

Area of application

Rappold grinding wheels are used in the global industry if highest precision, faultless surfaces and economic grinding processes are required.

Product properties

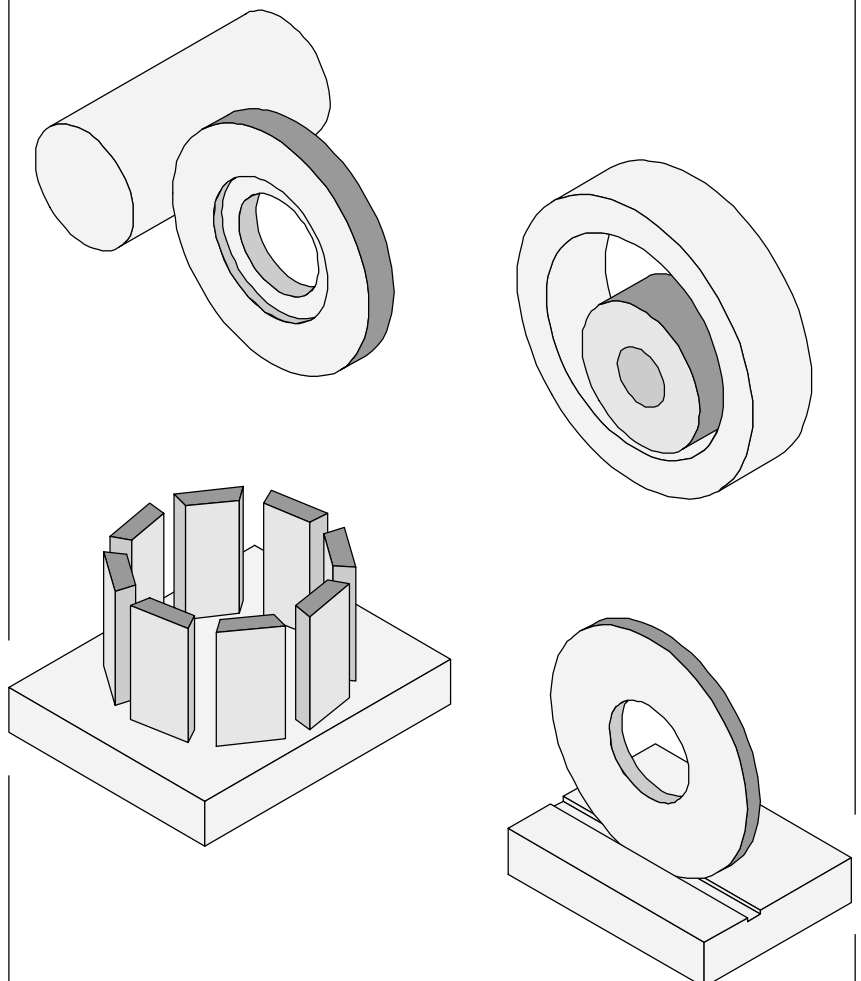
- ▲ Extensive range for use with various materials
- ▲ Available for practical all machines due to many different forms and dimensions
- ▲ Environmentally friendly composition

Advantages

- ▲ Excellent performance and efficiency
- ▲ Short grinding times
- ▲ Constant cutting performance and grinding forces
- ▲ Excellent form holding
- ▲ Less frequent dressing cycles

