



NISSIN DIAMOND

DIAMOND
PcBN
CUTTING
TOOLS



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to contact us



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#nissindaiyan



Introduction of N-BRAND

N-BRAND

The latest diamond cutting tools are now available for immediate delivery!

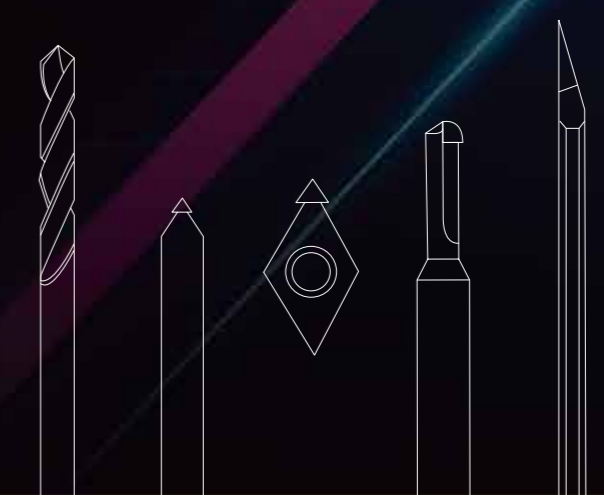


About N-BRAND

Nissin Diamond presents
Niche products by
New Market-Creation Tools

Explore the latest processing techniques that we've been eager to explore. However, there were significant barriers such as time and cost associated with taking on these challenges. Nissin Diamond is committed to providing rapid delivery and cost-effective pricing for our next-generation processing solutions to meet the needs of those embracing these challenges. Transforming new technology into future value!

- S** Single Crystal Diamond
- P** PCD
- C** CBN

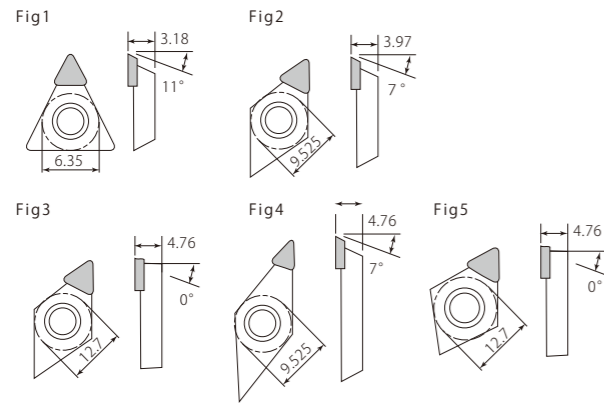


- S** N-Insert
- S** N-FaceMill
- S** N-Inner R Mill
- S** N-Square Mill
- S** N-Ball Mill
- P** N-Super-Hale
- C** N-Super-Hale

Single Crystal Diamond Inserts

N-Insert

For turning resin and non-ferrous metals
achievable mirror finish



Product Lineup

Model Part Number	R	Stock	Fig
TPGW110302-MCD	0.2	●	Fig1
TPGW110304-MCD	0.4	●	Fig1
TPGW110308-MCD	0.8	○	Fig1
TPGW110310-MCD	1	○	Fig1
DCGW11T302-MCD	0.2	●	Fig2
DCGW11T304-MCD	0.4	●	Fig2
DCGW11T308-MCD	0.8	○	Fig2
DCGW11T310-MCD	1	○	Fig2
DNGA150404-MCD	0.4	●	Fig3
DNGA150408-MCD	0.8	●	Fig3
DNGA150410-MCD	1	○	Fig3
DNGA150412-MCD	1.2	○	Fig3
VCGW160402-MCD	0.2	●	Fig4
VCGW160404-MCD	0.4	●	Fig4
VCGW160408-MCD	0.8	○	Fig4
CNGA120404-MCD	0.4	●	Fig5
CNGA120408-MCD	0.8	●	Fig5

Machining Conditions

Work Material	Vc		Coolant
	Cutting Speed	Depth of Cut	
Silver	50~300	0.005~0.05	Cutting Fluid
Aluminum	100~2,500	0.005~0.05	Emulsion
Magnesium	100~2,500	0.005~0.05	Emulsion
Gold	50~300	0.005~0.05	Cutting Fluid
Copper	50~500	0.005~0.04	Cutting Fluid
PC	50~200	0.01~0.1	Emulsion/Air
PE	80~350	0.01~0.1	Emulsion
PEEK	60~250	0.01~0.1	Emulsion
PMMA	80~300	0.01~0.1	Emulsion/Air
POM	80~350	0.01~0.1	Emulsion
PTFE	70~300	0.01~0.1	Emulsion
PVC	60~250	0.01~0.1	Emulsion

○ is a semi-stock item (Delivery time: approx. 40 days)
Other shapes are available upon request. (Delivery time: approx. 40 days).



