ООО "КТЦ РУ"
Адрес: 420053, Республика Татарстан,
г. Казань, ул. Декабристов, д. 85 Б
Моб: +7 (927) 249-10-49
Тел: +7 (843) 524-77-55
Факс: +7 (843) 212-01-71
E-mail: ktcru@mail.ru
www.ktckazan.ru

TOOLGAL
Innovative Diamond Tools

GRINDING WHEELS CATALOGUE

www.toolgal.com

TOOLGAL
Innovative Diamond Tools

Israel
Toolgal Head Office, Degania "A" 15120 Israel
Orit Korin
Tel: 00-972 4 6608014 Fax: 00-972 4 6752620
E-Mail: oritk@toolgal.com
www.toolgal.com

Germany
Yaron Sheffy, Rosmar Strasse 65
Tel: 00-49-22 34271749 Fax: 00-49-22 34273772
E-Mail: ysheffy@t-online.de Skype: ysheffy

Hungary
Tool-World Kft
Stracz Peter , 7666 Pogány, Templom köz 5.
Tel: 00-36 30 9082939
E-Mail: peter.stracz@tool-world.hu

Netherlands
A one Industrial Diamond & C.B.N
Yossi Shemesh , Amstelveen Turfschip 3 1186XA
Tel: 00-31 207851173 Fax: 00-31 848675666
E-Mail:yossi@aoneindustrial.com Skype: yshe999

Poland , Czech Republic, Slovakia
WEZA Aleksander Zak
Alek ,Chorzow ul.Niedziedziniec 14F/4, 41506
Tel: 00-48 48515145990
E-Mail: biuro@weza.pl

Spain
Pomdi HERRAMIENTAS DE DIAMANTE, S. A.
Alberto Oliva , MECO Cº de Villanueva, 20 28880
Tel: 00-34 91 8860061 Fax: 00-34 91 8860086
E-Mail: aoliva@pomdi.com
Site: http://www.pomdi.com/

Thailand
KNK INTECH CO.,LTD.
Mr. Nattana Kregnavakul ,Bangna Bangkok 111/47 Soi Lasal 32 10260
Tel: 00-662 7493122 Fax: 00-662 749 3828
E-Mail:nattana@knkintech.com

United States
TOOLGAL USA INDUSTRIAL CORP
David Ginzburg , Elberton Georgia 283 A Tribble St 30635
Tel: 00-17 062839556 Fax: 00-1706 283 9558
E-Mail: ginzburgd@toolgalusa.com
www.toolgal.com

Russian Federat

ООО "КТЦ РУ"
Адрес: 420053, Республика Татарстан,
г. Казань, ул. Декабристов, д. 85 Б
Моб: +7 (927) 249-10-49
Тел: +7 (843) 524-77-55
Факс: +7 (843) 212-01-71
E-mail: ktcru@mail.ru
www.ktckazan.ru

Table of Contents

Company Profile.....6
General Information.....7
General Safety Rules.....8
FEPA Sdandard.....9
Application Guide.....13
Straight Wheels.....25
1A1.....26
14A1&3A1.....27
1V1.....28
3V1&14V1.....29
4A9 & 4V9 Geometrical Reinforced Narrow Ring.....30
1F1,3F1 & 14F1.....31
1E1, 3E1 & 14E1.....32
9A3.....33
1A1 Centerless.....34
1A1R.....35
Cup Wheels.....37
11V9.....38
11A2.....39
11A9.....40
11V5.....41
12V9.....42
12A2 V20°-V45°.....43
12A9.....44
12V5.....45
4V2.....46
4A2.....47
4BT9.....48
6A2.....49
6A9.....50
Wheels For Inserts Grinding.....51
Inserts.....52
Grinding Wheels for Saws.....53
12V9.....54
4V2.....55
6A2.....56
6AA2.....57
VOLD 9.....58
14F1 Loroch, Tempo & Schmidt Machins.....59
Truing & Dressing Guide.....61

COMPANY PROFILE

"Toolgal Diamond Wheels" is a division of the Toolgal Group. (See www.toolgal.com), located in Kibbutz Degania 'A', Israel Founded in the early 60s.

Toolgal is made up of 3 Divisions:

1. Diamond, Cutting, Drilling & Polishing tools and segments for stone and construction (Concrete and Asphalt).
2. Diamond chain saw.
3. Grinding Wheels for hard metal and steel tools industry.

Toolgal Diamond Wheels is an experienced manufacturer of High Quality Diamond and Borazon grinding wheels.
Toolgal supplies the wheels for several applications mainly:

- Carbide Round tools on CNC machines: Flute Grinding, Gash Grinding, end facing, Clearance angle Cylindrical grinding.
- Insert grinding for machines such as: AGATHON, WENDT, HAAS, WAIDA and EWAG.
- Woodworking saws and tools.
- HSS tools.
- Cut off wheels.
- Many more which can be found in our catalogue.

Among Toolgal's customers' you can find top Carbide and HSS tools manufacturer such as ISCAR and IMC group, Vargus and Kennametal.
The wheels are sold to the domestic market and are exported to many countries in Europe, America and the Far East.

Toolgal acquired a highly respected reputation in the last 40 years for:

- Production High Quality products
- Full 'In House' control along the entire production process ("Powder to Product")
- Devoted customer service, by identifying customer needs and developing tools accordingly.
- Cooperation with our distributors for identifying the market's ever changing needs.
- Cooperation with the Israeli government Chief Scientist Office for special R&D projects.
- Hand on - customer technical support.

GENERAL INFORMATION

STORAGE

Diamond and CBN grinding wheels should be carefully stored in original package, keep core oiled.

MACHINES

Machines should be in good working condition, well maintained and free of vibration. Special attention should be given that the spindle runs true and that the spindle bearings are in good condition.

WHEEL MOUNTING

After cleaning and checking the mounting arbor and flange, the wheel should be running true to within 0.02 mm.

COOLANT

- synthetic oil - Most popular
- emulsion (water based)

Water with rust inhibitor added is sufficient for diamond grinding wheels. The life of CBN grinding tools can be recommended by significantly increased by using pure oil. In any case an emulsion with an oil concentration as manufacturer should be used.

CUTTING FLUIDS

Cutting fluids should be used whenever possible while using diamond wheels to reduce the heat generated by grinding and extend the wheel's life. If it is necessary to grind dry a corret resin-bond wheel should be used.

COOLANT FLOW

The best cooling effects is achieved when the outlet speed of the cooling lubricant is adapted to the peripheral speed of the grinding wheel, and the nozzle opening is only slightly wider than the grinding rim.

A small trickle of coolant occasionally applied is better than no coolant at all. This causes alternate heating and quenching, which can cause damage to the diamond wheel and carbide tools.

GENERAL SAFETY RULES

1. Always strictly follow the safety rules prescribed for Toolgal tools as well as the instructions for the use of machines and/or electrical tools.
   Always strictly keep to safety rules issued by organization responsible for the prevention of accidents.
2. To avoid risks associated with the use of rotating tools it is strongly recommended to use the utmost caution and concentration when working.
3. Always wear correctly sized gloves that allow the sensitivity necessary to operate the tool correctly and give adequate protection in the event of the blade being touched during use.
4. Install only tools in perfect condition that are recommended for the material to be worked and that are suitable for the type of machine used.
5. Do not use cracked or deformed tools.
6. Check that the balancing, keying and centering of rotary tools is carried out correctly.
7. Mount the tool correctly using the proper tightening and adjustment devices.
8. Remove all tightening and adjustment devices before use.
9. Check that the tool rotates in the correct direction.
10. Always use safety glasses or protective screens to protect the eyes.
11. The work area and the area around the machine must be free of obstacles.
12. The work area must be properly lit.
13. Before starting any kind of work, install all the safety devices prescribed by the builder of the machine or power tool.
14. The operator must be at least 18 years old and of the minimum age prescribed by the laws in force. They must be adequately trained in the use of the machine or power tool.
15. Avoid using machines or power tools in the event of any illness or physical condition that may reduce reflexes or awareness and increase exposure to risk.
16. Do not use the machine or power tool under the influence of alcohol or drugs.

FEPA STANDARD

GRINDING WHEELS SHAPES

Toolgal defines wheel types and dimensions according to the FEPA rules.
This catalogue shows the most common shapes and dimensions in accordance with those rules.
To order wheels please refer to the letter in the drawings, as shown on the drawing of the specific wheel you wish to order.

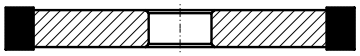
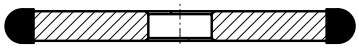
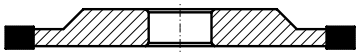
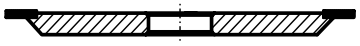
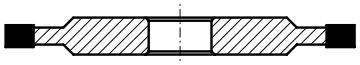
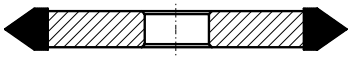
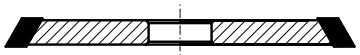
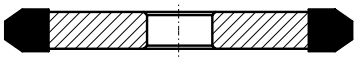
Sample order for 14A1 wheel:

Type	D	U	X	T	H	Specification
14A1	150	5	3	8	20	

Sample order for 1E1 wheel:

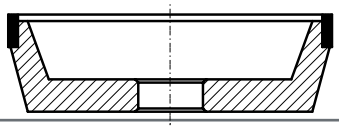
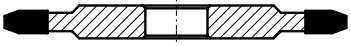
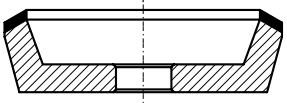
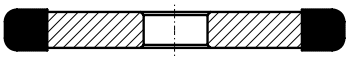
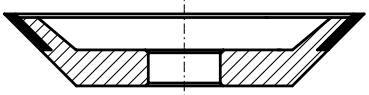
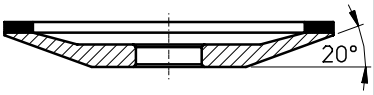
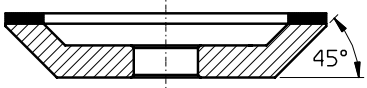
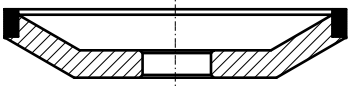
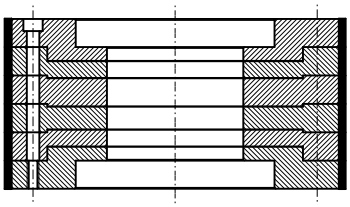
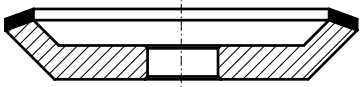
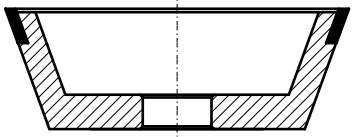
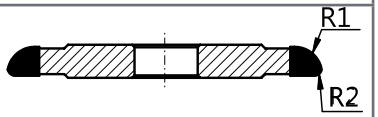
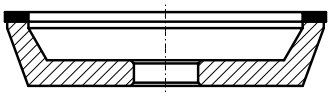
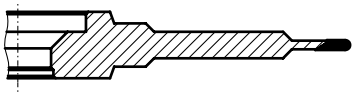
Type	D	U	X	T	H	Specification
1E1	150	6	2	6	25	

GRINDING WHEELS COMMON SHAPES DESIGNATIONS

Cod of designation	Outline drawing	Cod of designation	Outline drawing
1A1		1F1	
3A1		3F1	
4A9		14F1	
14A1		1E1	
1V1		3E1	
3V1		14E1	
14V1		1D1	

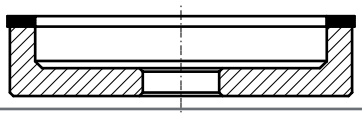
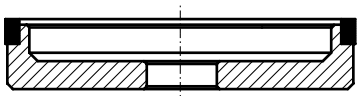
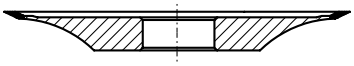
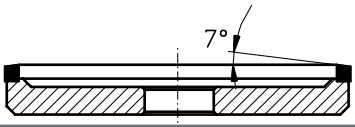
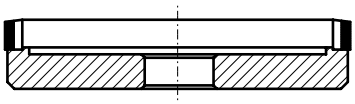
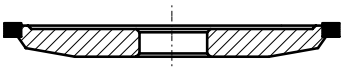
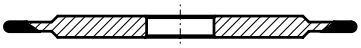
FEPA STANDARD

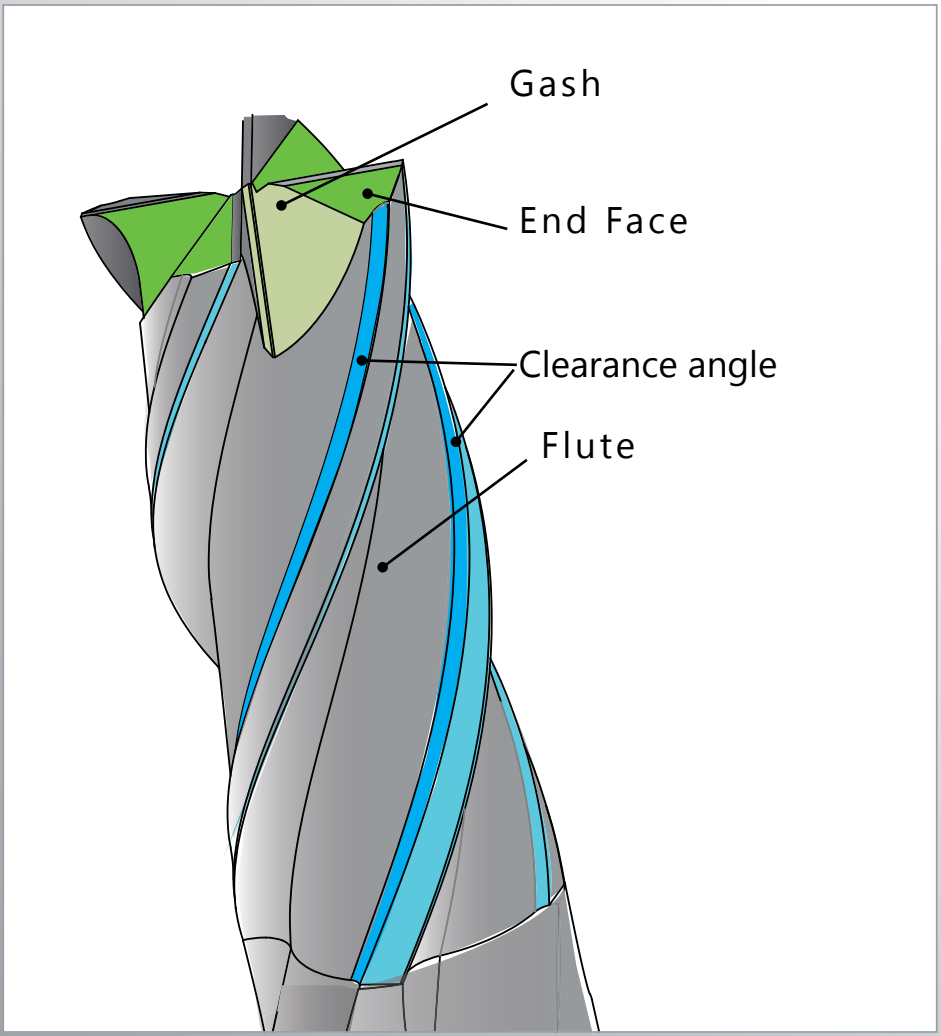
GRINDING WHEELS COMMON SHAPES DESIGNATIONS