External/Internal Cylindrical Grinding

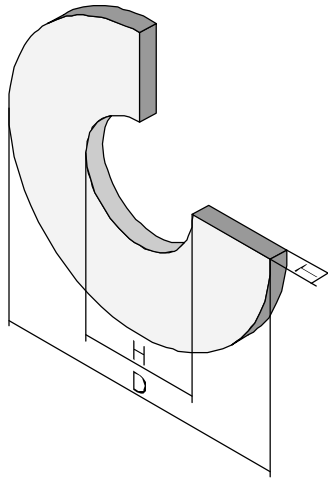
Surface and Profile Grinding



Wheel Shapes

Straight Grinding Wheel

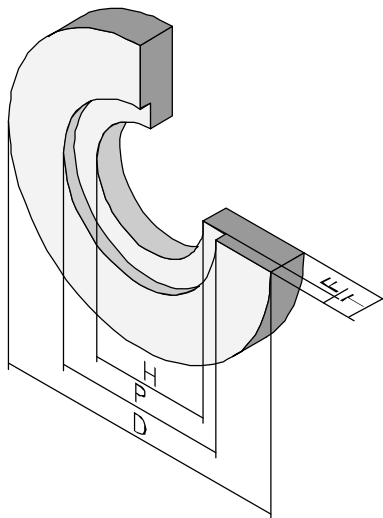
T1-DxTxH



e.g.
T1-500x32x203,2
7A80 J7 V042

Straight Grinding Wheel, recessed on one side

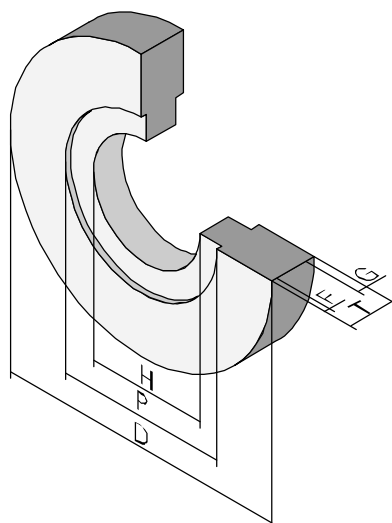
T5-DxTxH-1-PxF



e.g.
T5-500x63x203,2-1-290x20
7A80 J7 V042

Straight Grinding Wheel, recessed on both sides

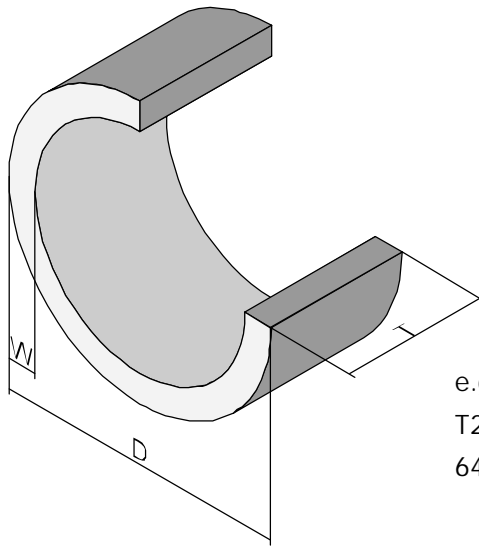
T7-DxTxH-2-PxF/G



e.g.
T7-500x80x203,2-2-290x10/15
7A80 J7 V042

Grinding Cylinder

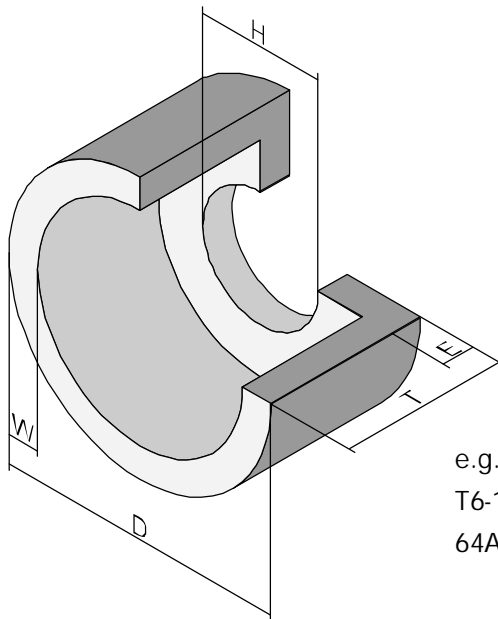
T2-DxT-W..



e.g.
T2-200x100-W20
64A46 H15 VP042

Straight Cup

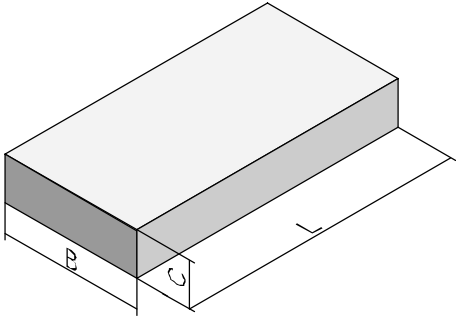
T6-DxTxH-W..-E..



