

# RESIN BONDED GRINDING TOOLS with CBN and diamond

*SWATY COMET*



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## TROUBLESHOOTING

The table below lists the most common problems which may occur during grinding; these are mostly related to the selection of the grinding tool. In some cases, these problems can be eliminated only by using a different superabrasive tool (metal bonded, vitrified bonded), grinding procedure or machine..

PROBLEM	GRIT TYPE	GRIT SIZE	BOND HARDNESS	CONCENTRATION	PERIPHERAL SPEED	SPECIFIC REMOVAL
Poor cutting capacity	D CBN	↑↑	↓↓	↑↑	↓↓	↓↓
Excessive wear of abrasive layer	D CBN		↑↑	↑↑	↓↓	↓↓
Too coarse workpiece surface	D CBN	↓↓	↓↓	↓↓		↓↓
Overheating of the workpiece	D CBN		↓↓	↓↓		↓↓
Overheating of the grinding tool	D CBN	↑↑	↓↓	↓↓	↓↓	↓↓
Unstable grinding tool edge/profile	D CBN		↑↑	↑↑	↓↓	

↑↑ Select a tool with a higher value/Increase

↓↓ Select a tool with a lower value/Decreases

Above recommendations should be used merely as general guidelines. For concrete problems, please consult COMET's technical service department and provide as much information on the procedure, machine, tool application and the workpiece as possible (see Grinding Report, page. 23). It can be seen from the table that in most cases opposite applies to the recommended peripheral speeds for diamond grinding tools than for CBN grinding tools. This is because in boundary cases the recommended speeds for diamond tools are significantly lower than those for CBN tools. Cooling or increasing the amount of coolant fed to the grinding site usually helps resolve all of the above problems. Tool dressing is also helpful, but should not be done too frequently as it increases the wear of the abrasive layer.

## INCORRECT HANDLING

**DON'T** ever handle the grinding tools roughly.

**DON'T** ever store the grinding tools in a humid environment or at extreme temperatures.

**DON'T** ever use a grinding tool without first checking its intended application.

**DON'T** ever use a damaged or incorrectly used grinding tool.

**DON'T** ever mount a damaged grinding tool.

**DON'T** use mounting flanges that are inappropriate, damaged, dirty or worn out.

**DON'T** tighten the mounting flange excessively, as this could damage it.

**DON'T** ne prekoračite pri delu maksimalne dovoljene delovne obodne hitrosti!

**DON'T** ever grind without using a safety guard, which must cover at least one half of the grinding tool.

**DON'T** ever use a machine not in good mechanical condition or not maintained regularly.

**DON'T** apply excessive pressure to grinding tools, as this may slow down the machine.

**DON'T** ever use a machine without an appropriate dust removal system.

**DON'T** apply side pressure to thin grinding wheels.

**DON'T** stop the grinding tool after use by applying pressure to the tool edge or side. Always switch the machine off and allow the tool to stop revolving.

**DON'T** use a machine in a position where you do not have full control of the machine.

## CORRECT HANDLING

**DO** always handle the grinding tools with extreme caution, especially those which have already been used.

### STORAGE

**DO** always protect the grinding tools from mechanical damage and adverse environmental influences during storage.

### TOOL SELECTION

**DO** always follow the information on the label or tool when selecting a grinding tool, as well as information on limitations of use from the catalogue. **DO** always request additional information from the manufacturer or supplier when in doubt concerning wheel selection.

### VISUAL INSPECTION

**DO** always visually inspect grinding tools before mounting and eliminate damaged ones.

### MOUNTING

**DO** always mount the grinding tool onto the machine in accordance with the tool and machine manufacturers' instructions.

**DO** always use the original tools supplied by the machine manufacturer to change the grinding tool.

**DO** always use the correct mounting flanges for grinding tool and check that they are undamaged and free of burrs.

**DO** always check to see that the workpiece is firmly secured before beginning grinding.

**DO** always run newly mounted grinding tools at maximum operating speed first, then reduce rpms to operating speed and allow the tool to run for at least 60 seconds before you may begin grinding.

### FURTHER SAFETY PRECAUTIONS

**DO** always install a safety guard on the machine before grinding.

**DO** regularly check the operating speed of the machine, and ALWAYS after maintenance and repairs.

**DO** always check the driving belt tension to achieve optimum power transmission.

**DO** always wear personal protective gear, depending on the machine type and application: protective wear for eyes and face, protective footwear, gloves, ear protection, respiratory protection (face masks), and other safety gear.

**DO** always use the grinding tools for the applications they were designed for.

**DO** always place the machine in an appropriate place, where there is no possibility of mechanical damage.

**DO** always keep the workplace orderly, to prevent slips or falls during grinding operations.

# DIACOM Pro HIGHLY DURABLE GRINDING TOOLS

Compared to standard bakelite grinding wheels, highly durable grinding wheels DIACOM Pro have a greater temperature stability, better thermal conductivity and higher tensile and bending strength. They are suitable for demanding grinding applications, in case of extensive material removal and consequently large thermal and mechanical loads on the grinding tool.

Highly durable DIACOM Pro grinding wheels have become established primarily in the field of CNC tool grinding, where grinding tools with improved properties are required due to ever harder worked materials and increasingly more difficult grinding conditions, as well as constant demands for greater productivity.

GRINDING TYPE	QUALITY	APPLICATIONS
Bakelite	Soft elastic resin bond	For lower material removal rates and sharpening
Polyimide	Hard elastic resin bond	For new products with large material removal rates
Polyimide porous	Hard elastic resin bond with pores	For new products with very large material removal rates
Vitrified-bonded	Hard and brittle bond	For new products with very large material removal rates and possibility of profiling

**NEW**

**Porous structure,  
copper core**  
Grinding wheels for less  
WORKPIECE HEATING!

The advantages of **DIACOM Pro** highly durable grinding wheels compared to standard grinding wheels include:

- **temperature stability,**
- **wear resistance,**
- **better productivity,**
- **stronger bond matrix,**
- **better grit retention.**





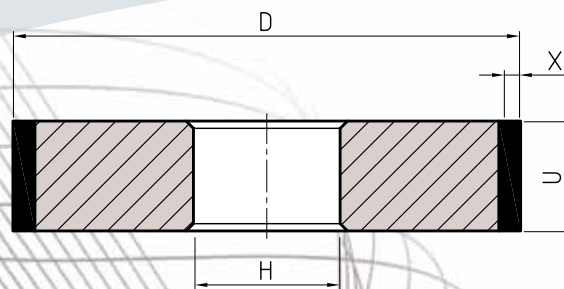


## EXTRA-THICK GRINDING WHEELS 1A1

These grinding wheels are distinguished by a uniform abrasive layer which is composed of several wavy, interconnected segments. The main advantage of wavy contact surfaces between the segments is an improved surface quality of the workpiece.

This type of grinding wheels is suitable for type 1A1 wheels with diameters between 300 and 500 mm.

**NEW**



U = from 30 to 100 mm

Wavy contact surfaces  
between individual  
segments!

EXTRA-THICK grinding wheels are intended for:

- surface grinding with the side of the wheel
- external cylindrical grinding
- centerless grinding



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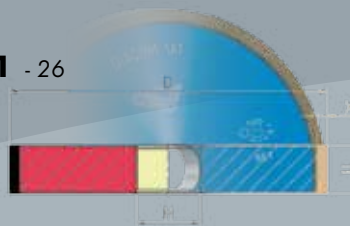






## GRINDING TOOL TYPES

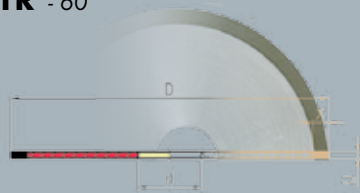
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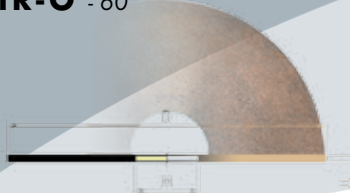
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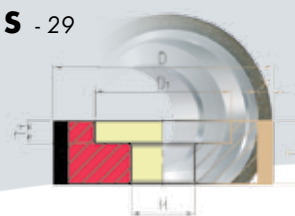
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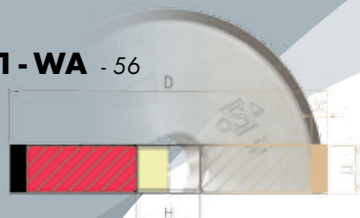
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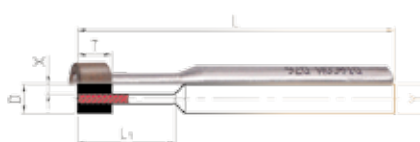
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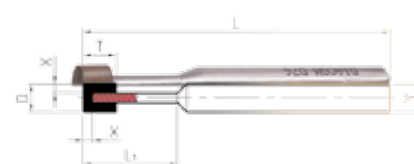
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**1A1W** - 28



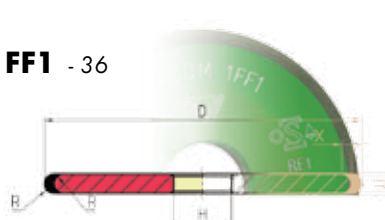
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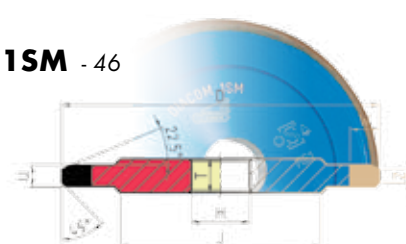
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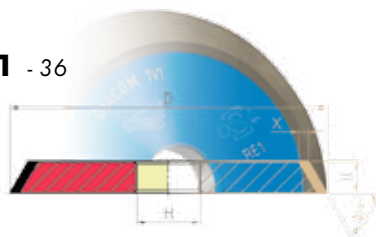
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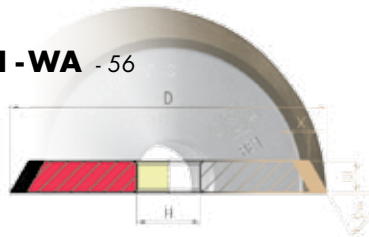
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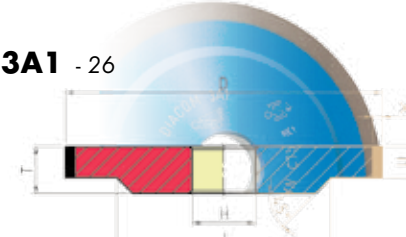
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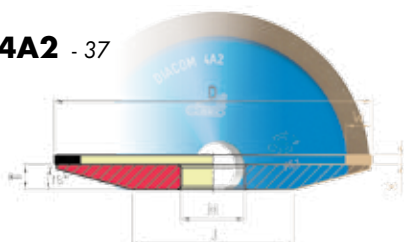
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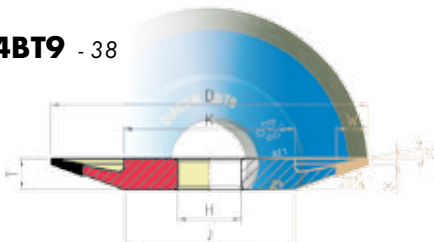
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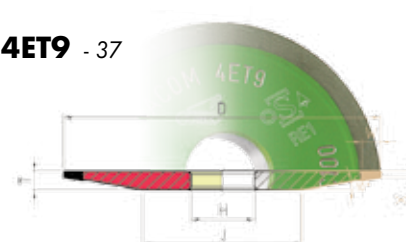
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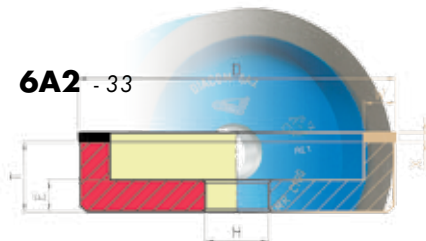
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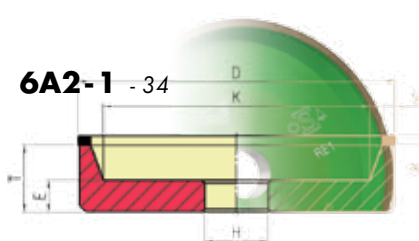
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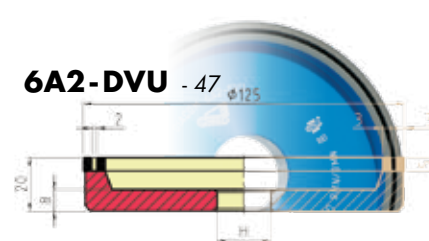
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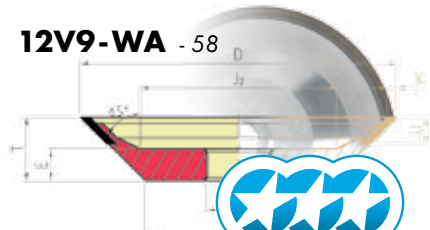
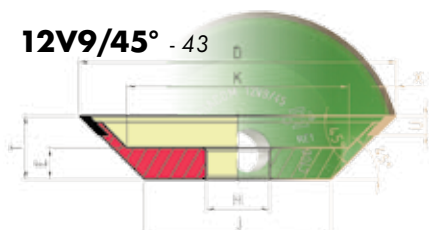
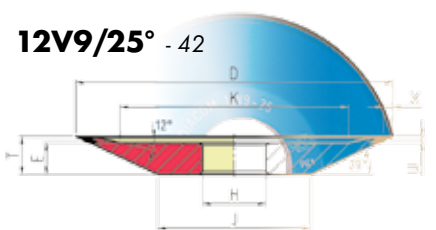
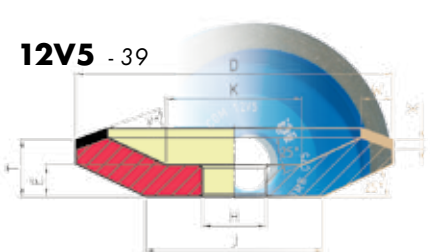
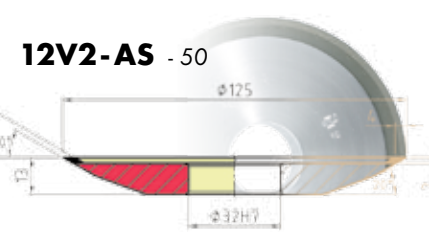
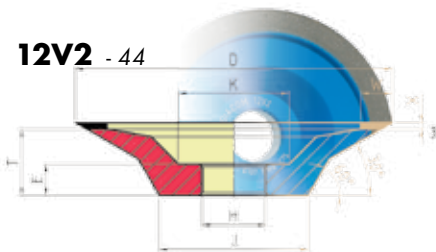
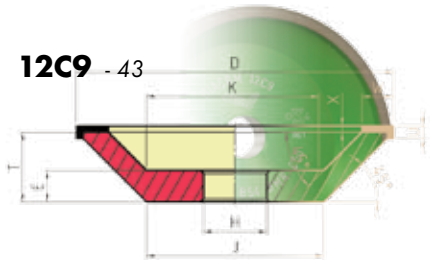
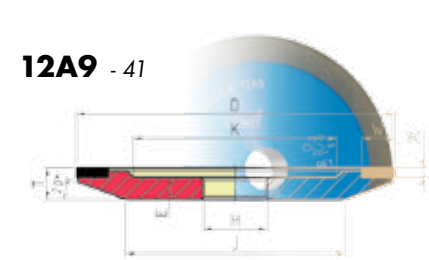
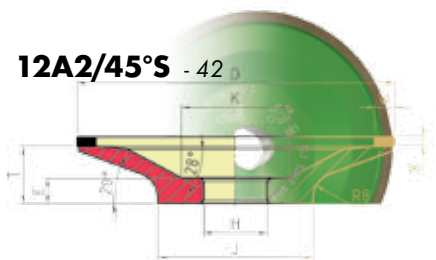
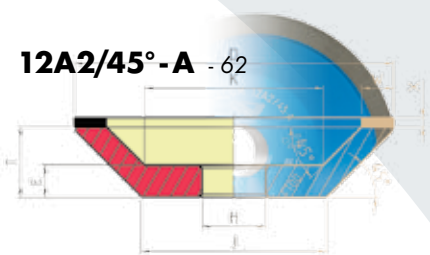
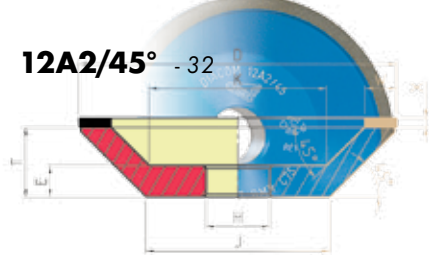
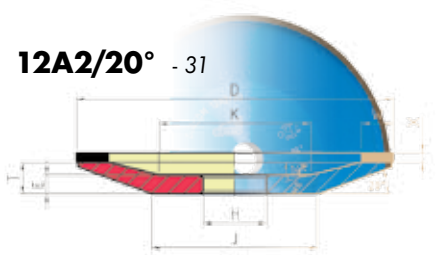
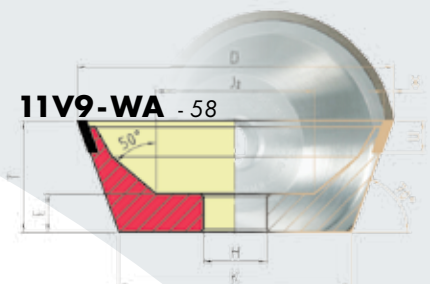
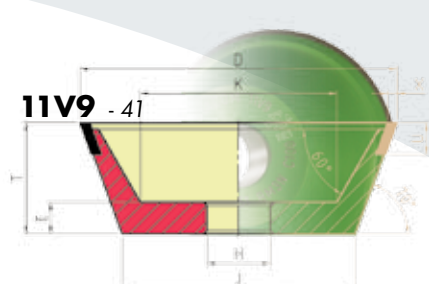
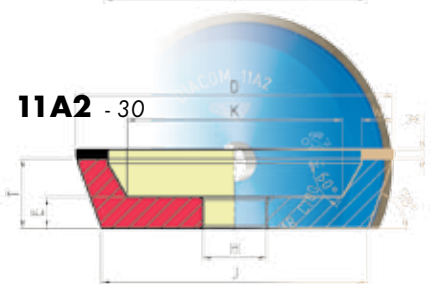
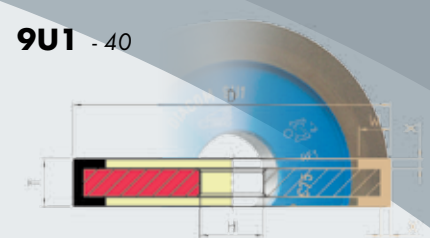
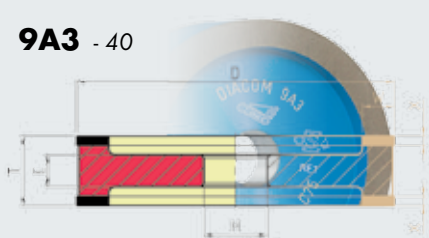
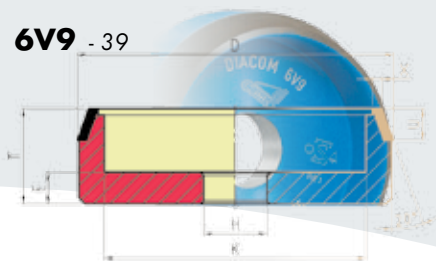
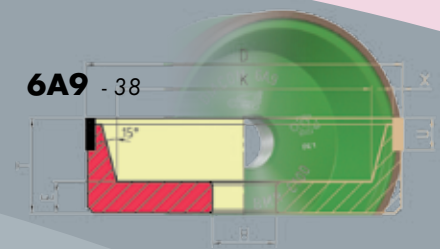
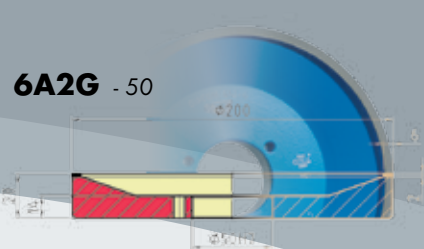
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## GRINDING TOOL TYPES

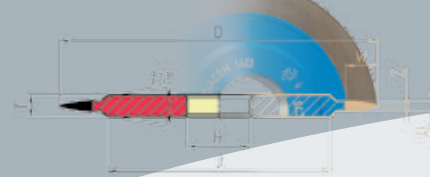
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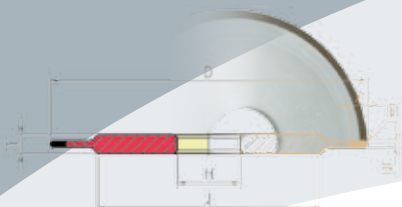
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**14EE1 - 54**



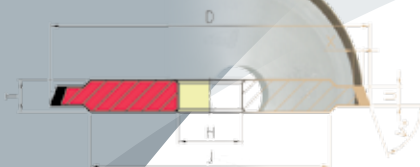
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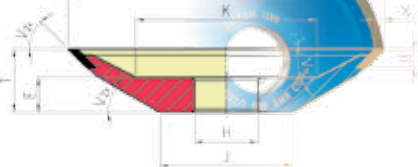
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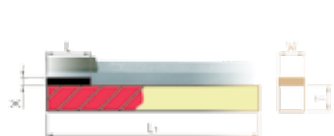
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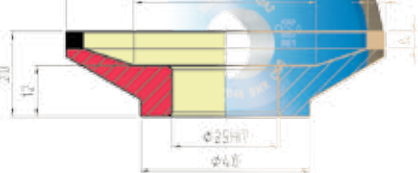
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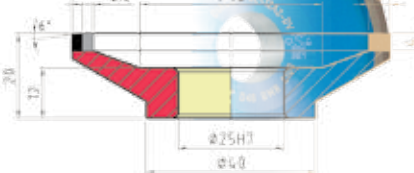
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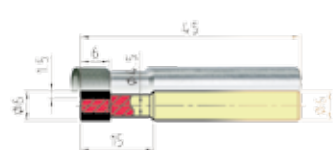
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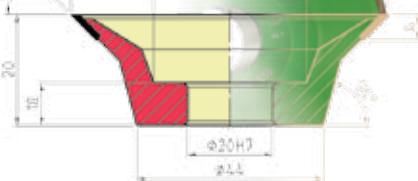
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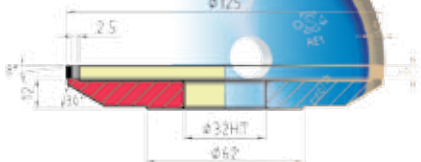
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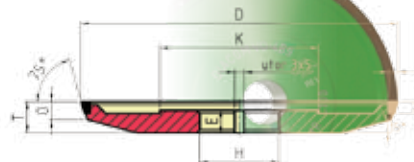
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**VB-12B9 - 49**



