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CONTRACTOR

CRYSTON DIAMOND

Brief History of Cryston Diamond Industral Co., LTD.





Cryston Diamond Industrial Co., Ltd. was established in 1937 under the name of ASAHINA Grinding Works, the first Japanese company to succeed in the manufacture of Diamond Wheels.

Through our long history and fourty years' experience, Cryston has made a great contribution in the industries of super-hard tools and precision machinery.

Cryston has developed many new products and attained several patents over the years. Now our products are supplied not only to the domestic market but through-out the world.

'Industrial Diamond Review', has highly praised our products. our products.

With the remarkable development of modern industry, greater precision and more speed are required. In response to these demands, we at CRYSTON are expending every effort to constantly improve our products !

We welcome all requests and suggestions.

K. ODA President CRYSTON DIAMOND IND. CO., LTD.





Application :

7771-2

DIAMOND = Tungsten Carbide, ceramics, Glass, Optical Lenses, Quartz, Ferrites, Plastics, Stone, Sapphire, Silicon, Beryeliumoxide, other exotic materials. Combination grinding (Tung-

sten Carbide + Steel)

CBN=Cubic Boron Nitride

- Tool steel, Die steel
- Hardened carbon steel, Alloy steel
- Stainless steel
- Cast steel
- Super alloy (Alnico, Inconel)
- Others, medium hardness steel and iron, Forgings, Castings

