

## Sumi Dual Mill Series DGC Type



- Milling cutter for high-efficient general face milling
- Unique body design can use two types of different inserts
- Insert line-up includes double-sided SNMU and ONMU types

# Sumi Dual Mill DGC Type



## General Features

Sumi Dual Mill DGC type utilizes double-sided inserts for excellent economy. This is a general-purpose cutter featuring high cutting edge strength for high efficiency milling and low-burr chipbreaker design that provides high quality machined surface.

The DGC type insert lineup includes double-sided SNMU and ONMU types.

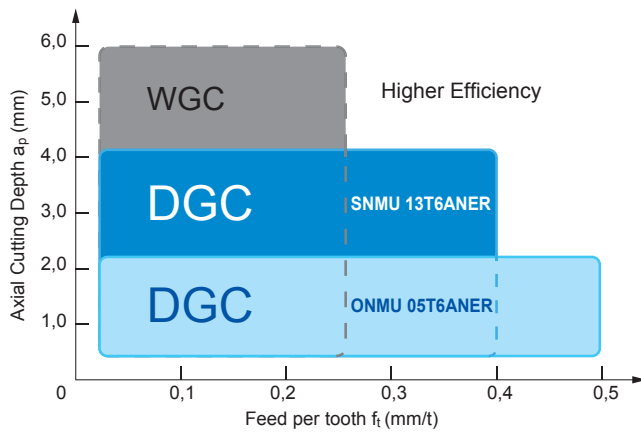
Up to 16 corners can be used for improved economy.



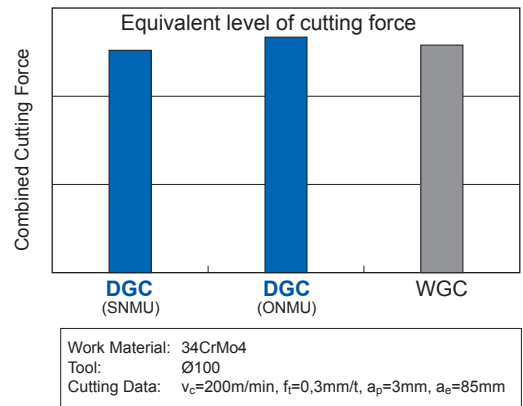
## Characteristics

- Same cutting performance as single-sided inserts plus superior economy.
- Achieves level of cutting edge sharpness and machined surface quality equivalent to single-sided cutter at a maximum cutting depth of  $a_p \leq 3\text{mm}$ .

## Recommended Cutting Conditions for General Steel Milling

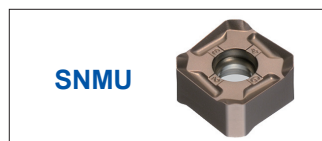


## Cutting Force Comparison



## Dual-Purpose Body

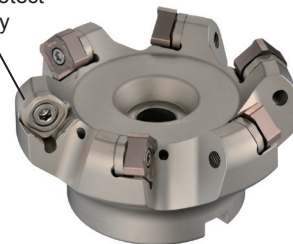
Two types of inserts can be used with a single body depending on milling application to help reduce costs. Stronger than single-sided cutters.



- first recommendation
- economical double-sided design offers 8 cutting edges with SNMU inserts
- maximum depth of cut:  $a_p = 6\text{mm}$

shim to protect cutter body

+



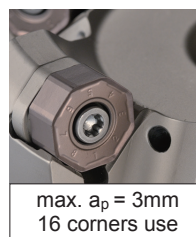
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- double-sided design with 16 corners for improved economy
- maximum depth of cut:  $a_p = 3\text{mm}$



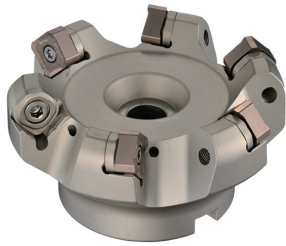
Use two types of inserts for different applications.