Single Crystal Diamond Inserts

N-Insert

For turning resin and non-ferrous metals
achievable mirror finish

Application/Lathe
Immediate Delivery

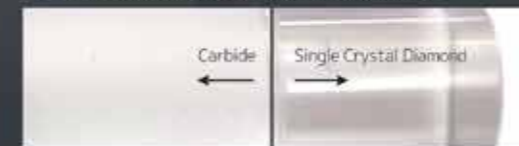
Mirror surface from
resin to non-ferrous metals
can be completed by cutting

Product Lineup

Carbide + PCD: Cutting + Buff Polishing OR Gas Polishing
Single Crystal Diamond: Cutting Only

Machining time is dramatically reduced

Acrylic Resin (Extruded Material)
φ20 external finishing process
Vc=188m/min fz=0.01 ap=0.05mm 仕上



Brass
φ30 external finishing process
Vc=188m/min fz=0.01 ap=0.05mm 仕上



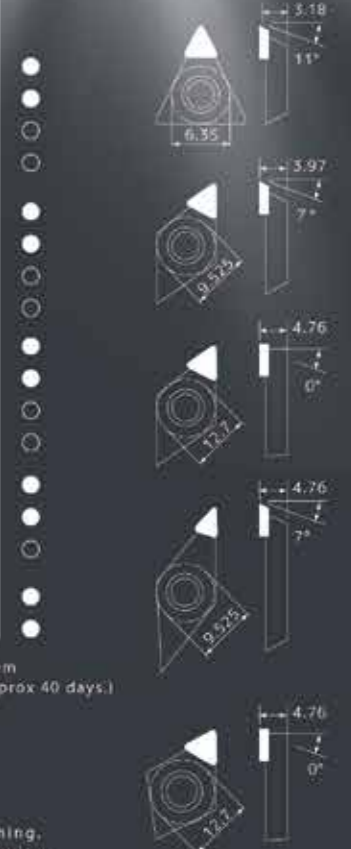
ADC12
φ20 external finishing process
Vc=188m/min fz=0.01 ap=0.05mm 仕上



Model Part Number

TPGW110302-MCD	R0.2
TPGW110304-MCD	R0.4
TPGW110308-MCD	R0.8
TPGW110310-MCD	R1.0
DCGW11T302-MCD	R0.2
DCGW11T304-MCD	R0.4
DCGW11T308-MCD	R0.8
DCGW11T310-MCD	R1.0
DNGA150404-MCD	R0.4
DNGA150408-MCD	R0.8
DNGA150410-MCD	R1.0
DNGA150412-MCD	R1.2
VCGW160402-MCD	R0.2
VCGW160404-MCD	R0.4
VCGW160408-MCD	R0.8
CNGA120404-MCD	R0.4
CNGA120408-MCD	R0.8

R



● Standard Stock Item ○ Semi-Standard Stock Item
○ is a Semi-Standard Stock Item (Delivery time: approx 40 days).
Other shapes are available upon request.
(Delivery time: approx. 40 days).

Additional Options

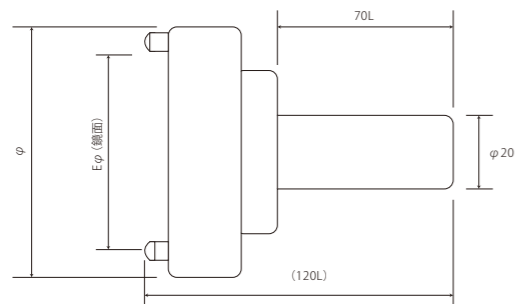
Achieve high precision with R-precision finishing.
Improve surface accuracy with R-precision lapping.

