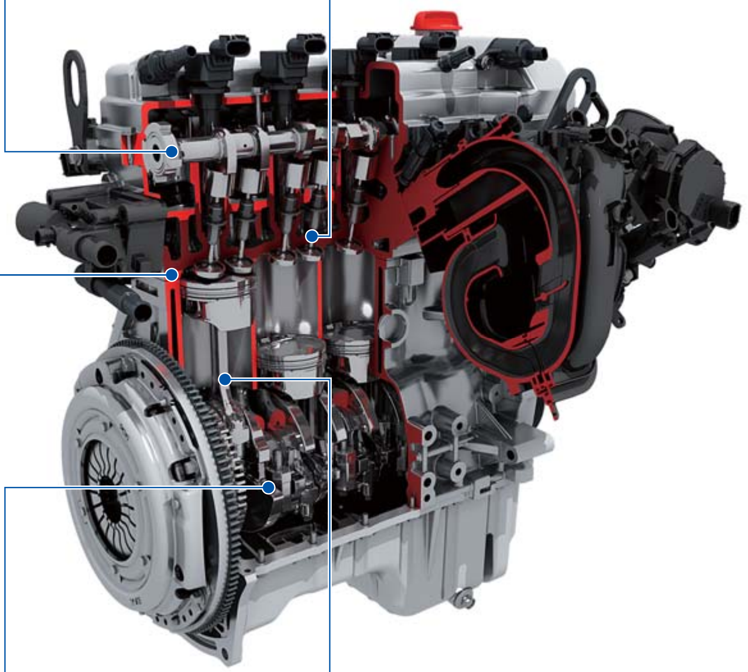
Noritake

Grinding Solutions For Automotive Engine Manufacturing Processes

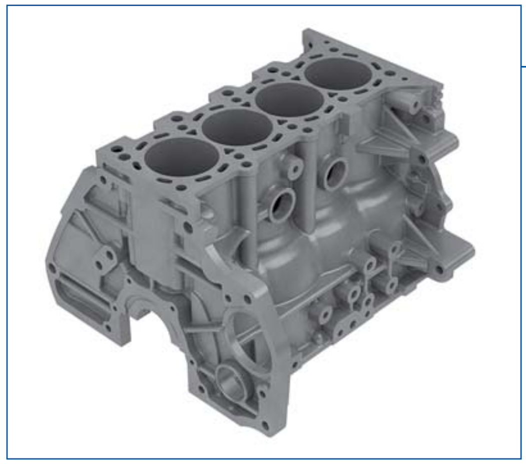
Engine

Camshaft

Engine valve

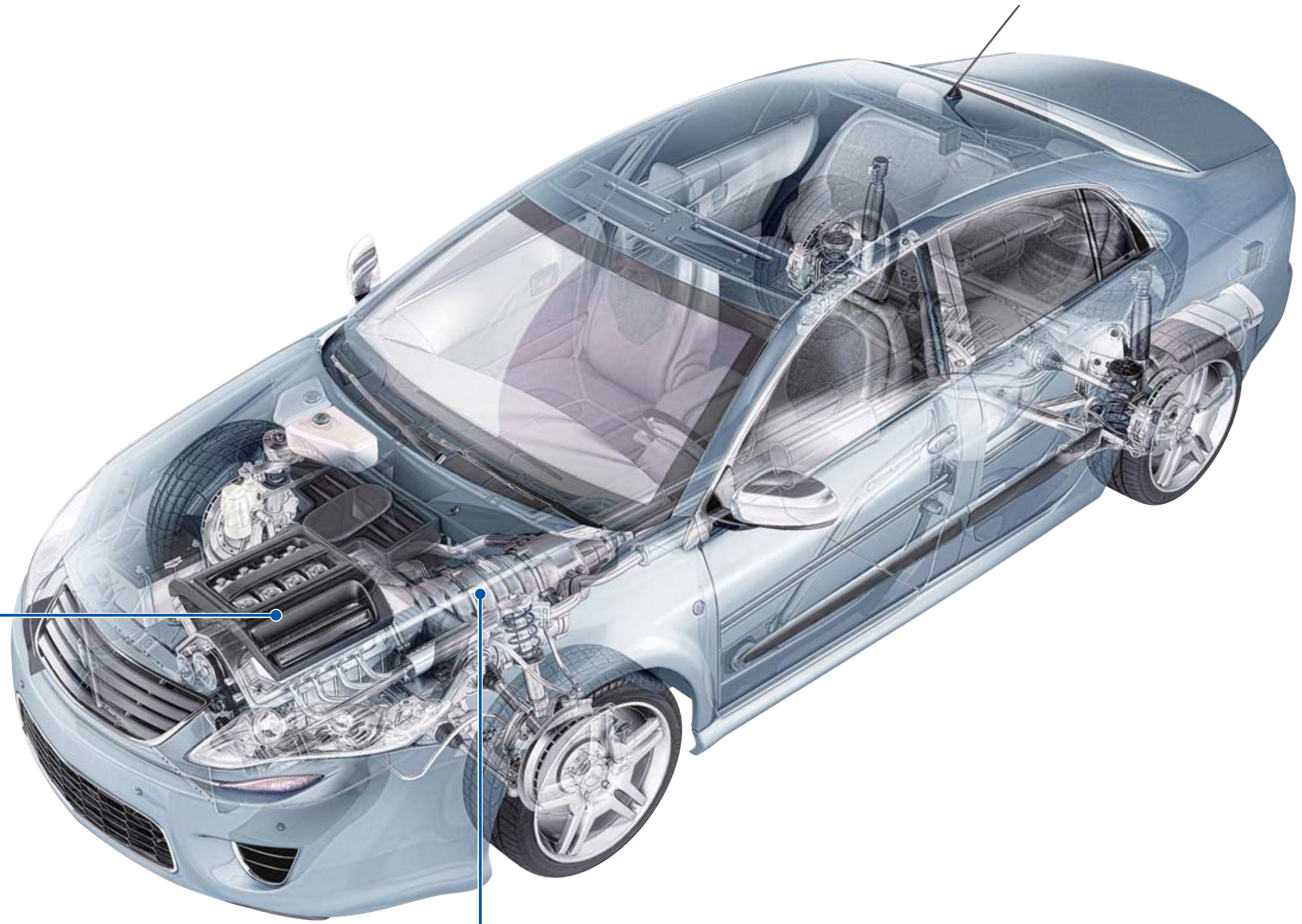


Cylinder block



Crankshaft

Connecting rod

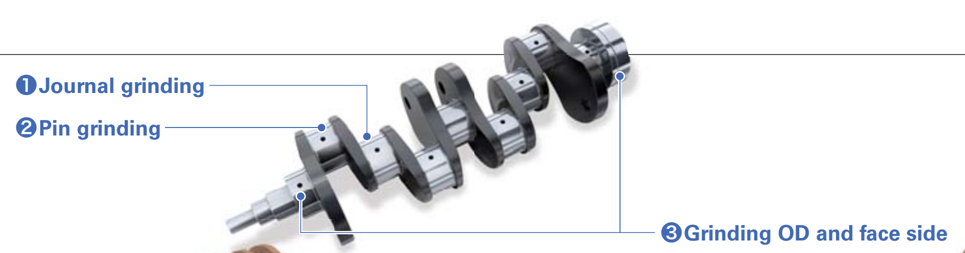


Transmission

Gear

Issues and Proposals for Improvement of Automotive Engine Manufacturing Processes