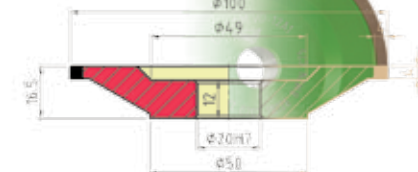
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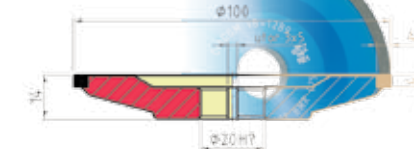
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**VD-12B9 - 49**





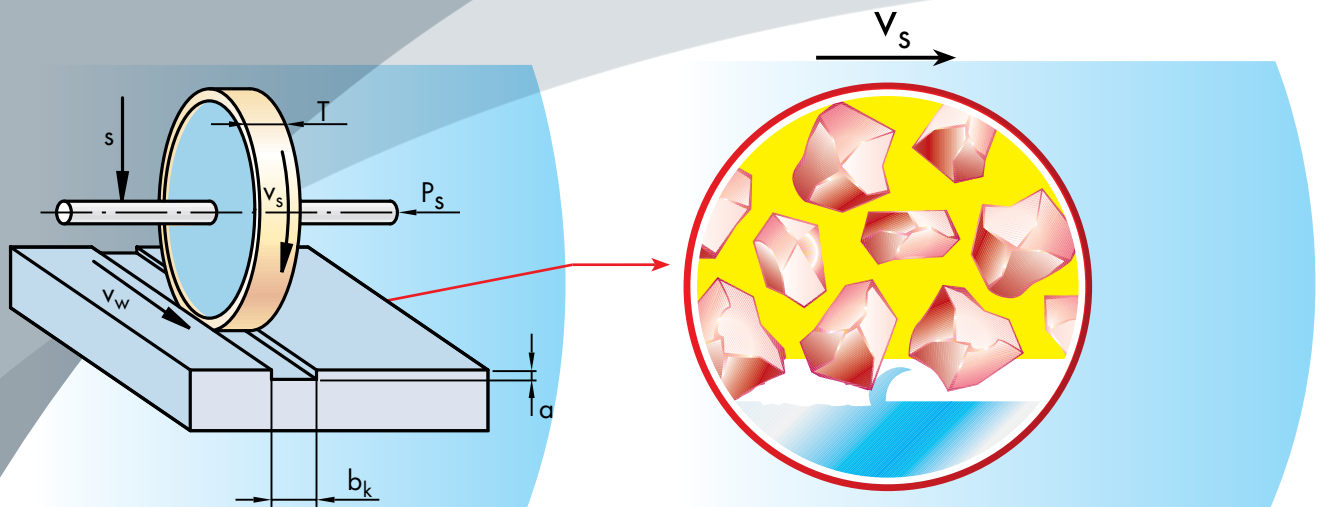




## GRINDING AND GENERAL INFORMATION

Grinding with superabrasives is a procedure in which the cutting part of the abrasives consists of a large number of non-uniformly distributed cutting edges. These cutting edges are formed using superabrasive grit. Superabrasive particles are bonded into the abrasive ring of the grinding tool together with certain fillers using phenol-formaldehyde or polyimide resin. The abrasive ring on the grinding tool core, which provides appropriate strength and rigidity, reduces vibrations and the heat.

### Basic grinding parameters



- $v_s$  - peripheral speed, which depends on the rpm and grinding tool diameter (m/s)
- $D$  - grinding tool diameter (mm)
- $n$  - axle rpm (min<sup>-1</sup>)
- $P_s$  - power
- $a$  - feed rate (mm)
- $v_w$  - workpiece speed (mm/min)

$$v_s = \frac{\pi \times D \times n}{60000}$$

The parameters depend on certain specifics of the grinding procedure (creep-feed, centerless, surface grinding).

- $G$  - the grinding factor represents efficiency; it is the ratio of the volume of the ground-away workpiece material to the volume of the abrasive consumed. One should always strive to attain the maximum value of the grinding factor. In precision grinding with superabrasives, the volume of abrasive wear consists of the volume of wear during grinding and volume of wear during dressing.

- $V_w$  - volume of removed material (mm<sup>3</sup>)
- $V_s$  - volume of consumed abrasive (mm<sup>3</sup>)

$$G = \frac{V_w}{V_s}$$

Specific material removal rate is defined as:

- $t_c$  - contact time (s)
- $b_k$  - width of contact surface (mm)
- $Q_w$  - ground-off material per time unit ( $\frac{\text{mm}^3}{\text{s}}$ )

$$Q_w' = \frac{V_w}{(t_c b_k)} = \frac{Q_w}{b_k} \left( \frac{\text{mm}^3}{\text{s}} \frac{1}{\text{mm}} \right)$$



## Basic grinding factors

- workpiece; material, shape, hardness
- type of grinding
- grinding parameters;  $v_s$ ,  $d$ ,  $Q_w$
- grinding tool; appropriate shape and core, appropriately selected components of the abrasive ring
- dressing of the grinding tool
- cooling and lubrication
- type and condition of the grinding machine

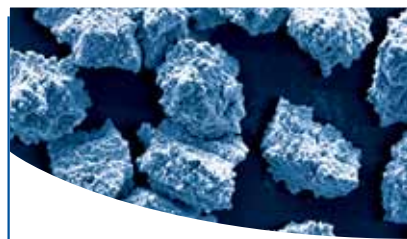
The efficiency and cost-efficiency of grinding with superabrasive grit are affected by all of the above factors. This catalogue focuses primarily on the correct selection of grinding tools, as well as on the interactions and our recommendations regarding other factors..

## Superabrasive grit

Various types of CBN and diamond grits are used as superabrasives in grinding tools. Some samples are shown on the pictures below.



Diamond grit UNCOATED

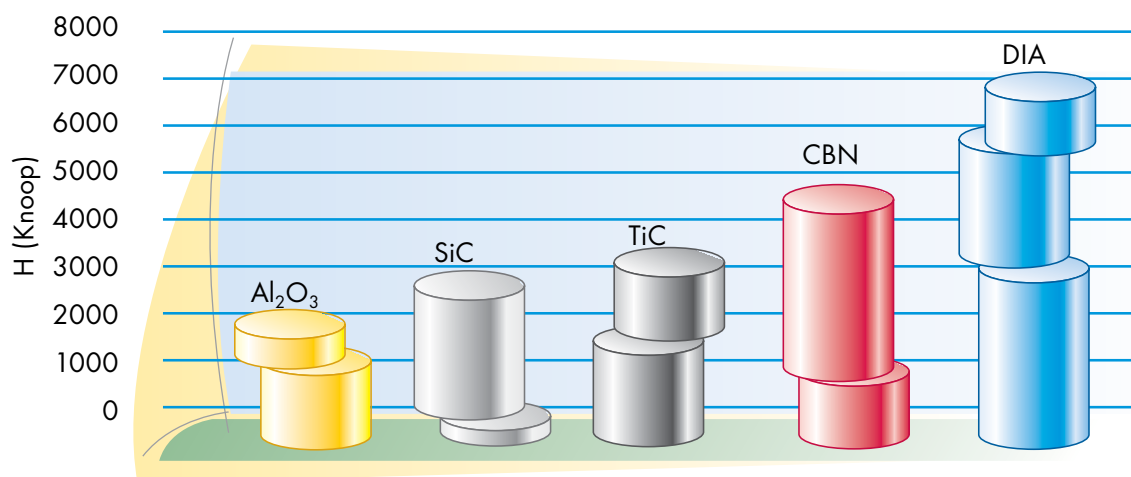


Diamond grit COATED



CBN grit UNCOATED

In comparison with standard abrasives (aluminum oxide, silicon carbide), CBN and diamond grits are distinguished by greater hardness (H), wear resistance and thermal conductivity.



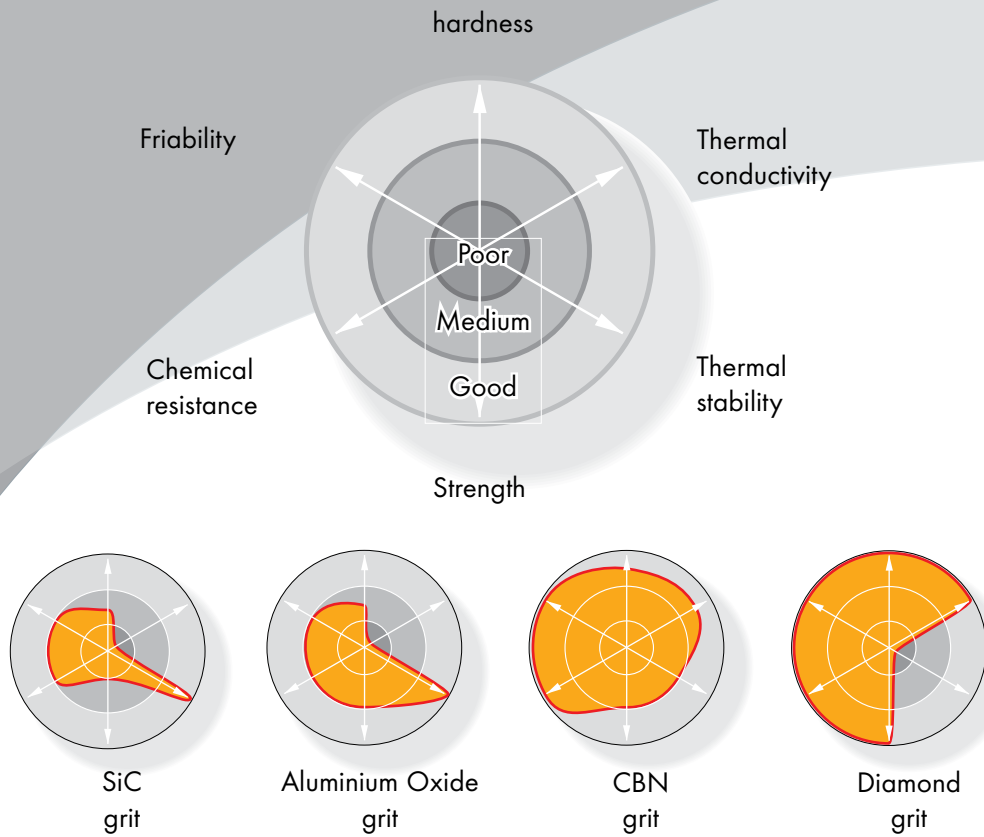
As the hardest abrasive material, diamond grits are used in the production of grinding tools for grinding and finishing tungsten carbides, combinations of tungsten carbides with steel and tools made of Polycrystalline diamond, ceramics, etc.

CBN grits are the second hardest abrasive material, but have a greater thermal stability than diamond grits. They are suitable for working high-speed steels, chromium steels, cementing steels, steels for hot and cold treatment and steels for ball bearings. The majority of superabrasives in the production of resin bonded grinding tools are coated with a metal coating which provides them better retention in bond matrix and heat transfer from the abrasive grit to its surroundings.

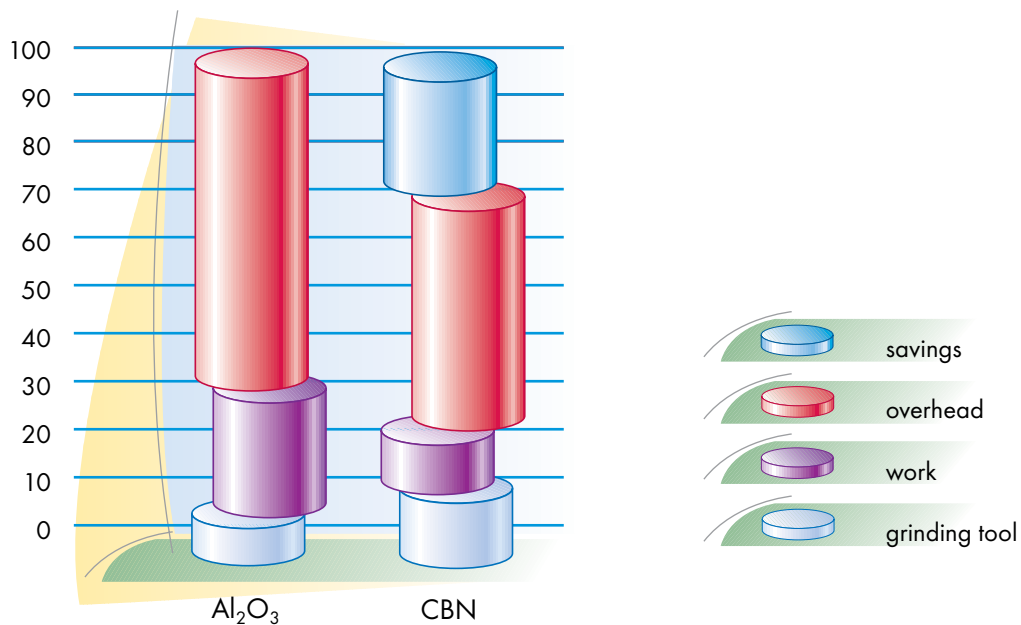




The proportion of use of abrasives with superabrasive grits increases on a constant basis. Comet uses superabrasive grit from the world's most reputable manufacturers.



Comparison of the cost-efficiency of grinding of different types of steel.





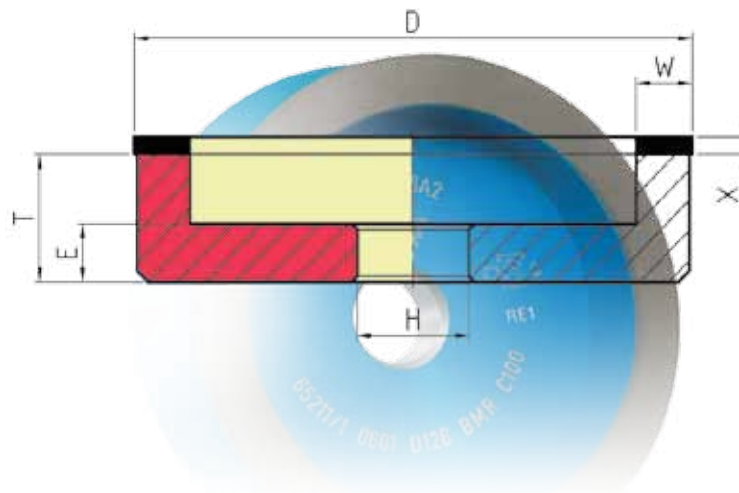
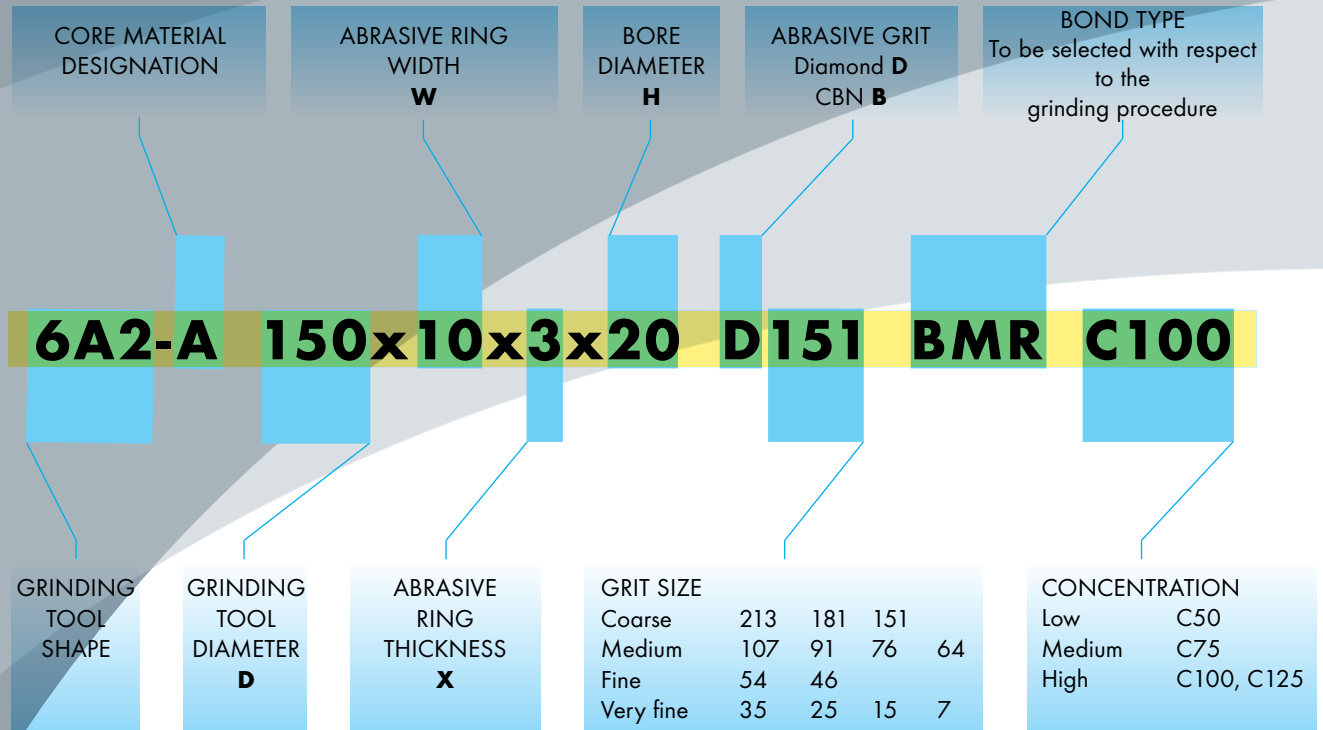
# APPLICATION OF RESIN BONDED CBN AND DIAMOND GRINDING TOOLS

- tool grinding in the toolmaking industry
- the production and sharpening of cutting tools for woodworking and metalworking such as: cutters, drills, reamers
- grinding of inserts for turning and cutting of tungsten carbides, high-speed steel and ceramics
- the automotive industry; grinding of cylinders, valves and shafts
- the glassmaking industry; polishing of automatic and decorative glass
- the aerospace industry; grinding of parts for jet engines





# DESIGNATION, SELECTION AND ORDERING OF GRINDING TOOLS



## Shapes of grinding tools

These are designated according to EN 13236 and FEPA standards. Selection of the most rigid types is recommended, as massive cores are less sensitive to impact and prevent vibrations. Also, cup shapes are better for face grinding than wheel shapes.



## Core material

MATERIAL	DESIGNATION	VIBRATION REDUCTION	HEAT TRANSFER CAPACITY	MECHANICAL STRENGTH
SINTER-ALUMINIUM	/	■ ■ ■	■ ■ ■	■ ■ ■
DURALUMINIUM	A	■ ■	■ ■ ■ ■	■ ■ ■ ■
BAKELITE	B	■ ■ ■ ■ ■	■	■ ■
STEEL	J	■	■ ■ ■ ■	■ ■ ■ ■ ■
ABRASIVE BASE	N	■ ■ ■	■ ■ ■	■ ■ ■

Worst ■  
Best ■ ■ ■ ■ ■

**SINTER-ALUMINIUM** - Medium weight material used for rigid grinding wheel bases. It adequately dampens vibrations, removes heat and provides good mechanical strength.

**DURALUMINIUM** - A heavier material which should be used when more stable bases are needed. It provides good mechanical strength and also better heat removal than sinter-aluminium.

**STEEL** - Steel bases are significantly heavier than the other four types of materials. They are used whenever good mechanical properties need to be ensured even with thin abrasives, for example cutting-off wheels (1A1R).

**BAKELITE** - A lighter material with very good vibration dampening properties, which is suitable primarily for wide abrasive rings that are used for surface or external cylindrical grinding (e.g. for the 1A1 shape).

**ABRASIVE BASE** - This material has the same mechanical properties as sinter-aluminium and is suitable primarily for less demanding applications and smaller, type 1A1 shapes (up to D=200mm). It can also be used when full wear/use of the diamond ring is desired.

## Grinding tool dimensions

**GRINDING TOOL DIAMETER (D)**: For more efficient grinding, use the maximum possible grinding tool diameter, taking into account the recommended peripheral speed of grinding (depending on the type and method of grinding and workpiece material), which are stated in the table on page 21. The variation of peripheral speed with rpm is also shown in this table.

**ABRASIVE RING THICKNESS (X)**: In general, it is cost-effective to use the greatest standard thickness to reduce core costs during the production of grinding tools.

**BORE DIAMETER (H)**: This depends on the spindle diameter. Standard bore diameter is 20 mm H7, while other bore diameters can be produced to order.

## Selection of the type and quality of superabrasive grit

Select **DIAMOND** grit (**D**) for non-ferrite materials (tungsten carbides, ceramics, PCD, etc.).

Select **CBN** grit (**B**) for ferrite materials (steels).

The quality of superabrasive grits is represented by its properties, such as shape, friability, thermal stability and type of grit coating. In special cases or problems, please consult Comet's technical department.





