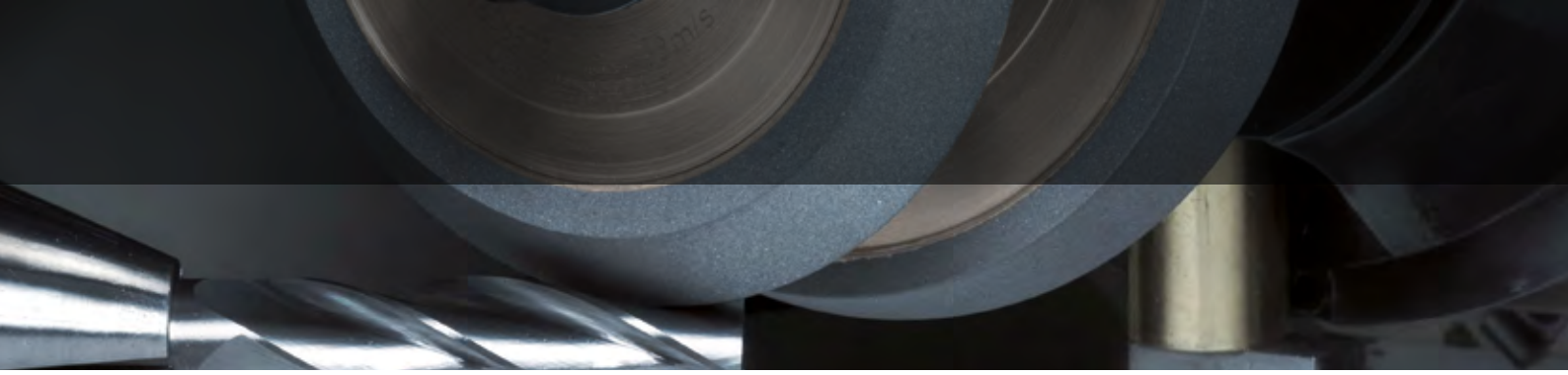
PRODUCT CATALOGUE
SPECIALISED PRECISION

January 2013 issue

A Company of the SWAROVSKI Group

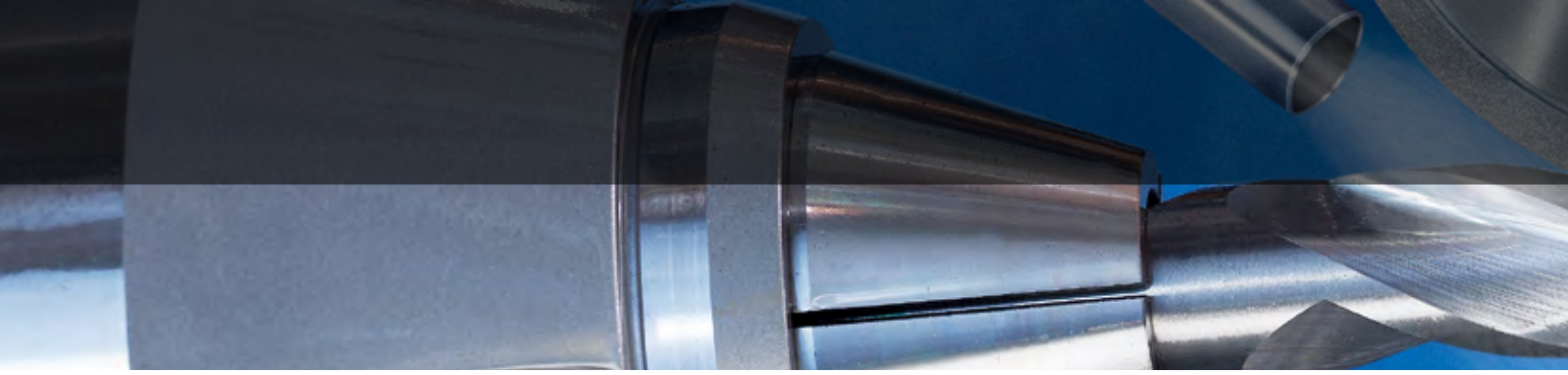
TYROLIT



CONTENTS

CONTENTS

CONTENTS



TYROLIT today

TYROLIT, a company within the Swarovski Group, is positioned as one of the world's largest manufacturers of grinding, cut-off, sawing, drilling and dressing tools and as a supplier of tool and machine systems for the construction and natural stone industry. Since it was founded in 1919, business at TYROLIT has been backed by one single OBJECTIVE:
to produce the best tools and machines in the world.

Quality

The high quality standards applying to our products, our dealings within and outside of the company and the services we provide to our business partners are embodied in the company's strategic position.

Ongoing internal and external testing and inspection in accordance with the international standards ISO 9001:2000 and VDA 6.4 provide for a sustained process of optimisation.
Aim: To continually increase the level of quality.

Innovation and technology

A key success factor is the continual development of new technologies geared to the needs of our customers, users, the markets and the environment.

Some 97 employees in research and development work daily to ensure that TYROLIT continues to be what it is today: a market leader in innovation and technology. around the world.

People

The quality of our products and services starts with the quality of our employees.

We are fully aware of this, which is why we create a motivating, social environment that attracts the best, trains and develops them and makes them want to stay for the long term.

Logistics

On the basis of our central location in Europe, our global network of regional sites in Europe, Asia and North and South America guarantees timely deliveries and individually tailored on-site services.

TYROLIT expansion

The quality requirements on us and our 80,000 products and the resulting demands that creates have an impact.

Thus Tyrolit and its workforce of 4100 employees are represented worldwide, with 28 production locations in 13 countries and a global network of sales organisations and distributors that is constantly expanding.

Orders

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Deliveries

General terms and conditions of business: **www.tyrolit.com**

Delivery periods and modification

EXPLANATION OF TERMS	DELIVERY PERIODS
Stock type: All products in our catalogue that are listed **with type numbers** are **in stock**.	**delivery on request**
Recommended stock type: A standard range created by our application engineers and marketing managers, which guarantees optimum grinding results for various grinding applications and the materials to be processed.	
Alternative stock type: Existing products, which – based on our global market and product experience – also guarantee good grinding results, but which are replaced in the short to medium term by **recommended stock** types.	

Breadth of product range: Precision is our business! However, if the specifications available do not provide you with the perfect solution, modifications to the recommended product range (dimensions) can also be made, i.e. grit size, hardness and structure.	The corresponding delivery periods can be found in the relevant chapter, or in the quote or order confirmation documentation.

Example of breadth of product range

Breadth of product range

C	60	H	5	Stock type
C	46 – 180	F – I	5 – 8	5 – 6 weeks DP
C	80	F	8	

→ Recommended standard specification

→ Possible range of modifications; grit size, hardness and structure

→ Example of a possible modification

Modification on request

To ensure quicker delivery periods in urgent cases, existing stock types (recommended stock types) can be modified to suit customer dimensions.
The current delivery period and price will be provided accordingly to the inquiry.

See current supplement for price list.

Specification designation and overview of abrasives

Specification as short characterisation of grinding tool

Example

89A		60	M	5	V	217
Abrasive description		**Grit size description**	**Hardness**	**Structure**	**Bond**	**Bond designation**
10A	Regular aluminium oxide	Grit size indication in mesh (sieve sizes per inch) **14 – 36 coarse** **46 – 60 medium** **80 – 220 fine** **800 – 1200 very fine**	Hardness ascends alphabetically e.g. **G = soft** **R = hard**	The higher the number, the more open the wheel is.	**V =** Vitrified-bonded **B =** Resin-bonded **E =** Elastic-bonded **G =** Galvanic-bonded	Internal code, which defines bond type.
50A	Mixture of 89A and 10A					
52A	Semi-friable aluminium oxide					
80A	Mixture of 88A and special aluminium oxide					
87A	Mixture of 89A and 88A					
88A	Pink fused aluminium oxide					
89A	White fused aluminium oxide					
91A	Ruby fused aluminium oxide					
92A	Mixture of 89A and special aluminium oxide					
93A	Mixture of 89A and 91A					
97A	Special aluminium oxide					
454A	Mixture of sintered aluminium oxide and 89A					
455A	Mixture of sintered aluminium oxide and 89A					
C	Green silicon carbide					
1C	Black silicon carbide					
50C	Silicon carbide mixture Green/black					

Example of a vitrified-bonded TYROLIT grinding wheel with conventional abrasive grain 89A 60 M5 V217.

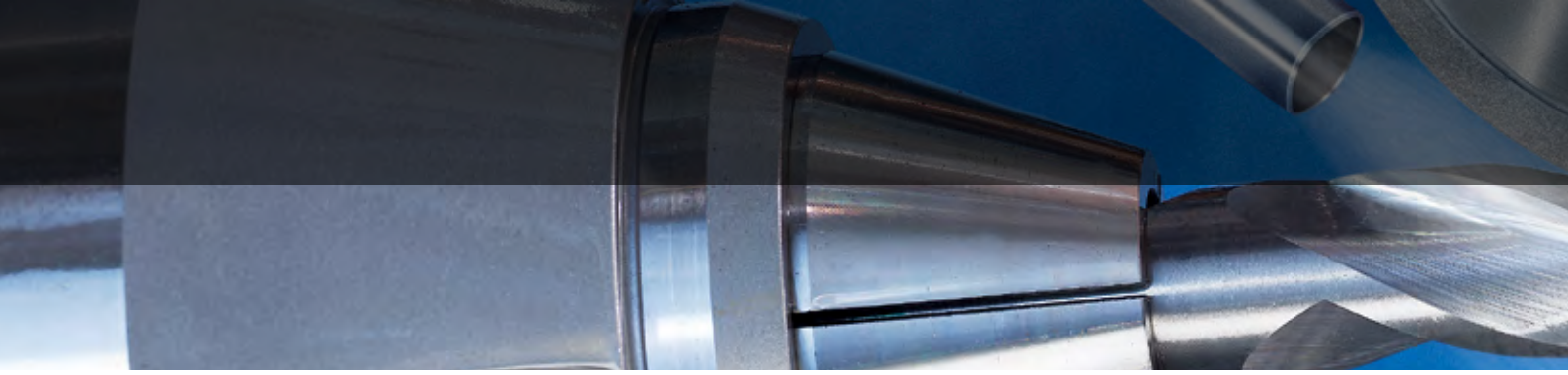
B		126	C50	B	54
Abrasive description		**Grit size description**	**Concentration**	**Bond**	**Bond designation**
B	CBN	Grit size indication in µm (average grain diameter according to FEPA) **35 – 181 µm**	The grain concentration shows the grain volume in carat, according to the unit of volume of the grinding layer.	**B =** Resin-bonded **M =** Metal-bonded	Internal code, which defines bond type.
D	Diamond				

Example of a resin-bonded TYROLIT grinding wheel with CBN abrasive grain B 126 C50 B54.

Materials table (example)

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
C					○	○	○	●		●		●

● highly suitable ○ limited suitability



Safety information


Pay attention to the safety recommendations


Use dust mask


Use eye protection


Use ear protection


Use gloves


Do not use damaged wheels


Personal safety


Not permitted for side grinding


Dry grinding


Wet grinding


No freehand work

Materials


Steel

Stainless steel


Cast iron

Nonferrous metals

HSS: tool steel

HM-TC: cemented carbide

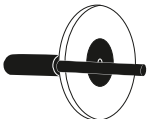

Industrial ceramics

Titanium

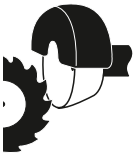
Abbreviations

DP = delivery period
PU = packing units (item)
V_S = max. permitted operating speed

Machine pictograms



External cylindrical grinding



- Universal tool grinding
- CNC tool grinding

- Reciprocating surface grinding
- Profile surface grinding
- Surface grinding with rings and segments

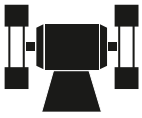
- Cutting rotating work pieces
- Stationary cut-off grinding

Internal cylindrical grinding

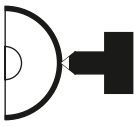
Off-hand grinding and cutting

Hand held grinding

Pedestal and swing frame grinding



- Floorstand grinding
- Sharpening and polishing wheels



Dressing and sharpening

Saw sharpening

EXTERNAL CYLINDRICAL GRINDING
CONVENTIONAL CERAMICS

Product advantages:

A comprehensive quality assurance system together with modern manufacturing technologies and production facilities form the basis for ultra-precise external cylindrical grinding tools tailored to customers' requirements.

- Lifetime of tools (=service life) optimised
- Cutting ability (=stock removal rate) tailored to application
- Economic efficiency of grinding process is uppermost
- Quality of workpieces dressed to size according to customer requirements

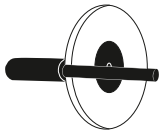
Application tips:

The key factor is the adjustment of the grinding wheel in the overall process (workpiece, tool, machine, parameters, coolant, dressing technology etc., as well as the specific requirements of the particular grinding applications

- The choice of specification, such as the adjustment of process parameters, can be optimised by TYROLIT application engineers to suit customer requirements
- Recommended operating speed: 25 – 35 m/sec
- Workpiece peripheral speed: depends on workpiece diameter
- Overlap rate: 30 – 40 % of wheel width
- For optimised dressing, see page 112 or 124 to 126

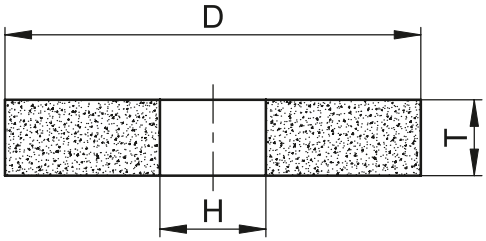
Safety information:

- Take note of the safety information, particularly in the case of maximum operating speed of 50 m/s
- See chapter "Safety when grinding" (page 128)



Non and low-alloyed steels

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
50A		●	○							○		●
89A			●	○	●	○				○		●



Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
664590	1	300	25	127	50A 60 K5 AV217	1	Maximum operating speed 50 m/s Grit size 60 Ra approx. 0.35 – 0.50 µm Grit size 80 Ra approx. 0.20 – 0.35 µm
690785	1	300	40	76.2	89A 80 J5 AV217	1	
664594	1	356	50	127	50A 60 K5 AV217	1	
655882	1	400	20	127	50A 60 K5 AV217	1	
889228	1	400	20	127	89A 80 J5 AV217	1	
664598	1	400	25	127	50A 60 K5 AV217	1	
881114	1	400	25	127	89A 80 J5 AV217	1	
664600	1	400	30	127	50A 60 K5 AV217	1	
39869	1	400	30	127	89A 80 J5 AV217	1	
655883	1	400	40	127	50A 60 K5 AV217	1	
620118	1	400	40	127	89A 80 J5 AV217	1	
119385	1	400	40	127	89A 120 K11 V3	1	General purpose / Angular plunge grinding
655886	1	400	50	127	50A 60 K5 AV217	1	Maximum operating speed 50 m/s Grit size 60 Ra approx. 0.35 – 0.50 µm Grit size 80 Ra approx. 0.20 – 0.35 µm
71665	1	400	50	127	89A 80 J5 AV217	1	
655888	1	400	60	127	50A 60 K5 AV217	1	
70954	1	400	60	127	89A 80 J5 AV217	1	
655891	1	400	80	127	50A 60 K5 AV217	1	
655864	1	400	80	127	89A 80 J5 AV217	1	
655898	1	500	40	203.2	50A 60 K5 AV217	1	
713537	1	500	40	203.2	89A 80 J5 AV217	1	
655902	1	500	50	203.2	50A 60 K5 AV217	1	
655869	1	500	50	203.2	89A 80 J5 AV217	1	
119392	1	500	50	203,2	89A 120 K11 V3	1	General purpose / Angular plunge grinding
655906	1	500	60	203.2	50A 60 K5 AV217	1	Maximum operating speed 50 m/s Grit size 60 Ra approx. 0.35 – 0.50 µm Grit size 80 Ra approx. 0.20 – 0.35 µm
39867	1	500	60	203.2	89A 80 J5 AV217	1	
655909	1	500	80	203.2	50A 60 K5 AV217	1	
655875	1	500	80	203.2	89A 80 J5 AV217	1	
655911	1	600	80	305	50A 60 K5 AV217	1	
655876	1	600	80	305	89A 80 J5 AV217	1	

Breadth of product range*

50A	60	K	5	Stock type
50A	46 – 80	I – K	5 – 8	5 – 6 weeks DP

89A	80	J	5	Stock type
89A	46 – 120	I – K	5 – 8	5 – 6 weeks DP

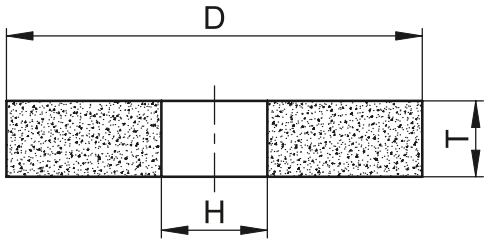
* For production reasons, the minimum quantity ordered may differ from non-stock types.

Alternative stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
44866	1	300	25	127	89A 60 K5 AV217	1	
690784	1	300	40	76.2	89A 60 K5 AV217	1	
66141	1	300	40	127	89A 60 K5 AV217	1	
170606	1	350	32	127	89A 60 K5 AV217	1	
42216	1	350	40	127	89A 60 K5 AV217	1	
293034	1	356	50	127	89A 46 J6 AV217	1	
485430	1	356	50	127	89A 60 K5 AV217	1	Maximum operating speed 50 m/s
170608	1	400	32	127	89A 60 K5 AV217	1	
25473	1	400	40	127	89A 60 K5 AV217	1	
523437	1	450	25	203.2	89A 60 K5 AV217	1	
523430	1	450	50	203.2	89A 60 K5 AV217	1	
202294	1	500	60	203.2	89A 60 K5 AV217	1	
523435	1	610	50	304.8	89A 60 K5 AV217	1	

High-alloyed steels and HSS

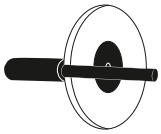
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
97A, 454A			○		●	●	○					●



Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
664561	1	400	20	127	454A 80 J10 V3	1	
664564	1	400	20	127	97A 80 J5 AV237	1	
655916	1	400	25	127	454A 80 J10 V3	1	
664571	1	400	25	127	97A 80 J5 AV237	1	
655918	1	400	30	127	454A 80 J10 V3	1	
664573	1	400	30	127	97A 80 J5 AV237	1	
655919	1	400	40	127	454A 80 J10 V3	1	
664575	1	400	40	127	97A 80 J5 AV237	1	
216066	1	400	50	127	454A 80 J10 V3	1	
664578	1	400	50	127	97A 80 J5 AV237	1	
655921	1	400	60	127	454A 80 J10 V3	1	Maximum operating speed 50 m/s
664580	1	400	60	127	97A 80 J5 AV237	1	
664562	1	400	80	127	454A 80 J10 V3	1	Grit size 80
664582	1	400	80	127	97A 80 J5 AV237	1	Ra approx. 0.20 – 0.35 µm
655927	1	500	40	203.2	454A 80 J10 V3	1	
664583	1	500	40	203.2	97A 80 J5 AV237	1	
655929	1	500	50	203.2	454A 80 J10 V3	1	
664585	1	500	50	203.2	97A 80 J5 AV237	1	
216068	1	500	60	203.2	454A 80 J10 V3	1	
664587	1	500	60	203.2	97A 80 J5 AV237	1	
655935	1	500	80	203.2	454A 80 J10 V3	1	
664588	1	500	80	203.2	97A 80 J5 AV237	1	
655938	1	600	80	305	454A 80 J10 V3	1	
664589	1	600	80	305	97A 80 J5 AV237	1	



Breadth of product range*

454A	80	J	10	Stock type
454A	80 – 120	I – K	6 – 11	5 – 6 weeks DP

97A	80	J	5	Stock type
97A	46 – 120	I – K	5 – 8	5 – 6 weeks DP

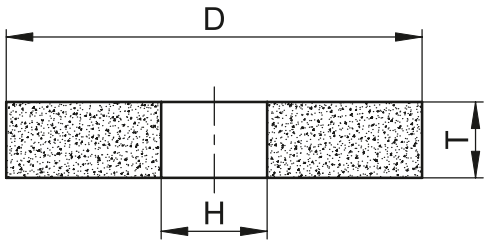
* For production reasons, the minimum quantity ordered may differ from non-stock types.

Alternative stock type, shape 1, 20

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
494259	1	250	13	76.2	454A 60 L7 G V3	1	Maximum operating speed 50 m/s
494271	1	355	25	127	454A 60 L7 G V3	1	
690233	1	400	40	127	92A 60 I5 AV217	1	
293789	1	500	50	203.2	92A 60I 5A V217	1	
290670	20	400	40	127	89A 60K 5A V217	1	
36576	20	400	50	127	454A 70 J5 V3	1	

Cemented carbide

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
C					○	○	○	●		●		●



Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
655957	1	400	40	127	C60 H5 AV18	1	Maximum operating speed 50 m/s If stock removal requirement are low, limited suitability for nonferrous heavy metals. For additional SiC specifications, see reciprocating surface grinding for cemented carbide.
656023	1	400	40	127	C100 H5 AV18	1	
655958	1	400	50	127	C60 H5 AV18	1	
656025	1	400	50	127	C100 H5 AV18	1	

Breadth of product range*

C	60	H	5	Stock type
C	60 – 120	H – J	5 – 8	5 – 6 weeks DP

C	100	H	5	Stock type
C	60 – 120	H – J	5 – 8	5 – 6 weeks DP

* For production reasons, the minimum quantity ordered may differ from non-stock types.

EXTERNAL CYLINDRICAL GRINDING
CBN & DIAMOND RESIN

Product advantages:

- VIB star is a system with vibration dampening cores that ensures a consistent and quiet grinding process
- Lower costs as a result of increased grinding ratio
- Consistent power consumption through constant self-sharpening effect

Application tips:

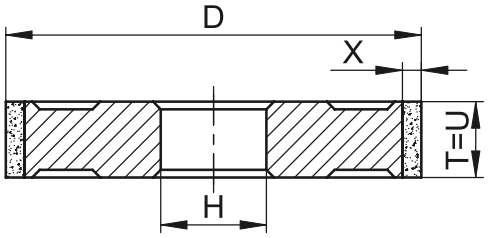
- Longitudinal feed/overlap rate: 30 – 50% of thickness of diamond section width
- Workpiece peripheral speed: depends on workpiece diameter
- Recommended cutting speed for CBN grinding wheels for HSS and high-alloyed tool steel is 22 – 30 m/s
- Recommended cutting speed for diamond grinding wheels for cemented carbide and industrial ceramics is 15 – 25 m/s
- Concentrically trueing and sharpening of wheel before initial use with
  – unhardened structural steel shaft
  – silicon carbide grinding wheel
- Ensure good coolant supply

Safety information:

- Max. operating speed = 63 m/s
- Observe safety information
- See chapter "Safety when grinding" (page 128)

High-alloyed steels and HSS

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
B			○		●	●	○					●



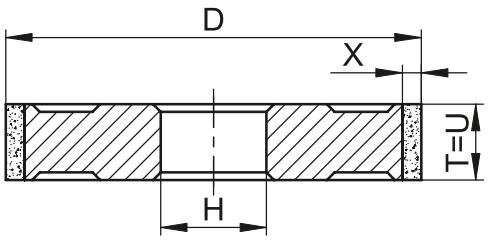
Shape 1A1

Recommended stock type, shape 1A1

TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
914301	1A1	200	15	51	15	3	B126 C50 B VIB-STAR	1	Maximum operating speed = 63 m/s Please observe information on dressing and sharpening of diamond and CBN tools; see chapter "Dressing and sharpening" (page 113 – 116).
485142	1A1	250	15	51	15	3	B126 C50 B VIB-STAR	1	
877158	1A1	300	20	76.2	20	3	B126 C50 B VIB-STAR	1	
885972	1A1	300	20	127	20	3	B126 C50 B VIB-STAR	1	
366816	1A1	350	20	127	20	3	B126 C50 B VIB-STAR	1	
874510	1A1	350	20	127	25	3	B126 C75 B VIB-STAR	1	
872688	1A1	400	20	127	20	3	B126 C50 B VIB-STAR	1	
473086	1A1	400	30	127	30	3	B126 C50 B VIB-STAR	1	

Cemented carbide

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
Diam.								●	●			●



Shape 1A1

Recommended stock type, shape 1A1

TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
914284	1A1	200	10	51	10	3	D126 C75 B VIB-STAR	1	Maximum operating speed = 63 m/s Please observe information on dressing and sharpening of diamond and CBN tools; see chapter "Dressing and sharpening" (page 113 – 116).
872702	1A1	250	15	51	15	3	D126 C75 B VIB-STAR	1	
897485	1A1	300	20	76.2	20	3	D126 C75 B VIB-STAR	1	
907436	1A1	300	15	127	15	3	D126 C75 B VIB-STAR	1	
914288	1A1	300	20	127	20	3	D126 C75 B VIB-STAR	1	
924298	1A1	350	20	127	20	3	D126 C75 B VIB-STAR	1	
914293	1A1	400	20	127	20	3	D126 C75 B VIB-STAR	1	

RECIPROCATING SURFACE GRINDING
CONVENTIONAL CERAMICS

Product advantages:

- Less wear
- Cool grinding
- High cutting ability

Application tips:

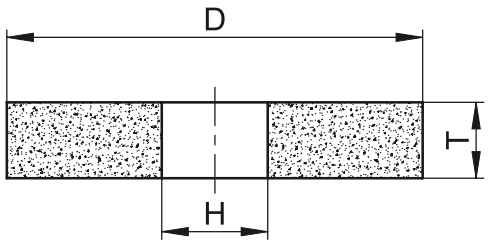
- Recommended operating speed: 20 – 30 m/s
- Table traverse speed: 10 – 20 m/min
- Infeed when roughing: 0.01 – 0.03 mm/stroke
- Infeed when finishing: 0.002 – 0.004 mm/stroke
- Transverse stroke (contact width in%): 30 – 40% of wheel width
- Finishing: 1 – 3 strokes (without infeed)
- Ensure good coolant supply

Safety information:

- Take note of the safety information, particularly in the case of maximum operating speed of 50 m/s
- See chapter "Safety when grinding" (page 128)

Non and low-alloyed steels

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
89A		●	●	●	●	○						●
93A			●		●	●						●



Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
566308	1	205	13	31.75	89A 46 I8 AV217	1	
664544	1	205	13	31.75	89A 80 J8 AV217	1	
8673	1	205	13	31.75	93A 46 H8 AV217	1	
498701	1	225	25	51	89A 46 I8 AV217	1	
664545	1	225	25	51	89A 80 J8 AV217	1	
664563	1	225	25	51	93A 46 H8 AV217	1	
664546	1	250	25	51	89A 80 J8 AV217	1	
498402	1	250	25	51	93A 46 H8 AV217	1	
331692	1	250	25	76.2	89A 46 I8 AV217	1	
664548	1	250	25	76.2	89A 80 J8 AV217	1	
664566	1	250	25	76.2	93A 46 H8 AV217	1	
351901	1	300	30	76.2	89A 46 I8 AV217	1	
664549	1	300	30	76.2	89A 80 J8 AV217	1	
849597	1	300	30	76.2	93A 46 H8 AV217	1	
523359	1	300	50	76.2	89A 46 I8 AV217	1	
664552	1	300	50	76.2	89A 80 J8 AV217	1	
628383	1	300	50	76.2	93A 46 H8 AV217	1	
936929	1	300	50	127	89A 46 I8 AV217	1	
664557	1	300	50	127	89A 80 J8 AV217	1	
143581	1	300	50	127	93A 46 H8 AV217	1	Grit size 46 for rough operations Grit size 80 for finer surface finishes
215986	1	350	40	127	89A 46 I8 AV217	1	
666533	1	350	40	127	89A 80 J8 AV217	1	
524016	1	350	40	127	93A 46 H8 AV217	1	
56484	1	350	50	127	89A 46 I8 AV217	1	
664558	1	350	50	127	89A 80 J8 AV217	1	
302416	1	355	50	127	89A 46 I8 AV217	1	
357751	1	355	50	127	93A 46 H8 AV217	1	
803992	1	400	40	127	89A 46 I8 AV217	1	
666530	1	400	40	127	89A 80 J8 AV217	1	
16667	1	400	40	127	93A 46 H8 AV217	1	
64598	1	400	50	127	89A 46 I8 AV217	1	
666532	1	400	50	127	89A 80 J8 AV217	1	
117241	1	400	50	127	93A 46 H8 AV217	1	
140088	1	400	60	127	89A 46 I8 AV217	1	
666529	1	400	60	127	89A 80 J8 AV217	1	
793338	1	400	60	127	93A 46 H8 AV217	1	
295600	1	400	80	127	89A 46 I8 AV217	1	
666534	1	400	80	127	89A 80 J8 AV217	1	
706357	1	400	80	127	93A 46 H8 AV217	1	

RECIPROCATING SURFACE GRINDING
CONVENTIONAL CERAMICS

Breadth of product range*

89A	46	I	8	Stock type
89A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

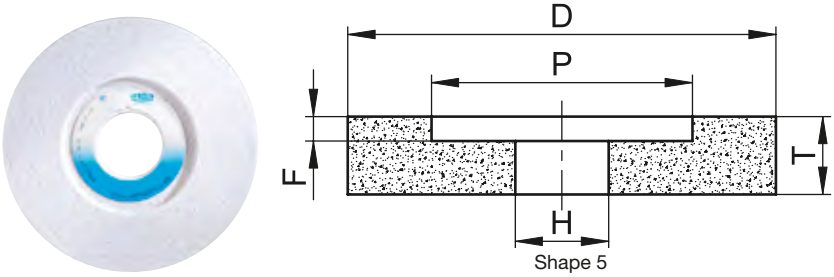
93A	46	H	8	Stock type
93A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

89A	80	J	8	Stock type
89A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

* For production reasons, the minimum quantity ordered may differ from non-stock types.