Crankshaft



	①Journal grinding	①Journal grinding (simultaneous grinding)	②Pin grinding	③Grinding OD and side face
Aspects	Multiple grinding locations	Long grinding wheel replacement time	Insufficient coolant at grinding point	Large contact area between grinding wheel and workpiece
Issues	It takes too much time to grind	Improving grinding wheel life to reduce wheel changing time	Grinding burn	Grinding burn on side face

Proposal – ①Journal grinding

Grinding wheel with dresser

VN1 (CBN wheel)
Standard specifications: CB 100 M 180 VN1

Metal bond rotary dresser
Standard specifications: SD 40 Q 90 MW7

Coolant

Noritake Cool
■SEC-Y(water base coolant) Better suited for Lubricity
■NK-Z(L)(water base coolant) Better suited for corrosion prevention

Filtration

Epoch separator

Proposal – ①Journal grinding (simultaneous grinding)

Grinding wheel with dresser

CX grinding wheel
(Conventional grinding wheel)
Standard specifications: CX 60 L 8 V104

Proposal – ②Pin grinding

Grinding wheel with dresser

Σ wheel
(CBN wheel)
Product Description ➡P.15
Standard specifications: CBX 120 M 180 VV2 (Σ)

Metal bond rotary dresser
Standard specifications: SD 40 Q 90 MW7

V35, V57
(Conventional grinding wheel)
Standard specification
For smaller OD size wheel: SH 60 L 8 V35
For larger OD size wheel : SH 60 L 9 V57XP

LL Blade dresser
Standard specifications: L3T1-0803

Coolant

Noritake Cool
■SEC-Y (water base coolant) Better suited for Lubricity
■NK-Z(L) (water base coolant) Better suited for corrosion prevention

Filtration

Epoch separator

Proposal – ③Grinding OD and side face

Grinding wheel with dresser

V35
(Conventional grinding wheel)
Standard specification
Front portion: SK 60 J 8 V35
Rear portion: SK 60 H 10 V35P

LL Blade dresser
Standard specifications: L3T1-0803

Coolant

Noritake Cool
■SEC-Y (water base coolant) Better suited for Lubricity
■NK-Z(L) (water base coolant) Better suited for corrosion prevention

Filtration

Epoch separator

Camshaft

	①Journal grinding	①Journal grinding (simultaneous grinding)	②Camlobe grinding
Aspects	Multiple grinding locations	Long grinding wheel replacement time	Grinding heat can accumulate due to large contact area
Issues	Long grinding time	Improving grinding wheel life to reduce wheel changing time	Grinding cracks and residual stress

Proposal – ①Journal grinding

Grinding wheel with dresser

VN1 (CBN wheel)
Standard specifications: CB 100 M 180 VN1

Metal bond rotary dresser
Standard specifications: SD 40 Q 90 MW7

Coolant

Noritake Cool
■SEC-Z(water base coolant) Better suited for Lubricity
■NK-Z(L)(water base coolant) Better suited for corrosion prevention

Filtration

Epoch separator

Proposal – ①Journal grinding (simultaneous grinding)

Grinding wheel with dresser

CX grinding wheel
(Conventional grinding wheel)
Standard specifications: CX 60-8 V104

Proposal – ②Camlobe grinding

Grinding wheel with dresser

One grinding process

■Grinding FCD materials
Sharp Kaiser (CBN wheel)
Product Description➡P.11
Standard specifications: CBX 120 Q 180 VSH1

■Grinding FC chill material
SW5 (CBN wheel)
Standard specifications: CB 80 O + 200 VSW5

Two grinding processes

Rough Grinding Process
SW5 (CBN wheel)
Standard specifications: CB 80 O + 200 VSW5

Finish grinding process
■Wheel Outer diameter ϕ250 to 350mm
Sharp Kaiser (CBN wheel)
Product Description➡P.11
Standard specifications: CBX 120 Q 180 VSH1

■Wheel Outer diameter ϕ150mm or less (concave cam)
Mega Life Wheel (CBN Wheel)
Standard specifications: CBX 120 Q 180 VML1
Vol.1

Coolant

Noritake Cool
■SEC-Z(water base coolant) Better suited for Lubricity
■NK-Z(L)(water base coolant) Better suited for corrosion prevention

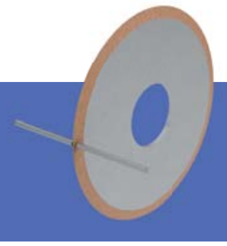
Filtration

Epoch separator

Vol.X This icon shows that products were published in the Technical Information magazine NORITAKE TECHNICAL JOURNAL. Shown next to the icon is the publications page number.

Issues and Proposals for Improvement of Automotive Engine Manufacturing Processes

Engine valve

	①Cutting	②Stem grinding	③Groove grinding	④Face grinding
Process				
Aspects	High efficiency cutting	Grinding wheel wear and form loss	Form loss due to workpiece shape complexity	Grinding wheel wear and form loss
Issues	Short wheel life	Inconsistent workpiece accuracy	Deterioration of groove shape, deterioration of surface roughness	Deterioration of surface roughness, frequent shape and cutting ability maintenance

①Cutting — Proposal

Grinding wheel with dresser

Rim saw
Standard specifications:
CB 80 to 100 MRX27

Coolant

Noritake-cut
EPS-6X
(Oil base coolant)

Filtration

Centrifugal

②Stem grinding — Proposal

Grinding wheel with dresser

VN1
(CBN wheel)
Standard specifications:
CB 100 N 200 VN1

Metal bond rotary dresser
Standard specifications:
SD 40 Q 90 MW7

SK and GC grinding wheels
(Conventional grinding wheel)
Standard specification
Rough: SK 60 M 8 V35, GC 60 M 8 V81
Finish: SK 100 M 8 V35, GC 100 M 8 V81