Single Crystal Diamond Face Milling Tools

N-Face Mill

Face milling operations enable mirror cutting on materials such as resin.

Fig1



Eφ is Effective Finishing Diameter (Mirror Finish)



Cutter body + Arbor



Blade

Product Lineup

Cutter body + Arbor				
Model Part Number	φ	Eφ	Stock	Fig
N-FM080	φ80	φ73	●	Fig1
N-FM100	φ100	φ93	●	Fig1
N-FM125	φ125	φ118	●	Fig1

Arbor Diameter : φ20
Other shapes are available upon request.
(Delivery time: approx. 45 days).

Blade			
Model Part Number	Material	Stock	Application
N-FM-MCD	Single Crystal Diamond	●	Finishing
N-FM-PCD	PCD	●	Coarse
N-FM-WC	Carbide	●	Coarse

Machining Conditions

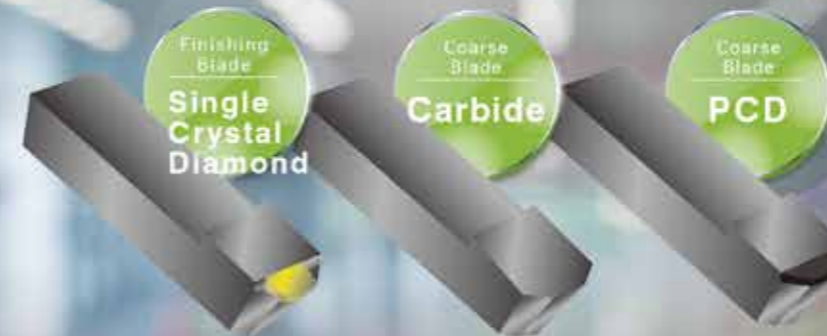
Work Material	Vc Cutting Speed	ap (mm) Depth of Cut	Coolant
Silver	50~300	0.005~0.05	Cutting Fluid
Aluminum	100~2,500	0.005~0.05	Emulsion
Magnesium	100~2,500	0.005~0.05	Emulsion
Gold	50~300	0.005~0.05	Cutting Fluid
Copper	50~500	0.005~0.04	Cutting Fluid
PC	50~200	0.01~0.1	Emulsion/Air
PE	80~350	0.01~0.1	Emulsion
PEEK	60~250	0.01~0.1	Emulsion
PMMA	80~300	0.01~0.1	Emulsion/Air
POM	80~350	0.01~0.1	Emulsion
PTFE	70~300	0.01~0.1	Emulsion
PVC	60~250	0.01~0.1	Emulsion

Single Crystal Diamond Face Milling Tools

N-FaceMill

Face milling operations enable mirror cutting on materials such as resin.

Featuring a lightweight aluminum body that is compatible with BT30 tool holders



Mirror cutting is achievable with Single Crystal Diamond Only

Rough and finishing processes are completed in a single step

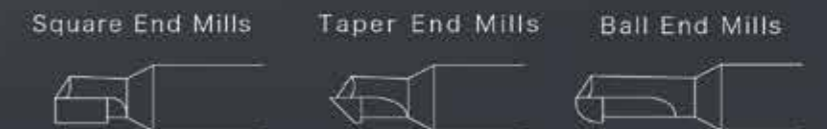
- >Reduction of Buff Polishing Process
- >Reduction in Processing Time
- >Easy Setup
- >Regrinding Possible

Size Range

Cutter Diameter: φ80~
Arbor Diameter: φ16~



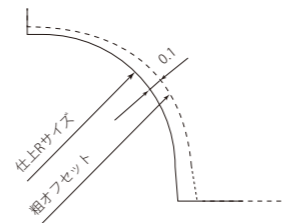
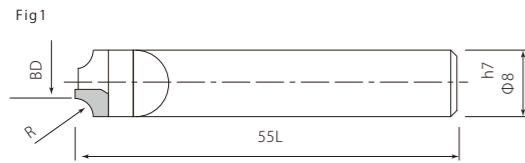
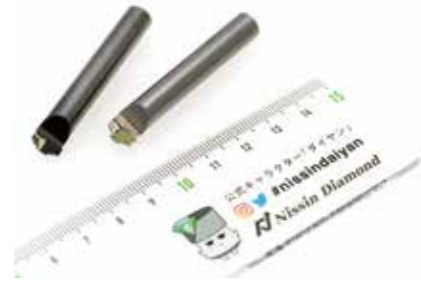
When combined with other single crystal tools, various ideas come forth!