## Selection of superabrasive grit size

The size of abrasive grits determines the effect of grinding. The most cost-effective choice is the coarsest granulation that still achieves the required surface finish. If a greater amount of materials needs to be removed during grinding, a combination of coarse grinding and finish grinding is the most cost-effective.

In the table, grit size according to the FEPA, US ASTM and German DIN standard are stated for comparison. To simplify, one can view the sizes according to the FEPA standard as approximately corresponding to mean grit size in microns (D126 is approx. 0.126 mm).

	FEPA	ASTM-E-11	DIN 848
Coarse grinding	213	70/80	212/180
	181	80/100	180/150
	151	100/120	150/125
	126	120/140	125/106
Medium fine grinding	107	140/170	106/90
	91	170/200	90/75
	76	200/230	75/63
Fine grinding	64	230/270	63/53
	54	270/325	53/45
	46	325/400	45/38

POLISHING Micron size	DIACOM designation	D35	D25	D15	D7
	Size µm	28 - 40	16 - 34	10 - 20	5 - 10

All quality characteristics of the grinding tool are determined by the workpiece type and material, grinding method and the grinding machine, while the abrasive grit size is selected on the basis of the required grinding depth and surface quality.

GRIT SIZE ACCORDING to FEPA		Surface finish R (micron)	Surface quality N	GRINDING METHOD
Diamond	CBN			
	B181	1.12	N7 - N6	Very coarse grinding
	B151	0.75	N6	
	B126	0.66	N6	
D181	B107	0.53	N6 - N5	
D151	B91	0.50	N6 - N5	
D126	B76	0.45	N6 - N5	
D107	B64	0.40	N5	
D91	B54	0.33	N5 - N4	Medium fine grinding
D76	B46	0.25	N5 - N4	
D64	B35	0.18	N4	
D54		0.16	N4 - N3	
D46		0.15	N4 - N3	
Sizes - Micron			N3 - N2	Polishing

The table applies to the grinding of tungsten carbides K20 and HSS-64 HRc.

As shown in the table, CBN grit size for grinding must be 2-3 grades smaller in order to achieve the same surface quality as with diamond abrasives. The achieved surface quality also largely depends on the grinding procedure, specific material removal rate, workpiece material and cooling.



## Bond type selection

Bond	Stability and hardness	Relative Hardness (%)	Grinding Method							Cooling		Workpiece			
			SURFACE GRINDING	VARIOUS SHARPENING	EXTERNAL CYLINDRICAL	INTERNAL CYLINDRICAL	CUTTING	FREE-HAND GRINDING	DEPTH CUTTING	YES	NO	TUNGSTEN CARBIDES (DIA)	STEELS (CBN)	COMBINATIONS OF	T. CARBIDES AND STEEL
BMR	STANDARD	50													
BMRT	HARDER BMR	65													
BMN	SOFTER, BMR	40													
BMS	INCREASED THERMAL STABILITY	60													
BMK	BOND FOR MOUNTED POINTS AND ROLLS	60													
BME	INCREASED WEAR RESISTANCE	75													
BM1E	WET SURFACE GRINDING	65													
BM1EG	BOND FOR 14A1R TYPES	75													
BM1R	BOND FOR 14A1 and 1A1-R TYPES	75													
BM3N	SOFTER, FOR WIDER RINGS	35													
BM75	SURFACE GRINDING WITH CBN GRITS	35													
BR	BOND FOR POLISHING	40													
V80	LARGE MATERIAL REMOVAL RATES ON CNC MACHINES	80													
V80T	HARDER V80	85													
CX100	BOND WITH BETTER EDGE STABILITY FOR SHAPENING AND PROFILE GRINDING	80													
CXB	BOND WITH BETTER EDGE STABILITY FOR SHARPENING AND PROFILE GRINDING	80													
PIMR	HIGHER THERMAL STABILITY AND WEAR RESISTANCE	95													
PIMS	HIGHER THERMAL STABILITY AND WEAR RESISTANCE	95													
RJK	BOND FOR GRINDING PCD and PCBN														

This table shows only the most widely used bonds.

Comparison of results:

	SOFTER BONDS	HARDER BONDS
Material removal capacity	Great	Smaller
Relative material removal rate	Great	Smaller
Pressure/spindle load	Smaller	Great
Grinding factor G	Smaller	Great
Grinding tool life	Smaller	Great
Contact surface temperature	Smaller	Great

In addition to the bond, the grinding tool hardness also depends on the concentration of superabrasive grits.





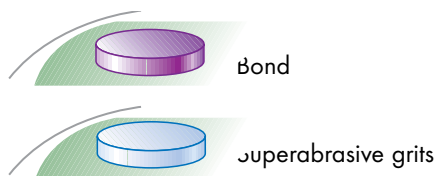
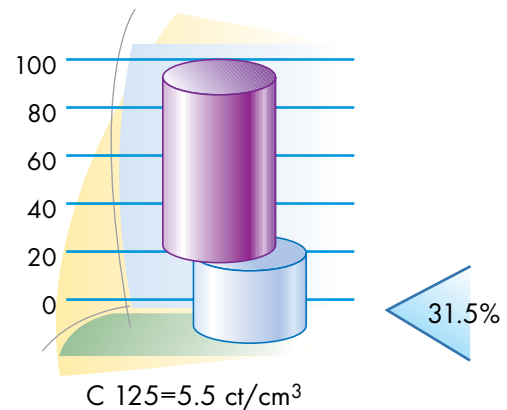
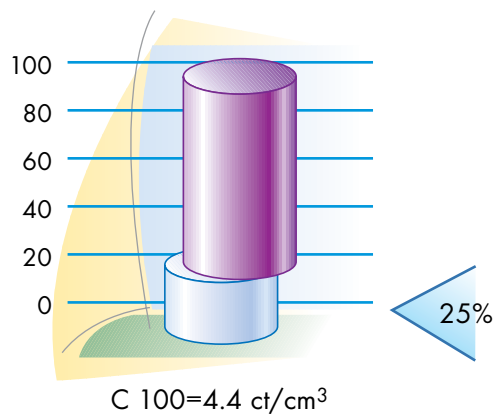
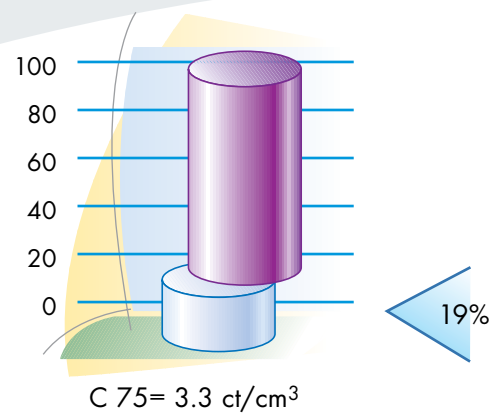
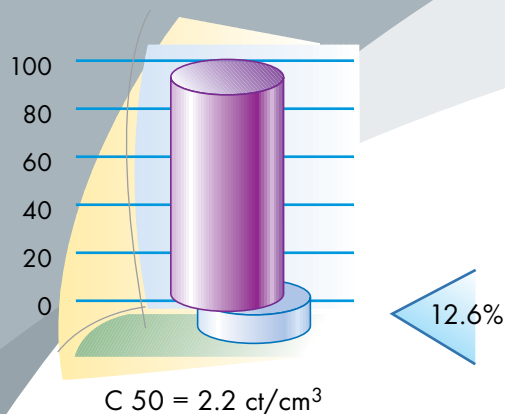
## Superabrasive grit concentration

The concentration should be selected with respect to the grinding procedure.

Low concentrations are recommended for fine abrasive grits, large contact surfaces between the abrasive and workpiece and in manual grinding; high concentrations are more suitable for coarse grits, small contact surfaces and whenever large profile stability of the grinding tool is required.

This is expressed as the quantity of diamond cubic boron nitride grits in carats/cm<sup>3</sup> of the abrasive ring (1 ct = 0.2 g).

The diagrams show the volume percentage of superabrasive grit in the abrasive ring.



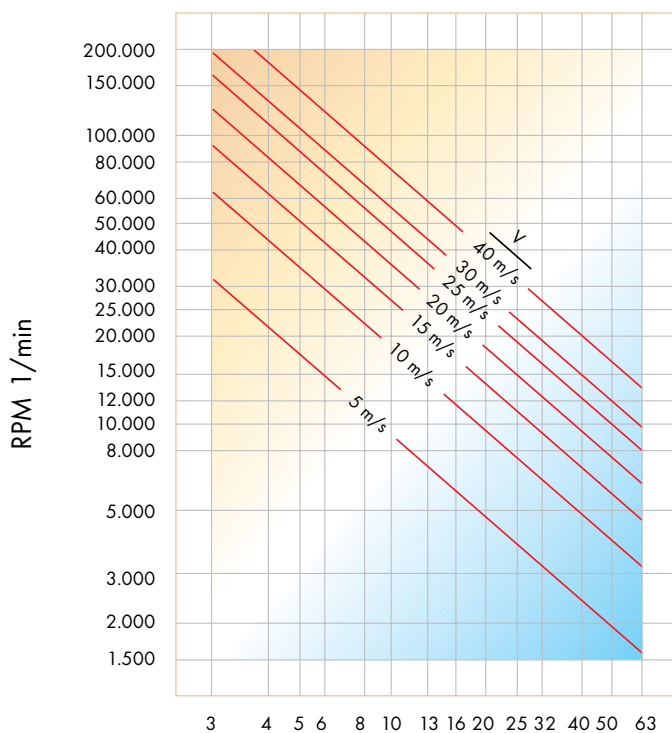
# RECOMMENDATIONS AND TIPS FOR SELECTING OPERATING PARAMETERS

Apart from a correct selection of grinding tool type and quality, it is important to observe recommendations on peripheral speeds, which are given in the table below (along with rpm) for optimum grinding with Comet abrasives.

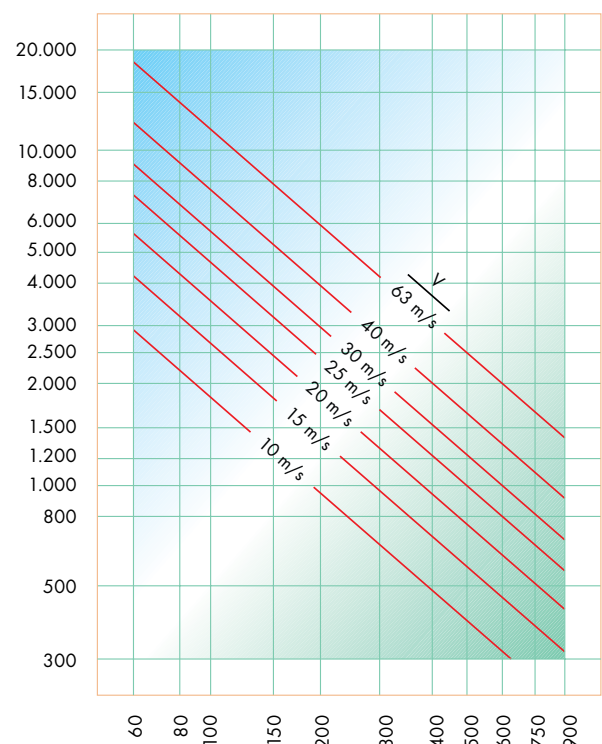
## Recommended peripheral speeds

GRINDING PROCEDURE	Speeds $v_s$ (m/s)			
	Diamond grinding tools		CBN grinding tools	
	Wet grinding	Dry grinding	Wet grinding	Dry grinding
Flat surface grinding	20 - 30	15 - 20	22 - 35	15 - 22
Internal cylindrical grinding	10 - 20	8 - 12	18 - 30	15 - 20
External cylindrical grinding	20 - 30		25 - 35	18 - 22
Tool sharpening	18 - 28	15 - 22	20 - 30	18 - 25
CNC tool grinding	18 - 22		30 - 70	

Diagram for determining grinding tool rpm



Grinding tool diameter (mm)

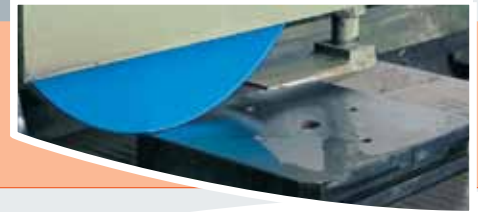






## Recommended parameters for various grinding procedures

**Flat surface grinding**



**External cylindrical grinding**



**Internal cylindrical grinding**



**Tool grinding and sharpening**



**CNC tool grinding**



### Phases of grinding for the production of mills

Flute grinding

Clearance angle grinding

Face grinding

Gashing

FREED RATE  m/min	WORKPIECE SPEED  m/min	GRINDING		
		Coarse	Medium	Fine
		mm		
5 - 20	Crossfeed rate up to 1/3 of abrasive ring width	0.01 - 0.03	0.005 - 0.02	0.001 - 0.01
0.5 - 3.0	Peripheral speed 15 - 40 m/min	0.01 - 0.02	0.005 - 0.01	0.001 - 0.005
0.5 - 2.0	Peripheral speed 15 - 40 m/min	0.005 - 0.02	0.005 - 0.01	0.001 - 0.005
0.5 - 6.0		0.02 - 0.01	0.01 - 0.02	0.005 - 0.001

GRINDING TOOL PERIPHERAL SPEED ( $v_s$ ) m/s		FEED RATE mm/min		GRINDING DEPTH mm	
D	CBN	D	CBN	D	CBN
18 - 22	30 - 70	25 - 100	50 - 200	Full flute depth - up to approx. 6 mm	Full flute depth - up to approx. 6 mm
18 - 22	30 - 70	50 - 300	200 - 300	0.3 - 1	0.3 - 1.5
18 - 22	30 - 70	30 - 40	60 - 70	Depending on face geometry	Depending on face geometry
18 - 22	30 - 70	30 - 70	40 - 50	Full flute depth - up to approx. 4 mm	Full flute depth - up to approx. 5 mm





# INSTRUCTIONS FOR USE OF GRINDING TOOLS

The following manufacturers/users are responsible for safety during grinding:

## Grinding tool manufacturer

The grinding tool manufacturer must manufacture a safe tool, which is achieved through a correct selection of raw materials, a correct technological manufacturing procedure and the required product control:

- safety control (at increased peripheral speeds, cracks)
- quality control (dimensions, hardness, runout and balance)

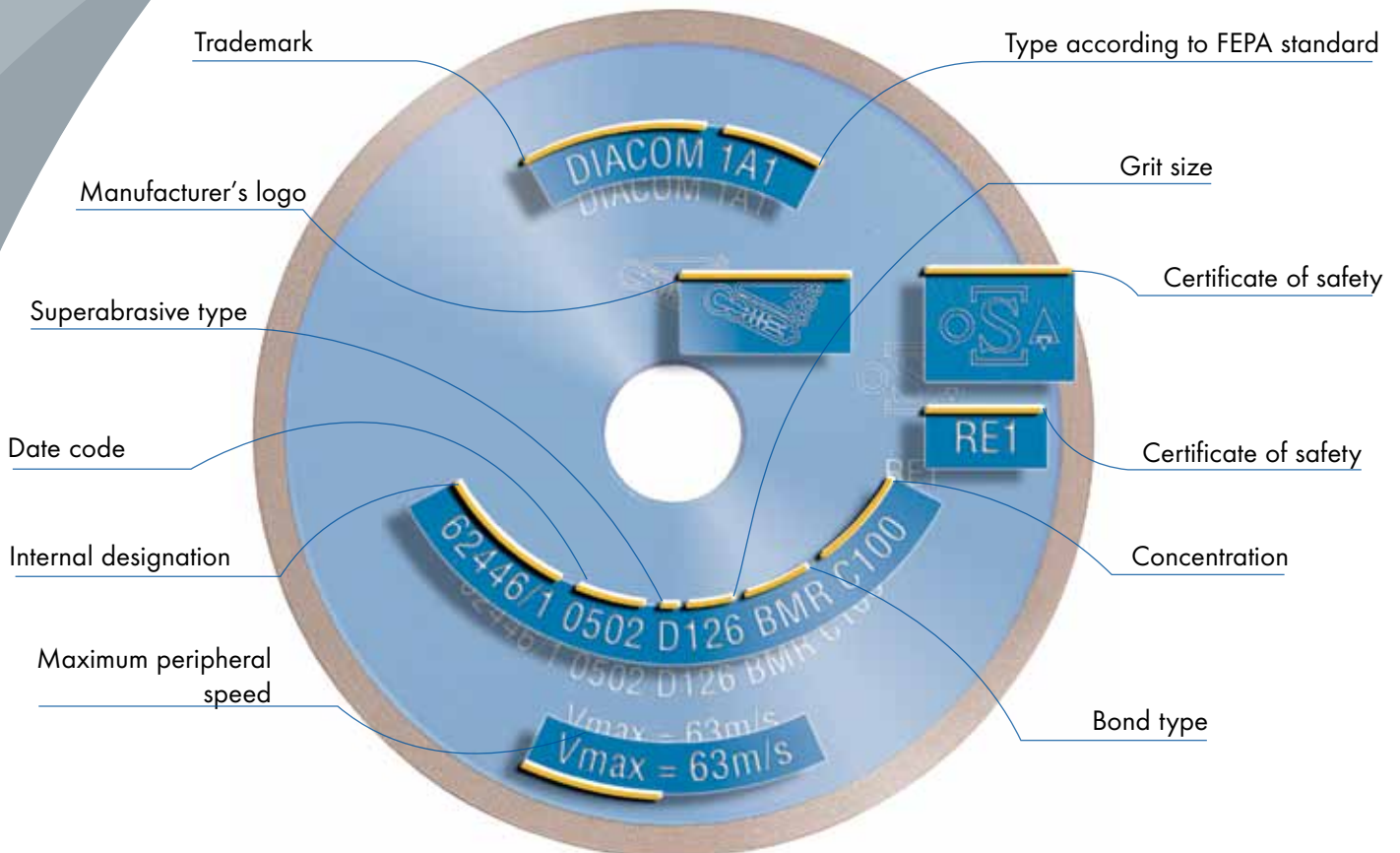
Control methods are prescribed by the ISO 13236 and FEPA international standards, as well as Comet's internal standards.

The following must be marked on grinding tools by the manufacturer:

- Manufacturer's name
- Product dimensions
- Quality (type and size of abrasive grit, bond quality and concentration)
- Max. peripheral speed
- Safety warnings regarding tool use:



- Most frequent markings on grinding tools:



## Grinding machine manufacturer

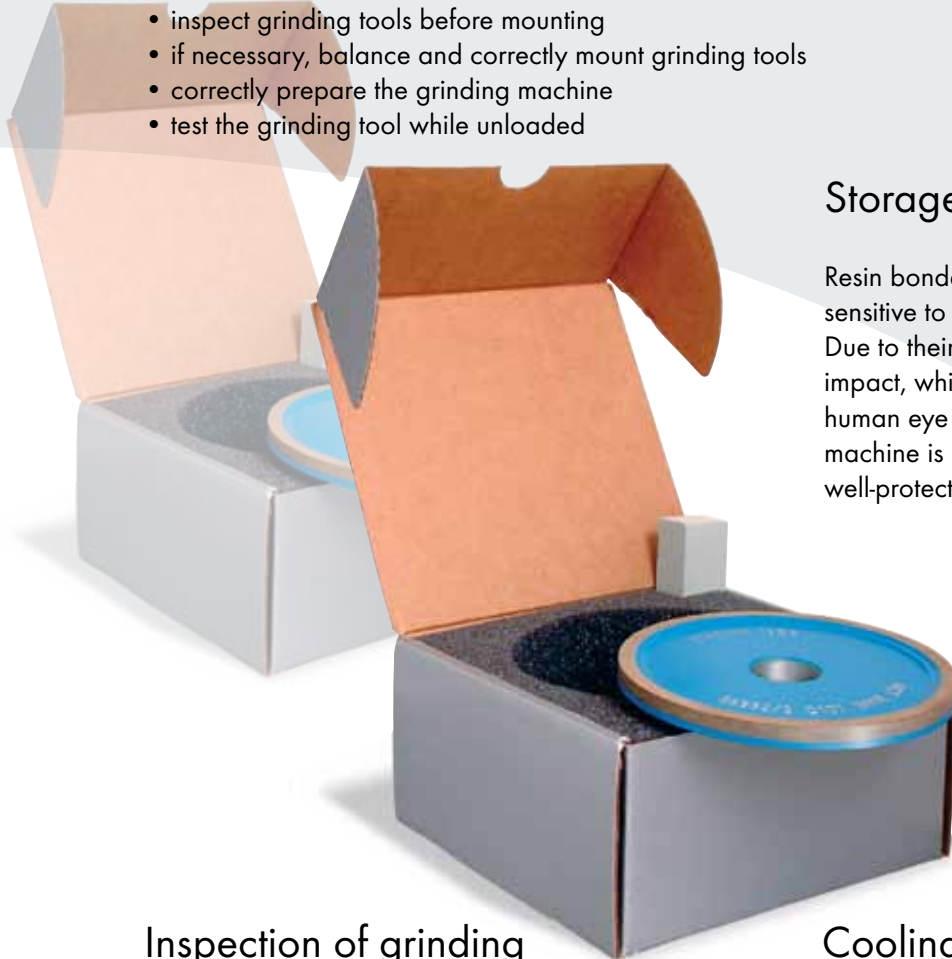
The grinding machine manufacturer must ensure a stable machine installation and strength of the protective housings. The strokes and displacements must be set so that the required product accuracy can be achieved. Instructions for correct and safe use of the machine must also be prepared.



## Machine/tool user:

During work, users must follow the instructions of the tool and machine manufacturer, and most importantly:

- provide adequate storage for the grinding tools
- inspect grinding tools before mounting
- if necessary, balance and correctly mount grinding tools
- correctly prepare the grinding machine
- test the grinding tool while unloaded



## Storage of grinding tools

Resin bonded grinding tools are sensitive to atmospheric influences. Due to their fragility, they are also very sensitive to impact, which causes cracks that are invisible to the human eye but may cause the tool to break when the machine is started. Grinding tools must be stored well-protected, preferably in the original packaging.