LL Blade dresser NEO
Standard specifications:
L3T1-0803 N

Coolant

Noritake cool
SEC-Z
(Water base coolant)

Filtration

Epoch separator

③Groove grinding — Proposal

Grinding wheel with dresser

Electroplated wheel
Standard specifications:
CB 400 PC5 (Standard type)
CB 120 PC5 (Truing type)

Coolant

Noritake-cut
EPS-6X
(Oil base coolant)

Filtration

Centrifugal

④Face grinding — Proposal

Grinding wheel with dresser

VN1
(CBN wheel)
Standard specifications:
CB 120 N 200 VN1

Metal bond rotary dresser
Standard specifications:
SD 40 Q 90 MW7

CX grinding wheel
(Conventional grinding wheel)
Standard specifications:
CX 100 P 7 V104

LL Blade dresser NEO
Standard specifications:
L3T1-0803 N

Coolant

Noritake-cut
EPS-6X
(Oil base coolant)

Filtration

Centrifugal

Vol.X This icon shows that products were published in the Technical Information magazine NORITAKE TECHNICAL JOURNAL.
Shown next to the icon is the publications page number.

Issues and Proposals for Improvement of Automotive Engine Manufacturing Processes

Connecting rod

Process: ①Width grinding

- **Aspects:** Low flatness and thickness variation requirements
- **Issues:** Stable cutting ability, preventing grinding burn

Proposal

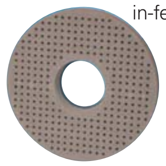
Grinding wheel with dresser

Case of carrier grinding

Neopox (Conventional grinding wheel)
Standard specifications: 83A 46 J 15 YTS

LL single-point dresser NEO
Standard specifications: L1S1-1203N

Case of in-feed grinding



Flatdy (Conventional grinding wheel)
Standard specifications: 83A 46 H 12 BHXS1

LL single-point dresser NEO
Standard specifications: L1S1-1203N

Coolant

Noritake cool SEC-Y (Water base coolant)

Filtration

Epoch separator

Process: ②Inner diameter grinding (internal grinding)

- **Aspects:** Must meet cylindricity and surface roughness requirements
- **Issues:** Deterioration of surface roughness

Proposal

Grinding wheel with dresser

VN1 (CBN wheel)
Standard specifications: CB 170 M 200 VN1

Metal bond rotary dresser
Standard specifications: SD 40 Q 90 MW7

Coolant

Noritake cool SEC-Y (Water base coolant)

Filtration

Epoch separator

Process: ②Inner diameter grinding (honing)

- **Aspects:** Must meet cylindricity and surface roughness requirements
- **Issues:** Balanced cutting ability and tool life

Proposal

Grinding wheel with dresser

MKD Series (Diamond Wheel)
Product Description➡P.13
Standard specification
Rough: SD 270 to 325 M 50 MKD
Finish: SD 400 to 600 M 35 MKD

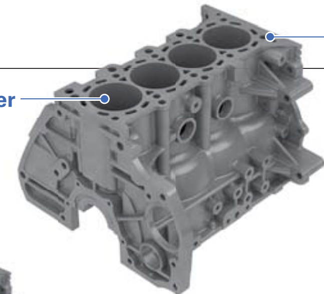
Coolant

Noritake cut 0091 (Oil base coolant)

Filtration

A-0 filter

Cylinder block



Process: ①Inner diameter grinding of Cylinder (honing)

- **Aspects:** Must meet cylindricity and surface roughness requirements
- **Issues:** Balanced cutting ability and tool life

Proposal

Grinding wheel with dresser

Rough grinding

MKD Series (Diamond Wheel)
Product Description➡P.13
Standard specifications: SD 170 to 400 O 20 MKD

Finish grinding

■Non-cast iron
MHB Series (Diamond Wheel)
Product Description➡P.14
Standard specifications: SD 500 to 2500–MHB

■Cast iron
MH5 Series (Diamond Wheel)
Standard specifications: SD 500 to 2500 H 20 MH5

Coolant

Noritake cool SA-2000CB (K) (Water base coolant)

Filtration

Combination Filtration System
Filtration configuration: Magnetic separator + Paper Filter

Process: ②Top surface machining

- **Aspects:** High Efficiency grinding
- **Issues:** Short tool life, high surface roughness

Proposal

Grinding wheel with dresser

Grit Ace (Diamond Wheel)
Standard specifications: SD 40
Vol.1

Coolant

Noritake cool ES-20KP (Water base coolant)

Filtration

Combination Filtration System
Filtration configuration: Magnetic separator + Paper Filter

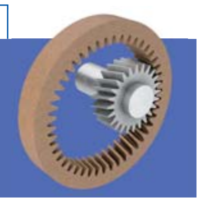
Vol.X This icon shows that products were published in the Technical Information magazine NORITAKE TECHNICAL JOURNAL. Shown next to the icon is the publications page number.

Issues and Proposals for Improvement of Automotive Engine Manufacturing Processes

Gear

Heat treatment → Small gear → Width grinding → Inner diameter grinding (honing) → Gear grinding • polishing → Complete

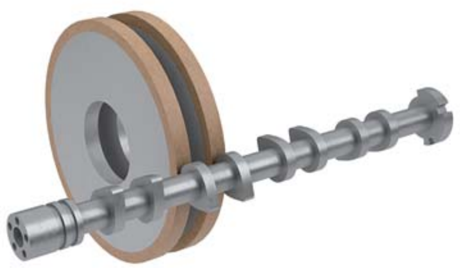
Heat treatment → Large gear → Internal grinding → Periphery and end face grinding → Gear grinding • polishing → Complete

