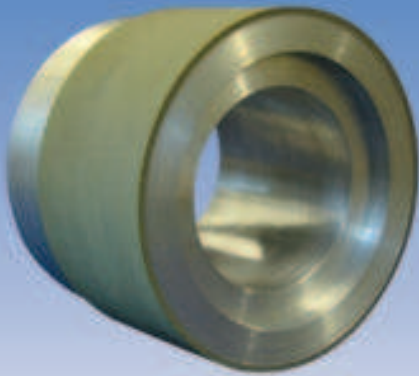


# Resin & Metal Bond Wheels for Grinding Hardmetal



# Range Offered

Wendt India manufactures and supplies the widest range of Diamond and CBN Wheels as per International Standards. When it comes to Complex grinding or tough to machine material, WENDT has always been the automatic Choice. Its technological superiority comes from its heritage and access to the latest technology.

## Bonds

The bond decisively influences both the grinding behavior and the service life of the grinding tool. Wheel performance and the economics of grinding depend largely on the selection of the right bond.

### The choice of Resin or Metal Bond depends on:

- Form holding properties / Free cutting
- Ability to stay sharp.
- Dry or Wet grinding.
- Shock absorbing, elasticity of Abrasive layer
- Heat resistance of Abrasive
- Oscillation grinding / Creep feed grinding
- Heat conductivity
- Conditions of the machine
- Shape and dimension of the tool
- Surface finish required
- Material to be ground



The bond must adhere to the grains as long as possible while simultaneously wearing in such a way that the tips of the abrasive grains can cut freely in the course of the metal removal process. This process is called the "self-sharpening effect". It results from the combined effect of the bond, grain size and concentration on the one hand, and bond wear caused by chip formation on the other hand.

The optimal bond is the one that offers the most cost-effective balance between the stock removal rate on the workpiece and the wear of the abrasive layer. In order to accomplish a wider variety of grinding tasks, a wide variety of bonds must be made available. Our engineers will help you select the right specification for your application.

## Resin Bond

Resin Bond is a very versatile type of bond. Its range of application covers more than half the machining tasks for which Diamond and CBN grinding tools can be used.

The outstanding features of a Resin Bond are that it enables large cutting volumes and ensures soft and cool grinding.

### Resin Bonds

| Diamond                                          | Standard Bonds           | CBN                                    |
|--------------------------------------------------|--------------------------|----------------------------------------|
| BXH                                              | Very Soft                | RXF                                    |
| BJ ; BXJ<br>BJ..D ; BXN<br>BJ...W                | Soft Grinding            | RXJ                                    |
| BN<br>BJ..D ; BXR<br>BN...W ; BXR...W            | Free Cutting, Stable     | RN...D<br>RN...W ; RXN<br>RN...S ; RXR |
| BN<br>BR...D<br>BR...W ; BXS<br>BR...S ; BXR...S | Wear Resistant           | RR...D<br>RR...W<br>RR...S ; RXS       |
| BY<br>BY...W ; BXY<br>BXY...S                    | Extremely Wear Resistant | RX...S                                 |

Pictorial view of Resin Bond Wheel abrasive section



- Bond
- Fillers
- Coated Diamond / CBN Grit

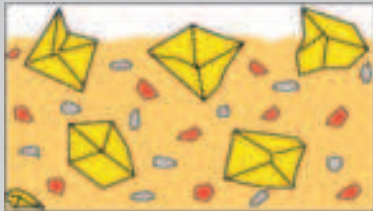
## Metal bond

Sintered metal bonds can be divided into four main groups:

**Bronze, Steel, Cobalt and Hybrid bonds.**

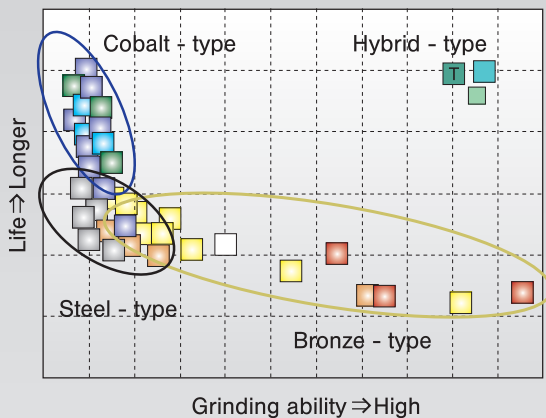
The higher mechanical stability and thermal load capacity of Sintered Metal Bonds gives them a greater resistance to wear than offered by Resin Bonds. This is utilized especially in connection with grinding tools for profile grinding and machining of materials which exhibit a strong abrading effect, such as glass, ceramics, ferrite etc.