## Inspection of grinding tools before mounting

Packaging does provide for safe transport, but nevertheless the cartons or cases must not be thrown during reloading. After their receipt at the warehouse and especially directly before their mounting onto the grinding machine, grinding tools must be visually inspected.

## Mounting of grinding tools

High-quality grinding requires grinding machines with rigid construction, a powerful drive and high-quality spindle bearings. During mounting, it is recommended that the flange first be partially tightened and that one minimizes runout using a measuring device. All contact surfaces must be clean. Once mounted, grinding tools should not be removed from the spindle until they are worn out.

## Cooling

Cooling should be performed whenever the grinding procedure allows for it, since the coolant transfers away heat and chips and enables better workpiece surface quality. We recommend use of a water solution with up to 2% oil, and oil with additives. Use of water solutions with additives is not recommended during grinding with resin bonded CBN grinding tools, due to the risk of chemical degradation of the abrasive. Feeding of coolant at the contact area is significantly better than feeding it to the grinding tool core or workpiece.





## Dressing of grinding tools and opening of the structure

If the grinding parameters are not optimal, the abrasive ring wears unevenly. Vitrified bonded (SiC) grinding tools G-K are used for dressing. Their grit size must be one grade coarser than that of the superabrasive grits, which are dressed. Both grinding tools here revolve in the same direction, whereby the peripheral speed of the SiC grinding tool is 15-25 m/s, and that of the superabrasive grinding tool is lower by half. Grinding tools with abrasive rings on the face can also be dressed by rubbing them against SiC 160-180 abrasive grits, which are applied onto a flat metal or glass surface.

This reopens the surface of a dulled grinding tool, even though the grinding tools are already self-sharpening when correctly used. The structure of dulled grinding tools can also be opened using a grinding stone, which is enclosed with the grinding tool. A wet grinding stone is pressed against the rotating grinding tool by hand. Resin bonded CBN grinding tools for flat surface grinding of hardened steels are sometimes also dressed by grinding into soft steels at a peripheral speed of approx. 15 m/s.

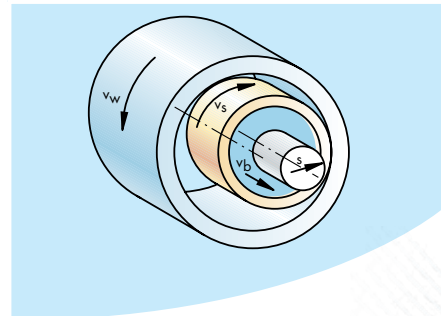
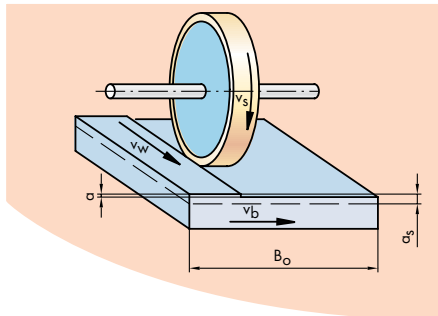


## Ordering

When ordering grinding tools, please state all the necessary parameters in your order: tool type, dimensions and quality. For repeat orders, grinding tool identification number will suffice.

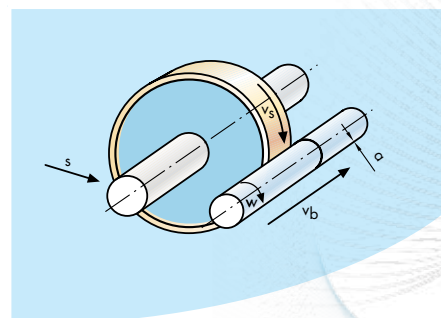
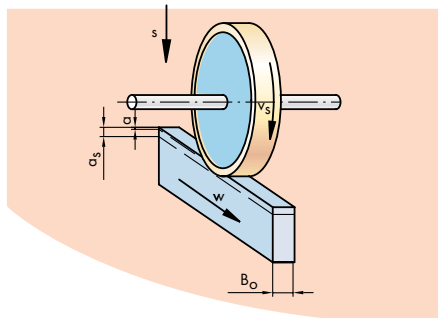
- If you are already using the grinding tool, order an identical one (all data required for the order is engraved on the tool and also can be found on the label on the box). If your grinding tool is not manufactured by COMET, please add the manufacturer's name in your order (in addition to the prescribed data).

Surface grinding with cross feed



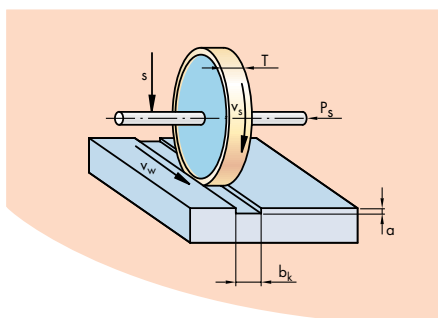
Internal cylindrical grinding

Profile grinding



External cylindrical grinding

Surface grinding



- $v_s$  - peripheral speed
- $v_w$  - speed of workpiece motion
- $v_b$  - cross feed speed
- $s$  - tool transverse feed rate
- $a$  - grinding depth per turn
- $a_s$  - total grinding depth
- $B_o$  - ground surface width
- $G$  - volume grinding ratio
- $V_w$  - volume of removed material
- $V_s$  - volume amount of wear of wheel

# GRINDING REPORT

The purpose of the grinding report is to listen to clients' opinions and respond to their needs. If the grinding tool is not included in our standard product range, please provide data under A and B when ordering.

## CUSTOMER DATA:

Produced on order No.: \_\_\_\_\_  
Shape and quality of grinding wheel: \_\_\_\_\_  
Dimension of grinding wheel: \_\_\_\_\_

Customer: \_\_\_\_\_  
Address: \_\_\_\_\_  
Contact person: \_\_\_\_\_ Phone: \_\_\_\_\_

A

Description: \_\_\_\_\_ Material: \_\_\_\_\_  
Hardness: \_\_\_\_\_ Surface finish: N,Ra,Rt,Rz

B

Grinding method \_\_\_\_\_  
Grinding machine: \_\_\_\_\_ Power of main spindle **Ps**: \_\_\_\_\_ W  
Grinding wheel peripheral speed **v<sub>s</sub>**: \_\_\_\_\_ m/s or rpm \_\_\_\_\_ min<sup>-1</sup>  
Workpiece speed **v<sub>w</sub>**: \_\_\_\_\_ m/min or rpm \_\_\_\_\_ min<sup>-1</sup>  
Infeed **a**: \_\_\_\_\_ mm  
Cross feed speed **v<sub>b</sub>**: \_\_\_\_\_ m/min and Cross feed **b**: \_\_\_\_\_ mm  
Grinding allowance **a<sub>s</sub>**: \_\_\_\_\_ mm  
Other process parameters: \_\_\_\_\_  
Cooling: ☐ YES ☐ NO Coolant type (designation): \_\_\_\_\_  
Flow rate (pressure): \_\_\_\_\_ l/min

## GRINDING REPORT:

Surface finish: \_\_\_\_\_ Observations: \_\_\_\_\_  
Material removal volume **V<sub>w</sub>**: \_\_\_\_\_  
Grinding wheel layer volume **V<sub>s</sub>**: \_\_\_\_\_  
Process (grinding) time **t<sub>s</sub>**: \_\_\_\_\_  
Dressing infeed **a<sub>d</sub>**: \_\_\_\_\_  
Dressing frequency: \_\_\_\_\_  
G ratio **G = V<sub>w</sub> / V<sub>s</sub>**: \_\_\_\_\_

## COMPARISON WITH SIMILAR GRINDING WHEELS FROM OTHER MANUFACTURERS:

Manufacturer: \_\_\_\_\_ Wheel designation: \_\_\_\_\_  
Notes: \_\_\_\_\_  
☐ Better ☐ Better ☐ Worse

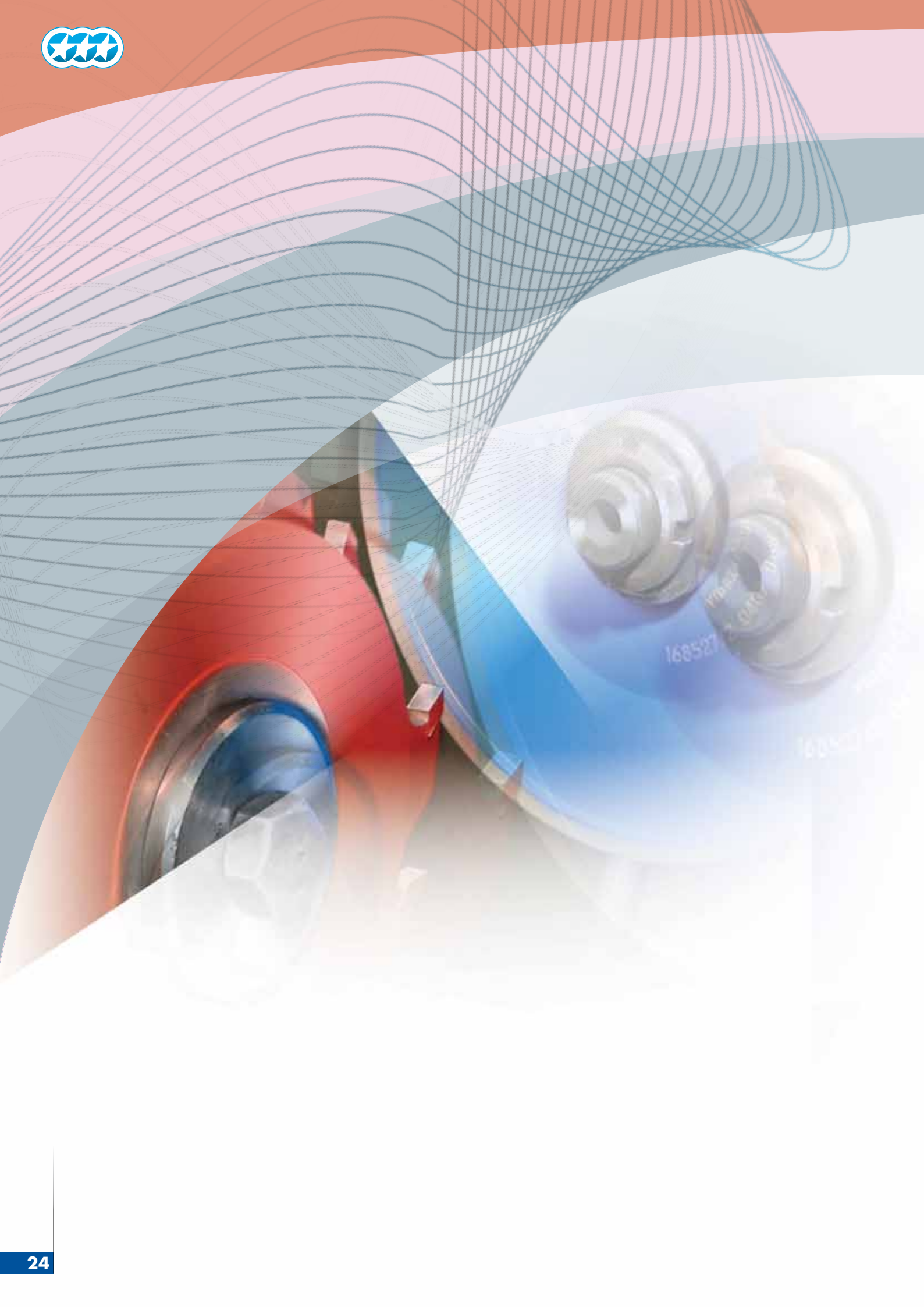
## TESTED SAMPLE:

Tested sample: ☐ Appropriate ☐ Semi-appropriate  
☐ Inappropriate, why? \_\_\_\_\_

Signature, date: \_\_\_\_\_

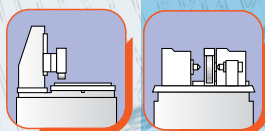






## REVIEW OF GRINDING TOOLS BY TYPE

01



Surface grinding with tool circumference  
and external cylindrical grinding 26

02



Internal cylindrical grinding 28

03



Face surface grinding 30

04



Tool grinding and sharpening 36

05



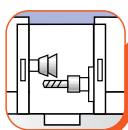
Tool grinding and sharpening  
PRODUCT RANGE FOR WOOD 46

06



Profile grinding 54

07



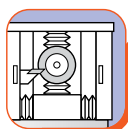
CNC tool grinding 56

08



Cutting 60

09



Grinding of PCD and PCBN 62

10



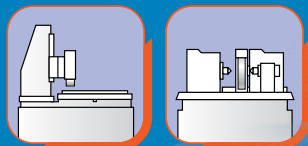
Hand grinding 63





# SURFACE GRINDING WITH TOOL CIRCUMFERENCE AND EXTERNAL CYLINDRICAL GRINDING

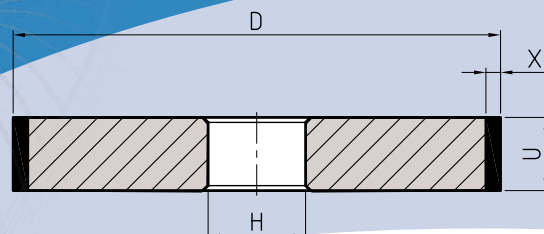
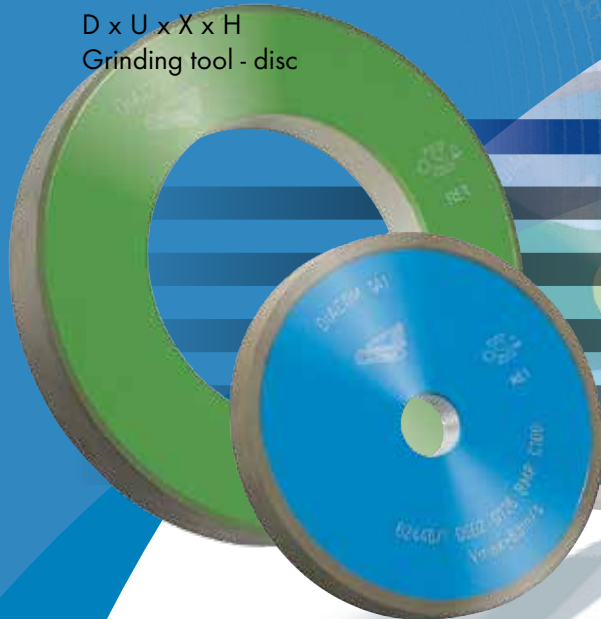
01



## DIACOM 1A1

D x U x X x H

Grinding tool - disc

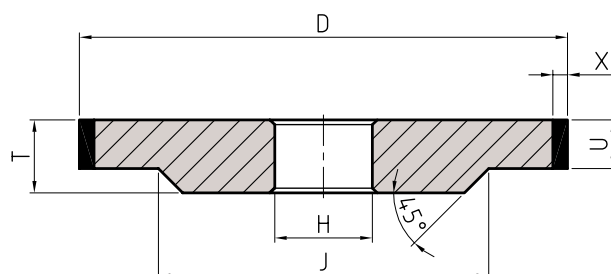
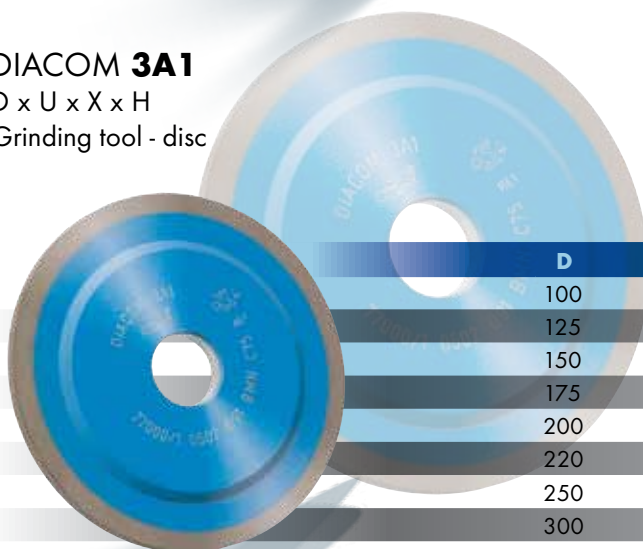


D	X	T=U
100	2 3 4 5 6 10	6 8 10 12 15
125	2 3 4 5 6 10	6 8 10 12 15
150	2 3 4 5 6 10	6 8 10 12 15
175	3 5 6 10	6 8 10 15 20 25
200	3 4 5 6 10	6 10 15 20 25
220	3 4 20	10 15 20 25
250	3 5 6 10	10 15 20 25
300	3 5 8 10 12	10 15 20 25 30
350	3 5 8 10	10 15 20 25 30
400	3 5 10	10 15 20 25 30
500	3 6 10	10 15 20 25 30

## DIACOM 3A1

D x U x X x H

Grinding tool - disc

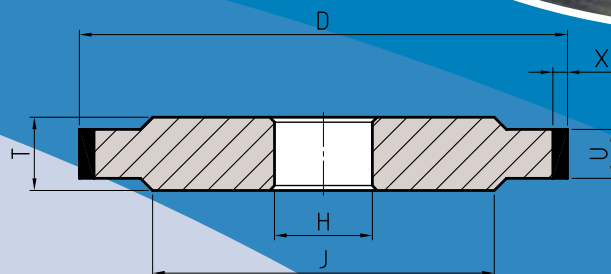


D	U	X	J	T
100	5 10	3 5 6	70	10 15
125	5 10	3 5 6	100	10 15
150	5 10	3 5 6	120	10 15
175	8 10 15	3 5 6	140	15 25
200	10 15	3 5 6	160	15 25
220	10 15	3 4	180	15 25
250	10 15	3 5 6	200	15 25
300	10 15	3 5 8 10	250	15 25
350	15 25	3 5 8 10	300	15 25
400	10 15	3 5	350	15 25
500	10 15	3 6	400	15 25

The standard bore diameter (H) is  $\varnothing 20 \text{ H7}$ ; other diameters and grinding tools of other dimensions are manufactured to order.





**DIACOM 14A1**  
D x U x X x H  
Grinding tool - disc



D	U	X	J	T
125	5 10	5	95	10 15
150	5 10	5	120	10 15
175	5 10	5	140	10 15
200	5 10	5	160	10 15
300	10	3 5	240	16
350	10	3 5	280	16
400	10	3 5	330	16
500	10	3 6	430	18

## QUALITY OF GRINDING TOOLS FOR SURFACE AND EXTERNAL CYLINDRICAL GRINDING

GROUND MATERIAL		Grit type	Grit size	Bond	Concentration	Notes
Steels						
	Non-hardened steel	B	107 - 181	BMR	75 - 100	
	Tool steel	B	64 - 126	BM75	50 - 75	
	High-speed steels (HSS)	B	64 - 126	BMRT	50 - 75	
Hard metals						
	Tungsten carbides	D	46 - 151	BMR, BMN	75 - 100	





# INTERNAL CYLINDRICAL GRINDING

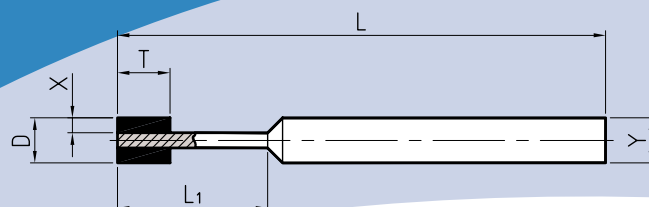
02



## DIACOM 1A1W

$D \times T \times X \times Y \times L$

Grinding tool - mounted point

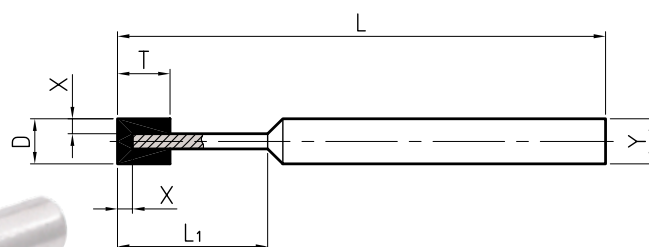


D	T	X	L	L1	Y
6	6	1.5	70	20	6
7	6 8 10	2	70	20	6
8	8 10	2	70	20	6
9	8 10	2	70	20	6
10	8 10	2	70		6
12	8 10	2	70		6
15	8 10 15	2	70		(6) 8
18	8 10 15	2	70		(6) 8
20	8 10 15	3	70		(6) 8

## DIACOM 1A8W

$D \times T \times X \times Y \times L$

Grinding tool - mounted point



D	T	X	L	L1	Y
4	6	1	(45) 70	20	6
5	6	1.5	(45) 70	20	6
6	6	2	70	20	6

## QUALITY OF GRINDING TOOLS FOR INTERNAL CYLINDRICAL GRINDING

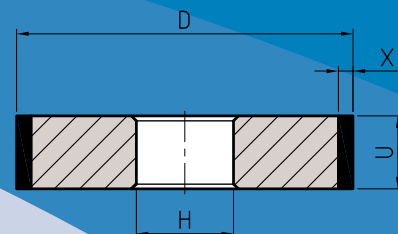
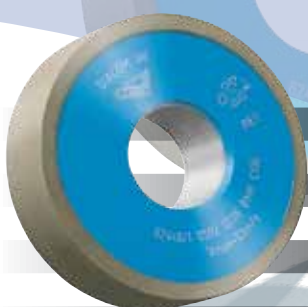
GROUND MATERIAL		Grit type	Grit size	Bond	Concentration	Notes
Steels						
	Non-hardened steel	B	107 - 181	BMK	75 - 100	
	Tool steel	B	64 - 126	BMK	100	
Hard metals						
	Tungsten carbides	D	46 - 151	V80, V80T	100	



## DIACOM 1A1

D x U x X x H

Grinding tool - roll



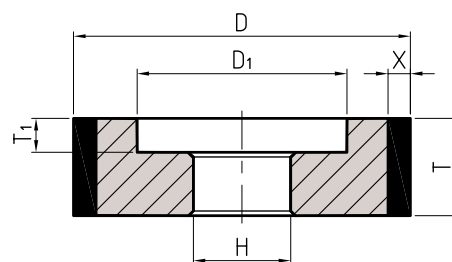
D	H	X	T=U
6	3	1.5	6 8 10
7	3	2	6 8 10
8	4	2	6 8 10
9	4 5	2	10 15
10	4 6	2	10 15
12	4 6 8	2	10 15
15	*	2	10 15 20
18	*	2	10 15 20
20	*	2 3	10 15 20
22	*	3 5	10 15 20
25	*	3 5	10 15 20
30	*	3 5	10 15 20
35	*	3	6 10 15 20
40	*	3 5	5 6 8 10 15 20
45	*	4	5 6 8 10 15 20
50	*	3	5 6 8 10 15 20
55	*	3	5 6 8 10 12
63	*	3 5	5 6 8 10 12
75	*	3 4 5	5 6 8 10 12 15
80	*	3	6 8 10 12 15
85	*	3	6 8 10 12 15
90	*	3	6 8 10 12 15
100	*	2 3 4 5	6 8 10 12 15

\* Bore diameter (H) manufactured to order.

