

PRODUCT NEWS

PN-E-006

SERIES EXPANSION

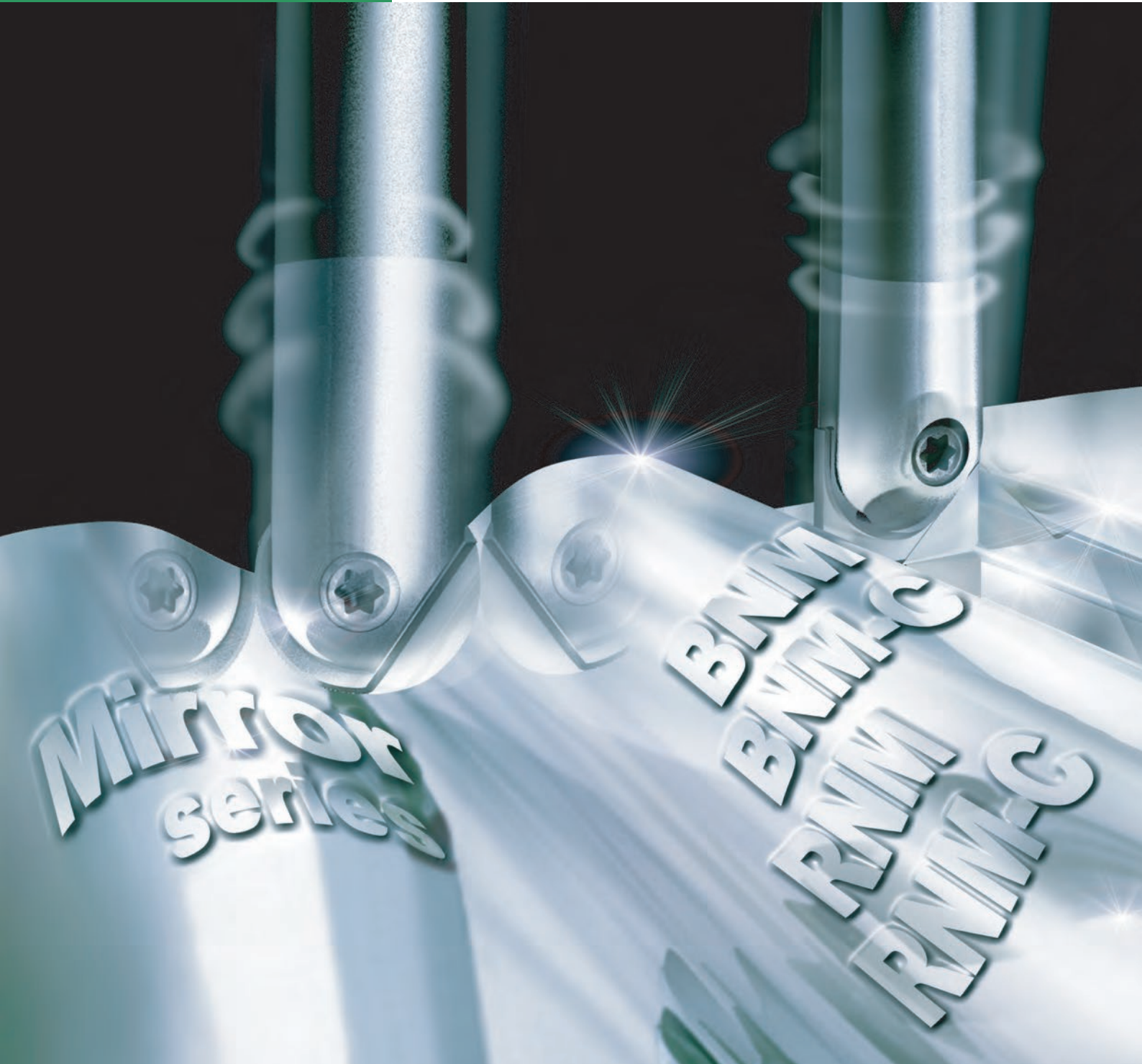
KALIP TEKNİK

DIJET

High Precision Indexable Ball Nose End Mill & Radius End Mill

MIRROR^{BNM&RNM} Series

“Mirror Ball & Mirror Radius”



KALIP TEKNİK

www.kalipteknik.com.tr

BNM
type

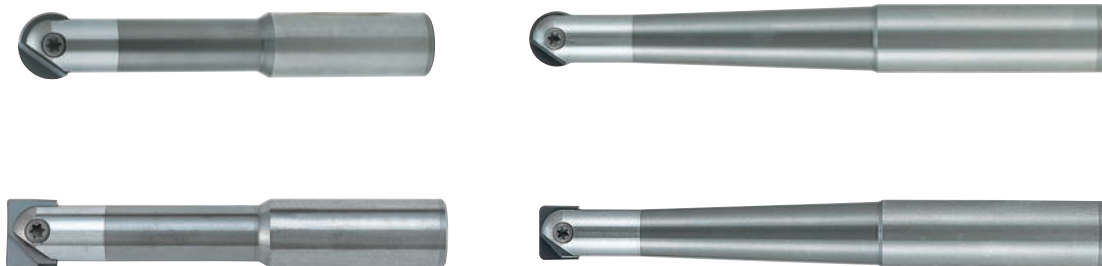
Carbide shank holder type

High Precision Indexable Ball Nose End Mill

- Insert radius from accuracy is **below ± 0.010 mm** when fixed to the holder.
(accuracy **below ± 0.006 mm** in insert alone).