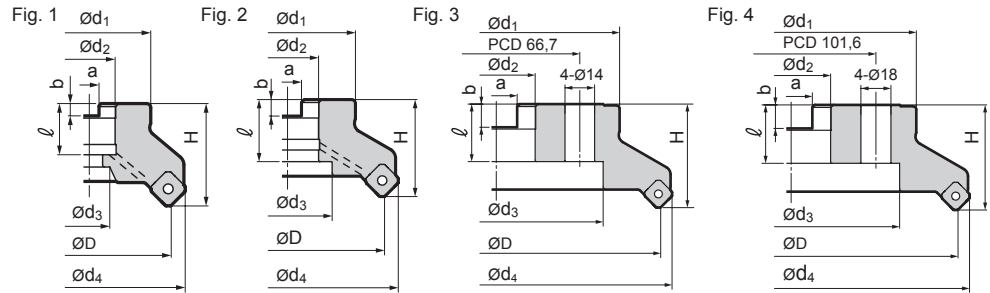
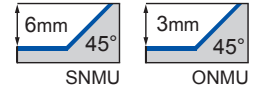
# Sumi Dual Mill DGC(M/F) 13000RS Type

## General Milling of Steel and Cast Iron

### Body – Shell type



Rake Angle	Radial	-10°
	Axial	-5°



Cutter body  $\varnothing D \geq 160\text{mm}$ : no inner coolant

### Body – Dimensions

#### ● Type: DGC, Standard Pitch

Cat. No.	Stock	Dimension (mm)				Mounting					No. of Teeth	Weight (kg)	Fig.
		$\varnothing D$	$\varnothing d_4$	$\varnothing d_1$	H	$\varnothing d_2$	$\varnothing d_3$	a	b	$\ell$			
DGC 13040 RS	●	40 (42,90)	54	36	40 (38,44)	16	13,5	8,4	5,6	18	3	0,3	1
DGC 13050 RS	●	50 (52,90)	64	40	40 (38,44)	22	18,0	10,4	6,3	20	3	0,4	1
DGC 13063 RS	●	63 (65,90)	77	50	40 (38,44)	22	18,0	10,4	6,3	20	4	0,5	1
DGC 13080 RS	●	80 (82,90)	94	60	50 (48,44)	27	20,0	12,4	7,0	25	4	1,2	1
DGC 13100 RS	●	100 (102,90)	114	70	50 (48,44)	32	46,0	14,4	8,5	32	5	1,6	2
DGC 13125 RS	●	125 (127,90)	139	80	63 (61,44)	40	52,0	16,4	9,5	29	6	2,8	1
DGC 13160 RS	●	160 (162,90)	174	130	63 (61,44)	40	88,0	16,4	9,5	29	7	4,5	3
DGC 13200 RS	○	200 (202,90)	214	150	63 (61,44)	60	130,0	25,7	14,0	35	8	7,1	4
DGC 13250 RS	○	250 (252,90)	264	190	63 (61,44)	60	160,0	25,7	14,0	35	10	11,2	4

#### ● Type: DGCM, Medium Pitch

Cat. No.	Stock	Dimension (mm)				Mounting					No. of Teeth	Weight (kg)	Fig.
		$\varnothing D$	$\varnothing d_4$	$\varnothing d_1$	H	$\varnothing d_2$	$\varnothing d_3$	a	b	$\ell$			
DGCM 13050 RS	●	50 (52,90)	64	40	40 (38,44)	22	18	10,4	6,3	20	4	0,3	1
DGCM 13063 RS	●	63 (65,90)	77	50	40 (38,44)	22	18	10,4	6,3	20	5	0,5	1
DGCM 13080 RS	●	80 (82,90)	94	60	50 (48,44)	27	20	12,4	7,0	25	6	1,1	1
DGCM 13100 RS	●	100 (102,90)	114	70	50 (48,44)	32	46	14,4	8,5	32	7	1,5	2
DGCM 13125 RS	●	125 (127,90)	139	80	63 (61,44)	40	52	16,4	9,5	29	8	2,8	1
DGCM 13160 RS	●	160 (162,90)	174	130	63 (61,44)	40	88	16,4	9,5	29	10	4,6	3
DGCM 13200 RS	○	200 (202,90)	214	150	63 (61,44)	60	130	25,7	14,0	35	12	7,0	4
DGCM 13250 RS	○	250 (252,90)	264	190	63 (61,44)	60	160	25,7	14,0	35	14	11,1	4