	Width grinding	Inner diameter grinding (honing)	Internal grinding	Periphery and end face grinding	Gear grinding	Gear grinding + polishing	Gear honing
Process	Width grinding 	Inner diameter grinding (honing) 	Internal grinding 	Periphery and end face grinding 	Gear grinding 	Gear grinding + polishing 	Gear honing 
Aspects	Large stock removal	Must meet cylindricity and surface roughness requirements	Grinding wheel diameter is smaller than workpiece inner diameter	Large contact area between grinding wheel and workpiece	Dressing conditions that are prone to glazing	Grinding and polishing are possible with one grinding wheel	Large number of teeth where grinding wheel and workpiece mesh
Issues	Wheel surface loses form, decreasing cutting ability	Balanced cutting ability and tool life	Deterioration of surface roughness	Grinding burn on side face	Grinding burn	Reducing grinding time	Short wheel life
	Proposal	Proposal	Proposal	Proposal	Proposal	Proposal	Proposal
Grinding wheel with dresser	 **Besler Wheel** (CBN Wheel) Standard specifications: CBC 230 P 75 BX331	 Rough grinding **MIK1 Series** (CBN Wheel) Standard specifications: CBM 120 to 200 M 50 MIK1 Finish grinding **MH5 Series** (CBN Wheel) Standard specifications: CB 325 to 1000 H 30 MH5	 **CX grinding wheel** (Conventional grinding wheel) Standard specifications: CXZ 120 N 8 V104  **LL single-point dresser** Standard specifications: L1T1-0603  **VN1** (CBN wheel) Standard specifications: CB 170 M 200 VN1  **Metal bond rotary dresser** Standard specifications: SD 40 Q 90 MW7	 **LIFE KING** (Conventional grinding wheel) Standard specifications: TA 60 J 8 VLK1  **LL Blade dresser** Standard specifications: L3T1-0803  **VN1** (CBN wheel) Standard specifications: CBX 120 P 150 VN1KP  **Metal bond rotary dresser** Standard specifications: SD 40 Q 90 MW7	 **Gear Ace** (for continuous generation type gear grinding) Standard specifications: TA 80 I 10 VLK1P Vol.2	 **Multi-layer gear grinding wheel** Standard specifications Grinding section: CZ 120 I 10 V700P Polishing section: A800	 **Gear Ace** (for Gear Honing) Standard specification Resinoid-bond grinding wheel: CXY 100 R 7 Y1605 Vitrified-bond grinding wheel: MA/SK 100 N 6 V53
Coolant	Noritake cool SEC-Y (Water base coolant) 	Noritake cut 0091 (Oil base coolant) 	Noritake cool SEC-Y (Water base coolant) 	Noritake cool SEC-Y (Water base coolant) 	—		Noritake cut 0091 (Oil base coolant) 
Filtration	 Epoch separator	 **Combination Filtration System** Filtration configuration: Magnetic separator + Paper Filter  A-0 filter	 Epoch separator	 Epoch separator	Case of using oil base coolant  Lambda filter system	Case of using water base coolant  Epoch separator	 Magnetic separator tank unit

Vol.X This icon shows that products were published in the Technical Information magazine NORITAKE TECHNICAL JOURNAL. Shown next to the icon is the publications page number.

Grinding Solution: Cam lobe Grinding

Fig. 1 Outline of Cam lobe grinding



In order for an engine to achieve high power output and low fuel consumption, the cam's concave profile is becoming more crucial. Grinding issues, such as grinding cracks and residual stress, are more likely to occur compared to traditional shapes. In addition, materials that have high strength and toughness, such as ductile cast iron, will be more difficult to grind compared to the gray cast iron because of the high heat buildup. This issue will lead into the problem mentioned previously, which will be prone to occur more easily. In these types of applications, utilizing a CBN wheel with a high cutting ability is favorable. But these types of wheels tends to have a short wheel life, which means there will be more frequent wheel changes. This will lead to production loss, and end up increasing the cost per part, due to machine down time. We would need to look into a CBN wheel for cam lobe grinding that has both high cutting ability and long wheel life. Noritake would like to introduce Sharp Kaizer as the Vitrified bonded CBN wheel suited for such cam lobe grinding.

Sharp Kaiser (Vitrified-bond CBN wheel)

Feature: Good balance between cutting ability and wheel life due to the homogeneous structure and increased grain protrusion.

Fig. 2 Sharp Kaiser

The cam lobe grinding test of ductile cast iron material was carried out under the test conditions in Table 1. Fig. 3 shows the power consumption of the Sharp Kaiser and the traditional products. The power consumption of the Sharp Kaiser is lower than that of the traditional product, which shows that the cutting ability is improved. In addition, Fig. 4 compares the grinding results between Sharp Kaiser and the traditional product when grinding with equivalent power consumption. After dressing both wheels so that they each produce the same quality, the Sharp Kaizer had held It's surface finish by 1.9 times longer, and the roundness by 2.9 times longer than the traditional product. The surface roughness is 12% finer and the residual stress is 75% lower, thus improving the overall workpiece quality. Sharp Kaizer is able to achieve such long life because of the improved bond structure uniformity and the improved cutting ability due to its higher grain protrusion (Fig. 5). In other case studies, not only does the Sharp Kaizer improve the work finish quality and reduce scratches, but it also increased it's dressing interval by 1.5 to 2 times compared to the traditional product.

Table 1 Test conditions

[Grinding wheel]

Specifications	CBX140-V
Dimensions	ø350×T35×ø20mm

[Workpiece]

Material	FCD700

[Grinding conditions]

Grinding method	Cam lobe grinding
Grinding wheel speed	140m/s
Grinding efficiency	110mm³/mm･s
Dresser	Rotary dresser (SD30)
Coolant	Water base coolant