recommended
cutting conditions



Cat.No.	Stock	Dimensions (mm)									Parts		Inserts	Fig			
		φDc	R	ℓ ₁	ℓ ₂	L	φD1	θ	θ _k	φDs	Screws	Wrench					
BNMS-060017S-S06C	●	6	3	—	17	60	5.5	—	—	6	FSW-2005H	A-06	BNM-060...	1			
BNMS-060030T-S10C	●			15	30	80		6°	4°14'	10				2			
BNMM-060035S-S06C	●			—	35	92		—	—	6				1			
BNML-060017S-S06C	●			—	17	120		—	—	6							
BNMS-080025S-S08C	●	8	4	—	25	90	7.5	—	—	8	FSW-2506H	A-07	BNM-080... RNM-080... FRM-080...	1			
BNMM-080035S-S08C	●				35	92											
BNML-080075S-S08C	●				75	140											
BNML-080095S-S08C	●				95	160											
BNML-080075T-S12C	●			20	75	132		2°	1°37'	12				2			
BNMS-100030S-S10C	●	10	5	—	30	100	9.5	—	—	10	FSW-3007H	A-08	BNM-100... RNM-100... FRM-100...	1			
BNMM-100043S-S10C	●				43												
BNML-100075S-S10C	●				75										140		
BNML-100080S-S10C	○				80										220		
BNML-100095S-S10C	●				95										160		
BNML-100140S-S10C	●				140										220		
BNML-100075T-S12C	●			32.1	75	132		1°30'	0°49'	12				2			
BNMS-120028S-S12C	●	12	6	—	28	84	11.5	—	—	12	FSW-3509H	A-10	BNM-120... RNM-120... FRM-120...	1			
BNMM-120053S-S12C	●				53	110											
BNML-120095S-S12C	●				95	160											
BNML-120100S-S12C	○				100	220											
BNML-120085T-S16C	●			33.8	85	145		2°	1°27'	16				2			
BNML-120130S-S12C	○			—	130	200		—	—	12				1			
BNML-120150S-S12C	○				150	220											

Note) All cutters are supplied without inserts or wrenches.

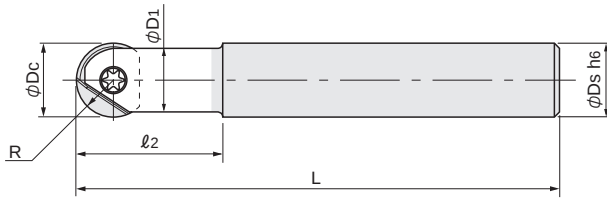


Fig 1

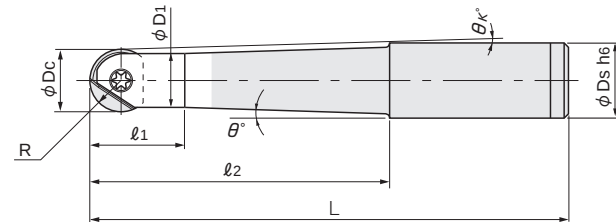


Fig 2

Cat.No.	Stock	Dimensions (mm)									Parts		Inserts	Fig.
		φD _C	R	ℓ ₁	ℓ ₂	L	φD ₁	θ	θ _k	φD _S	Screws	Wrench		
BNMS-160033S-S16C	●	16	8	—	33	93	15	—	—	16	FSW-4013H	A-15	BNM-160... RNM-160... FRM-160...	1
BNMM-160063T-S20C	●			37.5	63	123		4°	2°5'	20				2
BNML-160070S-S16C	●			—	70	140		—	—	16				1
BNML-160090S-S16C	●				90	160								
BNML-160100S-S16C	○				220									
BNML-160100T-S20C	●			44.5	100	166		2°	1°15'	20				2
BNML-160110S-S16C	●			—	110	180		—	—	16				1
BNML-160150S-S16C	●				150	220								
BNMS-200039S-S20C	●	20	10	—	39	105	19	—	—	20	FSW-5016H	A-20W	BNM-200... RNM-200... FRM-200...	1
BNMM-200075S-S20C	●				75	141								
BNML-200100S-S20C	○				100	220								
BNML-200105S-S20C	●				105	180								
BNML-200115T-S25C	●			64.3	115	191		2°	1°22'	25				2
BNML-200125S-S20C	●			—	125	200		—	—	20				1
BNML-200170S-S20C	●				170	250								
BNML-200220S-S20C	○				220	300								
BNMM-250090S-S25C	●	25	12.5	—	90	166	24	—	—	25	FSW-6020	A-30	BNM-250... FRM-250...	1
BNML-250100S-S25C	○				100	220								
BNML-250140S-S25C	●				140	250								
BNML-250170S-S25C	○				170	250								
BNMM-300120S-S32C	●	30	15	—	120	200	29	—	—	32	FSW-8025S	A-30	BNM-300/320... FRM-300...	1
BNML-300100S-S32C	●				100	220								
BNML-300140S-S32C	●				140	250								
BNML-300170S-S32C	●				170	250								
BNML-300220S-S32C	○				220	300								

Note) 1. All cutters are supplied without inserts or wrenches.