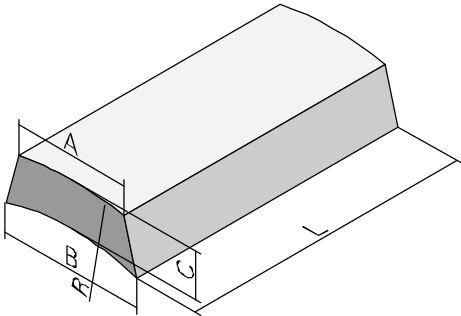
e.g.
T6-175x100x76,2-W20-E20
64A46 H15 VP042

Segments

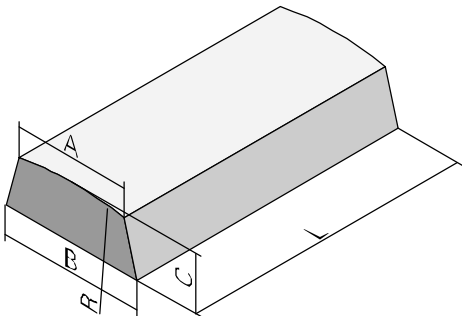
T3101-BxCxL



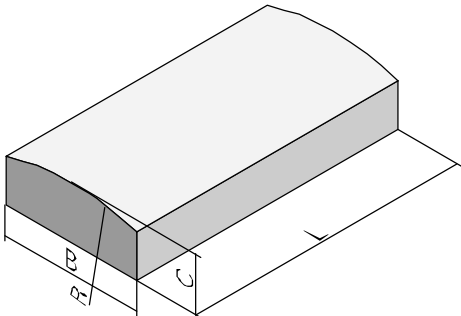
T3105-B/AxCxL-R



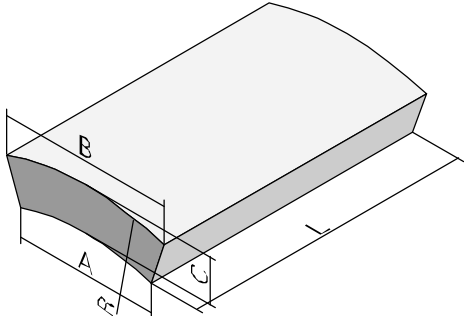
T3102-B/AxCxL-R



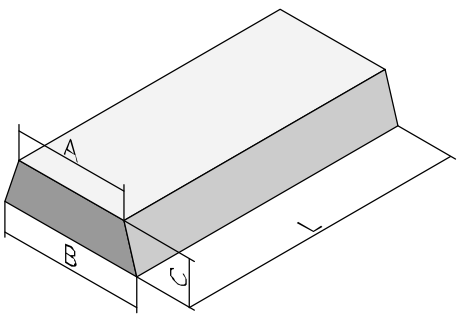
T3108-BxCxL-R



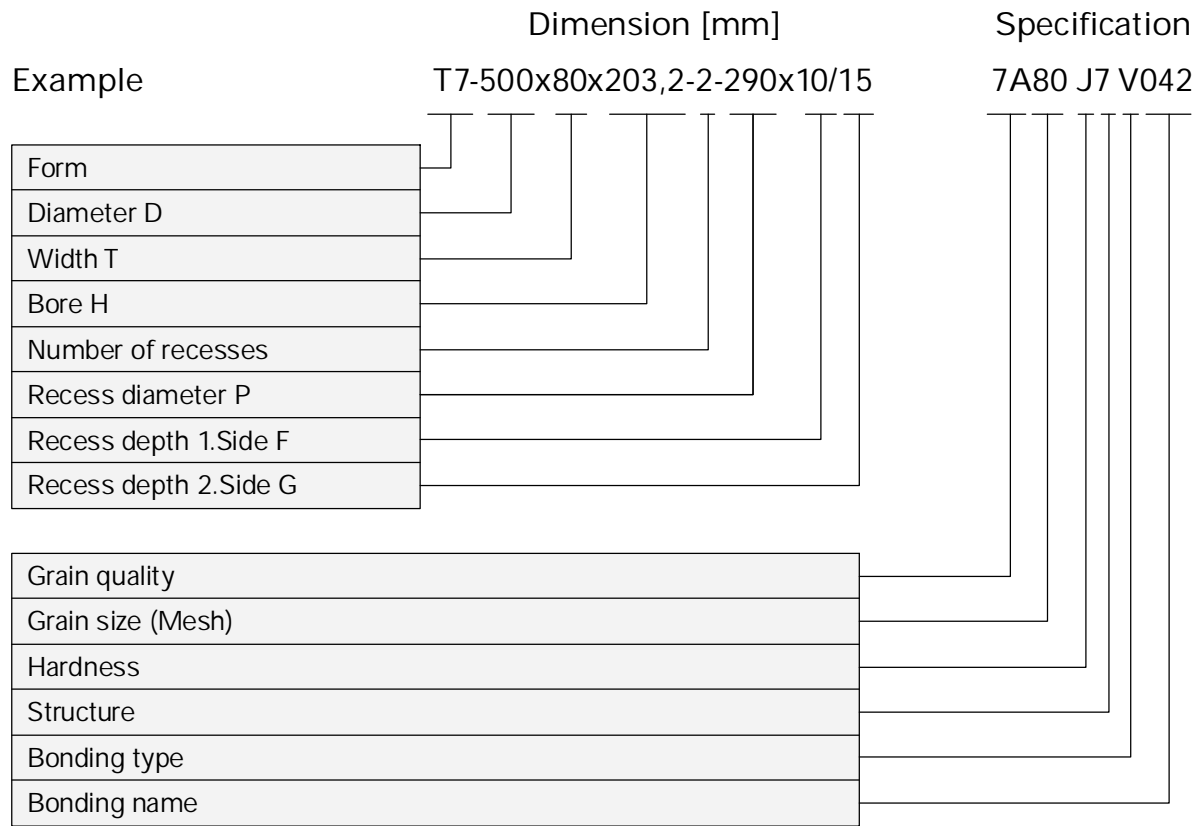
T3104-B/AxCxL-R



T3109-B/AxCxL



Designation



Grain sizes

The assignment of numbers to specific grain size distributions has been determined on the basis of an internationally applicable standard. The surface roughness generated during the grinding action is less independent on the abrasive grain size selected than on the actual dressing and grinding process. Coarse grinding wheels are more efficient, but produce a rougher surface. Grinding profiles or small radii considerably influence the selection of grain size. The manner in which the wheel is mounted and trued must be taken into consideration.

Grain size	Dimension [mm]		
	from	to	
8	2,83	2,00	very coarse
10	2,38	1,68	
12	2,00	1,41	
14	1,68	1,19	coarse
16	1,41	1,00	
20	1,19	0,84	
24	0,84	0,60	medium
30	0,71	0,50	
36	0,60	0,42	
46	0,42	0,30	medium
54	0,35	0,25	
60	0,30	0,21	
70	0,25	0,18	
80	0,21	0,15	

Grain size	Dimension [mm]		
	from	to	
90	0,18	0,13	fine
100	0,15	0,11	
120	0,13	0,09	
150	0,11	0,06	
180	0,09	0,05	
220	0,075	0,045	very fine
240	0,047	0,043	
280	0,038	0,035	
320	0,031	0,028	
400	0,018	0,016	
500	0,014	0,012	
600	0,010	0,008	
800	0,008	0,006	
1000	0,005	0,004	

Hardness

The term “hardness of grinding wheel” does not refer to the abrasive grain, but designates the resistance of the bond to grains being removed during the grinding process.

In other words, grain particles break out of a soft wheel more readily than out of a hard wheel. The letters A to Z characterise the degree of hardness.

Letter symbols	Hardness grade