Fig. 3 Power Consumption

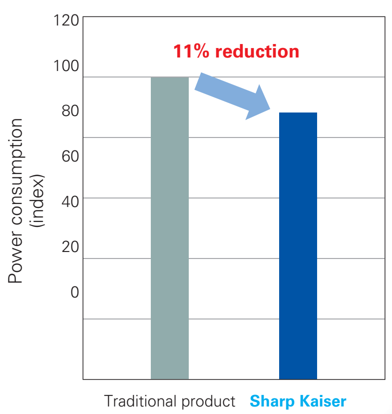


Fig. 4 Test results

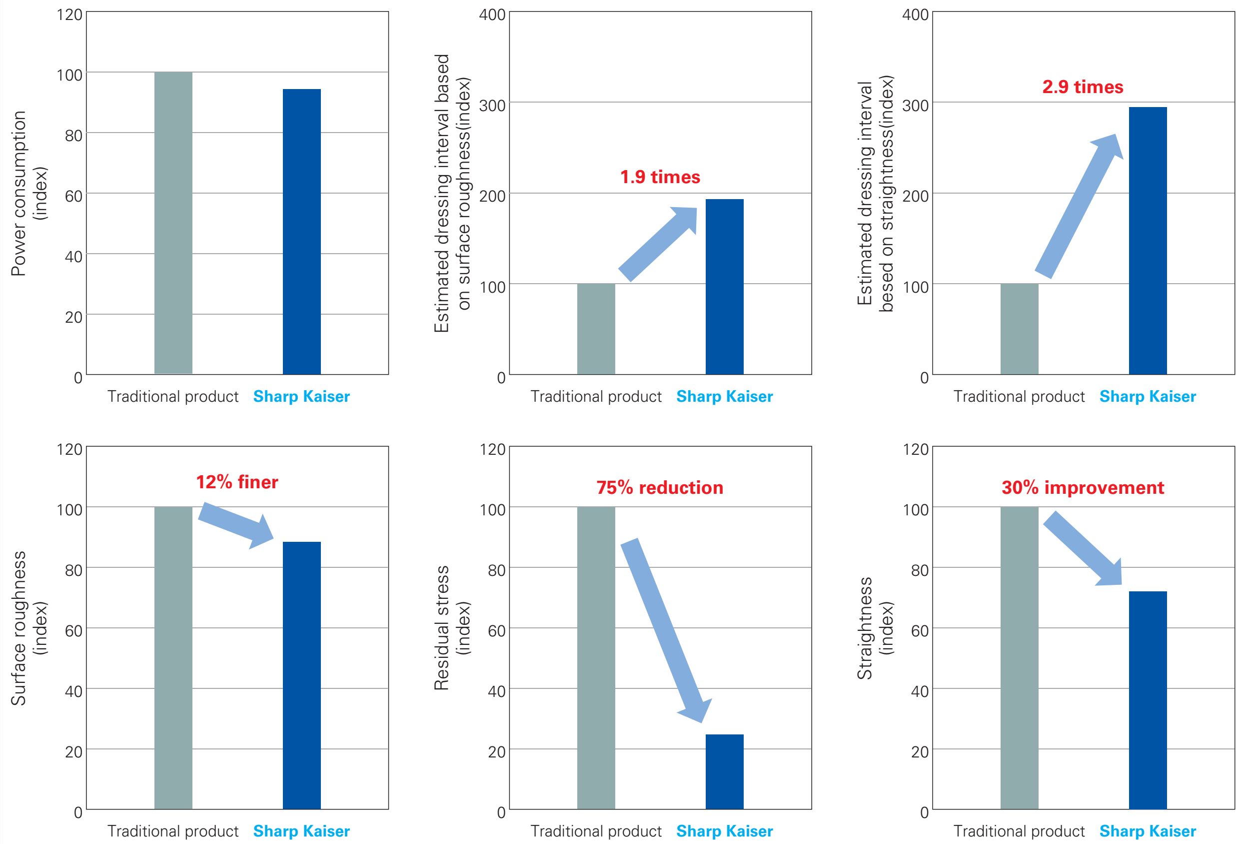
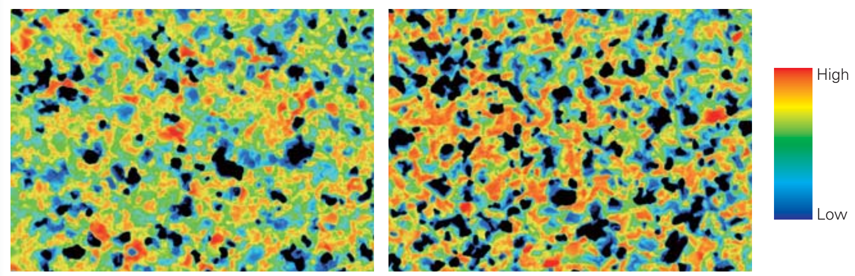


Fig. 5 Abrasive grain protrusion condition on grinding wheel surface



Traditional product　Sharp Kaiser

Grinding solution: Cylinder bore grinding (honing) of cylinder block

The inner surface of the cylinder block is finished by honing, and metal-bonded diamond/CBN honing tools are commonly used. This grinding method is characterized by inserting the honing head into the bore and grinding by expanding the tool against the work surface while rotating and reciprocating within the cylinder bore. Honing is required the formation of a plateau surface as well as grinding within the cycle time. Therefore, the surface roughness and cutting ability corresponding to each grinding process are required for honing tools. In addition, since the tool is used without dressing, honing tools must maintain consistent cutting ability throughout its tool-life. NORITAKE's lineup of bonds for diamond/CBN honing tools can sustain high grinding efficiency and stable cutting ability even on high hardness workpieces or when surface roughness finer than Rz4μm is required. Noritake would like to introduce the MKD series for honing rough process and the MHB series for honing finish and plateau process.

Fig. 6
Schematic diagram of cylinder bore grinding (honing)

MKD Series (Diamond Tools)

Feature: Extending tool life and maintaining cutting ability with high hardness microstructure bond

The test conditions and comparison between a traditional Honing Tool and the MKD Series Honing Tool are shown in Table 2. The MKD Series Tool achieved 2.2 times longer tool life while maintaining the same stock removal amount as the traditional product (Fig. 7). The MKD series uses a high-hardness bond to improve the cutting of abrasive grains as well as improve grinding efficiency. Although clogging is caused by the high wear resistance of common high-hardness bonds, the MKD series has a fine bond structure that promotes bond abrasion by ground chips, thus ensuring abrasive grain protrusion and enabling stabilization of cycle time due to good cutting ability (Fig. 8). Since the MKD series can maintain the cutting ability of the rough process, the surface roughness and bore accuracy are stabilized after the rough process, and it is also effective for stabilization of the finish process (stabilization of cycle time, surface roughness, and bore accuracy).

Table 2 Test conditions

Grinding method	Mechanically extended honing
Tool specifications	SD400 (Traditional product)
	SD400 (MKD Series)
Tool dimensions	L60 × W4mm (6 pcs)
Peripheral speed of tool	53m/min
Tool reciprocating speed	22m/min
Workpiece material	Cast iron (FC250(JIS))
Workpiece dimensions	ø84×L135mm
Coolant	Water base coolant

Fig. 7 Test results

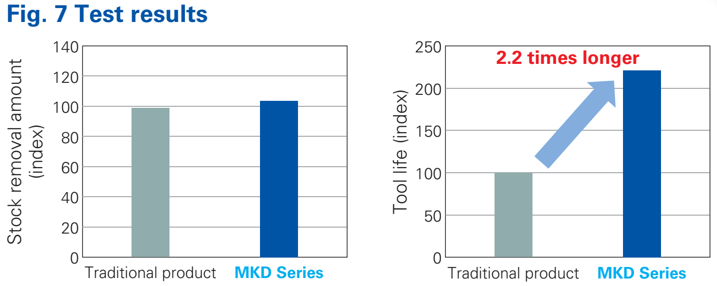


Fig. 8 Structure of Traditional Product and MKD Series

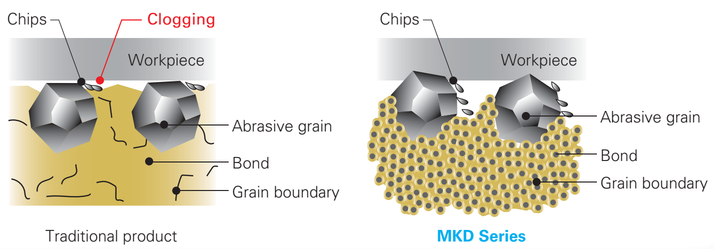


Fig. 9
MKD Series

MHB Series (Diamond Tools) [Patent pending]

Feature: Improving cutting ability and longer tool life through the development of special fillers

The MHB Series 3 was compared with the Traditional product under the test conditions shown in Table 3. The MHB series has a 30% improvement in stock removal amount compared to traditional products, and the tool life is equivalent or better (Fig. 11). In addition, we were able to confirm that the grinding efficiency was also stable. The MHB series features a special filler instead of the traditional solid lubricant (filler) (Fig. 12). The special filler wears gradually during grinding to form a chip pocket, enabling suppression of grinding force and stable cutting edge renewal cycles. Also, special fillers are chemically bonded with bonds and abrasive grains, so wear can be reduced compared to traditional fillers. MHB series realizes cycle time reduction and improvement of cycle time stability while maintaining tool life.