#### ● Type: DGCF, Fine Pitch

Cat. No.	Stock	Dimension (mm)				Mounting					No. of Teeth	Weight (kg)	Fig.
		$\varnothing D$	$\varnothing d_4$	$\varnothing d_1$	H	$\varnothing d_2$	$\varnothing d_3$	a	b	$\ell$			
DGCF 13050 RS	●	50 (52,90)	64	40	40 (38,44)	22	18	10,4	6,3	20	5	0,3	1
DGCF 13063 RS	●	63 (65,90)	77	50	40 (38,44)	22	18	10,4	6,3	20	6	0,5	1
DGCF 13080 RS	●	80 (82,90)	94	60	50 (48,44)	27	20	12,4	7,0	25	8	1,1	1
DGCF 13100 RS	●	100 (102,90)	114	70	50 (48,44)	32	46	14,4	8,5	32	10	1,4	2
DGCF 13125 RS	●	125 (127,90)	139	80	63 (61,44)	40	52	16,4	9,5	29	12	2,7	1
DGCF 13160 RS	●	160 (162,90)	174	130	63 (61,44)	40	88	16,4	9,5	29	14	4,4	3
DGCF 13200 RS	○	200 (202,90)	214	150	63 (61,44)	60	130	25,7	14,0	35	16	6,9	4
DGCF 13250 RS	○	250 (252,90)	264	190	63 (61,44)	60	160	25,7	14,0	35	18	11,0	4

○ Japan stock

● Euro stock

( ) Figures in brackets indicate values for ONMU inserts.  
Inserts are not included.

Note: Please use screw according to JIS B1176 for securing  $\varnothing 80/\varnothing 100$  cutter to the arbor ( $\varnothing 80 \Rightarrow M12 \times 30$  to 35mm,  $\varnothing 100 \Rightarrow M16 \times 40$  to 45mm)

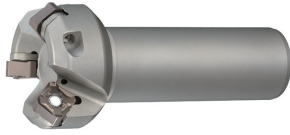
### Identification Details

<b>DGC</b>	<b>M</b>	<b>13</b>	<b>050</b>	<b>R</b>	<b>S</b>
Cutter Series	M: Medium F: Fine	Insert Size	Cutter Diameter	Direction	Metric

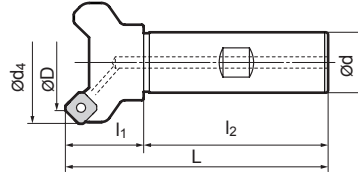
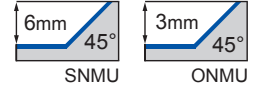
# Sumi Dual Mill DGC 13000EW Type

## General Milling for Steel and Cast Iron

### ■ Body – Shank Type



Rake Angle	Radial	-10°
	Axial	-5°



### ■ Body – Dimensions

Cat. No.	Stock	Dimension (mm)						No. of Teeth	Weight (kg)
		ØD	Ød <sub>4</sub>	Ød	l <sub>1</sub>	l <sub>2</sub>	L		
DGC 13040 EW	●	40 (42,90)	54	32	40 (38,44)	85	125	3	0,7
DGC 13050 EW	●	50 (52,90)	65	32	40 (38,44)	85	125	3	0,9
DGC 13063 EW	●	63 (65,90)	77	32	40 (38,44)	85	125	4	1,1

● Euro stock

( ) Figures in brackets indicate values for inserts of type ONMU

### ■ Identification Details

<b>DGC</b>	<b>13</b>	<b>040</b>	<b>EW</b>
Cutter Series	Insert Size	Cutter Diameter	Endmill Type Weldon

### ■ Inserts + Grades

Application	Coated Carbide					Fig.
	P	M	M	K		
High Speed/Light cut	●			●		
General Purpose		●	●	●		
Roughing		●	●		●	
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	
SNMU 13T6ANER L		●	●	●		1
SNMU 13T6ANER G	●	●	●	●	●	1
SNMU 13T6ANER H	●	●	●	●	●	1
ONMU 05T6ANER L		●	●	●		2
ONMU 05T6ANER G	●	●	●	●	●	2