2

Diamond & CBN Wheels Standard Shapes



3-

Standard Diamond & CBN Wheels for Various Grinders

Items marked with . indicate stock items

| CODE | MACHINE | TYPE | TYPE | | | SI | ZE | IN | mm | | | GRIZ SIZE | |
|---------|----------------------------|------|-------|-----|------|----------------|-----|-------|-----|----|-------|-----------|---------|
| NO. | MACHINE | NO. | TYPE | D | W | X ₁ | U | X_2 | Т | θ | Н | BOND | |
| SW01 | WAIDA DW-31S | 38 | 11A2C | 150 | 15 | 1.0 | | | 20 | | 36 | D280M | |
| SW02 | WAIDA DW-31S | 7 | 1A1H | 120 | | | | 1.7 | 3.5 | | 36 | D150M | |
| SW03 | WAIDA DW-31S | 44 | 11C9C | 150 | 12 | 1.0 | 2 | 1.5 | 20 | | 36 | D600M | |
| • SW06 | ITO DP-1 | 46 | 12C9C | 134 | 8 | 1.0 | 4 | 1.0 | 15 | | 33 | D220M | D220RDS |
| • SW07 | ITO DP-2 | 46 | 12C9C | 125 | 8 | 1.0 | 4 | 1.0 | 15 | | 33 | D220M | D220RDS |
| • SW09 | ITO DP-3N | 43 | 11C9 | 100 | 8 | 1.0 | 4 | 1.0 | 50 | | 31.75 | D220RDS | |
| • SW11 | 11DA GT-200A, GT-200U | 43 | 11C9 | 100 | 8 | 1.0 | 5 | 1.0 | 50 | 1 | 17 | D220RDS | |
| • SW12 | 11DA GT-200FR, G-3FR | 45 | 11C9B | 100 | 8 | 1.0 | 5 | 1.0 | 50 | | 17 | D220RDS | |
| • SW13 | 11DA G-3 | 45 | 11C9B | 100 | 5 | 1.0 | 4 | 1.5 | 13 | | 17 | D220RDS | |
| • SW14 | TOSHIBA TUNGALOY, TFG-200S | 46 | 12C9C | 125 | 8 | 1.0 | 3 | 1.0 | 15 | | 25 | D220RS | D600RS |
| • SW141 | ASAHI DIA-ACE SDG-3 | 39 | 12A2C | 125 | 8 | 1.0 | | | 15 | _ | 25 | D220RS | D600RS |
| • SW18 | GOMI MACHINE G-71 | 46 | 12C9C | 134 | 8 | 1.0 | 4 | 1.0 | 15 | _ | 31.75 | D220RDS | D220M |
| • SW19 | MAKINO C-40 | 34 | 11A2 | 125 | 10 | 1.5 | | | 30 | | 31.75 | D220RDS | |
| • SW20 | MAKINO YGR-25 | 34 | 11A2 | 100 | 5 | 2.0 | | | 30 | | 31.75 | D220RDS | |
| • SW26 | CITIZEN CG-7 | 47 | 9A3 | 150 | 7 | 1.0 | | | 25 | | 36 | D400RS | D600RS |
| • SW28 | ELECTRIC BENCH GRINDER | 49 | 3A2T | 70 | 12.5 | 0.5 | | | 30 | | 12.7 | D320RDS | |
| • SW30 | GRINDER : GU, GSR, GTL | 9 | 14A1 | 150 | | | 4 | 3 | 10 | | 31.75 | D200RDS | |
| • SW31 | GRINDER : GU, GSR, GTL | 6 | 1A1 | 150 | | | | 2 | 10 | | 31.75 | D200RDS | |
| SW32 | EX-CELL-O | 33 | 6A2 | 150 | 20 | 1.5 | | | 20 | | 31.75 | D220RS | |
| • SW24 | MATSUZAWA MZ-8 | 35 | 12A2 | 125 | 6 | 1.5 | | | 13 | | 16 | D500RS | |
| SW27 | SAKAZAKI SG-5 | 33 | 6A2 | 100 | 8 | 2 | | | 30 | | 14.5 | D320RDS | |
| SW33 | AGATHON | 47 | 9A3 | 175 | 6 | 2 | | | 35 | | 20 | D220RS | |
| SW34 | CITIZEN, TSUGAMI | 6 | 1A1 | 70 | | | | 3 | 6 | | 12 | D220RDS | |
| SW35 | HAUSER, TRIPET JIG GRINDER | 6 | 1A1 | 20 | | | | 3 | 6 | | 5 | * | |
| SW36 | EWAG, TSUGAMI | 34 | 11A2 | 75 | 3 | 4 | 0.0 | | 25 | | 20 | * | |
| SW37 | WICKMAN | 33 | 6A2 | 200 | 15 | 2 | | | 30 | | 31.75 | * | |
| SW38 | EWAG | 33 | 6A2 | 30 | 3 | 4 | | | 25 | | 6 | * | |
| SW39 | EWAG | 31 | 11V9 | 50 | | | 8 | 2 | 25 | 70 | 20 | * | |
| SW40 | MAKINO | 31 | 11V9 | 75 | | | 8 | 2 | 35 | 70 | 20 | * | |
| SW41 | TSUGAMI | 31 | 11V9 | 100 | | | 10 | 2 | 40 | 70 | 20 | * | |
| PG07 | OPTICAL PROJECTION | 14 | 11EE1 | 150 | | | 3 | 3 | 7 | 60 | 32 | * | |
| • PG01 | PROFILE GRINDER | 15 | 1V9 | 150 | 7 | 1.0 | | | | 15 | 32 | D200MVD | D360MVD |
| • PG011 | " | 16 | 1B9 | 150 | 7 | 1.0 | | | | 15 | 32 | D200MVD | D360MVD |
| • PG05 | WAIDA, WASINO, OKAMOTO | 16 | 1B9 | 75 | 5 | 1.0 | | | | 15 | 24 | D200MVD | D360MVD |

* Diamond/CBN, Grit Size and Bond must be specified.

How to Order

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To Handle your order properly the following information must be specified

- 1 TYPE . . Such as 1A1, 6A2
- 2 SIZE. . . Diameter, Thickness, Hole, Rim width,
- 3 BOND, GRIT SIZE, GRADE, Concentration and Depth of Diamond or CBN Section

(see marking system described on page 2)

- 4 Wet or dry grinding
- 5 Quantity
- 6 Material to be GROUND

When a special wheel is required, a detailed print or sketch should be sent with your order.