2. When $\phi 32$ insert mounted on Dc30 holder, the dimensions of ℓ_2, L are 1mm longer than value above.

Screw	Torque(N.m)
FSW-2005H	0.5
FSW-2506H	0.9
FSW-3007H	1.2
FSW-3509H	2.0
FSW-4013H	3.0
FSW-5016H	4.0
FSW-6020	6.0
FSW-8025S	6.0

MBX type

Modular Head type

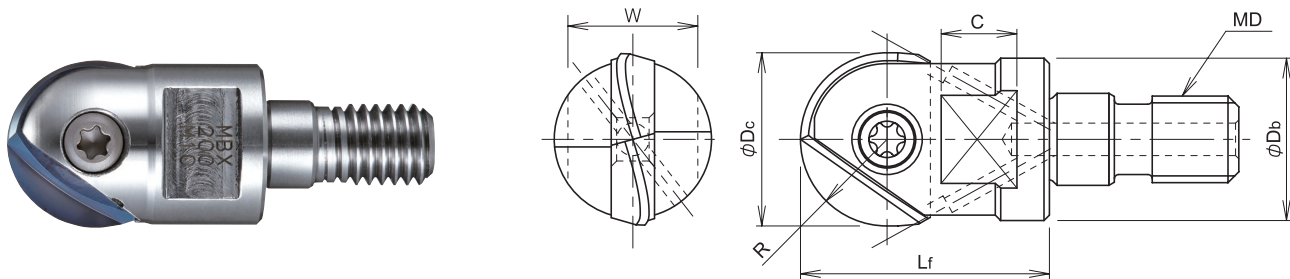
High Precision Indexable Ball Nose End Mill

- Insert radius from accuracy is **below ± 0.010 mm** when fixed to the holder (accuracy **below ± 0.006 mm** in insert alone).
- O.D. runout is below 0.015 mm when fixed to MSN carbide shank holder.

Through
coolant
hole



recommended
cutting conditions



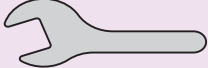
Cat.No.	Stock	Dimensions (mm)							Parts		Inserts
		ϕD_c	R	L_f	ϕD_b	MD	C	W	Screws	Wrench	
MBX-100-M6	●	10	5	18	9.7	M6	6.5	8	FSW-3007H	A-08	BNM-100...
MBX-120-M6	●	12	6	20	11.5	M6			FSW-3509H	A-10	BNM-120...
MBX-160-M8	●	16	8	23	15	M8	8	12	FSW-4013H	A-15	BNM-160...
MBX-200-M10	●	20	10	30	19	M10		14	FSW-5016H	A-20W	BNM-200...
MBX-250-M12	●	25	12.5	35	24	M12	10	17	FSW-6020	A-30	BNM-250...
MBX-300-M16	●	30	15	43	29	M16	12.5	22	FSW-8025S	A-30	BNM-300/320...

Note) 1. All cutters are supplied without inserts or wrenches.

2. When $\phi 32$ insert mounted on Dc30 holder, the dimensions of L_f are 1mm longer than value above.

Screw	Torque(N.m)
FSW-3007H	1.2
FSW-3509H	2.0
FSW-4013H	3.0
FSW-5016H	4.0
FSW-6020	6.0
FSW-8025S	6.0

■ Spanner

	Cat.No.	MD	Torque	width across flat	Thickness	Length
	DS-08	M6	8.0 N.m	8	4	85
	DS-12	M8	16 N.m	12	4	93

※ prevent over tightening by short grip

BNM
type

Neutral style geometry

strictly for finishing applications

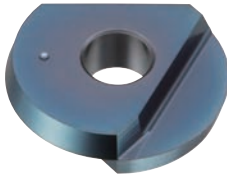
P

M

K

N

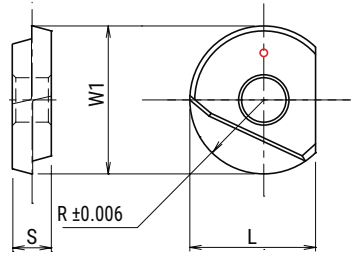
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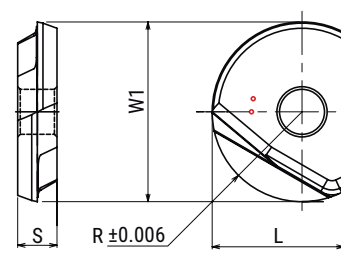
Radius accuracy
 $\pm 0.006 \text{ mm}$

● DH111, JC10000, KT9

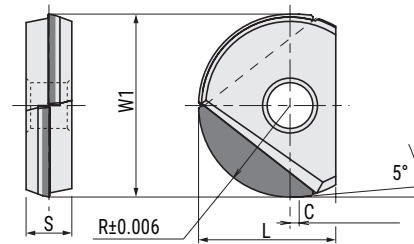
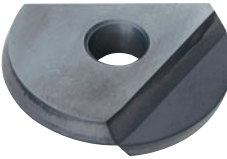
$W1 \leq 10$



$W1 \geq 12$



● CBN



Cat.No.	PVD Coating	CBN	Diamond Coating	Uncoated	Dimensions(mm)				
	DH111	JBN245	JC10000	KT9	R	W1	L	C	S
BNM-060	●		○	●	3	6	5	-	2
BNM-080	●		○	●	4	8	7	-	2.4
BNM-100	●		○	●	5	10	8.5	-	2.6
BNM-120	●		○	●	6	12	10	-	3
BNM-160	●	○	○	●	8	16	12	0.8	4
BNM-200	●	○	○	●	10	20	15	1	5
BNM-250	●	○		○	12.5	25	18.5	1	6
BNM-300	●	○		○	15	30	22.5	1	7
BNM-320	●			○	16	32	23.5	-	7

Note) 1.inserts per case (JC10000 or JBN245 /1 insert per case)
2.DH111 is recommended when wet cutting

BNM-SS
type

Sharp helical geometry

good for finishing and semi finishing
general steel, mold steel & stainless steel