## DIACOM 1A1S

D x T x X x H x D<sub>1</sub> x T<sub>1</sub>

Grinding tool - roll



D	T	X	H	D <sub>1</sub>	T <sub>1</sub>
15	10 15	2	6	10	4 6
18	10 15	2	6 8	12	4 6
20	10 15	3	8 10	12	4 6
22	10 15	5	8 10	12	4 6
25	10 15	3 5	10 13	13 17	4 6
30	15 20	3 5	10 13	16 20	6 8
35	15 20	3	13 16	25	6 8
40	15 20	3	13 20	30	6 8







# FACE SURFACE GRINDING

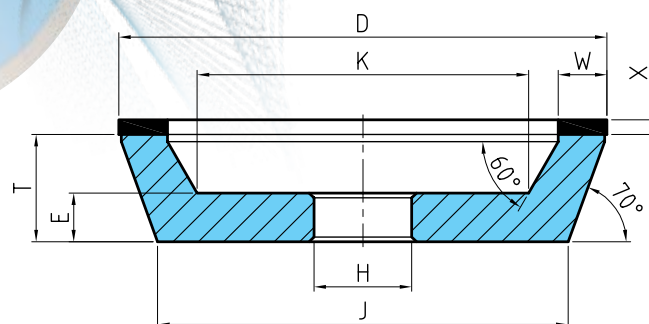
03



## DIACOM 11A2

D x W x X x H

Grinding tool - cup



D	X	W	T	E	K	J
50	2 3	5 10	13	8	27	41
75	2 3		18	10		62
75		3 4 5 6 10	18	10	62 60 58 56 48	62
100	2 3 4		22	10		84
100		3 4 5 6 8 10 12.5	22	10	82 80 78 76 72 68 63	84
125	2 3 4		23	10		109
125		3 4 5 6 10 12.5 15	23	10	106 104 102 100 92 87 82	109
150	2 3 4		23	10		134
150		6 8 10 12.5 15 20	23	10	125 121 117 112 107 97	134
175	2 3 4		23	12		159
175		6 10 15	23	12	153 145 135	159
200	2 3 4		23	12		184
200		6 8 10 15	23	12	178 174 170 160	184
250	2 3 4		23	12		234
250		10 12 15	23	12	220 216 210	234

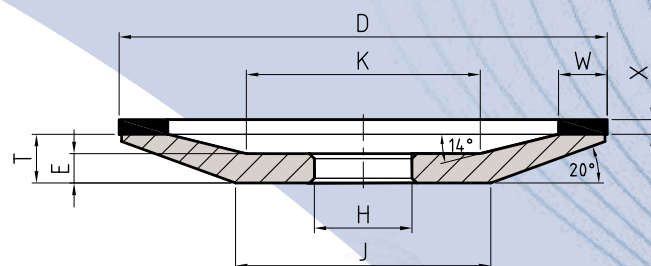
The standard bore diameter (H) is  $\varnothing 20 H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.



# DIACOM 12A2/20°

D x W x X x H

Grinding tool - plate



D	X	W	T	E	K	J
50	2 3		7	5		16 19
50		3 5	7	5	28 24	
75	2 3 4		9	6		30 33 36
75		3 4 5 6 10	9	6	45 43 41 39 31	
100	2 3 4		10	6		50 52 55
100		2 3 4 5 6 8 10 12.5	10	6	64 62 60 58 56 52 48 43	
125	2 3 4		14	8		53 55 58
125		3 4 5 6 8 10 12.5 15	14	8	71 69 67 65 61 57 52 47	
150	2 3 4		16	9		67 69 72
150		3 4 5 6 8 10 15 20	16	9	88 86 84 82 78 74 64 54	
175	2 3 4		18	10		81 83 86
175		6 8 10 15	18	10	99 95 91 81	
200	2 3 4		20	11		95 97 100
200		3 4 5 6 8 10 12 15	20	11	122 120 118 116 112 108 104 98	
250	2 3 4		23	13		128 131 134
250		10 15	23	13	150 140	





## FACE SURFACE GRINDING

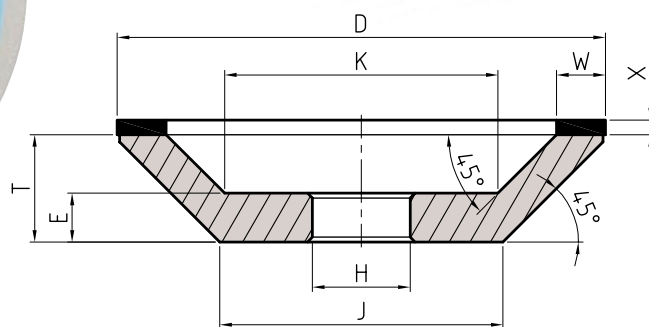
03



### DIACOM 12A2/45°

D x W x X x H

Grinding tool - conical plate



D	X	W	T	E	K	J
50	2 3	3 5 10	13	8	34 30 20	25 26
75	2 3 4		18	10		40 41 42
75		3 4 5 6 10	18	10	53 51 49 47 39	
100	2 3 4		22	10		57 58 59
100		3 4 5 6 8 10 12.5	22	10	70 68 66 64 60 56 51	
125	2 3 4		23	10		80 81 82
125		3 4 5 6 10 12.5 15	23	10	93 91 89 87 79 74 69	
150	2 3 4		23	10		105 106 107
150		3 4 5 6 8 10 12.5 15 20	23	10	118 116 114 112 108 104 99 94 84	
175	2 3 4		23	12		130 131 132
175		6 8 10 15	23	12	141 137 133 123	
200	2 3 4		23	12		155 156 157
200		5 6 8 10 12 15	23	12	168 166 162 158 154 148	
250	2 3 4		23	12		205 206 207
250		10 15	23	12	208 198	

The standard bore diameter (H) is  $\varnothing 20 H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.

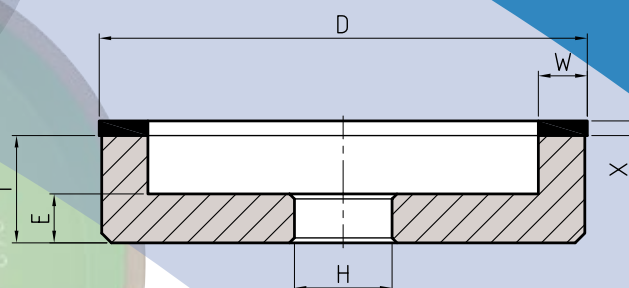




## DIACOM 6A2

D x W x X x H

Grinding tool - cylindrical cup



D	W	X	T	E
30	3 5	2 3	18	8
40	3 4 5	2 3	20	8
45	3 5	2 3	20	8
50	3 5	2 3	20	10
55	10	2 3	20	10
63	3 5 10	2 3	20	10
75	2 3 4 5 6 8 10	2 3	20	10
90	3 4 5 6 8 10	2 3	22	10
100	2 3 4 4.5 5 6 8 10 12.5 20	2 3	22	10
125	2 3 4 5 6 8 10 12.5 25 30	2 3 4	22	10
150	3 5 6 8 10 12.5 15 20 25	2 3 4	22	10
175	3 4 5 6 10 15 20 25	2 3 4	24	13
200	4 5 6 8 10 15 20 25	2 3 4	25	13
250	6 10 15 25	2 3 4	25	13





## FACE SURFACE GRINDING

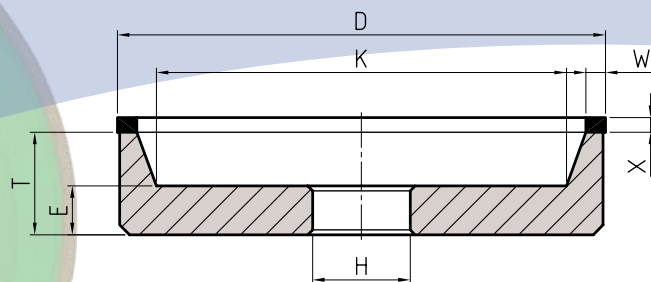
03



### DIACOM 6A2-1

D x W x X x H

Grinding tool - cup




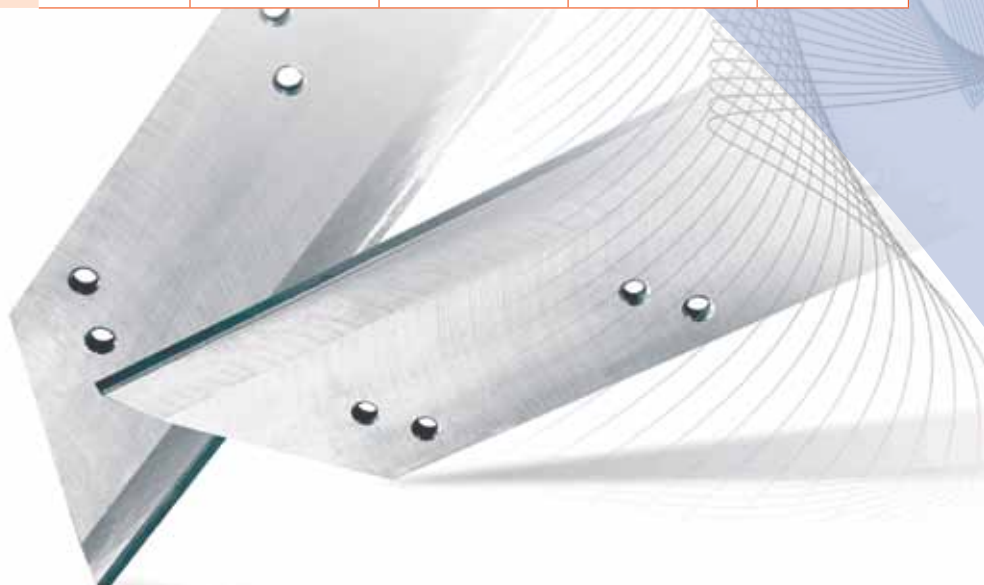
D	X	W	T	E	K
30	2	3	18	8	17
40	2	3 4	20	8	25 23
45	2	3 4	20	8	30 28
50	2	3 5	20	10	37 33
55	2	10	20	10	28
63	2	5 10	20	10	46 36
75	2	2 3 4 5	20	10	64 62 60 58
100	2	3 4 5 6	22	10	85 83 82 79
125	2	3 4 5 6	22	10	110 108 106 104
150	2	3 4 5 6	22	10	135 133 131 129
175	3	3 4 5 6	24	13	161 159 157 155
200	4	4 5 6	25	13	183 181 179

The standard bore diameter (H) is  $\varnothing 20 \text{ H7}$ ; other diameters and grinding tools of other dimensions are manufactured to order.



## QUALITY OF GRINDING TOOLS FOR FACE SURFACE GRINDING

GROUND MATERIAL		Grit type	Grit size	Bond	Concentration	Notes
Steels						
	Non-hardened steel	B	107 - 181	BMR	75 - 100	
	Tool steel	B	64 - 126	BM75	50 - 75	
	High-speed steels (HSS)	B	64 - 126	BMRT	50 - 75	
Hard metals						
	Tungsten carbides	D	46 - 151	BMR, BMRT	75 - 100	
Technical ceramics						
		D	91 - 151	BMR	75	







## TOOL GRINDING AND SHARPENING

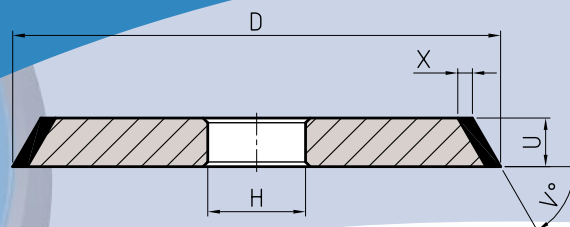
# 04



### DIACOM 1V1

$D \times U \times X/V^\circ \times H$

Grinding tool - disc

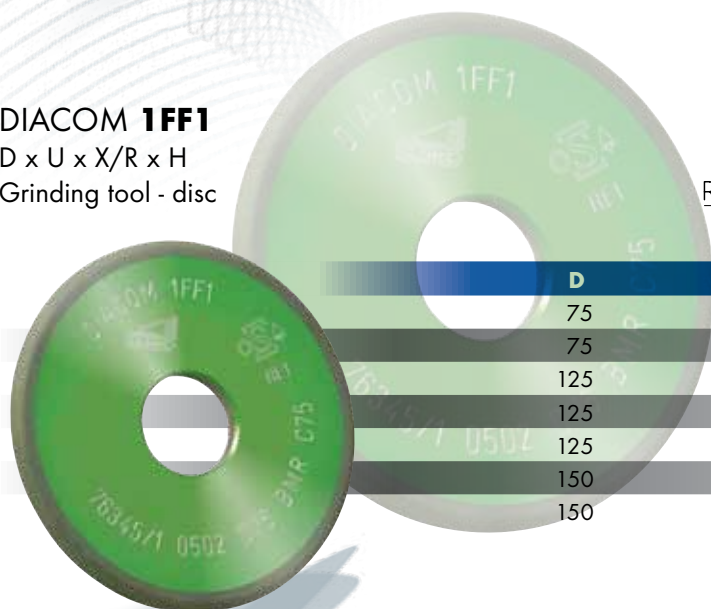
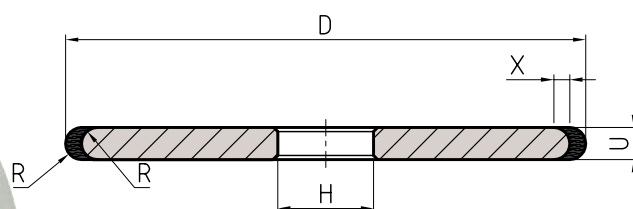


D	X	U	V°
40	1.5 2 3	5	70
75	1.5 2 3	6	45 70
75	1.5 2 3	10	70
90	1.5 2 3	6	70
90	1.5 2 3	10	70
100	1.5 2 3	6	45 70
100	1.5 2 3	10	70
125	1.5 2 3	6	45
125	1.5 2 3	10	45 70
125	5	10	80

### DIACOM 1FF1

$D \times U \times X/R \times H$

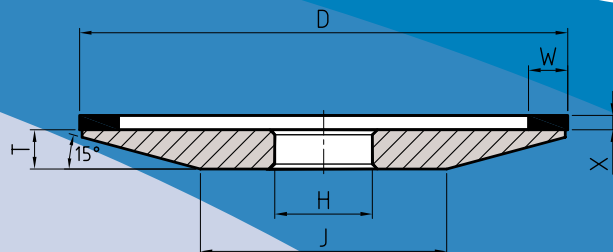
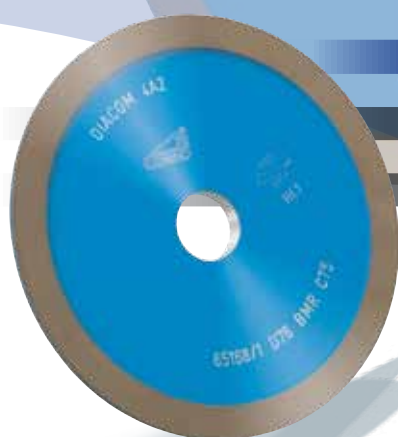
Grinding tool - disc



D	R	X	U
75	2	2	4
75	4	2	8
125	3	2	6
125	4	2	8
125	8	2	16
150	2.5	2	5
150	10	2	20

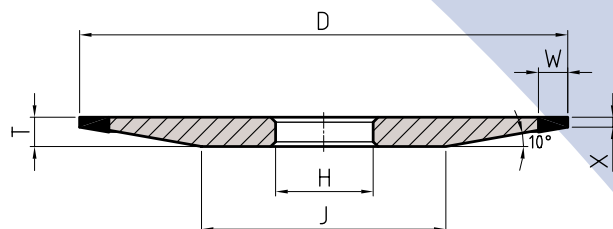
The standard bore diameter (H) is  $\varnothing 20 H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.

**DIACOM 4A2**  
D x W x X x H  
Grinding tool - disc



D	X	T	W	J
75	2 3 4	6	3 4 5 6 8 10	37 40 44
100	2 3 4	8	3 4 5 6 8 10	47 50 54
125	2 3 4	8	3 4 5 6 8 10	72 75 79
150	2 3 4	8	3 4 5 6 8 10	97 100 104
175	2 3 4	10	3 4 5 6 8 10	107 111 114

**DIACOM 4ET9**  
D x W x X x H  
Grinding tool - disc



D	X	W	T	J
50	1 2	5 6	4	14 25
75	1 2	6	5	27 39
100	1 2	6	6	41 52
125	1 2	6	8	43 55
150	1 2	6 10	10	43 57



# TOOL GRINDING AND SHARPENING

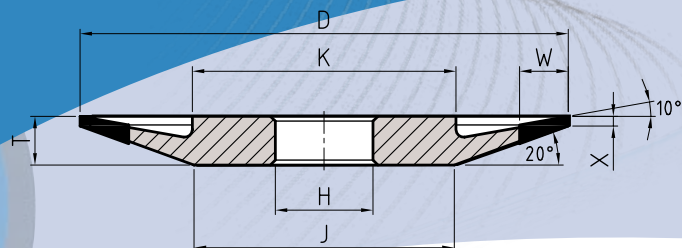
## 04



### DIACOM **4BT9**

D x W x X x H

Grinding tool - disc

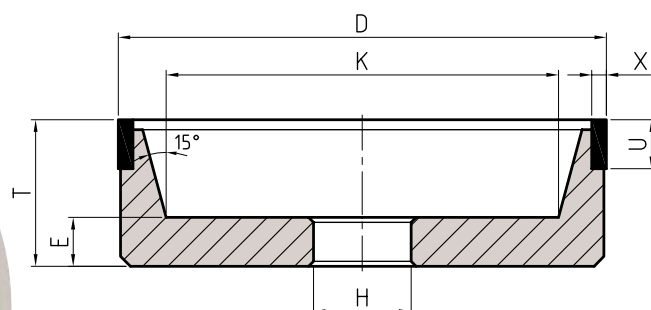


D	X	W	T	K=J
50	1 2	6 10	6	20 26
75	1 2	6 10	8	34 40
100	1 2	6 10	10	48 54
125	1 2	6 10	12	62 68
150	1 2	6 10	14	76 82

### DIACOM **6A9**

D x X x U x H

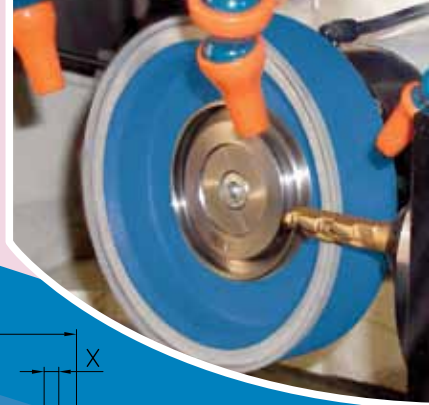
Grinding tool - cup



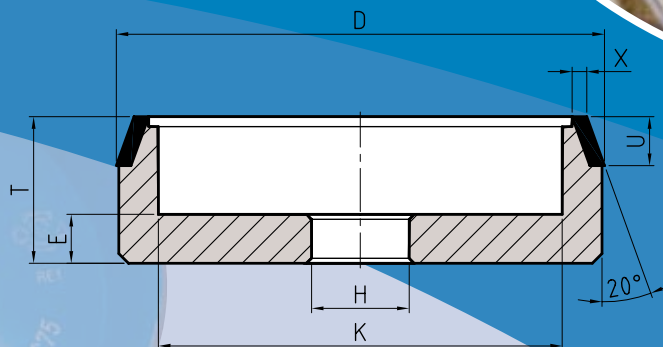
D	X	U	T	E	K
50	2 3	6 10	20	8	37 35
75	2 3	6 10	25	10	60 58
100	2 3	6 10	30	10	82 80
125	2 3 4	6 10	30	10	107 105 103
150	2 3 4	6 10	35	10	130 128 126

The standard bore diameter (H) is  $\varnothing 20 H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.



