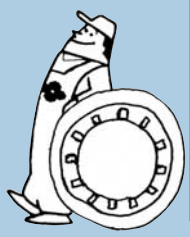
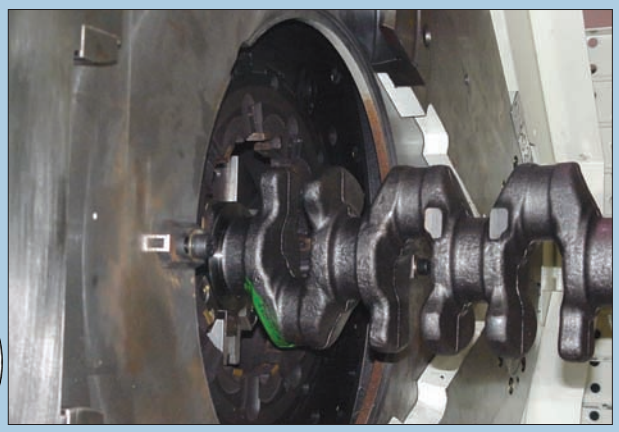
Milling Cutters

(Special purpose)

G

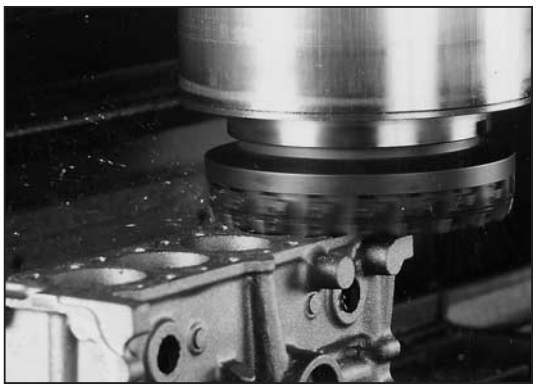
G37 ~ G45





SEC-High-Feed Mill
SEC-High-Feed Mill
SEC-High-Feed Mill
SEC-High-Feed Mill

SEC-
High-Feed Facemills



■ General Features

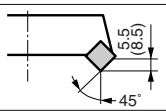
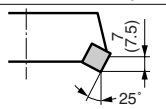
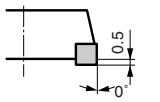
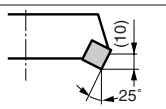
Sumitomo Electric SEC-High Feed facemills make high performance milling particularly suited for cast irons, aluminium and exotic materials. Edge reference system design is rugged, simple and easy to maintain.

■ Characteristics

- Unique design for high speed, high feed machining
- Edge reference system provides simple, easy and fast insert indexing
- Cutter design makes it ideal for use on low-horsepowered machines with high performance
- An excellent range of cutter designs & insert grades to suit various applications
- Quick change system provides fast setting on the machine

	Type	System	Applicable cutter size
①	NF type	Quick Change System	Below ϕ 160mm
②	2 Piece type	2 piece System	Below ϕ 200mm
③		2 piece with center bolt	

■ Specification

Application		Cat. No.	A.A. & Max D.O.C. (5000 type)	Rake Angle		Applicable Insert	Page
Machining	Surface roughness			Axial Rake	Radial Rake		
Roughing	25S	**NRV4000 type**		–5°	–6°	SNC43MW	G40
		NRV5000 type				SNC535	
Roughing/ Finishing	18S	**DPV4000 type**		+5°	+5°	SDCN42R/L	G40
		DPV5000 type				SDCN53R/L	
Finishing	12.5S	**NFV4000 type**		–5°	–6°	6SS43M	G41
		NFV5000 type				6SS53M	
Roughing / Finishing of Aluminum Alloy	12.5S	**APV5000 type**		+18°	–2°	SDC53R/L	G41

■ Recommended Conditions

Cat. No.	Insert	Grade	Recommended cutting conditions		
			V(m /min)	f (mm /rev)	d(mm)
NRV4000Type	SNC43MW	ACK200	80 - 120	0.1 - 0.2	~ 3
NRV5000Type	SNC535	ACK200	80 - 120	0.1 - 0.2	~ 3
DPV4000Type	SDCN42R/L	G10E	80 - 120	0.1 - 0.2	~ 3
DPV5000Type	SDCN53R/L	G10E	80 - 120	0.1 - 0.2	~ 5
NFV4000Type	6SS43M	H10E	120 - 200	0.1 - 0.2	~ 0.5
NFV5000Type	6SS53M	H10E	120 - 200	0.1 - 0.2	~ 0.5
APV5000Type	SDC53R/L	H1	> 400	0.1 - 0.3	~ 3

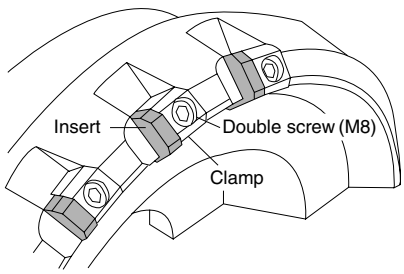
■ General Features

Conventional milling cutters are designed with several parts to locate and clamp each insert. The edge reference system on the other hand, utilises only one part for the same purposes. This system is adopted by our entire high-feed cutter series.