P M K S



Radius accuracy
 ± 0.006 mm

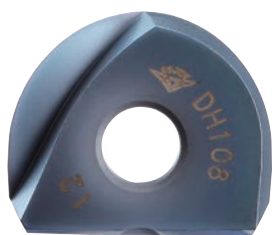


Fig 1

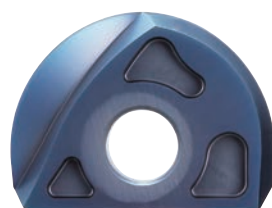
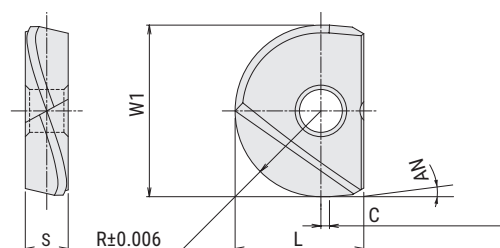
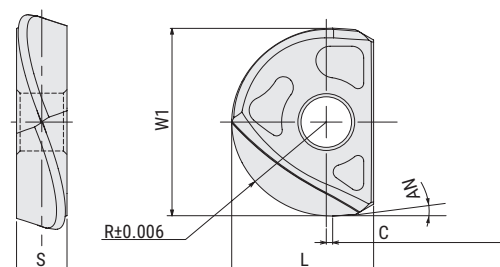


Fig 2



Cat.No.	PVD Coating		Dimensions(mm)						Fig.
	DH108	DS108	R	L	W1	S	C	AN	
BNM-060-SS	●	●	3	5	6	2	—	10°	1
BNM-080-SS	●	●	4	7	8	2.4	0.5	5°	
BNM-100-SS	●	●	5	8.5	10	2.6	1		
BNM-120-SS	●	●	6	10	12	3			
BNM-160-SS	●	●	8	12	16	4			
BNM-200-SS	●	●	10	15	20	5	1	5°	2
BNM-250-SS	●	●	12.5	18.5	25	6			
BNM-300-SS	○	○	15	22.5	30	7			
BNM-320-SS	●	●	16	23.5	32				

Note) 2 inserts per case

BNM-S
type

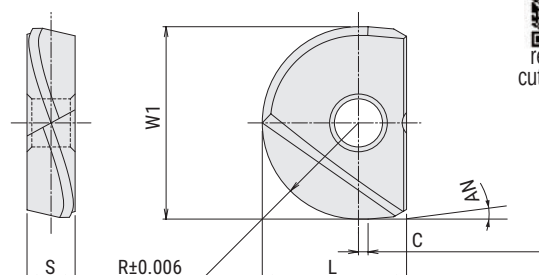
Sharp helical geometry

good for semi-finishing & finishing
non-ferrous metals such as aluminium, copper

N



Radius accuracy
 ± 0.006 mm



Cat.No.	Uncoated	DLC Coating	Dimensions (mm)					
	FZ05	JC20003	R	L	W1	S	C	AN
BNM-060-S	●	○	3	5	6	2	—	10°
BNM-080-S	●	○	4	7	8	2.4	0.5	5°
BNM-100-S	●	○	5	8.5	10	2.6	1	
BNM-120-S	●	○	6	10	12	3		
BNM-160-S	●	○	8	12	16	4		
BNM-200-S	●	○	10	15	20	5		
BNM-250-S	○	○	12.5	18.5	25	6		
BNM-300-S	○	○	15	22.5	30	7		

Note) 2 inserts per case



BNM-TG
type

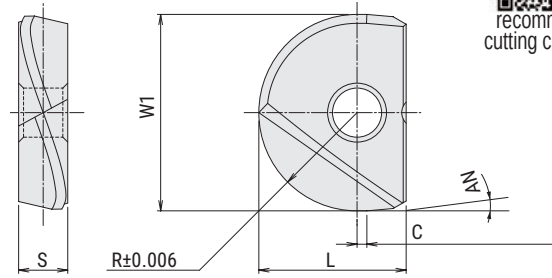
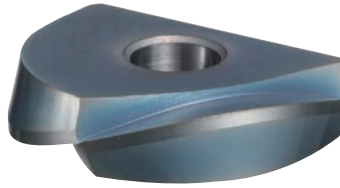
Helical geometry

good for finishing hard material/weld up to 60 HRC

K **H**



Radius accuracy
 ± 0.006 mm



Cat.No.	PVD Coating	Dimensions(mm)					
	DH102	R	L	W1	S	C	AN
BNM-060-TG	●	3	5	6	2	—	10°
BNM-080-TG	●	4	7	8	2.4	0.5	5°
BNM-100-TG	●	5	8.5	10	2.6	1	
BNM-120-TG	●	6	10	12	3	1.5	
BNM-160-TG	●	8	12	16	4		
BNM-200-TG	●	10	15	20	5	2	
BNM-250-TG	●	12.5	18.5	25	6		
BNM-300-TG	○	15	22.5	30	7		
BNM-320-TG	●	16	32	32			