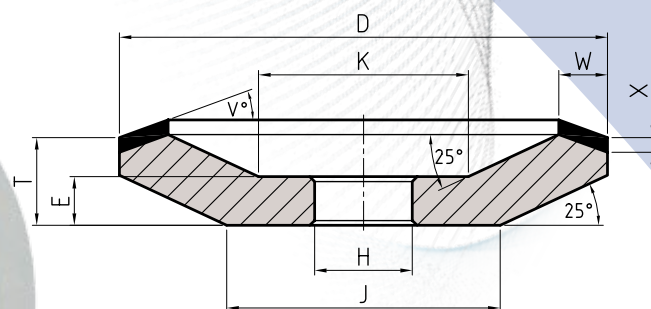


**DIACOM 6V9**  
D x X x U x H  
Grinding tool - cup



D	X	U	T	E	K
75	2	6	25	8	63
75	3	6	25	8	61
75	2	10	25	8	60
75	3	10	25	8	58
100	2	6	30	10	88
100	3	6	30	10	86
100	2	10	30	10	85
100	3	10	30	10	83
125	2	6	35	10	113
125	3	6	35	10	111
125	2	10	35	10	110
125	3	10	35	10	108
150	2	10	35	10	135
150	3	10	35	10	133

**DIACOM 12V5**  
D x W x X x H  
Grinding tool - cup



D	T	W	X	V°	K	J	E
75	15	4	2 3	10 20	45	36	10
75	15	6	2 3	10 20	41	36	10
100	16	6	2 3	10 20	66	56	10
100	18	10	2 3	10 20	48	56	10
125	18	6	2 3	10 20	84	82	10
125	18	10	2 3	10 20	72	82	10
150	20	6	2 3	10 20	100	102	12
150	20	10	2 3	10 20	92	102	12





# TOOL GRINDING AND SHARPENING

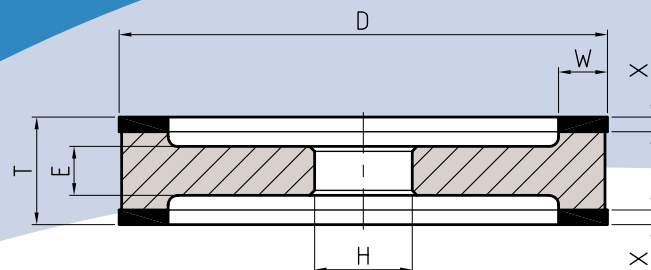
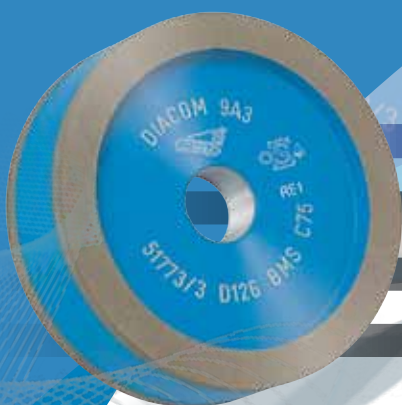
## 04



### DIACOM 9A3

D x W x X x H

Grinding tool - disc

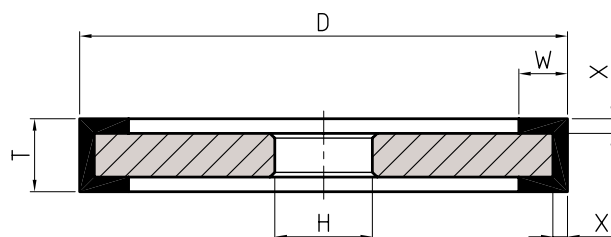


D	W	X	T	E
75	6	2 3 4	22	10
100	6 10	2 3 4	22	10
125	6 10	2 3 4	22	10
150	10 15	2 3 4	25	14
175	6 10 15	2 3 4	25	14
200	10 15	3 4	30	18

### DIACOM 9U1

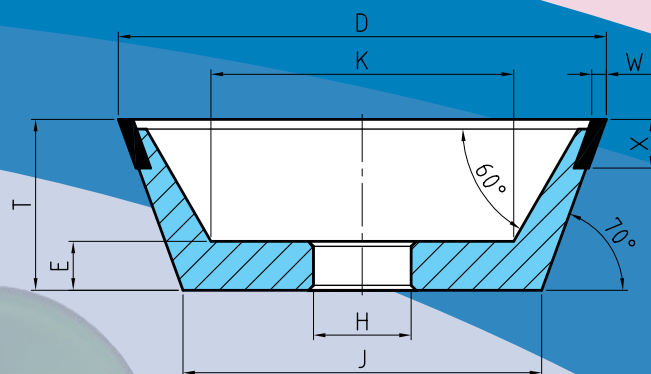
D x T x W x X x H

Grinding tool - disc



D	T	W	X
75	10 15	6 10	2 3
100	10 15	6 10	2 3
125	10 15	6 10	2 3
150	10 15	6 10	2 3
200	15	15	3

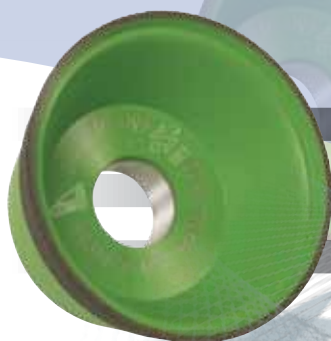
The standard bore diameter (H) is  $\varnothing 20 H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.



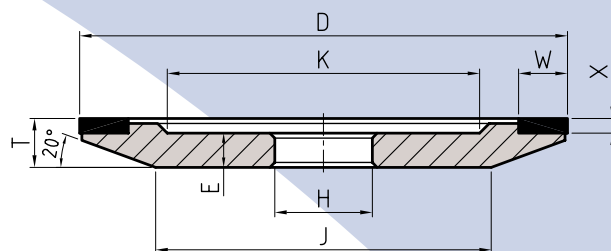
### DIACOM 11V9

D x X x U x H

Grinding tool - conical cup



D	X	U	T	E	K	J
40	1.5 2 3	5	18	8	22 21 19	26
50	2 3	5	20	8	29 27	34
75	1.5 2 3	6 10	30	9	46 45 43	52
90	1.5 2 3	6 10	35	10	55 54 52	64
100	1.5 2 3	6 10	35	10	65 64 62	74
125	1.5 2 3	6 10	40	10	84 83 81	95
150	1.5 2 3	6 10	50	10	98 97 95	113



### DIACOM 12A9

D x W x X x H

Grinding tool - disc



D	X	W	T	E	K(W,E)	J(X)
50	2 3		10			16 22
50		3		7 8	28 30	
50		5		7 8	24 26	
75	2 3		10			41 47
75		6		7 8	47 49	
75		10		7 8	39 41	
100	2 3		10			66 55
100		6		7 8	72 74	
100		10		7 8	64 66	
125	2 3		10			91 97
125		6		7 8	97 99	
125		10		7 8	89 91	
150	2 3		12			105 111
150		6		9 10	122 124	
150		10		9 10	114 116	
175	2 3		12			130 136
175		6		9 10	147 149	
175		10		9 10	139 141	
200	2 3		12			155 161
200		6		9 10	172 174	
200		10		9 10	164 166	







## TOOL GRINDING AND SHARPENING

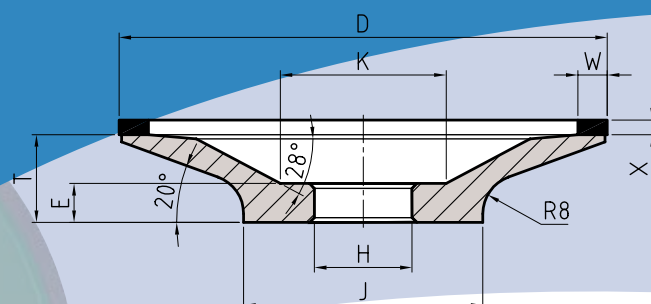
# 04



### DIACOM **12A2/45°S**

D x W x X x H

Grinding tool - cup

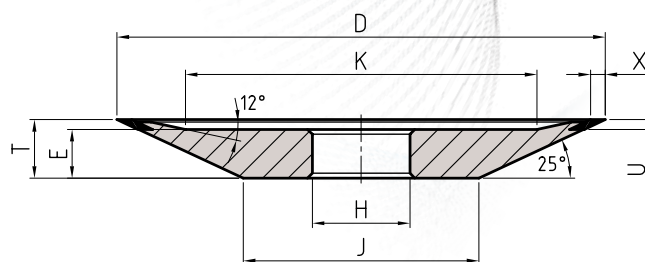
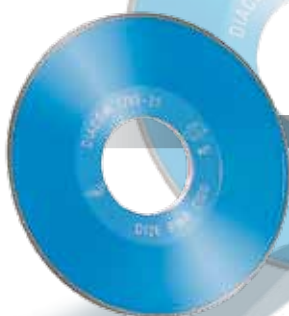


D	X	W	T	E	K	J
100	2 3 4	6	18	8	34	49
125	2 3 4	6	19	9	56	74
150	2 3 4	6	20	10	78	99
175	2 3 4	6	20	10	93	114
200	2 3 4	6	21	11	128	149

### DIACOM **12V9/25°**

D x X x U x H

Grinding tool - plate



D	X	U	T	E	K	J
100	3	2	12	10	72	50
125	3	2	13	10	88	70
150	3	3	16	10	86	82

The standard bore diameter (H) is  $\varnothing 20$  H7; other diameters and grinding tools of other dimensions are manufactured to order.

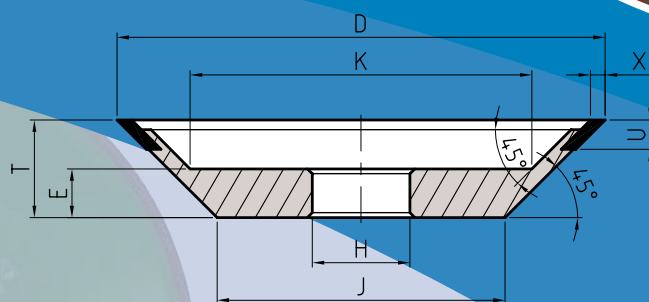




## DIACOM 12V9/45°

D x X x U x H

Grinding tool - cup

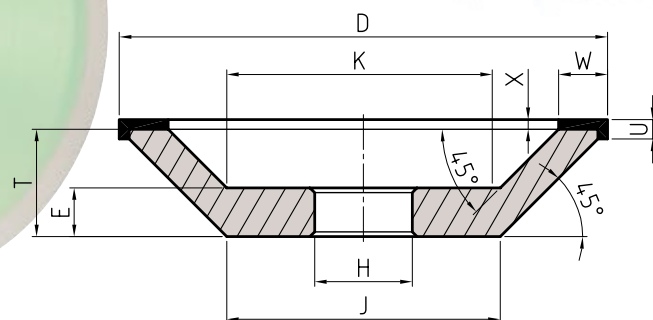


D	X	U	T	E	K	J
50	2	5	15	8	26	19
75	1.5 2 3	6	20	8	42 41 39	34
85	1.5 2 3	6	20	10	56 55 53	44
100	1.5 2 3	6 10	20	10	71 70 68	59
125	1.5 2 3	6 10	25	10	86 85 83	74
150	1.5 2 3	6 10	25	10	111 110 108	99
175	1.5 2 3	6 10	25	10	136 135 133	124

## DIACOM 12C9

D x W x X/U x H

Grinding tool - cup



D	X	W	T	E	U	K	J
50	1	3 5	18	10	2	28 24	14
75	2	6 8 10	22	10	4	39 35 31	31
100	2	6 8 10 12.5	22	10	4	64 60 56 51	56
125	2	6 8 10 12.5	22	10	4	89 85 81 76	81
150	2	8 10 12.5 15	22	10	4	110 106 101 96	106



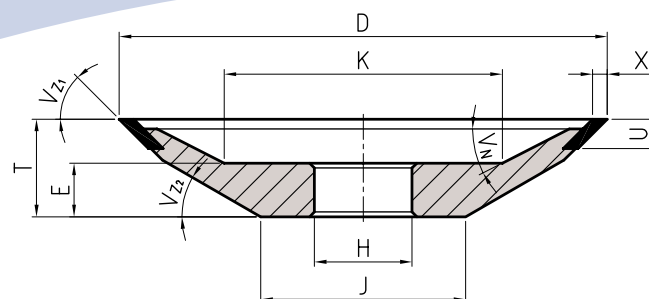
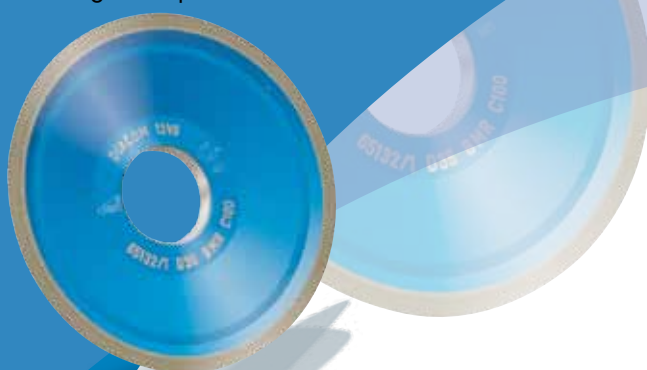


# TOOL GRINDING AND SHARPENING

04

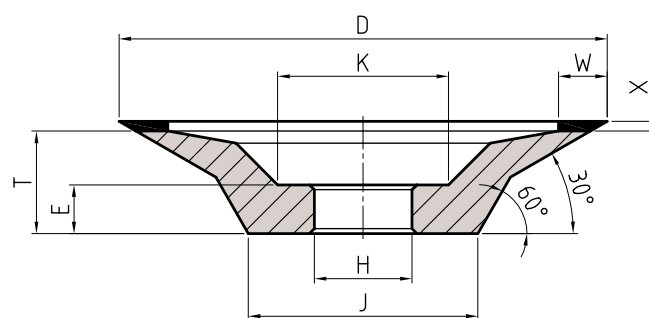
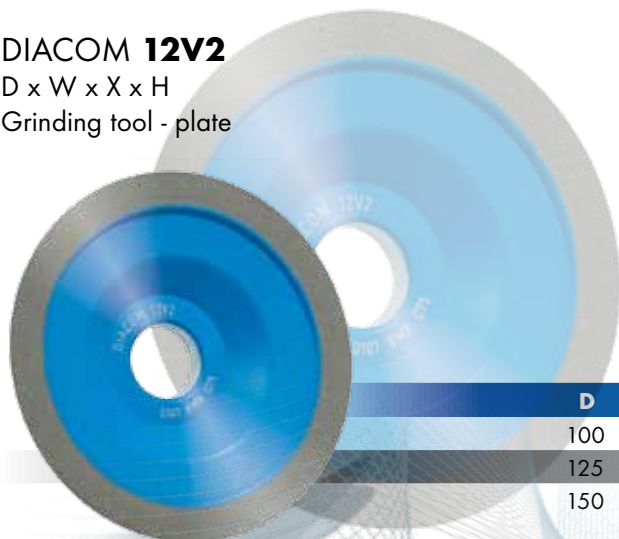


**DIACOM 15V9**  
D x X x U x H  
Grinding tool - plate



D	X	U	T	E	K	Vz <sub>1</sub>	Vz <sub>2</sub>	Vn	J <sub>1</sub>	F	J
75	2	6	13	6	38	45	30	22	59	5	43
75	3	6	13	6	38	45	30	25	59	5	43
85	2	6	15	8	52	45	30	27	69	7	45
100	2	6	20	11	57	45	30	25	82	12	42
100	3	6	20	11	57	45	30	27	82	12	42
150	2	6	20	11	76	30	20	14	122	12	56
150	3	6	20	11	76	30	20	15	122	12	56
150	2	6	20	11	79	45	30	14	134	12	92
150	3	6	20	11	79	45	30	15	134	12	92
175	2	8	25	11	85	45	30	18	155	15	103
200	2	6	25	11	95	45	30	15	184	17	125

**DIACOM 12V2**  
D x W x X x H  
Grinding tool - plate



D	W	X	T	E	K	J
100	10	2	23	10	35	47
125	10	2	23	10	60	72
150	10	2	23	12	89	98

The standard bore diameter (H) is  $\varnothing 20$  H7; other diameters and grinding tools of other dimensions are manufactured to order.







# TOOL GRINDING AND SHARPENING

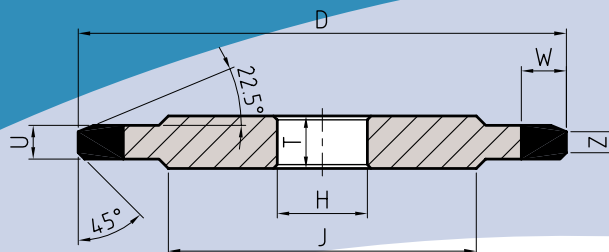
05



## PRODUCT RANGE FOR WOOD

### DIACOM 1SM

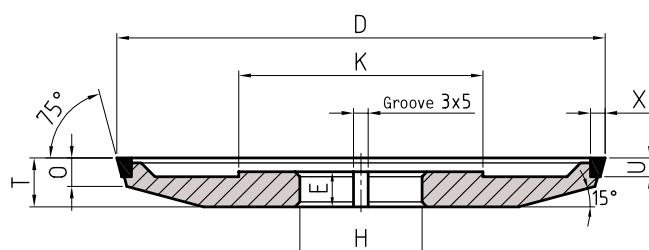
D x W x U/Z x H  
Grinding tool - disc



d	D	Z	W	U	T	J
4	75 100	0.9	6	4.5	7	51
6	75 100	1.9	6	4.5	7	51
8	75 100	2.8	6	5.0	7	51
10	75 100	3.7	6	6.4	7	51
12	75 100	4.7	6	7.4	7	51
14	75 100	5.7	6	8.4	7	51

### DIACOM VD-4B9

D x X x U x H  
Grinding tool - disc



D	U	X	H (H7)	T	E	K	O
75	3.0	3	25	10	8.0	50	4.5
100	1.8	3	25	9	8.2	50	3
100	3.0	3	25	10	8.0	50	4.5
100	3.8	3	25	10	7.2	50	5.8
100	4.0	4.5	25	10	7.0	50	6.2
125	1.8	3	25	12	11.2	62	3.3
125	3.8	3	25	14	11.2	62	5.8
150	1.8	3	25	12	11.2	75	6.3
150	3.8	3	25	14	11.2	75	3.3

\* Variants with H=25 and 3x5 groove (designated as VD), and H=32 without groove (designated as VB), are used the most. Other bore variants with nonstandard U and X values are made to order.

The standard bore diameter (H) is  $\varnothing 20$  H7; other diameters and grinding tools of other dimensions are manufactured to order.

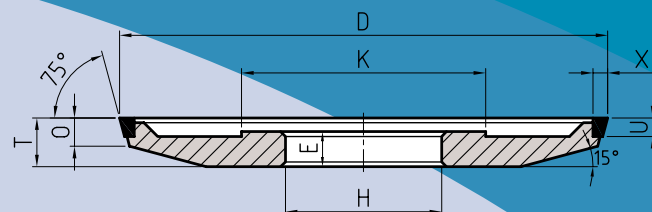




## DIACOM VB-4B9

D x X x U x H

Grinding tool - disc

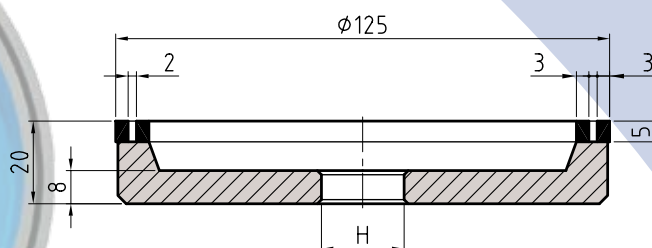


D	U	X	H (H7)	T	E	K	Ø
75	3.0	3	32	10	8.0	50	4.5
100	1.8	3	32	9	8.2	50	3
100	3.0	3	32	10	8.0	50	4.5
100	3.8	3	32	10	7.2	50	5.8
100	4.0	4.5	32	10	7.0	50	6.2
125	1.8	3	32	12	11.2	62	3.3
125	3.8	3	32	14	11.2	62	5.8
150	3.8	3	32	14	11.2	75	6.3
150	1.8	3	32	12	11.2	75	3.3

## DIACOM 6A2-DVU

125 x 8 x 5 x H

Grinding tool - cup





## TOOL GRINDING AND SHARPENING

05

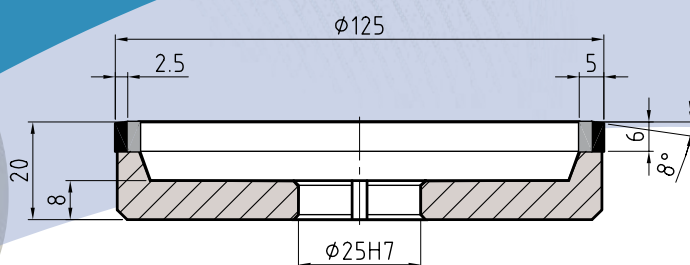
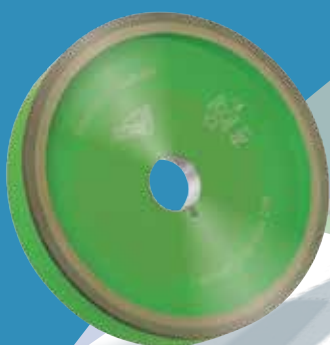


### PRODUCT RANGE FOR WOOD

#### DIACOM **VD 6A2-DV**

125 x 5 x 6 x 25

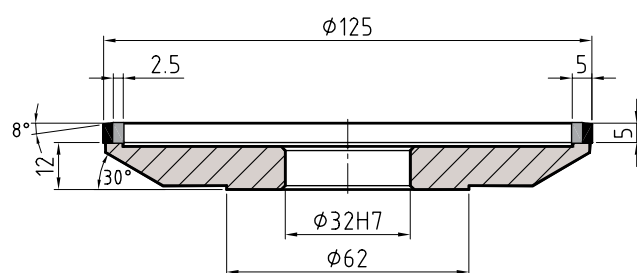
Grinding tool - cup



#### DIACOM **VB 6A2-DV**

125 x 5 x 5 x 32

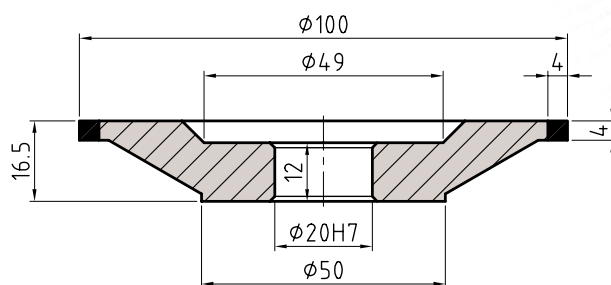
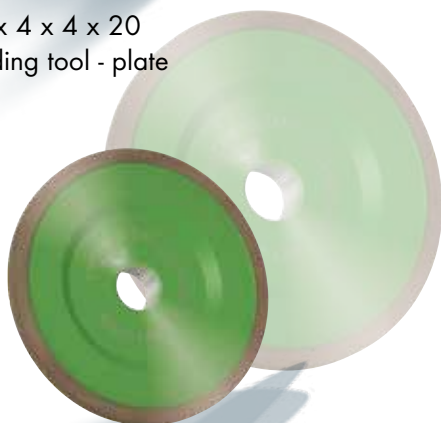
Grinding tool - disc



#### DIACOM **VD-12A1**

100 x 4 x 4 x 20

Grinding tool - plate

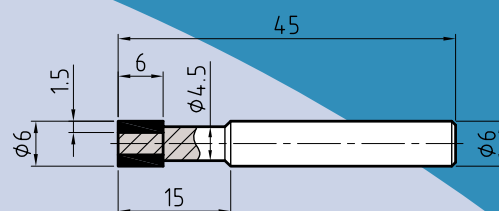
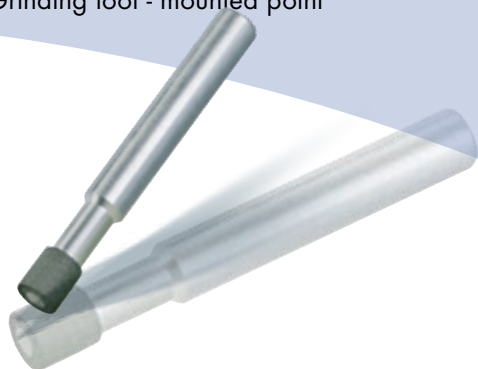


The standard bore diameter (H) is  $\phi 20 H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.