Cod of designation	Outline drawing	Cod of designation	Outline drawing
3D1		11A9	
14D1		11V5	
1L1		12V9	
3L1		12A2	
14L1		12A2	
9A3		12A9	
CENTERLESS		12V5	
		4V2	
1A1R		4A2	
11V9		4BT9	
		14F1	
11A2		14F1	

FEPA STANDARD

GRINDING WHEELS COMMON SHAPES DESIGNATIONS

Cod of designation	Outline drawing	Cod of designation	Outline drawing
6A2		6A9	
4V2		12V9	
6A2		6AA2	
VOLD 9		14F1	



APPLICATION GUIDE

TOOLGAL'S BONDS

TOOLGAL BONDS ARE DIVIDED INTO 4 MAIN GROUPS:

- **Phenol group** (Toolgal code CB)
  Pressed with thermal stability - 200^{0}C
  Main applications: OD, Mini Tools, Cylindrical Grinding
- **Polyimide group** (Toolgal code PI)
  Pressed with thermal stability - 350^{0}C.
  Main applications: Inserts grinding, Dry grinding
- **Metal bond group** (Toolgal code HBBM or CR)
  with thermal stability - 670^0 C - 800^0 C
  Main applications: Groove grinding, Threaded tools, special profiling/shapes

Composite group (Toolgal code RM)
Double matrix resin & metal pressed with thermal stability - 350^{0}C
Main applications: Fluting, Gashing

Selection assistant for TOOLGAL bond system		
Grinding Wheels	Wear resistance	Recommendations for use
RM6/7		High-performance resin bond for deep grinding, particularly wear-resistant
RM5		High-performance resin bond for flute grinding
PI		More wear-resistant resin bond preferably wet grinding
CB		Standard resin bond for CNC application

RM SERIES GENERAL GRINDING ADVANTAGES

- Excellent surface quality at maximum feed rate
- Consistent work-piece dimensions for uniformity
- Very low spindle load reduces thermal and mechanical load
- High wear resistance for longer life
- Cost effectiveness
- Wide range fits all types of CNC machines

FLUTE GRINDING

RM6/7 Recommended for tough and long production runs Q.W 6.7
RM5 Recommended for standard production runs Q.W 4

- Low cutting force
- Fast cutting speed
- High feed rate at low load
- Superior surface quality
- Maintains perfect wheel form
- Preserves work-piece core diameter
- Longer intervals between dressing
- Optimal grit size D64 (270#)

RECOMMENDED CUTTING SPEED

BOND	APPLICATION	MATERIAL	M/S	SFM	FEED RATE	DEPTH OF CUT	QW mm3/ mm*s
RM 6	Flute	WC	18	3,150-3,550	80-120 mm/min	Up to 4mm	6.7
RM 7	Flute	WC	16	3,150-3,550	80-120 mm/min	Up to 3.6mm	6.7
RM 5	Flute	WC	18	3,150-3,550	80 mm/min	Up to 3.0mm	4

Qw' Table

$$Qw' = \frac{Ae \cdot F}{60}$$

Qw' - specific material removal rate [$mm^3/mm/min$]
F - feed rate [mm/min]
Ae - depth of cut [mm]
Toolgal's Wheel can generate the highest Qw' possible.
To maximize the Qw' please follow the recommendation bellow.

Ae (mm)	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5
40						2.7	3.0	3.3	3.7	4.0	4.3
50					2.9	3.3	3.8	4.2	4.6	5.0	5.4
60				3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.0
80			3.3	4.0	4.7	5.3	6.0	6.7	7.3	8.0	8.7
90		3.0	3.8	4.5	5.3	6.0	6.8	7.5	8.3	9.0	9.8
100	2.5	3.3	4.2	5.0	5.8	6.7	7.5	8.3	9.2	10.0	10.8
120	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	NR	NR
140	3.5	4.7	5.8	7.0	8.2	9.3	10.5	11.7	NR	NR	
160	4.0	5.3	6.7	8.0	9.3	10.7	12.0	NR	NR		
180	4.5	6.0	7.5	9.0	10.5	12.0	NR	NR			
200	5.0	6.7	8.3	10.0	11.7	NR	NR				
F (mm/min)											

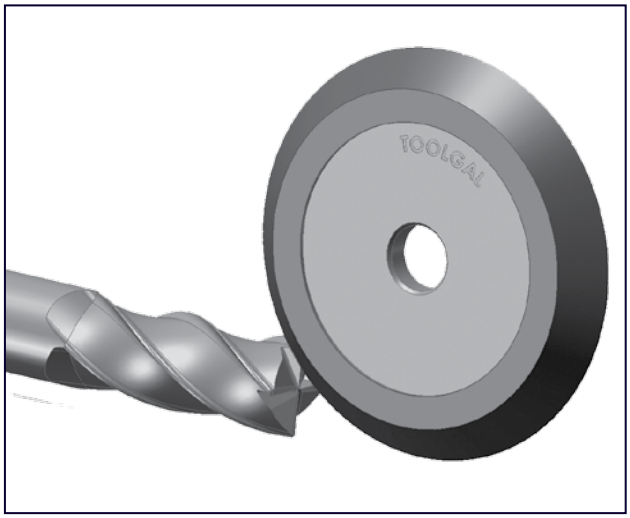
Non Economic Small Tools Standard Stock Removal High Stock Removal Not Recommended

GASH

RM6 Recommended for tough and long production runs

RM5 Recommended for standard production runs

- Good profile and corner stability
- Fast cutting speed
- Sharp wheel edge
- Optimal grit size: D64 C100 (270#)



RECOMMENDED CUTTING SPEED

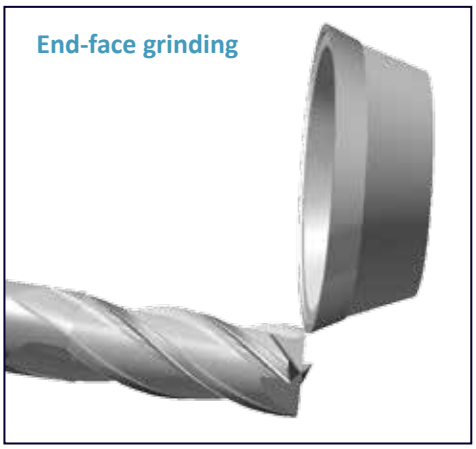
BOND	APPICATION	MATERIAL	M/S	SFM
RM 6	Gash	WC	22	3,150-3,550
RM 5	Gash	WC	22	3,150-3,550

CLEARANCE ANGLES

(end-face and OD)

CB4/RM6

- Ideal for end-face and outside diameter (OD) applications, first and second relief clerance angle
- Exceptional surface quality prevents tool cutting and edge chipping
- Optimal grit size D46 (400#)



MINI CARBIDE TOOLS

CB4 or PI

- Perfect edge stability
- Good surface finish
- Polished with up to very fine D7 grit(Mirror finishing)

GROOVE/THREADED TOOLS GRINDING

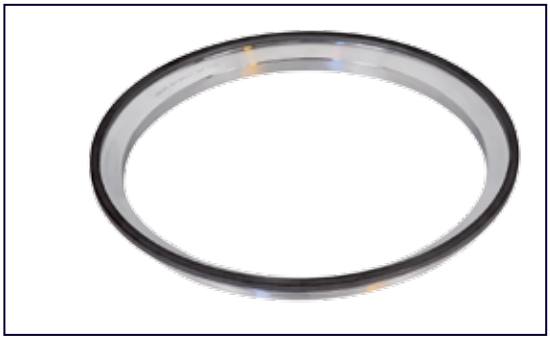
Pure Metal HBBM or RM515

Hard bond which keep corner and profile.
Recommended C100 – C150
Grit sizes D25 -D126 (760# -140#)

HSS CIRCULAR TOOLS GRINDINGON CNC MACHINES THE 9 SERIES

RM921G for fluting
RM901 for fluting
RM944 for gashing
CB951 for OD and End-Face
CB964 CBN wheels for dry grinding applications

INSERT GRINDING



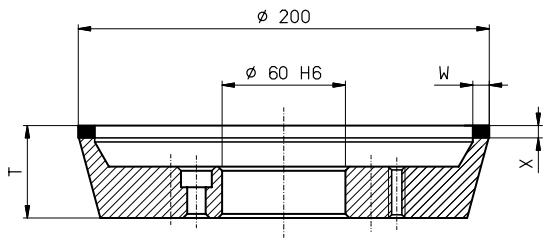
CB4 or PI

- Ideal for peripheral grinding of carbide inserts to achieve highly polished surface on MACHINES such as:**WAIDA** , **AGATHON**, **EWAG** and **Wendt**
- Long dressing interval
- Durable with high wear resistance (0.1µm per insert)

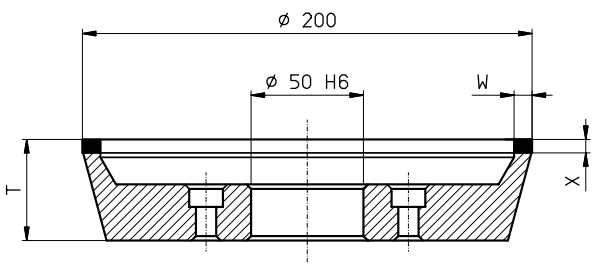
- TOOLGAL CB4 or PI
- Gives the wheel long life time
- Gives long interval between dressing
- Gives the inserts excellent finishing Less than 5µm chipping on edge surface maximizes the cost effectiveness of your inserts production

WORKPIECE	BOND	GRIT SIZE
Standard tungsten carbide inserts	CB or PI family High performance resin bond	D35-D54
Polished tungsten carbide inserts		D15-D35

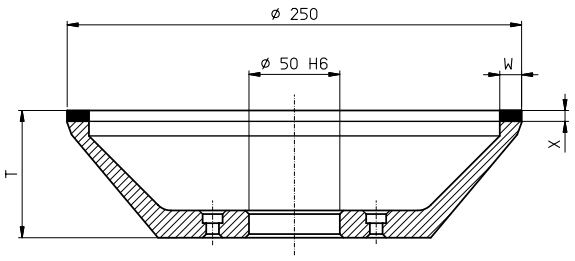
Shape 11A2B
WAIDA



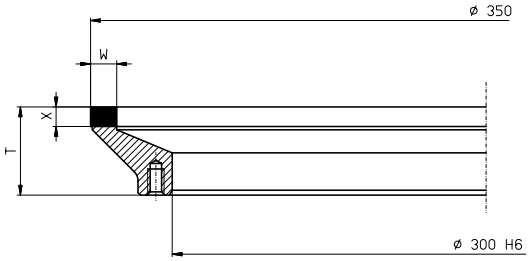
Shape 11A2B
EWAG, COBRON



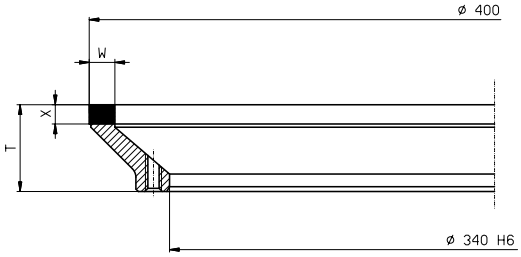
Shape 11A2B
EWAG, COBRON



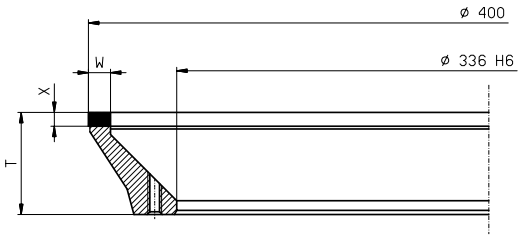
Shape 12A2JT
AGATHON 350



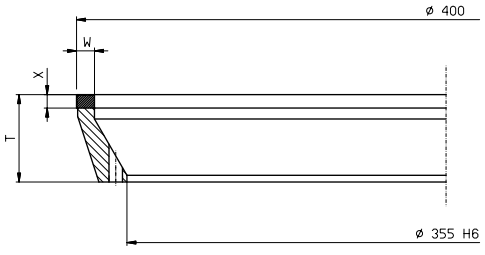
Shape 12A2JT
AGATHON 400 PENTA



Shape 11A2H
WENDT WAC 735
CENTRO



Shape 11A2H
WENDT WAC 735
QUATTRO



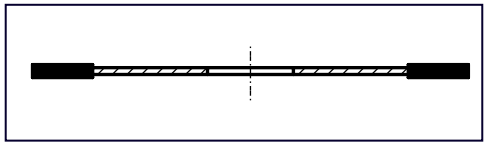
Grain Size Vs. Surface Quality (Ra)

