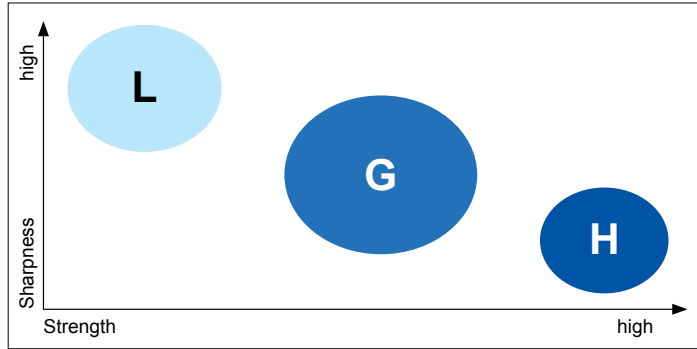


# Sumi Dual Mill DFC Type




## ■ New Insert Design Provides Excellent Machining Accuracy

- The new insert design separates the location area and cutting edge producing an optimized solution.
- Machining accuracy is comparable to single sided inserts provided the DOC is less than 3mm.
- The SEC-Sumi Dual Mill design, equips the user with a highly stable cutter for high feed machining applications.

## ● Chipbreaker Selection Map

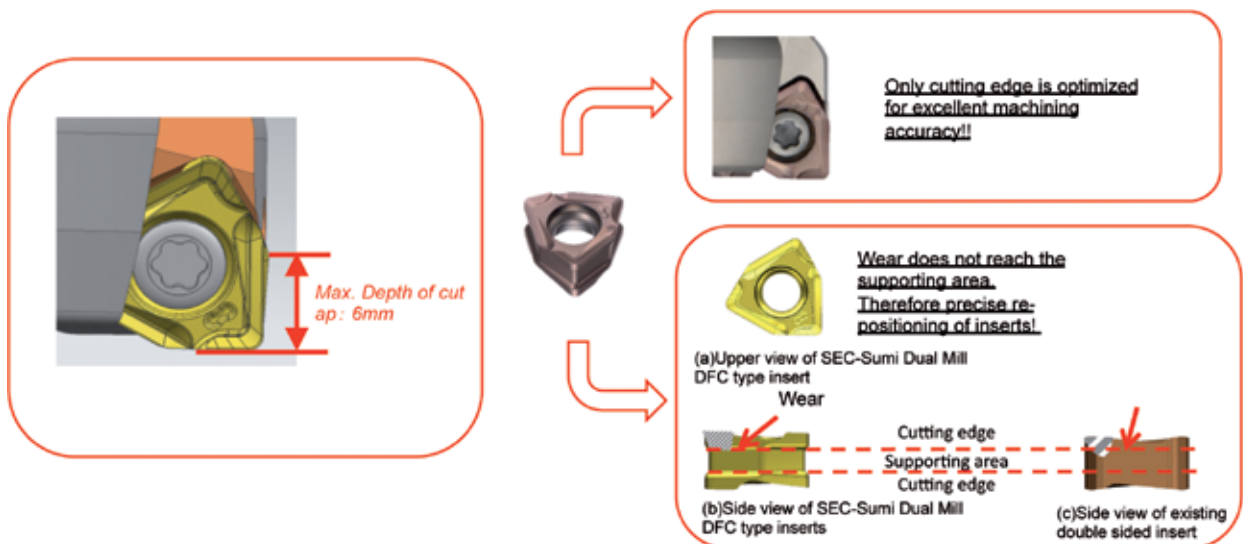


Cat. No.	R0.8
XNMMU0606__PNER-L	●
XNMMU0606__PNER-G	●
XNMMU0606__PNER-H	●

Work Material	Steel, Cast Iron		
Chip breaker	L type	G type	H type
Feature	Low cutting force	General purpose	Strong edge
Cutting edge geometry	 30°	 25°	 20°
Application	Light cut, low rigidity milling and reduced burrs	Main breaker for General purpose applications	Roughing, heavy interrupted and hardness steel milling


## ■ Stable and High Cutting Performance Combined with High Toughness


- The excellent cutter performance offers efficient machining, enables high feed rate capability.
- The new insert construction provides extremely accurate edge to edge indexing whilst the location area offers high security and stability.





# Sumi Dual Mill DFC Type

## Application Examples

Work piece		Sumitomo	Comp.
Workpiece material: Steel (HRB 269-330) 	<b>Breaker</b>	G	
	<b>Grade</b>	ACP200	
	<b>Vc m/min</b>	226	200
	<b>Vf mm/min</b>	1260	
	<b>ft mm/t</b>	0.28	0.2
	<b>ap mm</b>	2	2
	<b>ae mm</b>	5	5
	<b>DRY or WET</b>	WET	WET
	<b>Tool diameter</b>	80	
	<b>N. o. t.</b>	5	
<b>Result</b>	Efficiency: 158% achieved.		
<b>Evaluation</b>	Wear resistance, efficiency		

Work piece		Sumitomo	Comp.
Workpiece material: S235 (Carbon steel) Face milling 	<b>Breaker</b>	G	
	<b>Grade</b>	ACP200	
	<b>Vc m/min</b>	180	180
	<b>Vf mm/min</b>	1092	910
	<b>ft mm/t</b>	0.3	0.2
	<b>ap mm</b>	2pass x 2mm	2pass x 2mm
	<b>ae mm</b>	50	50
	<b>DRY or WET</b>	DRY	DRY
	<b>Tool diameter</b>	63mm	63mm
	<b>N. o. t.</b>	4	5
<b>Result</b>	Efficiency: 120% achieved.		
<b>Evaluation</b>	Wear resistance, efficiency		

Work piece		Sumitomo	Comp.
Workpiece material: Cast Iron 	<b>Breaker</b>	G	
	<b>Grade</b>	ACP200	
	<b>Vc m/min</b>	156	156
	<b>Vf mm/min</b>	536	404
	<b>ft mm/t</b>	0.17	0.09
	<b>ap mm</b>	2.2	2.2
	<b>ae mm</b>	63.5	63.5
	<b>DRY or WET</b>	DRY	DRY
	<b>Tool diameter</b>	80mm	80mm
	<b>N. o. t.</b>	5	7
<b>Result</b>	Efficiency: 133% achieved. Tool life: 138% achieved.		
<b>Evaluation</b>	Efficiency, tool life		

Work piece		Sumitomo	Comp.
Workpiece material: Cr-Mo alloy 	<b>Breaker</b>	G	
	<b>Grade</b>	ACP200	
	<b>Vc m/min</b>	200	200
	<b>Vf mm/min</b>	838	838
	<b>ft mm/t</b>	0.2	0.13
	<b>ap mm</b>	6	6
	<b>ae mm</b>	43	43
	<b>DRY or WET</b>	DRY	DRY
	<b>Tool diameter</b>	80mm	80mm
	<b>N. o. t.</b>	5	8
<b>Result</b>	Tool life: 120% achieved.		
<b>Evaluation</b>	Efficiency		



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