Alternative stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
32963	1	125	10	25	89A 46 I7 V217	1	
32965	1	150	13	32	89A 60 J7 V217	1	
850504	1	180	13	31.75	89A 60 K5 AV217	1	
33502	1	250	40	76.2	88A 46 J7 V217	1	
228819	1	250	40	76.2	89A 46 J7 V217	1	
45701	1	300	30	76.2	87A 36 J7 AV217	1	
96235	1	350	40	127	87A 36 J7 AV217	1	
61571	1	350	50	127	88A 46 J7 V217	1	
12950	1	400	50	127	87A 36 J7 AV217	1	



Shape 5

Recommended stock type, shape 5

TYPE NO.	SHAPE	DIAM.	T	H	P X F	SPECIFICATION	PU	COMMENTS
260141	5	300	50	76.2	155 x 10	89A 46 I8 AV217	1	
664584	5	300	50	76.2	155 x 10	89A 80 J8 AV217	1	
893552	5	300	50	76.2	155 x 10	93A 46 H8 AV217	1	
664574	5	300	50	127	190 x 10	89A 46 I8 AV217	1	
664626	5	300	50	127	190 x 10	89A 80 J8 AV217	1	
664642	5	300	50	127	190 x 10	93A 46 H8 AV217	1	
467466	5	350	50	127	200 x 10	89A 46 I8 AV217	1	
664629	5	350	50	127	200 x 10	89A 80 J8 AV217	1	Grit size 46 for rough operations Grit size 80 for finer surface finishes
231513	5	350	50	127	200 x 10	93A 46 H8 AV217	1	
548613	5	400	50	127	200 x 10	89A 46 I8 AV217	1	
664630	5	400	50	127	200 x 10	89A 80 J8 AV217	1	
557153	5	400	50	127	200 x 10	93A 46 H8 AV217	1	
664581	5	400	60	127	200 x 10	89A 46 I8 AV217	1	
664632	5	400	60	127	200 x 10	89A 80 J8 AV217	1	
664643	5	400	60	127	200 x 10	93A 46 H8 AV217	1	

Breadth of product range*

89A	46	I	8	Stock type
89A	46 – 60	H – J	5 – 9	5 – 6 weeks DP

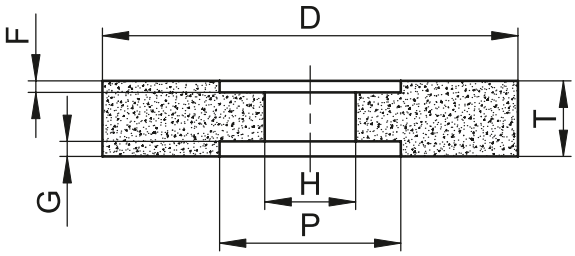
93A	46	H	8	Stock type
93A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

89A	80	J	8	Stock type
89A	70 – 100	H – J	5 – 9	5 – 6 weeks DP

* For production reasons, the minimum quantity ordered may differ from non-stock types.

Alternative stock type, shape 5

TYPE NO.	SHAPE	DIAM.	T	H	P X F	SPECIFICATION	PU	COMMENTS
235262	5	350	50	127	190 x 10	87A 36 J8 AV217	1	
369514	5	350	50	127	190 x 10	89A 46 I8 AV237-P22	1	
235264	5	400	50	127	200 x 10	87A 36 J8 AV217	1	
123064	5	400	50	127	200 x 10	89A 46 I8 AV237-P22	1	
658122	5	400	50	127	190 x 10	93A 46 I8 AV217	1	



Shape 7

Recommended stock type, shape 7

TYPE NO.	SHAPE	DIAM.	T	H	P X F / G	SPECIFICATION	PU	COMMENTS
665281	7	300	50	76.2	155 x 10 / 10	89A 46 I8 AV217	1	
664648	7	300	50	76.2	155 x 10 / 10	89A 80 J8 AV217	1	
109336	7	300	50	76.2	155 x 10 / 10	93A 46 H8 AV217	1	
665287	7	350	50	127	200 x 10 / 10	89A 46 I8 AV217	1	
664645	7	400	60	127	200 x 10 / 10	89A 46 I8 AV217	1	
664652	7	400	60	127	200 x 10 / 10	89A 80 J8 AV217	1	Grit size 46 for rough operations Grit size 80 for finer surface finishes
664657	7	400	60	127	200 x 10 / 10	93A 46 H8 AV217	1	
664646	7	400	80	127	190 x 15 / 15	89A 46 I8 AV217	1	
664656	7	400	80	127	190 x 15 / 15	89A 80 J8 AV217	1	
664658	7	400	80	127	190 x 15 / 15	93A 46 H8 AV217	1	
664647	7	400	100	127	200 x 20 / 30	89A 46 I8 AV217	1	

Breadth of product range*

89A	46	I	8	Stock type
89A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

89A	80	J	8	Stock type
89A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

93A	46	H	8	Stock type
93A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

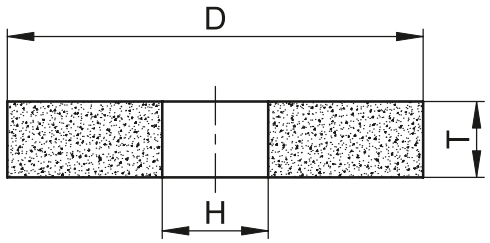
* For production reasons, the minimum quantity ordered may differ from non-stock types.

Alternative stock type, shape 7

TYPE NO.	SHAPE	DIAM.	T	H	P X F / G	SPECIFICATION	PU	COMMENTS
8749	7	300	50	76.2	155 x 10 / 10	50A 36 J8 AV217	1	
265130	7	300	50	76.2	154 x 11 / 18	88A 36 J7 V217	1	
641286	7	300	50	76.2	155 x 10 / 10	89A 60 I10 AV217	1	
493780	7	400	63	127	200 x 10 / 10	89A 46 I10 AV237	1	
235260	7	400	75	127	200 x 10 / 20	89A 46 I8 AV237-P22	1	
122991	7	400	75	127	200 x 10 / 20	89A 46 H8 AV227	1	
235261	7	400	75	127	200 x 10 / 20	93A 46 I8 AV217	1	
67472	7	400	100	127	200 x 20 / 35	89A 46 H8 AV217	1	
63824	7	400	100	152.4	220 x 15 / 15	89A 46 I8 AV237-P22	1	

High-alloyed steels and HSS

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
454A, 97A			○		●	●	○					●
F13			●	○	●	○						●



Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
441342	1	200	20	51	97A 46 H8 AV237	1	
441403	1	200	20	51	F13A 46 HH11 V	1	
664623	1	205	13	31.75	454A 60 J10 V3	1	
664401	1	205	13	31.75	97A 46 H8 AV237	1	
664405	1	205	13	31.75	97A 80 H8 AV237	1	
664435	1	205	13	31.75	F13A 46 HH11 V	1	
664383	1	225	25	51	454A 60 J10 V3	1	
228481	1	225	25	51	97A 46 H8 AV237	1	
664406	1	225	25	51	97A 80 H8 AV237	1	
441401	1	225	25	51	F13A 46 HH11 V	1	
664384	1	250	25	51	454A 60 J10 V3	1	
85536	1	250	25	51	97A 46 H8 AV237	1	
664407	1	250	25	51	97A 80 H8 AV237	1	
441399	1	250	25	51	F13A 46 HH11 V	1	
664389	1	250	25	76.2	454A 60 J10 V3	1	
248826	1	250	25	76.2	97A 46 H8 AV237	1	
664409	1	250	25	76.2	97A 80 H8 AV237	1	
469827	1	250	25	76.2	F13A 46 HH11 V	1	
664390	1	300	30	76.2	454A 60 J10 V3	1	
664402	1	300	30	76.2	97A 46 H8 AV237	1	
664410	1	300	30	76.2	97A 80 H8 AV237	1	For achievable surface finishes (standard values), see table on page 123
365997	1	300	30	76.2	F13A 46 HH11 V	1	
664391	1	300	50	76.2	454A 60 J10 V3	1	
635305	1	300	50	76.2	97A 46 H8 AV237	1	
311791	1	300	50	76.2	97A 80 H8 AV237	1	
665267	1	300	50	76.2	F13A 46 HH11 V	1	
664393	1	300	50	127	454A 60 J10 V3	1	
441348	1	300	50	127	97A 46 H8 AV237	1	
664412	1	300	50	127	97A 80 H8 AV237	1	
665269	1	300	50	127	F13A 46 HH11 V	1	
494874	1	350	40	127	454A 60 J10 V3	1	
441350	1	350	40	127	97A 46 H8 AV237	1	
664419	1	350	40	127	97A 80 H8 AV237	1	
665282	1	350	40	127	F13A 46 HH11 V	1	
664394	1	350	50	127	454A 60 J10 V3	1	
441351	1	350	50	127	97A 46 H8 AV237	1	
664420	1	350	50	127	97A 80 H8 AV237	1	
665294	1	350	50	127	F13A 46 HH11 V	1	
664396	1	400	40	127	454A 60 J10 V3	1	
524159	1	400	40	127	97A 46 H8 AV237	1	
664423	1	400	40	127	97A 80 H8 AV237	1	

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
665295	1	400	40	127	F13A 46 HH11 V	1	For achievable surface finishes (standard values), see table on page 123
664397	1	400	50	127	454A 60 J10 V3	1	
630054	1	400	50	127	97A 46 H8 AV237	1	
664426	1	400	50	127	97A 80 H8 AV237	1	
665296	1	400	50	127	F13A 46 HH11 V	1	
333396	1	400	60	127	454A 60 J10 V3	1	
846590	1	400	60	127	97A 46 H8 AV237	1	
664427	1	400	60	127	97A 80 H8 AV237	1	
665270	1	400	60	127	F13A 46 HH11 V	1	
664398	1	400	80	127	454A 60 J10 V3	1	
476380	1	400	80	127	97A 46 H8 AV237	1	
664428	1	400	80	127	97A 80 H8 AV237	1	
665273	1	400	80	127	F13A 46 HH11 V	1	
361668	1	500	80	203.2	89A 54 H10 AV2	1	

Breadth of product range*

454A	60	J	10	Stock type
454A	46 – 80	I – K	7 – 11	5 – 6 weeks DP

97A	46	H	8	Stock type
97A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

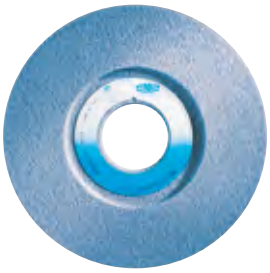
97A	80	H	8	Stock type
97A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

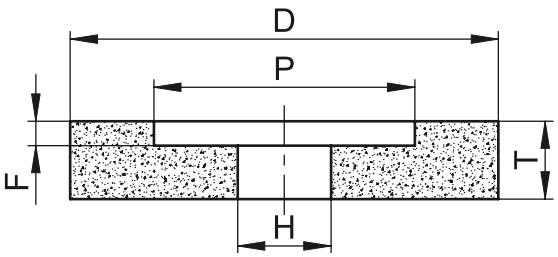
F13A	46	HH	11	Stock type
F13A	46 – 120	FF – HH	11 – 12	5 – 6 weeks DP

* For production reasons, the minimum quantity ordered may differ from non-stock types.

Alternative stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
749042	1	180	16	32	92A 60 H23 V237-W4	1	
344194	1	180	16	32	89A 46 I7 AV237	1	
344195	1	180	20	32	89A 46 I7 AV237	1	
494254	1	200	20	31.75	454A 60 L7 G V3	1	
305260	1	200	20	32	454A 46 L7 G V3	1	
212627	1	250	25	76.2	454A 60 L7 G V3	1	
713071	1	250	25	76.2	97A 46 H8 AV217	1	
305269	1	300	32	127	454A 46 H5 V3	1	
577274	1	300	50	76.2	92A 46 H8 AV217	1	
590725	1	300	50	127	92A 46 H23 V237-W2	1	
305279	1	350	40	127	454A 46 H5 V3	1	
305281	1	350	50	127	454A 46 H5 V3	1	
359223	1	350	50	127	92A 46 H8 AV217	1	
57038	1	350	50	127	97A 46 I8 AV217	1	
305285	1	400	50	127	454A 46 H5 V3	1	
307001	1	400	50	127	89A 46 H8 AV237-P25	1	
259325	1	400	50	127	92A 46 H8 AV217	1	
733646	1	400	50	127	97A 46 H8 AV217	1	
554635	1	400	50	127	97A 46 J9 AV217-P3	1	





Shape 5

Recommended stock type, shape 5

TYPE NO.	SHAPE	DIAM.	T	H	P x F	SPECIFICATION	PU	COMMENTS
664447	5	300	50	76.2	155 x 10	454A 60 J10 V3	1	
664456	5	300	50	76.2	155 x 10	97A 46 H8 AV237	1	
664465	5	300	50	76.2	155 x 10	97A 80 H8 AV237	1	
664478	5	300	50	76.2	155 x 10	F13A 46 HH11 V	1	
664451	5	300	50	127	190 x 10	454A 60 J10 V3	1	
664459	5	300	50	127	190 x 10	97A 46 H8 AV237	1	
664472	5	300	50	127	190 x 10	97A 80 H8 AV237	1	
664480	5	300	50	127	190 x 10	F13A 46 HH11 V	1	
664452	5	350	50	127	200 x 10	454A 60 J10 V3	1	
441352	5	350	50	127	200 x 10	97A 46 H8 AV237	1	For achievable surface finishes (standard values), see table on page 123
664474	5	350	50	127	200 x 10	97A 80 H8 AV237	1	
665297	5	350	50	127	200 x 10	F13 A46 HH11 V	1	
664453	5	400	50	127	200 x 10	454A 60 J10 V3	1	
593711	5	400	50	127	200 x 10	97A 46 H8 AV237	1	
664476	5	400	50	127	200 x 10	97A 80 H8 AV237	1	
593712	5	400	50	127	200 x 10	F13A 46 HH11 V	1	
664455	5	400	60	127	200 x 10	454A 60 J10 V3	1	
664463	5	400	60	127	200 x 10	97A 46 H8 AV237	1	
664477	5	400	60	127	200 x 10	97A 80 H8 AV237	1	
664482	5	400	60	127	200 x 10	F13A 46 HH11 V	1	

Breadth of product range*

454A	60	J	10	Stock type
454A	46 – 80	I – K	7 – 11	5 – 6 weeks DP

97A	46	H	8	Stock type
97A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

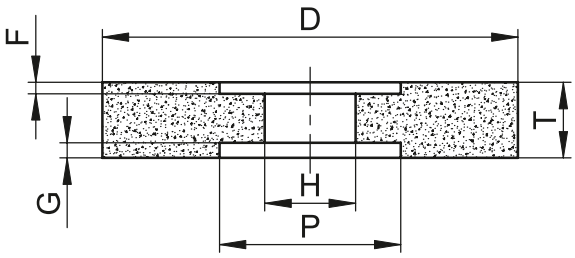
97A	80	H	8	Stock type
97A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

F13A	46	HH	11	Stock type
F13A	46 – 120	FF – HH	11 – 12	5 – 6 weeks DP

* For production reasons, the minimum quantity ordered may differ from non-stock types.

Alternative stock type, shape 5

TYPE NO.	SHAPE	DIAM.	T	H	P x F	SPECIFICATION	PU	COMMENTS
494274	5	180	25	31.75	105 x 12	454A 60 L7 G V3	1	
280358	5	300	50	127	190 x 10	F16A 60 HH11 V	1	
197044	5	350	50	127	200 x 10	454A 54 J10 V3-P23	1	
12696	5	350	50	127	190 x 10	F16A 60 HH12 V	1	
110964	5	350	50	127	190 x 10	F18A 80 GG11 V	1	
293802	5	400	50	127	190 x 10	454A 46 J10 V3	1	
36579	5	400	50	127	200 x 10	454A 60 J10 V3	1	
657669	5	400	50	127	190 x 10	92A 46 H8 AV217	1	
12695	5	400	50	127	200 x 10	F16A 60 HH12 V	1	
92284	5	400	50	127	200 x 10	F18A 80 GG11 V	1	



Shape 7

Recommended stock type, shape 7

TYPE NO.	SHAPE	DIAM.	T	H	P x F / G	SPECIFICATION	PU	COMMENTS
664485	7	300	50	76.2	155 x 10 / 10	454A 60 J10 V3	1	For achievable surface finishes (standard values), see table on page 123
359403	7	300	50	76.2	155 x 10 / 10	97A 46 H8 AV237	1	
664498	7	300	50	76.2	155 x 10 / 10	97A 80 H8 AV237	1	
664506	7	300	50	76.2	155 x 10 / 10	F13A 46 HH11 V	1	
566387	7	350	50	127	200 x 10 / 10	97A 46 H8 AV237	1	
665285	7	350	50	127	200 x 10 / 10	F13A 46 HH11 V	1	
664490	7	400	60	127	200 x 10 / 10	454A 60 J10 V3	1	
664497	7	400	60	127	200 x 10 / 10	97A 46 H8 AV237	1	
664502	7	400	60	127	200 x 10 / 10	97A 80 H8 AV237	1	
664510	7	400	60	127	200 x 10 / 10	F13A 46 HH11 V	1	
664493	7	400	80	127	190 x 15 / 15	454A 60 J10 V3	1	
512393	7	400	80	127	190 x 15 / 15	97A 46 H8 AV237	1	
664504	7	400	80	127	190 x 15 / 15	97A 80 H8 AV237	1	
665278	7	400	80	127	190 x 15 / 15	F13A 46 HH11 V	1	

Breadth of product range*

454A	60	J	10	Stock type
454A	46 – 80	I – K	7 – 11	5 – 6 weeks DP

97A	46	H	8	Stock type
97A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

97A	80	H	8	Stock type
97A	46 – 100	H – J	5 – 9	5 – 6 weeks DP

F13A	46	HH	11	Stock type
F13A	46 – 120	FF – HH	11 – 12	5 – 6 weeks DP

* For production reasons, the minimum quantity ordered may differ from non-stock types.

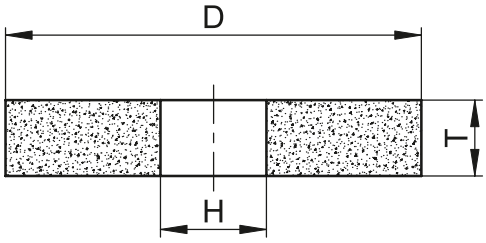
Alternative stock type, shape 7

TYPE NO.	SHAPE	DIAM.	T	H	P x F / G	SPECIFICATION	PU	COMMENTS
176979	7	300	50	76.2	160 x 10 / 10	454A 46 K8 V3	1	
293865	7	300	50	76.2	155 x 10 / 10	454A 46 J10 V3	1	
657667	7	300	50	76.2	155 x 10 / 10	92A 46 H8 AV217	1	
293867	7	300	50	76.2	155 x 10 / 10	F18A 46 HH12 V	1	
232678	7	400	75	127	215 x 10 / 20	454A 54 K13 V3-P23	1	
94720	7	400	75	127	200 x 10 / 20	F16A 60 HH12 V	1	
232665	7	400	100	152.4	220 x 15 / 15	F18A 70 GG11 V	1	
114648	7	450	76	203.2	280 x 10 / 20	F16A 60 HH12 V45A	1	

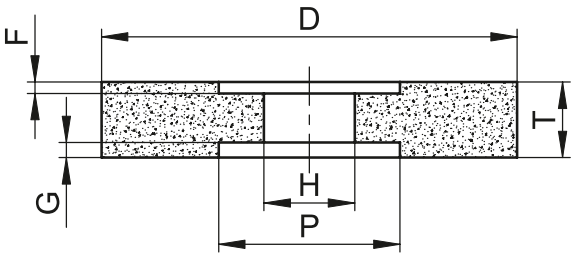
RECIPROCATING SURFACE GRINDING
CONVENTIONAL CERAMICS

Stainless steel

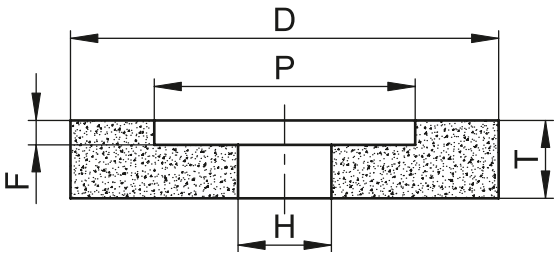
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
80A		○	●	○	●		●					●



Shape 1



Shape 7



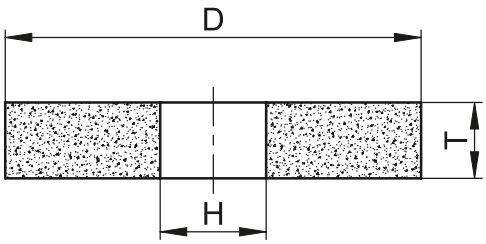
Shape 5

Recommended stock type, shape 1, 5, 7

TYPE NO.	SHAPE	DIAM.	T	H	P x F / G	SPECIFICATION	PU	COMMENTS
657501	1	250	25	51		80A 54 I9 AV217-P23	1	
27420	1	400	50	127		80A 54 I9 AV217-P23	1	
664514	5	300	50	76.2	155 x 10	80A 54 I9 AV217-P23	1	
657665	5	400	50	127	190 x 10	80A 54 I9 AV217-P23	1	
10845	7	300	50	76.2	155 x 10 / 10	80A 54 I9 AV217-P23	1	
664515	7	400	50	76.2	155 x 10 / 10	80A 54 I9 AV217-P23	1	

Cemented carbide

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
C	○				●	●	○	○	○	●		●



Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
664530	1	300	40	127	C80 H8 AV18	1	Maximum operating speed = 50 m/s, also suitable for external cylindrical, structure 8 – limited suitability for nonferrous heavy metals
664531	1	300	50	127	C80 H8 AV18	1	
664535	1	400	40	127	C80 H8 AV18	1	
664536	1	400	50	127	C80 H8 AV18	1	

Breadth of product range*

C	80	H	8	Stock type
C	46 – 180	F – I	5 – 8	5 – 6 weeks DP

* For production reasons, the minimum quantity ordered may differ from non-stock types.

RECIPROCATING SURFACE GRINDING
CBN & DIAMOND RESIN

Product advantages:

- VIB star is a system with vibration dampening cores that ensures a consistent and quiet grinding process
- Lower costs as a result of increased grinding ratio
- Consistent power consumption through constant self-sharpening effect

Application tips:

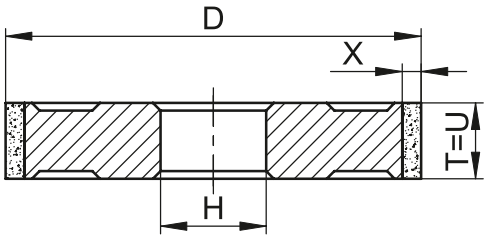
- Table traverse speed: 10 – 20 m/min
- Transverse stroke/overlap rate: 30 – 40% of thickness of diamond section
- Standard value for infeed: 1/10 of grinding grit size (e.g. D126 -> infeed 12 µm)
- Recommended cutting speed for CBN grinding wheels for HSS and high-alloyed tool steel is 22 – 30 m/s
- Recommended cutting speed for diamond grinding wheels for cemented carbide and industrial ceramics is 15 – 25 m/s
- Concentrically trueing and sharpening of wheel before initial use with
  – unhardened structural steel block
  – AV500 dressing device with silicon carbide grinding wheel (see chapter "Dressing and sharpening", page 113)
- Ensure good coolant supply

Safety information:

- Max. peripheral speed = 63 m/s
- Observe safety information
- See chapter "Safety when grinding" (page 128)

High-alloyed steels and HSS

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
B			○		●	●	○					●



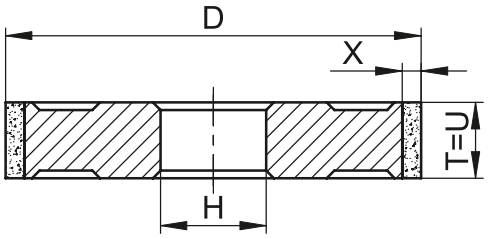
Shape 1A1

Recommended stock type, shape 1A1

TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
914301	1A1	200	15	51	15	3	B126 C50 B VIB-STAR	1	Maximum operating speed = 63 m/s Please observe information on dressing and sharpening of diamond and CBN tools; see chapter "Dressing and sharpening" (page 113 – 116).
485142	1A1	250	15	51	15	3	B126 C50 B VIB-STAR	1	
877158	1A1	300	20	76.2	20	3	B126 C50 B VIB-STAR	1	
885972	1A1	300	20	127	20	3	B126 C50 B VIB-STAR	1	
366816	1A1	350	20	127	20	3	B126 C50 B VIB-STAR	1	
874510	1A1	350	20	127	20	3	B126 C75 B VIB-STAR	1	
872688	1A1	400	20	127	20	3	B126 C50 B VIB-STAR	1	
473086	1A1	400	30	127	30	3	B126 C50 B VIB-STAR	1	

Cemented carbide

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
Diam.								●	●			●



Shape 1A1

Recommended stock type, shape 1A1

TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
914284	1A1	200	10	51	10	3	D126 C75 B VIB-STAR	1	Maximum operating speed = 63 m/s Please observe information on dressing and sharpening of diamond and CBN tools; see chapter "Dressing and sharpening" (page 113 – 116).
872702	1A1	250	15	51	15	3	D126 C75 B VIB-STAR	1	
897485	1A1	300	20	76.2	20	3	D126 C75 B VIB-STAR	1	
907436	1A1	300	15	127	15	3	D126 C75 B VIB-STAR	1	
914288	1A1	300	20	127	20	3	D126 C75 B VIB-STAR	1	
924298	1A1	350	20	127	20	3	D126 C75 B VIB-STAR	1	
914293	1A1	400	20	127	20	3	D126 C75 B VIB-STAR	1	

PROFILE SURFACE GRINDING
CONVENTIONAL CERAMICS

Product advantages:

- Special aluminium oxide profile grinding wheels with highly porous structure
- Optimum profile retention
- Minimum dressing diamond wear

Application tips:

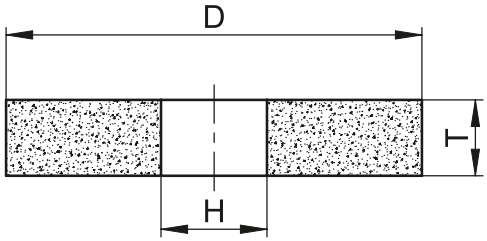
- Recommended operating speed: 25 – 30 m/s
- Infeed: 0.003 – 0.1 mm/stroke
- Traverse speed: 10 – 20 m/min
- Ensure good coolant supply
- For optimised dressing, see page 112 or 124 to 126

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

High-alloyed steels

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
80A		○	●	○	●		●					●
C (nitriding steel)					●	●	○	●	○			●



Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
163110	1	225	25	51	80A 80 J9 AV17-P25	1	
421779	1	250	15	51	80A 80 J9 AV17-P25	1	
148656	1	250	20	51	80A 120 J9 AV17-P8	1	
337183	1	250	20	51	C180 F8 AV18-P8	1	for nitriding steel

Breadth of product range*

C	180	F	8	Stock type
C	120 – 180	F	8	5 – 6 weeks DP

* For production reasons, the minimum quantity ordered may differ from non-stock types.

