

# INTER-DIAMENT®

**Folder**

High efficient grinding wheels  
for resharpening of  
**PCD** & **PCBN** inserts



polycrystal line

## What is the PCD & PCBN?

**PCD** (polycrystalline diamond) is a superhard synthetic material used for cutting tools production. It is composed of micron size very hard diamond grains. These grains are bound by metal bond and placed on sintered carbide base. Thanks to that composition, it is possible to get a material with excellent properties, which is broadly used in machining.

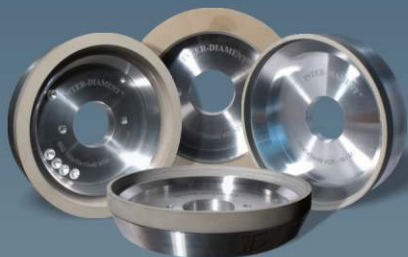
PCD is mainly applied to the machining of the following materials: ceramics, laminates, wood, plastics, rubber, aluminium and copper.

**PCBN** (polycrystalline CBN) is a synthetic tool material made similarly as PCD. The difference is that instead of diamond grains the CBN (cubic boron nitride) grains are used.

PCBN is mainly applied to the machining of the following materials: tool steels, high-speed steels and high alloy steels.

## The advantages of polycrystal line grinding wheels

- ◆ high quality of PCD & PCBN insert edges after sharpening;
- ◆ short grinding time;
- ◆ long tool life;
- ◆ high efficiency and accuracy of sharpening;
- ◆ remarkable decreasing of unitary grinding costs;
- ◆ cool grinding.



## How to sharpen the tools with PCD & PCBN inserts?

Tools with PCD&PCBN inserts are very retentive, but demand an occasional sharpening.

In comparison with conventional tool materials, the sharpening of PCD&PCBN tools requires another approach in scope of grinding methods and grinding wheels characteristics.

The sharpening of polycrystalline tools is a very challenging task both for users and for wheel manufacturers.

To ensure the proper condition of PCD&PCBN sharpening process the following factors are indispensable:

- high precision grinding machine with stiff construction and vibration dampening system which can guarantee high precision grinding, demanded during sharpening of PCD & PCBN inserts;
- specially designed grinding wheels appropriate for high efficient and precision machining, which assures getting an excellent blade edge quality.

## What grinding wheels to use?

**INTER-DIAMENT**<sup>®</sup> company by use of special vitrified bonds has created a high efficient diamond wheels **polycrystal line** suitable for sharpening tools with PCD&PCBN inserts.

Thanks to modern technology, these grinding wheels have met the application in

extremely accurate and efficient sharpening processes of PCD&PCBN tools, which are progressively wide spreading in advanced manufacturing techniques in many branches of industry.

## How to choose a proper wheel?

The most important criterion of wheel selection is required surface quality of sharpened blade. In grinding wheels for sharpening PCD&PCBN inserts the four grain sizes are used:

Other wheel parameters (grain concentration, its hardness and structure) are chosen individually for each user in dependence on machining type, used grinder and properties of sharpened tool.

### Grain size selection

Grain size	Machining type	Application
<b>D22</b>	<b>rough</b>	Regenerative grinding a blade edge profiling and sharpening of much worn inserts.
<b>D15</b>	<b>universal</b>	Standard grain size – there is a possibility of getting a high sharpening efficiency and good quality machined surfaces by take advantage of additional spark-out passes.
<b>D9</b>	<b>finish</b>	Finishing grinding – getting a very good quality of machined surfaces.
<b>D6</b>	<b>superfinish</b>	Superfinish grinding – getting a brilliant quality of machined surfaces.

## How to set the machining parameters?

During PCD & PCBN inserts sharpening one should pay a particular attention to the proper selection of machining parameters.

Diamond grinding wheel, even made with the most advanced technology, never be efficient if its working conditions or machining parameters will be improper.