End Mills for Rounding and Chamfering

N-InnerR Mill

Mirror surface cutting is possible with resin R chamfering



Product Lineup

R0.75				
Model Part Number	BD	Material	Stock	Application
N-RM R0.75 - PCD	φ4.0	PCD	○	Coarse
N-RM R0.75 - MCD	φ4.0	Single Crystal Diamond	○	Finishing

R1.0				
Model Part Number	BD	Material	Stock	Application
N-RM R1.0 - PCD	φ4.0	PCD	●	Coarse
N-RM R1.0 - MCD	φ4.0	Single Crystal Diamond	●	Finishing

R1.25				
Model Part Number	BD	Material	Stock	Application
N-RM R1.25 - PCD	φ4.0	PCD	○	Coarse
N-RM R1.25 - MCD	φ4.0	Single Crystal Diamond	○	Finishing

R1.5				
Model Part Number	BD	Material	Stock	Application
N-RM R1.5 - PCD	φ4.0	PCD	●	Coarse
N-RM R1.5 - MCD	φ4.0	Single Crystal Diamond	●	Finishing

R1.75				
Model Part Number	BD	Material	Stock	Application
N-RM R1.75 - PCD	φ4.0	PCD	○	Coarse
N-RM R1.75 - MCD	φ4.0	Single Crystal Diamond	○	Finishing

R2.0				
Model Part Number	BD	Material	Stock	Application
N-RM R2.0 - PCD	φ4.0	PCD	●	Coarse
N-RM R2.0 - MCD	φ4.0	Single Crystal Diamond	●	Finishing

R2.25				
Model Part Number	BD	Material	Stock	Application
N-RM R2.25 - PCD	φ4.0	PCD	○	Coarse
N-RM R2.25 - MCD	φ4.0	Single Crystal Diamond	○	Finishing

R2.5				
Model Part Number	BD	Material	Stock	Application
N-RM R2.5 - PCD	φ4.0	PCD	●	Coarse
N-RM R2.5 - MCD	φ4.0	Single Crystal Diamond	●	Finishing

○ is a semi-stock item (Delivery time: approx. 45 days)
Other shapes are available upon request. (Delivery time: approx. 45 days).

Coarse Machining Conditions

Rotational Speed : S=10,000~15,000rpm/min
Table Feed : Vf=300~1,000mm/min

Finish Machining Conditions

For Polycarbonate, approximately 1/2 of the values below

Rotational Speed : S=10,000~15,000rpm/min
Table Feed : Vf=300~1,000mm/min
Depth of Cut : ap= ~0.1mm

Reference values, may vary depending on the material being cut and the machining equipment.

Acrylic Processing

End Mills for Rounding and Chamfering

N-InnerR Mill

Mirror surface cutting is possible with resin R chamfering

Application M/C
Immediate Delivery

Achieving mirror finish
with cutting for
edge beveling

No Polishing Required!

Mirror finish achievable
through cutting

Traditional Processing: Cutting + Buff Polishing
or Gas Polishing

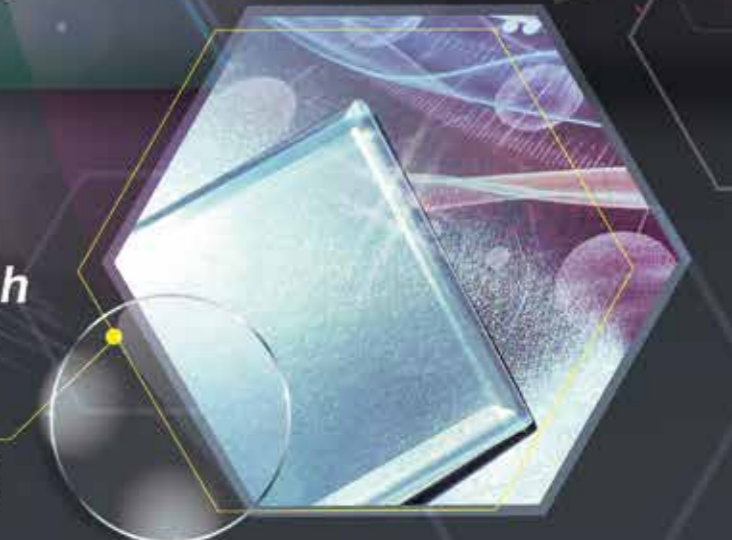
Since it's only cutting,
process reduction is possible.