Alternative stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
876616	1	180	6	32	80A 120 I7 GV112	1	
876613	1	180	8	32	80A 120 I7 GV112	1	
876590	1	180	10	32	80A 120 I7 GV112	1	
876618	1	180	10	32	80A 80 I7 GV112	1	
876591	1	180	13	32	80A 80 I7 GV112	1	
876610	1	180	13	32	80A 120 I7 GV112	1	
688752	1	200	10	32	80A 80 I7 GV112	1	
876619	1	200	10	32	80A 120 I7 GV112	1	
876611	1	200	13	32	80A 120 I7 GV112	1	

SURFACE GRINDING WITH RINGS AND SEGMENTS

CERAMIC / CONVENTIONAL RESIN

Product advantages:

- High stock removal rate
- Self-sharpening
- Cool grinding

Application tips:

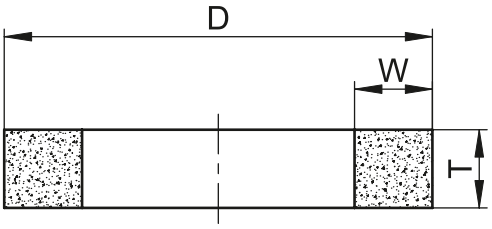
- Recommended operating speed: 25 – 30 m/s
- Traverse speed: 2 – 10 m/min
- Infeed 0.005 – 0.03 mm/stroke
- Sparking out without infeed 1 – 3 strokes
- Ensure good coolant supply

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

High-alloyed steels and HSS

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
50A		●	○									●
89A cer.			●	○	●	○						●
89A bak.			○		●	●						●
97A, 454A			○		●	●	○					●
91A, 92A			●		●	●						●



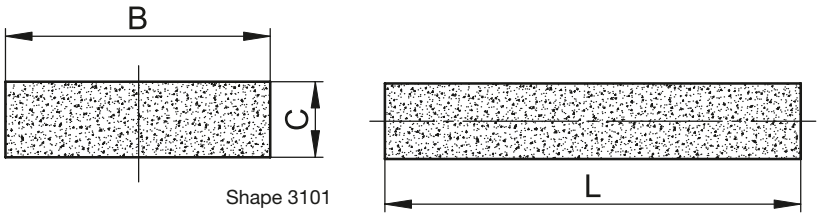
Shape 2

Recommended stock type, shape 2

TYPE NO.	SHAPE	DIAM.	T	W	SPECIFICATION	PU	COMMENTS
664621	2	200	90	20	92A 46 H10 AV237	1	
461733	2	200	90	20	91A 46 G9 AV217	1	
468751	2	200	100	20	89A 46 G10 AV217	1	
664622	2	200	100	20	92A 46 H10 AV237	1	
469614	2	200	100	20	89A 60 G4 B22-W4E	1	Göckel, Reform (planer and chopper knives)
469619	2	250	100	25	89A 60 G4 B22-W4E	1	Göckel, Reform (planer and chopper knives)

Associated adhesives

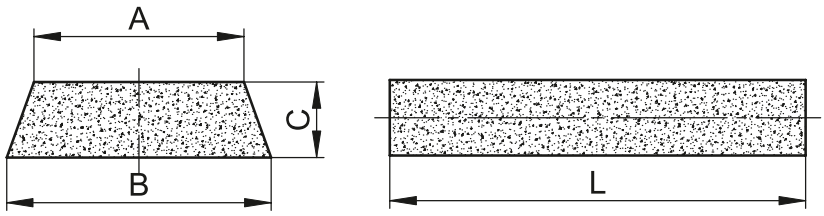
709899	103K02	1	Vinapas adhesive; 0.5 kg



Shape 3101

Recommended stock type, shape 3101

TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
664628	3101	120	40	200	454A 46 K13 V3	1	
664633	3101	120	40	200	50A 36 I8 AV2	1	
664634	3101	120	40	200	89A 36 I8 AV2	1	
664640	3101	120	40	200	97A 46 G10 AV237	1	



Shape 3109

Recommended stock type, shape 3109

TYPE NO.	SHAPE	B / A	C	L	SPECIFICATION	PU	COMMENTS
229899	3109	103 / 94	38	200	454A 46 K13 V3	1	
664653	3109	103 / 94	38	200	50A 36 I8 AV2	1	
664654	3109	103 / 94	38	200	89A 36 I8 AV2	1	
664655	3109	103 / 94	38	200	97A 46 G10 AV237	1	

INTERNAL CYLINDRICAL GRINDING
CONVENTIONAL CERAMICS

Product advantages:

- Optimum profile retention
- Low thermal load, cool grinding
- Universal use

Application tips:

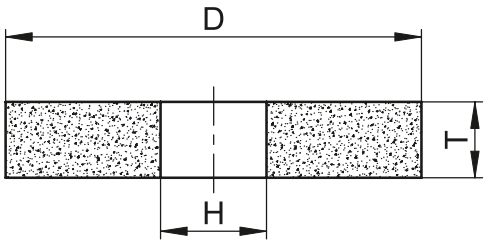
- Recommended operating speed: 30 – 50 m/s
- Pre-grinding infeed: 0.02 – 0.05 mm/stroke
- Semi-finish grinding infeed: 0.01 – 0.005 mm/stroke
- Finish grinding infeed: 0.001 – 0.002 mm/stroke
- Spark-out infeed: 5 strokes
- Ensure good coolant supply

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

Non and low-alloyed steels

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
89A			●	○	●	○				○		●

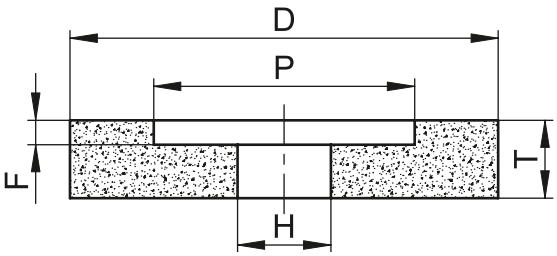


Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
234391	1	15	15	6	89A 60 J5 V111	25	
807005	1	15	15	6	89A 80 I5 V111	25	
234390	1	20	20	6	89A 60 J5 V111	25	
664711	1	20	20	6	89A 80 I5 V111	25	
664699	1	25	25	6	89A 60 J5 V111	10	
664712	1	25	25	6	89A 80 I5 V111	10	
807013	1	25	25	8	89A 60 J5 V111	10	
664715	1	25	25	8	89A 80 I5 V111	10	
795621	1	25	25	10	89A 60 J5 V111	10	
664716	1	25	25	10	89A 80 I5 V111	10	
664703	1	30	30	10	89A 60 J5 V111	10	Maximum operating speed 50 m/s
664717	1	30	30	10	89A 80 I5 V111	10	
445055	1	32	25	10	89A 60 J5 V111	10	
664718	1	32	25	10	89A 80 I5 V111	10	
664704	1	32	32	10	89A 60 J5 V111	10	
563191	1	32	32	10	89A 80 I5 V111	10	
664706	1	40	40	13	89A 60 J5 V111	10	
664719	1	40	40	13	89A 80 I5 V111	10	
234387	1	50	40	16	89A 60 J5 V111	10	
664721	1	50	40	16	89A 80 I5 V111	10	
664708	1	50	50	16	89A 60 J5 V111	10	
664722	1	50	50	16	89A 80 I5 V111	10	

INTERNAL CYLINDRICAL GRINDING
CONVENTIONAL CERAMICS



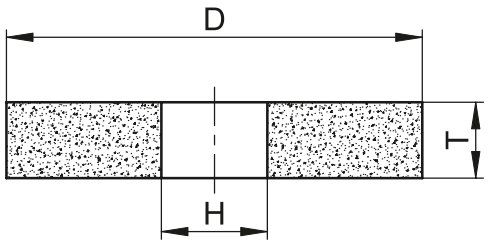
Shape 5

Recommended stock type, shape 5

TYPE NO.	SHAPE	DIAM.	T	H	P x F	SPECIFICATION	PU	COMMENTS
664768	5	20	20	6	13 x 7	89A 60 J5 V111	25	Maximum operating speed 50 m/s
664787	5	20	20	6	13 x 7	89A 80 I5 V111	25	
664771	5	25	25	6	12 x 13	89A 60 J5 V111	10	
664791	5	25	25	6	12 x 13	89A 80 I5 V111	10	
664772	5	25	25	10	16 x 10	89A 60 J5 V111	10	
664792	5	25	25	10	16 x 10	89A 80 I5 V111	10	
664777	5	32	32	10	18 x 16	89A 60 J5 V111	10	
664793	5	32	32	10	18 x 16	89A 80 I5 V111	10	
664780	5	40	40	13	20 x 20	89A 60 J5 V111	10	
664794	5	40	40	13	20 x 20	89A 80 I5 V111	10	
664783	5	50	40	16	30 x 13	89A 60 J5 V111	10	
664795	5	50	40	16	30 x 13	89A 80 I5 V111	10	
664785	5	50	50	16	25 x 25	89A 60 J5 V111	10	
664796	5	50	50	16	25 x 25	89A 80 I5 V111	10	

High-alloyed steels and HSS

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
97A, AT			○		●	●	○					●



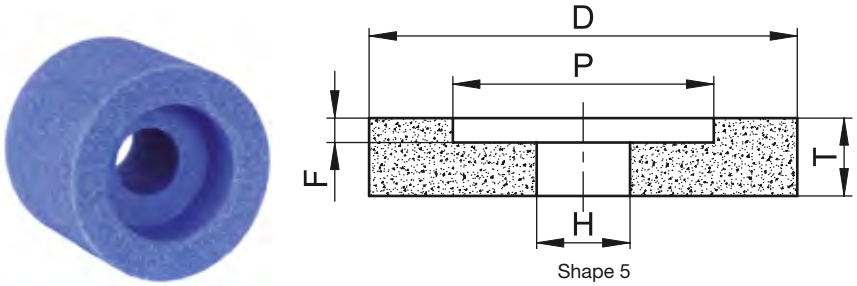
Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
781647	1	15	15	6	97A 80 I5 V112	25	Maximum operating speed 80 m/s
664683	1	15	15	6	AT 60 J6 VCOL	25	
781649	1	20	20	6	97A 80 I5 V112	25	
664684	1	20	20	6	AT 60 J6 VCOL	25	
664666	1	25	25	6	97A 80 I5 V112	10	
664685	1	25	25	6	AT 60 J6 VCOL	10	
664668	1	25	25	8	97A 80 I5 V112	10	
664686	1	25	25	8	AT 60 J6 VCOL	10	
664669	1	25	25	10	97A 80 I5 V112	10	
664689	1	25	25	10	AT 60 J6 VCOL	10	
664670	1	30	30	10	97A 80 I5 V112	10	
664692	1	30	30	10	AT 60 J6 VCOL	10	
664672	1	32	25	10	97A 80 I5 V112	10	

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
664693	1	32	25	10	AT 60 J6 VCOL	10	
664673	1	32	32	10	97A 80 I5 V112	10	
664694	1	32	32	10	AT 60 J6 VCOL	10	
747519	1	32	32	10	97A 60 K6 V112	10	
747522	1	40	25	10	97A 60 K6 V112	10	
664675	1	40	40	13	97A 80 I5 V112	10	Maximum operating speed 80 m/s
664695	1	40	40	13	AT 60 J6 VCOL	10	
664677	1	50	40	16	97A 80 I5 V112	10	
664696	1	50	40	16	AT 60 J6 VCOL	10	
664679	1	50	50	16	97A 80 I5 V112	10	
664697	1	50	50	16	AT 60 J6 VCOL	10	



Shape 5

Recommended stock type, shape 5

TYPE NO.	SHAPE	DIAM.	T	H	P x F	SPECIFICATION	PU	COMMENTS
664728	5	20	20	6	13 x 7	97A 80 I5 V112	25	
664757	5	20	20	6	13 x 7	AT 60 J6 VCOL	25	
664737	5	25	25	6	12 x 13	97A 80 I5 V112	10	
664759	5	25	25	6	12 x 13	AT 60 J6 VCOL	10	
664738	5	25	25	10	16 x 10	97A 80 I5 V112	10	
664760	5	25	25	10	16 x 10	AT 60 J6 VCOL	10	
664742	5	32	32	10	18 x 16	97A 80 I5 V112	10	
664761	5	32	32	10	18 x 16	AT 60 J6 VCOL	10	Maximum operating speed 80 m/s
664744	5	40	40	13	20 x 20	97A 80 I5 V112	10	
664764	5	40	40	13	20 x 20	AT 60 J6 VCOL	10	
664746	5	50	40	16	30 x 13	97A 80 I5 V112	10	
664766	5	50	40	16	30 x 13	AT 60 J6 VCOL	10	
664749	5	50	50	16	25 x 25	97A 80 I5 V112	10	
664767	5	50	50	16	25 x 25	AT 60 J6 VCOL	10	

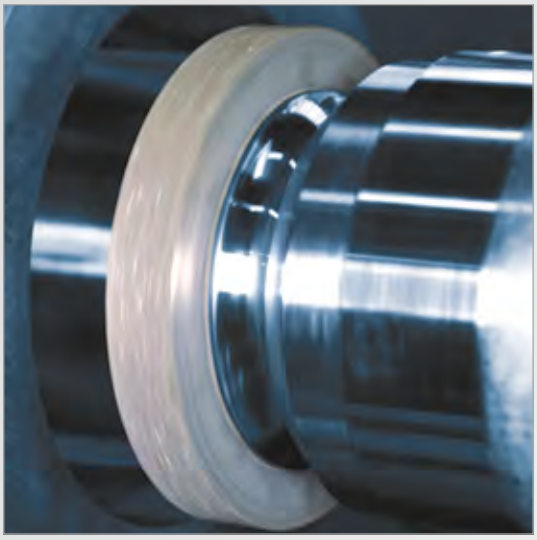
Alternative stock type, shape 5

TYPE NO.	SHAPE	DIAM.	T	H	P x F	SPECIFICATION	PU	COMMENTS
747511	5	20	20	6	13 x 7	97A 60 K6 V112	10	
293798	5	25	25	10	16 x 10	454A 100 K9 V3	10	
747516	5	25	25	10	16 x 10	97A 60 K6 V112	10	
747526	5	40	32	16	25 x 13	97A 60 K6 V112	10	Maximum operating speed 80 m/s
232811	5	40	40	10	16 x 20	455A 80 L6 V3	10	
747530	5	50	40	16	30 x 13	97A 60 K6 V112	10	

INTERNAL CYLINDRICAL GRINDING
CBN & DIAMOND – GALVANIC / RESIN

Product advantages:

- Compared to conventional grinding tools, diamond and CBN tools are characterised by a better lifetime and shorter grinding times.
- Improved dimensional accuracy as a result of long tool life



Application tips:

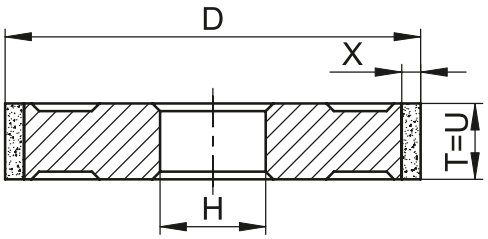
- Recommended cutting speed for HSS and high-alloyed tool steel is 15 – 35 m/s
- Recommended cutting speed for cemented carbide and industrial ceramics is 15 – 25 m/s
- Cooling with emulsion recommended

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

High-alloyed steels and HSS

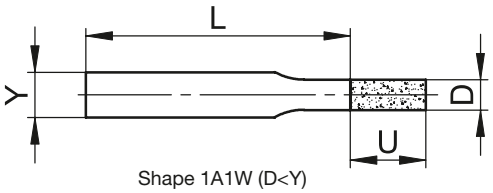
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
B			○		●	●	○				○	●



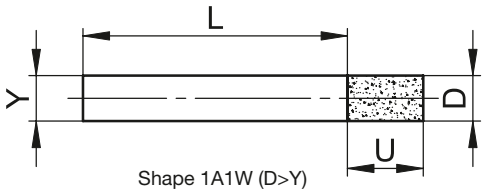
Shape 1A1

Recommended stock type, shape 1A1

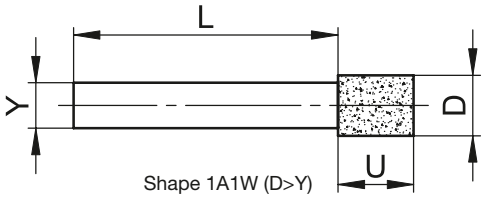
TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
384481	1A1	12	10	6	10	2	B126 C75 B54	1	CBN resin-bonded
34937	1A1	15	10	6	10	2	B126 C75 B54	1	
127356	1A1	20	10	6	10	2	B126 C75 B54	1	
55282	1A1	25	10	8	10	3	B126 C75 B54	1	
43017	1A1	30	10	10	10	3	B126 C75 B54	1	
29371	1A1	40	10	10	10	2	B126 C75 B54	1	



Shape 1A1W (D<Y)



Shape 1A1W (D>Y)



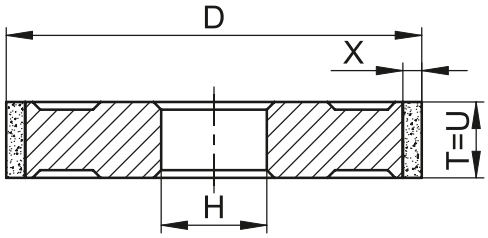
Shape 1A1W (D>Y)

Recommended stock type, shape 1A1W

TYPE NO.	SHAPE	DIAM.	U	Y x L	SPECIFICATION	PU	COMMENTS
477403	1A1W	1.5	4	S3 x 50	B91 GST	5	CBN galvanic-bonded CBN layer, single
477406	1A1W	2	4	S3 x 50	B91 GST	5	
477407	1A1W	2.5	4	S3 x 50	B91 GST	5	
477409	1A1W	3	5	S3 x 50	B91 GST	5	
477411	1A1W	4	5	S3 x 50	B126 GST	5	
477412	1A1W	5	7	S3 x 50	B126 GST	5	
477413	1A1W	6	7	S6 x 50	B126 GST	5	
477414	1A1W	7	8	S6 x 50	B126 GST	5	
477416	1A1W	8	10	S6 x 50	B126 GST	5	
477418	1A1W	12	10	S6 x 50	B151 GST	5	

Cemented carbide and industrial ceramics

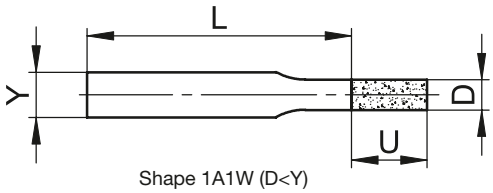
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
Diam.								●	●		○	●



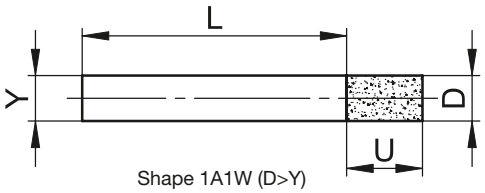
Shape 1A1

Recommended stock type, shape 1A1

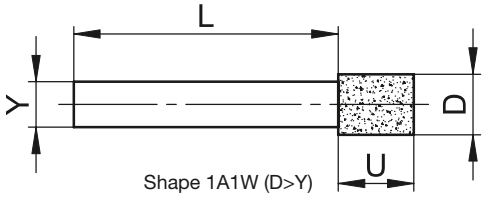
TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
786986	1A1	12	10	6	10	2	D91 C75 B	1	Diamond resin-bonded
786952	1A1	15	10	6	10	2	D91 C75 B	1	
786953	1A1	20	10	6	10	2	D91 C75 B	1	
665019	1A1	25	10	8	10	3	D91 C75 B	1	
319980	1A1	30	10	10	10	3	D91 C75 B	1	
872750	1A1	40	10	10	10	2	D91 C75 B	1	



Shape 1A1W (D<Y)



Shape 1A1W (D>Y)



Shape 1A1W (D>Y)

Recommended stock type, shape 1A1W

TYPE NO.	SHAPE	DIAM.	U	Y x L	SPECIFICATION	PU	COMMENTS
477335	1A1W	1	4	S3 x 50	D91 XGST	5	Diamond galvanic-bonded Diamond layer, single
477342	1A1W	2	4	S3 x 50	D91 XGST	5	
477346	1A1W	3	5	S3 x 50	D91 XGST	5	
477349	1A1W	4	5	S3 x 50	D126 XGST	5	
477352	1A1W	6	7	S6 x 50	D126 XGST	5	
477356	1A1W	8	10	S6 x 50	D126 XGST	5	
477358	1A1W	10	10	S6 x 50	D151 XGST	5	
477360	1A1W	15	10	S6 x 50	D151 XGST	5	

NOTES:

HAND HELD GRINDING

TYROLIT offers a wide range of hand-operated tools, both in aluminium oxide and silicon carbide, depending on the application.

Information on specification

Files, bench stones, knife blade files and hollow chisel stones:

- COARSE = grit size 120
- MEDIUM = grit size 240
- FINE = grit size 400
- SUPER = grit size 1200 (shape 90B, 90HM)

Combination stones

- COMBI = grit size 120/400

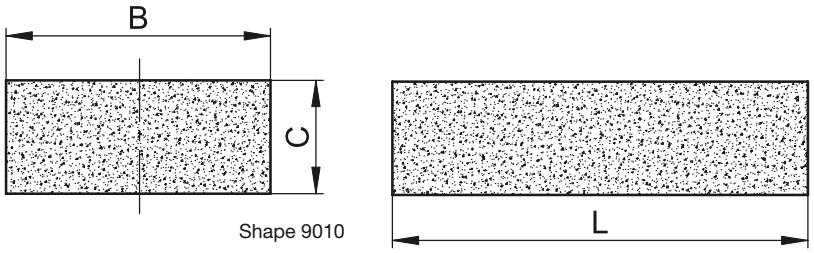
TYFIX Hand rubbing bricks

- For improving surface (removal of rust, colour, contamination)
- MEDIUM = grit size 100
- FINE = grit size 240

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

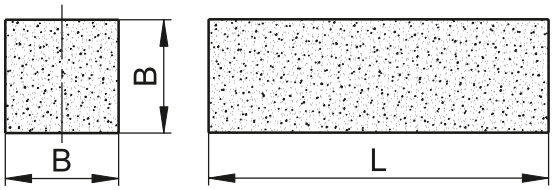
Vitrified-bonded



Shape 9010

Flat files, shape 9010

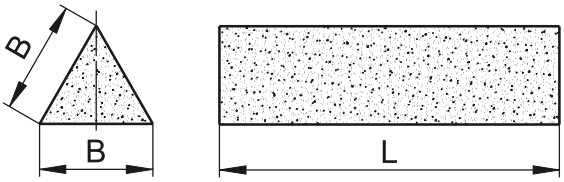
TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
548	9010	6	3	100	89AMEDIUM	10	
547	9010	6	3	100	89AFINE	10	
556	9010	6	3	100	CCOARSE	10	
557	9010	6	3	100	CMEDIUM	10	
555	9010	6	3	100	CFINE	10	
550	9010	10	5	100	89AMEDIUM	10	
549	9010	10	5	100	89AFINE	10	
559	9010	10	5	100	CCOARSE	10	
560	9010	10	5	100	CMEDIUM	10	
558	9010	10	5	100	CFINE	10	
552	9010	13	6	150	89AMEDIUM	10	
551	9010	13	6	150	89AFINE	10	
562	9010	13	6	150	CCOARSE	10	
563	9010	13	6	150	CMEDIUM	10	
561	9010	13	6	150	CFINE	10	
554	9010	30	13	200	89AMEDIUM	10	
566	9010	30	13	200	CMEDIUM	10	
564	9010	30	13	200	CFINE	10	



Shape 9011

Square files, shape 9011

TYPE NO.	SHAPE	B	L	SPECIFICATION	PU	COMMENTS
729	9011	6	100	89AMEDIUM	10	
728	9011	6	100	89AFINE	10	
749	9011	6	100	CMEDIUM	10	
747	9011	6	100	CFINE	10	
732	9011	10	100	89AMEDIUM	10	
733	9011	10	100	89AFINE	10	
754	9011	10	100	CMEDIUM	10	
752	9011	10	100	CFINE	10	
739	9011	13	150	89AMEDIUM	10	
738	9011	13	150	89AFINE	10	
760	9011	13	150	CMEDIUM	10	
758	9011	13	150	CFINE	10	
742	9011	16	150	89AMEDIUM	10	
741	9011	16	150	89AFINE	10	
763	9011	16	150	CMEDIUM	10	
761	9011	16	150	CFINE	10	
746	9011	20	200	89AMEDIUM	10	
6341	9011	20	200	89AFINE	10	
768	9011	20	200	CCOARSE	10	
769	9011	20	200	CMEDIUM	10	
767	9011	20	200	CFINE	10	

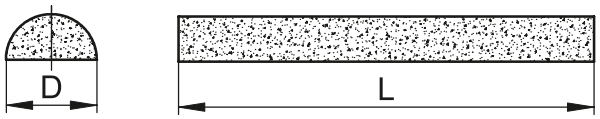


Shape 9020

Triangular files, shape 9020

TYPE NO.	SHAPE	B	L	SPECIFICATION	PU	COMMENTS
501	9020	6	100	89AMEDIUM	10	
519	9020	6	100	CMEDIUM	10	
518	9020	6	100	CFINE	10	
504*	9020	10	100	89AMEDIUM	10	
505	9020	10	100	89AFINE	10	
525	9020	10	100	CMEDIUM	10	
523	9020	10	100	CFINE	10	
510*	9020	13	150	89AMEDIUM	10	
511	9020	13	150	89AFINE	10	
533	9020	13	150	CMEDIUM	10	
531	9020	13	150	CFINE	10	
512*	9020	16	150	89AMEDIUM	10	
8807*	9020	16	150	89AFINE	10	
536	9020	16	150	CMEDIUM	10	
534	9020	16	150	CFINE	10	
516	9020	20	200	89AMEDIUM	10	
8808	9020	20	200	89AFINE	10	
542	9020	20	200	CMEDIUM	10	
540	9020	20	200	CFINE	10	