FEPA GRIT		MEAN ROUGHNESS RA (µm)		SURFACE QUALITY	GRINDING PROCESS
DIAMOND	CBN	DIAMOND	CBN	N	
-	B301	-	2.10	N8	
-	B251	-	1.77	N8-N7	Very Rough Grinding
-	B213	-	1.41	N7	
-	B181	-	1.12	N7-N6	
-	B151	-	0.75	N6	
-	B126	-	0.66	N6	
D181	B107	0.53	0.53	N6-N5	
D151	B91	0.50	0.50	N6-N5	Rough Grinding
D126	B76	0.45	0.45	N6-N5	
D107	B64	0.40	0.40	N5	
D91	B54	0.33	0.33	N5-N4	Semi Finish Grinding
D76	B46	0.25	0.25	N5-N4	
D64	-	0.18	-	N4	
D54	-	0.16	-	N4-N3	Fine Grinding
D46	-	0.15	-	N4-N3	
MD24	-	0.12	-	N3	
MD20	-	0.05	-	N3-N2	Ultrafine Grinding
MD10	-	0.025	-	N2-N1	

	N1	N2	N3	N4	N5	N6	N7	N8
Ra (μ m)	0.025	0.05	0.10	0.2	0.4	0.8	1.60	3.20
Ra (μ m)	0.500	0.80	1.25	2.5	5.0	8.0	16.01	32.0
Ra (μ m)	0.400	0.63	1.00	0.2	4.0	6.3	10.0	16.0

1A1R CUT-OFF WHEELS

For wet and dry cutting/slicing of tungsten-carbide and steel parts
Diameter 75-200 mm



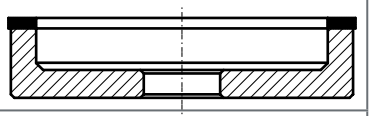
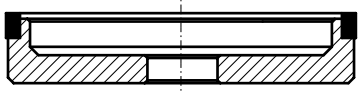
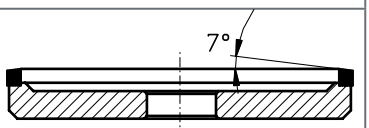
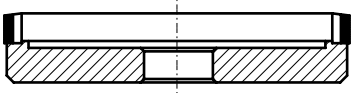
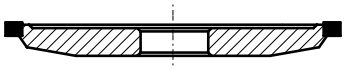
Specifications:

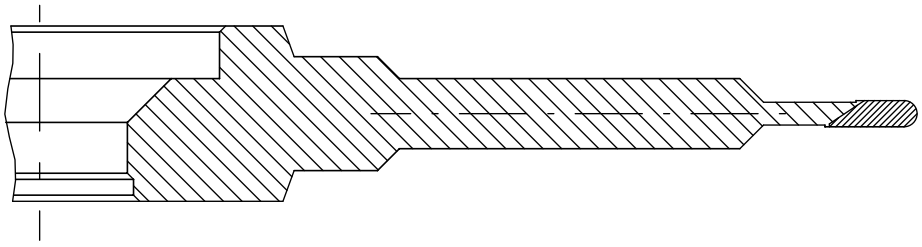
DIAMOND FOR TUNGSTEN-CARBIDE		CBN FOR HSS/STEEL	
Wet	Dry	Wet	Dry
RM501 D126 C100	PI203 D126 C100	RM901 B126 V240	CB964 B126 V180

Wood working and saw blades grinding applications

Face grinding – CB475 D46, D600 C100
Side grinding – C470/5
Top (Peripheral) grinding – CB475
Profiling TIGRA CNC– CB331, CB475 ,
C125-HAND, C100

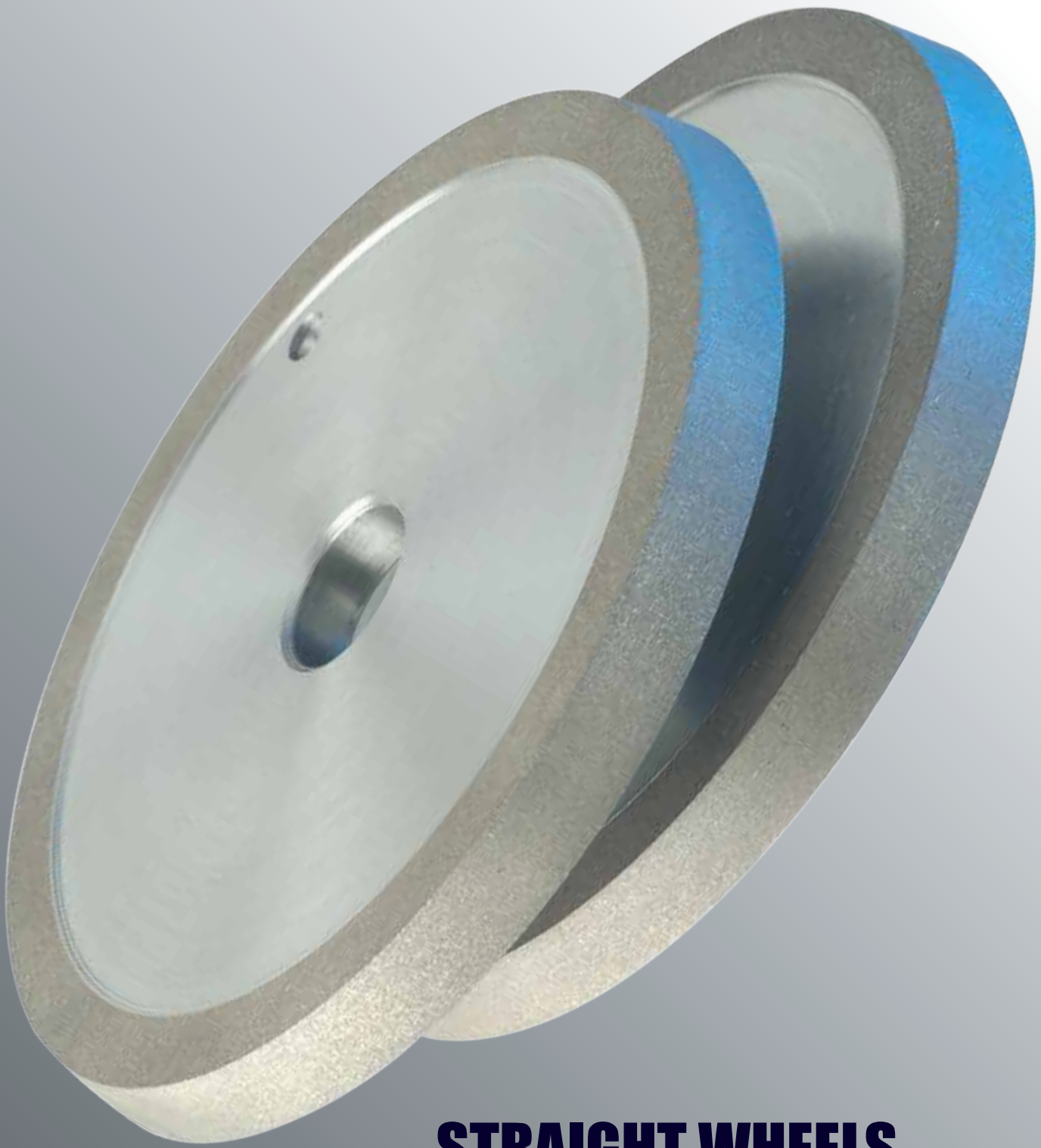
HSS saw blade grinding (Loroch,
SCHMIDT TOMPO) – CB971-V240, CB967-V210

Cod of designation	Outline drawing
6A2	
6A9	
4V2	
12V9	
6A2	
6AA2	
VOLD 9	



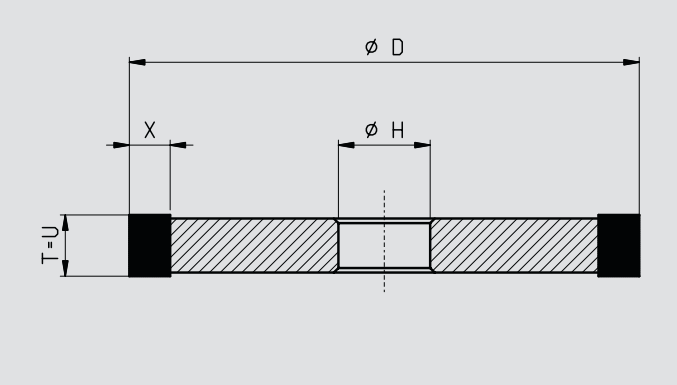
ADDITIONAL APPLICATIONS

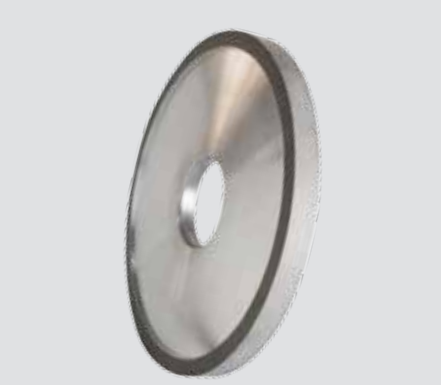
Cermet grinding – C451, CB352
WC/STEEL grinding – CB967
Crashing wheels- CR bond series
Dry Grinding
WC CB475, PI202 (C75)
HSS CB964 (V180), applicable for wet grinding applications too



STRAIGHT WHEELS

1A1





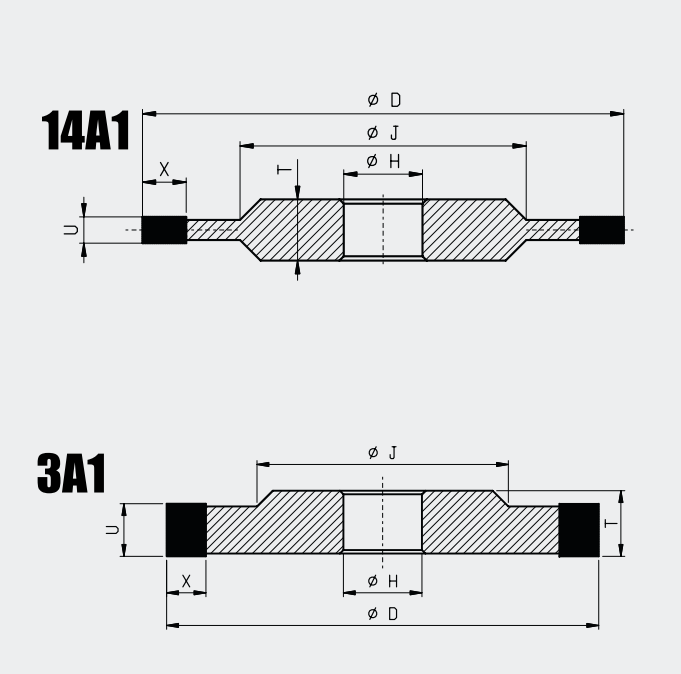
		X		Bonds available				
DØ	T	X6	X10	Diamond			CBN	
50	6,8,10	•		CB4	RM5	RM6/7	CB9	RM9
75	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
100	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
125	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
150	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
Special 175	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
Special 200	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
special 250	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
Special 305	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
Special 350	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
Special 400	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
Special 500	6,10,12,15	•	•	CB4	RM5		CB9	RM9

Other dimensions available on request - Please indicate required T ,X and H

SAMPLE ORDER:

TYPE	D	U	X	H	Application
1A1	100	6	10	20	

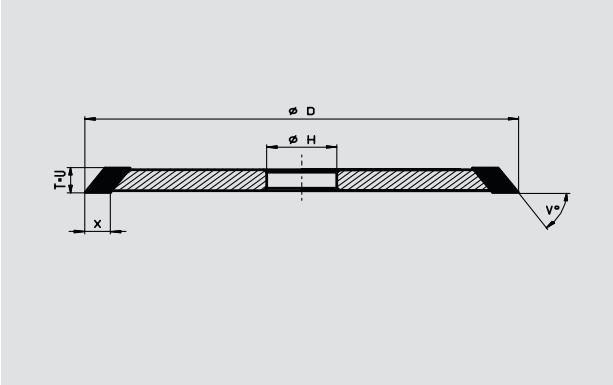
14A1 & 3A1

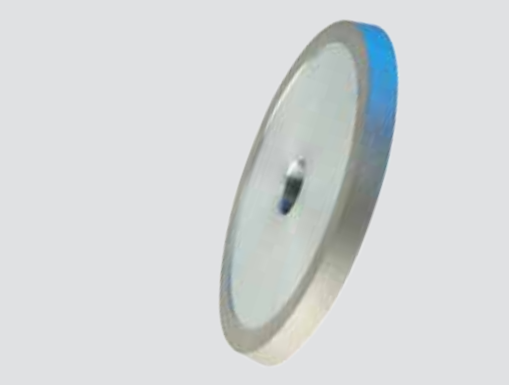


		X		Bonds available				
DØ	U	X6	X10	Diamond			CBN	
50	2,4,5	•		CB4	RM5		CB9	RM9
50	6,8,10	•	•	CB4	RM5	RM6/7	CB9	RM9
75	2,3,4,5	•		CB4	RM5		CB9	RM9
75	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
100	2,3,4,5	•		CB4	RM5		CB9	RM9
100	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
125	2,3,4,5	•		CB4	RM5		CB9	RM9
125	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
150	2,3,4,5	•		CB4	RM5		CB9	RM9
150	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
Special 175	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
Special 200	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
special 250	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
Special 305	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
Special 350	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
Special 400	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
Special 500	6,10,12,15	•	•	CB4	RM5		CB9	RM9

Other dimensions available on request - Please indicate required U ,X and H

1V1





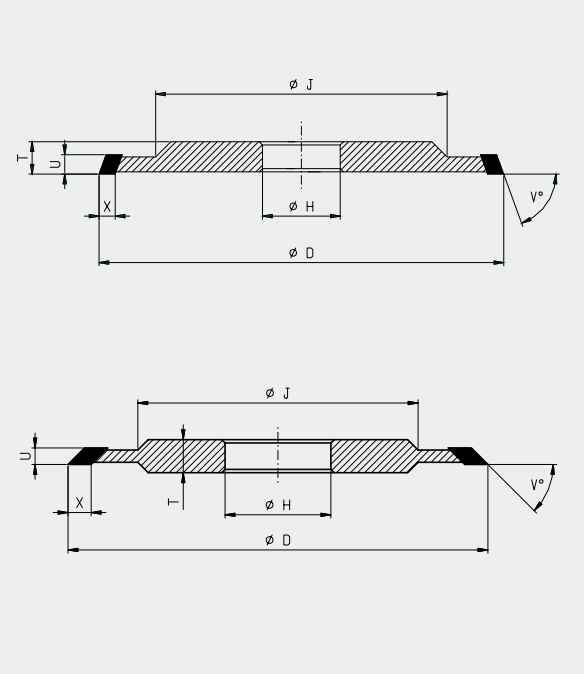
		X		Bonds available				
DØ	T	X6	X10	Diamond			CBN	
50	6,8,10	•	•	CB4	RM5	RM6/7	CB9	RM9
75	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
100	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
125	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
150	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
Special 175	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
Special 200	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9