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Bond of CRYSTON Diamond & CBN Wheels

Since the efficiency of the Diamond & CBN Wheel is characterized by its bond, selection should be based upon use.

CRYSTON Diamond & CBN WHEELS are manufactured in various bonds by the most modern techniques available, backed up by many years of experience in industrial Diamond & CBN applications.

(A) Resinoid Bond

Especially suitable for finish grinding of hard materials. Generally recommended on tool and cutter grinders, cylindrical and surface grinders. It is the most popular Bond of today.

For wet or dry grinding

High Speed Steel + Tungsten Carbide Combination grinding

(B) Metal Bond (PF Bond)

Especially suitable for the grinding of edges, forms, and profiles as well as for rough and finish grinding of hard tools. Also used for cutting blades. For rough grinding and offhand, wet or dry grinding

(C) Vitrified Bond

Permits quick grinding and has a longer life than the resinoid bond. Is the bond used in CRYSTON's Blue-Coloured Hand Stone (Have). Generally used for offhand, wet grinding

(D) Electro-plated Bond

This holds Diamond & CBN abrasive tightly by means of the electroplating method. It is used for files, wheels for dental use, minute internal wheels, the thinnest saws and all kinds of wheels. Its practical sphere is extremely wide and provides fine, efficient wet or dry grinding.

CONCENTRATION

CRYSTON Diamond & CBN wheels are usually made in concentrations of 100, 75 and 50, For exceptional situations concentrations of 125 and 150 are also available. CRYSTON Diamond will be pleased to supply you with the necessary information, as to which Diamond & CBN concentration would be most suitable for your operation.

How to use CRYSTON Diamond & CBN Wheels

Please note the following points concerning use of Diamond & CBN wheels.

To obtain more efficient results :

- 1. The grinding machine should be vibration free.
- 2. Check flanges and spindle for burrs and cleanliness.
- Mount wheel and correct run-out by tapping lightly with a wooden block or true by dressing. Recheck with indicator before using. Maximum permissible run-out is 0.02 mm.
- 4. Diamond & CBN wheel efficiency is greatly increased through use of coolant. Coolant should always be directed to the point of contact of the Diamond or CBN wheel and work piece.
- 5. When dry grinding keep wheel and workpiece absolutely dry.
- 6. Avoid Excessive Feeds. Following conditions recommended for finish and wheel life:

Wheel Downfeed : $0.01 \sim 0.02 \text{ mm}$ Table Travel : $3 \sim 30 \text{ m/min}$ Crossfeed : $0.8 \sim 1.6 \text{ mm}$

- 7. Always keep a clean grinding wheel surface.
- 8. For daily dressing we recommend "CRYSTON Diamond Cleaner" (which protects the wheel) or a soft grade 220 mesh silicon carbide dressing stick.
- 9. The peripheral speed should be adjust as follows : --

| | R : Resinoid bond | V: Vitrified bond |
|------------------|--------------------------|------------------------|
| [1] Wet grinding | M : Metal bond (PF Bond) | P: Electro-plated bond |

| BOND | DIAMOND | CBN |
|---------|-----------------|-----------------|
| R | MAX 1,700 m/min | MAX 2,500 m/min |
| M. V. P | MAX 1,400 m/min | MAX 2,000 m/min |

- [2] Dry grinding the peripheral speed is 20 40% lower than above.
- 10. Grinding pressure should be kept as follows :

| Resinoid bond | under | 1kg/cm ² |
|--------------------|-------------|----------------------|
| Vitrified bond | under | 2kg/cm ² |
| Metal bond | under 3 | \sim 4kg/cm 2 |
| Electro-plated bor | nd — figure | e missing |



Standard Dimensions for ELECTRO-PLATED Diamond/CBN Tools.

An entirely new and original electro-plated method developed by our technical staff has been used for the Cryston electro-plated diamond tools. As a result surprising performance and life which have been unavailable with conventional electro-plating method, are now available.