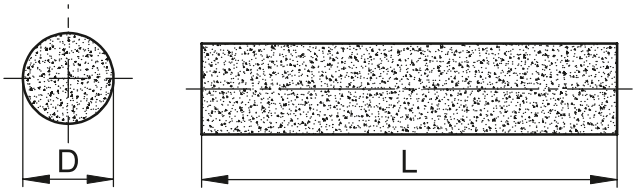
* machined



Shape 9040

Half round files, shape 9040

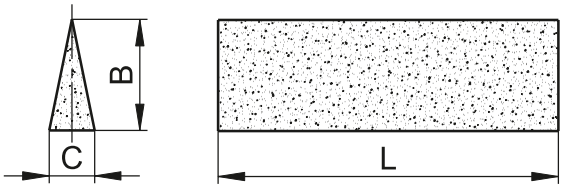
TYPE NO.	SHAPE	DIAM.	L	SPECIFICATION	PU	COMMENTS
6313	9040	6	100	89AMEDIUM	10	
603	9040	10	100	89AMEDIUM	10	
607	9040	13	150	89AMEDIUM	10	
629	9040	13	150	CFINE	10	
610	9040	16	150	89AMEDIUM	10	
633	9040	16	150	CMEDIUM	10	
632	9040	16	150	CFINE	10	
637	9040	20	200	CMEDIUM	10	



Shape 9030

Round files, shape 9030

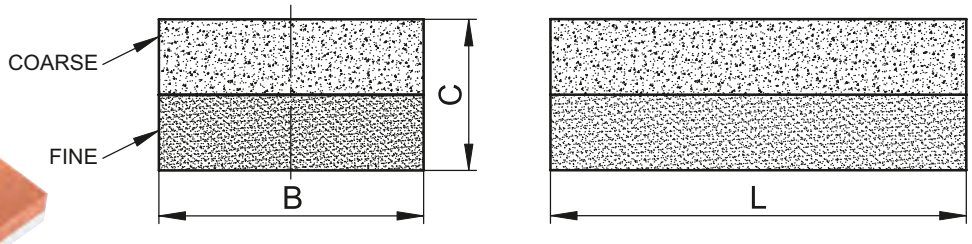
TYPE NO.	SHAPE	DIAM.	L	SPECIFICATION	PU	COMMENTS
660	9030	6	100	89AFINE	10	
616	9030	6	100	CMEDIUM	10	
614	9030	6	100	CFINE	10	
666	9030	10	100	89AMEDIUM	10	
664	9030	10	100	89AFINE	10	
656	9030	10	100	CFINE	10	
671	9030	13	150	89AMEDIUM	10	
657	9030	13	150	89AFINE	10	
693	9030	13	150	CMEDIUM	10	
691	9030	13	150	CFINE	10	
674	9030	16	150	89AMEDIUM	10	
698	9030	16	150	CMEDIUM	10	
696	9030	16	150	CFINE	10	



Shape 90FMK

Ceramic knife blade files, shape 90FMK

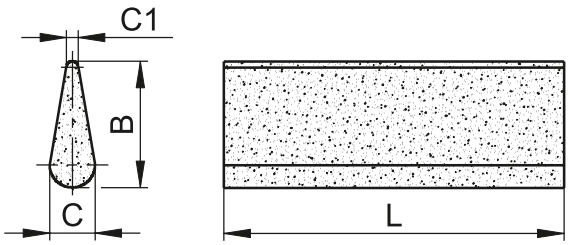
TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
6322	90FMK	25	3	100	89AMEDIUM	10	
6321	90FMK	25	3	100	89AFINE	10	
6324	90FMK	25	3	100	CMEDIUM	10	



Shape 90K

Combination stones, shape 90K, 90SK

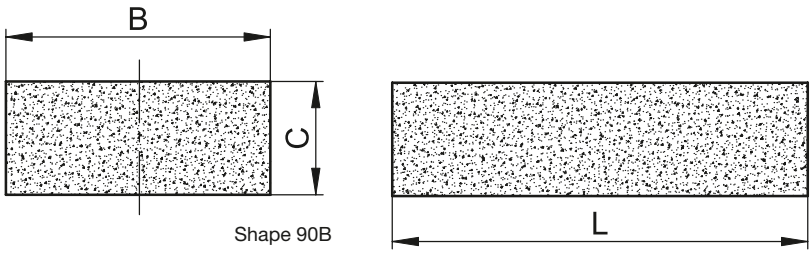
TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
185988	90K	18	10	75	89ACOMBI	10	
186109	90K	18	10	75	CCOMBI	10	
6314	90K	25	13	100	89ACOMBI	10	
642	90K	25	13	100	CCOMBI	10	
640	90K	40	20	125	89ACOMBI	10	
6317	90K	40	20	125	CCOMBI	10	
6315	90K	50	25	150	89ACOMBI	10	
644	90K	50	25	150	CCOMBI	10	
6316	90K	50	25	200	89ACOMBI	10	
645	90K	50	25	200	CCOMBI	10	
6318	90SK	25	20	100	CCOMBI	10	both front faces with radius of 10 mm



Shape 90HM

Hollow chisel stones, shape 90HM

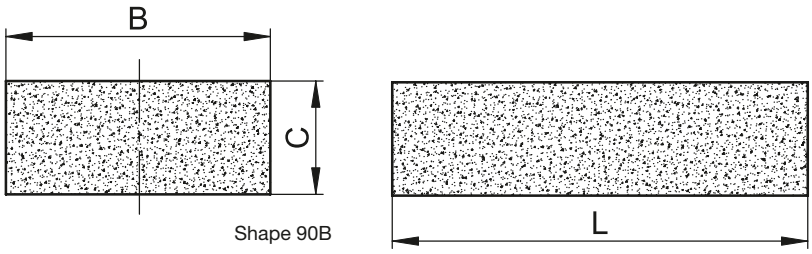
TYPE NO.	SHAPE	B	C	C1	L	SPECIFICATION	PU	COMMENTS
577	90HM	25	6	1	100	89AMEDIUM	10	
576	90HM	25	6	1	100	89AFINE	10	
584	90HM	25	6	1	100	CMEDIUM	10	
583	90HM	25	6	1	100	CFINE	10	
579	90HM	45	6	2	115	89AMEDIUM	10	
15885	90HM	45	6	2	115	89AFINE	10	
587	90HM	45	6	2	115	CMEDIUM	10	
9017	90HM	45	6	2	115	CFINE	10	
28465	90HM	45	10	3	100	89ASUPER	10	
6309	90HM	45	10	3	100	89AMEDIUM	10	
578	90HM	45	10	3	100	89AFINE	10	
586	90HM	45	10	3	100	CMEDIUM	10	
6310	90HM	45	10	3	100	CFINE	10	
20332	90HM	50	16	5	150	CFINE	10	



Shape 90B

Bench stones, shape 90B

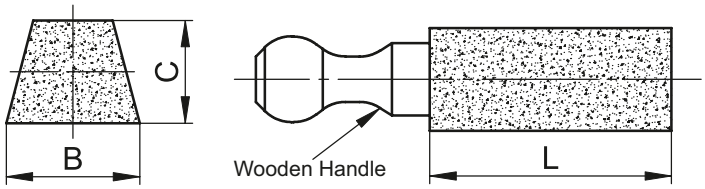
TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
20311	90B	25	6	100	CFINE	10	
8804	90B	25	13	100	89AMEDIUM	10	
469	90B	25	13	100	CMEDIUM	10	
20313	90B	25	13	100	CFINE	10	
28466	90B	45	13	100	89ASUPER	10	
28467	90B	50	25	150	89ASUPER	10	
456	90B	50	25	150	89AMEDIUM	10	
457	90B	50	25	150	89AFINE	10	
481	90B	50	25	150	CMEDIUM	10	
479	90B	50	25	150	CFINE	10	
462	90B	50	25	200	89AMEDIUM	10	
461	90B	50	25	200	89AFINE	10	
485	90B	50	25	200	CMEDIUM	10	
486	90B	50	25	200	CFINE	10	



Shape 90B

Coarse bench stones, shape 90B

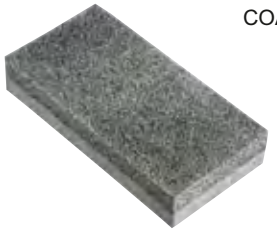
TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
29382	90B	50	25	200	1C 24 M5 V15	10	
103622	90B	50	25	200	1 C36 L5 V15	10	
28869	90B	50	50	200	1 C24 M5 V15	10	

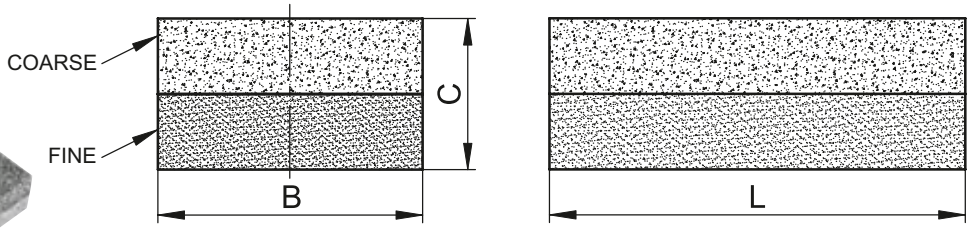


Shape 90FGH

Ceramic files with handle, shape 90FHG

TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
79664	90FHG	40	30	230	C70 O5 V18	1	

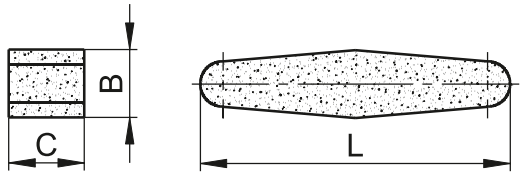




Shape 90K

Combined rubbing bricks for tiles, shape 90K

TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
175220	90K	80	30	160	C24 M5 V15 / C70 L5 V15	1	
146640	90K	120	30	200	C24 M5 V15 / C70 L5 V15	1	

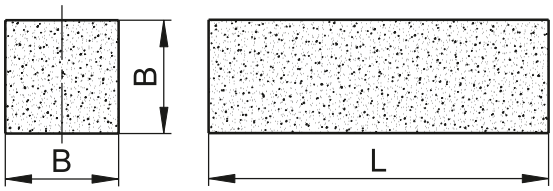


Shape 90W

Whetstones, shape 90W

TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
362775	90W	35	13	230	AC-V	1	

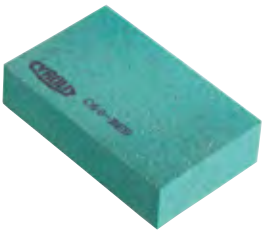
Elastic-bonded

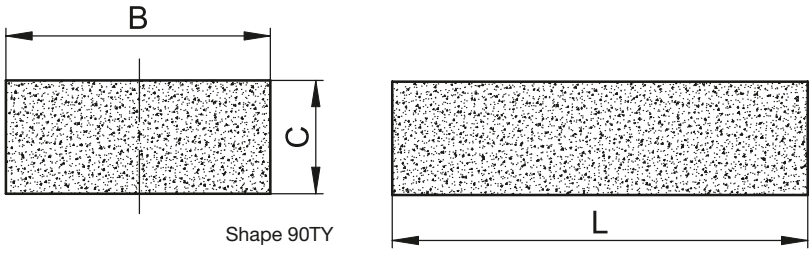


Shape 9011

Square files, shape 9011

TYPE NO.	SHAPE	B	L	SPECIFICATION	PU	COMMENTS
35677	9011	15	100	C80 – BE15	10	Deburring (coarse)
6335	9011	20	100	C400 – BE15	10	Polishing (fine)





Shape 90TY

TYFIX hand rubbing bricks, shape 90TY

TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COLOUR	COMMENTS
1872	90TY	50	20	80	C60 – BE5	1	Green	Coarse
1870	90TY	40	20	50	C100 – BE5	1	Green	Medium
1873	90TY	50	20	80	C100 – BE5	1	Green	Medium
1874	90TY	50	20	80	C240 BE5	1	Green	Fine
501861	90TY	40	20	80	CMEDIUM	1	Grey	
502437	90TY	55	30	110	CMEDIUM	1	Dark blue	
502457	90TY	55	30	110	CFINE	1	Light blue	

Resin-bonded

Hand-operated lappers, shape 90H

TYPE NO.	SHAPE	L	L2 – W – X	SPECIFICATION	PU	COMMENTS
91963	90H	150	40 – 10 – 2	D35 C50 B	1	
95717	90H	150	25 – 10 – 2	D35 C50 B	1	

Galvanic-bonded

Diamond files, shape 90N

TYPE NO.	SHAPE	L	L2 – W	SPECIFICATION	PU	COMMENTS
477283	90N	140	70 – 3	D126 GST	1	Square
477430	90N	140	70 – 3	D126 GST	1	Half round
477289	90N	140	70 – 3	D126 GST	1	Flat point
136528	90N	140	70 – 2.68	D126 GST	1	Round
136535	90N	140	70 – 3.6	D126 GST	1	Triangular
477422	90N	140	70 – 5	D126 GST	1	Flat

FLOORSTAND GRINDING WHEELS
CONVENTIONAL CERAMICS

Product advantages:

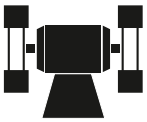
- Grinding wheel specification can be used universally
- Reducing ring set (universally suitable for current machine shafts)
- Extremely smooth running
- Stackable individual packaging to suit racks

Application tips:

- Sharpening a cemented carbide tipped tool
- Regrinding a HSS tool

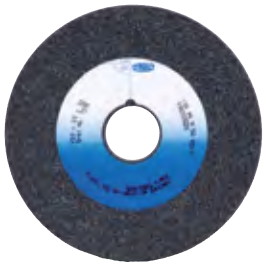
Safety information:

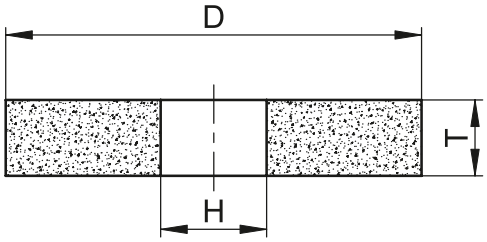
- Take note of the safety information, particularly in the case of maximum operating speed of 40 m/s
- See chapter "Safety when grinding" (page 128)



Non and low-alloyed steels


	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
10A		●	○							○	●	





Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
7205	1	150	20	32	10A 46 N5 AV217	1	
2693	1	150	20	32	10A 60 M5 AV217	1	
52223	1	150	25	32	10A 46 N5 AV217	1	
2758	1	150	25	32	10A 60 M5 AV217	1	
2909	1	175	20	32	10A 60 M5 AV217	1	
2962	1	175	25	32	10A 60 M5 AV217	1	
68134	1	175	25	51	10A 60 M5 AV217	1	
548815	1	175	32	32	10A 60 M5 AV217	1	
664210	1	180	13	51	10A 36 N5 AV217	1	
600134	1	200	20	32	10A 36 N5 AV217	1	
15842	1	200	20	32	10A 46 N5 AV217	1	
15839	1	200	20	32	10A 60 M5 AV217	1	
3140	1	200	20	32	10A 80 M5 AV217	1	
869452	1	200	20	51	10A 46 N5 AV217	1	
781702	1	200	20	51	10A 60 M5 AV217	1	
98940	1	200	20	51	10A 80 M5 AV217	1	
31694	1	200	25	32	10A 46 N5 AV217	1	Maximum operating speed 40 m/s
9572	1	200	25	32	10A 60 M5 AV217	1	
3217	1	200	25	32	10A 80 M5 AV217	1	
116708	1	200	25	51	10A 46 N5 AV217	1	
718361	1	200	25	51	10A 60 M5 AV217	1	
923580	1	200	25	51	10A 80 M5 AV217	1	
664256	1	200	32	51	10A 36 N5 AV217	1	
675264	1	200	32	51	10A 46 N5 AV217	1	
516594	1	200	32	51	10A 60 M5 AV217	1	
675262	1	200	32	51	10A 80 M5 AV217	1	
3474	1	250	25	32	10A 60 M5 AV217	1	
664265	1	250	25	76	10A 36 N5 AV217	1	
664261	1	250	32	32	10A 36 N5 AV217	1	
3538	1	250	32	32	10A 60 M5 AV217	1	
737812	1	250	32	51	10A 60 M5 AV217	1	
110032	1	300	40	51	10A 60 M5 AV217	1	
34983	1	300	40	76	10A 60 M5 AV217	1	

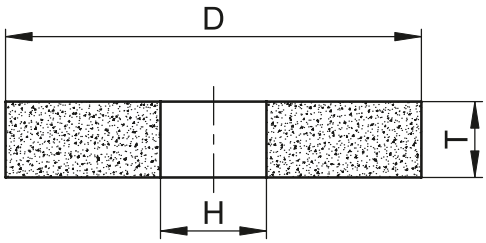
Alternative stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
147698	1	125	20	32	10A 36 M5 AV17	1	Maximum operating speed 40 m/s
147626	1	125	20	32	10A 60 M5 AV17	1	
147574	1	150	20	32	10A 36 P5 AV17	1	
146965	1	150	20	32	10A 601 M5 AV217	1	
147601	1	150	25	32	10A 36 P5 AV17	1	
147600	1	175	25	32	10A 36 P5 AV17	1	
147656	1	200	20	40	10A 36 P5 AV17	1	
146910	1	200	25	32	10A 361 P5 AV17	1	
147629	1	200	25	40	10A 36 P5 AV17	1	
147652	1	200	25	51	10A 36 P5 AV17	1	
147701	1	250	32	51	10A 36 P5 AV17	1	
32981	1	350	50	127	10A 24 Q5 AV17	1	

Comments: See chapter "Accessories and reducing rings" (page 114)

High-alloyed steels and HSS

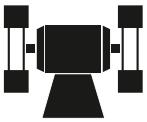
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
89A			●	○	●	●				○	●	



Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
449559	1	125	20	32	89A 46 M5 AV217	1	Maximum operating speed 40 m/s
2536	1	125	20	32	89A 60 M5 AV217	1	
281719	1	125	20	32	89A 80 M5 AV217	1	
664052	1	150	13	25	89A 80 M5 AV217	1	
2697	1	150	20	32	89A 46 M5 AV217	1	
2699	1	150	20	32	89A 60 M5 AV217	1	
764468	1	150	20	32	89A 80 M5 AV217	1	
853353	1	150	25	32	89A 46 M5 AV217	1	
2762	1	150	25	32	89A 60 M5 AV217	1	
147614	1	150	25	32	89A 80 L5 AV217	1	
2916	1	175	20	32	89A 60 M5 AV217	1	
543615	1	175	20	32	89A 80 M5 AV217	1	
16022	1	175	25	32	89A 60 M5 AV217	1	
2973	1	175	25	32	89A 80 L5 AV217	1	
723118	1	175	25	51	89A 60 M5 AV217	1	
377415	1	175	25	51	89A 80 M5 AV217	1	
3020	1	175	32	32	89A 60 M5 AV217	1	



Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
918448	1	175	32	32	89A 80 M5 AV217	1	
664043	1	180	13	51	89A 46 M5 AV217	1	
664045	1	200	20	31.75	89A 46 M5 AV217	1	
664063	1	200	20	31.75	89A 80 M5 AV217	1	
471114	1	200	20	31.75	89A 60 M5 AV217	1	
3145	1	200	20	32	89A 60 M5 AV217	1	
3142	1	200	20	32	89A 46 M5 AV217	1	
820958	1	200	20	32	89A 80 M5 AV217	1	
664048	1	200	20	51	89A 46 M5 AV217	1	
841086	1	200	20	51	89A 60 M5 AV217	1	
826839	1	200	20	51	89A 80 M5 AV217	1	
95702	1	200	25	31.75	89A 60 M5 AV217	1	
3220	1	200	25	32	89A 46 M5 AV217	1	
33435	1	200	25	51	89A 80 L5 AV217	1	
39540	1	200	25	32	89A 60 M5 AV217	1	Maximum operating speed 40 m/s
129550	1	200	25	32	89A 80 M5 AV217	1	
50184	1	200	25	51	89A 46 M5 AV217	1	
534539	1	200	25	51	89A 60 M5 AV217	1	
99864	1	200	32	51	89A 46 M5 AV217	1	
723117	1	200	32	51	89A 60 M5 AV217	1	
78379	1	200	32	51	89A 80 M5 AV217	1	
831179	1	250	25	32	89A 60 M5 AV217	1	
664078	1	250	25	76	89A 80 M5 AV217	1	
34961	1	250	25	76	89A 60 M5 AV217	1	
3545	1	250	32	32	89A 60 M5 AV217	1	
126665	1	250	32	32	89A 80 M5 AV217	1	
111799	1	250	32	51	89A 60 M5 AV217	1	
867598	1	300	40	51	89A 60 M5 AV217	1	
30840	1	300	40	76	89A 60 M5 AV217	1	

Alternative stock type, shape 1

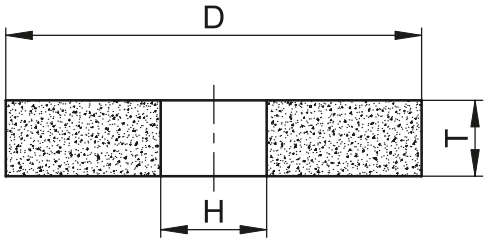
TYPEN NR.	FORM	D	T	H	SPEZIFIKATION	VPE	BEMERKUNGEN
73667	1	150	10	20	89A 80 L5 AV55	1	
103872	1	150	20	16	89A 60 M5 AV55	1	
413774	1	150	20	20	89A 60 L5 AV217	1	
7210	1	150	20	32	89A 60 K5 AV217	1	
122996	1	200	20	20	89A 60 L5 AV217	1	
184247	1	200	20	20	89A 60 M5 AV55	1	
16615	1	200	20	32	89A 46 K5 AV217	1	
3144	1	200	20	32	89A 60 K5 AV217	1	Maximum operating speed 40 m/s
122997	1	200	25	20	89A 60 L5 AV217	1	
68340	1	200	25	20	89A 60 M5 AV55	1	
3222	1	200	25	32	89A 60 K5 AV217	1	
146630	1	200	25	32	89A 46 K5 AV217	1	
7374	1	200	25	32	89A 80 L5 AV217	1	
407610	1	250	10	32	89A 60 K5 AV217	1	
127554	1	300	32	127	89A 60 K5 AV217	1	

Comments: See chapter "Accessories and reducing rings" (page 118)

FLOORSTAND GRINDING WHEELS
CONVENTIONAL CERAMICS

Cemented carbide

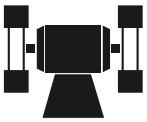
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
C					○	○	○	●		●	●	



Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
2529	1	125	20	32	C80 J5 V15	1	
664185	1	150	13	25	C80 J5 V15	1	
56155	1	150	16	32	C80 J5 V15	1	
2658	1	150	20	20	C80 J5 V15	1	
2680	1	150	20	32	C46 K5 V15	1	
861009	1	150	20	32	C60 K5 V15	1	
123633	1	150	20	32	C80 J5 V15	1	
2751	1	150	25	32	C46 K5 V15	1	
333180	1	150	25	32	C60 K5 V15	1	
2753	1	150	25	32	C80 J5 V15	1	
2905	1	175	20	32	C80 J5 V15	1	
2956	1	175	25	32	C80 J5 V15	1	
9653	1	175	25	51	C80 J5 V15	1	
3011	1	175	32	32	C80 J5 V15	1	Maximum operating speed 40 m/s
7348	1	200	20	20	C80 J5 V15	1	
848657	1	200	20	31.75	C46 K5 V15	1	
154428	1	200	20	31.75	C80 J5 V15	1	
3135	1	200	20	32	C80 J5 V15	1	
3132	1	200	20	32	C46 K5 V15	1	
596597	1	200	20	32	C60 K5 V15	1	
837436	1	200	20	51	C46 K5 V15	1	
794548	1	200	20	51	C60 K5 V15	1	
872497	1	200	20	51	C80 J5 V15	1	
3186	1	200	25	20	C80 J5 V15	1	
812	1	200	25	31.75	C80 J5 V15	1	
3206	1	200	25	32	C46 K5 V15	1	
3210	1	200	25	32	C80 J5 V15	1	



Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
819893	1	200	25	32	C60 K5 V15	1	
63538	1	200	25	51	C46 K5 V15	1	
263506	1	200	25	51	C60 K5 V15	1	
822622	1	200	25	51	C80 J5 V15	1	
879608	1	200	32	51	C46 K5 V15	1	
9651	1	200	32	51	C80 J5 V15	1	
103851	1	200	25	76	C80 J5 V15	1	Maximum operating speed 40 m/s
75079	1	250	25	32	C80 J5 V15	1	
49680	1	250	25	76	C80 J5 V15	1	
58964	1	250	32	32	C80 J5 V15	1	
822623	1	250	32	51	C80 J5 V15	1	
822624	1	300	40	51	C80 J5 V15	1	
9652	1	300	40	76	C80 J5 V15	1	

Alternative stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
11182	1	150	20	32	C120 J5 V15	1	
450328	1	150	20	32	C60 J5 AV15	1	
146906	1	150	20	32	C80 J5 V15	1	
146644	1	150	25	32	C80 J5 V15	1	
3208	1	200	25	32	C60 J5 V15	1	Maximum operating speed 40 m/s
72045	1	203	20	32	C120 J5 V15	1	
59861	1	203	25	32	C120 J5 V15	1	
28584	1	350	32	127	C60 J5 V15	1	

Comments: See chapter "Accessories and reducing rings" (page 118)

SHARPENING AND POLISHING WHEELS
ELASTIC

Product advantages:

- Particularly soft (in soft-elastic types)
- Easily profiled
- Ultra-fine surfaces achievable in the shortest possible time
- Long lifetime at recommended RPM
- Cool grinding
- Also suitable for use on flexible shafts
- Improved cutting ability and longer lifetime of your cutting tools
- Easy handling, meaning sharp tool cutting right away (C400-BE15 and C800-BE11)

Application tips:

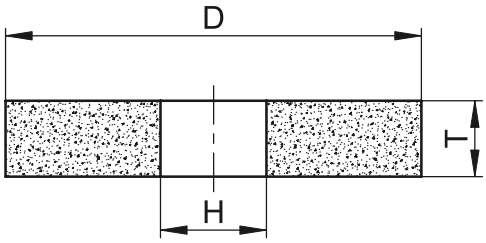
- Polishing steel, nonferrous heavy metal, precious metal and sintered metal or plastic (C240-BE15)
- Fine grinding of various precision mechanical components, like watches, glasses, medical technology (C150-BE13)
- Effect grinding (C46-BE16 and C46-BE19F)
- Deburring (C80-BE15)
- Whetting of all kinds of kitchen and pocket knives (C400-BE15)
- Not suitable for sharp edges, large burrs or high stock removal
- For whetting, deburring and sharpening knives, splitting tools and axes (C400-BE15)
- Dressing stone (ceramic bond) for elastic grinding wheels (see chapter "Dressing and sharpening")
- Vs = 16 m/s – 32 m/s maximum operating speed for floorstand grinding

Safety information:

- Vs = 16m/s for soft-elastic wheels
- Vs = 32m/s for hard-elastic wheels
- Operating speed for elastic wheels is always linked to the wheel bond
- **Rotational direction for sharpening wheels away from tool bearing**
- Flange diameter is minimum 2/3 of wheel diameter
- Observe safety information
- See chapter "Safety when grinding" (page 128)

Sharpening wheels for cutting tools

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
C		●	●	●	●	●	●	●			●	



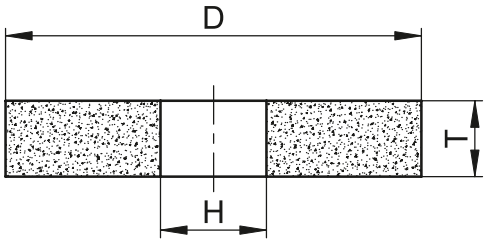
Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
7133	1	125	25	20	C800 – BE11	1	Sharpening of whittlers
10016	1	125	20	32	C800 – BE11	1	
2540	1	125	25	32	C800 – BE11	1	
669110	1	150	20	20	C800 – BE11	1	
7204	1	150	20	32	C800 – BE11	1	
669109	1	175	20	32	C800 – BE11	1	