[Coarse] R2.0 - PCD(R2.1)
Vc=251m, Vf=1,000mm/min

[Finishing] R2.0 - MCD
Vc=188m, Vf=1,000mm/min

Achieved with Our Original
Blade Specifications



Model Part Number	Application	BD	Stock
N-RM R0.75 - PCD	Coarse	φ4.0	○
N-RM R0.75 - MCD	Finishing	φ4.0	○
N-RM R1.0 - PCD	Coarse	φ4.0	●
N-RM R1.0 - MCD	Finishing	φ4.0	○
N-RM R1.25 - PCD	Coarse	φ4.0	○
N-RM R1.25 - MCD	Finishing	φ4.0	○
N-RM R1.5 - PCD	Coarse	φ4.0	●
N-RM R1.5 - MCD	Finishing	φ4.0	○
N-RM R1.75 - PCD	Coarse	φ4.0	○
N-RM R1.75 - MCD	Finishing	φ4.0	○
N-RM R2.0 - PCD	Coarse	φ4.0	●
N-RM R2.0 - MCD	Finishing	φ4.0	○
N-RM R2.25 - PCD	Coarse	φ4.0	○
N-RM R2.25 - MCD	Finishing	φ4.0	○
N-RM R2.5 - PCD	Coarse	φ4.0	●
N-RM R2.5 - MCD	Finishing	φ4.0	○

● Standard Stock Item ○ Semi-Standard Stock Item
○ is a Semi-Standard Stock Item (Delivery time: approx 45 days.)

For pricing details, contact us.

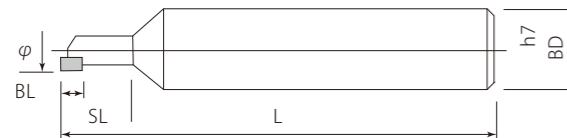
Additional/custom sizes and configurations are available upon request.



Single Crystal Diamond Square End Mills

N-Square Mill

Achieved high-quality mirror finish on the outer perimeter and extended the tool lifespan.



Machining of Resins and Non-Ferrous Metals
Reduce the rotational speed to one-third for hard and brittle materials

Product Lineup

Model Part Number	φ	BL	SL	BD	L	Stock
N-SM0010	φ0.1	0.05	0.3	6	50	●
N-SM0020	φ0.2	0.1	0.6	6	50	●
N-SM0030	φ0.3	0.15	0.9	6	50	●
N-SM0040	φ0.4	0.2	1.2	6	50	○
N-SM0050	φ0.5	0.25	1.5	6	50	●
N-SM0060	φ0.6	0.3	1.8	6	50	○
N-SM0070	φ0.7	0.35	2.1	6	50	○
N-SM0080	φ0.8	0.4	2.4	6	50	●
N-SM0090	φ0.9	0.45	2.7	6	50	○
N-SM0100	φ1	0.5	1.5	6	55	●
N-SM0200	φ2	1.5	3	6	55	●
N-SM0400	φ4	2	4	6	55	●
N-SM0600	φ6	3	9	8	55	●
N-SM0800	φ8	4	12	8	55	●
N-SM1000	φ10	5	15	10	60	●
N-SM1200	φ12	6	18	12	60	●

○ is a semi-stock item (Delivery time: approx. 45 days)
Other shapes are available upon request. (Delivery time: approx. 45 days).