Items marked with
indicate stock items

FILES (Diamond & Borazon)

| | Kinds | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | Total | Diamond |
|----------------|---------------|--|----------------------|-------|----------|----------------------|-------------------------|--------------|-----------------------|-------------------|----------------------------|----------------------------|----------------|-------------------------|--------|-------------------|
| | | Flat | Half- round | Round | Square | Tri- angular | Oval | | Flat point- ed end | Single bloated | Knife | Double Half-round | Bamboo leaf | Clam | length | Diamond length |
| Descriț | tion | 1-w-e T T | ₩J | Ū, | * | ₹ZĮ | тЮ | | | ₩Ţ | | ₩ T | | | | |
| Preci- sion | 12- | $\begin{array}{c} W & T \\ 5 \times 1 \end{array}$ | $W T 3.8 \times 1.5$ | 2.4 | W 2.2 | $W T 3.6 \times 3.1$ | $^{W}_{2.8 \times 2.2}$ | W T 4×1.5 | w т 5.5×1.0 | W T 3.6×1.4 | $\frac{W}{1.2 \times 4.3}$ | $\frac{W}{3.5 \times 1.8}$ | wт 4.5×1 | | 140 | 40 |
| Iron- work | | | 5.4×2.2 | 2.6 | 2.6 | 4×3.5 | 4×2.6 | 4.8×2.2 | 4×2 | 4.8×2.2 | 2×5.4 | 4.6×2.7 | | $^{W}_{4.6 \times 2.2}$ | 170 | 50 |
| Preci- sion | 10- pieces | | 4.7×1.8 | 2.8 | 2.5 | 3.8×3.3 | 3.5×2.3 | 4.8×1.8 | 6×1 | 5×1.7 | 1.6×5.5 | | | | 140 | 50 |
| Iron- work | set | | 7.4×2.6 | 3.5 | 3.0 | 6×5.2 | 6.4×4 | 8×2.6 | 7×7.3 | 7.5×2.5 | 2.5×8 | | | | 180 | 50 |
| Preci- sion | 8- pieces | | 5.5×2.0 | 3.2 | 2.8 | 4×3.5 | 4×2.6 | 5.3×2 | 6.5×1.4 | | | | | | 180 | 50&70 |
| I WORK | set | 8.6×3 | 9×3.2 | 4.5 | 4.2 | 7.2×6.2 | 7.2×4.8 | 8.8×3.2 | 8×3 | | | | | | 200 | 50@70 |
| Preci- sion | 5- pieces | 8.2×1.5 | 5.7×2 | 3.5 | 3.0 | 5.2×4.5 | | | | | | | | | 200 | 50&80 |
| Iron- work | set | 10.8×3.4 | 10×3.7 | 5.4 | 5.0 | 8.5×7.4 | | | | | | | | | 230 | 50 02 80 |

* Normal Diamond & CBN grit size is 200 Size in mm (approximate dimensions) 5 pieces No. 1 ~ No. 5 in a set are of inexpensive Cryston set. CBN and other types and dimensions are available upon order.



Internal wheel (Diamond · CBN)







Electro-plated Diamond/CBN Tools



♦ Various Electro-Plated Wheels

For wheel shapes, refer to the sketches on page 1.

Lens Centering wheels (lens, watch glass grinding)

Cryston lens centering wheels are well-known for their excellent cutting quality, long life and fine finished surface.



Instructions for operation

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- Set the wheel to ensuring that the abrasive face is free from vibration, which may be detrimental to both finish, precision and life. In particular, for internal, grinding vibration should be within 0.01 mm.
- 2. Due to sharp cutting quality, only slight grinding pressure

is required.

- 3. While dry grinding is possible, wet grinding will improve cutting quality and life.
- · For other special shapes, consult us.