Fine grinding and polishing wheels

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
C	○	●	●	●	●	●	●	●	○	●	●	



Shape 1

Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
19435	1	125	20	20	C400 – BE15	1	Sharpening of kitchen knives
7203	1	150	20	32	C400 – BE15	1	
22411	1	200	25	32	C400 – BE15	1	
7186	1	150	20	20	C80 – BE15	1	Surface improvement on pre-ground workpieces (lower stock removal possible)
802276	1	150	10	25	C150 – BE13	1	
2661	1	150	20	20	C150 – BE15	1	
22257	1	150	20	32	C150 – BE16	1	
71212	1	150	20	20	C400 – BE16	1	
7362	1	200	25	20	C80 – BE15	1	
32765	1	200	25	32	C150 – BE15	1	
320369	1	200	25	20	C240 – BE15	1	

BE11 = medium, vmax = 25 m/s
BE13 = soft, vmax = 16 m/s

BE15 = medium, vmax = 20 m/s
BE16 = hard, vmax = 32 m/s

Flange diameter is minimum 2/3 of wheel diameter

SAW SHARPENING

Product advantages:

- Specially selected grain qualities and innovative bonds systems with efficient grinding wheel design, guarantee you optimum quality of the cutting edge

Application tips:

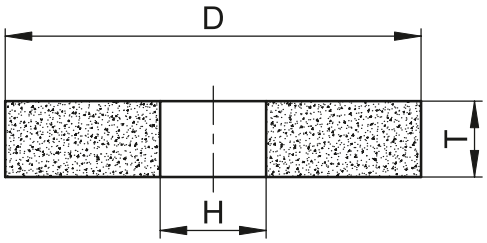
- Operating speed: 25 – 40 m/s

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

Grinding tools for automatic saw sharpening machines

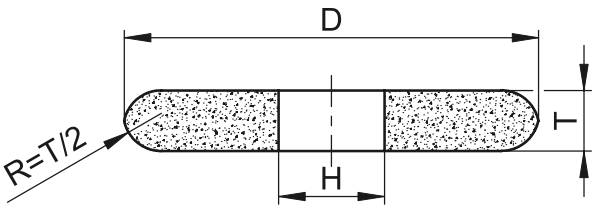
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
SA					●	●					●	●
A		●	○								●	●
88A, 89A			●		●	●					●	●
455A					●							●
52A		●									●	●



Shape 1

Recommended stock type, shape 1

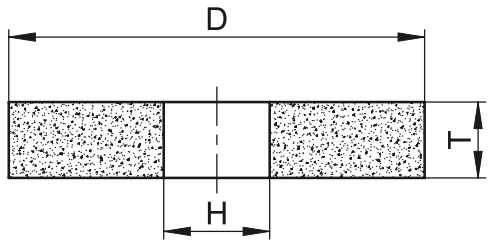
TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
292129	1	150	1.5	32	SA 80 L4 VN-MOD	10	
935730	1	150	2	32	SA 80 L4 VN-MOD	10	
123688	1	150	2.5	32	SA 80 L4 VN-MOD	10	
47009	1	150	3	32	SA 80 L4 VN-MOD	10	
226295	1	150	3	32	SA 80 L5 VN-MOD	10	
47010	1	150	4	32	SA 80 L4 VN-MOD	10	
159000	1	150	4	32	SA 80 L5 VN-MOD	10	
667182	1	150	5	32	SA 80 L5 VN-MOD	10	
946904	1	150	6	32	SA 60 L5 VN-MOD	10	
47005	1	150	6	32	SA 80 L4 VN-MOD	10	
17256	1	150	6	38	SA 60 K5 VN-MOD	10	
441302	1	150	8	32	SA 60 L5 VN-MOD	10	
441301	1	150	10	32	SA 60 L5 VN-MOD	10	
922647	1	200	1.5	32	SA 80 L4 VN-MOD	10	
804963	1	200	1.75	32	SA 80 L4 VN-MOD	10	Maximum operating speed 63 m/s
922857	1	200	2	32	SA 80 L4 VN-MOD	10	
804964	1	200	2	32	SA 80 L4 VN-MOD	10	
867603	1	200	2.5	32	SA 80 L4 VN-MOD	10	
922860	1	200	3	32	SA 80 L5 VN-MOD	10	
804957	1	200	3.5	32	SA 80 L5 VN-MOD	10	
804945	1	200	4	32	SA 80 L5 VN-MOD	10	
804993	1	200	5	32	SA 60 L5 VN-MOD	10	
805000	1	200	6	32	SA 60 L5 VN-MOD	10	
804976	1	200	8	32	SA 60 L5 VN-MOD	10	
804979	1	200	10	32	SA 60 L5 VN-MOD	10	
901252	1	250	3	32	SA 80 L4 VN-MOD	10	
901254	1	250	4	32	SA 80 L4 VN-MOD	10	
901256	1	250	5	32	SA 60 L5 VN-MOD	10	
901258	1	250	6	32	SA 60 L5 VN-MOD	10	



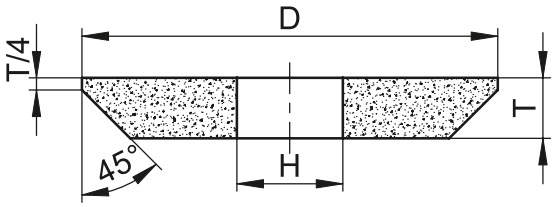
Shape 1F

Recommended stock type, shape 1F

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
805007	1F	200	8	32	SA 60 K5 VN-MOD	10	Maximum operating speed 63 m/s
804986	1F	200	8	32	SA 60 L5 VN-MOD	10	
805008	1F	200	10	32	SA 60 K5 VN-MOD	10	
804983	1F	200	10	32	SA 60 L5 VN-MOD	10	
805017	1F	250	8	32	SA 60 K5 VN-MOD	10	
805018	1F	250	10	32	SA 60 K5 VN-MOD	10	
805019	1F	250	12	32	SA 60 K5 VN-MOD	10	
805015	1F	250	13	32	SA 60 K5 VN-MOD	10	



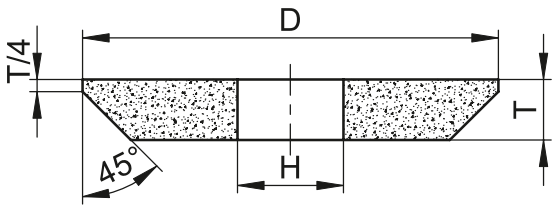
Shape 1



Shape 1C

Recommended stock type, shape 1, 1C

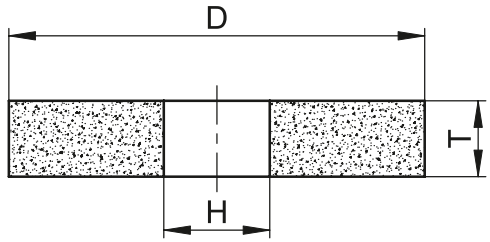
TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
18825	1	150	3	30	88A 80 M5 AV217	10	Steel blade relief grinding for CC saws
55375	1	150	3	32	88A 80 M5 AV217	10	
9293	1	150	4	20	88A 80 M5 AV217	10	
19117	1	150	4	20	A 60 N4 B2	10	
291120	1	150	4	32	88A 80 M5 AV217	10	
719904	1	150	6	38	88A 60 K5 AV217	10	
490222	1	150	6	38	88A 80 K5 AV217	10	
455124	1	150	8	32	89A 60 M5 AV217	10	
10265	1	150	10	32	89A 60 M5 AV217	10	
719906	1	175	3	51	89A 60 M5 AV217	10	
123222	1	175	6	51	89A 60 M5 AV217	10	
50845	1	175	8	51	89A 60 M5 AV217	10	
448603	1	200	2	32	88A 80 M5 AV217	10	
7318	1	200	3	32	88A 80 M5 V217	10	
3070	1	200	6	20	89A 60 M5 AV217	10	
110554	1	200	6	32	89A 60 K5 AV217	10	
7328	1	200	6	32	89A 60 M5 V217	10	
107050	1	200	6	32	89A 60 M5 V227	10	
3077	1	200	8	20	89A 60 M5 AV217	10	
525686	1	200	8	32	89A 60 M5 AV217	10	
3085	1	200	10	20	89A 60 M5 AV217	10	
3091	1	200	10	32	89A 60 K5 AV217	10	
608080	1	200	10	32	89A 60 M5 AV217	10	
762445	1	200	10	32	89A 60 M5 AV217E5	10	with peripheral treatment
3092	1	200	10	32	89A 60 M5 V217	10	
28549	1C	200	10	32	89A 60 M5 AV217	10	
51494	1	200	13	32	89A 60 M5 AV217	10	
3424	1	250	10	20	89A 60 M5 AV217	10	
437634	1	250	10	32	52A 54 M5 V217E5	10	with peripheral treatment
461239	1	250	10	32	89A 60 M5 V217E5	10	with peripheral treatment
33249	1	250	13	20	89A 60 M5 AV217	10	
719922	1	250	13	32	89A 60 M5 AV217	10	



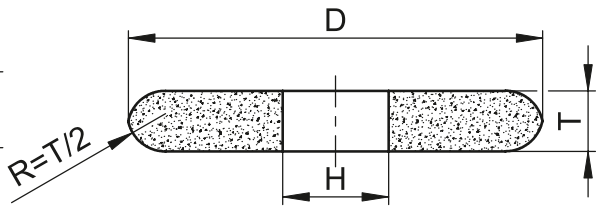
Shape 1C

Recommended stock type, shape 1C

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
172352	1C	175	8	20	88A 60 N4 AV217	10	Two-layer wheels
					89A 60 M5 AV217		
719918	1C	200	10	20	88A 60 N4 AV217	10	
					89A 60 M5 AV217		
720012	1C	200	10	32	88A 60 N4 AV217	10	
					89A 60 M5 AV217		
162874	1C	200	12	20	88A 60 N4 V217	10	
					89A 60 M5 AV217		
161678	1C	250	10	20	88A 60 N4 AV217	10	
					89A 60 M5 AV217		



Shape 1



Shape 1F

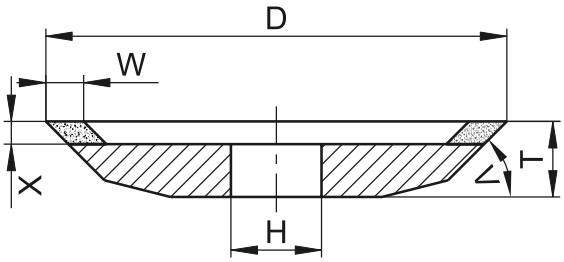
Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
740908	1F	140	3,2	12	88A 54 K5 AV217	1	Saw sharpening of chain saw sharpening machines
123716*	1F	140	3,8	12	50A 54 K5 AV217	1	
244477	1F	140	4,5	12	88A 54 K5 AV217	1	
150403	1	200	10	32	455A 60 M7 B82	1	for stellite band and frame saws; maximum operating speed is 63 m/s
237227	1	250	10	32	455A 60 M7 B82	1	
476545	1	250	12	32	455A 60 M7 B82	1	
150402	1F	300	10	32	455A 60 L7 B82	1	
179959	1	300	10	40	455A 80 M6 B22	1	
223733	1	300	12	40	455A 60 M7 B82	1	
226682	1	300	10	30	455A 80 M6 B22	1	
241857	1	300	10	32	455A 80 K6 B22	1	
313636	1	300	10	40	455A 60 M7 B82	1	
267138	1	300	12	40	455A 80 M6 B22	1	
471747*	1	300	12	40	455A 80 M6 B22	1	
485953	1	300	8	32	455A 80 M6 B22	1	
527875	1	300	10	32	455A 60 L7 B82	1	
487467	1	350	10	127	455A 80 M6 B22	10	
226679*	1	350	10	127	455A 80 M6 B22	10	
226680*	1	350	13	127	455A 80 M6 B22	10	

* machined

Chip surface grinding (tooth-face grinding) for CC saws

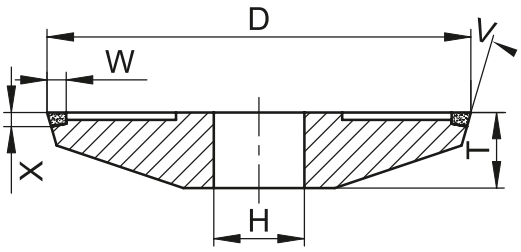
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
Diam.								●				●



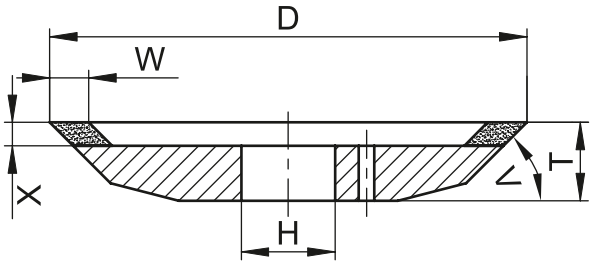
Shape 4V2

Recommended stock type, shape 4V2

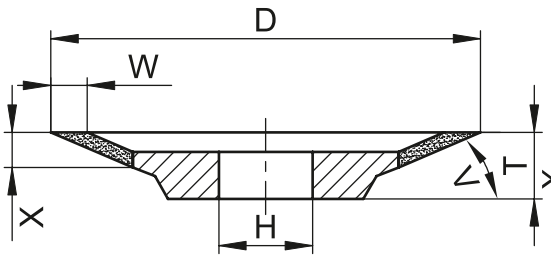
TYPE NO.	SHAPE	DIAM.	T	H	W	X	V	SPECIFICATION	PU	COMMENTS
462631	4V2	150	12	32	4	2	30	D46 C125 B	1	e.g. Akemat
462630	4V2	150	12	32	4	2	30	D76 C125 B	1	



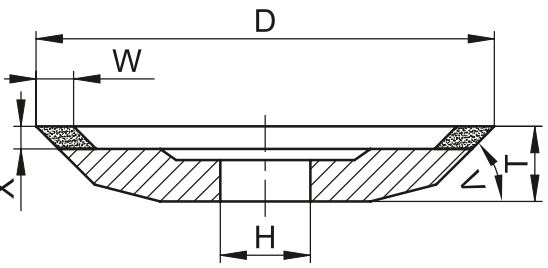
Shape 4B9



Shape 4V2H



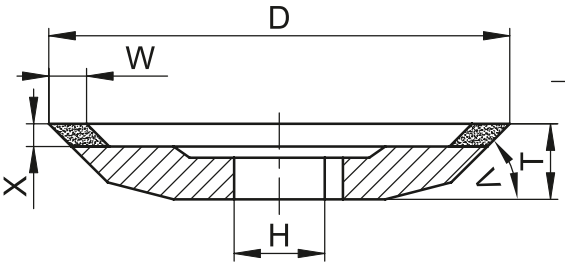
Shape 3V9



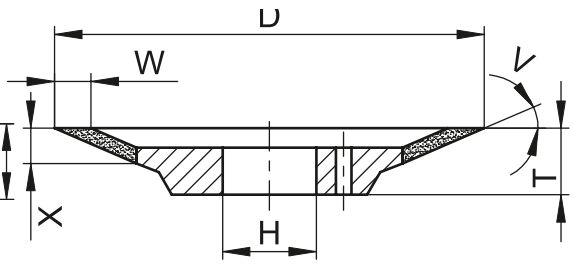
Shape 12V2

Recommended stock type, shape 4B9, 3V9, 4V2, 4V2H, 12V2

TYPE NO.	SHAPE	DIAM.	T	H	W	X	V	SPECIFICATION	PU	COMMENTS
369110	4B9	125	11.5	32	2.5	1.2	15	D54 C75 B	1	e.g Vollmer, Biberach
820013	4B9	125	12	32	3	1.8	15	D126 C75 B	1	e.g. Vollmer, Biberach, narrow tooth pitch
583911	4B9	125	12	32	3	2	15	D76 C125 B	1	e.g Vollmer, Biberach
18567	4B9	125	14	32	3	3.8	15	D126 C100 B	1	e.g. Vollmer, Biberach, large tooth pitch
462788	4B9	125	12	32	3	3.8	15	D54 C125 B	1	e.g. Vollmer, Biberach, large tooth pitch
665040	4B9	125	14	32	3	3.8	15	D54 C75 B	1	e.g. Vollmer, Biberach, large tooth pitch
563857	3V9	125	13	32	2.5	5.5	20	D46 C100 B	1	e.g. Vollmer, Biberach, narrow tooth pitch
462631	4V2	150	12	32	4	2	30	D126 C100 B	1	e.g Vollmer, Biberach
462630	4V2	150	12	32	4	2	30	D76 C125 B	1	e.g Vollmer, Biberach
379577	4V2H	200	13	32	4	2	30	D46 C125 B	1	e.g Vollmer, Biberach
462760	4V2H	200	13	32	4	2	30	D76 C125 B	1	e.g Vollmer, Biberach
462766	12V2	200	13	32	4	2	30	D46 C125 B	1	e.g Vollmer, Biberach



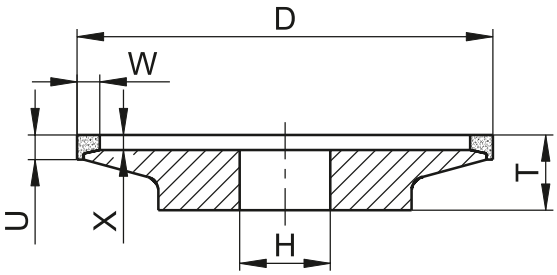
Shape 12V2N



Shape 3V9H

Recommended stock type, shape 12V2N, 3V9, 3V9H

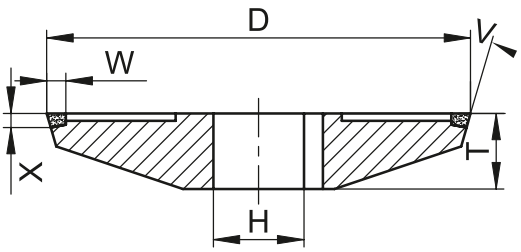
TYPE NO.	SHAPE	DIAM.	T	H	W	X	V	SPECIFICATION	PU	COMMENTS
462654	12V2N	200	14	32	4	2	30	D46 C125 B	1	e.g. Akemat
578936	3V9	150	13	32	2.5	5.5	20	D46 C100 B	1	e.g. Akemat, narrow tooth pitch
543102	3V9H	200	13	32	2.5	4.4	20	D46 C100 B	1	e.g. Akemat, driving pin hole, narrow tooth pitch



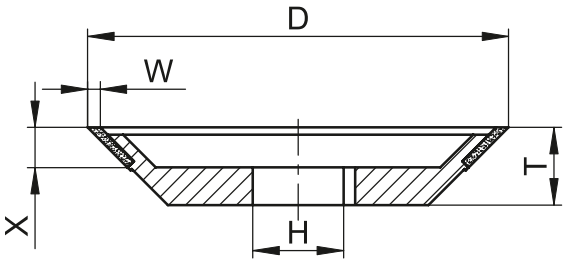
Shape 4C2

Recommended stock type, shape 4C2

TYPE NO.	SHAPE	DIAM.	T	H	U	W	X	SPECIFICATION	PU	COMMENTS
482702	4C2	150	10	32	2.5	3	1.5	D64 C100 B	1	large tooth pitch



Shape 4B9N



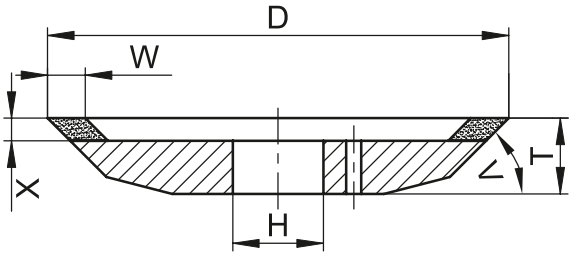
Shape 12V9N

Recommended stock type, 4B9N, 12V2N, 4B9H, 12V9N

TYPE NO.	SHAPE	DIAM.	T	H	W	X	V	SPECIFICATION	PU	COMMENTS
632932	4B9N	100	8	25	3	1.8		D54 C75 B	1	e.g. Vollmer, Dornhan, Widma, narrow tooth pitch
463032	4B9N	125	8	25	3	1.8		D76 C125 B	1	e.g. Vollmer, Dornhan, Widma, narrow tooth pitch
463026	12V2N**	100	10	25	4	2	30	D46 C100 B	1	e.g. Vollmer, Dornhan, Widma
405549*	4B9H	175	12	50.8	4	2		D76 C125 B	1	e.g. Vollmer, Dornhan,
462833	12V9N	125	26	25	3	3	15	D54 C75 B	1	e.g. Vollmer, Dornhan, Widma, large tooth pitch

* in set with TN 462829 or 462830 (see page 67)

** Shape 12V2N – see above for drawing



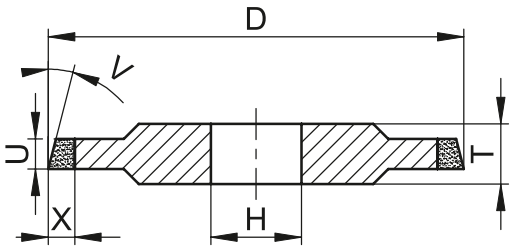
Shape 4V2H

Recommended stock type, shape 4V2H

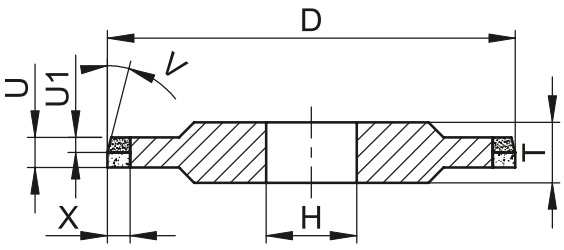
TYPE NO.	SHAPE	DIAM.	T	H	W	X	V	SPECIFICATION	PU	COMMENTS
462896	4V2H	150	13	32	3	3	30	D76 C125 B	1	e.g. Walter
462898	4V2H	160	13	32	4	2	30	D76 C125 B	1	e.g. Walter
379577	4V2H	200	13	32	4	2	30	D46 C125 B	1	e.g. Walter

Clearance Grinding (back grinding) for CC saws

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
Diam.								●				●



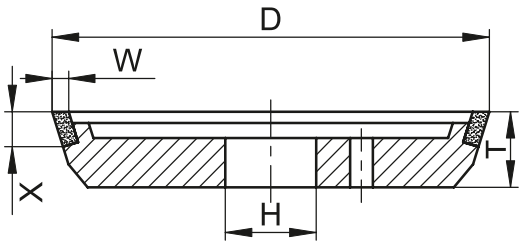
Shape 14B1



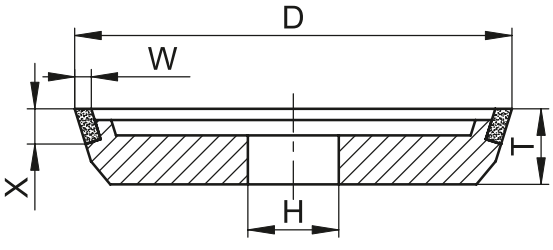
Shape 14M1Z

Recommended stock type, shape 14B1, 14M1Z

TYPE NO.	SHAPE	DIAM.	T	H	U	U1	X	V	SPECIFICATION	PU	COMMENTS
462503	14B1	127	8	32	5		8	15	D54 C125 B	1	e.g. Akemat
462514	14M1Z	127	8	32	2.5	2.5	6	15	D126 / D46 C125 B	1	e.g. Akemat, two-layer wheels



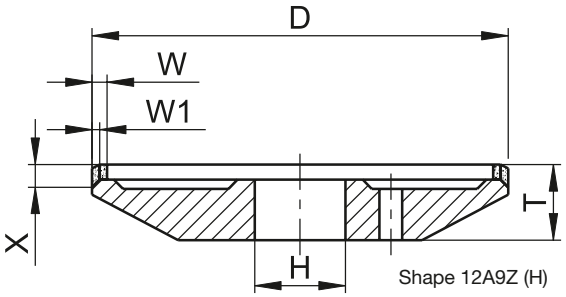
Shape 11B9H



Shape 11B9

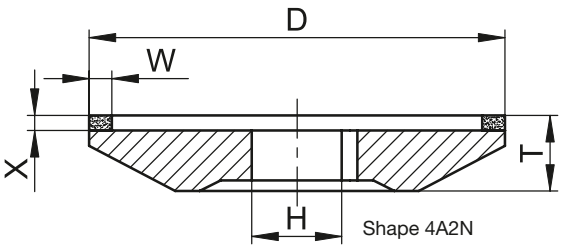
Recommended stock type, shape 11B9H, 11B9

TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
462756	11B9H	125	18	32	3	6.5	D54 C100 B	1	e.g. Vollmer Biberach, driving pin hole
477795	11B9	125	18	32	3	6.5	D54 C100 B	1	e.g Vollmer Biberach



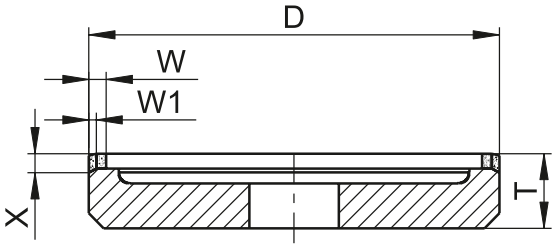
Recommended stock type, shape 12A9Z, 12A9H

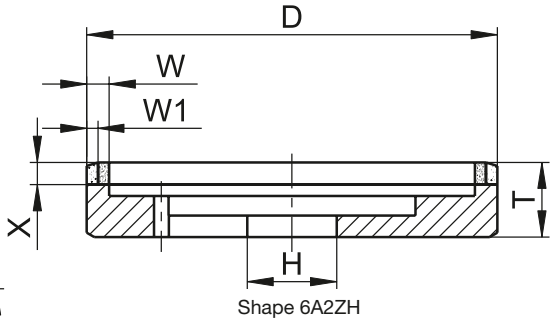
TYPE NO.	SHAPE	DIAM.	T	H	W	W1	X	SPECIFICATION	PU	COMMENTS
390582	12A9Z	125	18	32	5	2.5	6	D126 / D46 C100 B	1	e.g. Vollmer Biberach, double layer
286864	12A9Z	125	18	32	5	2.5	6	D126 / D46 C125 B	1	e.g. Vollmer Biberach, double layer
387531	12A9Z	125	22	32	5	2.5	10	D126 / D46 C100 B	1	e.g. Vollmer Biberach, double layer
462757	12A9H	125	18	32	5		6	D91 C100 B	1	e.g Vollmer Biberach

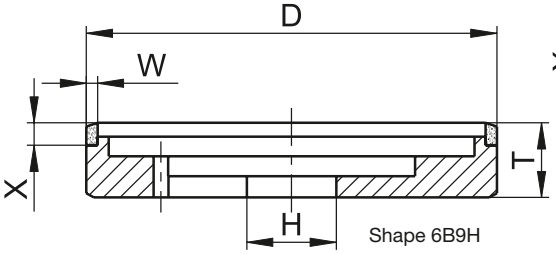


Recommended stock type, shape 4A2N

TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
489286	4A2N	100	12	25	5	3	D54 C75 B	1	e.g. Vollmer Dornhan