Note) 2 inserts per case

BNM-TS
type

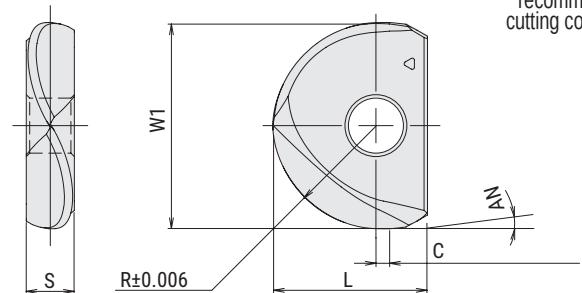
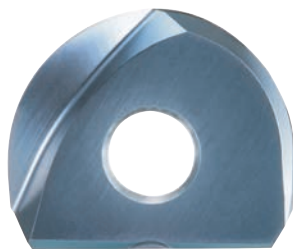
High Helix geometry

good for semi-finishing & finishing hard materials up to 60HRC

K **H**



Radius accuracy
 ± 0.006 mm



Cat.No.	PVD Coating	Dimensions(mm)					
	DH102	R	W1	L	S	C	AN
BNM-060-TS	●	3	6	5	2	—	10°
BNM-080-TS	●	4	8	7	2.4	0.5	5°
BNM-100-TS	●	5	10	8.5	2.6	1	
BNM-120-TS	●	6	12	10	3	1.5	
BNM-160-TS	●	8	16	12	4		
BNM-200-TS	●	10	20	15	5	2	
BNM-250-TS	●	12.5	25	18.5	6		
BNM-300-TS	○	15	30	22.5	7		
BNM-320-TS	●	16	32	23.5			

Note) 2 inserts per case

■ Grade selection guide

Material	BNM				BNM-S		BNM-SS		BNM-TG	BNM-TS
	DH111	JC10000	KT9	JBN245	FZ05	JC20003	DH108	DS108	DH102	DH102
Carbon steel below 250HB	◎☆						◎			
Cast steel below 285HB	◎☆						◎			
Tool & Die steel below 255HB	◎☆						◎			
Mold steel 30 - 36HRC	○						◎			
Mold steel 38 - 43HRC	○						◎			
Hardened die steel 42 - 52HRC	○						◎		○	○
Hardened die steel 55 - 62HRC							○		◎	◎
HSS 63 - 70HRC									◎	◎
Grey cast iron 160 - 260HB	○			★			○		◎	◎
Nodular cast iron 170 - 300HB	○			★			○		◎	◎
Austenitic stainless steel (304,316,317) 17Cr	◎ ☆						◎			
Ferritic & martensitic stainless steel (403,420J2,430) 13Cr	◎ ☆						◎			
Aluminium alloy (A5052)			◎		◎	◎				
Aluminium alloy (A7075)			◎		◎	◎				
Aluminium alloy Si below13%			◎		◎	◎				
Copper alloy (C1100)			◎		◎	◎				
Graphite		○				◎				
Titanium alloy (Ti-6Al-4V) 35 - 43HRC	◎ ☆						◎	◎		
Heat resistant alloy (INCO718) 35 - 43HRC	◎ ☆						◎			

◎ : First choice ○ : Second choice ☆ : Wet cutting ★ : High speed machining

■ Controlled Torque Wrenches (with replaceable blade)

Wrenches are pre-set to protect screws and bodies against damage during both the tightening and loosening process



● Controlled Torque Wrenches (with replaceable blade)

Cat. No.	Torque #	Screw torque	Replacement blade	Applicable holders
TQC-06	T6	0.5Nm	B-06	BNM○-06... RNM○-06...
TQC-07	T7	0.9Nm	B-07	BNM○-08... RNM○-08...
TQC-08	T8	1.2Nm	B-08	BNM○-10... RNM○-10...
TQC-10	T10	2.0Nm	B-10	BNM○-12... RNM○-12...

● Replacement blade

Cat. No.	Torque #	Applicable wrench
B-06	T6	TQC-06
B-07	T7	TQC-07
B-08	T8	TQC-08
B-10	T10	TQC-10

★ Insert mounting information

1. Make sure the insert seat on body is carefully cleaned.
2. Make sure insert itself is clean, especially hole and face location.
3. Change insert screw when threads start to wear.
(approximately every 10-15 inserts)
4. Do not over tighten screw, see table for torque specifications.

tool dia.(mm)	Recommended torque
φDc	N·m
6	0.5
8	0.9
10	1.2
12	2.0
16	3.0
20	4.0
25	5.0
30	6.0
32	6.0