■ Characteristics

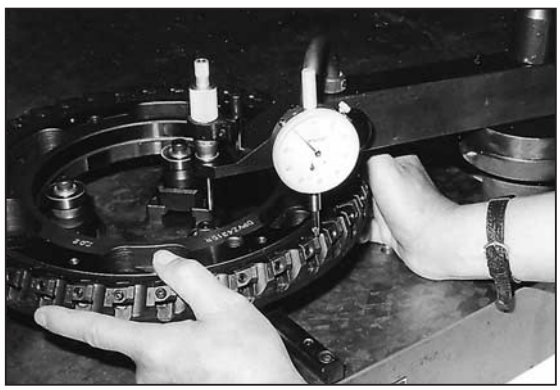
- Axial run-out of the inserts is kept within 5 to 10μm to ensure fine surface finish and longer too life.
- Simple design with fewer parts facilitates cleaning of cutter body and is comparatively inexpensive.
- Fewer parts allow for high-density cutter design, for higher efficiency and longer too life.

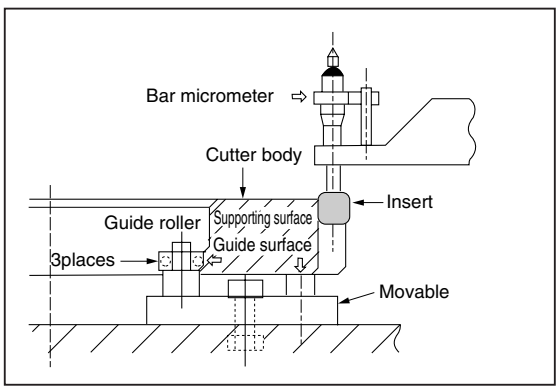
Fig. 1



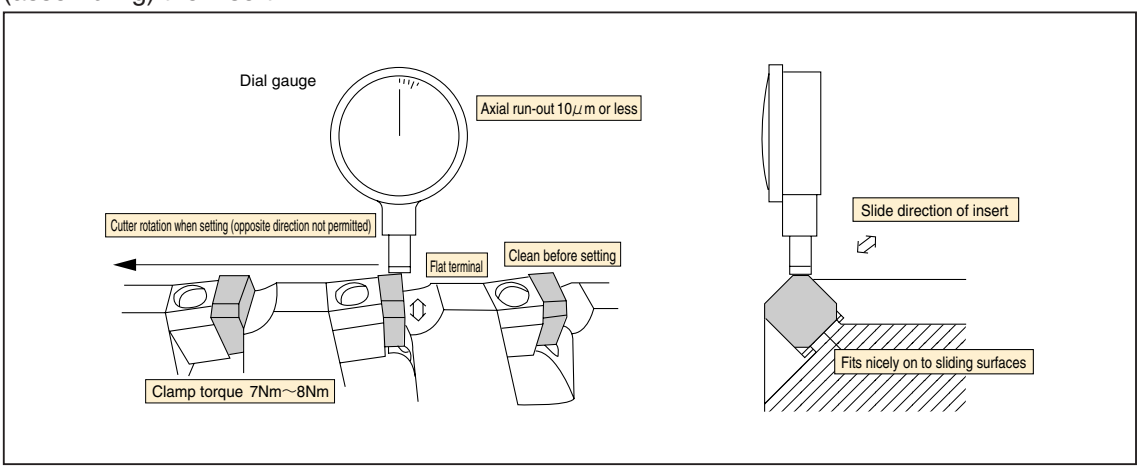
■ Insert setting

Application of the special assembly jig (as shown in the figure below) is recommended to accurately assemble the cutter.





Care should be taken to the items enclosed by ☐ in the following figure when setting (assembling) the insert



SEC-High-Feed Mill

NRV4000 / 5000 Type

High Feed Roughing Of Cast Iron

Recommended Conditions → G38

Rake Angle		
	Radial	−6°
	Axial	−5°

5.5mm 45° (4000 Type)

8.5mm 45° (5000 Type)

Fig 1

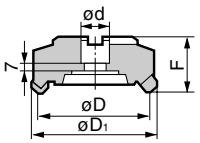
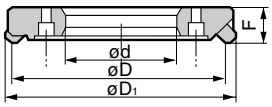


Fig 2



■ Body

Type	Cat. No.	Stock R	Stock L	Dimensions (mm) øD	øD1*	ød	F	No. of teeth	Weight (kg)	Fig
NF type	NRV ○100QR/L			100	112(118)	31.75	60	10	2.7	1
	NRV ○125QR/L			125	137(143)	38.1	60	14	3.8	1
	NRV ○160QR/L			160	172(177)	50.8	60	18	6.3	1
Two piece type	NRVZ ○200R/L			200	212(218)	80	40	24	5.8	2
	NRVZ ○250R/L			250	262(268)	120	40	30	9	2
	NRVZ ○315R/L			315	326(332)	180	40	36	12.5	2
	NRVZ ○355R/L			355	366(372)	220	40	42	15.5	2
	NRVZ ○400R/L			400	411(417)	250	40	48	18.8	2
	NRVZ ○450R/L			450	461(467)	300	40	54	22	2

・ 4 or 5 must be filed in "O"

・ Refer to pg G42 for special arbor for Fig1 type cutters.