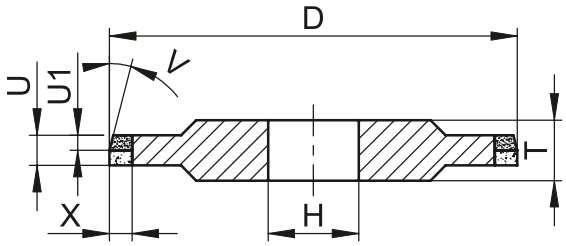




Recommended stock type, shape 6A9Z, 6A2ZH, 6B9H

TYPE NO.	SHAPE	DIAM.	T	H	W	W1	X	SPECIFICATION	PU	COMMENTS
389569	6A9Z	100	20	25	5	2.5	6	D126 / D46 C100 B	1	e.g. Vollmer Dornhan, double layer
462829*	6A2ZH	125	20	50.8	5	2.5	10	D126 / D46 C100 B	1	e.g. Vollmer Dornhan, double layer
462830*	6B9H	125	20	50.8	3		6	D64 C100 B	1	e.g. Vollmer Dornhan

* in set with TN 405549 (see page 65)



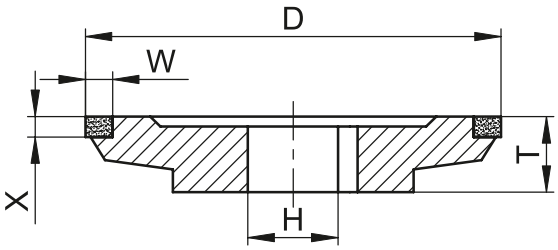
Shape 14M1Z

Recommended stock type, shape 14M1Z

TYPE NO.	SHAPE	DIAM.	T	H	U	U1	X	V	SPECIFICATION	PU	COMMENTS
462889	14M1Z	150	8	32	2.5	2.5	8	8	D126/D46 C100 B	1	e.g. Walter
462891	14M1Z	200	8	32	2.5	2.5	8	8	D126/D46 C100 B	1	

Flank machining for cemented carbide saws

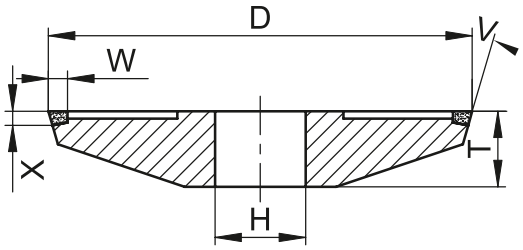
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
Diam.								●			○	●



Shape 12B9N

Recommended stock type, shape 12B9N

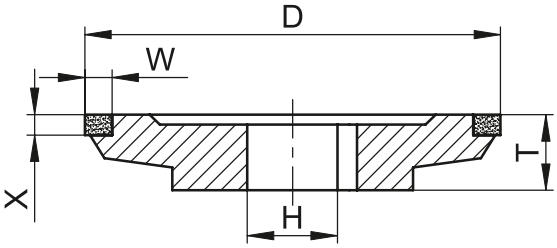
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
462658	12B9N	76	14	20	4.5	4	D91 C50 B	1	e.g. Akemat, Vollmer Dornhan
474564	12B9N	100	14	20	4.5	4	D91 C50 B	1	e.g. Vollmer Dornhan



Shape 4B9

Recommended stock type, shape 4B9

TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
462794	4B9	80	10	32	4	5	D107 C75 B	1	e.g Vollmer Biberach
328027	4B9	100	10	32	5	4	D91 C50 B	1	



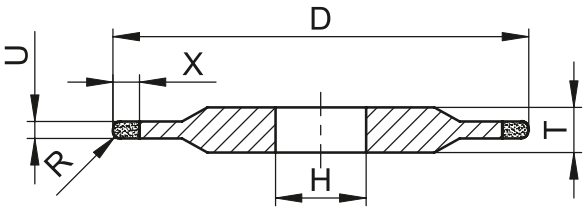
Shape 12B9N

Recommended stock type, shape 12B9N

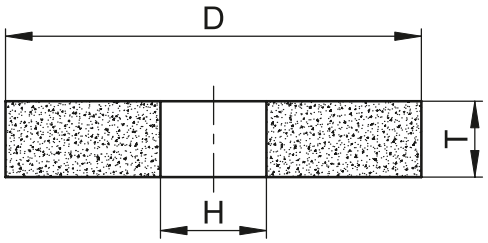
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
15810	12B9N	76	14	20	4.5	4	D64 C75 B	1	
840511	12B9N	100	14	20	4.5	4	D64 C75 B	1	
331135	12B9N	100	14	32	4.5	4	D64 C75 B	1	

Flank grinding

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
89A, 454A						●						●
Diam.								●				●
B						●					○	●



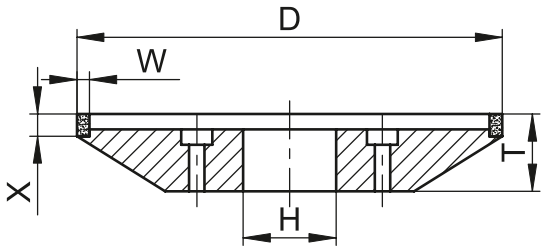
Shape 14F1 (R)



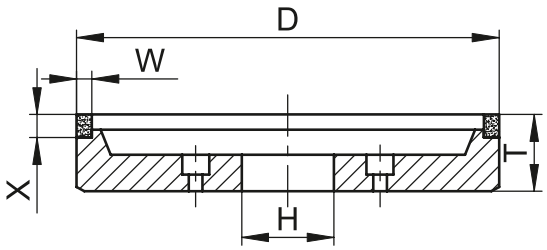
Shape 1

Universal and Weinig Rondamat profile grinding machines

TYPE NO.	SHAPE	DIAM.	T	H	U	X	R	SPECIFICATION	PU	COMMENTS
665983	14F1	200	10	20	4	7	2	D91 C100 B	1	Universal
665144	14F1	200	10	20	2	7	1	D46 C100 B	1	Universal
463137	14F1	200	10	31.75	4	7	2	B151 C75 B	1	Universal
462939	14F1	200	5	60	4	7	2	D91 C100 B	1	Weinig Rondamat
462943	14F1R	200	5	60	2	7	1	D46 C100 B	1	Weinig Rondamat
462926	14F1R	200	10	60	3	5	1.5	D64 C100 B	1	Weinig Rondamat
102804	1	225	5	60				89A 100 H5 V111	10	Weinig Rondamat
30806	1	225	5	60				89A 54 I5 AV53	10	Weinig Rondamat
619872	1	225	5	60				455A 54 L6 V3	10	Weinig Rondamat



Shape 4A9B



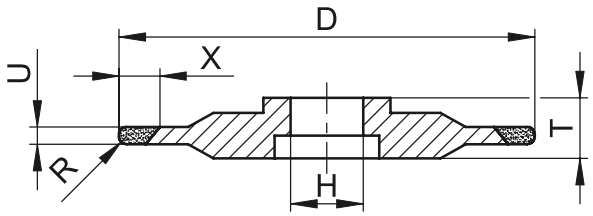
Shape 6A2B

Planer knife regrinding for Weinig Rondamat

TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
216613	4A9B	150	18	20	2	3.3	B126 C75 B	1	Weinig Rondamat (chip surface milling tools)
576078	4A9B	150	18	20	2	3.3	D64 C75 B	1	
34480	6A2B	125	18	20	3	4	B107 C50 B	1	Weinig Rondamat (clearance surface/back grinding)
590433	6A2B	125	18	20	3	4	D76 C75 B	1	

Tooth profile grinding

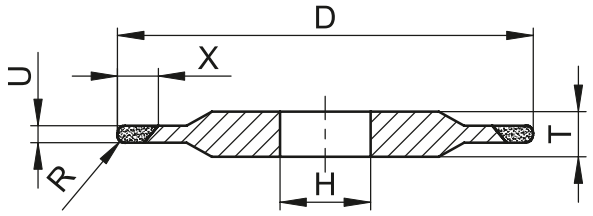
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
B					●	●						●



Shape 14F1

Recommended stock type, shape 14F1

TYPE NO.	SHAPE	DIAM.	T	H	U	X	R	SPECIFICATION	PU	COMMENTS
462911	14F1	150	20	20	1.3	8.4	0.65	B126 C125 B	1	e.g. Schmidt-Tempo ECE
462914	14F1	150	20	20	2	8.4	1	B126 C125 B	1	
462916	14F1	150	20	20	2.5	8.4	1.25	B151 C125 B	1	
462918	14F1	150	20	20	3	8.4	1.5	B151 C125 B	1	



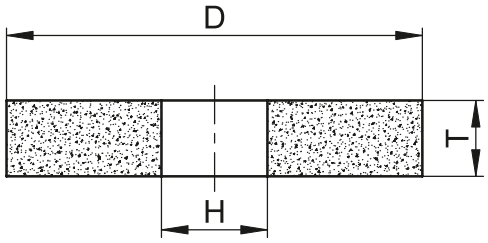
Shape 14F1

Recommended stock type, shape 14F1

TYPE NO.	SHAPE	DIAM.	T	H	U	X	R	SPECIFICATION	PU	COMMENTS
462924	14F1	200	8	32	1.3	8.4	0.65	B126 C125 B	1	e.g. Loroch, Rekord, Schmidt-Tempo
454693	14F1	200	8	32	1.6	8.4	0.8	B126 C125 B	1	
462928	14F1	200	8	32	2	8.4	1	B126 C125 B	1	
462932	14F1	200	8	32	2.5	8.4	1.25	B151 C125 B	1	
462937	14F1	200	8	32	3	12.5	1.5	B151 C125 B	1	

Saw blade polishing

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
C		○	○	●	●	●						●



Shape 1

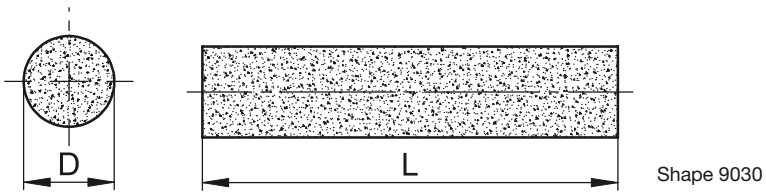
Recommended stock type, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
491888	1	250	25	32	C46 – BE16	1	Effect grinding of saw blades
401616	1	250	25	32	C46 – BE19F	1	Effect grinding of saw blades

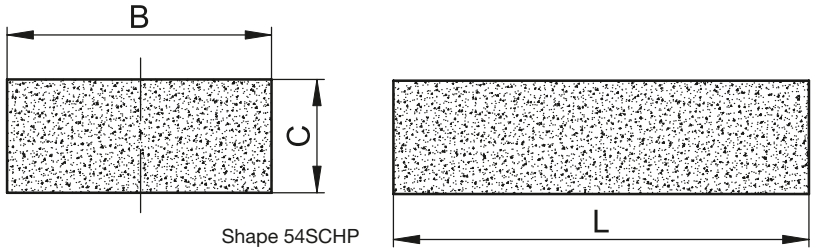
Comments:
BE16 = hard, vmax= 32 m/s BE19 = medium-hard, vmax = 32 m/s **Use 2/3 wheel flange**

Jointing stone

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
55AC, 454A						●						
C						●		●				



Shape 9030



Shape 54SCHP

Recommended stock type, shape 9030, 54SCH, 54SCHP, 90B

TYPE NO.	SHAPE	B	DIAM.	C	L	SPECIFICATION	PU	COMMENTS
775476	9030		12		32	C280 J5 V18	10	
351654	54SCH	20		15	60	C320 – 55 V18	10	
917288	54SCHP	60		15	160	454A 500 D2 B22	10	
668647	54SCHP	60		15	160	55AC 500 F4 B0S	10	
810975*	90B	60		15	160	55AC 500 F4 B0S	10	

* Shape 90B – see associated drawing

NOTES:

UNIVERSAL TOOL GRINDING
CONVENTIONAL CERAMICS

Product advantages:

- Grit sizes tailored to application (46 – 100) and qualities
- 89A white aluminium oxide suitable for universal use
- 91A ruby aluminium oxide – special aluminium oxide with high level of toughness, particularly suitable for intermittent grinding
- Cool grinding

Application tips:

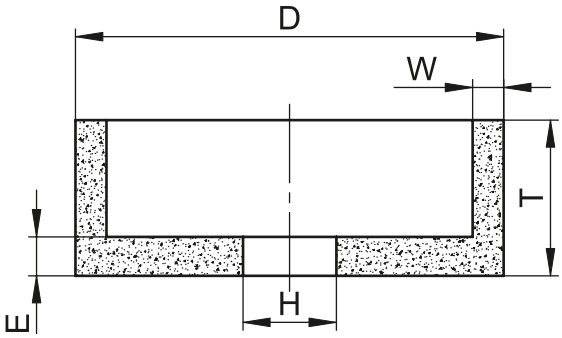
- Choice of grit size depends on the steel quality to be processed
- Low-alloyed steel = grit size 46 – 60
- HSS and special steels = grit size 60 – 80

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

Dry grinding

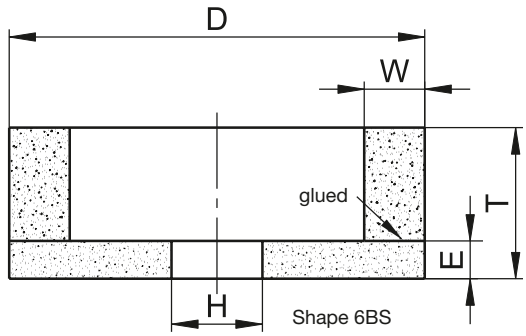
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
89A			●		●	●					●	
91A						●					●	
C								●			●	



Shape 6

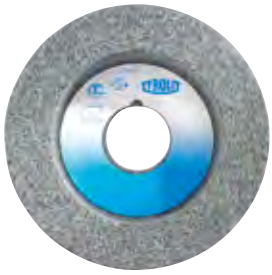
Recommended stock type, shape 6

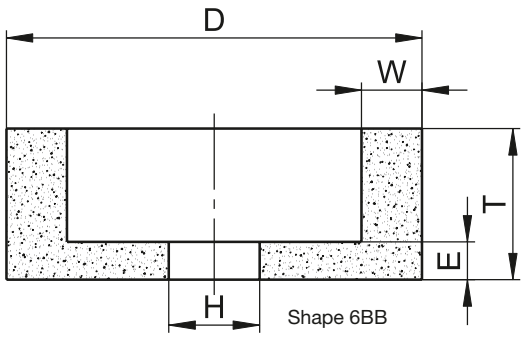
TYPE NO.	SHAPE	DIAM.	T	H	W – E	SPECIFICATION	PU	COMMENTS
5843	6	80	40	20	6 – 10	89A 60 K5 AV53	1	For achievable surface finishes (standard values), see table on page 123
34924	6	100	50	20	10 – 10	89A 46 K5 AV53	1	
19040	6	100	50	20	8 – 10	89A 54 I5 AV53	1	
5886	6	100	50	20	10 – 10	89A 60 J5 AV53	1	
5887	6	100	50	20	10 – 10	89A 60 K5 AV53	1	
49273	6	100	50	20	10 – 10	89A 60 M5 AV53	1	
9627	6	100	50	20	10 – 10	89A 80 I7 AV53	1	
568265	6	100	50	20	10 – 10	89A 80 I7 AV53U5	1	with peripheral treatment
5889	6	100	50	20	10 – 10	89A 80 J5 AV53	1	Achievable surface finishes (standard values) see table on page 123
8641	6	100	50	20	10 – 10	89A 80 K5 AV53	1	
54820	6	100	50	20	10 – 10	89A 80 L5 V55	1	
122989	6	100	50	20	10 – 10	91A 80 L5 AV217	1	
139155	6	100	50	20	10 – 10	C80 I5 V15	1	for CC and coated tools
131991	6	125	50	32	13 – 13	89A 60 K5 V53	1	For achievable surface finishes (standard values), see table on page 123
451151	6	125	63	20	8 – 13	89A 54 I5 AV53	1	
78847	6	150	50	32	12 – 15	89A 60 K5 V53	1	
77824	6	150	60	50	15 – 15	89A 36 H7 V217	1	
438088	6	150	63	32	15 – 16	91A 46 G9 AV21 7P3	1	
84809	6	150	70	28	17 – 16	89A 36 H8 V217	1	
91350	6	150	76	28	17.5 – 16	89A 46 J8 V217	1	
186445	6	150	80	32	10 – 16	89A 60 J5 AV53	1	
365824	6	150	80	50	10 – 16	89A 46 H7 AV53	1	
75803	6	165	60	32	15 – 15	91A 46 G9 AV21 7P3	1	
54119	6	175	75	76.2	17.5 – 17	89A 36 J8 V217	1	
126245	6	175	75	78	15 – 18	89A 36 H7 AV217	1	
712490	6	175	75	78	15 – 18	89A 36 J10 AV237 P22	1	
91441	6	175	75	78	15 – 18	89A 46 H7 V217	1	
587026	6	175	80	32	13 – 20	89A 46 G10 AV217	1	
70128	6	200	80	78	20 – 20	89A 36 H7 V217	1	
798715	6	200	80	78	20 – 20	89A 36 J10 AV237 P22	1	



Recommended stock type, shape 6BS

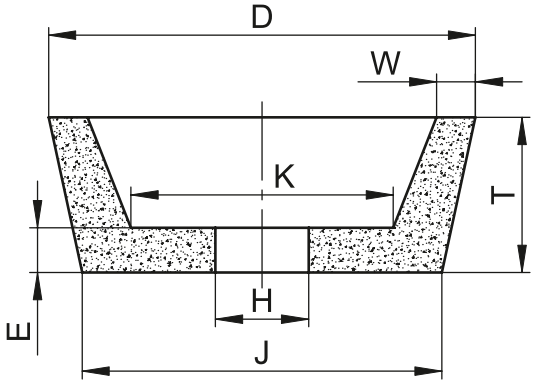
TYPE NO.	SHAPE	DIAM.	T	H	W – E	SPECIFICATION	PU	COMMENTS
70092	6BS	200	100	51	25 – 25	89A 36 I8 AV217	1	





Recommended stock type, shape 6BB

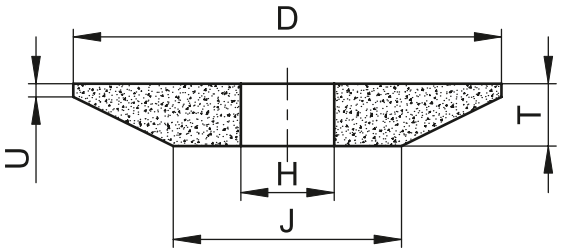
TYPE NO.	SHAPE	DIAM.	T	H	W – E	SPECIFICATION	PU	COMMENTS
24299	6BB	127	63	32	22.5 – 13	C46 J5 V15	2	for mining drill grinding machines
108479	6BB	200	100	32	25.5 – 20	C46 J5 V15	1	



Shape 11

Recommended stock type, shape 11

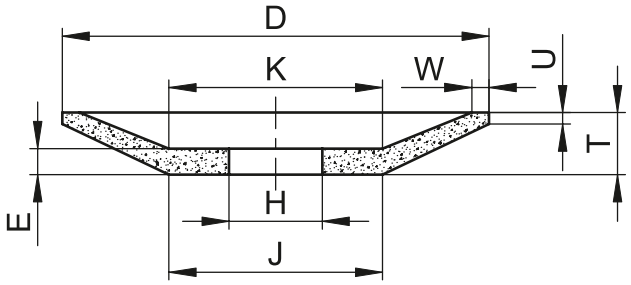
TYPE NO.	SHAPE	D / J	T	H	W – E	K	SPECIFICATION	PU	COMMENTS
334166	11	80 / 57	32	20	6 – 8	46	89A 100 H5 AV53	1	
338237	11	80 / 57	32	20	6 – 8	46	89A 60 K5 AV53	1	
4917	11	100 / 71	40	20	8 – 10	56	89A 46 J5 AV53	1	
4924	11	100 / 71	40	20	8 – 10	56	89A 60 K5 AV53	1	
631057	11	100 / 71	40	32	8 – 10	56	89A 60 J5 AV53	1	
63195	11	100 / 80	50	32	9 – 13	67	89A 60 K5 V53	1	
31675	11	125 / 96	40	20	8 – 10	81	89A 46 K5 AV53	1	
331500	11	125 / 96	40	32	8 – 10	81	89A 60 J5 AV53	1	
203176	11	150 / 114	50	32	10 – 13	96	89A 46 I5 AV53	1	
498229	11	150 / 114	50	32	10 – 13	96	89A 60 J5 AV53	1	



Shape 3

Recommended stock type, shape 3

TYPE NO.	SHAPE	D / J	T / U	H	SPECIFICATION	PU	COMMENTS
31009	3	150 / 75	8 / 2	20	89A60J5AV53	1	



Shape 12

Recommended stock type, shape 12

TYPE NO.	SHAPE	D / J	T / U	H	W – E	K	SPECIFICATION	PU	COMMENTS
19659	12	100 / 50	13 / 3	20	5 – 7	50	89A 60 K5 AV53	1	
364685	12	125 / 63	13 / 3	20	6 – 7	63	89A 60 I5 AV53	1	
216789	12	125 / 63	13.3 / 3	20	6 – 7	63	89A 46 J5 AV53	1	
9398	12	150 / 75	16 / 3	20	10 – 10	85	89A 60 J5 AV53	1	
9833	12	175 / 85	18 / 3	20	10 – 10	85	89A 60 I5 AV53	1	

UNIVERSAL TOOL GRINDING
CBN & DIAMOND RESIN

Product advantages:

- Bond systems and cores optimally tailored for dry grinding by means of high heat conductivity
- Particularly cool grinding

Application tips:

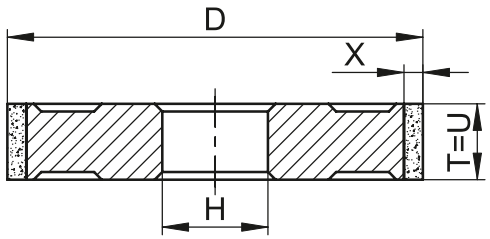
- Recommended operating speed for cemented carbide: 16 – 22 m/s
- Recommended operating speed for HSS: 20 – 25 m/s

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

Dry grinding for HSS

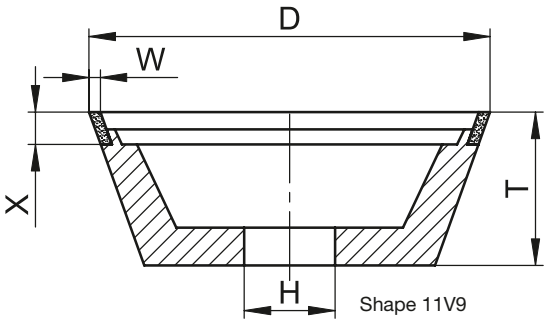
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
AMIGO, B			●		●	●					●	



Shape 1A1

Recommended stock type, shape 1A1

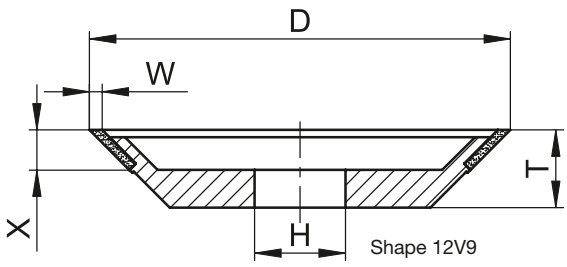
TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
620464	1A1	100	10	20	10	6	B126 C50 B54 BA	1	



Shape 11V9

Recommended stock type, shape 11V9

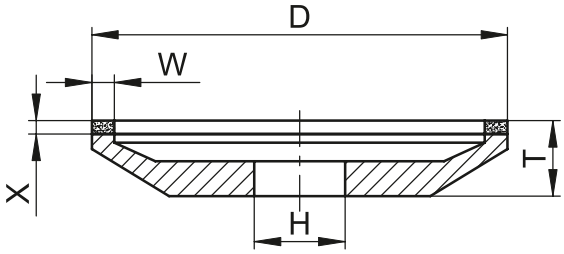
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
640777	11V9	75	30	20	2	10	AMIGO B126 C75 B	1	
666288	11V9	100	35	20	2	10	AMIGO B181 C75 B	1	
561391	11V9	100	35	20	2	10	B151 C75 B	1	Long life
617388	11V9	100	35	20	2	10	AMIGO B126 C75 B	1	
644514	11V9	100	35	20	2	10	AMIGO B91 C75 B	1	
636398	11V9	100	35	20	3	10	AMIGO B126 C75 B	1	
649723	11V9	100	35	32	2	10	AMIGO B126 C75 B	1	
641854	11V9	125	40	20	2	10	AMIGO B126 C75 B	1	
644532	11V9	125	40	20	2	10	AMIGO B91 C75 B	1	



Shape 12V9

Recommended stock type, shape 12V9

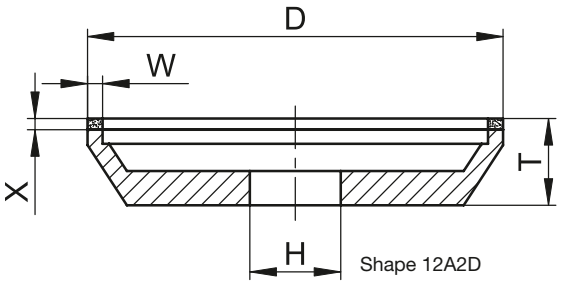
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
703242	12V9	75	20	20	2	6	AMIGO B126 C75 B	1	
636658	12V9	100	20	20	2	10	AMIGO B126 C75 B	1	
85701	12V9	100	20	20	2	10	B151 C75 B	1	Long life
840506	12V9	125	25	20	2	10	AMIGO B126 C75 B	1	



Shape 12A2

Recommended stock type, shape 12A2

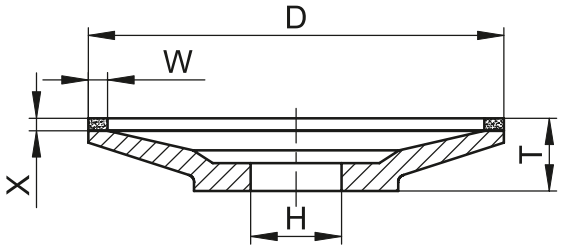
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
436484	12A2	150	18	20	5	2	B126 C50 B	1	
124644	12A2	150	18	20	5	3	B126 C50 B	1	
337051	12A2	150	18	20	4	3	B126 C75 B	1	
649692	12A2	175	20	20	6	2	B151 C75 B	1	



Shape 12A2D

Recommended stock type, shape 12A2D

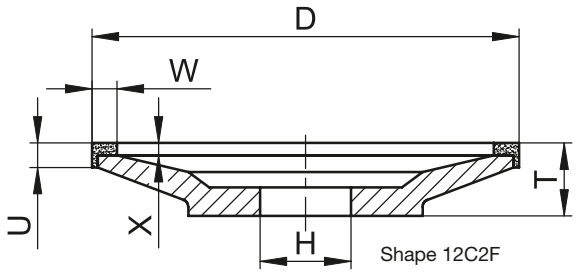
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
217976	12A2D	100	25	20	6	2	B126 C50 B	1	
666137	12A2D	100	25	20	6	3	B126 C50 B	1	



Shape 12A2F

Recommended stock type, shape 12A2F

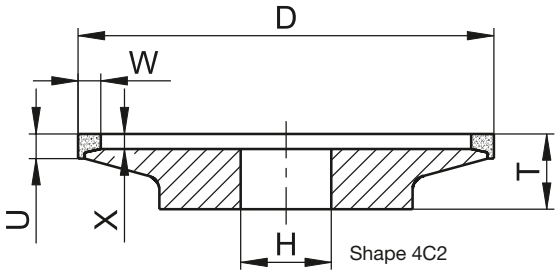
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
69502	12A2F	125	23	20	5	4	B126 C50 B	1	