DIA/CBN turning tools (Sintered Diamond & CBN) (Bite = Turning Tool)

♦ Diamond bites, having better abrasion-resistance and cutting quality than conventional cutting tools, are known for lack of built up edge. Fine finished surface is available next to that of natural diamond. Extremely effective for cutting of non-ferrous metal and non-metallic materials.

♦ CBN bites, having hardness next to diamond and high heat-resistance, have excellent life when cutting hard ferrous materials of hardness above 50 HRC. Especially suitable for hardenable alloy steel, tool steel, heatresisting steel and alloy.

(Shapes of DIA/CBN Bites) Items marked with eindicate stock items. A type straight tools (35 type) Relief angle Total lengt B type side blade (HT51 type) C type slant blade (37 type) D type side facing tools (33-0 type) Total length Cutting H Front cutting edge angle point Cuttin W position w W ABTE 8R-Rake angle Core heigh Shank width Side cutting edge angle Shank heigh Ĥ H 17 H 1 5 H F type boring (HT35 type) G type cutoff/grooing (43 type) H type helicoid (CDA type) E type internal (47 type) Cutting edge width W 00 W W Ĥ] H H \Box 1 type side facing blade tool (33 type) J type slant blade (37 type) K type insert (with hole, without hole) L type bozaLock 0 W W \oplus ⊕) H h M 11 ļ ļ Ĥ P type threading tools (HT15 type) M type internal grooving (HT60 type) N type flat blade/fit cutting O type fit cutting/chamfering (41 type) 1 W ŵ 1 Ŵ W te ļų Ĥ Ĥ Ĥ Q type inverted slant blade (HT53 type) R type slant blade (37 type) S type slant blade (31 type) **BNZ** insert whole surface W V Ŵ BRNG BSNG BTNG П Η Ĥ l H 7

* Right-handed wherever applicable

* Right-handed wherever applicable.

* As complex shapes other than these basic shapes are available, consult us.

Diamond turning tools (natural diamond)

♦ Diamond bites are used for precision cutting of soft metal or non-metallic materials. Depending upon the purpose, they

are capable of mirror or rainbow finish, with exceptionally high accuracy.



(Major cutting edge shapes)



Diamond Dressers

Quality diamond is especially selected and is sintermounted.

Selection of dresser is specified in accordance with kind of grinding wheel and work.



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Diamond Mesh Dressers

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(Diaform type)

Selected diamond grains are sintered by powerful metal bond. Suitable for all kinds of grinding wheel, such as GC, WA and C.

| R type | | No. | H | D | Х | D | L | Fine La 7 |
|--------------|--|-------|----|----|---|-------|-------|-----------------------|
| cylindrical | CDM 2 | M·O×2 | 1 | 8 | 7 | 11-12 | 50 | нр |
| shape) | GDIVI 2 | M·0×1 | (| 6 | 7 | 11-12 | 50 | |
| R type | | No. | Н | D | x | D | L | cu to d |
| cylindrical | 0014.0 | M·O×2 | 9 | .5 | 6 | 11.12 | 50 | |
| shape) | CDM 3 | M·O×1 | 9 | .5 | 3 | 11-12 | 50 | нр р |
| | the second s | | _ | | | | - | W |
| A type | | No. | l | W | X | 1 | D L | 1 +X+1+ 12 + |
| oblong | CDM 5 | M·O×2 | 13 | 6 | 6 | 11- | 12 50 | |
| shape) | CDM 5 | M·O×1 | 10 | 4 | 7 | 11- | 12 50 | |
| A type | | No. | 1 | W | X | θ | | 15" 7 W FX+11+ -12 -7 |
| oblong shape | | M·O×2 | 13 | 6 | 6 | | 12 50 | |
| opiond snape | CDM 7 | M·O×1 | 10 | - | - | | 12 50 | |

Diamond Wheels for turning tools (Bites)

These wheels have been developed for grinding of compax tools, with more than double, the grinding efficiency of conventional wheels. Capable of high speed grinding with precision cutting edge.