Fig. 10
MHB Series

Table 3 Test conditions

Grinding method	Mechanically extended honing
Tool specifications	SD700 (Traditional product)
	SD700 (MHB Series)
Tool dimensions	L75 × W4mm (6 pcs)
Peripheral speed of tool	95m/min
Tool reciprocating speed	25m/min
Workpiece material	Cast iron (equivalent to FC250(JIS))
Workpiece dimensions	ø84×L135mm
Coolant	Water base coolant

Fig. 11 Test results

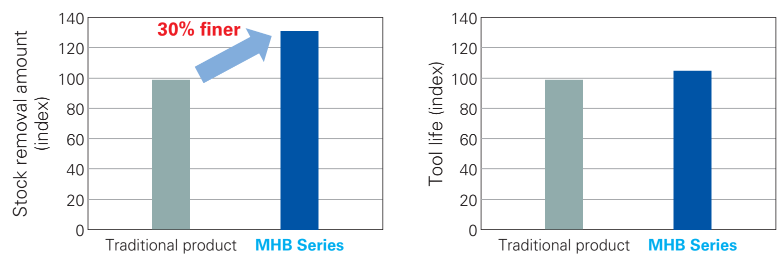
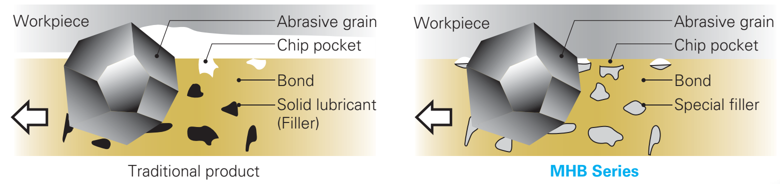


Fig. 12 Structure of Traditional Product and MHB Series

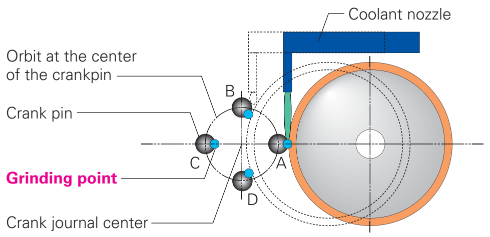


Grinding Solution: Crankshaft Pin Grinding

In crankshaft pin grinding, the crankshaft rotates and the CBN wheel spindle slides back and forth in synch with the crankshaft pin's position (Fig. 13). In the process, the position of the grinding point and the supply state of the coolant change continuously as shown in Fig. 14. At points B and D, the coolant supply to the grinding point deteriorates. This is known to lead to such issues as grinding burn, cracking, and hardness reduction. At the same time, there is a demand to extend the dressing interval as much as possible in order to reduce the tool cost per machine. Further improved cutting ability and wheel life are also required. This section introduces the Σ(Sigma) Wheel as a vitrified CBN wheel suitable for crankshaft pin grinding.

Fig. 13 Schematic of Crankshaft Pin Grinding

Fig. 14 Pin Grinding Details



Σ Wheel (Vitrified-bond CBN wheel)

Feature: Improved lubricity with special coating agent prevents grinding burn

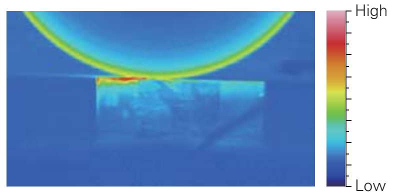
The results of grinding tests using thermography are shown in Table 4. We confirmed that the ambient temperature at the grinding point decreased by about 20% (Fig. 15(a), (b)) and the amount of heat generated was reduced. In addition, the surface roughness and wheel wear remain the same as the standard product, but the power consumption has been reduced by about 10%, and the cutting ability has been improved (Fig. 15 (c)). The Σ Wheel is specially coated to reduce grinding heat (Fig. 16). This effect was achieved by the lubricity improvement that the special coating agent provides. In the field, we were able to achieve a dressing interval 2 to 4 times that of the current product by suppressing hardness reduction and preventing grinding burn. In addition, we were able to shorten the cycle time because of the reduced power consumption.

Table 4 Test conditions

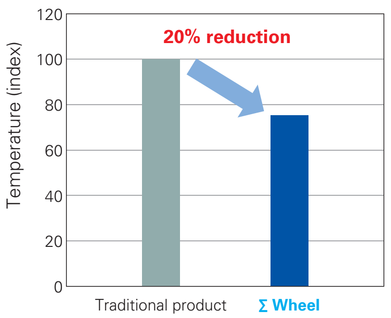
[Grinding wheel]

Wheel spec	①CB80-V (Traditional product) ②CB80-V (Σ Wheel)
Coolant	Water base coolant Dry grinding when measuring temperature

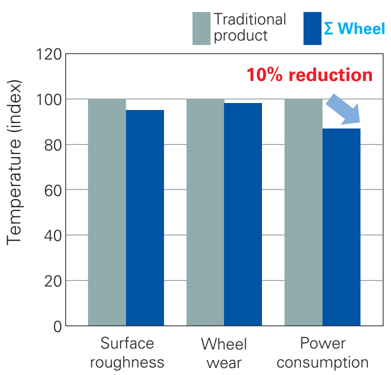
Fig. 15 Grinding Characteristics of Σ Wheel



(a)Example of temperature measurement using thermography

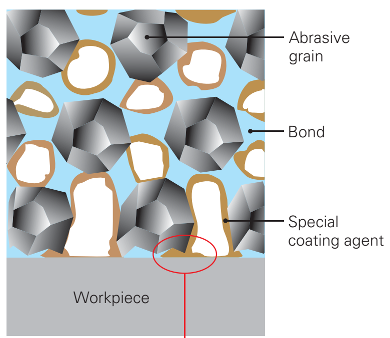


(b)Thermographic temperature measurement results



(c)Other grinding test results

Fig. 16 Schematic Diagram of Σ Wheel



Special coating agent with excellent lubricity effectively prevents grinding burn near the grinding point grinding burn

Fig. 17 Σ Wheel

Advantage of NORITAKE TECHNICAL JOURNAL

The products shown in Vol.X are published
in the Technical Information Magazine NORITAKE TECHNICAL JOURNAL.
If you register some information through the Noritake website,
you can see everything from the first publication to the newest issue for free.