Pictorial view of Metal Bond Wheel  
abrasive section



■ Bond ■ Fillers ■ Coated Diamond/CBN Grit

### Metal Bond System



### Sintered Metal Bonds

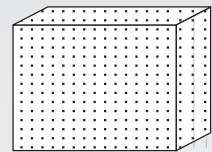
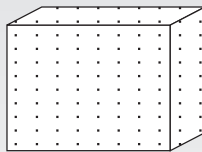
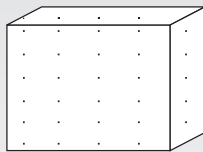
| Diamond                                                  | Standard Bonds           | CBN                         |
|----------------------------------------------------------|--------------------------|-----------------------------|
| MHJ...J                                                  | Extremely Soft           | SF...N                      |
| MJ ; MHJ...N                                             | Soft Grinding            | SJ...N                      |
| MHL...J<br>MHL...N<br>MHL...r                            | Soft Stable              | SML...N                     |
| MN...J ; MHN...J<br>MN...N ; MHN...N<br>MN...R ; MHN...R | Free Cutting, Stable     | SN...N ; SMN...N<br>SMN...R |
| MR...J ; MHR...J<br>MR...N ; MHR...N<br>MR...R ; MHR...R | Wear Resistant           | SR...N ; SMR...R            |
| MX...J<br>MX...N ; MHS...R<br>MX...R                     | Extremely Wear Resistant | SX...N ; SMX...N<br>SMX...R |
| MC...N ; MHC...N                                         | Profile Crushable        | SC...N ; SMC...N            |



## Concentration

1 carat = 0.2 grams

Concentration is defined as percentage weight of grinding grit per cubic unit of grinding layer. Internationally accepted standards for concentration are not available. However Wendt standards of concentration are provided below.



| Low                                |      | Medium |      | High |      |      |
|------------------------------------|------|--------|------|------|------|------|
| 25                                 | 38   | 50     | 75   | 100  | 125  | 150  |
| Carat/cm <sup>3</sup>              |      |        |      |      |      |      |
| 1,1                                | 1,65 | 2,2    | 3,3  | 4,4  | 5,5  | 6,6  |
| Volume-related concentration data: |      |        |      |      |      |      |
| V6                                 | V9   | V12    | V18  | V24  | V30  | V36  |
| V60                                | V90  | V120   | V180 | V240 | V300 | V360 |

# Resin & Metal Bond Wheels for Grinding Hardmetal

## Recommendations & guidelines for selection of concentration in relation to grinding forces

| Grinding factors | Area of contact between wheel and workpiece |            | Bond      |           | Profile and edge strength | Cutting efficiency<br>Soft Grinding |
|------------------|---------------------------------------------|------------|-----------|-----------|---------------------------|-------------------------------------|
|                  | Large<br>↓                                  | Small<br>↓ | Hard<br>↓ | Soft<br>↓ |                           |                                     |
| Concentration    | Low                                         | High       | High      | Low       | High                      | Low                                 |