・ Refer to pg G42 for special arbor for Fig2 type cutters.

＊： Dimension in parentheses is for 5000 Type.

■ Insert

Fig 3

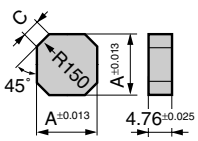
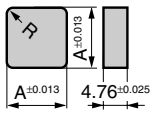


Fig 4



Cat. No.	Coated Carbide ACK200	Coated Carbide ACK300	Coated Carbide ACZ310	Carbide G10E	Ceramic NS260	Dimensions (mm) A	C	R	Fig	Applicable Cutter
SNC 43MW				●		12.70	3.0	–	3	NRV4000
SNC 433						12.70	–	1.2	4	NRV4000
SNC 434						12.70	–	1.6	4	NRV4000
SNC 435						12.70	–	2.0	4	NRV4000
SNC 436						12.70	–	2.4	4	NRV4000
SNC 535						15.875	–	2.0	4	NRV5000
SNMN 432				●	●	12.70	–	0.8	4	NRV4000
SNMN 433		●	●	●	●	12.70	–	1.2	4	NRV4000
SNMN 434					●	12.70	–	1.6	4	NRV4000
SNMN 435			●		●	12.70	–	2.0	4	NRV4000
SNMN 436			●			12.70	–	2.4	4	NRV4000

・ Shape of SNMN insert is similar to Fig 4 but with the following tolerances:
A ± 0.08、thickness 4.76 ± 0.13

■ Parts

Clamp Below φ 160	Clamp Over φ 200	Screw	Wrench	Applicable Cutter	The above cutters must be used with:
NW41RR	NW42RR	WB6-20	TH030	NRV4000R	・ NF Type Arbor
NW41RL	NW42RL			NRV4000L	
NW51R	NW52R	WV6-20	TH030	NRV5000R	・ 2pcs type Adaptor
NW51L	NW52L			NRV5000L	

SEC-High-Feed Mill

DPV4000 / 5000 Type

High Feed Medium Finishing Of Cast Iron

Recommended Conditions → G38

Rake Angle		
	Radial	+5°
	Axial	+10°

7mm 25° (4000 Type)

7.5mm 25° (5000 Type)

Fig 1

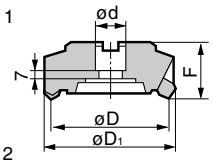
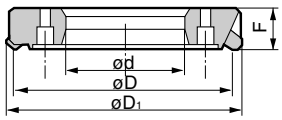


Fig 2



■ Body

Type	Cat. No.	Stock R	Stock L	Dimensions (mm) øD	øD1*	ød	F	No. of teeth 4000	No. of teeth 5000	Weight (kg)	Fig
NF type	DPV ○100QR/L			100	107.2(109.6)	31.75	60	12	10	2.6	1
	DPV ○125QR/L			125	131.5(133.6)	38.1	60	16	14	3.6	1
	DPV ○160QR/L			160	165.8(176.6)	50.8	60	20	18	6.0	1
Two piece type	DPVZ ○200R/L			200	206.5(208)	80	40	26	24	5.5	2
	DPVZ ○250R/L			250	256 (258)	120	40	32	30	9	2
	DPVZ ○315R/L			315	322.5(323)	180	40	38	36	12	2
	DPVZ ○355R/L			355	361.5(363)	220	40	44	42	15	2
	DPVZ ○400R/L			400	406.5(408)	250	40	50	48	17.8	2
	DPVZ ○450R/L			450	456.5(458)	300	40	56	54	20.8	2

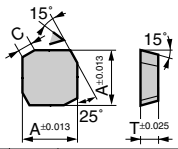
・ 4 or 5 must be filed in "O"

・ Refer to pg G42 for special arbor for Fig1 type cutters.

・ Refer to pg G42 for special arbor for Fig2 type cutters.

＊： Dimension in parentheses is for 5000 Type.