Machining Conditions

φ	Rotational Speed (min-1)	ap (mm) Depth of Cut
φ0.1	10,000~40,000	0.004
φ0.2	10,000~40,000	0.009
φ0.3	10,000~40,000	0.01
φ0.4	10,000~40,000	0.01
φ0.5	10,000~40,000	0.02
φ0.6	10,000~40,000	0.03
φ0.7	10,000~40,000	0.03
φ0.8	10,000~40,000	0.04
φ0.9	10,000~40,000	0.04
φ1	10,000~40,000	0.04
φ2	10,000~30,000	0.09
φ4	10,000~20,000	0.1
φ6	5,000~10,000	0.1
φ8	5,000~10,000	0.1
φ10	5,000~10,000	0.1
φ12	5,000~10,000	0.1

Recommend high-speed rotation whenever possible.
Reference values, may vary depending on the material being cut and the machining equipment



Single Crystal Diamond Square End Mills

N-Square Mill

Achieved high-quality mirror finish on the outer perimeter and extended the tool lifespan.

Application M/C
Immediate Delivery

Product Lineup

Model Part Number	φ	BL	SL	BD	L	Stock
N-SM0010	φ0.1	0.05	0.3	6	50	●
N-SM0020	φ0.2	0.1	0.6	6	50	●
N-SM0030	φ0.3	0.15	0.9	6	50	●
N-SM0040	φ0.4	0.2	1.2	6	50	○
N-SM0050	φ0.5	0.25	1.5	6	50	●
N-SM0060	φ0.6	0.3	1.8	6	50	○
N-SM0070	φ0.7	0.35	2.1	6	50	○
N-SM0080	φ0.8	0.4	2.4	6	50	●
N-SM0090	φ0.9	0.45	2.7	6	50	○
N-SM0100	φ1	0.5	1.5	6	55	●
N-SM0200	φ2	1.5	3	6	55	●
N-SM0400	φ4	2	4	6	55	●
N-SM0600	φ6	3	9	8	55	●
N-SM0800	φ8	4	12	8	55	●
N-SM1000	φ10	5	15	10	60	●
N-SM1200	φ12	6	18	12	60	●

● Standard Stock Item ○ Semi-Standard Stock Item
○ is a Semi-Standard Stock Item
(Delivery time: approx 45 days.)

For pricing inquiries, please feel free to contact us.



Mirror finish achievable through cutting

Surface roughen is improved six times compared to carbide cutting tools.



World's Longest: 12mm~ Blade Length

Seamless production of single crystal diamond tools with blade widths ranging from 12mm and above is exclusively offered by Nissin Diamond. Also, suitable for work pieces with a minimum thickness of 12mm.

Acrylic: An Example of Pocket-Perimeter Machining

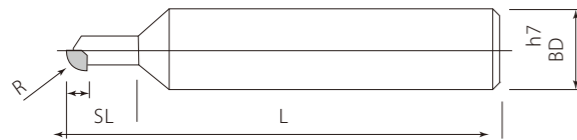


With various single crystal diamond tools, the possibilities expand even further

Single Crystal Diamond Ball End Mills

N-Ball Mill

Mirror Finish and Extended Lifespan
Achieved for Free-form Surfaces



Machining of Resins and Non-Ferrous Metals
Reduce the rotational speed to
one-third for hard and brittle materials

Product Lineup

Model Part Number	φ	SL	BD	L	Stock
N -BM0010	0.1	0.6	6	50	●
N -BM0020	0.2	1.2	6	50	●
N -BM0030	0.3	1.8	6	50	●
N -BM0040	0.4	2.4	6	50	○
N -BM0050	0.5	3	6	50	●
N -BM0060	0.6	3.6	6	50	○
N -BM0070	0.7	4.2	6	50	○
N -BM0080	0.8	4.8	6	50	●
N -BM0090	0.9	5.4	6	50	○
N -BM0100	1	5	6	50	●
N -BM0150	1.5	5	6	50	○
N -BM0200	2	5	6	50	●
N -BM0250	2.5	5	6	50	○
N -BM0300	3	5	6	50	●
N -BM0350	3.5	8	8	50	○
N -BM0400	4	8	8	50	●
N -BM0450	4.5	10	10	50	○
N -BM0500	5	10	10	50	●

○ is a semi-stock item (Delivery time: approx. 45 days)
Other shapes are available upon request. (Delivery time: approx. 45 days).