## Surface Finish

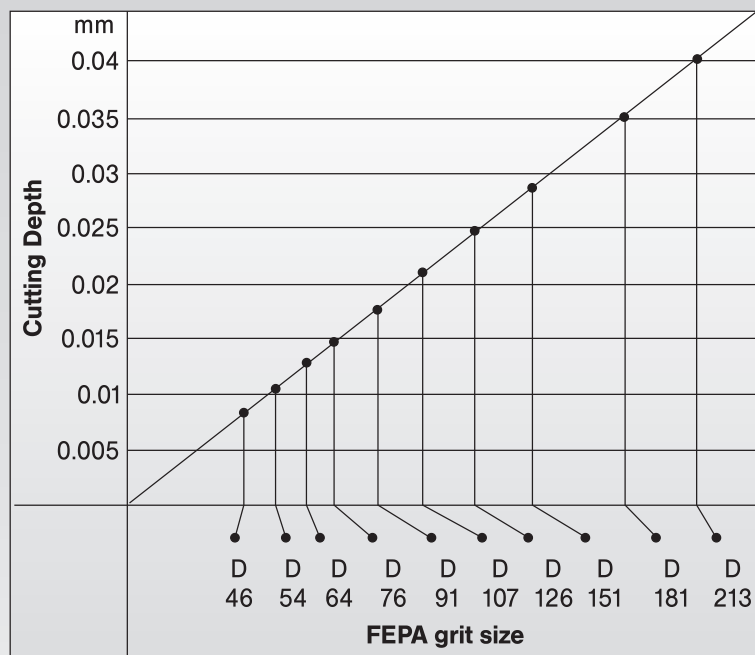
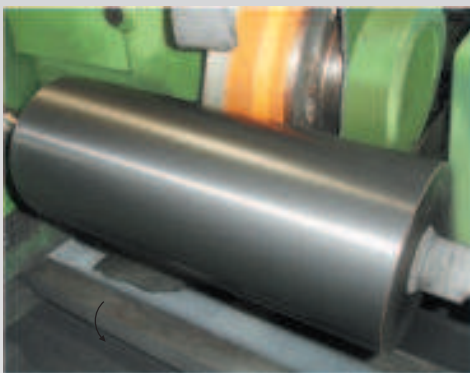
Three factors affect the choice of Abrasive grit :

- Quantity of material to be removed,
- Surface-finish and wheel life.
- Material removal and wheel-life

Depend on the adjustment when oscillation grinding, and (on pass and in-feed depth ) when plunge-grinding. A wheel used properly shows a grit penetration depth equal to  $1/5 - 1/8$  of the grit dimension. If the level of roughness needed is known, it is possible to choose the right grit using the following charts:

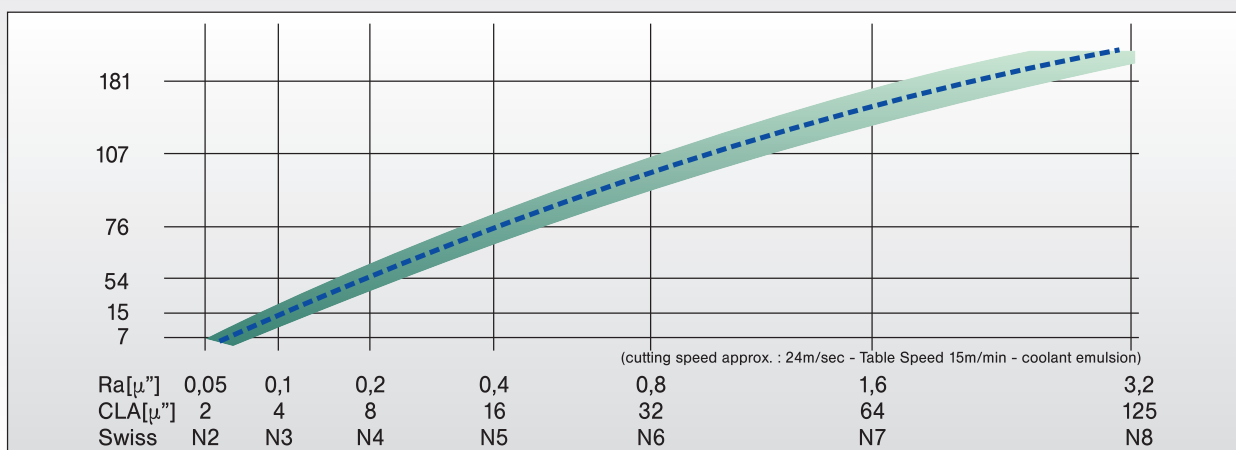
## Permissible Cutting Depth

For Oscillation Grinding



## Surface Finish Vs Grit Size

Selection Guideline for Grinding of Carbide and Ceramics



## Resin Bond Applications and Industries

Wendt offers Resin Bond Diamond/CBN Wheels conforming to FEPA standard from 5mm to 675mm diameter for Industries / Applications.