A B C D	extremely soft
E F	very soft
G H	soft
J K L	medium
M N O P	hard
Q R S T	very hard
U V W X Y Z	extremely hard

Structure

Every grinding wheel has a natural porosity. This is expressed in structure numbers ranging from 1 to 9. These are considered standard structures. The higher the structure number, the more porous the

grinding wheel. The natural porosity of a grinding wheel can be increased artificially by the addition of special pore generating agent, which produces additional pore space. This additional porosity is expressed

in structure numbers 11 to 19, which are known as porous or open structures.

Initial operation

- Before mounting, always carefully inspect wheel for damages caused by transportation or by other means
- The ring test should be carried out immediately before mounting a new or used grinding wheel
The wheel should be lightly tapped to the right and to the left of the vertical centreline with a non-metallic hammer. The wheel must be dry for the ring test. A crack-free wheel will emit a clear ringing sound; a damaged wheel will sound dull
- Flange screws must be tightened in a criss-cross sequence and by using a torque wrench.
- Check the grinding wheel for an imbalance. If necessary balance it
- Adjust work-rests and safety guards
- Never exceed the highest permissible peripheral speed!
- An initial run with all necessary care should be taken

Storage

Grinding wheels require careful handling and special storage. The storage area must be dry and free from frost and large variations in temperature. Condensation on the wheels must be avoided. Excessive vibration from machinery and other sources must also be avoided. Vitrified bonded grinding wheels can be stored indefinitely. Resinoid bonded grinding wheels may begin to break down after two to three years and should not be stored for a longer period than this.