Shape 12C2F

Recommended stock type, shape 12C2F

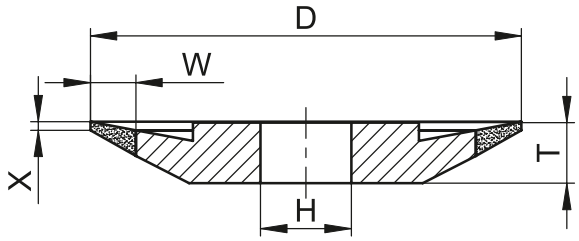
TYPE NO.	SHAPE	DIAM.	T	H	W	U	X	SPECIFICATION	PU	COMMENTS
646778	12C2F	125	23	20	5	5	4	AMIGO B91 C75 B	1	
641839	12C2F	125	23	20	5	5	4	AMIGO B151 C75 B	1	
641842	12C2F	150	23	20	5	5	4	AMIGO B151 C75 B	1	



Shape 4C2

Recommended stock type, shape 4C2

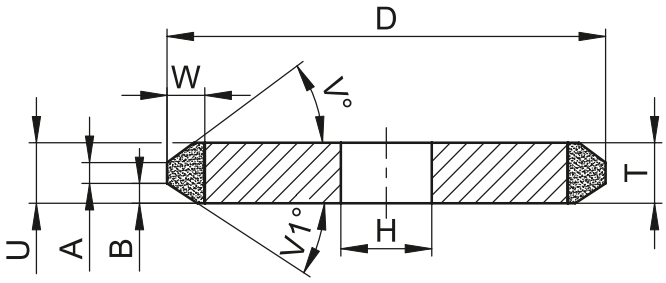
TYPE NO.	SHAPE	DIAM.	T	H	U	W	R	SPECIFICATION	PU	COMMENTS
83827	4C2	100	13	20	5.1	6	2	B126 C75 B	1	



Shape 4BT9

Recommended stock type, shape 4BT9

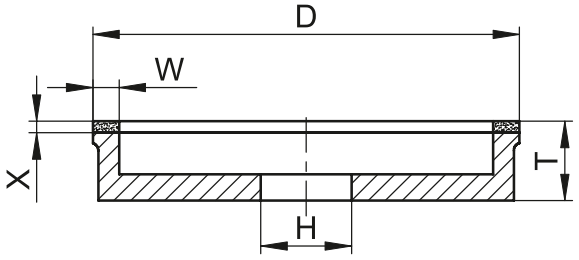
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
119325	4BT9	100	10	20	10	1	B126 C75 B	1	



Shape 1BM1

Recommended stock type, shape 1BM1

TYPE NO.	SHAPE	DIAM.	T	H	U	A	B	X	V°	V1°	SPECIFICATION	PU	COMMENTS
463068	1BM1	75	4	20	4	0.9	1.5	8	45	22.5	B91 C75 B	1	Drill bit diameter 4 mm
102748	1BM1	75	4.5	20	4.5	1.7	1.5	7	45	22.5	B91 C75 B	1	Drill bit diameter 5 and 6 mm
463070	1BM1	75	5	20	5	2.4	1.5	6.5	45	22.5	B91 C75 B	1	Drill bit diameter 8 mm
463071	1BM1	75	6	20	6	3.7	1.5	6	45	22.5	B91 C75 B	1	Drill bit diameter 10 mm



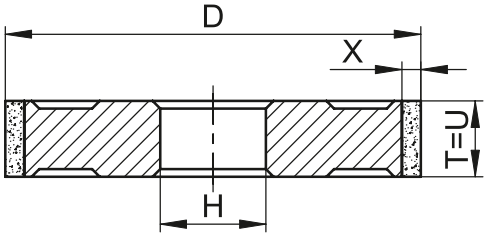
Shape 6A2

Recommended stock type, shape 6A2

TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
735896	6A2	100	30	20	3	6	B126 C75 B	1	

Dry grinding for cemented carbide

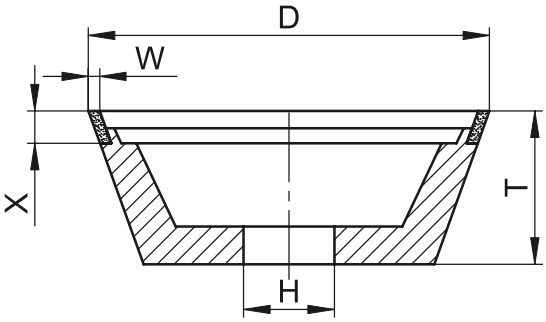
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
DIAGO, D								●			●	



Shape 1A1

Recommended stock type, shape 1A1

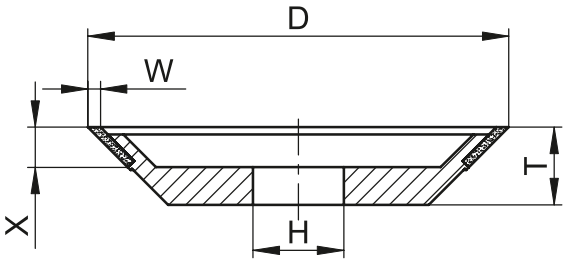
TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
640978	1A1	100	10	20	10	6	D64 C50 B	1	



Shape 11V9

Recommended stock type, shape 11V9

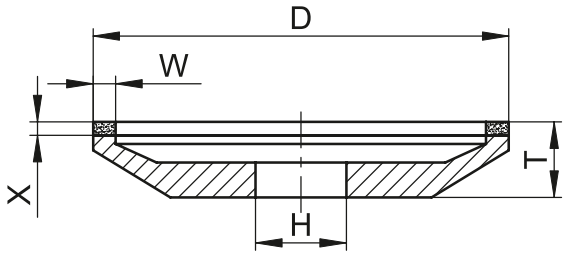
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
249717	11V9	75	30	20	2	6	D126 C75 B	1	Long life
679634	11V9	75	30	20	2	10	DIAGO D126 C75 B	1	
721301	11V9	75	30	20	2	10	DIAGO D64 C50 B	1	
676589	11V9	100	35	20	2	10	DIAGO D181 C75 B	1	
46198	11V9	100	35	20	3	10	DIAGO D181 C75 B	1	
675309	11V9	100	35	20	2	10	DIAGO D126 C75 B	1	
335803	11V9	100	35	31.75	2	10	DIAGO D126 C75 B	1	
681915	11V9	100	35	20	2	10	DIAGO D91 C75 B	1	
675272	11V9	100	35	20	2	10	DIAGO D64 C50 B	1	
576021	11V9	100	35	20	2	10	D126 C75 B	1	Long life
5028	11V9	100	35	20	3	10	D126 C75 B	1	Long life
561390	11V9	100	35	20	3	10	D126 C75 B	1	Long life
675318	11V9	100	35	20	3	10	DIAGO D126 C75 B	1	
721303	11V9	100	35	20	3	10	DIAGO D64 C50 B	1	
679946	11V9	125	40	20	3	10	DIAGO D126 C75 B	1	



Shape 12V9

Recommended stock type, shape 12V9

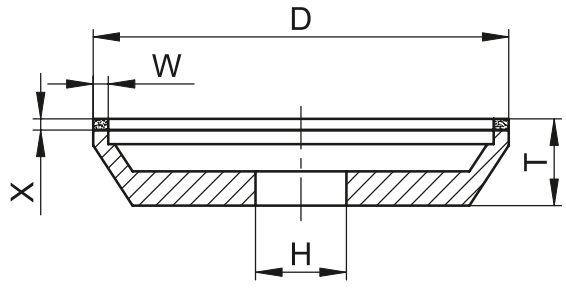
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
696324	12V9	75	20	20	2	6	DIAGO D126 C75 B	1	
721319	12V9	75	20	20	2	6	DIAGO D64 C50 B	1	
689930	12V9	100	20	20	2	10	DIAGO D126 C75 B	1	
311250	12V9	125	25	20	2	10	D126 C75 B	1	Long life
90998	12V9	125	25	20	2	6	D54 C65 B	1	
194540	12V9	100	20	20	2	10	DIAGO D91 C75 B	1	
43588	12V9	100	20	20	2	10	D91 C75 B	1	



Shape 12A2

Recommended stock type, shape 12A2

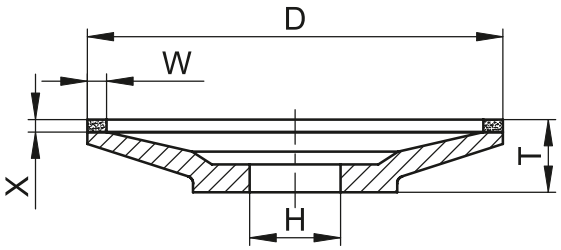
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
19220	12A2	125	16	20	6	2	D126 C75 B	1	
291603	12A2	150	18	20	5	3	D91 C75 B	1	



Shape 12A2D

Recommended stock type, shape 12A2D

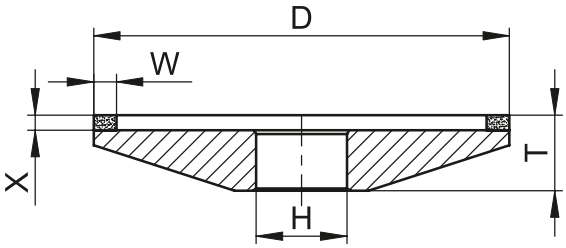
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
104376	12A2D	100	25	20	5	3	D91 C75 B	1	
28162	12A2D	100	25	20	6	2	D126 C75 B	1	
38012	12A2D	100	25	20	6	2	D64 C50 B	1	
462949	12A2D	100	27	20	6	4	D64 C50 B	1	
779789	12A2D	100	25	20	10	3	D91 C75 B	1	



Shape 12A2F

Recommended stock type, shape 12A2F

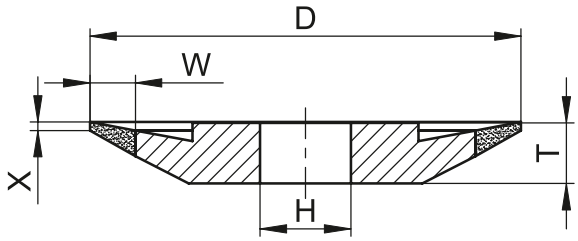
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
102902	12A2F	125	23	20	5	4	D126 C50 B	1	
842923	12A2F	125	23	20	5	4	D151 C75 B	1	Long life
731399	12A2F	125	23	20	5	4	D151 C75 B	1	
731387	12A2F	125	23	20	5	4	D64 C50 B	1	
97868	12A2F	125	23	20	5	4	D64 C50 B	1	Long life
416671	12A2F	150	22	20	4	3	D64 C50 B	1	
679671	12A2F	150	23	20	5	4	D126 C75 B	1	



Shape 4A2

Recommended stock type, shape 4A2

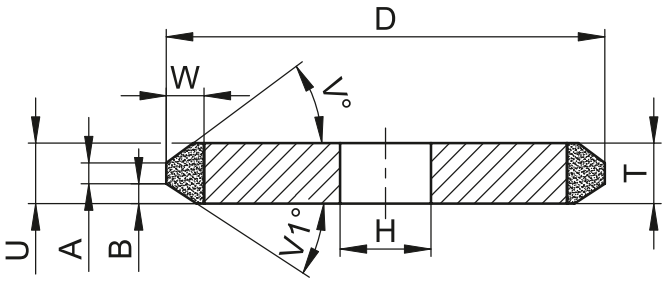
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
86734	4A2	125	10	20	5	2	D64 C50 B	1	
480500	4A2	125	10	20	5	2	D126 C75 B	1	
215813	4A2	150	12	20	5	2	D126 C50 B	1	
436472	4A2	150	12	20	5	2	D64 C50 B	1	



Shape 4BT9

Recommended stock type, shape 4BT9

TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
255835	4BT9	100	10	20	10	1	D91 C75 B	1	



Shape 1BM1

Recommended stock type, shape 1BM1

TYPE NO.	SHAPE	DIAM.	T	H	U	A	B	X	V°	V1°	SPECIFICATION	PU	COMMENTS
790783	1BM1	75	4	20	4	0.9	1.5	8	45	22.5	D64 C75 B	1	Drill bit diameter 4 mm
848480	1BM1	75	4.5	20	4.5	1.7	1.5	7	45	22.5	D64 C75 B	1	Drill bit diameter 5 and 6 mm
790784	1BM1	75	5	20	5	2.4	1.5	6.5	45	22.5	D64 C75 B	1	Drill bit diameter 8 mm
867805	1BM1	75	6	20	6	3.7	1.5	6	45	22.5	D64 C75 B	1	Drill bit diameter 10 mm

CNC TOOL GRINDING
CBN & DIAMOND RESIN

Product advantages:

- For various applications in regrinding and tool manufacturing
- Bond systems for oil and emulsion
- Resin bond systems with high edge stability

Application tips:

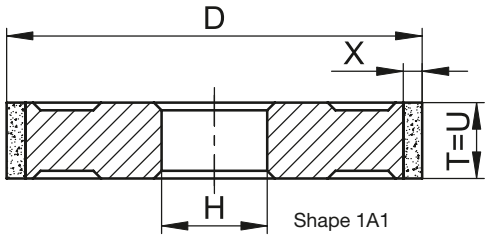
- Cutting speed for CBN cup grinding wheels should be up to 30% higher than for diamond wheels
- Optimum peripheral speed for CBN grinding wheels (for flute grinding) 20 – 25 m/s
- For CBN wheels and cup wheels, the operating speeds should be 5 – 8 m/s faster compared to the standard values for diamond wheels
- Ensure good coolant supply
- For optimised dressing, see page 113, 116

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

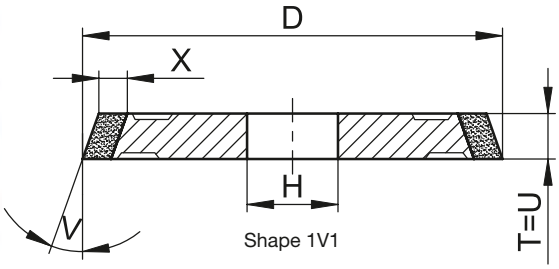
Wet grinding for HSS

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
STARTEC-BASIC, B					●	●						●



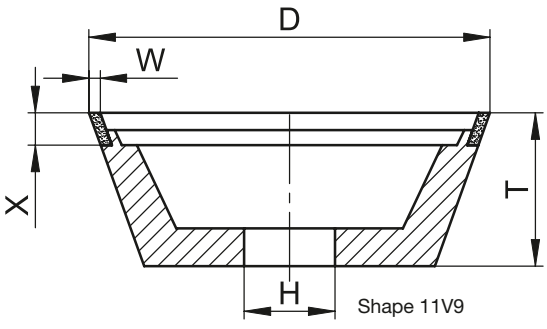
Recommended stock type, shape 1A1

TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
906950	1A1	100	6	20	6	6	STARTEC-BASIC BL126 3PD	1	Optimum operating speed vc = 20 – 25 m/s
906951	1A1	100	10	20	10	6	STARTEC-BASIC BL126 3PD	1	
906954	1A1	125	10	20	10	6	STARTEC-BASIC BL126 3PD	1	



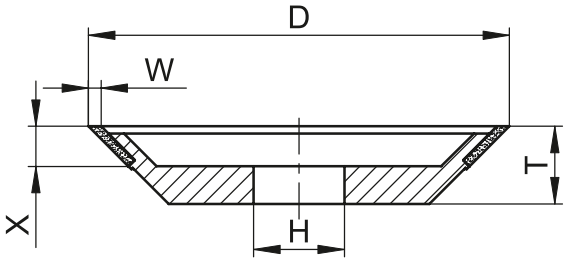
Recommended stock type, shape 1V1

TYPE NO.	SHAPE	DIAM.	T	H	U	X	V	SPECIFICATION	PU	COMMENTS
906946	1V1	125	12	20	12	6	45	STARTEC-BASIC BL126 3PD	1	Optimum operating speed
906947	1V1	150	6	20	6	6	15	STARTEC-BASIC BL126 3PD	1	vc = 20 – 25 m/s



Recommended stock type, shape 11V9

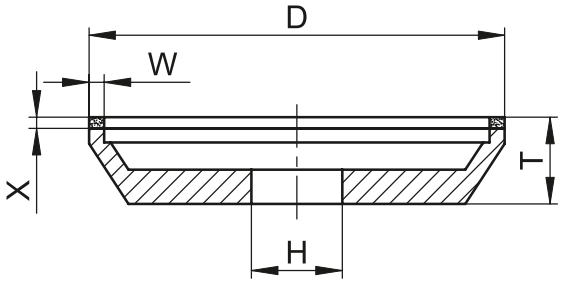
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
75669	11V9	75	30	20	2	10	STARTEC-BASIC BL126 3PD	1	Optimum operating speed vc = 25 – 30 m/s
494983	11V9	75	30	20	2	10	STARTEC-BASIC BL76 3PD	1	
494985	11V9	100	35	20	2	10	STARTEC-BASIC BL76 3PD	1	
532564	11V9	100	35	20	3	10	STARTEC-BASIC BL76 3PD	1	
494987	11V9	125	40	20	2	10	STARTEC-BASIC BL76 3PD	1	



Shape 12V9

Recommended stock type, shape 12V9

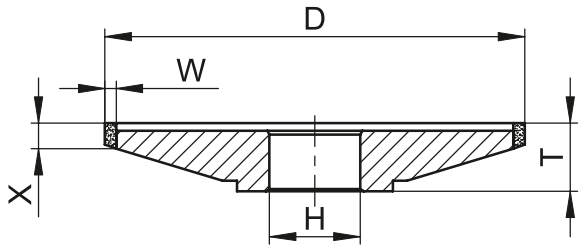
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
75679	12V9	100	20	20	2	10	STARTEC-BASIC BL126 3PD	1	Optimum operating speed vc = 25 – 30 m/s
532571	12V9	100	20	20	2	10	STARTEC-BASIC BL76 3PD	1	
75685	12V9	125	25	20	2	10	STARTEC-BASIC BL126 3PD	1	
495027	12V9	125	25	20	2	10	STARTEC-BASIC BL76 3PD	1	



Shape 12A2D

Recommended stock type, shape 12A2D

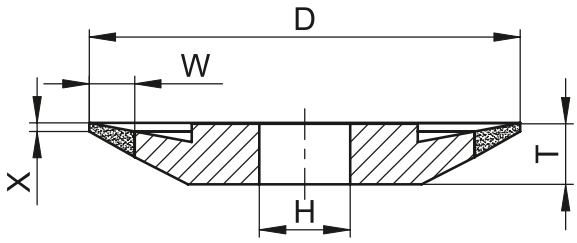
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
495046	12A2D	100	25	20	5	3	B91 C100 B	1	
173085	12A2D	125	25	20	15	3	B91 C100 B	1	



Shape 4B2

Recommended stock type, shape 4B2

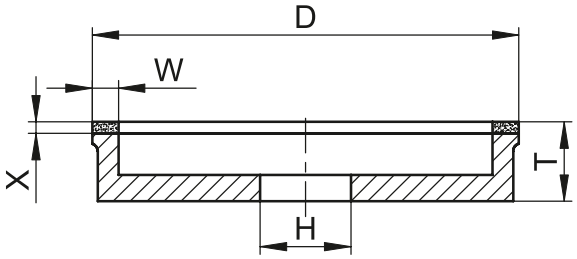
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
667930	4B2	150	18	20	2	2	B126 C100 B	1	Chip surface, hobbing cutter



Shape 4BT9

Recommended stock type, shape 4BT9

TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
495058	4BT9	125	10	20	10	1	STARTEC-BASIC BL126 3PD	1	



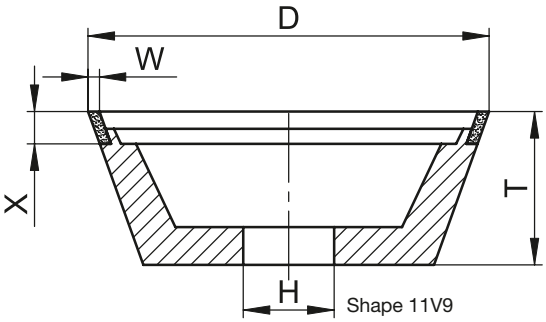
Shape 6A2

Recommended stock type, shape 6A2

TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
495038	6A2	125	30	20	5	3	STARTEC-BASIC BL91 3PD	1	
495037	6A2	150	35	20	5	3	STARTEC-BASIC BL91 3PD	1	

Wet grinding for cemented carbide

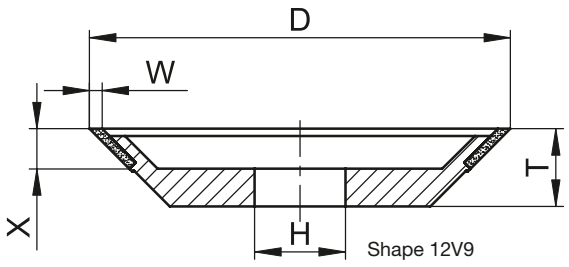
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
STARTEC-BASIC, B								●				●



Shape 11V9

Recommended stock type, shape 11V9

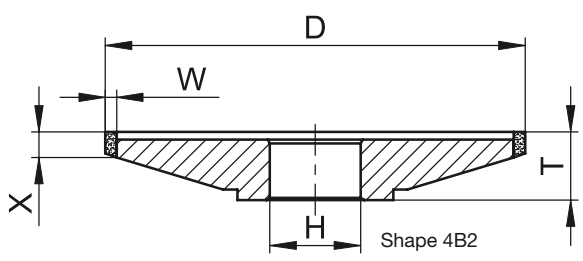
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
390970	11V9	75	30	20	2	10	STARTEC-BASIC DE64 3BS	1	
357223	11V9	100	35	20	2	10	STARTEC-BASIC DE64 3BS	1	Optimum operating speed
532514	11V9	100	35	20	3	10	STARTEC-BASIC DE64 3BS	1	vc = 18 – 25 m/s
494978	11V9	125	40	20	2	10	STARTEC-BASIC DE64 3BS	1	



Shape 12V9

Recommended stock type, shape 12V9

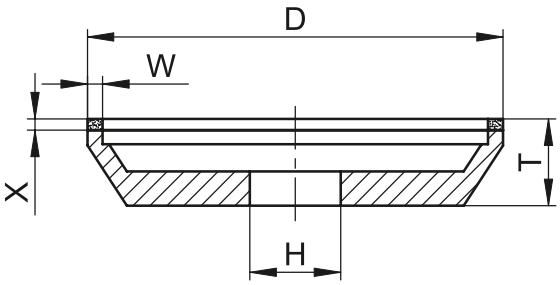
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
495020	12V9	75	20	20	2	6	STARTEC-BASIC DE64 3BS	1	Optimum operating speed
532510	12V9	100	20	20	2	10	STARTEC-BASIC DE64 3BS	1	vc = 18 – 25 m/s
532529	12V9	100	20	20	3	10	STARTEC-BASIC DE64 3BS	1	
363993	12V9	125	25	20	2	10	STARTEC-BASIC DE64 3BS	1	
532540	12V9	125	25	20	3	10	STARTEC-BASIC DE64 3BS	1	



Shape 4B2

Recommended stock type, shape 4B2

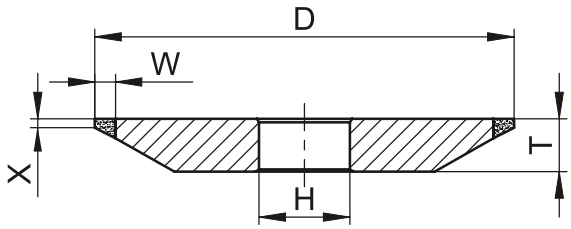
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
665141	4B2	150	18	20	2	2	STARTEC-BASIC DE64 3BX	1	for hobbing cutter



Shape 12A2D

Recommended stock type, shape 12A2D

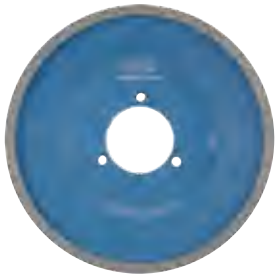
TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
495044	12A2D	125	25	20	15	3	D54 C75 B	1	

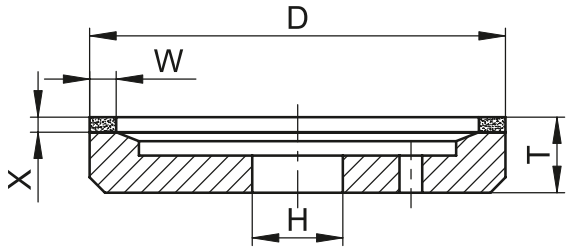


Shape 4ET9

Recommended stock type, shape 4ET9

TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
897024	4ET9	150	14	32	10	1	D126 C100 B	1	





Shape 6A2H (6A2T = design with threaded bore)

Recommended stock type, shape 6A2H

TYPE NO.	SHAPE	DIAM.	T	H	W	X	SPECIFICATION	PU	COMMENTS
462673	6A2H	200	30	50	8	4	STARTEC-BASIC DE126 3BP	1	for planer and paper knives; e.g. Göckel, Reform
470272	6A2T	200	35	75	8	4	D126 C100 B	1	
665142	6A2H	200	30	50	8	4	D64 C75 B	1	
665143	6A2T	200	35	75	8	4	D64 C75 B	1	

CNC TOOL GRINDING
HIGH PERFORMANCE GRINDING TOOLS
CBN & DIAMOND METAL

Product advantages:

- Bond systems for oil and emulsion
- Optimum results with oil coolant, reduced cutting performance with emulsion
- Highest edge stability on cup grinding wheels 11V9 and 12V9

Application tips:

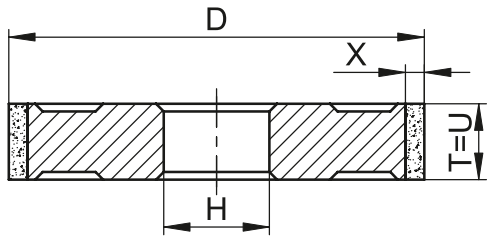
- Use STARTEC XP-P for optimum cutting performance
- Use STARTEC HP for standard applications
- Cutting speed recommendation for flute grinding
  Solid carbide: 16 – 18 m/s
  HSS: 20 – 25 m/s
- Cutting speed recommendation for cup grinding wheels
  Solid carbide: 18 – 24 m/s
  HSS: 20 – 30 m/s
- Always ensure enough coolant is available
- Dressing and sharpening instructions see page 113, 116

Safety information:

- Always respect safety instructions for grinding tools
- See chapter Safety with grinding on page 128

Wet grinding for HSS

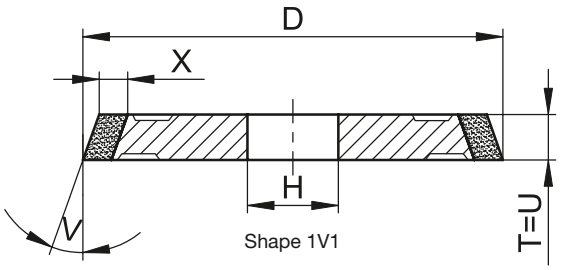
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
STARTEC-XP-P STARTEC-HP					●	●						●