- Rotary Tools
- Cutting Tool Industries
- Printing and Paper Roll grinding
- Ceramic and Tile grinding
- Wood Working Tools
- Creep Feed grinding
- Notch and Slot grinding
- Tungsten Carbide Roll grinding
- Tool Resharpener/Restoring
- Optical Profile grinding
- Double Disc grinding
- Centreless grinding

Also on offer are customised Resin Bond Wheels for grinding precision components in Machine Tools, Aerospace, Defense, Watch and Die & Mould Industries.



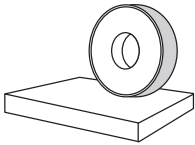
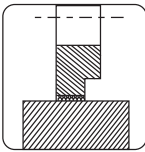
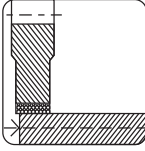
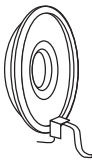
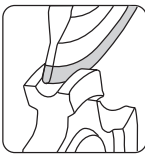
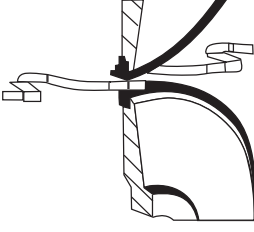
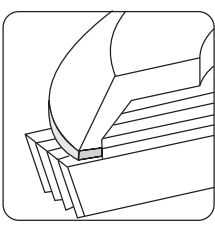
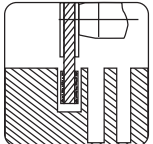
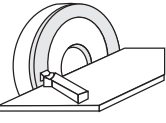
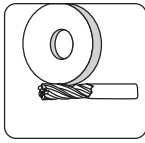
## Metal Bond Applications and Industries

Wendt offers Metal Bond Diamond/CBN Wheels conforming to FEPA Standard ranging from 6mm to 700mm in diameter for Industries / Applications.

- Ceramic and Refractory grinding
- Tile grinding
- TC Roll grinding
- Rotary Tools grinding
- Automotive and Construction Glass grinding
- Flute grinding
- Centreless grinding
- Wheel Dressing
- Concrete/RCC Core Drilling
- Precision Component Form grinding

In addition, we offer the most exclusive range of Metal Bond Diamond Wheels and Tools for customer specific critical applications.



| Wheels                                                                              | Wheel Shapes                                                                        | Geometric Representation                                                             | Components                                                                            |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|    |    |    |    |
| Wheels with Internal Cooling                                                        | TYPE 1A1                                                                            | Flat Surface Grinding                                                                | Ferrite Cores                                                                         |
|    |    |    |    |
| Cutoff Wheels                                                                       | TYPE 1V1                                                                            | Cylindrical Surface Grinding                                                         | Ceramic Rods, Cylinders                                                               |
|    |    |    |    |
| Wheels for Wood working Machines                                                    | TYPE 12A2                                                                           | Profile Grinding                                                                     | Profiled Jobs – ground on OPG                                                         |
|   |   |   |   |
| 675 ø Cup Wheel for Ceramic Grinding                                                | TYPE 3A9                                                                            | Face Grinding                                                                        | Carbide Inserts                                                                       |
|  |  |  |  |
| Double Cup Gundrill Reshaping Wheels                                                | TYPE 11A2                                                                           | One-pass Groove Grinding                                                             | Piston Rings                                                                          |
|  |  |  |  |
| 450 X 400 Centreless Wheel                                                          | TYPE 6A2                                                                            | Centerless Grinding                                                                  | Carbide Rods                                                                          |
|  |  |  |  |
| Hybrid Wheels for Carbide Endmills and Drills                                       | TYPE 15V9                                                                           | Flute Grinding                                                                       | Carbide / HSS Drills Tools                                                            |

Since continuous improvements are made, specifications are subject to change without notice.

## บริษัท ทูลส์ คีน จำกัด

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