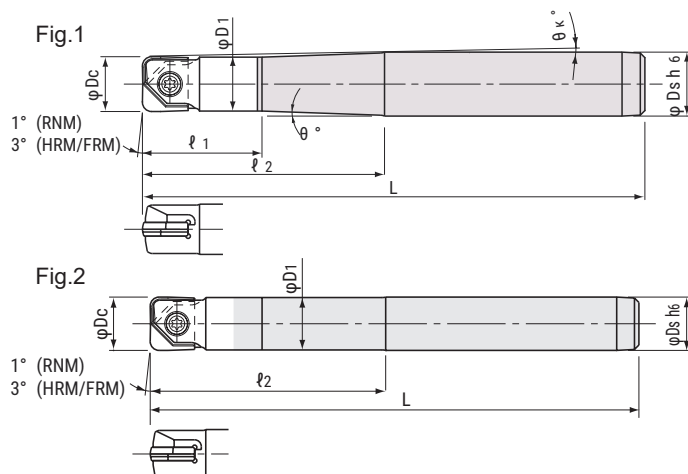
RNM
type

Carbide shank holder type

High Precision Indexable Radius End Mill

- Corner radius accuracy **below $\pm 0.010\text{mm}$**

C-Body



Cat.No.	Stock	Dimensions (mm)								Parts		Inserts	Fig							
		φDc	ℓ1	ℓ2	L	φD1	θ°	θk	φDs	Screws	Wrench									
RNMS-060015U-S06C	●	6	—	15	60	5.7	—	—	6	FSW-2005H	A-06	RNM-060... HRM-060... FRM-060...	2							
RNMM-060030U-S06C	●			30	80															
RNMS-080020U-S08C	●	8	—	20	70	7.6	—	—	8	FSW-2506H	A-07	RNM-080... HRM-080/090... FRM-080...	2							
RNMM-080040U-S08C	●			40	90															
RNMM-080053T-S12C	●		20	53	110	7.8	2°	2°12'	12				1							
RNML-080075S-S08C	●		—	75	140		—	—	8				2							
RNMS-100025U-S10C	●	10	—	25	75	9.5	—	—	10	FSW-3007H	A-08	RNM-100... HRM-100/110... FRM-100...	2							
RNMM-100050U-S10C	●			50	100															
RNMM-100050S-S10C	●			50	110	9.8														
RNMM-100053T-S12C	●		22.5	53	110	9.8	1°	1°7'	12				1							
RNML-100075S-S10C	●		—	75	140		—	—	10				2							
RNMS-120030U-S12C	●	12	—	30	80	11.5	—	—	12	FSW-3509H	A-10	RNM-120... HRM-120/130... FRM-120/130...	2							
RNMM-120060U-S12C	●			60	110															
RNMM-120053S-S12C	●			53	110	11.8														
RNML-120095S-S12C	●			95	160															
RNMS-160035U-S16C	●	16	—	35	90	15.5	—	—	16	FSW-4013H	A-15	RNM-160... HRM-160/170... FRM-160/170...	2							
RNMM-160070S-S16C	●			70	140	15.8														
RNMM-160090S-S16C	●			90	160															
RNML-160120S-S16C	●			120	210															
RNML-160150S-S16C	○			150	220															
RNMS-200040U-S20C	○	20	—	40	105	19.5	—	—	20	FSW-5016H	A-20W	RNM-200... HRM-200/220... FRM-200/210...	2							
RNMM-200075S-S20C	●			75	141	19.8														
RNMM-200105S-S20C	●			105	180															
RNML-200150S-S20C	●			150	220															
RNML-200170S-S20C	●			170	250															
RNMM-250090S-S25C	●	25	—	90	166	24.8	—	—	25	FSW-6020	A-30	FRM-250...	2							
RNMM-250140S-S25C	○			140	220															
RNML-250190S-S25C	○			190	260															
RNMM-300106S-S32C	○	30	—	106	186	29.8	—	—	32	FSW-8025S	A-30	FRM-300...	2							
RNMM-320106S-S32C	○	32				31.8						FRM-320...								

Note) All cutters are supplied without inserts or wrenches.

Screw	Torque (N.m)	Screw	Torque (N.m)
FSW-2005H	0.5	FSW-4013H	3.0
FSW-2506H	0.9	FSW-5016H	4.0
FSW-3007H	1.2	FSW-6020	5.0
FSW-3509H	2.0	FSW-8025S	6.0

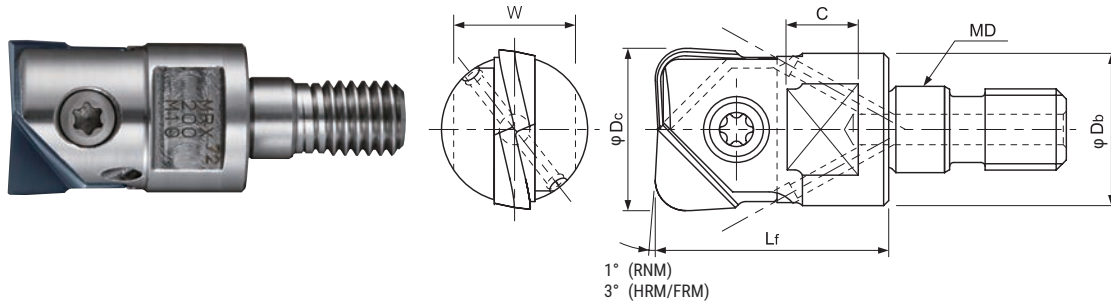
MRX
type

Modular Head Type

High Precision Indexable Radius End Mill

- RNM / Corner radius accuracy **below $\pm 0.010\text{mm}$**
- HRM / Corner radius accuracy **$\pm 0.015\text{ mm}$**
- FRM / Corner radius accuracy **$\pm 0.010\text{ mm}$**
- O.D. run out / MRX + MSN carbide shank **below $\pm 0.015\text{mm}$**

Through
coolant
hole



Cat.No.	Stock	Dimensions (mm)						Parts		Inserts
		φDc	Lf	φDb	MD	C	W	Screws	Wrench	
MRX-100-M6	●	10	18	9.7	M6	6.5	8	FSW-3007H	A-08	RNM-100... HRM-100/110... FRM-100...
MRX-120-M6	●	12	20	11.5	M6			FSW-3509H	A-10	RNM-120... HRM-120/130... FRM-120/130...
MRX-160-M8	●	16	23	15	M8	8	12	FSW-4013H	A-15	RNM-160... HRM-160/170... FRM-160/170...
MRX-200-M10	●	20	30	18.5	M10			FSW-5016H	A-20W	RNM-200... HRM-200/220... FRM-200/210...
MRX-250-M12	●	25	35	24	M12	10	17	FSW-6020	A-30	FRM-250/260...
MRX-300-M16	○	30	43	29	M16	12.5	22	FSW-8025S	A-30	FRM-300...
MRX-320-M16	●	32		30	M16					FRM-320...

Note) All cutters are supplied without inserts or wrenches.