● Euro stock

Fig. 1

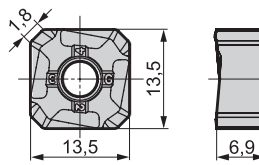
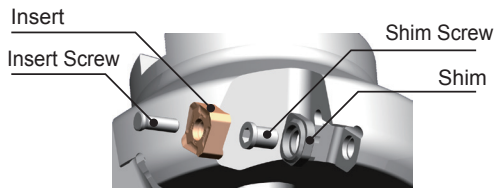
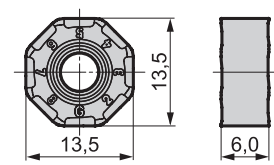


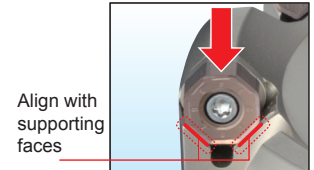
Fig. 2



### Attaching Octagonal Inserts

Firmly align insert with supporting face, press down in the direction of the arrow and tighten the screw to fix the insert.

Press down firmly from above



### ■ Spare Parts

Shim	Shim Screw	L Type Wrench	Insert Srew	Spanner
DGCS13R	BW0609F	LH040	BFTX0412IP	TRDR15IP

### Optional

Insert Srew (*)
BFTX0418IP

\*Corners can be changed simply by loosening the screw. (Only suitable for DGC / DGCM types with body size ≥ Ø80).

### ■ SNMU – Recommended Cutting Conditions

ISO	Work Material	Fit-ness	Cutting Speed v <sub>c</sub> (m/min)	Feed Rate f <sub>t</sub> (min/t)	Depth of Cut (mm)	Grade
P	General Steel	◎	150-200-250	0,10-0,25-0,40	<4	ACP200 ACP300
	Alloyed Steel	◎	180-250-350	0,10-0,30-0,45	<4	ACP200 ACP300
	Die Steel	◎	100-150-200	0,15-0,25-0,35	<4	ACP200 ACP300
M	Stainless Steel	◎	160-200-250	0,15-0,23-0,30	<3	ACP300
K	GG+GGG	◎	100-200-250	0,10-0,25-0,40	<5	ACK200 ACK300

Min. – Optimum – Max.

### ■ ONMU – Recommended Cutting Conditions

ISO	Work Material	Fit-ness	Cutting Speed v <sub>c</sub> (m/min)	Feed Rate f <sub>t</sub> (min/t)	Depth of Cut (mm)	Grade
P	General Steel	◎	150-200-250	0,10-0,30-0,50	<2	ACP200 ACP300
	Alloyed Steel	◎	180-250-350	0,10-0,50-0,50	<2	ACP200 ACP300
	Die Steel	◎	100-150-200	0,15-0,25-0,30	<2	ACP200 ACP300
M	Stainless Steel	◎	160-200-250	0,15-0,23-0,30	<2	ACP300
K	GG+GGG	◎	100-200-250	0,10-0,30-0,50	<2	ACK200 ACK300

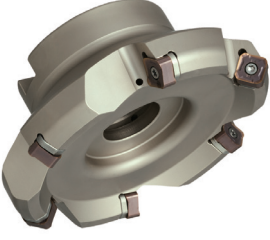

◎ Preferred choice

◎ Suitable

# Sumi Dual Mill DGC Type

## Line-up

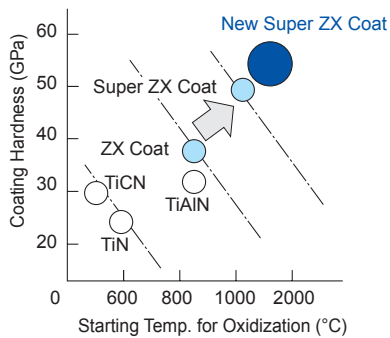
Choose a tool that fits your application from a comprehensive line-up

Cat. No	DGC 13000 RS	DGCM 13000 RS	DGCF 13000 RS	DGC 13000 EW
Type	Standard pitch	Medium pitch	Fine pitch	Endmill type
Cutter Diameter	Ø40mm ~ Ø250mm	Ø50mm ~ Ø250mm	Ø50mm ~ Ø250mm	Ø40mm ~ Ø63mm
Cutting Edges	3 ~ 10	4 ~ 14	5 ~ 18	3 ~ 4
Shape				