Machining Conditions

φ	^(min-1) Rotational Speed	^{ap (mm)} Depth of Cut
φ0.1	10,000~40,000	0.004
φ0.2	10,000~40,000	0.009
φ0.3	10,000~40,000	0.01
φ0.4	10,000~40,000	0.01
φ0.5	10,000~40,000	0.02
φ0.6	10,000~40,000	0.03
φ0.7	10,000~40,000	0.03
φ0.8	10,000~40,000	0.04
φ0.9	10,000~40,000	0.04
φ1	10,000~40,000	0.04
φ2	10,000~30,000	0.09
φ4	10,000~20,000	0.1
φ6	5,000~10,000	0.1
φ8	5,000~10,000	0.1
φ10	5,000~10,000	0.1
φ12	5,000~10,000	0.1

Recommend high-speed rotation whenever possible.
Reference values, may vary depending on the material
being cut and the machining equipment

Single Crystal Diamond Ball End Mills

N-Ball Mill

Mirror Finish and Extended Lifespan
Achieved for Free-form Surfaces

Application M/C Immediate Delivery

Maximize your company's
strengths through our diverse
product range and the flexibility
of our 'mirror finishing' technology,
which includes speciali

Single Crystal Diamond Tool	PCD - Carbide Tool
<p>Compare edges with a ball end mills of the same size</p> <p>×5000 Enlarged view.</p> <p>Outer second face</p> <p>Flute face</p> <p>Chamfer</p>	<p>Compare edges with a ball end mills of the same size</p> <p>×5000 Enlarged view</p> <p>Outer second face</p> <p>Flute face</p>
<p>Mirror finish achievable</p>	<p>Clouding of the cutting surface</p>

The work piece's surface roughness is 1/6th that of PCD,
and achieving mirror finishes exclusively through cutting is possible only with single crystal diamond tools

Product Lineup

Model Part Number	R	SL	BD	L	Stock
N -BM0010	0.1	0.6	6	50	●
N -BM0020	0.2	1.2	6	50	●
N -BM0030	0.3	1.8	6	50	●
N -BM0040	0.4	2.4	6	50	○
N -BM0050	0.5	3	6	50	●
N -BM0060	0.6	3.6	6	50	○
N -BM0070	0.7	4.2	6	50	○
N -BM0080	0.8	4.8	6	50	●
N -BM0090	0.9	5.4	6	50	○
N -BM0100	1	5	6	50	●
N -BM0150	1.5	5	6	50	○
N -BM0200	2	5	6	50	●
N -BM0250	2.5	5	6	50	○
N -BM0300	3	5	6	50	●
N -BM0350	3.5	8	8	50	○
N -BM0400	4	8	8	50	●
N -BM0450	4.5	10	10	50	○
N -BM0500	5	10	10	50	●

● Standard Stock Item ○ Semi-Standard Stock Item
○ is a Semi-Standard Stock Item (Delivery time: approx 45 days.)

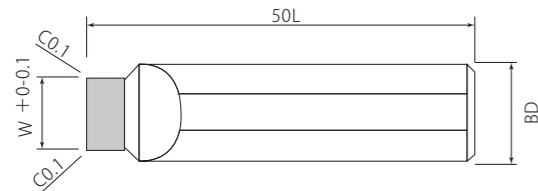
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please feel free to contact us.



PCD / CBN Super Hale Bite

N-Super Hale

The Birth of Tools for Maximizing Surface Precision



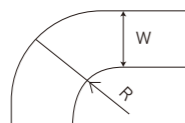
Product Lineup

PCD				
Model Part Number	W	BD	MinC	Stock
N-SH4-PCD	4	φ6	R8	●
N-SH5-PCD	5	φ6	R7	●
N-SH6-PCD	6	φ6	R6.5	●
N-SH7-PCD	7	φ8	R8	●
N-SH8-PCD	8	φ8	R8.5	●
N-SH9-PCD	9	φ10	R9.2	●
N-SH10-PCD	10	φ10	R10.5	●

CBN				
Model Part Number	W	BD	MinC	Stock
N-SH4-CBN	4	φ6	R8	○
N-SH5-CBN	5	φ6	R7	●
N-SH6-CBN	6	φ6	R6.5	○
N-SH7-CBN	7	φ8	R8	○
N-SH8-CBN	8	φ8	R8.5	○
N-SH9-CBN	9	φ10	R9.2	○
N-SH10-CBN	10	φ10	R10.5	●