Conditions of work :

• Grit, bond :

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- Speed :
- Dressing :
- Cleaner • Wet grinding :
- Soluble (5-15%) Instructions for Grinding
- Set it to make sure it is free from vibration to be below 0.015 mm.

700-1200 M/min

for rough finish=200 RXC for finish=600 MVC

- Feed a sufficient amount of coolant.
- Use Cryston cleaner for dressing.
- Use rigid grinding machine

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Diamond Paste (Compound)

• Diamond paste is available in grease form. Unlike other abrasives, it is capable of precision and mirror finish in a very short period of time.

under

| | Code No. | Mesh(#)(converted value) | Micron (µ) | Application |
|---|----------|--------------------------|------------------|------------------------------------|
| • | C P 01 | = 15000 | $0 \sim 1$ (1) | for mirror |
| • | C P 02 | 10000 | $0 \sim 2$ (1.5) | finish |
| • | C P 03 | 8000 | 1/2~3 (2) | Super finish |
| • | C P 04 | 5000 | $2 \sim 4$ (3) | Super Imsn |
| • | C P 05 | 3000 | 4~8 (5) | Lich finish |
| • | C P 06 | 2000 | 6~12 (8) | High finish |
| ۰ | C P 07 | 1500 | 8~15 (10) | Medium finish |
| • | C P 08 | 1000 | 10~20 (16) | |
| • | C P 09 | 800 | 15~25 (20) | Modium outting |
| ۰ | C P 10 | 600 | 20~30 (28) | Medium cutting |
| • | C P 11 | 400 | 30~40 (37) | Lloous outling |
| | C P 12 | 320 | 40~60 (44) | Heavy cutting |

Also available below # 320 Above ones are for standard (Medium) Concentration. Other Concentrations and grades available on request.

Diamond Hand Stones (Pet name : Blue Hand Stones) (Hones)

♦ For edging and removal of burrs extensively used by manufacturers of carbide tools, dies, and precision jigs and tools.



• Each grain (# 180 ~ # 3000) available in stock.

| | Code No. | Type | L 1 | W | R | θ | X |
|---|----------|----------------|-----|-------|---|-----|---|
| • | H201 | Flat | 20 | 3, 5 | | | 1 |
| • | H 351 | Flat | 3 5 | 7 | | | 1 |
| • | H 401 | Flat | 4 0 | 5, 10 | | | 1 |
| | H402 | Half- round | 4 0 | 6 | 3 | | 1 |
| | H 403 | Triangle | 4 0 | 6 | | 60° | 1 |

PAT. 164570

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In use by almost all industries throughout World.

A large sales record has been established in the carbide and high speed steel, hob industries in the production of jigs tools, die, glass and ceramics.

| | Code No. | Application | Grain | Color of Handle |
|---|----------|---------------|-------|-----------------|
| • | NH24 | Rough finish | #240 | Red |
| • | NH32 | Medium finish | #320 | Blue |
| • | NH40 | Fine finish | #400 | Yellow |
| • | NH60 | High finish | #600 | Green |

Dry Cutting Wheels for Stone

Capable of the dry cutting (stone, concrete, tile, carbon, roof tile and ceramics).

(Separately available for extra hard ceramics, resin and glass)

| | Code No. | D | Т | х | н | |
|---|----------|-----|-----|---|---------------------------|----------------------|
| • | D R 01 | 100 | 1.3 | 3 | As per your specification | For Handiwork |
| • | D R 02 | 110 | 1.3 | 3 | As per your specification | For Handiwork |
| • | D R 03 | 125 | 1.3 | 3 | As per your specification | For deep grooving |
| • | D R 04 | 150 | 1.5 | 3 | As per your specification | For deep grooving |

• Subject to change without prior notice for technological Inovation. No reproduction shall be allowed without prior consent.

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Distributor

Size in mm



• Available in both 5g and economy size 10g.

Items marked with • indicate stock items.