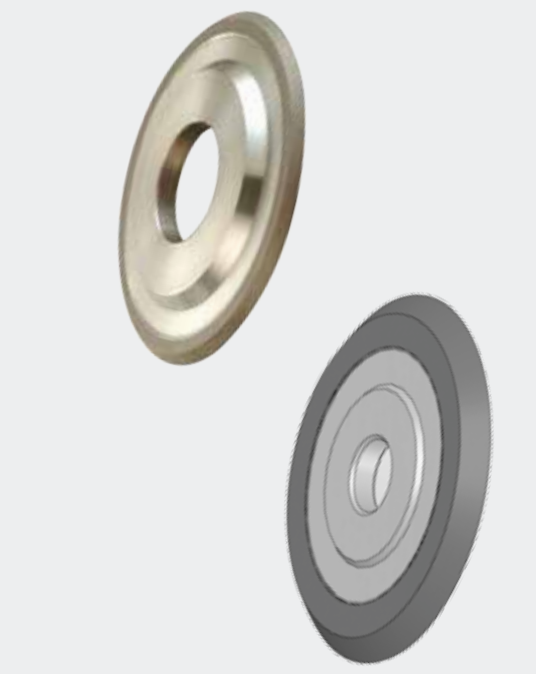
Other dimensions available on request - Please indicate required T ,X,V and H
Toolgal determine angle inside the ring

SAMPLE ORDER:

TYPE	D	U	X	V⁰	H	Application
1V1	100	6	10	45	20	

3V1 & 14V1



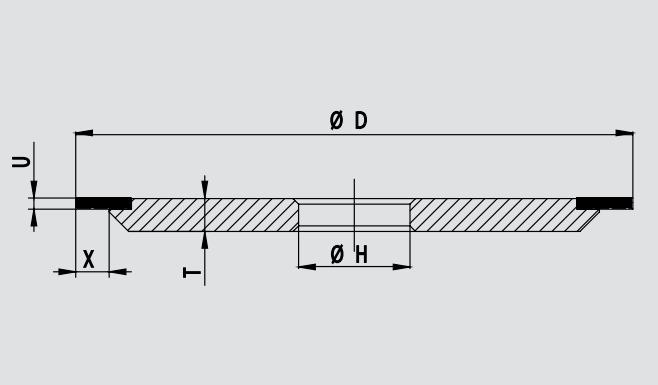


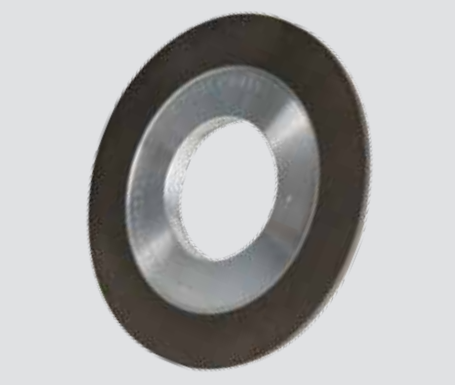
		X		Bonds available				
DØ	U	X6	X10	Diamond			CBN	
50	2,4,5	•		CB4	RM5		CB9	RM9
50	6,8,10	•	•	CB4	RM5	RM6/7	CB9	RM9
75	2,3,4,5	•		CB4	RM5		CB9	RM9
75	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
100	2,3,4,5	•		CB4	RM5		CB9	RM9
100	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
125	2,3,4,5	•		CB4	RM5		CB9	RM9
125	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
150	2,3,4,5	•		CB4	RM5		CB9	RM9
150	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9
Special 175	6,8,10,12,15	•	•	CB4	RM5		CB9	RM9
Special 200	6,8,10,12,15	•	•	CB4	RM5	RM6/7	CB9	RM9

Other dimensions available on request - Please indicate required U ,X,V and H

4A9 & 4V9

Geometrical Reinforced Narrow Ring





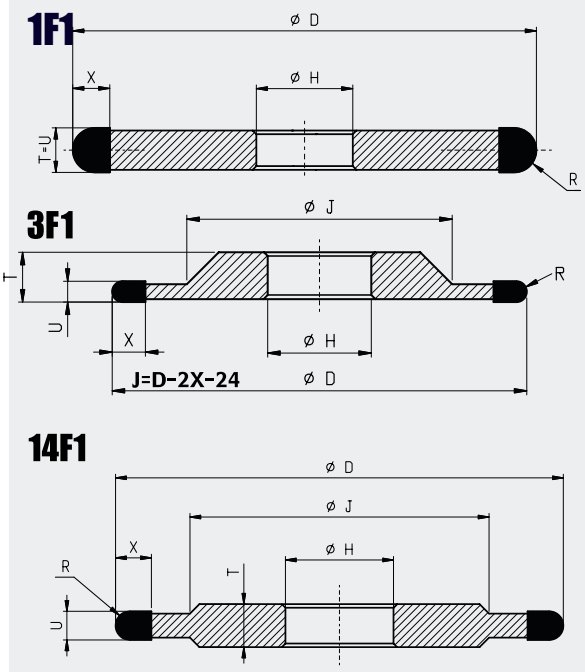
		X	Bonds available			
DØ	U	X6	Diamond		CBN	
50	0.8, 1, 1.5, 2 ,2.5 ,3	•	CB4	RM5	CB9	RM9
75	0.8, 1, 1.5, 2 ,2.5 ,3	•	CB4	RM5	CB9	RM9
75	0.8, 1, 1.5, 2 ,2.5 ,3	•	CB4	RM5	CB9	RM9
100	0.8, 1, 1.5, 2 ,2.5 ,3	•	CB4	RM5	CB9	RM9
125	0.8, 1, 1.5, 2 ,2.5 ,3	•	CB4	RM5	CB9	RM9
150	0.8, 1, 1.5, 2 ,2.5 ,3	•	CB4	RM5	CB9	RM9

Other dimensions available on request - Please indicate required T X and H

SAMPLE ORDER:

TYPE	D	U	X	V⁰	H	Application
4A9 & 4V9	100	1	6	If needed	20	

1F1 , 3F1 & 14F1



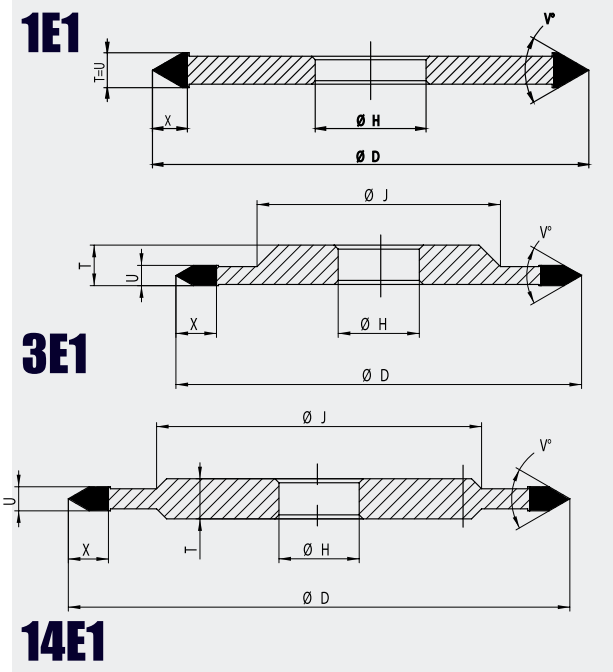
		X		Bonds available				
DØ	U	X6	X10	Diamond			CBN	
100	2,3,4,5	•		CB4	RM5		CB9	RM9
100	6,8,10,12,15,20	•	•	CB4	RM5	RM6/7	CB9	RM9
125	2,3,4,5	•		CB4	RM5		CB9	RM9
125	6,8,10,12,15,20	•	•	CB4	RM5	RM6/7	CB9	RM9
150	2,3,4,5	•		CB4	RM5		CB9	RM9
150	6,8,10,12,15,20	•	•	CB4	RM5	RM6/7	CB9	RM9
175	2,3,4,5	•		CB4	RM5		CB9	RM9
175	6,8,10,12,15,20	•	•	CB4	RM5		CB9	RM9
200	1.8,2,3,6	•		CB4	RM5		CB9	RM9
200	1.8,2,3,6	•	•	CB4	RM5		CB9	RM9

Other dimensions available on request - Please indicate required U X and H

SAMPLE ORDER:

TYPE	D	U	X	H	T	R	Application
3F1	175	3	6	20	14	1.5	

1E1, 3E1 & 14E1



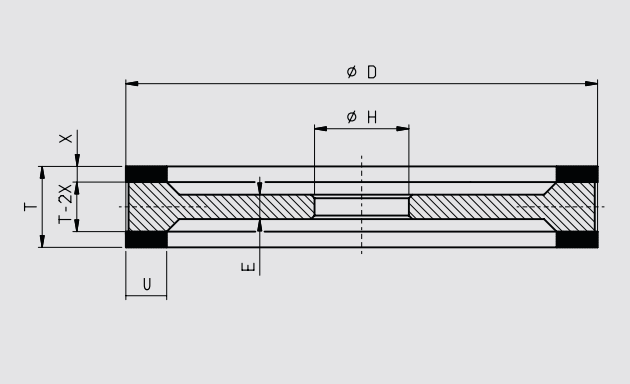
			Bonds available					
DØ	U	X	Diamond				CBN	
100	2,3,6,10	6,8,10	HBBM	CB4	RM5	RM6	CB9	RM9
125	2,3,6,10	6,8,10	HBBM	CB4	RM5	RM6	CB9	RM9
150	2,3,6,10	6,8,10	HBBM	CB4	RM5	RM6	CB9	RM9
175	2,3,6,10	6,8,10	HBBM	CB4	RM5	RM6	CB9	RM9
200	2,3,6,10	6,8,10	HBBM	CB4	RM5	RM6	CB9	RM9

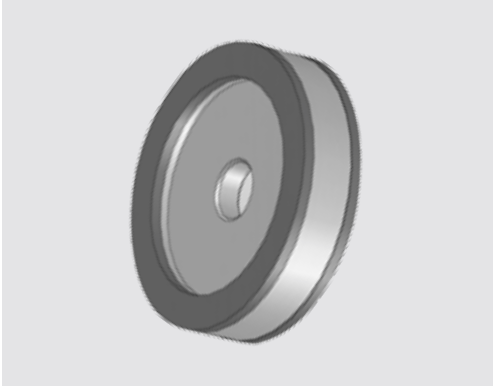
Other dimensions available on request - Please indicate required U ,X, V and H
Toolgal determine angle inside the ring

SAMPLE ORDER:

TYPE	D	U	X	V⁰	H	application
1E1	125	10	10	30	20	

9A3





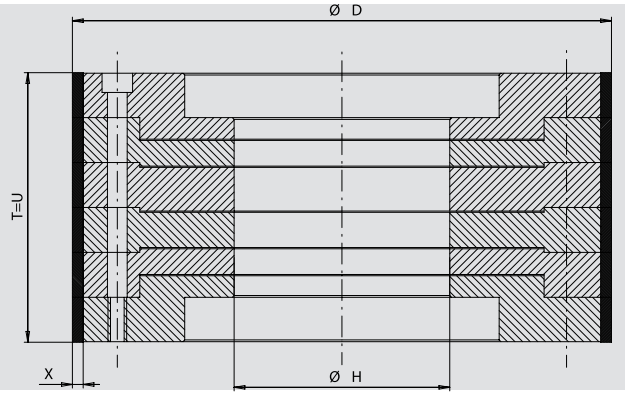
			Bonds available			
DØ	U	X	Diamond		CBN	
100	6,10	3,4,5	CB4	RM5	CB9	RM9
125	6,10	3,4,5	CB4	RM5	CB9	RM9
150	6,10	3,4,5	CB4	RM5	CB9	RM9
175	6,10	3,4,5	CB4	RM5	CB9	RM9
200	6,10	3,4,5	CB4	RM5	CB9	RM9

Other dimensions available on request - Please indicate required U1,U2 , X and H

SAMPLE ORDER:

TYPE	D	U1	U2	X	T	H	Application
9A3	175	6	4	6	14	1.5	

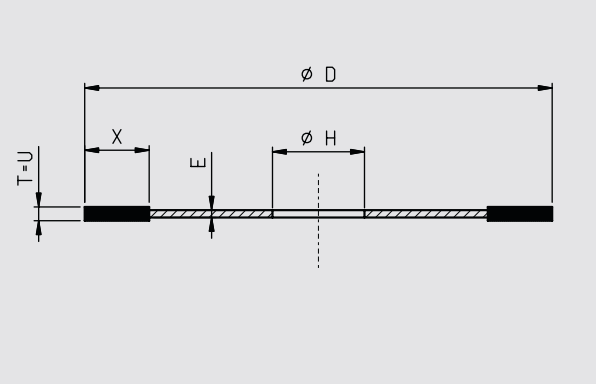
1A1 CENTERLESS



			Bonds available
DØ	T	X	Diamond
305	101.6 , 150, 205	6	CB
350	101.6 ,150, 205	6	CB
400	101.6 ,150, 205	6	CB
450	101.6,150, 205	6	CB

Other dimensions available on request - Please indicate required U X and H

1A1R



			Bonds available		
DØ	U	X	Diamond		CBN
75	1.2	6	CB	RM5	CB9
100	1.2	6	CB	RM5	CB9
125	1.2	6	CB	RM5	CB9
150	1.2	7	CB	RM5	CB9
200	1.4	7	CB	RM5	CB9
250	1.6	5.5	CB	RM5	CB9