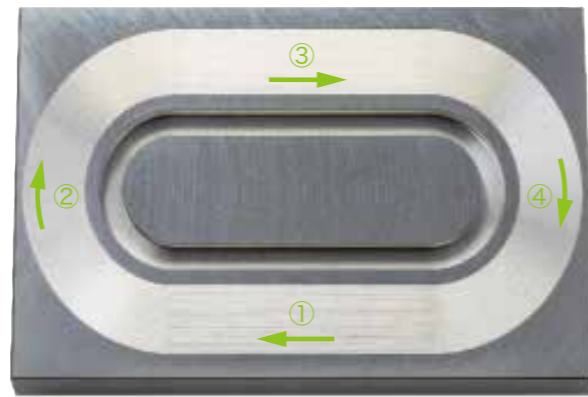
○ is a semi-stock item (Delivery time: approx. 40 days)
Other shapes are available upon request.
(Delivery time: approx. 40 days).

MinC is
The R-dimension of the curve in the machining path with the smallest radius



For interference prevention, verification is required

Examples of Aluminum Processing



Machine : a61nx(Pro.6) Sealing Face Width : 10mm
Work Material : Aluminum (A5052) Groove Depth : 0.03mm
Work Size : 90 × 55 × 10mm Feed Rate : 6,000mm/min
Tool Material : Carbide

Surface Finish Our Achieved Values

- ① Ra0.304 μm ② Ra0.330 μm
- ③ Ra0.315 μm ④ Ra0.356 μm

General Hale Machining



Super Hale Machining



Single Crystal Diamond / PCD / CBN

N-Super Hale

The Birth of Tools for Maximizing Surface Precision

Long-term stability of seal groove processing accuracy

Custom-designed solutions to meet specific processing needs

Seamless production of single crystal diamond inserts with blade widths exceeding 10mm is also feasible.

- Support in creating custom machining programs for customers
- Setting cutting conditions & producing Super Hale bite
- Maintenance Procedures for Super hale bite



SMART TOOL
Super Hale™

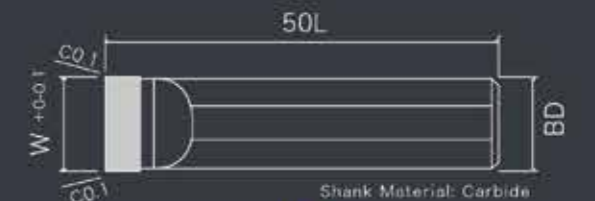
Compatible with super Hale specifications

Next generation hale machining technology solution developed by Makino Milling Machine, Co., Ltd. Realization of ultra-high vacuum seal surface without polishing

SMART TOOL is a product developed by Makino Milling Machine Co., Ltd.

Immediate delivery stock items of PCD and CBN tools.

N-SuperHale



PCD	Model Part Number	W	BD	MinC	Stock
	N-SH4-PCD	4	φ6	R8	●
	N-SH5-PCD	5	φ6	R7	●
	N-SH6-PCD	6	φ6	R6.5	●
	N-SH7-PCD	7	φ8	R8	●
	N-SH8-PCD	8	φ8	R8.5	●
	N-SH9-PCD	9	φ10	R9.2	●
	N-SH10-PCD	10	φ10	R10.5	●

CBN	Model Part Number	W	BD	MinC	Stock
	N-SH4-CBN	4	φ6	R8	○
	N-SH5-CBN	5	φ6	R7	●
	N-SH6-CBN	6	φ6	R6.5	○
	N-SH7-CBN	7	φ8	R8	○
	N-SH8-CBN	8	φ8	R8.5	○
	N-SH9-CBN	9	φ10	R9.2	○
	N-SH10-CBN	10	φ10	R10.5	●

● Standard Stock Item ○ Semi-Standard Stock Item

○ is a Semi-Standard Stock Item (Delivery time: approx 40 days.)

MinC is
The R-dimension of the curve in the machining path with the smallest radius



For interference prevention, verification is required