External Cylindrical Grinding

Roughing with Straight Grinding Wheels Types 1, 5, 7

Application	Specification	
Universal Application unhardened steel hardened steel	7A60 K5 V900W 54A60 J7 V904W	
Unhardened steel machining or constructional steel	31A54 K6 V600W	
Hardened steel, low-alloy up to 62 HRc case-hard., quenched and tempered steel flame-hard. and induction hardened steel	54A60 J7 V904W 54A60 J7 V904W	85S54 K6 V601W
Hardened steel, high-alloy > 62 HRc e.g. HSS, tool steel, ...	31A80 K6 V900W	670-8A80 H8 V601W
Stainless steel, acid and heat resistant steel unhardened hardened, high-alloy	31A54 K6 V600W 54A60 J7 V904W 2C80 J15 VPLF035	
Hard-chrome plated steel solid pieces thin-walled pieces (tubes)	670-8A54/60 H16 VPMFSR601W 54A60 H15 VPMF904W	
Nitriding steel untreated	54A60 J7 V904W	
Cast iron and cast steel Gray cast iron Cast steel annealed cast iron, nodular cast iron	2C60 H6 V035 54A60 J7 V904W 55A60 H8 V900W	85S54 K6 V601W 85S54 K6 V601W 85S54 K6 V601W
Tungsten carbide and Ceramics	2C80 F13 VPMF035	
Non-ferrous metals Aluminium, copper, bronze ...	2C46 H15 VP035	
Plastics	2C46 H15 VP035	
Rubber	7A60 H18 VPHHGG900W (only for 30 m/s)	

Finishing and High Precision Grinding

Types 1, 5, 7

Finishing	Ø ≤ 500 mm	Ø > 500 mm	High precision grinding
Universal Application			
unhardened steel	54A120 H15 VPMF604W	31A54 L6 V065	81A120 H8 V601W
hardened steel	54A120 H15 VPMF604W	8A60 J7 V088	
hardened, unhardened	670-8A80 H8 V601W	670-8A80 H8 V601W	
Unhardened steel			
Machining or constructional steel	54A60 J7 V904W	54A60 J7 V904W	64A180 J6 V042
Hardened steel, low-alloy up to 62 HRC			
case-hardened, quenched and tempered steel	7A80 J7 V042 670-8A80 H8 V601W	54A60 H8 V604W 670-8A60 H8 V601W	2C320 G2 VPS81 8A240 K4 V042
flame-hardened and induction hardened steel	7A80 H8 V042 670-8A80 H8 V601W	54A60 H8 V604W 670-8A80 H8 V601W	
Hardened steel, high-alloy			
62 - 64 HRC	93N120 H8 V602W 670-8A80 H8 V601W	93N80 H8 V602W 85A80 H8 V601W	2C320 G12 VPS81 8A240 H15 VPMF088
> 64 HRC	2C120 F15 VPMF035	2C80 F13 VPMF035	2C240 F15 VPMF035 2C500 L7 B200MC
Stainless steel, acid and heat resistant steel			
unhardened	54A80 H8 V604W	54A60 J7 V904W	2C280 G12 VPS77
hardened, high-alloy	54A120 H15 VPMF904W 2C120 F15 VPMF035 670-8A80 H8 V601W	54A80 H15 VPMF904W 2C80 F13 VPMF035 670-8A60 H8 V601W	2C320 G12 VPS81 C500 L7 BS
Hard-chrome plated steel			
solid pieces	54A120 H15 VPMF604W	54A80 H15 VPMF604W	42A280 H7 B200MC
thin-walled pieces (tubes)	54A60 H15 VPMF904W 2C80 J15 VPLF035	54A80 H15 VPMF904W 2C60 H15 VP035	42A280 H7 B200MC
Cast iron and cast steel			
Gray cast iron	2C80 H5 V035	2C60 H6 V035	2C120 H15 VPMF035
Cast steel	54A80 H8 V604W	54A60 H8 V604W	2C120 H15 VPMF035
annealed cast iron, nodular cast iron	55N120 H8 V902W	55N80 H8 V902W	2C120 H15 VPMF035
in general	670-8A80 H8 V601W	670-8A60 H8 V601W	
Tungsten carbide and Ceramics			
	2C80 H5 V035	2C60 H6 V035	2C240 F15 VPMF035
Non-ferrous metals			
	2C80 H15 VP035	2C60 H15 VP035	