### Machining parameters selection

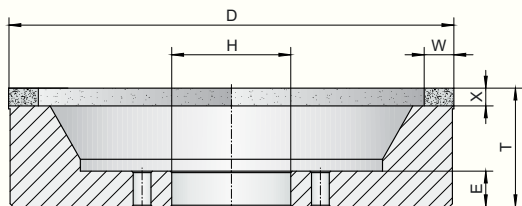
<b>Grinding velocity</b>	20 m/s – recommended 15÷30 m/s – acceptable*
<b>Allowance</b>	rough grinding: 0,02÷0,05 mm / pass standard grinding: 0,01÷0,025 mm / pass finish grinding: 0,005÷0,01 mm / pass
<b>Oscillation frequency</b>	60 1/min – recommended 50÷120 1/min – acceptable
<b>Number of sparking out passes</b>	3÷8
<b>Recommended abrasive stick</b>	Aluminium oxide abrasive stick 5410 - 20x10x100 99A 320 J7V
<b>Coolant</b>	Water-oil emulsion 3÷5%
<b>Remarks</b>	Infeed of grinding wheel must be done <b>always</b> out of machining zone.

\* If the wheel seems to be too hard, one should decrease the grinding velocity to 15÷18 m/s and to dress the wheel more frequently. If the wheel is wearing out too fast one should increase the grinding velocity to 22÷30 m/s.

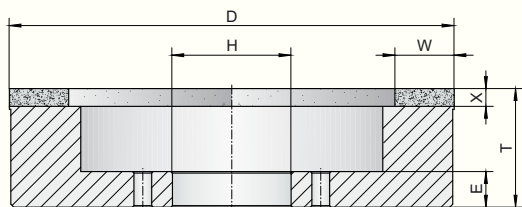
Wheel type

## 6A2 VCM

version  $W \leq 15$  mm



version  $W = 20$  mm



### Wheel dimensions

D	W	X	T	E	H
30	3	5	25	8	on request
50	3•5	5	25	10	
75	3•5•10	5	25	10	
80	3•5•10	5	25	10	
100	3•6•10•15	5	25	10	
125	3	5	25•40	12	
	5•6•10•15•20	5•10	25•40	12	
150	3•4•5•6•8•10•15•20	5•6•10	40	12	
200	4•5•6•10•15•20	5•8	57	13	
250	4•6	5•8	70	15	
	10•15•20	6•10	70	15	

### Wheel parameters

Grain size

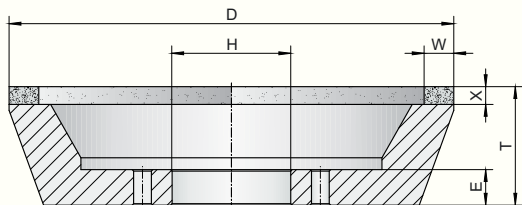
D6 • D9 • D15 • D22

### Order example

D W X H  
**6A2 150x5x10x40 VCM D15**  
**6A2 250x6 x 8 x 40 VCM D9**

Wheel type

## 11A2 VCM



### Wheel dimensions

D	W	X	T	E	H
30	3	5	25	8	on request
50	3•5	5	25	10	
75	3•5•10	5	25	10	
80	3•5•10	5	25	10	
100	3•6•10•15	5	25	10	
125	3	5	25•40	12	
	5•6•10•15•20	5•10	25•40	12	
150	3•4•5•6•8•10•15•20	5•6•10	40	12	
200	4•5•6•10•15•20	5•8	57	13	
250	4•6	5•8	70	15	
	10•15•20	6•10	70	15	

### Wheel parameters

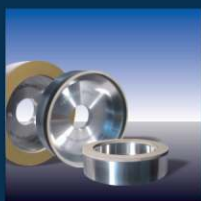
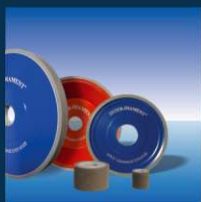
Grain size

D6 • D9 • D15 • D22

### Order example

D W X H  
**11A2 150x5x10x40 VCM D15**  
**11A2 250x6 x 8 x 40 VCM D9**

# INTER-DIAMENT<sup>®</sup>



## offers:

- vitrified bonded aluminium oxide and silicon carbide wheels;
- vitrified bonded CBN wheels;
- resin bonded diamond and CBN wheels;
- electroplated diamond and CBN wheels;
- grinding wheels for PCD & PCBN inserts;
- composite plates for machining;
- diamond dressers.



ISO 9001:2000

lista certyfikowanych właściwości  
dostępna na [www.sgs.com](http://www.sgs.com)

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