### DIACOM **US-1A1W**

6 x 6 x 1.5 x 6 x 45

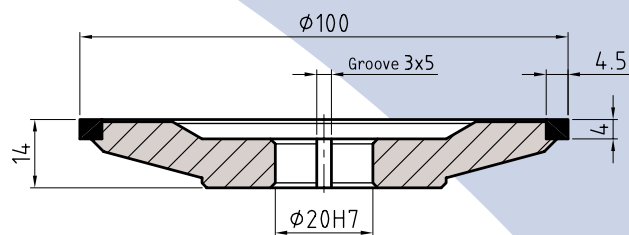
Grinding tool - mounted point



### DIACOM **VD-12B9**

100 x 4.5 x 4 x 20

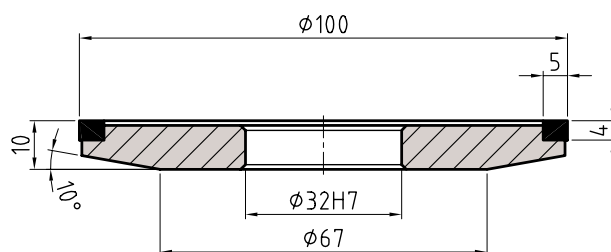
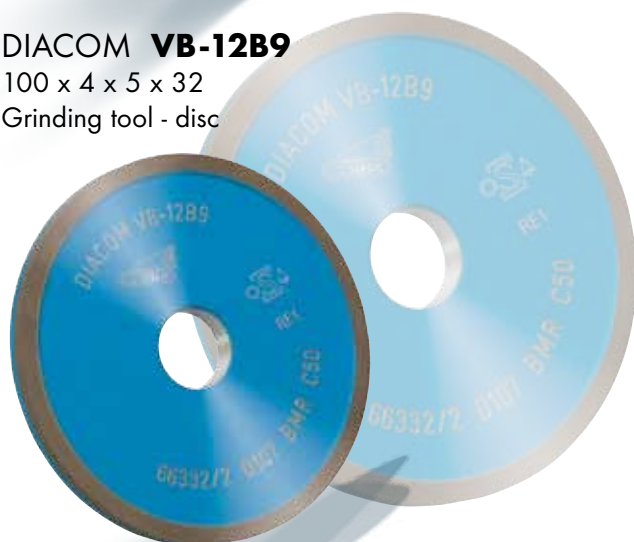
Grinding tool - plate



### DIACOM **VB-12B9**

100 x 4 x 5 x 32

Grinding tool - disc







## TOOL GRINDING AND SHARPENING

05

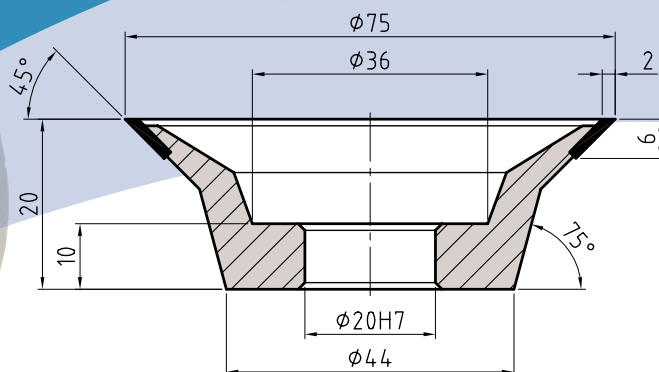
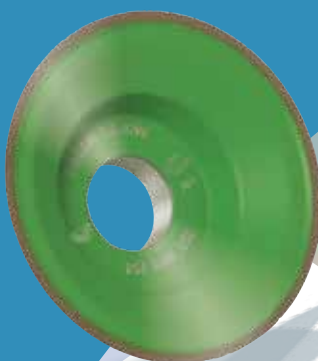


### PRODUCT RANGE FOR WOOD

#### DIACOM **US-12V9**

75 x 2 x 6 x 20

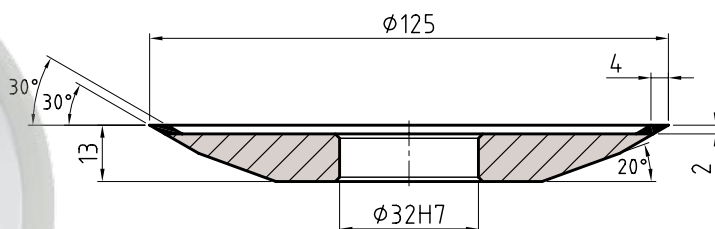
Grinding tool - cup



#### DIACOM **12V2-AS**

125 x 4 x 2 x 32

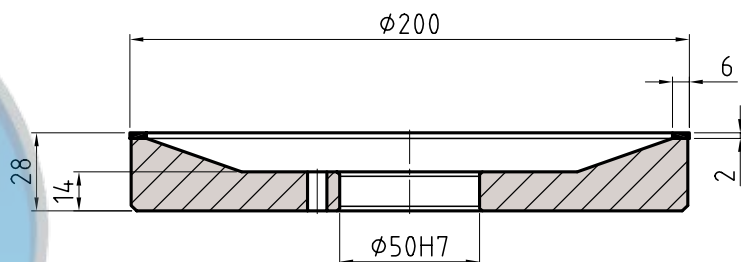
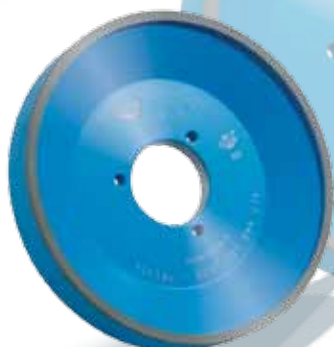
Grinding tool - disc



#### DIACOM **6A2G** (GÖCKEL)

200 x 6 x 2 x 50

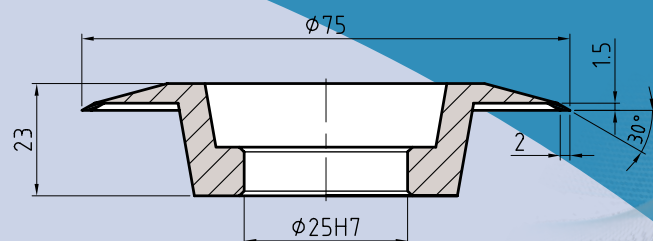
Grinding tool - plate



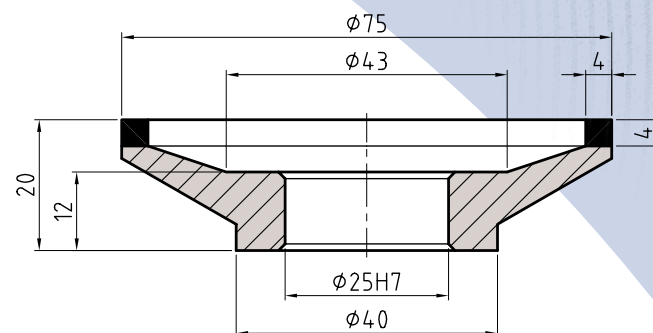
The standard bore diameter (H) is  $\varnothing 20 H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.



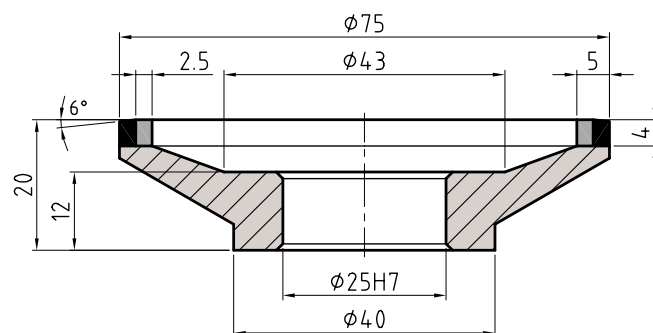
**DIACOM LL-11V2**  
75 x 2 x 1.5 x 25  
Grinding tool



**DIACOM LL-12A2**  
75 x 4 x 4 x 25  
Grinding tool - cup



**DIACOM LL-12A2-DV**  
75 x 5 x 4 x 25  
Grinding tool - cup






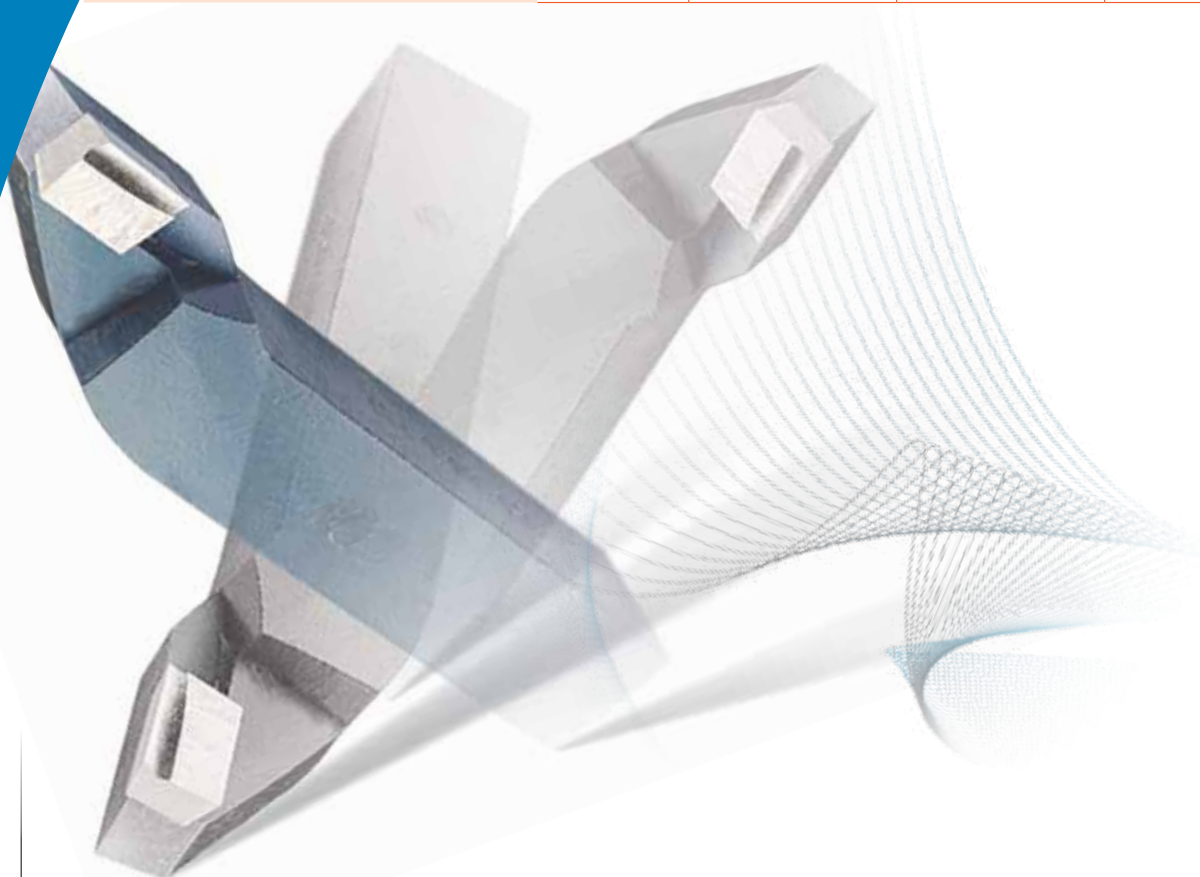
## TOOL GRINDING AND SHARPENING

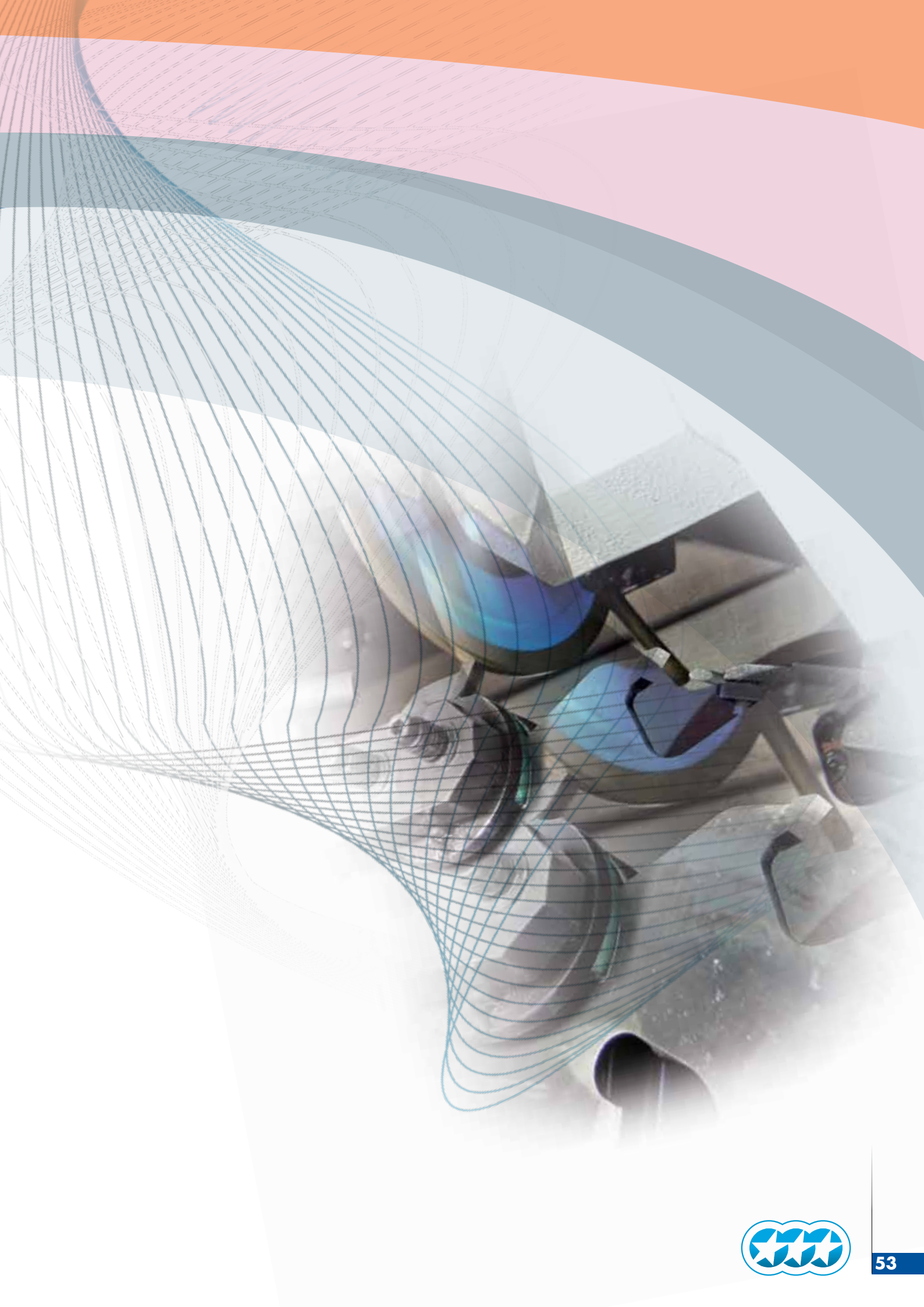
05



### QUALITY OF GRINDING TOOLS FOR TOOL GRINDING AND SHARPENING

GROUND MATERIAL		Grit type	Grit size	Bond	Concentration	Notes
Steels						
	Tool steel	B	46 - 126	BME, V80	75 - 100	V80 for wet grinding
	High-speed steels (HSS)	B	46 - 126	BMRT, V80	50 - 75	
Hard metals						
	Tungsten carbides	D	46 - 151	BMR, BMRT V80	75 - 125	
PCD, PCBN						
		D	10 - 30 micron	RJK, BR	100 - 125	
Stellites						
		B	64 - 126	BMR, BMRT	75 - 100	









# PROFILE GRINDING

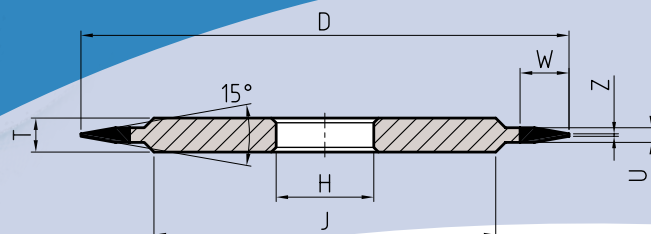
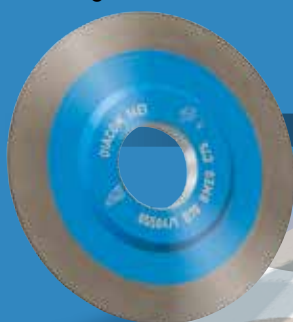
06



## DIACOM 14E1

D x W x Z x H

Grinding tool - disc

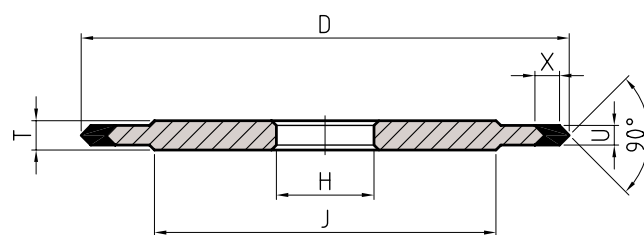


D	W	Z	T	J	U	V°
100	10	0.5	7	70	3	15
125	10	0.5	7	95	3	15
150	10	0.5	7	120	3	15

## DIACOM 14EE1

D x U x X/V° x H

Grinding tool - disc

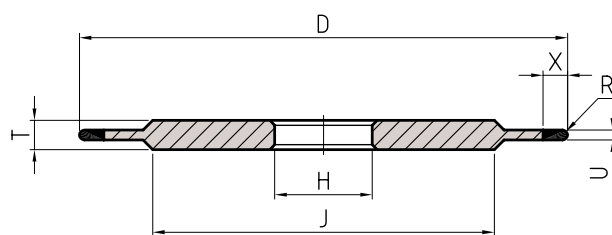


D	U	X	V°	J	T
125	4	5	45	95	6
150	4	3	90	120	6

## DIACOM 14F1

D x U x X/R x H

Grinding tool - disc



D	U	X	T	J
50	2 3 4 5	3 5	6	30
75	2 3 4 5	3 5	6	50
100	2 3 4 5	3 5	6	70
125	2 3 4 5	3 5	6	95
150	2 3 4 5	3 5	6	120
175	2 3 4 5	3 5	6	140
200	2 3 4 5	3 5	10	160
250	2 3 4 5	5 8	10	200


Produced on steel cores

The standard bore diameter (H) is  $\varnothing 20 H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.