Advantage 1
Description of grinding and polishing basics

Advantage 2
Propose tools and usage techniques for special themes

Advantage 3
Description of solving technical issues based on case studies

Web registration procedure [free]

1 Search with search engine

Enter search words

NORITAKE TECHNICAL JOURNAL Search

or

1 QR Cord reading

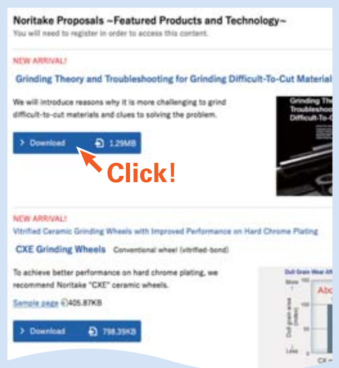
Read this QR Cord and move to site

2 Enter required info on the form

Please full in required info

3 Registration complete

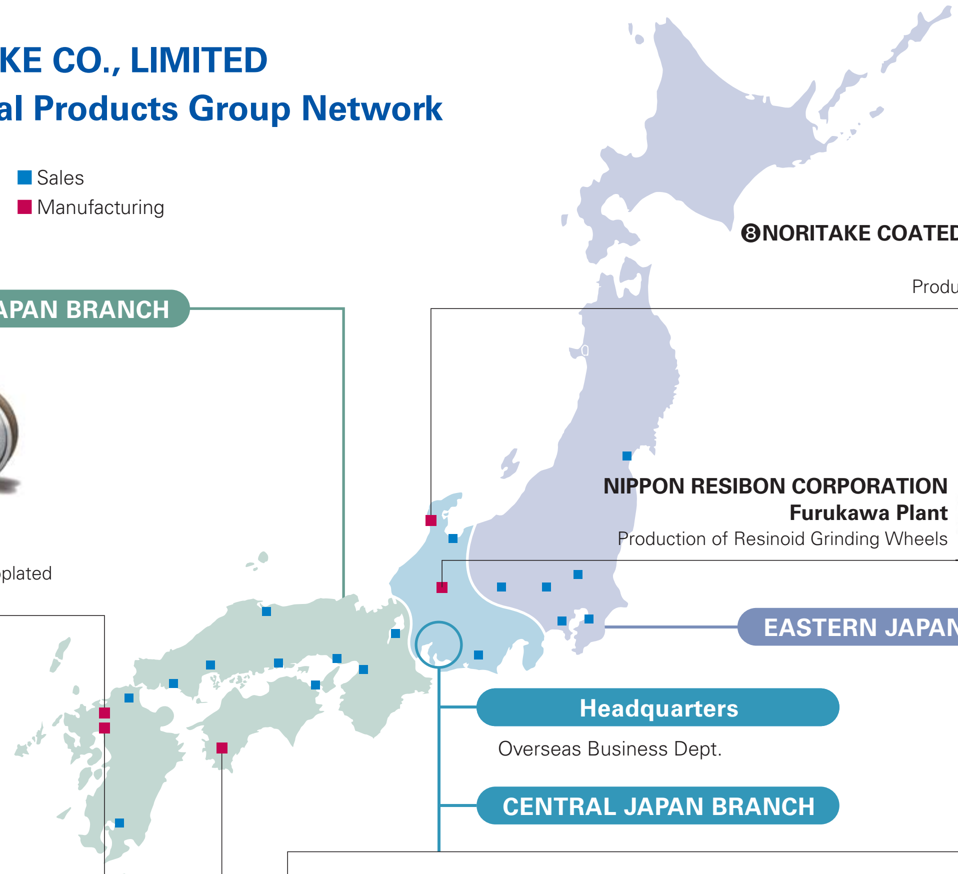
Your Password will be sent by e-mail



NORITAKE CO., LIMITED
Industrial Products Group Network

Domestic

■Sales
■Manufacturing



WESTERN JAPAN BRANCH

❺Yasu Plant
Production of Electroplated Wheels

❻Kurume Plant
Production of Diamond and CBN Tools

❼HIROSHIMA KENMA K.K.
Production of Resinoid Grinding Wheels

❽NORITAKE COATED ABRASIVE CO., LTD
Noto Plant
Production of Coated Abrasives

NIPPON RESIBON CORPORATION
Furukawa Plant
Production of Resinoid Grinding Wheels

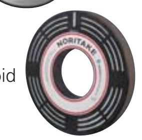
EASTERN JAPAN BRANCH

Headquarters
Overseas Business Dept.

CENTRAL JAPAN BRANCH

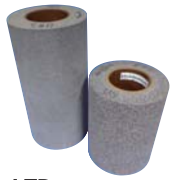
■❶ **Miyoshi Plant**
Production of Vitrified Grinding Wheels and Vitrified CBN Wheels

■❷ **Kamori Plant**
Production of Resinoid Grinding Wheels



■**NORITAKE RECYCLE CENTER CO., LIMITED**
Production of Recycled Grinding Wheels

■❸**NORITAKE COATED ABRASIVE CO., LTD**
Miyoshi Plant
Production of Coated Abrasives



■❹**TONO KENMA CO., LTD**
Production of Internal Grinding Wheels

■**Komaki Plant**
Test center

❶Miyoshi Plant

❷Kamori Plant

❸NORITAKE COATED ABRASIVE CO., LTD Miyoshi Plant

❹TONO KENMA CO., LTD

❺Yasu Plant

❻Kurume Plant

❼HIROSHIMA KENMA K.K.