Finishing	$\varnothing \leq 500 \text{ mm}$	$> 500 \text{ mm}$	High precision grinding
Plastics	2C80 H15 VP035	2C60 H15 VP035	
Rubber			
shore hardness ≥ 70	2C80 H18 VP035	2C80 H18 VP035	
shore hardness < 70 *	7A60 H18 VPHHGG900W	7A60 H18 VPHHGG900W	

* only for 30 m/s

Internal Cylindrical Grinding

With Straight Grinding Wheels (Types 1, 5)

Application	≤ Ø 20 mm	21 - 40 mm	> 40 mm
Universal Application			
unhardened steel	54A60 J7 V604W	54A60 H8 V604W	54A60 H8 V604W
hardened steel	670-8A80 J7 V601W	670-8A80 H13 VP601	670-8A80 H13 VP601
Unhardened steel			
Machining or constructional steel	54A80 J7 V604W 670-8A80 J7 V601W	54A60 H8 V604W	54A60 H8 V604W
Hardened steel, low-alloy up to 62 HRC			
case-hardened, quenched and tempered steel	54A80 H8 V604W 670-8A80 J7 V601W	54A120 H15 VPMF604W	54A80 H15 VPMF604W
flame-hardened and induction hardened steel	54A80 H8 V604W	54A120 H15 VPMF604W	54A80 H15 VPMF604W
Hardened steel, high-alloy > 62 HRC			
tool steel, HSS, ...	2C80 G6 V035 670-8A120 H13 VP601	2C120 H18 VP035 670-8A80 H13 VP601	2C60 H15 VP035 670-8A80 H13 VP601
Stainless steel , acid and heat resistant steel			
unhardened	54A120 H15 VPMF604W	54A120 H15 VPMF604W	54A80 H15 VPMF604W
hardened	2C120 H18 VP035	2C120 H18 VP035	2C120 H18 VP035
Hard-chrome plated steel			
	54A120 H18 VPMF604W 670-8A80 H13 VP601	54A80 H15 VPMF604W 670-8A80 H13 VP601	54A80 H15 VPMF604W 670-8A80 H13 VP601
Nitriding steel			
untreated	54A80 J7 V604W	54A60 J7 V604W	54A60 J7 V604W
hardened			
< 62 HRC (gas-nitrided)	81A80 H8 V601W	81A60 H8 V601W	81A60 H8 V601W
> 62 HRC (bath-nitrided)	2C120 H18 VP035	2C120 H18 VP035	2C60 H15 VP035
Cast iron and cast steel			
Gray cast iron	670-8A120 H13 VP601	670-8A120 H13 VP601	670-8A80 H13 VP601
Cast steel	55N80 H8 V602W	55N80 H8 V602W	55N60 H8 V602W
annealed cast iron, nod. cast iron	54A120 H15 VPMF604W	54A80 H15 VPMF604W	54A80 H15 VPMF604W
Tungsten carbide and Ceramics			
	2C80 G6 V035	2C120 H18 VP035	2C120 H18 VP035
Non-ferrous metals			
Aluminium, copper, bronze ...	2C80 G6 V035	2C120 H18 VP035	2C60 H15 VP035

Application	$\leq \emptyset$ 20 mm	21 - 40 mm	> 40 mm
Plastics	2C80 G6 V035	2C120 H18 VP035	2C60 H15 VP035
Rubber	2C80 G6 V035	2C120 H18 VP035	2C60 H15 VP035

Surface and Profile Grinding

With Straight Grinding Wheels (Types 1, 5, 7)