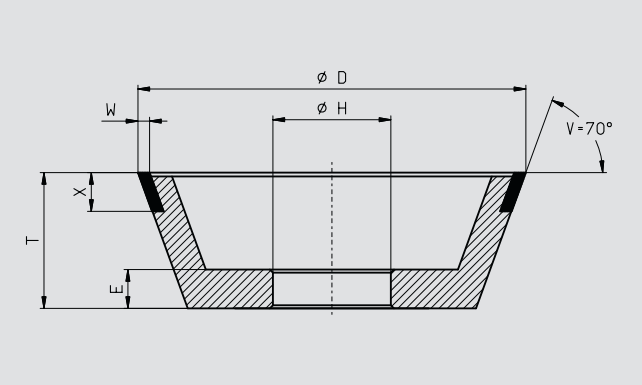
Other dimensions available on request - Please indicate required W X and H

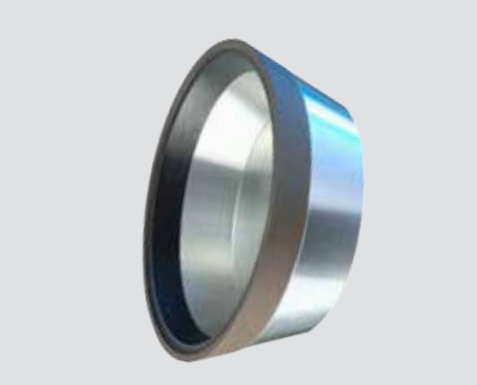
SAMPLE ORDER:

TYPE	D	T	X	H	Application
1A1R	100	1.5	7.5	20	

CUP WHEELS

11V9





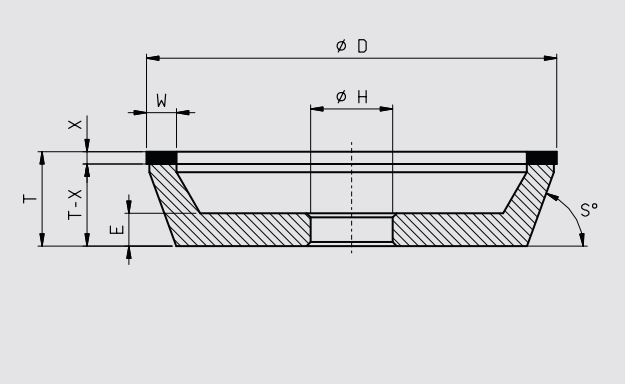
			Bonds available				
DØ	U	X	Diamond			CBN	
50	2,3	10	CB	RM5	RM6	CB9	RM9
75	2,3	10	CB	RM5	RM6	CB9	RM9
100	2,3	10	CB	RM5	RM6	CB9	RM9
125	2,3	10	CB	RM5	RM6	CB9	RM9
150	2,3	10	CB	RM5	RM6	CB9	RM9

Other dimensions available on request - Please indicate required W X and H

SAMPLE ORDER:

TYPE	D	W	X	H	T	V	Application
11V9	100	3	10	20	35	70⁰	

11A2



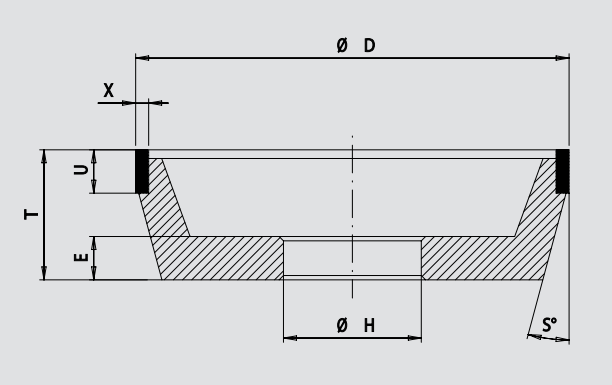
			Bonds available				
DØ	W	X	Diamond			CBN	
50	2,4,6	6	CB	RM5	RM6	CB9	RM9
75	2,4,6	6	CB	RM5	RM6	CB9	RM9
100	4,6	6	CB	RM5	RM6	CB9	RM9
125	4,6	6	CB	RM5	RM6	CB9	RM9
150	4,6	6	CB	RM5	RM6	CB9	RM9

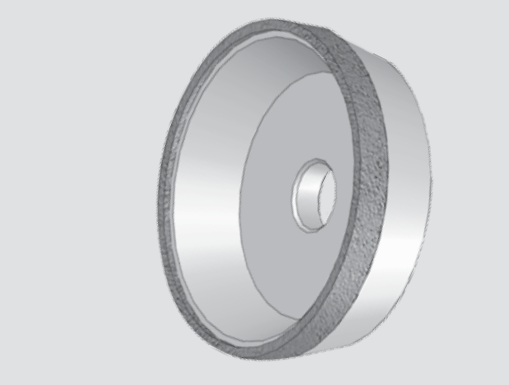
Other dimensions available on request - Please indicate required W, X and H

SAMPLE ORDER:

TYPE	D	W	X	T	H	Application
11A2	100	6	3	26	20	

11A9





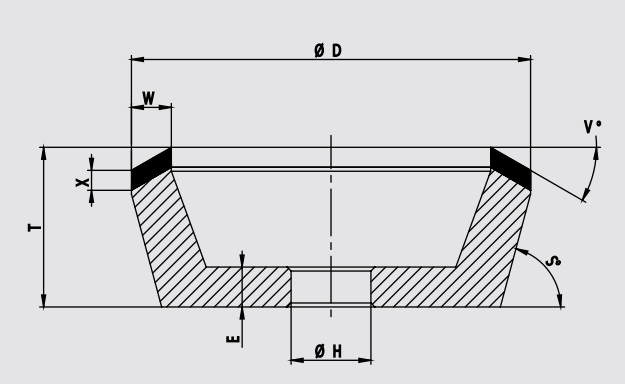
			Bonds available				
DØ	U	X	Diamond			CBN	
50	6	6	CB	RM5	RM6	CB8	RM9
75	6	6	CB	RM5	RM6	CB9	RM9
100	6	6	CB	RM5	RM6	CB9	RM9
125	6	6	CB	RM5	RM6	CB9	RM9
150	6	6	CB	RM5	RM6	CB9	RM9

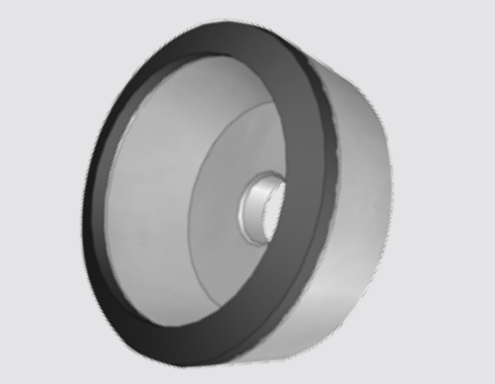
Other dimensions available on request - Please indicate required U and X "H"

SAMPLE ORDER:

TYPE	D	U	X	T	H	S	Application
11A9	125	6	6	25	20	20	

11V5





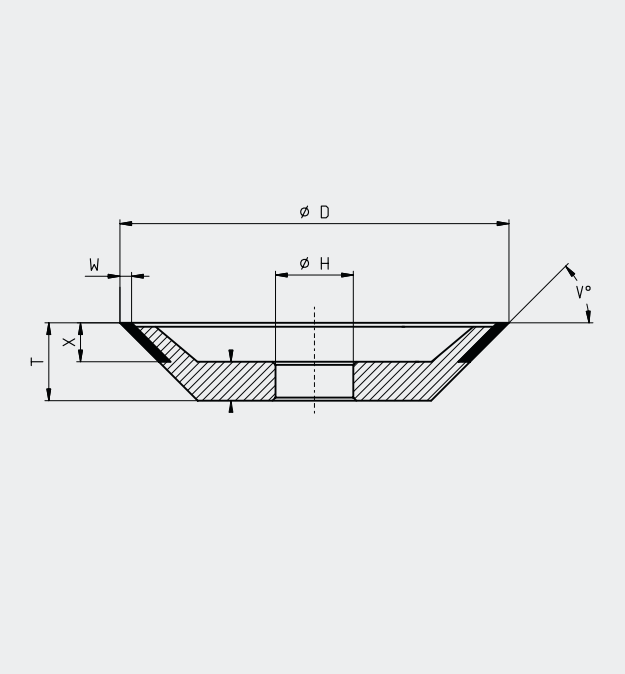
			Bonds available				
DØ	W	X	Diamond			CBN	
75	4,6	6	CB	RM5	RM6	CB9	RM9
100	4,6	6	CB	RM5	RM6	CB9	RM9
125	4,6	6	CB	RM5	RM6	CB9	RM9
150	4,6	6	CB	RM5	RM6	CB9	RM9

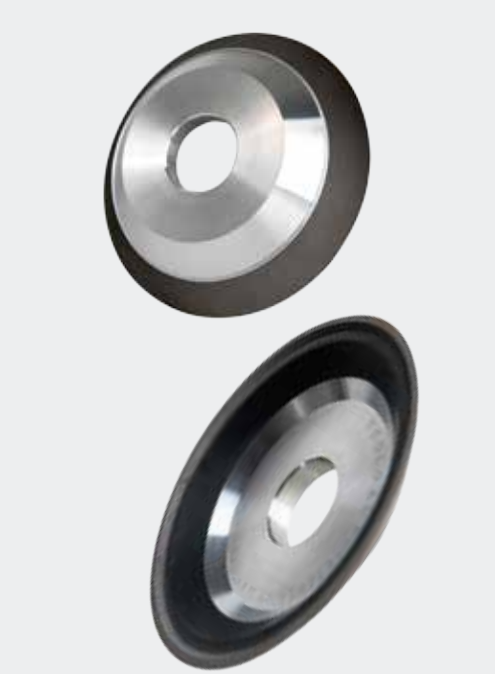
Other dimensions available on request - Please indicate required W, X, V and H

SAMPLE ORDER:

TYPE	D	W	X	T	V⁰	H	Application
11V5	100	10	6	35	30	20	

12V9





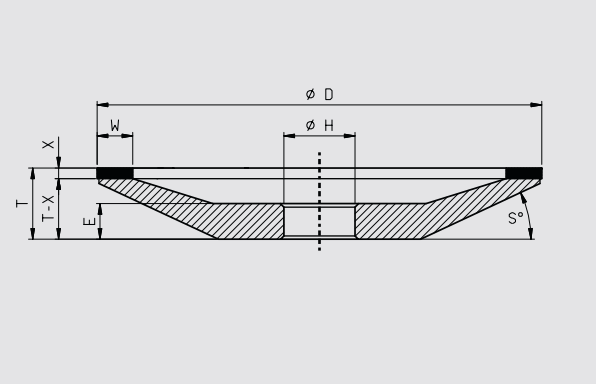
			Bonds available				
DØ	W	X	Diamond			CBN	
50	2, 3	10	CB	RM5	RM6	CB9	RM9
75	2, 3	10	CB	RM5	RM6	CB9	RM9
100	2, 3	10	CB	RM5	RM6	CB9	RM9
125	2, 3	10	CB	RM5	RM6	CB9	RM9
150	2, 3	10	CB	RM5	RM6	CB9	RM9

Other dimensions available on request - Please indicate required U X and H

SAMPLE ORDER:

TYPE	D	W	X	T	H	V STANDART	Application
12V9	100	3	10	35	20	70	

12A2 V20º or V45º



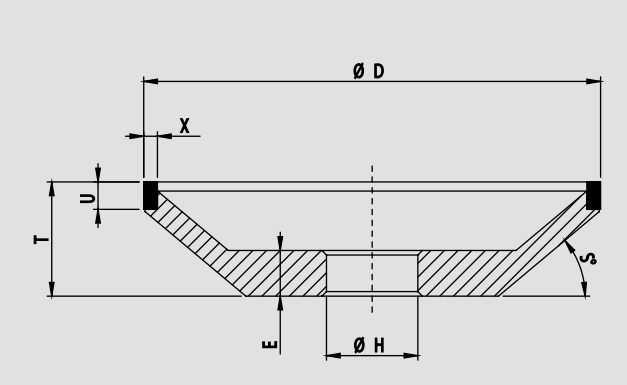
			Bonds available				
DØ	W	X	Diamond			CBN	
50	2,4,6	6	CB	RM5	RM6	CB9	RM9
75	2,4,6	6	CB	RM5	RM6	CB9	RM9
100	,4,6	6	CB	RM5	RM6	CB9	RM9
125	4,6	6	CB	RM5	RM6	CB9	RM9
150	4,6	6	CB	RM5	RM6	CB9	RM9

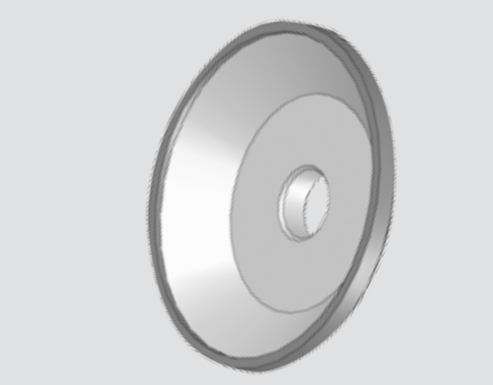
Other dimensions available on request - Please indicate required W ,X and H

SAMPLE ORDER:

TYPE	D	W	X	T	H	V	Application
12A2	125	10	3	26	20	45º	

12A9





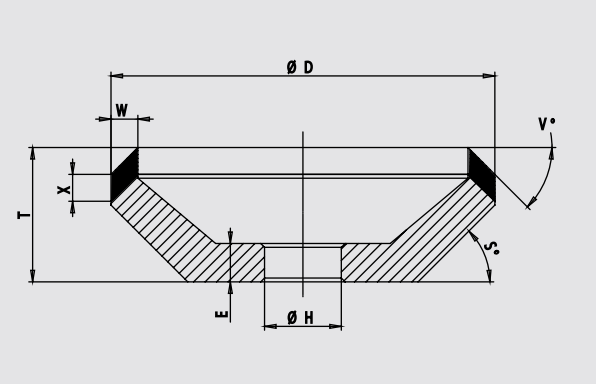
			Bonds available				
DØ	U	X	Diamond			CBN	
50	6	6	**CB**	RM5	RM6	CB9	RM9
75	6	6	**CB**	RM5	RM6	CB9	RM9
100	6	6	**CB**	RM5	RM6	CB9	RM9
125	6	6	**CB**	RM5	RM6	CB9	RM9
150	6	6	**CB**	RM5	RM6	CB9	RM9