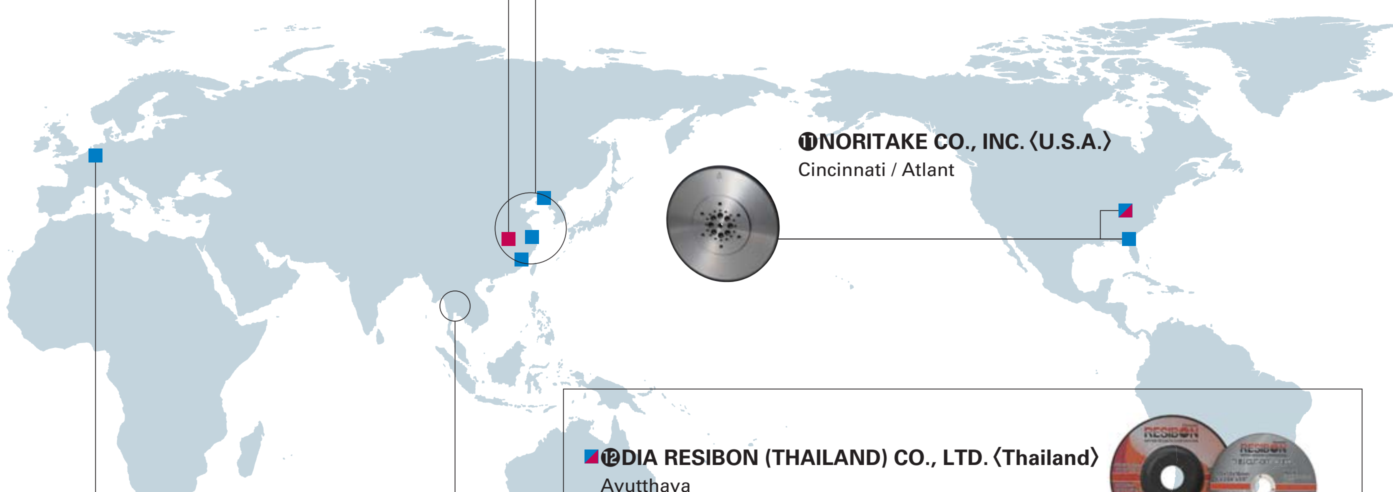
❽NORITAKE COATED ABRASIVE CO., LTD Noto Plant

ISO certification acquisition status

ISO9001:All NORITAKE Manufacturing Bases, All NORITAKE COATED ABRASIVE Manufacturing Bases, NIPPON RESIBON
ISO14001:NORITAKE Headquarters, All NORITAKE Manufacturing Bases, NORITAKE COATED ABRASIVE Headquarters, All NORITAKE COATED ABRASIVE Manufacturing Bases, HIROSHIMA KENMA K.K., NORITAKE RECYCLE CENTER, ZEN NORITAKE Headquarters

Global

■Sales
■Manufacturing
■Sales / Manufacturing



❾NORITAKE ABRASIVES (SUZHOU) CO., LTD.〈China〉
Suzhou
Production of Resinoid Grinding Wheels

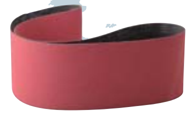
NORITAKE SHANGHAI TRADING CO., LTD.〈China〉
Shanghai / Guangzhou / Dalian

⓫NORITAKE CO., INC.〈U.S.A.〉
Cincinnati / Atlant

❿NORITAKE EUROPA GmbH〈Germany〉
Frankfurt

■**⓬DIA RESIBON (THAILAND) CO., LTD.〈Thailand〉**
Ayutthaya
Production of Resinoid Grinding Wheels

■**⓭SIAM COATED ABRASIVE CO., LTD.〈Thailand〉**
Rayong
Production of Coated Abrasives



■**⓮NORITAKE SA (THAILAND) CO., LTD.〈Thailand〉**
BANGKOK OFFICE
Production of Electroplated Wheels and CBN Tools

❾NORITAKE ABRASIVES (SUZHOU) CO., LTD.

❿NORITAKE EUROPA GmbH

⓫NORITAKE CO., INC.

⓬DIA RESIBON (THAILAND) CO., LTD.

⓭SIAM COATED ABRASIVE CO., LTD.

⓮NORITAKE SA (THAILAND) CO., LTD.

ISO certification acquisition status

ISO9001: NORITAKE SA (THAILAND), NORITAKE ABRASIVES (SUZHOU), SIAM COATED ABRASIVE, DIA RESIBON (THAILAND)
ISO14001: SIAM COATED ABRASIVE

NORITAKE CO., LIMITED

Grinding wheel, Dresser, Coolant

□Domestic Sales Locations

■**INDUSTRIAL PRODUCTS GROUP SALES DIVISION**
3-1-36 Noritake-Shinmachi, Nishi-Ku, Nagoya 451-8501 Japan
Tel +81-52-561-9833

■**EASTERN JAPAN BRANCH**
1-13-8 Toranomon, Minato-ku, Tokyo 105-8502 Japan
Tel +81-3-6205-4433

■**CENTRAL JAPAN BRANCH**
3-1-36 Noritake-Shinmachi, Nishi-Ku, Nagoya 451-8501 Japan
Tel +81-52-561-7226

■**WESTERN JAPAN BRANCH**
2-29 Minamisenrioka, Settsu, Osaka 566-0021 Japan
Tel +81-6-6319-1161

■**OVERSEAS SALES DEPT.**
3-1-36 Noritake-Shinmachi, Nishi-Ku, Nagoya 451-8501 Japan
Tel +81-52-561-9837

□Global Manufacturing and Sales Locations

■**NORITAKE CO., INC.**

Cincinnati Branch
4990 Alliance Dr., Mason, OH 45040, U.S.A.
Tel +1-513-234-0770

Atlanta Branch
490 Sun Valley Dr., Suite#102
Roswell, GA 30076, U.S.A.
Tel +1-770-518-8233

■**NORITAKE EUROPA GmbH.**
Kurhessenstrasse 3, D-64546
Mörfelden-Walldorf, Germany
Tel +49-61-05-2092-44

■**NORITAKE SHANGHAI TRADING CO., LTD.**

Shanghai Headquarter
Room 701 Aetna Tower No.107, Zun Yi Road,
Chang Ning District, Shanghai, 200051, China
Tel +86-21-6237-5667

Guangzhou Branch
2510 Goldlion Digital Network Centar, 138
Tiyu Road East, Guangzhou 510620, China
Tel +86-20-3877-2253

Dalian Branch
22K, International Finance Building,
No.15 Renmin Road Zhongshan
Dist Dalian 116001, China
Tel +86-411-825-06065

■**NORITAKE SA (THAILAND) CO., LTD.**

Bangkok Office
388 Amigo Tower, 17th Floor, Zone A/1, Siphraya Rord,
Mahapruetaram, Bangrak, Bangkok, 10500, Thailand
Tel +66-2-235-1688

Filtration

■**Fluid & Machine Technology Dept.**
Filtration System Section
3-1-36 Noritake-Shinmachi, Nishi-Ku, Nagoya 451-8501 Japan
Tel +81-52-561-4268

Website ▶

Contact us ▶

Distributed by

22060800SK