Application	≤ Ø 300 mm	> 300 mm
Universal Application		
unhardened steel	64A46 J8 V042 55A46 H9 V900W	61A46 J8 V042 54A46 H15 VPMF604W
hardened steel	55A60 H15 VP900W 670-8A46 H9 V601W	55A46 H15 VP900W 670-8A46 H15 VPH601W
Unhardened steel		
Machining or constructional steel	55A46 H9 V900W	61A46 J8 V042
Hardened steel, low-alloy up to 62 HRC		
case-hard., quenched and tempered steel	55A46 H15 VP900W	55A46 H15 VP900W
flame-hard. and induction hardened steel	55A60 H15 VP900W	55A60 H15 VP900W
in general	670-8A46 H9 V601W	670-8A46 H15 VPH601W
hardened steel, high-alloy über 62 HRC		
tool steel	670-8A60 F15 VPH601W 55A60 F15 VP900W	670-8A60 F15 VPH601W 55A60 H18 VP900W
HSS	81A60 F15 VPH601W	81A60 F15 VPH601W
stainless steel, acid and heat resistant		
unhardened	54A60 H15 VPH604W 2C60 H15 VP035	54A60 H15 VP0604W 2C60 H15 VP035
hardened, high-alloy	54A60 H15 VPH904W 670-8A60 F15 VPH601W	64A60 H18 VP042 670-8A60 F15 VPH601W
Nitriding steel		
untreated	55A46 H9 V900W	55A46 H15 VP900W
hardened		
< 62 HRC (gas-nitrided)	81A60 F15 VPH601W	81A60 F15 VPH601W
> 62 HRC (bath-nitrided)	2C60 F15 VPMF035	2C60 F18 VPMF035
Cast iron and cast steel		
Gray cast iron	2C60 H15 VP035	2C60 H15 VP035
Cast steel	55A60 H15 VP900W	55A60 H15 VP900W
annealed cast iron, nodular cast iron	55A60 H18 VP900W	55A60 H18 VP900W
Tungsten carbide and Ceramics		
	2C60 H15 VP035	2C60 H15 VP035

Application	$\leq \text{Ø } 300 \text{ mm}$	$> 300 \text{ mm}$
Non-ferrous metals Aluminium, copper, bronze ...	2C60 H15 VP035 2C60 H18 VP035	2C60 H15 VP035 2C60 H8 VP035

Profile Surface Grinding with Straight Wheels (Types 1, 5, 7)

			Reciprocating grinding	Creep-feed grinding
Slot grinding (Grinding wheels with Calibrated Width)				
Steel	unhardened	Roughing		54A60 H15 VPMF904W
		Finishing		54A80 H15 VPMF904W
	hardened	Roughing		54A60 F15 VPMF904W
		Finishing		54A80 F15 VPMF904W
in general				670-8A120 F15 VPMF601W
stainless steel, acid and				54A80 F15 VPMF904W
heat resistant (turbine parts)				7A60 H15 VPH900W
(e.g. Nimonic, Inconel, Udimet)				54A60 F15 VPH604W
Grinding Wheels Profiled with Diamond Dressing Tool				
Steel	unhardened		54A80 H8 V904W	54A60 F15 VPH904W
		hardened	54A80 H15 VPMF904W	54A80 F15 VPMF604W
stainless steel,			54A80 H15 VPMF904W	670-8A80 F15 VPH601W
acid and heat resistant steel				54A80 H15 VPH904W
(e.g. Nimonic, Inconel, Udimet)				54A80 F15 VPMF604W
Grinding Wheels Profiled with Steel Crush Forming Rolls				
Steel	unhardened	Roughing	54A80 H8 V904W	54A60 H15 VPH904W
		Finishing	54A180 H8 V904W	54A120 F15 VPMF904W
	hardened	Roughing	54A80 H8 V904W	54A60 F15 VPH904W
		Finishing	54A180 G8 V904W	54A120 F15 VPH904W
stainless steel,				
acid and heat resistant steel				
(e.g. Nimonic, Inconel, Udimet)				
			Roughing	54A60 H15 VPH904W
			Finishing	8A120 F15 VPMF088
Cast alloys			2C60 H15 VPMF035	2C60 H15 VPMF035
Grinding wheels profiled with rotary diamond truers				
Steel	unhardened		54A60 H8 V604W	54A46 H15 VPMF904W
		hardened	54A60 H15 VPMF604W	54A80 F18 VPH904W
				7A60 H15 VPH900W
				54A80 F15 VPMF904W
stainless steel,				
acid and heat resistant steel				670-8A120 H15 VPH601W
(zB Nimonic, Inconel, Udimet)			54A120 F15 VPMF904W	54A120 F15 VPH904W
big rolls				

With Type 2 Grinding Cylinders, Type 6 Straight Cup Wheels and Grinding Segments (Types 3101 up to 3109)