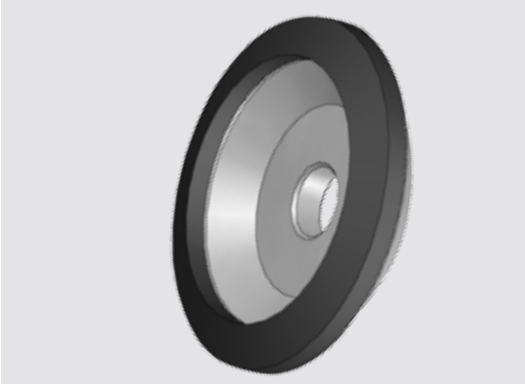
Other dimensions available on request - Please indicate required U X and H

SAMPLE ORDER:

TYPE	D	U	X	T	H	S	Application
12A9	125	10	3	26	20	45⁰	

12V5





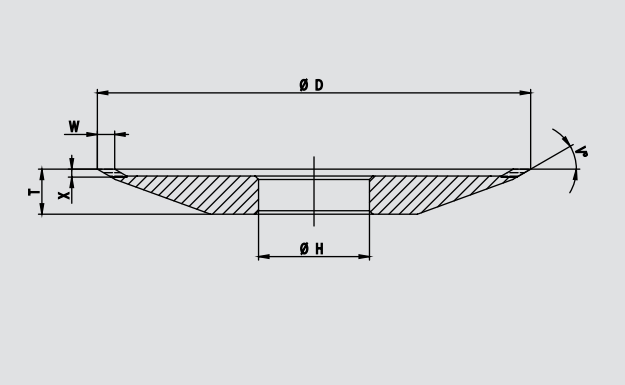
			Bonds available				
DØ	W	X	Diamond			CBN	
75	4,6	6	CB	RM5	RM6	CB9	RM9
100	4,6	6	CB	RM5	RM6	CB9	RM9
125	4,6	6	CB	RM5	RM6	CB9	RM9
150	4,6	6	CB	RM5	RM6	CB9	RM9

Other dimensions available on request - Please indicate required W X V and H

SAMPLE ORDER:

TYPE	D	W	X	T	V	H	Application
12A5	125	10	3	26	45⁰	20	

4V2



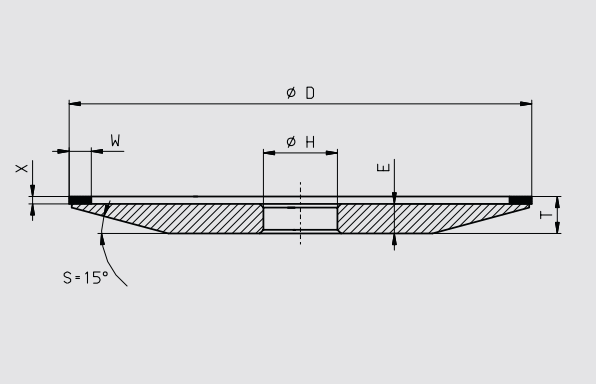
			Bonds available				
DØ	W	X	Diamond			CBN	
75	3,6,10	6	CB	RM5	RM6	CB9	RM9
100	3,6,10	6	CB	RM5	RM6	CB9	RM9
125	3,6,10	6	CB	RM5	RM6	CB9	RM9
150	3,6,10	6	CB	RM5	RM6	CB9	RM9

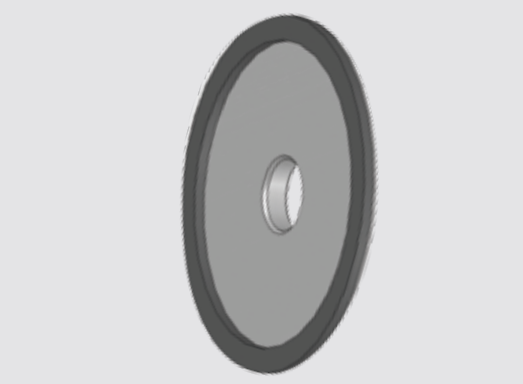
Other dimensions available on request - Please indicate required W X V and H

SAMPLE ORDER:

TYPE	D	W	X	T	H	V	Application
4V2	100	10	3	25	20	20	

4A2



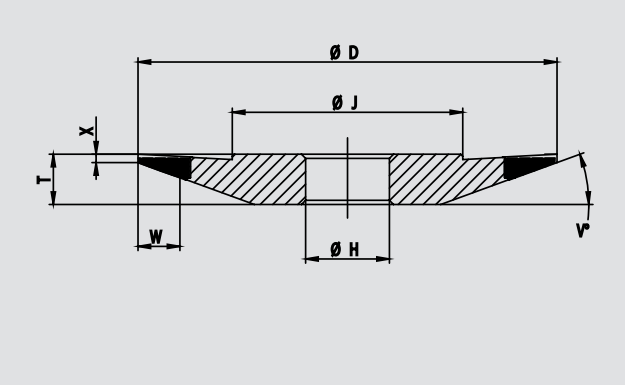


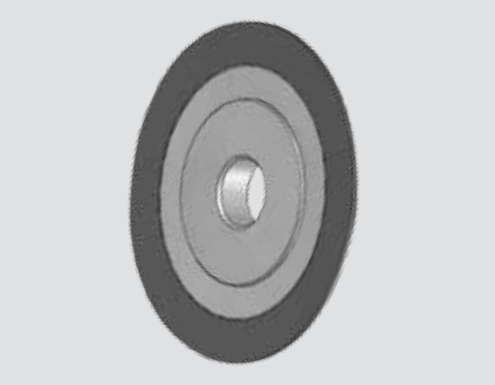
			Bonds available		
DØ	W	X	Diamond		
75	3,6,10	6	CB	RM5	RM6
100	3,6,10	6	CB	RM5	RM6
125	3,6,10	6	CB	RM5	RM6
150	3,6,10	6	CB	RM5	RM6

Other dimensions available on request - Please indicate required W X and H

TYPE	D	W	X	H	T	V	Application
4A2	125	5	3	20	10	15^0	

4BT9





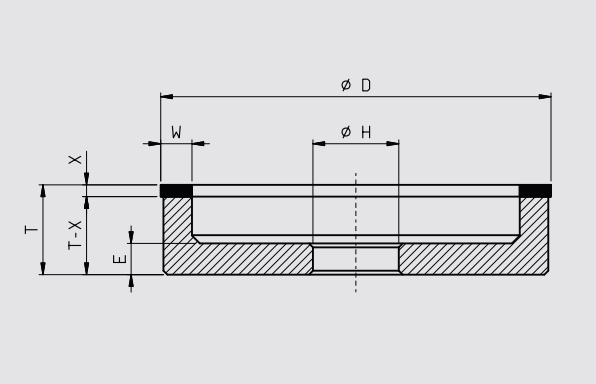
			Bonds available				
DØ	W	X	Diamond			CBN	
75	3,6,10	1,3,6	CB	RM5	RM6	CB9	RM9
100	3,6,10	1,3,6	CB	RM5	RM6	CB9	RM9

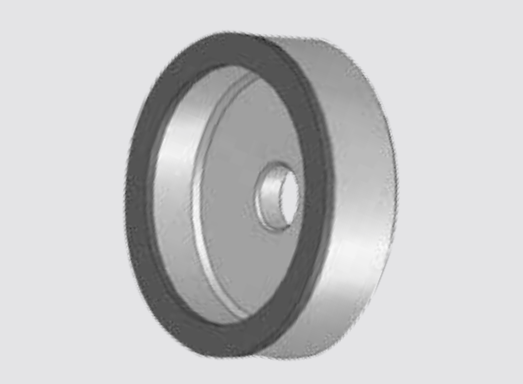
Other dimensions available on request - Please indicate required W X V and H

SAMPLE ORDER:

TYPE	D	W	X	V	H	Application
4BT9	100	10	3	20	20	

6A2





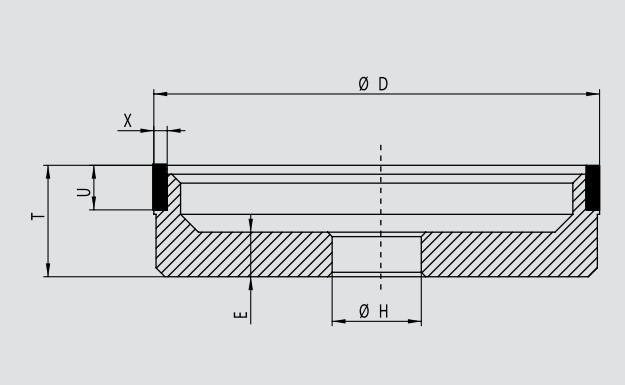
DØ	W	X
75	3,6,10	6
100	3,6,10	6
125	3,6,10	6
150	3,6,10	6
150	4,6	6

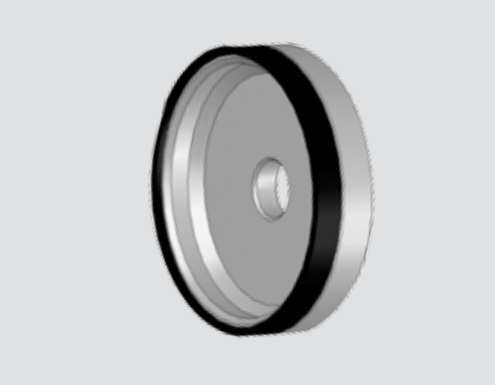
Other dimensions available on request - Please indicate required W X and H

SAMPLE ORDER:

TYPE	D	W	X	H	E	Application
6A2	75	10	3	20	10	

6A9



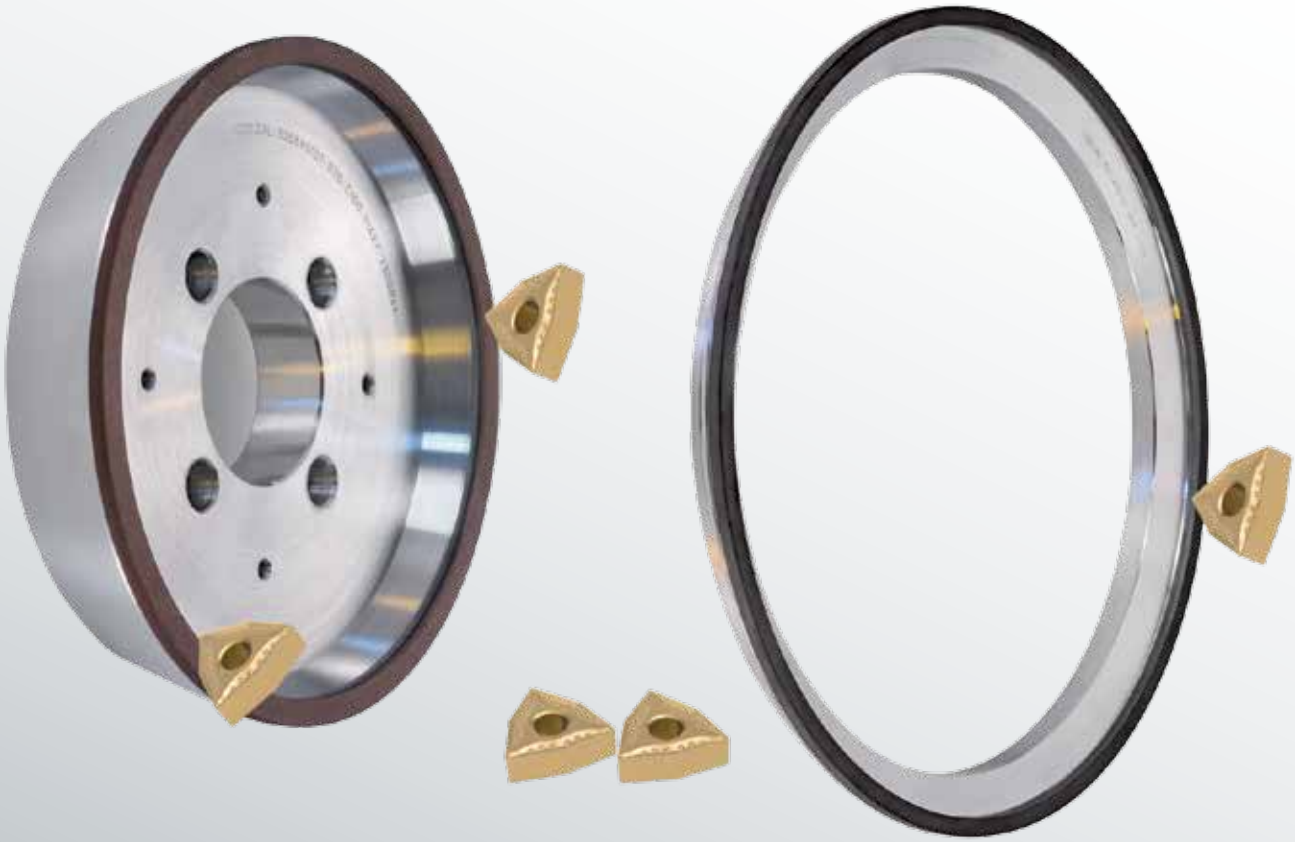


DØ	U	X
50	3,6,10	6
75	3,6,10	6
100	3,6,10	6
125	3,6,10	6
150	3,6,10	6

Other dimensions available on request - Please indicate required U X and H

SAMPLE ORDER:

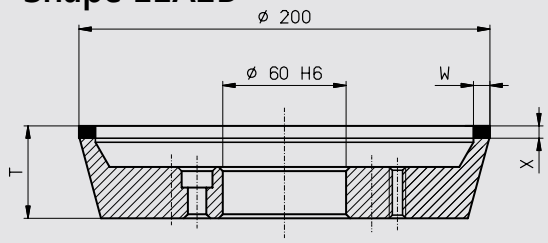
TYPE	D	U	X	T	E	H	Application
6A9	125	10	3	25	10	20	