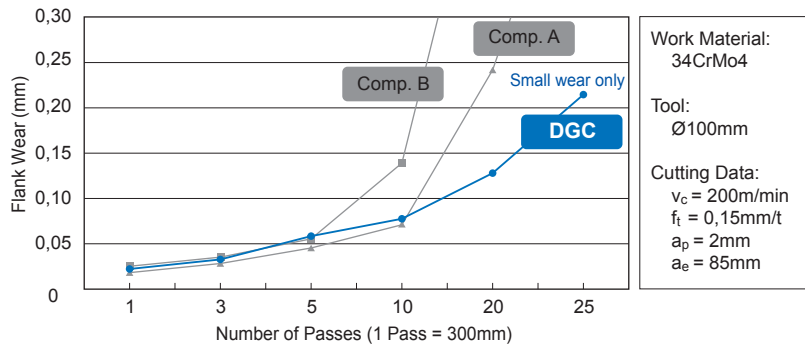
## High Reliability

Employs **New Super ZX Coating**, a multi-layer PVD coating grade and CVD coating grade with enhanced coating strength provided by newly developed stress control technology. Improved run-out precision reduces tool life deviation to achieve highly reliable tool life.

## Multi-layer PVD Coating



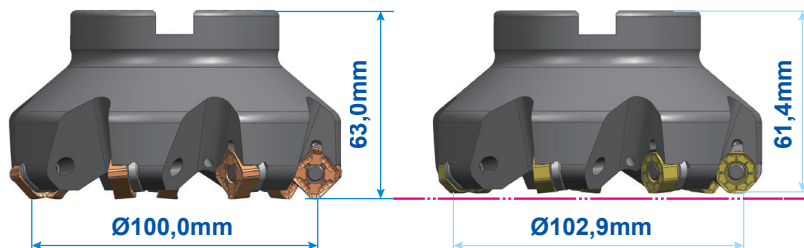
## Wear Resistance





## Cutter Diameter and Cutter Body Height

Insert: SNMU 13T6ANER (square)

Insert: ONMU 05T6ANER (octagonal)

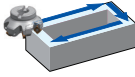


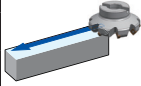
Example: $D_c = 100\text{mm}$	Number of Cutting Edges	Tool Diameter (mm)	Cutter Height (mm)	Max. Depth of Cut (mm)
SNMU 	8	100,0	63,0	6,0
ONMU 	16	102,9	61,4	3,0

Square inserts (SNMU) and octagonal inserts (ONMU) can be used interchangeably on the same body. Using these inserts the cutter will have different cutter diameter and cutter body height.

# Sumi Dual Mill DGC Type

## Application Examples

	Work Material		Automotive Component (Cast Steel)	
	Manufacturer	Sumitomo	Conventional	
	Tool	Cutter body	DGCM13080RS (Ø80)	Ø80
		Insert	SNMU13T6ANER-G 8 corners	Single sided 4 corners
		Grade	ACP200	PVD Grade
		No. of teeth	6	6
Cutting-data	Cutting speed (mm/min)	160	160	
	Feed rate (mm/t)	0,31	0,31	
	Feed rate (mm/min)	1.184	1.184	
	Axial DOC (mm)	3	3	
	Cutting width (mm)	60	60	
	No. of pieces	2	2	
	Dry/Wet	wet	wet	
Evaluation:	The new tool can achieve the machining with the same cutting condition as using positive inserts. It also improves economic efficiency with twice the number of effective corners using square negative inserts.			

	Work Material		Machine Parts (Cast Steel)	
	Manufacturer	Sumitomo	Conventional	
	Tool	Cutter body	DGCM13125RS (Ø125)	Ø125
		Insert	ONMU05T6ANER-G 16 corners	Double sided 8 corners
		Grade	ACP200	PVD Grade
		No. of teeth	8	8
Cutting-data	Cutting speed (mm/min)	160	160	
	Feed rate (mm/t)	0,29	0,29	
	Feed rate (mm/min)	945	945	
	Axial DOC (mm)	2,5	2,5	
	Dry/Wet	dry	dry	
Evaluation:	The new tool improves economic efficiency with twice the number of effective corners.			



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