## QUALITY OF GRINDING TOOLS FOR PROFILE GRINDING

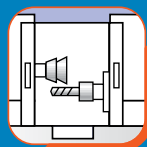
GROUND MATERIAL		Grit type	Grit size	Bond	Concentration	Notes
Steels						
	Tool steel	B	76 - 151	BMEG, V80	100 - 125	V80 for wet grinding
	High-speed steels (HSS)	B	76 - 151	BMRG, V80	100 - 125	
Hard metals						
	Tungsten carbides	D	46 - 151	BM4R, V80	100 - 125	





# CNC TOOL GRINDING

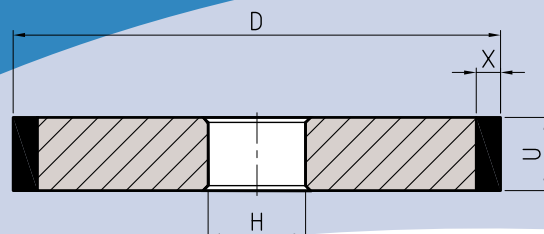
07



## DIACOM 1A1-WA

D x U x X x H

Grinding tool - disc

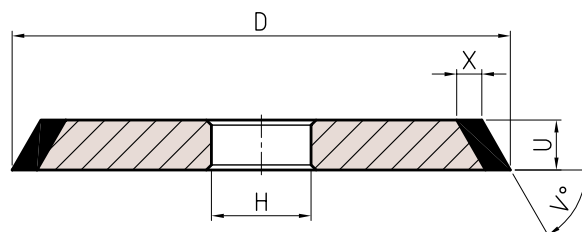


D	U	X	H	
50	4 6 10 12 15	3 4 5	20	
75	4 6 10	3 5	20	31.75
100	4 6 10 12 15	3 5 8 10	20	31.75
125	4 6 10 12 15	3 5 8 10	20	31.75
150	4 6 10 12 15	3 5 10	20	31.75

## DIACOM 1V1-WA

D x U x X x H

Grinding tool - disc



D	U	X	V°	H	
50	3 5	5 7	45	20	
75	6	3	45 70	20	31.75
75	10 15	3 5	60 70	20	31.75
100	6	3	45 70 75	20	31.75
100	10	3 5	70 75	20	31.75
125	6	3	45	20	31.75
125	6 8	5	70	20	31.75
125	10	3	45 70	20	31.75
125	10	5	80	20	31.75
125	12	5	75	20	31.75
125	15	5	70 80	20	31.75
150	10	3 4 5	45 70	20	31.75

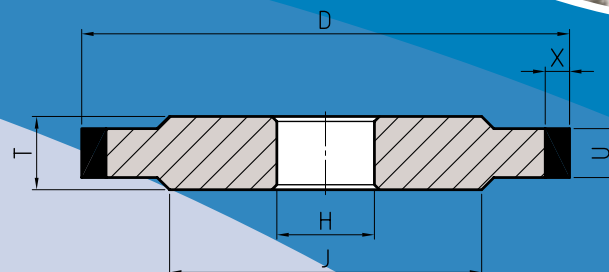
The standard bore diameter (H) is  $\varnothing 20 H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.



### DIACOM 14A1-WA

D x U x X x H

Grinding tool - disc

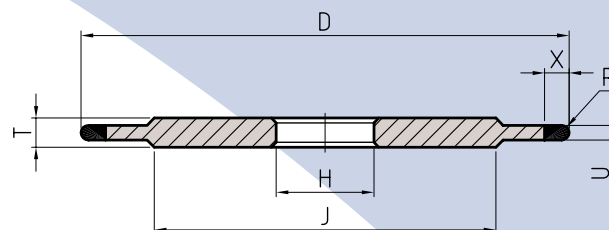


D	U	X	T	J	H
75	10	5	15 20	50	20 31.75
100	1 1.2 1.5	5	6	70	20 31.75
100	10 12 15	5 10	15 20	75	20 31.75
125	2 5	5	6	95	20 31.75
125	10 12 15	5 10	15 20	100	20 31.75
150	10 12 15	5 10	15 20	125	20 31.75

### DIACOM 14F1-WA

D x U x X x H

Grinding tool - disc



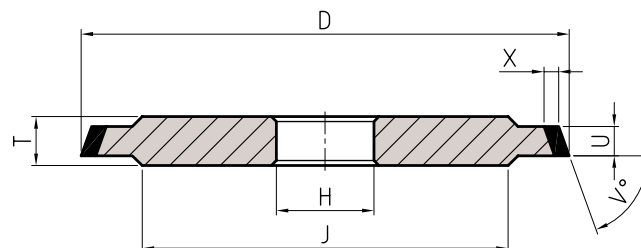
D	U	X	T	J	H
75	1 - 10	5	5 8 10	50	20 31.75
100	1 - 10	5	5 8 10	75	20 31.75
125	1 - 10	5	5 8 10	95	20 31.75
150	1 - 10	5	5 8 10	120	20 31.75

A steel base should be used for dimensions U=1 to U=3.

### DIACOM 14V1-WA

D x U x X x H

Grinding tool - disc



D	U	X	T	J	V°	H
75	6	3	10	50	45 70	20 31.75
75	10	3	15	50	70	20 31.75
100	6	3	10	75	45 70	20 31.75
100	10	3	15	75	70	20 31.75
125	6	3	10	100	45	20 31.75
125	10	3	15	100	45 70	20 31.75
125	10	5	15	100	80	20 31.75
125	12	5	15	100	75	20 31.75
125	15	5	20	100	70	20 31.75
150	10	3	15	125	45 70	20 31.75





# CNC TOOL GRINDING

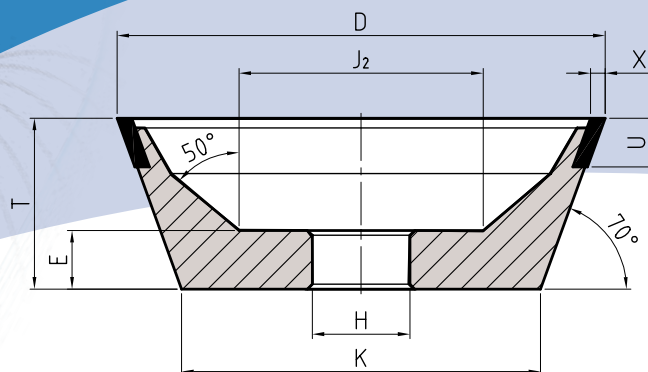
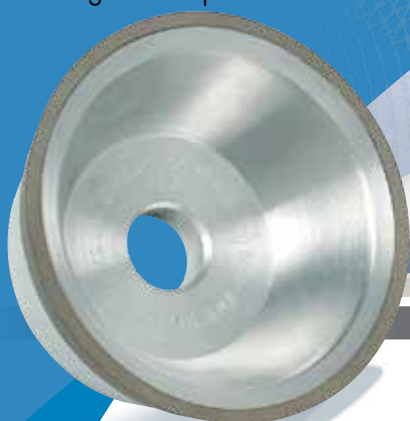
07



## DIACOM 11V9-WA

D x X x U x H

Grinding tool - cup

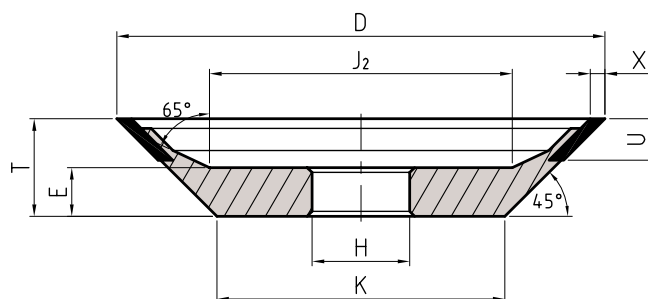


D	X	U	E	T	J <sub>2</sub>	K	H
75	3	10	12	30	37	52	20 31.75
100	3	10	12	35	50	74	20 31.75
125	3	10	12	35	75	99	20 31.75

## DIACOM 12V9-WA

D x X x U x H

Grinding tool - cup




D	X	U	E	T	J <sub>2</sub>	K	H
75	3	10	10	20	33	35	20 31.75
100	3	10	10	20	62	59	20 31.75
125	3	10	10	25	62	74	20 31.75

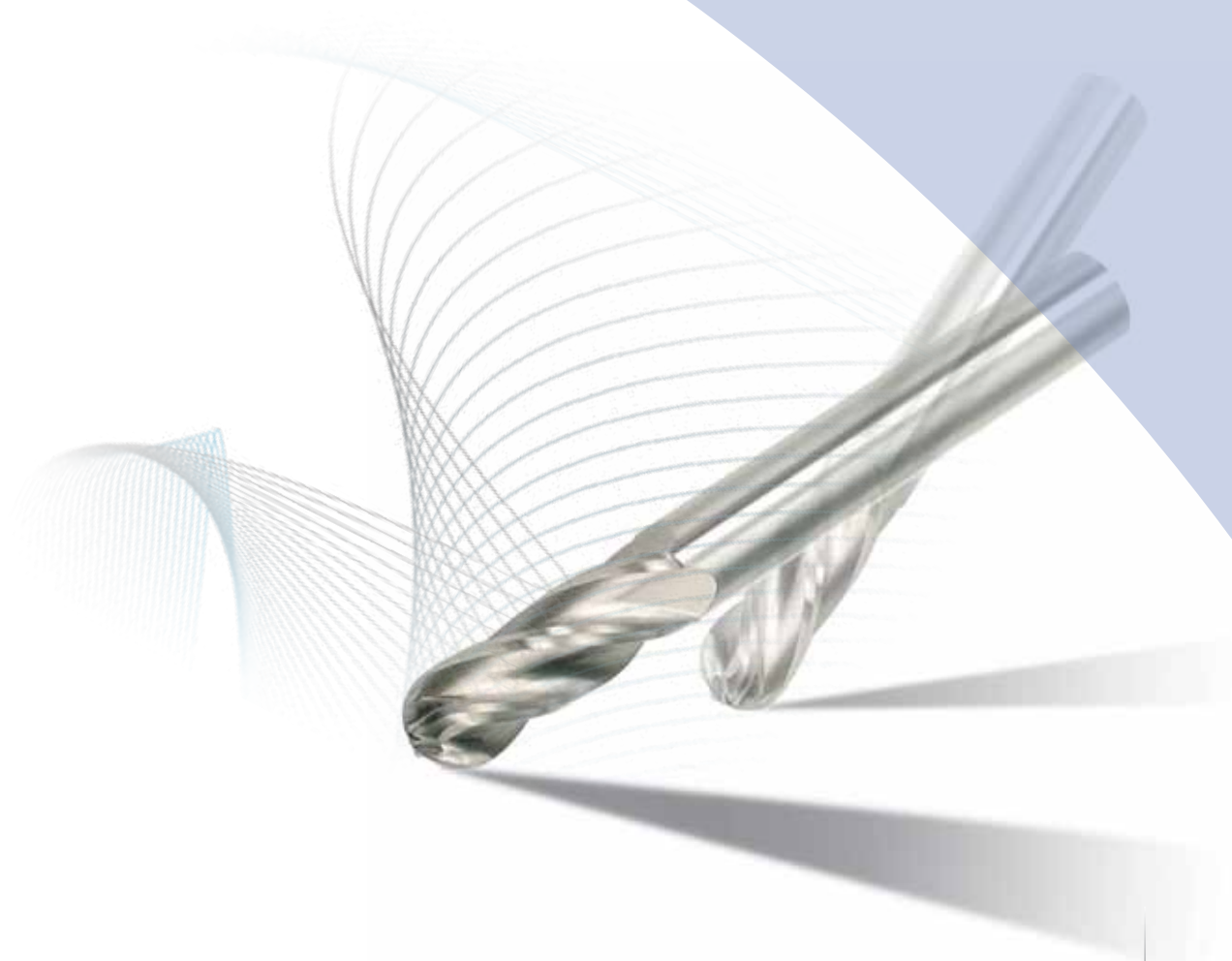
The standard bore diameter (H) is Ø 20 H7; other diameters and grinding tools of other dimensions are manufactured to order.





## QUALITY OF GRINDING TOOLS FOR CNC TOOL GRINDING

GROUND MATERIAL		Grit type	Grit size	Bond	Concentration
Steels					
	High-speed steels (HSS)	B	46 - 151	BMRT, V80T PIMR, BIMR	75 - 125 100 - 125
Trdine					
	Tungsten carbides	D	46 - 151	BMJS, V80T, PIMR, BIMR, PIMS, BIMS	75 - 100 75 - 125 100 - 125





# CUTTING

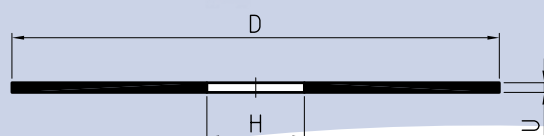
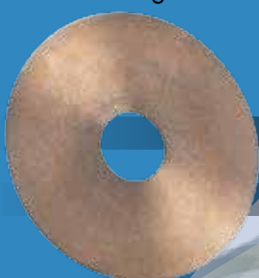
08



## DIACOM 1A1R-O

D x U x H

Corelles cutting-off wheel

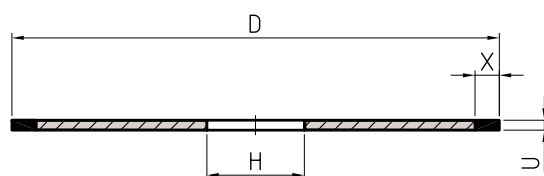


D	U	H
40	0.3 - 1.0	10
45	0.3 - 1.0	10
50	0.3 - 1.0	10
75	0.3 - 1.0	20
100	0.3 - 1.0	20

## DIACOM 1A1R

D x U x X x H

Cutter on metal blade

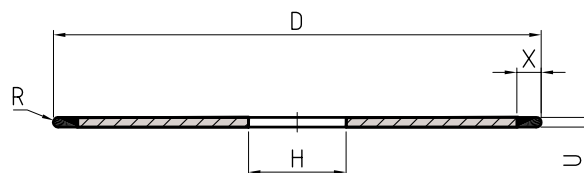


D	U	X
75	1.0 - 2.0	5
100	1.0 - 2.0	5
125	1.0 - 2.0	5
150	1.0 - 2.0	5 8
175	1.0 - 2.0	5
200	1.0 - 2.0	5 8
250	1.5 - 2.0	8
350	2.5	8

## DIACOM 1F1R

D x U x X x H

Cutter on metal blade





D	U	X	R
75	1.0 - 2.0	5	U/2
100	1.0 - 2.0	5	U/2
125	1.0 - 2.0	5	U/2
150	1.0 - 2.0	5 8	U/2
175	1.0 - 2.0	5	U/2
200	1.0 - 2.0	5 8	U/2
250	1.5 - 2.0	8	U/2
350	2.5	8	U/2

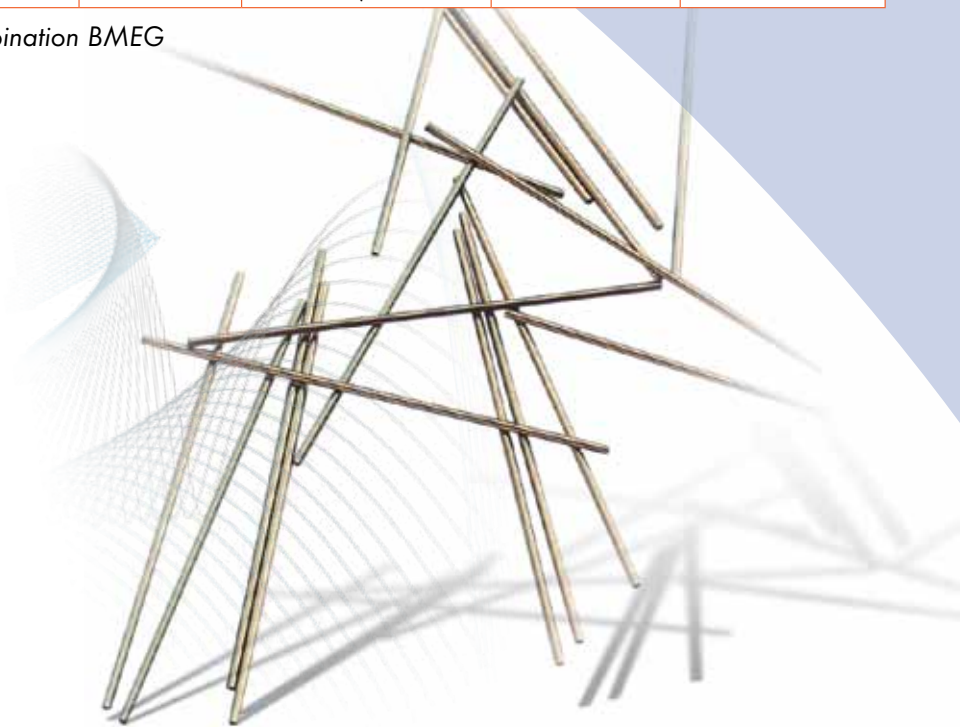
The standard bore diameter (H) is  $\varnothing 20 H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.



## QUALITY OF CUTTING TOOLS

GROUND MATERIAL		Grit type	Grit size	Bond	Concentration	Notes
Steels						
	Steels	B	35 - 76	BMRG, PIMR, BIMR	100 - 125	NO BODY
	Non-hardened	B	126 - 213	BM1R	100	WITH BODY
	Tool steel	B	107 - 181	BM1R, V80	100 - 125	
	High speed (HSS)	B	107 - 181	PIMR, BIMR	100 - 125	
Hard metals						
	Tungsten carbides	D	35 - 76	BMRG, PIMR, BIMR	100 - 125	NO BODY
	Tungsten carbides*	D	107 - 181	BMEG, BM1R, PIMR, BIMR	100 - 125	WITH BODY

\* during dry grinding or dry-wet combination BMEG



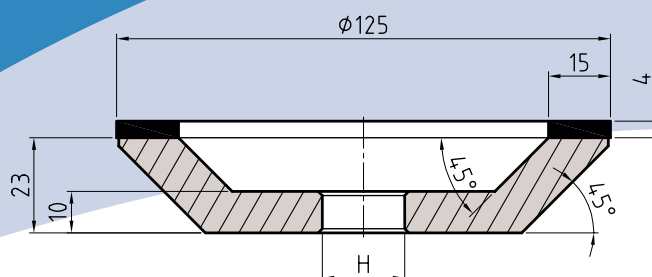
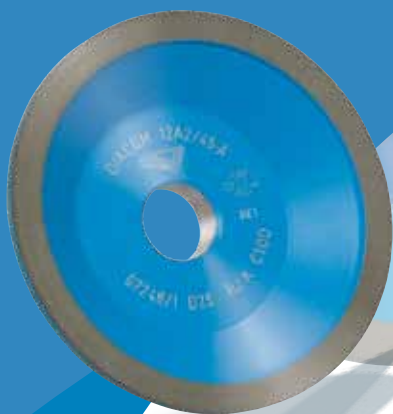


## GRINDING OF **PCD** and **PCBN**

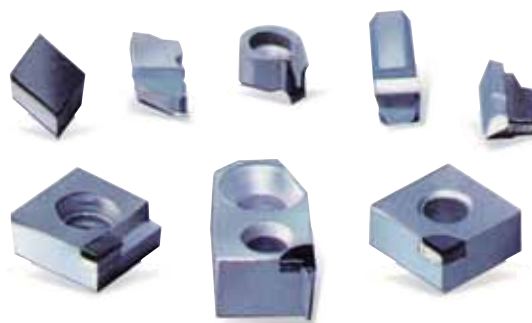
09



**DIACOM 12A2/45° - A**  
125 x 15 x 4 x H  
Grinding tool - conical plate



Resin bonded grinding tools for PCD/PCBN are intended for specialized high-precision machines with hydraulic feed, adjustable pressure and oscillatory movement of the workpiece (Lach, Ewag, Aghaton). They are emulsion-cooled.



The standard bore diameter (H) is  $\varnothing 20\ H7$ ; other diameters and grinding tools of other dimensions are manufactured to order.

## QUALITY OF GRINDING TOOLS FOR SURFACE GRINDING

GROUND MATERIAL		Grit type	Grit size	Bond	Concentration
	PCD and PCBN cutting tools	D	15 - 30	RJK	C100



# HAND GRINDING

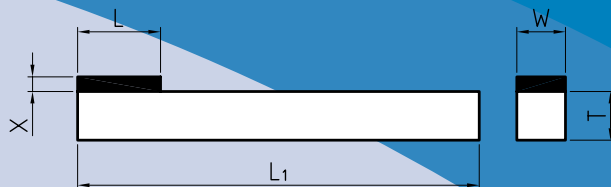
10



## DIACOM **HH1**

L x W x X x L<sub>1</sub>

Grinding tool - grinding file



L	W	X	L <sub>1</sub>	T
25	10	2 3	100 (125)	10
30	10	2 3	125	10
57	17	2 3	125	10

*Files of other dimensions are manufactured to order.*







P  
R  
O  
D  
U  
C  
T  
S  
A  
N  
G  
E  
C  
O  
M  
E  
T

**RESIN BONDED WHEELS** with  
silicon carbide and aluminium oxide

**FLEXIBLE ABRASIVES** from paper,  
cloth and non woven materials

**VITRIFIED BONDED GRINDING WHEELS**  
with SiC, Al-oxide and superabrasives

**DIAMOND  
DRESSING TOOLS**

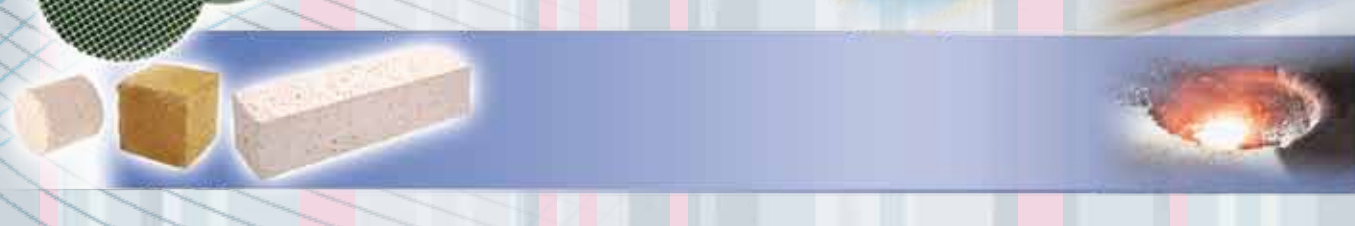
**RESIN BONDED GRINDING TOOLS**  
with diamond and CBN grits

**METAL BONDED  
diamond cutting-off tools**

**MAGNESITE AND SYNTHETIC BONDED  
GRINDING WHEELS** with  
silicon carbide and aluminium oxide

**INDUSTRIAL  
CLOTH**

**REFRACTORY  
PRODUCTS**







FACTORY STORE SWATYCOMET  
Zreče  
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