■ Insert



Cat. No.	Coated Carbide ACK200	Coated Carbide ACK300	Coated Carbide ACZ310	Carbide H10E	Dimensions (mm) A	T	C	Applicable Cutter
SDCN42R				●	12.70	3.18	3.5	DPV4000R
SDCN42L				●	12.70	3.18	3.5	DPV4000L
SDCN53R				●	15.875	5.0	5.0	DPV5000R
SDCN53L					15.875	5.0	5.0	DPV5000L

■ Parts

Clamp Below φ 160	Clamp Over φ 200	Screw	Wrench	Applicable Cutter	The above cutters must be used with:
HTW40R	HTW41R	WB6-20	TH030	DPV4000R	・ NF Type Arbor
HTW40L	HTW41L			DPV4000L	
HTW50R	HTW51R	WB6-20	TH030	DPV5000R	・ 2pcs type Adaptor
HTW50L	HTW51L			DPV5000L	

● mark : To be replaced by new items under the ACP / ACK series

SEC-High-Feed Mill

NFV4000 / 5000 Type

High Feed Roughing Of Cast Iron

Recommended Conditions → G38

Rake Angle		
	Radial	−6°
	Axial	−5°

0.5mm 0°

Fig 1

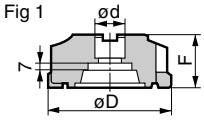
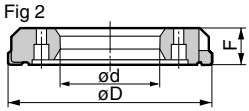


Fig 2



■ Body

Type	Cat. No.	Stock R	Stock L	Dimensions (mm) øD	—	ød	F	No. of teeth	Weight (kg)	Fig
NF type	NFV ○100QR/L			100		31.75	60	10	2.6	1
	NFV ○125QR/L			125		38.1	60	14	3.9	1
	NFV ○160QR/L			160		50.8	60	18	6.3	1
Two piece type	NFVZ ○200R/L			200		80	40	24	5.3	2
	NFVZ ○250R/L			250		120	40	30	9	2
	NFVZ ○315R/L			315		180	40	36	11.3	2
	NFVZ ○355R/L			355		220	40	42	14	2
	NFVZ ○400R/L			400		250	40	48	16.5	2
	NFVZ ○450R/L			450		300	40	54	21	2

· 4 or 5 must be filed in "O"

· Refer to pg G42 for special arbor for Fig1 type cutters.

· Refer to pg G42 for special arbor for Fig2 type cutters.

■ Insert

Fig 3

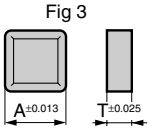


Fig 4

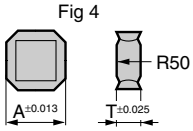
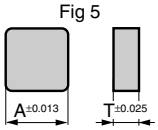


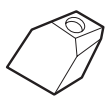
Fig 5



Cat. No.	Carbide H10E	Cermet T1200A	Ceramic NS260	Dimensions(mm) A	T	Fig	Applicable Cutter
SNEF43W	●			12.70	4.76	3	NFV4000
6SS43M	●			12.70	4.76	4	NFV4000
SNEF53W	●			15.875	4.76	3	NFV5000
SNEF53WT		●		15.875	4.76	3	NFV5000
6SS53M	●			15.875	4.76	4	NFV5000
SNEN535W		●		15.875	4.76	5	NFV5000

SNEF53WT and SNEN535W are available in T12A grade.
EH20Z (Coated Carbide) grade can also be produce.

■ Parts

				Applicable Cutter	The above cutters must be used with:
Clamp		Screw	Wrench		
Below ϕ 160	Over ϕ 200				
NW41FR	NW42FR	WB6-20	TH030	NFV4000R	· NF Type Arbor
NW41FL	NW42FL			NFV4000L	
NW51 R	NW52 R	WB6-20	TH030	NFV5000R	· 2pcs type Adaptor
NW51 L	NW52 L			NFV5000L	

SEC-High-Feed Mill

APV5000 Type

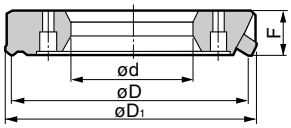
High Feed Medium Finishing Of Cast Iron

Recommended Conditions → G38

Rake Angle		
	Radial	−2°
	Axial	+18°

10mm 25°

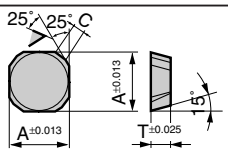
Fig 1



■ Body

Type	Cat. No.	Stock R	Stock L	Dimensions (mm) øD	øD1	ød	F	No. of teeth	Weight (kg)	Fig
Two piece type	APVZ 5200R/L			200	211	80	40	18	7.0	1
	APVZ 5250R/L			250	261	120	40	22	10.8	1
	APVZ 5315R/L			315	326	180	40	26	13.7	1
	APVZ 5355R/L			355	366	220	40	32	16.3	1
	APVZ 5400R/L			400	411	250	40	36	20.0	1
	APVZ 5450R/L			450	461	300	40	40	23.6	1

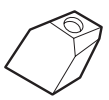
■ Insert



Tolerance of SDCH insert
A ± 0.025

Cat. No.	Carbide A30N	Carbide H1	Cermet T250A	Dimensions(mm) A	T	C	Applicable Cutter
SDC53R		●		15.88	4.76	2.5	APV5000R
SDC53L		●		15.88	4.76	2.5	APV5000L
SDC53TR	●			15.88	4.76	2.5	APV5000R
SDC53TL				15.88	4.76	2.5	APV5000L
SDC53TR-R				15.88	4.76	2.5	APV5000R
SDCH53TR	●			15.88	4.76	2.5	APV5000R
SDCH53TR-R				15.88	4.76	2.5	APV5000R