Screw	Torque (N.m)
FSW-3007H	1.2
FSW-3509H	2.0
FSW-4013H	3.0
FSW-5016H	4.0
FSW-6020	5.0
FSW-8025S	6.0

■ **Spanner**

	Cat.No.	MD	Torque	width across flat	Thickness	Length
	DS-08	M6	8.0 N.m	12	4	85
	DS-12	M8	16 N.m	12	4	93

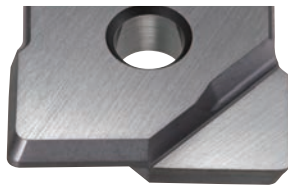
※ prevent over tightening by short grip

RNM
type

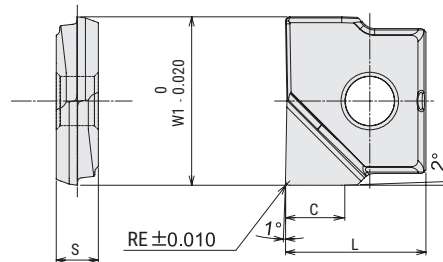
Neutral geometry

good for finishing non-ferrous metals such as aluminium, copper

N



Corner radius accuracy
 $\pm 0.010\text{mm}$



Cat.No.	Diamond Coating	Uncoated	Dimensions(mm)				
	JC10000	KT9 (K10)	RE	L	W1	S	C
RNM-080-R03		○	0.3	7	8	2.4	2.7
RNM-080-R05	●	●	0.5				
RNM-080-R10	○	●	1				
RNM-100-R03		○	0.3	8.5	10	2.6	3.3
RNM-100-R05	●	●	0.5				
RNM-100-R10	○	●	1				
RNM-100-R15		○	1.5				
RNM-100-R20		○	2	10	12	3	4
RNM-120-R03		○	0.3				
RNM-120-R05	○	●	0.5				
RNM-120-R10	○	●	1				
RNM-120-R15		○	1.5				
RNM-120-R20		●	2	12	16	4	5.3
RNM-160-R03		●	0.3				
RNM-160-R05		●	0.5				
RNM-160-R10		●	1				
RNM-160-R15		○	1.5				
RNM-160-R20		○	2	15	20	5	6.7
RNM-200-R03		○	0.3				
RNM-200-R05		○	0.5				
RNM-200-R10		●	1				
RNM-200-R15		○	1.5				
RNM-200-R20		○	2				

Note) 2 inserts per case (JC10000 / 1 insert per case)

HRM
type

High feed geometry

from Semi-finishing to finishing

P

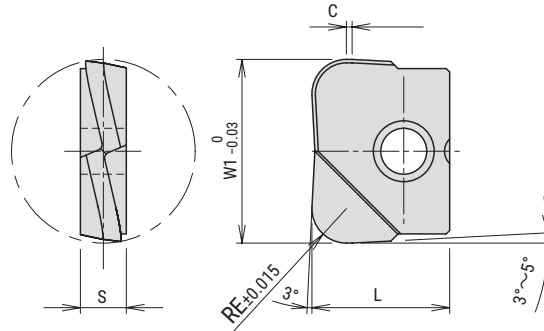
M

K

S



Corner radius accuracy
±0.015mm



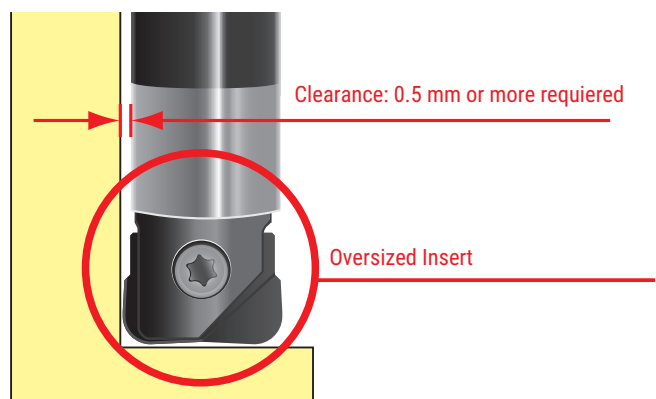
Cat.No.	PVD Coating	Dimensions(mm)				
	JC8015	RE	L	W1	S	C
HRM-060-R05	●	0.5	5	6	2	—
HRM-060-R10	●	1				
HRM-060-R15	●	1.5				
HRM-080-R20	●	2	7	8	2.4	0.3
HRM-090-R20	●			9		
HRM-100-R20	●	2	8.5	10	2.6	0.3
HRM-110-R20	●			11		
HRM-120-R20	●	2	10	12	3	0.5
HRM-130-R20	●			13		
HRM-160-R20	●	2	12	16	4	0.5
HRM-160-R30	●	3				
HRM-170-R30	●					
HRM-200-R20	●	2	15	20	5	0.5
HRM-200-R30	●	3				
HRM-220-R30	○					

Note) 2 inserts per case

Mirror Radius Oversized Insert

Recommended to use oversized insert ※ for increasing side clearance to prevent the damage of shank by sticking chips.