WHEELS FOR INSERTS GRINDING

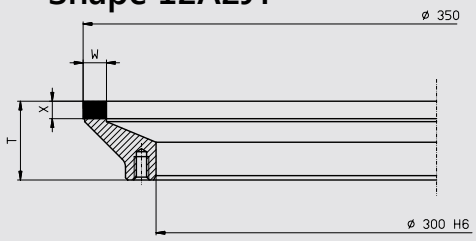
INSERTS

Shape 11A2B



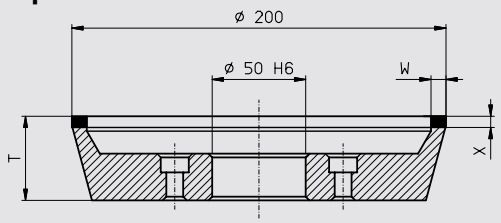
Machine: WAIDA				
D	W	X	T	H
200	6, 8, 10, 12	6	45	60

Shape 12A2JT



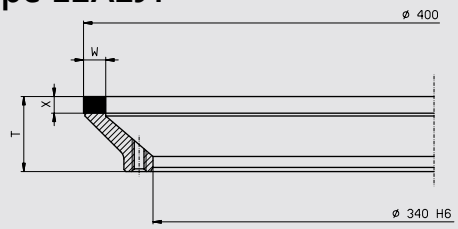
Machine: AGATHON 350				
D	W	X	T	H
350	6, 8, 10, 12,15	6	27	300

Shape 11A2B



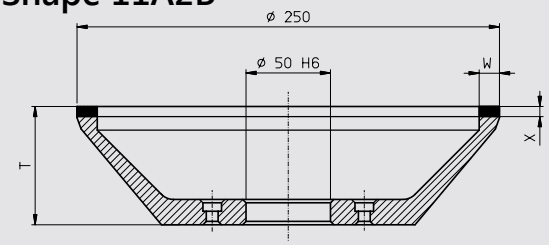
Machines: EWAG, COBRON				
D	W	X	T	H
200	6, 8, 10, 12	6	60	50

Shape 12A2JT



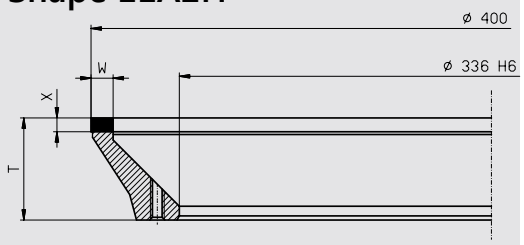
Machine: AGATHON 400 PENTA				
D	W	X	T	H
400	6, 8, 10, 12,15	6	28	340

Shape 11A2B



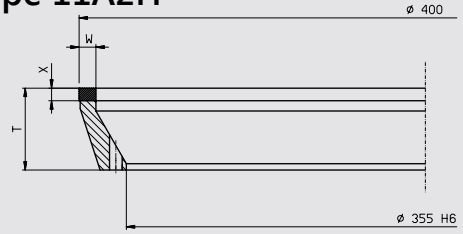
Machines: EWAG, COBRON				
D	W	X	T	H
200	6, 8, 10, 12	6	70	50

Shape 11A2H

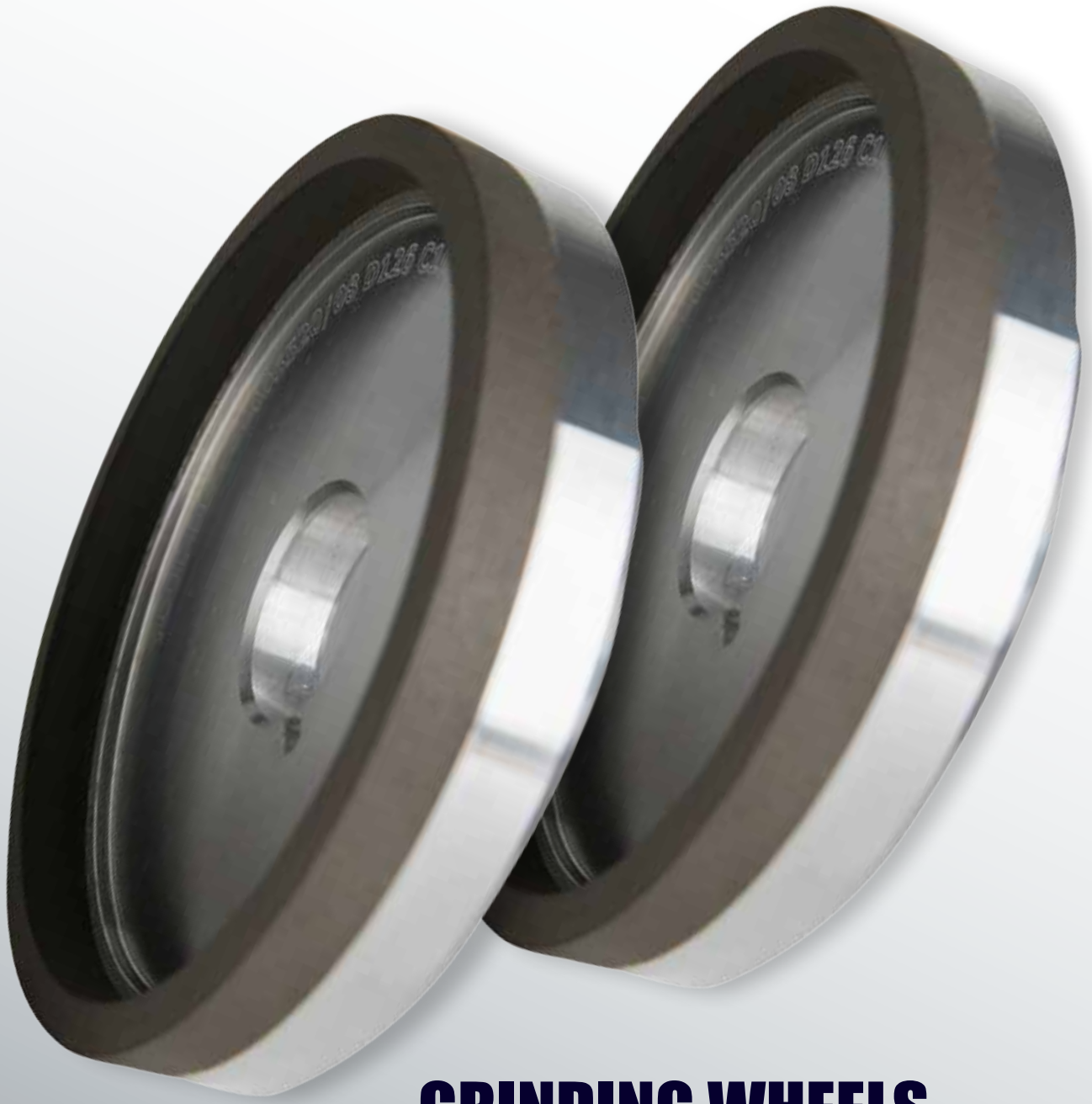


Machine: WENDT WAC 735 CENTRO				
D	W	X	T	H
400	6, 8, 10, 12,15	6	39	336

Shape 11A2H

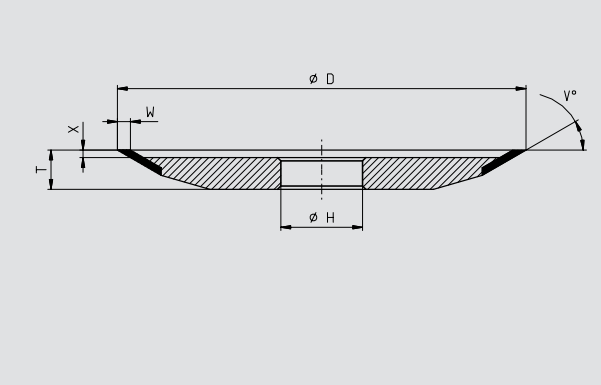


Machine: WENDT WAC 735 QUATTRO				
D	W	X	T	H
400	6, 8, 10, 12,15	6	39	355



GRINDING WHEELS FOR SAWS

12V9

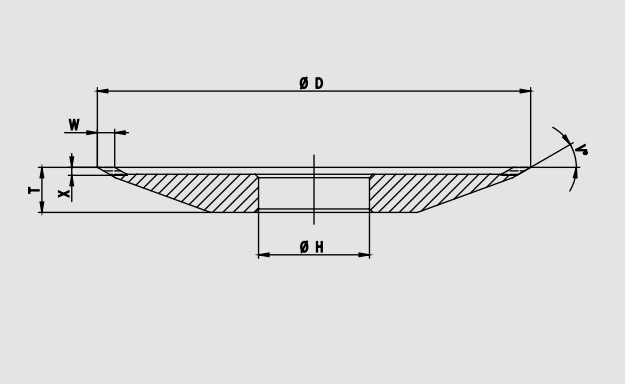


			Bonds available
DØ	W	X	Diamond
125	2	3.5	CB4
150	2	3.5	CB4
200	2.5	3	CB4

Other dimensions available on request - Please indicate required W X and H

TYPE	D	W	X	T	H	V	Application
12V9	100	10	3	25	20	20	

4V2



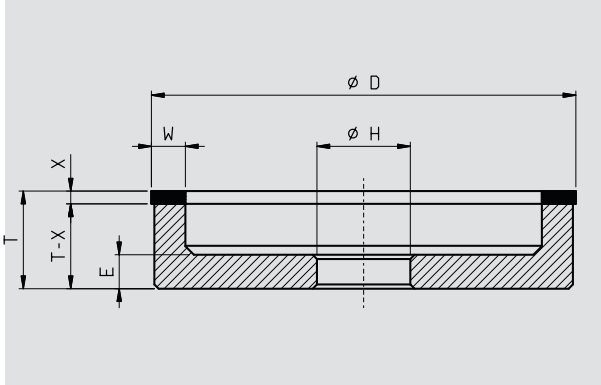
			Bonds available
DØ	W	X	Diamond
125	4	2	CB4
200	4	2	CB4

Other dimensions available on request - Please indicate required W X V and H

SAMPLE ORDER:

TYPE	D	W	X	V	H	Application
4V2	100	10	3	30	20	

6A2



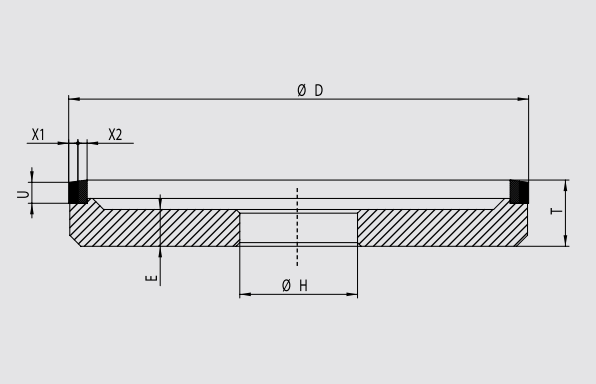
			Bonds available
D	W	X	Diamond
125	5	6	CB4

Other dimensions available on request - Please indicate required W X and H

SAMPLE ORDER:

TYPE	D	W	X	H	Application
6A2	125	5	6	35	

6AA2



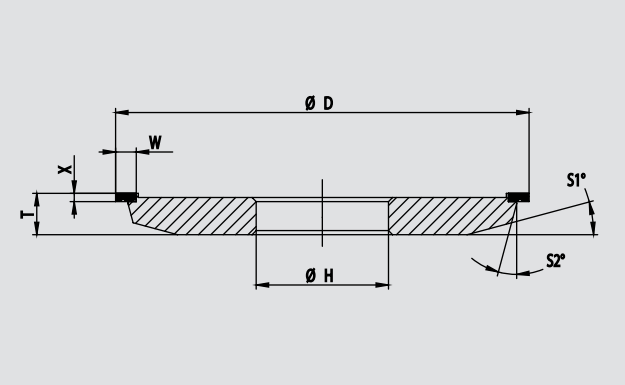
			Bonds available
DØ	X1,X2	U	Diamond
100	5+5	10	CB4
125	2.5+2.5	10	CB4

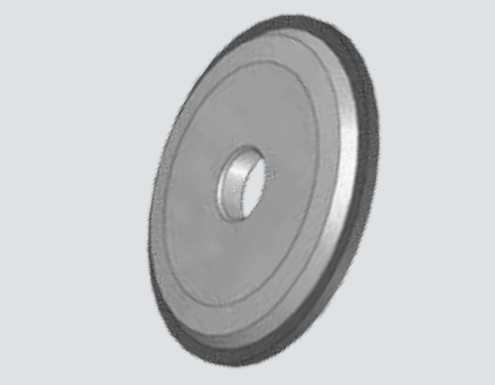
Other dimensions available on request - Please indicate required U X and H

SAMPLE ORDER:

TYPE	D	W	X	H	Application
6AA2	125	2.5+2.5	10	32	

vold 9





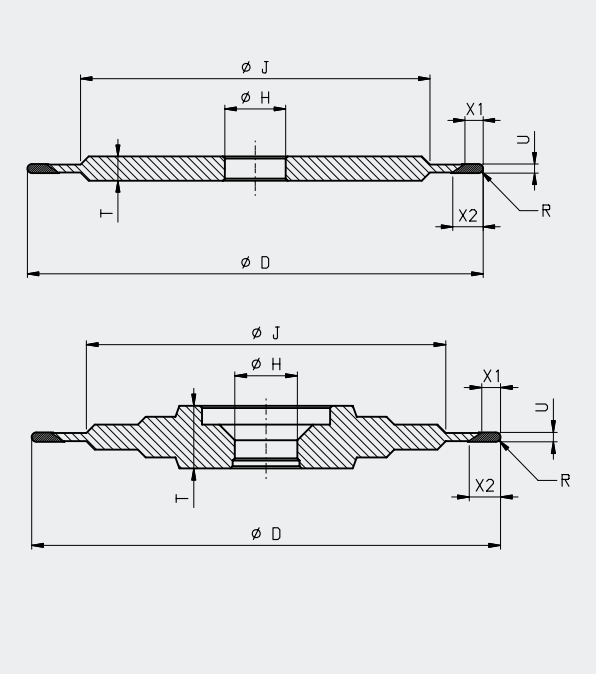
			Bonds available
DØ	W	X	Diamond
80	5	4	CB
100	5	4	CB