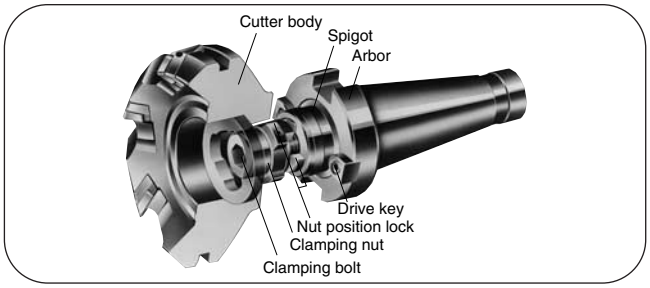
■ Parts

				Applicable Cutter	The above cutters must be used with:
Clamp		Screw	Wrench		
Below ϕ 160	Over ϕ 200				
AW51R	AW52R	WB6-20	TH030	APV5000R	· NF Type Arbor
AW51L	AW52L			APV5000L	· 2pcs type Adaptor

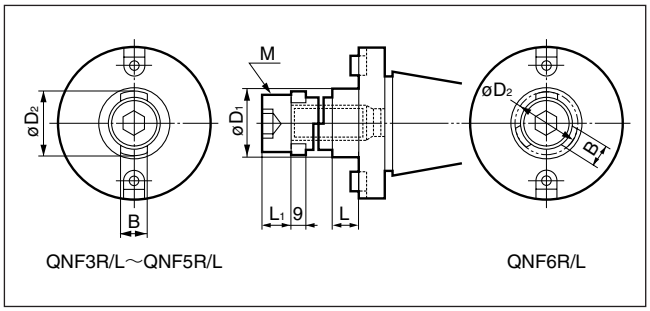
Special Cutters

■ Quick-NF Series

● Structure



● Arbor



Cat. No.	Dimensions (mm)					
	øD1	øD2	M	B	L	L1
○○○○ **QNF3R/L**	25.40	25	M12	12	16	12
○○○○ **QNF3R/L**	31.75	31	M16	15	22	16
○○○○ **QNF3R/L**	38.10	37	M20	18.5	21	16
○○○○ **QNF3R/L**	50.80	49.5	M20	20	20	16

Taper code must be filed in "O". (Ex. NT50A-QNF3R)

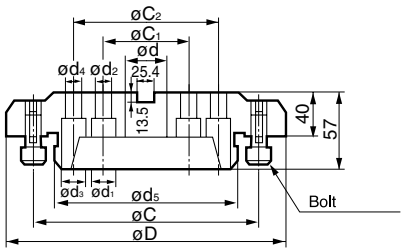
● Features

① Requires less time for mounting and removing.
② Less parts.
③ Conventional cutter can be easily adapted to quick change through slight modification.
④ Applicable to cutter diameters 3" (φ 80) ～6" (φ 160)

■ Two piece cutter

● Appearance

● Adaptor

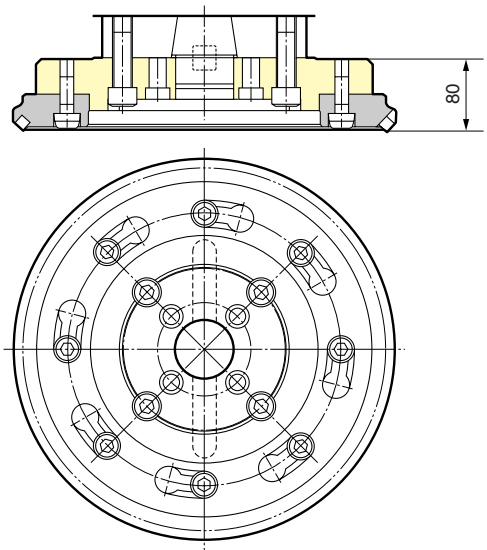


Cat. No.	Dimensions (mm)										No. of bolt n	Cutter size (mm)
	øD	ød	ød1	ød2	ød3	ød4	ød5	øC	øC1	øC2		
QAD 200	180	47.625	26	18	–	–	80	120	101.6	–	4	ø200
QAD 250	230	47.625	26	18	–	–	120	170	101.6	–	4	ø250
QAD 315	295	47.625	26	18	32	22	180	230	101.6	177.8	6	ø315
QAD 355	335	63.50	26	18	32	22	220	270	101.6	177.8	6	ø355
QAD 400	370	63.50	26	18	32	22	250	300	101.6	177.8	6	ø400
QAD 450	420	63.50	26	18	32	22	300	350	101.6	177.8	6	ø450

● Features

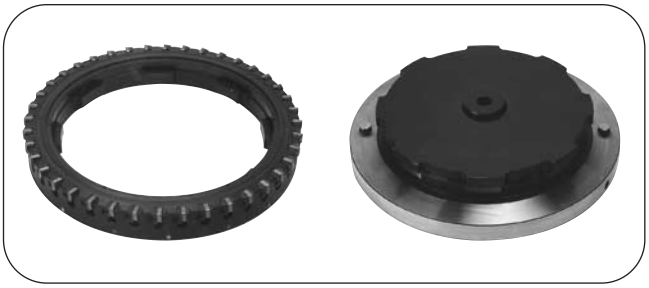
①Light weight ring cutter body.
②Cutter changing function without removing bolt.
③Tapered spline system is used to connect the adaptor to the cutter.
④For large diameter cutters (φ 200 and above).
⑤One adaptor setting can be used for several cutter body sizes.