(※) HRM-090-R20, HRM-110-R20, HRM-130-R20, HRM-170-R30, HRM-220-R30



FRM
type

High feed geometry

from Semi-finishing to finishing

P

M

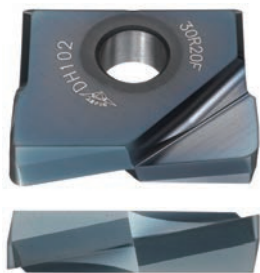
K

S

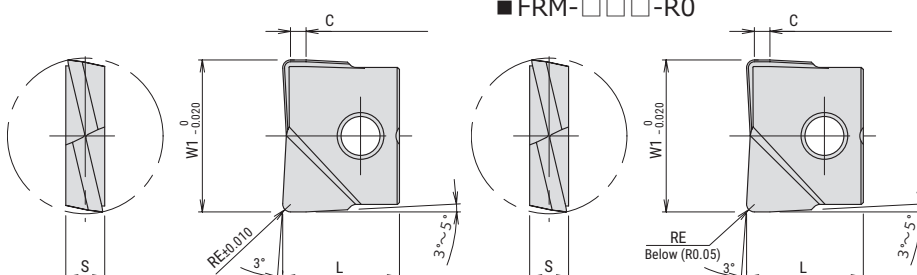
H



recommended
cutting conditions



Corner radius accuracy
±0.010mm



■ FRM-□□□-R0

Cat.No.	PVD Coating		Dimensions(mm)				
	DH102	JC8015	RE	L	W1	S	C
FRM-060-R0		◎	※	5	6	2	0.8
FRM-060-R03	●	◎	0.3				
FRM-060-R05	●	●	0.5				
FRM-060-R10	●	●	1				
FRM-080-R0		●	※	7	8	2.4	1.2
FRM-080-R03	●	◎	0.3				
FRM-080-R05	●	●	0.5				
FRM-080-R10	●	●	1				
FRM-100-R0		●	※	8.5	10	2.6	1.5
FRM-100-R03	●	◎	0.3				
FRM-100-R05	●	●	0.5				
FRM-100-R10	●	●	1				
FRM-100-R20	●	◎	2	10	12	3	1.5
FRM-120-R0		●	※				
FRM-120-R03	●	◎	0.3				
FRM-120-R05	●	●	0.5				
FRM-120-R10	●	●	1	10	13	3	1.5
FRM-120-R15	◎		1.5				
FRM-120-R20	●	●	2				
FRM-120-R30	●		3				
FRM-130-R05		◎	0.5	10	16	4	2
FRM-130-R10		◎	1				
FRM-160-R0		●	※				
FRM-160-R03	●	◎	0.3				
FRM-160-R05	●	●	0.5	12	17	4	2
FRM-160-R10	●	●	1				
FRM-160-R15	●		1.5				
FRM-160-R20	●	●	2				
FRM-160-R30	●		3	12	17	4	2
FRM-170-R03		◎	0.3				
FRM-170-R05		◎	0.5				
FRM-170-R10	●	●	1				
FRM-170-R20		◎	2				

Cat.No.	PVD Coating		Dimensions(mm)				
	DH102	JC8015	RE	L	W1	S	C
FRM-200-R0		●	※	15	20	5	2
FRM-200-R03	●	◎	0.3				
FRM-200-R05	●	●	0.5				
FRM-200-R10	●	●	1				
FRM-200-R15	●		1.5				
FRM-200-R20	●	●	2				
FRM-200-R30	●	◎	3	15	21	5	2
FRM-210-R05		◎	0.5				
FRM-210-R10	●	●	1				
FRM-210-R20		◎	2				
FRM-250-R03	●	◎	0.3	18.5	25	6	2.5
FRM-250-R05	●	◎	0.5				
FRM-250-R10	●	●	1				
FRM-250-R15	◎		1.5				
FRM-250-R20	●	●	2	18.5	26	6	2.5
FRM-250-R30	●	◎	3				
FRM-260-R03		◎	0.3				
FRM-260-R05		◎	0.5				
FRM-260-R10		◎	1	22.5	30	7	3
FRM-300-R03	○	◎	0.3				
FRM-300-R05	○	◎	0.5				
FRM-300-R10	○	○	1				
FRM-300-R20	○	○	2	23.5	32	7	3
FRM-300-R30	○	◎	3				
FRM-320-R03	●	◎	0.3				
FRM-320-R05	●	◎	0.5				
FRM-320-R10	●	●	1	23.5	32	7	3
FRM-320-R20	●	●	2				
FRM-320-R30	●		3				

※ Corner Radius below R0.05

Note) 2 inserts per case

■ Grade selection guide

Material	Insert	Grade	RNM		HRM	FRM	
			JC10000	KT9	JC8015	DH102	JC8015
Carbon steel below 250HB	FRM HRM	JC8015			◎		◎
Cast steel below 285HB	FRM HRM	JC8015			◎		◎
Tool & Die steel below 255HB	FRM HRM	JC8015			◎		◎
Mold steel 30 - 36HRC	FRM HRM	JC8015			◎		◎
Mold steel 38 - 43HRC	FRM HRM	JC8015			◎		◎
Hardened die steel 42 - 52HRC	FRM HRM	DH102 JC8015			○	◎	○
Hardened die steel 55 - 62HRC	FRM	DH102				◎	
HSS 63 - 70HRC	FRM	DH102				◎	
Grey & Nodular cast iron below 300HB	FRM HRM	DH102 JC8015			○	◎	○
Austenitic stainless steel (304,316,317) 17Cr	FRM HRM	JC8015			◎	○	◎
Aluminium alloy (A5052)	RNM	KT9		◎			
Copper alloy (C1100)	RNM	KT9		◎			
Graphite	RNM	JC10000	◎				
Titanium alloy (Ti-6Al-4V) 35 - 43HRC	HRM FRM	JC8015			◎		◎
Heat resistant alloy (INCO718) 35 - 43HRC	HRM FRM	JC8015			◎		◎

◎ : First choice ○ : Second choice



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