Other dimensions available on request - Please indicate required W X and H

SAMPLE ORDER:

TYPE	D	W	X	H	Application
vold 9	75	10	3	20	

14F1 Loroch, Tempo & Schmidt

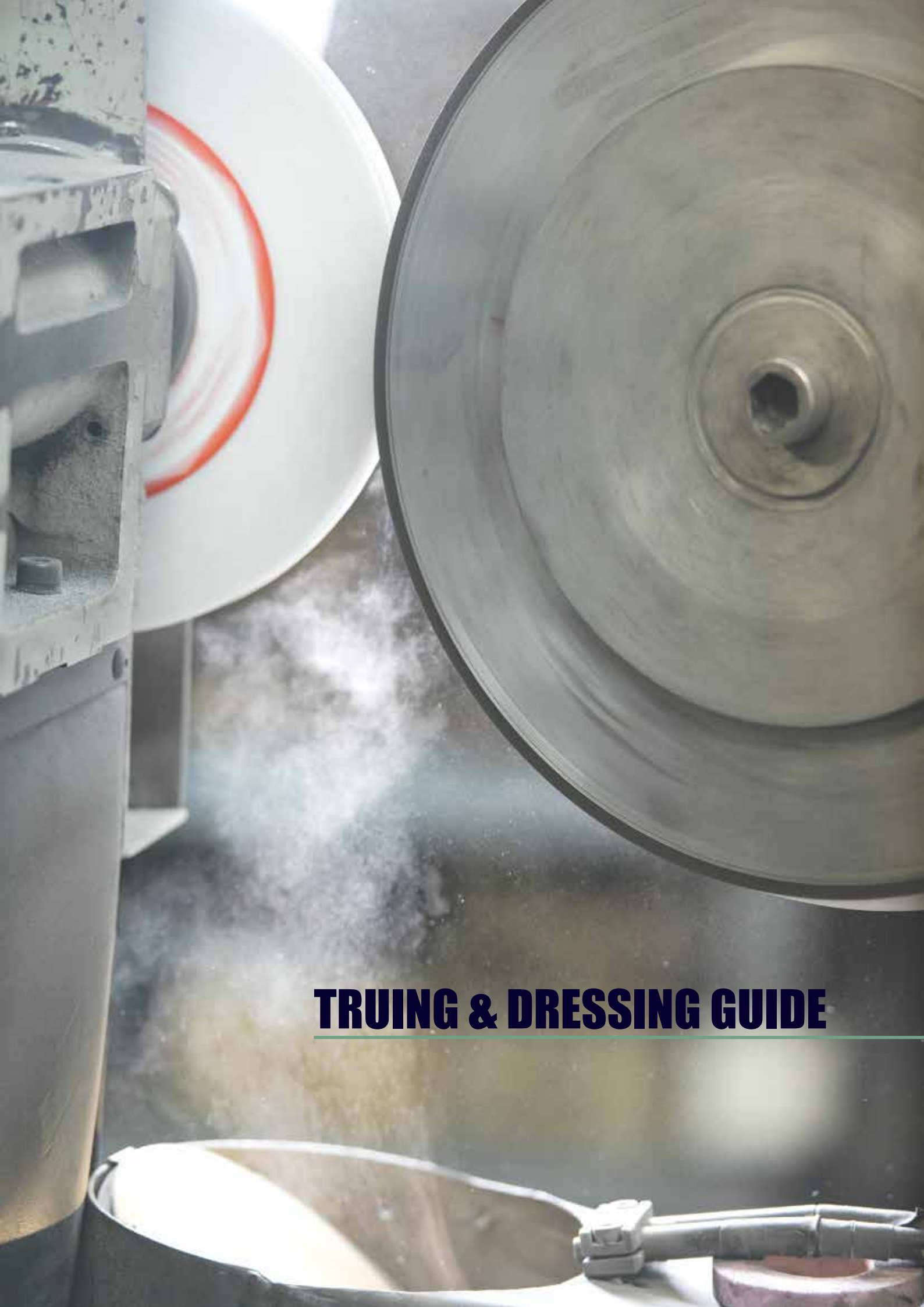


			Bonds available		
D	U	X	Diamond		CBN
200	0.8, 1, 2, 3	6,10	CB4	RM5	CB9

Other dimensions available on request - Please indicate required W X and H

SAMPLE ORDER:

TYPE	D	W	X	H	Application
14F1	200	3	6/9	32	



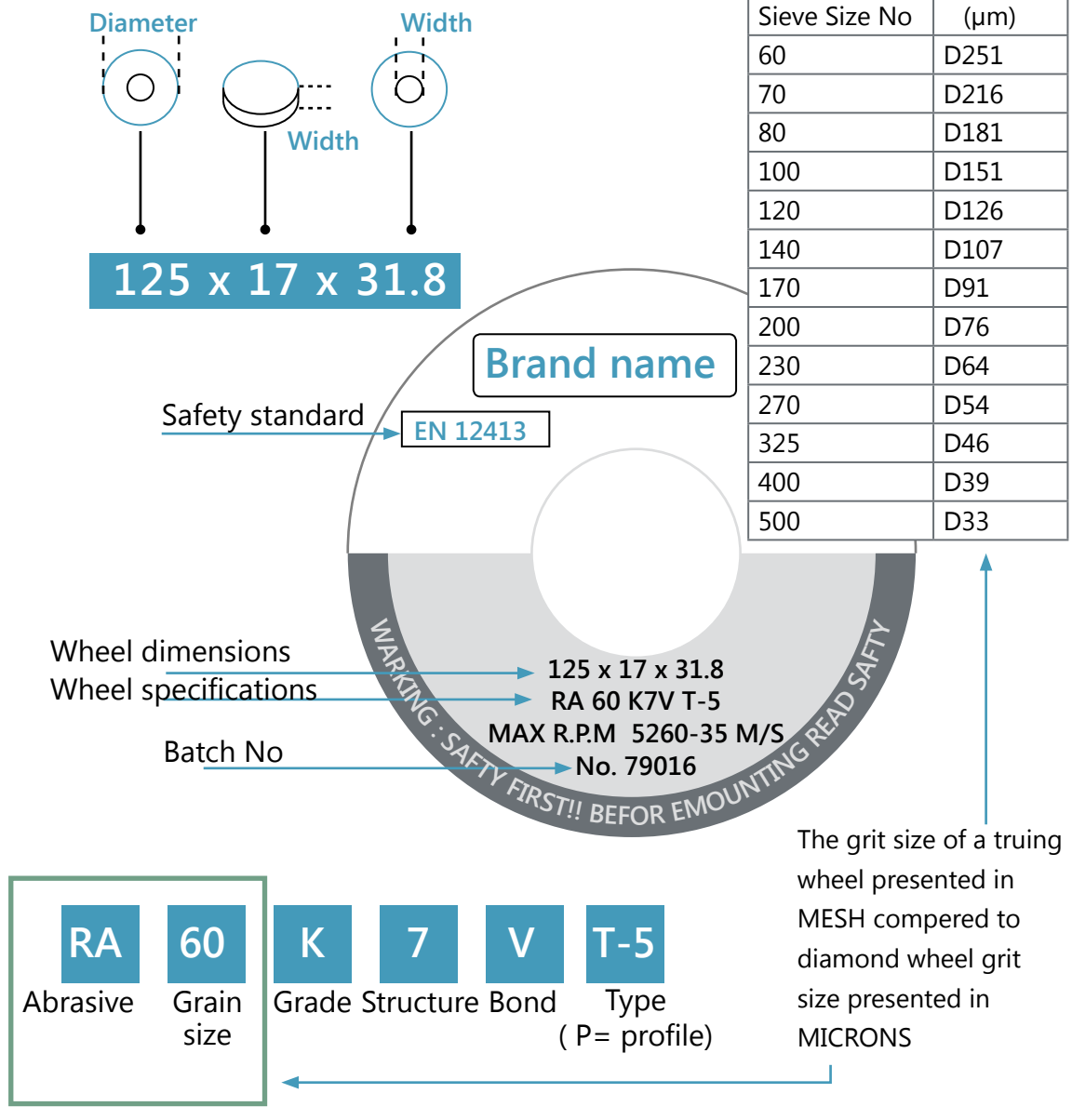
TRUING & DRESSING GUIDE

TRUING OF RM FLUTING WHEEL

- "Truing" primarily means to create a perfectly round and true running grinding wheel
- Truing is done by using a grinding machine and an abrasive wheel that the bond of the diamond wheel
- Recommended abrasive wheel:
  - Silicon Carbide (green) or Aluminum Oxide (White or Pink)
  - Grit size , 80-120 mesh
  - Hardness I, J or K
- Cutting (rotating) speed
  - Diamond wheel 200-1,000 SFM (1-5 m/s) => 400-700 RPM for Ø3-6" Diamond wheel
  - Dressing wheel 2,400-5,000 SFM (12-25 m/s) => 2,000 RPM for Ø8" Dressing wheel
- Oscillation rate: 8-10 IPM (inch per minute)

DEFINITION OF TRUING WHEEL

Wheel specification



(US Mesh) Sieve Size No	Size No. (µm)
60	D251
70	D216
80	D181
100	D151
120	D126
140	D107
170	D91
200	D76
230	D64
270	D54
325	D46
400	D39
500	D33

Definition of truing wheel

Abrasive	Grain Size
A Brown Aluminium Oxide	Coarse 24, 30, 36
BAS High performance Aluminium Oxide	Medium 46, 54, 60
WA White Aluminium Oxide	Fine 80, 100, 120, 150
WAB White Aluminium Oxide+Blue Bond	Very Fine 180, 220, 240
WAR White Aluminium Oxide+Red Bond	**Grade**
WAY White Aluminium Oxide+Yellow Bond	Soft B, C, D, E, F, G, H
WAG White Aluminium Oxide+Special Bond I	Medium I, J, K, L
WAP White Aluminium Oxide+Special Bond II	Hard M, N, O, P, Q
WAL Special grain and bond for improved surface integrity	**Structure**
PA Pink Aluminium Oxide	Medium/Standard Open/Porous
RA Ruby Aluminium Oxide	6 7 8 9 | 10 11 12 13 14 15
AS1 10% Ceramic Aluminium Oxide	**Bond**
AS3 30% Ceramic Aluminium Oxide	V Vitrified
AS5 50% Ceramic Aluminium Oxide	B Resinoid
DA White and Brown Aluminium Oxide	BF Reinforced Resinoid
SA Semi-friable Aluminium Oxide	
HA Monocrystal Aluminium Oxide	
KA Bubble alumina	
GC Green Silicon Carbide	
C Black Silicon Carbide	

Dressing of RM fluting wheel

- "**Dressing**" primarily means to clean the surface of the diamond wheel and expose the diamond grits
- Dressing is usually done by using a soft dressing stick with fine grits
- It is done by pushing the dressing stick firmly into the diamond wheel, few times, until the wheel sinks into the stick
- Recommended dressing stick:
  – **Aluminum** Oxide (White)
  – Grit size , **240-320 mesh**
  – Hardness **G or H**
- Dressing should be done right after the truing and in any time that the wheel is clogged and generating more load
- During the dressing process the diamond wheel should rotate in the same direction and speed as it is normally used

Dressing of D54/64 RM WHEELS
Abrasive wheel/stick selection

	GRIT SIZE → FINER											
	80	100	120	150	180	200	220	240	280	320		
TRUING	■	■	■									
DRESSING							■	■	■	■		
	BOND HARDNESS → HARDER											
	F	G	H	I	J	K						
TRUING				■	■	■						
DRESSING		■	■									

TOOLGAL RM DRY Truing

- Recommended abrasive wheel:
  - **Silicon Carbide** (green) or **Aluminum Oxide** (White or Pink)
  - Grit size **80-120 mesh**
  - Hardness **I, J or K**
  - D64-D46 = PA 120 J8V , GC 120 J7V
  - D91-D64 = PA 80 J8V

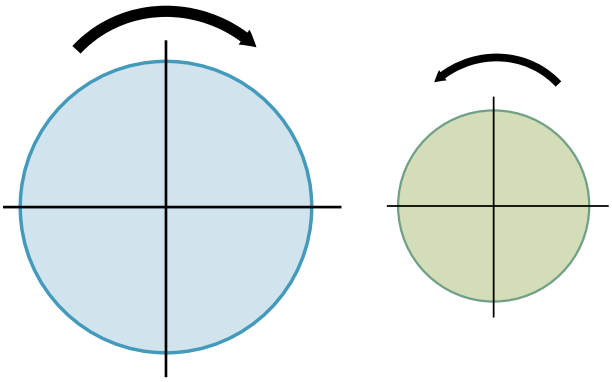
Speed ratio: The ratio of dresser surface speed divided by wheel surface speed

UNIDIRECTIONAL Dressing of the Wheel

Recommended working speed		
	"Peripheral Speed (M/s)"	
	Diamond Wheel	Truing Wheel
D	3	20
50	1150	7640
75	760	5090
100	570	3820
125	460	3060
150	380	2550
200	290	1910
250	230	1530
300	190	1270

Dressing Wheel
1800-2000 RPM

Diamond Wheel
250-300 RPM



GENERAL SELECTION GUIDE FOR DRESSING WHEEL/STICK

"Truing" primarily means to create a perfectly round and true running grinding wheel

Truing Data - Truing Wheel			
Hardness	Grain size	Abrasive	Grain Size of diamond
J ~ L	# 30 ~ 46	GC,C	#~80
I ~ K	# 45 ~ 80	GC,C	#100~180
I ~ K	# 80 ~ 120	GC,C	#220~360
H ~ J	# 120 ~ 220	GC,C	#400~

Dressing Data - Dressing Stick			
Hardness	Grain size	Abrasive	Grain Size of diamond
G ~ H	# 80 ~ 220	GC,WA	#100~180
G ~ H	# 150 ~ 600	GC,WA	#220~400
G ~ H	# 280 ~ 1200	GC,WA	#500~1000
F ~ G	# 600 ~ 2000	GC,WA	#120~2000