● Cutter mounting diagram

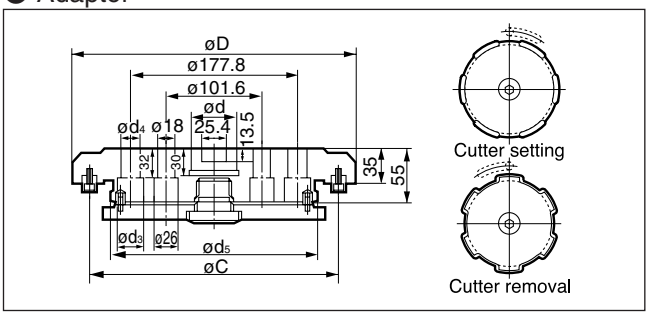


■ Two piece cutter with center bolt

● Appearance



● Adaptor

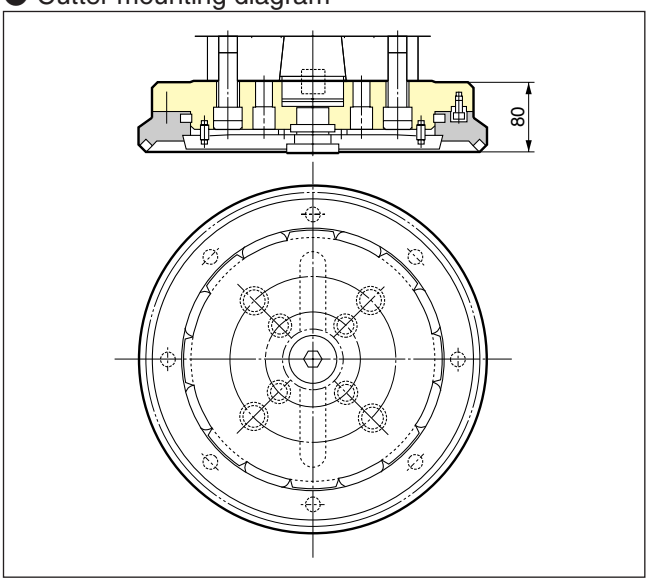


Cat. No.	Dimensions (mm)							Cutter size (mm)
	øD	ød	ød3	ød4	ød5	øC		
NQAD 200	180	47.625	–	–	105	155		ø200
NQAD 250	240	47.625	–	–	155	205		ø250
NQAD 315	305	47.625	32	22	220	270		ø315
NQAD 355	345	63.50	32	22	260	310		ø355
NQAD 400	390	63.50	32	22	305	355		ø400
NQAD 450	440	63.50	32	22	355	405		ø450

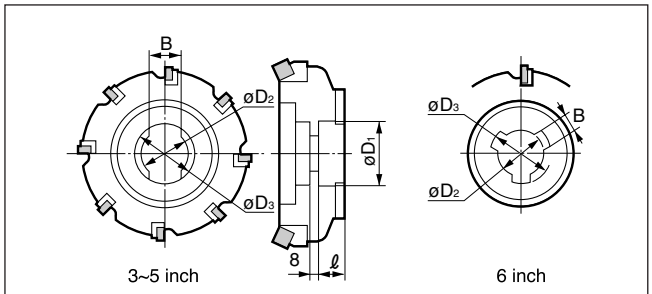
● Features

① With one clamping bolt, total weight of cutter is relatively lighter.
② Quick mounting.
③ Tapered spline system is used to connect the adaptor to the cutter.
④ Applicable to cutters over ϕ 200.

● Cutter mounting diagram



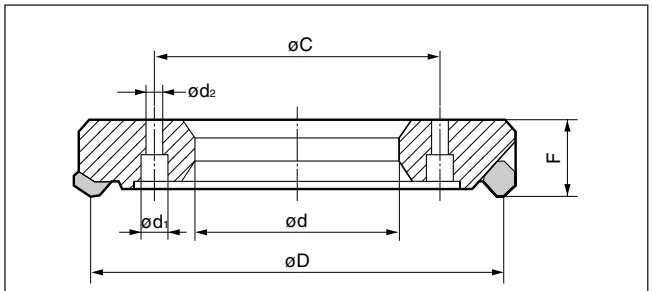
■ Quick-NF QNF cutter (Arbor type)



Applicable cutter size mm (inch)	Dimensions (mm)				
	øD1	øD2	øD3	ℓ	B
80 (3")	25.40	18.5	26	18	13.5
100 (4")	31.75	24.5	32	24	16.5
125 (5")	38.10	30	38	23	20
160 (6")	50.80	41.5	51.5	22	22

This design applies to the NF type high feed cutters (→ G40~G41)