Application	Grinding Cylinders (Types 2, 6)	Grinding Segments
Universal Application		
unhardened steel	54A46 H9 V604W	8A24 J8 V042
hardened steel	55A46 H18 VP900W	8A46 H18 VP088
Unhardened steel		
Machining steel	54A46 H9 V604W	8A24 H9 V042 670-8A46 F13 VPMF601W
general purpose constructional steel	55A46 H15 VP900W	8A36 H9 V042
Hardened steel, low-alloy up to 62 HRC		
case-hard., quenched and tempered steel	64A46 F9 V042	8A36 H18 VP088
flame-hard. and induction hardened steel	64A60 H18 VP042	8A36 H18 VP088
hardened steel, high-alloy > 62 HRC		
Tool steel	64A46 F18 VP042	7A36 E9 V042
HSS	8A46 H7 B200 670-8A36-2 H13 VP601	8A46 H7 B200
Stainless steel, acid and heat resistant		
unhardened	64A46 H9 V042	8A24 H9 V042
hardened, high-alloy	64A46 H18 VP042 670-8A36-2 H13 VP601	8A36 G9 V042
Nitriding steel		
untreated	7A54 H8 V042	8A24 H9 V042
Cast iron and cast steel		
Gray cast iron	64A46 H15 VP042	8A24 H9 V042
Cast steel	64A46 H15 VP042	8A24 H9 V042
annealed cast iron, nodular cast iron	2C46 H18 VP035	2C46 H18 VP035
Tungsten carbide		
	2C46 H18 VP035	2C60 G6 V035
Ceramics		
	1C46 H7 B200	1C36 H7 B200
Non-ferrous metals		
	2C46 H18 VP035	2C36 H18 VP035

Austria

Rappold Winterthur
Technologie GmbH
St.-Magdalener Straße 85
P.O.B. 52
A-9500 Villach
Telephone ++43 (0)4242/41 811-0
Facsimile Inland ++43 (0)4242/41 811-700
Facsimile Export ++43 (0)4242/41 811-701
E-Mail office@rappold-winterthur.at

Switzerland

WST Winterthur
Schleiftechnik AG
Oberer Deutweg 4
P.O.B. 56
CH-8411 Winterthur
Telephone ++41 (0)52/234 41 41
Facsimile ++41 (0)52/232 51 01
E-Mail wst@rappold-winterthur.com

Finland

Rapoflex Oy
Vitikka 1D
PL 122
SF-02631 ESPOO
Telephone ++358 (0)9/54 86 180
Facsimile ++358 (0)9/45 56 185
E-Mail rapoflex@kolumbus.fi

Czech republic

Rappold Brno s.r.o.
Mašikova 1
CZ-621 00 Brno
Telephone ++420 (0)5/41 229 071
Facsimile ++420 (0)5/41 229 070
E-Mail rb@rappold-brno.cz
website www.rappold-brno.cz

Slovenia

Rappold Winterthur
brusilna tehnika d.o.o.
Ulica Mirka Vadnova 19
SI-4000 Kranj
Telephone ++386 (0)4/23 40 679
Facsimile ++386 (0)4/23 40 678
E-Mail office@rappold-winterthur.si
website www.rappold-winterthur.si

Germany

Rappold Winterthur
Schleiftechnik GmbH
Hundsschleestraße 10
D-72766 Reutlingen
Telephone ++49 (0)7121/93 24-0
Facsimile ++49 (0)7121/93 24-24
E-Mail info@rappold-winterthur.de

USA

Winterthur Corporation
70 James Street
Worcester, MA 01603
Telephone ++1 508/831 79 18
Facsimile ++1 508/798 27 32
E-Mail cs@winterthurusa.com

Sweden

SlipNaxos AB
S-593 83 Västervik
Telephone ++46 (0)490/843 00
Facsimile ++46 (0)490/146 00
E-Mail support@slipnaxos.se
website www.slipnaxos.com

France

Winterthur Technologie
France Sarl
31, rue des Jardins
F-68000 Colmar
Telephone ++33(0)3 89 24 01 31
Facsimile ++33(0)3 89 24 07 26
E-Mail france@winterthur-tech.fr
website www.winterthur-tech.fr

Poland

Rappold Winterthur
Technika Szlifierska
Ul. Borowa 1
PL 41-250 Czeladz
Telephone ++48 32 763 45 00
Facsimile ++48 32 763 45 01
E-Mail info@rappold-winterthur.pl

Website

www.rappold-winterthur.com