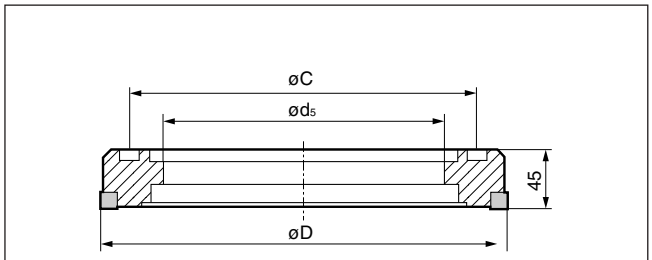
■ QAD cutter (Two pieces type)



Cutter size (mm)	Dimensions (mm)						No. of bolt	Adaptor Cat. No.
	øD	ød	ød1	ød2	øC	F		
ø200	200	80	24	14	120	40	4	QAD200
ø250	250	120	30	18	170	40	4	QAD250
ø315	315	180	30	18	230	40	6	QAD315
ø355	355	220	30	18	270	40	6	QAD355
ø400	400	250	30	18	300	40	8	QAD400
ø450	450	300	30	18	350	40	8	QAD450

This design applies to the 2 piece type high feed cutters (→ G40~G41)

■ NQAD cutter (Two piece type with center bolt)



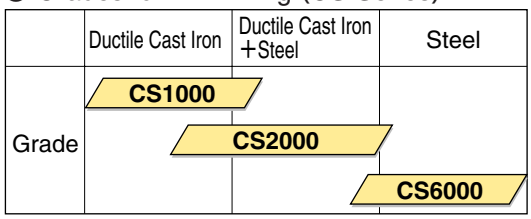
Applicable cutter size (mm)	Dimensions (mm)			Adaptor Cat. No.
	øD	ød5	øC	
ø200	200	105	155	NQAD200
ø250	250	155	205	NQAD250
ø315	315	220	270	NQAD315
ø355	355	260	310	NQAD355
ø400	400	305	355	NQAD400
ø450	450	355	405	NQAD450

This design applies to the 2 piece type high feed cutters with center bolt (→ G40~G41)

Tools For Automotive Components

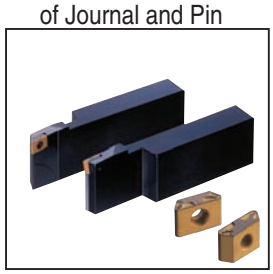
The high efficiency roughing of crank shafts, pin and journals that are found in automotives, ships, industrial machines (Tractor, compressors etc.) as well as precision machines.

● Grades for Pin Milling (CS Series)

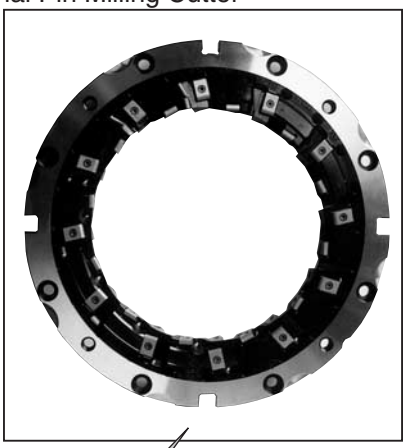


Grade	Characteristics
CS1000	Less adhesion and good wear resistance
CS2000	Good balance of wear and toughness
CS6000	Improved thermal cracking resistance and toughness

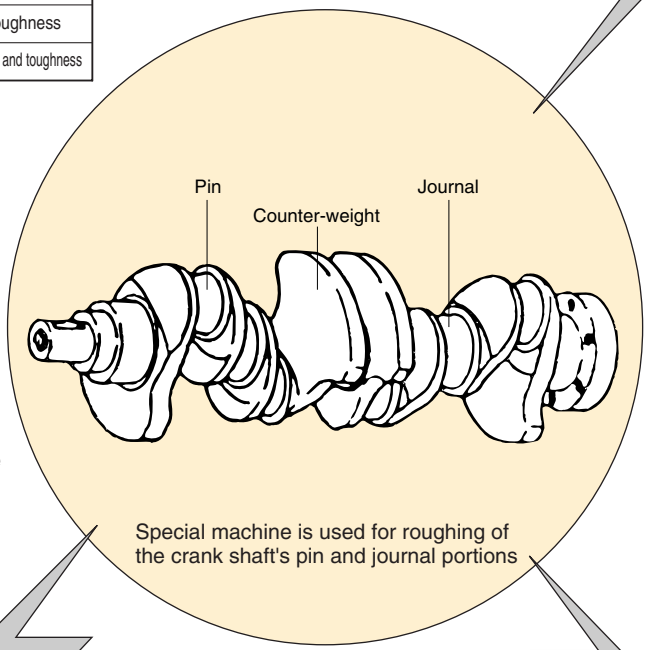
● SEC-Holder for turning of Journal and Pin



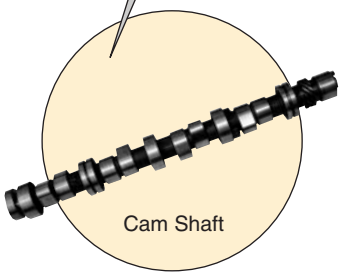
● Internal Pin Milling Cutter



● Cam Shaft Milling Cutter



Special machine is used for roughing of the crank shaft's pin and journal portions



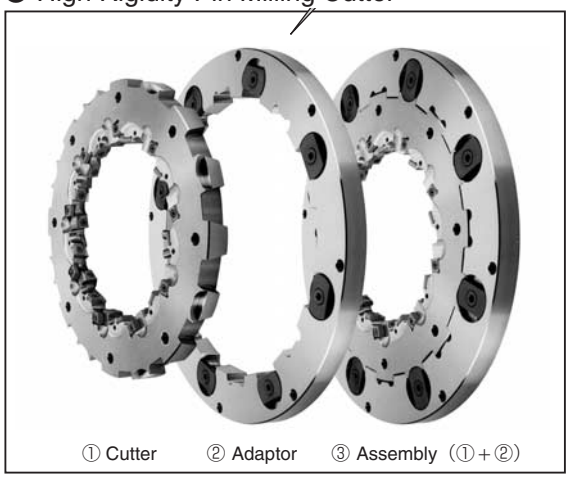
● High Rigidity Pin Milling Cutter

★ 3 times body rigidity with unique cross section

★ 75% reduction in tool change time with tapered spline groove system

★ "Keyless" design for longer cutter body life.

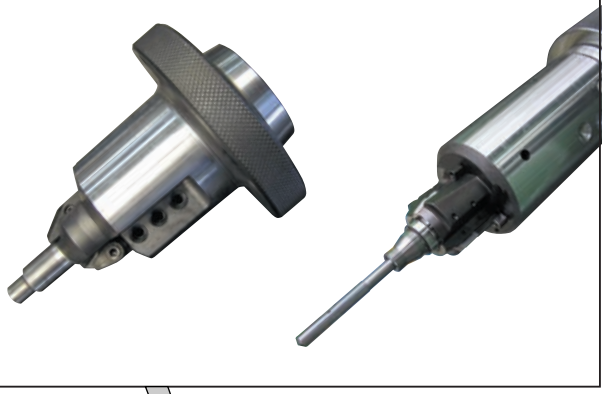
● High Rigidity Pin Milling Cutter



● External Pin Milling Cutter

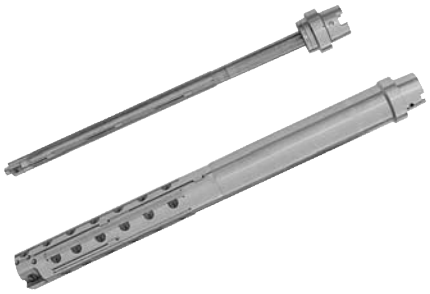
● Valve Seat Boring Cutter

Simultaneous finishing of valve seat face and guide hole



● Self-guided Boring Bars

Precision drilling of crank and cam bores

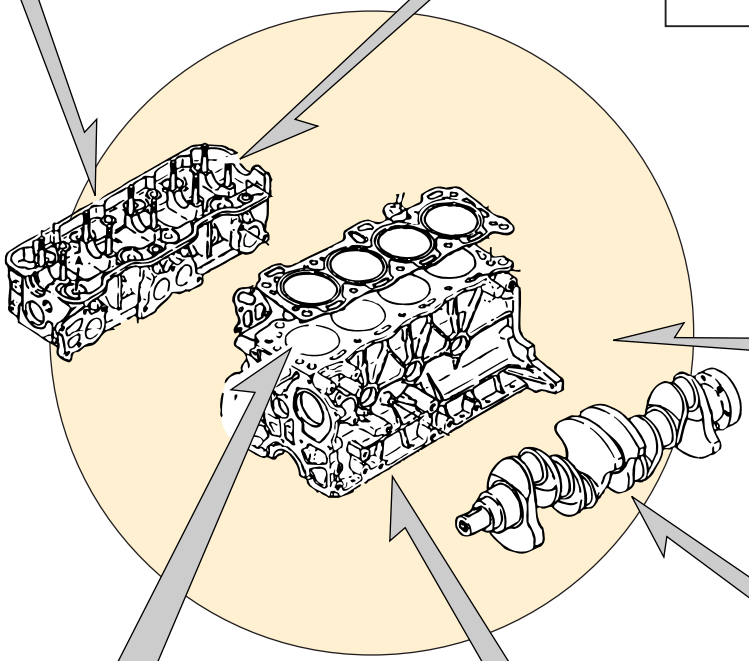


Precision finishing of crank and cam bores

● Carbide Line Boring Bar

● High-speed Cutter for Aluminum, RF Type

High speed milling of Aluminum. cylinder head and cylinder block



● SUMIBORON BN Finish Mill EASY

Finish milling of Cast Iron at V=2,000m/min

● Combination Side Cutter

Bearing width milling

● Turn Broach Cutter

Simultaneous milling of journal