Shape 1A1

Recommended stock type, shape 1A1

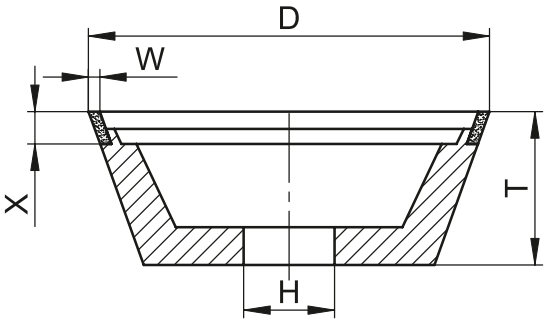
TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
759826	1A1	75	6	20	6	10	STARTEC XP-P B126 MXPP	1	
740383	1A1	75	10	20	10	10	STARTEC XP-P B126 MXPP	1	
751424	1A1	100	6	20	6	10	STARTEC XP-P B126 MXPP	1	
740382	1A1	100	10	20	10	10	STARTEC XP-P B126 MXPP	1	
772440	1A1	100	12	20	12	10	STARTEC XP-P B126 MXPP	1	
763854	1A1	100	15	20	15	10	STARTEC XP-P B126 MXPP	1	Optimum operating speed vc = 20 – 25 m/s
772442	1A1	125	6	20	6	10	STARTEC XP-P B126 MXPP	1	
772443	1A1	125	10	20	10	10	STARTEC XP-P B126 MXPP	1	
772444	1A1	125	12	20	12	10	STARTEC XP-P B126 MXPP	1	
772446	1A1	125	15	20	15	10	STARTEC XP-P B126 MXPP	1	
772447	1A1	150	8	20	8	10	STARTEC XP-P B126 MXPP	1	
772448	1A1	150	12	20	12	10	STARTEC XP-P B126 MXPP	1	



Shape 1V1

Recommended stock type, shape 1V1

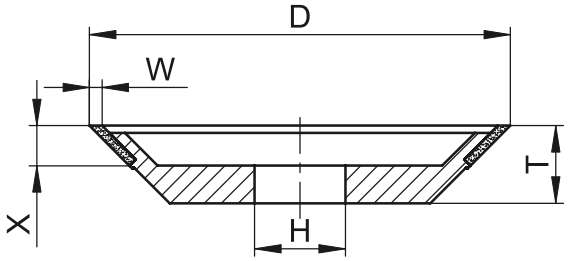
TYPE NO.	SHAPE	DIAM.	T	H	U	X	V°	SPECIFICATION	PU	COMMENTS
772453	1V1	75	10	20	10	10	15	STARTEC XP-P B126 MXPP	1	
772455	1V1	100	12	20	12	10	45	STARTEC XP-P B126 MXPP	1	
772458	1V1	125	10	20	10	10	15	STARTEC XP-P B126 MXPP	1	Optimum operating speed vc = 20 – 25 m/s
772461	1V1	125	10	20	10	10	45	STARTEC XP-P B126 MXPP	1	
772462	1V1	125	15	20	15	10	15	STARTEC XP-P B126 MXPP	1	
772465	1V1	150	12	20	12	10	10	STARTEC XP-P B126 MXPP	1	



Shape 11V9

Recommended stock type, shape 11V9 STARTEC-HP

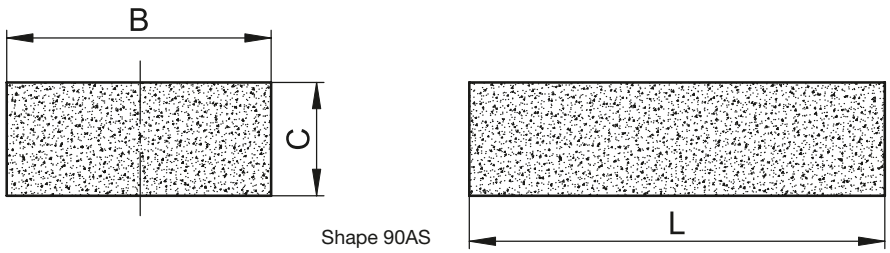
TYPE NO.	SHAPE	DIAM.	T	H	W	X	V°	SPECIFICATION	PU	COMMENTS
16587	11V9	75	30	20	3	10	20	STARTEC-HP BM76 3MC	1	Optimum operating speed vc = 20 – 30 m/s
769871	11V9	100	35	20	3	10	20	STARTEC-HP BM76 3MC	1	
771146	11V9	125	40	20	3	10	20	STARTEC-HP BM76 3MC	1	



Shape 12V9

Recommended stock type, shape 12V9 STARTEC-HP

TYPE NO.	SHAPE	DIAM.	T	H	W	X	V°	SPECIFICATION	PU	COMMENTS
771147	12V9	100	20	20	3	10	45	STARTEC-HP BM76 3MC	1	Optimum operating speed vc = 20 – 30 m/s
771148	12V9	125	25	20	3	10	45	STARTEC-HP BM76 3MC	1	



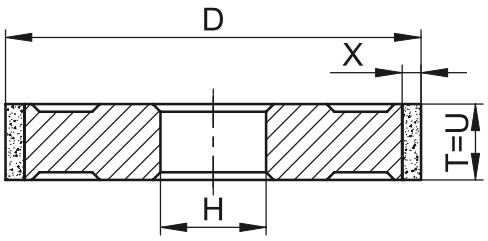
Shape 90AS

STARTEC Dressing stick for diamond and CBN grinding wheels, shape 90AS

TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
678953	90AS	24	13	200	A240 STARTEC	10	For STARTEC XP-P and HP

Wet grinding for cemented carbide

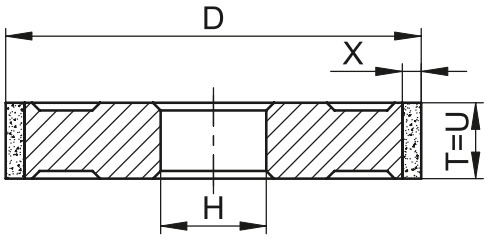
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
STARTEC-XP-P, STARTEC-HP								●				●



Shape 1A1

Recommended stock type, shape 1A1 STARTEC XP-P

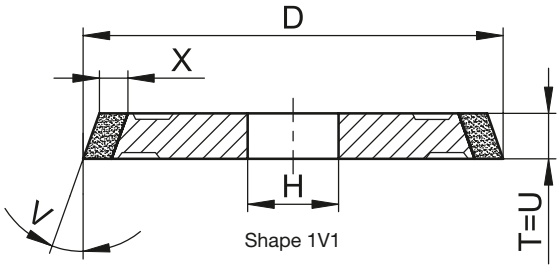
TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
679931*	1A1	75	6	20	6	6	STARTEC XP-P D54 MXPP	1	
679936*	1A1	75	10	20	10	6	STARTEC XP-P D54 MXPP	1	
679938*	1A1	100	6	20	6	6	STARTEC XP-P D54 MXPP	1	
679939*	1A1	100	10	20	10	6	STARTEC XP-P D54 MXPP	1	
694995*	1A1	100	10	31.75	10	6	STARTEC XP-P D54 MXPP	1	
679940*	1A1	100	12	20	12	6	STARTEC XP-P D54 MXPP	1	
685346*	1A1	100	12	31.75	12	6	STARTEC XP-P D54 MXPP	1	* = diameter 75, 100, 125 mm also in x = 10 mm ex stock is available
679942*	1A1	100	15	20	15	6	STARTEC XP-P D54 MXPP	1	
679945	1A1	125	6	20	6	6	STARTEC XP-P D54 MXPP	1	
679947	1A1	125	10	20	10	6	STARTEC XP-P D54 MXPP	1	
702678	1A1	125	10	31.75	10	6	STARTEC XP-P D54 MXPP	1	Optimum operating speed vc = 16 – 18 m/s
679948	1A1	125	12	20	12	6	STARTEC XP-P D54 MXPP	1	
712482	1A1	125	12	31.75	12	6	STARTEC XP-P D54 MXPP	1	
679949	1A1	125	15	20	15	6	STARTEC XP-P D54 MXPP	1	
684827	1A1	150	8	20	8	10	STARTEC XP-P D54 MXPP	1	
679951	1A1	150	10	20	10	10	STARTEC XP-P D54 MXPP	1	
679952	1A1	150	12	20	12	10	STARTEC XP-P D54 MXPP	1	
679953	1A1	150	15	20	15	10	STARTEC XP-P D54 MXPP	1	



Shape 1A1

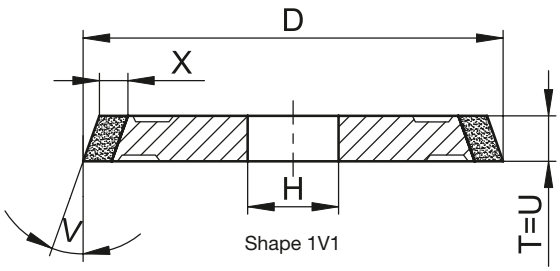
Recommended stock type, shape 1A1 STARTEC-HP

TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
572731	1A1	75	6	20	6	6	STARTEC-HP DN54 3MH	1	
474444	1A1	100	6	20	6	6	STARTEC-HP DN54 3MH	1	
408972	1A1	100	10	20	10	6	STARTEC-HP DN54 3MH	1	Optimum operating speed vc = 16 – 18 m/s
556715	1A1	100	12	20	12	6	STARTEC-HP DN54 3MH	1	
490259	1A1	100	15	20	15	6	STARTEC-HP DN54 3MH	1	
572741	1A1	125	10	20	10	6	STARTEC-HP DN54 3MH	1	



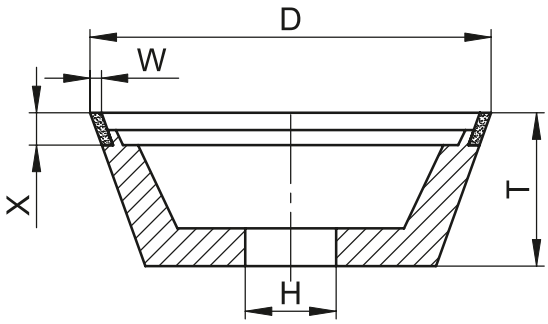
Recommended stock type, shape 1V1 STARTEC XP-P

TYPE NO.	SHAPE	D	T	H	U	X	V	SPECIFICATION	PU	COMMENTS
680097	1V1	75	6	20	6	6	15	STARTEC XP-P D54 MXPP	1	
680098	1V1	75	8	20	8	10	15	STARTEC XP-P D54 MXPP	1	
680099	1V1	75	10	20	10	10	15	STARTEC XP-P D54 MXPP	1	
680100	1V1	100	6	20	6	10	15	STARTEC XP-P D54 MXPP	1	
680102	1V1	100	10	20	10	10	15	STARTEC XP-P D54 MXPP	1	
680104	1V1	100	12	20	12	10	15	STARTEC XP-P D54 MXPP	1	
680107	1V1	100	12	20	12	10	45	STARTEC XP-P D54 MXPP	1	
680110	1V1	100	15	20	15	10	15	STARTEC XP-P D54 MXPP	1	Optimum operating speed
680112	1V1	125	6	20	6	10	15	STARTEC XP-P D54 MXPP	1	vc = 16 – 18 m/s
680114	1V1	125	10	20	10	10	15	STARTEC XP-P D54 MXPP	1	
680115	1V1	125	10	20	10	10	45	STARTEC XP-P D54 MXPP	1	
680116	1V1	125	12	20	12	10	15	STARTEC XP-P D54 MXPP	1	
680118	1V1	125	12	20	12	10	45	STARTEC XP-P D54 MXPP	1	
680120	1V1	125	15	20	15	10	15	STARTEC XP-P D54 MXPP	1	
680123	1V1	150	10	20	10	10	10	STARTEC XP-P D54 MXPP	1	
680124	1V1	150	12	20	12	10	10	STARTEC XP-P D54 MXPP	1	



Recommended stock type, shape 1V1 STARTEC-HP

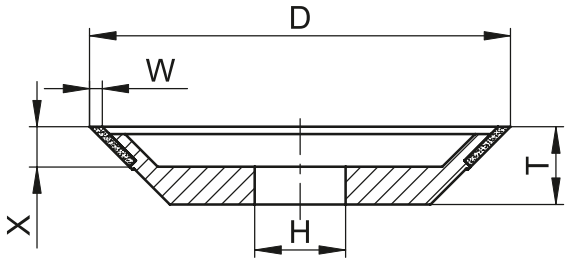
TYPE NO.	SHAPE	DIAM.	T	H	U	X	V	SPECIFICATION	PU	COMMENTS
572845	1V1	75	6	20	6	6	15	STARTEC-HP DN54 3MH	1	
572847	1V1	75	10	20	10	10	15	STARTEC-HP DN54 3MH	1	
490141	1V1	100	10	20	10	6	15	STARTEC-HP DN54 3MH	1	
572859	1V1	100	12	20	12	6	45	STARTEC-HP DN54 3MH	1	Optimum operating speed
572867	1V1	125	10	20	10	6	15	STARTEC-HP DN54 3MH	1	vc = 16 – 18 m/s
572868	1V1	125	10	31.75	10	6	15	STARTEC-HP DN54 3MH	1	
556731	1V1	125	12	20	12	6	15	STARTEC-HP DN54 3MH	1	
560672	1V1	125	12	20	12	6	45	STARTEC-HP DN54 3MH	1	



Shape 11V9

Recommended stock type, shape 11V9 STARTEC-HP

TYPE NO.	SHAPE	DIAM.	T	H	W	X	V	SPECIFICATION	PU	COMMENTS
626754	11V9	75	30	20	2	10	20	STARTEC-HP DN46 3MC	1	
529895	11V9	75	30	20	2	10	20	STARTEC-HP DN64 3MC	1	
22737	11V9	75	30	20	3	10	20	STARTEC-HP DN46 3MC	1	
758167	11V9	75	30	20	3	10	20	STARTEC-HP DN64 3MC	1	
530074	11V9	100	35	20	2	10	20	STARTEC-HP DN64 3MC	1	Optimum operating speed vc = 18 – 24 m/s
667542	11V9	100	35	20	3	10	20	STARTEC-HP DN46 3MC	1	
478973	11V9	100	35	20	3	10	20	STARTEC-HP DN64 3MC	1	
530077	11V9	125	40	20	2	10	20	STARTEC-HP DN64 3MC	1	
649099	11V9	125	40	20	3	10	20	STARTEC-HP DN46 3MC	1	
580760	11V9	125	40	20	3	10	20	STARTEC-HP DN64 3MC	1	



Shape 12V9

Recommended stock type, shape 12V9 STARTEC-HP

TYPE NO.	SHAPE	DIAM.	T	H	W	X	V	SPECIFICATION	PU	COMMENTS
530078	12V9	100	20	20	2	10	45	STARTEC-HP DN64 3MC	1	
580769	12V9	100	20	20	3	10	45	STARTEC-HP DN64 3MC	1	
530079	12V9	125	25	20	2	10	45	STARTEC-HP DN64 3MC	1	Optimum operating speed vc = 18 – 24 m/s
641156	12V9	125	25	20	3	10	45	STARTEC-HP DN64 3MC	1	
672678	12V9	125	25	20	3	10	45	STARTEC-HP DN46 3MC	1	

CUTTING ROTATING WORK PIECES
CBN & DIAMOND RESIN

Product advantages:

- Perfect cutting quality by virtue of innovative bond systems and tailored grain qualities
- Less wear
- High cutting ability – low heat build up
- Perfect cutting quality

Application tips:

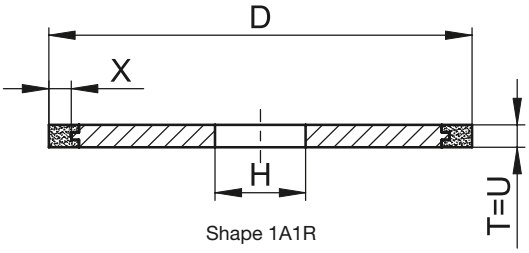
- Avoid applying too much pressure to prevent any cut deviation
- Ensure sufficient cooling
- Suitable for stationary machines and automatic saw sharpening machines

Safety information:

- Observe maximum operating speed
- Observe safety information
- See chapter "Safety when grinding" (page 128)

HSS

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
B						●					○	●



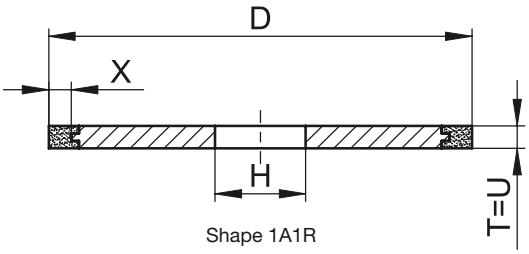
Shape 1A1R

Recommended stock type, shape 1A1R

TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
788700	1A1R	125	1	20	1	5	B126 C75 B53ST	1	
164485	1A1R	125	1	20	1	5	B151 C100 B53ST	1	
494701	1A1R	150	1	20	1	5	B151 C100 B53ST	1	

Cemented carbide

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
STARTEC-BASIC, D								●			○	●



Shape 1A1R

Recommended stock type, shape 1A1R

TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
157800	1A1R	75	0.8	20	0.8	5	D126 C75 B53ST	1	
299109	1A1R	75	1	20	1	5	D151 C75 B52ST	1	
119395	1A1R	100	0.8	20	0.8	5	D126 C100 B53ST	1	
100660	1A1R	100	1	20	1	5	D126 C100 B53ST	1	
108728	1A1R	100	1.5	20	1.5	5	D126 C75 B53ST	1	
101000	1A1R	125	1	20	1	5	D126 C100 B53ST	1	
148132	1A1R	150	1	20	1	5	D126 C100 B53ST	1	
317532	1A1R	150	1	20	1	5	D126 C75 B53ST	1	
278979	1A1R	150	1	20	1	5	D151 C100 B53ST	1	
667995	1A1R	200	1	22	1	5	STARTEC-BASIC DE126 3BP	1	Long life
858531	1A1R	200	1.2	20	1.2	7	D126 C100 B53ST	1	
603284	1A1R	200	1.2	30	1.2	7	D151 C100 B53ST	1	

Comments: See chapter "Cutting HSS / cemented carbide" (page 108 and 109)

OFF-HAND GRINDING AND CUTTING
CONVENTIONAL RESIN

Product advantages:

- Less effort required through high cutting ability
- Clean cutting quality
- Long lifetime
- Ultimate product safety

Application tips for grinding:

- Applying less pressure improves the grinding pattern (blank cutting area)
- Hard specifications are recommended for deburring (hardness R+S)
- Soft specifications are recommended for grinding large areas (hardness N+P)

Application tips for cutting:

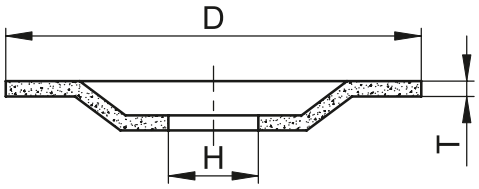
- Avoid applying too much pressure to prevent any cut deflection
- Soft specifications for large dimensions
- Watch out for small contact arcs

Safety information:

- Do not use cut-off wheels for grinding
- Observe max. permissible peripheral speed
- Observe safety information
- See chapter "Safety when grinding" (page 128)

Cast materials

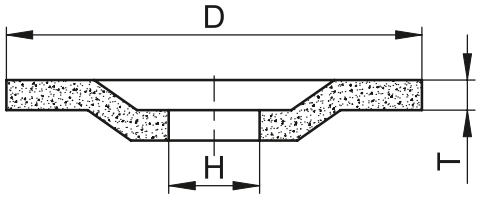
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
ZA, ZZA		○		○			○			●	●	



Shape 42F

Recommended cut-off wheels, shape 42F – PREMIUM FOCUR EXTRA

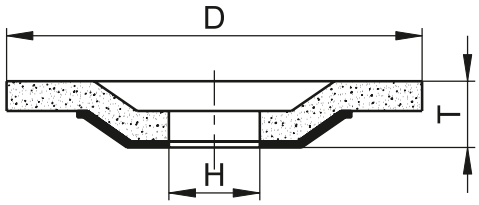
TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
855818	42F	230	3.5	22.23	ZA30P-BFXA	25	Very easy cutting tool for cutting large cross-sections.
929887	42F	178	3.5	22.23	ZA30R-BFXA	25	Optimum combination of high cutting ability and long lifetime
929889	42F	230	3.5	22.23	ZA30R-BFXA	25	



Shape 27F

Recommended rough grinding wheels, shape 27F – PREMIUM FOCUR EXTRA

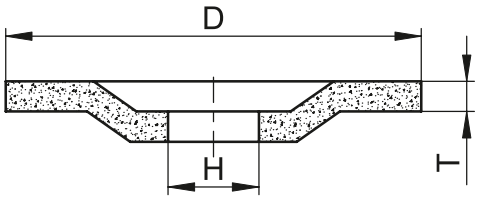
TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
233756	27F	125	7	22.23	ZA24N-BFX	10	Very easy cutting for surface grinding; optimum removal with low pressing force
233757	27F	178	4	22.23	ZA24N-BFX	10	
233759	27F	178	7	22.23	ZA24N-BFX	10	
233760	27F	230	4	22.23	ZA24N-BFX	10	
233762	27F	230	7	22.23	ZA24N-BFX	10	
233768	27F	178	7	22.23	ZA24P-BFX	10	Universal rough grinding wheel for all cast materials; very easy cutting for long lifetime
233771	27F	230	7	22.23	ZA24P-BFX	10	
233773	27F	125	7	22.23	ZZA24R-BFX	10	Extremely long lifetime and offers unbeatable value for money
233774	27F	178	4	22.23	ZZA24R-BFX	10	
233776	27F	178	7	22.23	ZZA24R-BFX	10	
233777	27F	230	4	22.23	ZZA24R-BFX	10	
233778	27F	230	7	22.23	ZZA24R-BFX	10	
929018	27F	178	7	22.23	ZZA24S-BFX	10	Particularly suitable for deburring
929020	27F	230	7	22.23	ZZA24S-BFX	10	



Shape 27FV

Recommended rough grinding wheels, shape 27FV – PREMIUM FOCUR EXTRA VIB STAR

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
474527	27FV	178	7	22.23	ZA24N-BFX	10	Vibration damping rough grinding wheel available in 4 hardness levels
474528	27FV	178	7	22.23	ZA24P-BFX	10	
474529	27FV	178	7	22.23	ZZA24R-BFX	10	
474531	27FV	178	7	22.23	ZZA24S-BFX	10	
474532	27FV	230	7	22.23	ZA24N-BFX	10	
474533	27FV	230	7	22.23	ZA24P-BFX	10	
474534	27FV	230	7	22.23	ZZA24R-BFX	10	
474535	27FV	230	7	22.23	ZZA24S-BFX	10	



Shape 27F

Recommended rough grinding wheels, shape 27F – PREMIUM T-GRIND

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
701518	27F	125	7	22.23	ZZA24T-BFK	10	Special type for high powered pneumatic and turbine grinders
701439	27F	178	7	22.23	ZZA24T-BFK	10	
701515	27F	230	7	22.23	ZZA24T-BFK	10	

NOTES:

STATIONARY CUT-OFF GRINDING
CONVENTIONAL RESIN

Product advantages:

- Less effort required through high cutting ability
- Clean cutting quality
- Long lifetime
- Ultimate product safety
- Customer-specific solutions

Application tips:

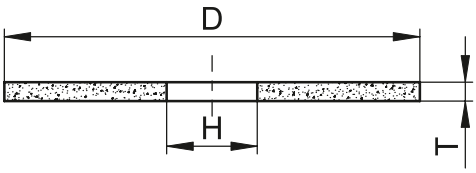
- Avoid applying too much pressure to prevent any cut deviation
- Soft specifications for large dimensions
- Watch out for small contact arcs
- Sufficient lubricant in lab cutting

Safety information:

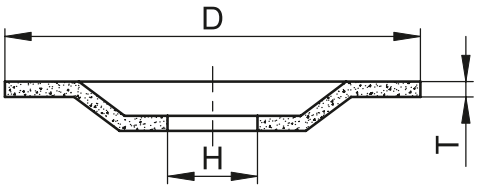
- Observe max. permissible peripheral speed
- Observe safety information
- See chapter "Safety when grinding" (page 128)

Stationary cut-off grinding

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
A		●	○	●	○		●			●	●	
101A, 102A		●	○	●	○		●			●	●	



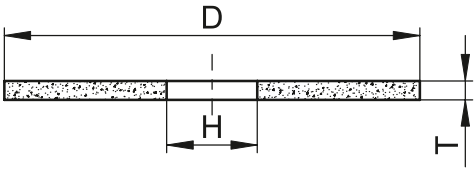
Shape 41F



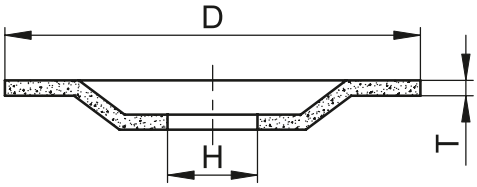
Shape 42F

Recommended stock type, shape 41F, 42F

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
647224	41F	250	2.5	25.4	A 24 Q4 BF97 / A2	10	Standard
647229	41F	300	3.5	32	A 24 Q4 BF97 / M	10	
647216	41F	350	3.5	40	A 24 Q4 BF97 / M	10	
647218	41F	400	4	40	A 24 Q4 BF97 / M	10	
460744	41F	500	5	40	A 24 P4 BF97 / M	10	
793077	41F	500	5.5	25.4	A 241 P4 BF98 / M	10	
647232	41F	600	6	60	A 24 O4 BF97 / M2	10	
647684	42F	400	5	60	A 24 Q4 BF97 / M	10	
647389	42F	500	6	60	A 24 P4 BF97 / M	10	
647377	42F	600	7	60	A 24 O4 BF97 / M2	10	



Shape 41F



Shape 42F

Recommended stock type, shape 41F, 42F

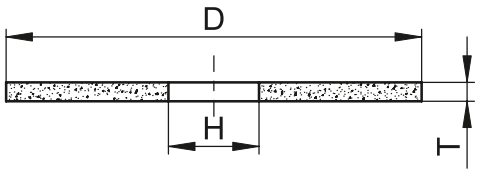
TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
647252	41F	250	2.5	25.4	102A 24 P3 BF14 / A2	10	Long life
647254	41F	300	3.5	32	102A 24 P3 BF14 / M	10	
647256	41F	350	3.5	40	102A 24 P4 BF71 / M	10	
647258	41F	400	4	40	102A 24 P4 BF71 / M	10	
647259	41F	500	5	40	101A 24 O4 BF71 / M	10	
647260	41F	600	6	60	101A 24 O4 BF71 / M2	10	
647685	42F	400	5	60	102A 24 P4 BF71 / M	10	
647426	42F	500	6	60	101A 24 O4 BF71 / M	10	
647424	42F	600	7	60	101A 24 O4 BF71 / M2	10	

Comments: See chapter "Accessories and reducing rings" (page 118)

STATIONARY CUT-OFF GRINDING
CONVENTIONAL RESIN

Laboratory cutting

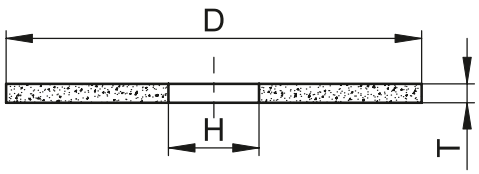
	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Titanium	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
A80-BS	○	○	●	○	●		●					●
A80-BM		●	●	●	●		●					●
A80-BH		●	○	●	○		●					●
89A	●	○	●	○	●		●					●
C80-BT	●	○	○	○	○		○		●			●



Shape 41N

Recommended stock type, shape 41N

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
165940	41N	250	1.5	32	A80-BS	10	Soft
167205	41N	250	1.5	32	A80-BM	10	Medium
167207	41N	250	1.5	32	A80-BH	10	Hard
167215	41N	230	1.5	32	A80-BM	10	Medium
167226	41N	300	2	32	A80-BM	10	Medium
167334	41N	350	2.5	32	A80-BM	10	Medium
167339	41N	400	3	32	A80-BM	10	Medium
167351	41N	432	3	32	A80-BM	10	Medium
597383	41N	350	2.5	32	89A 60 J5 B17 / 50	10	Very easy cutting
596848	41N	250	1.8	32	89A 60 L5 B17 / 50	10	Very easy cutting
597041	41N	300	2	32	89A 60 L5 B17 / 50	10	Very easy cutting



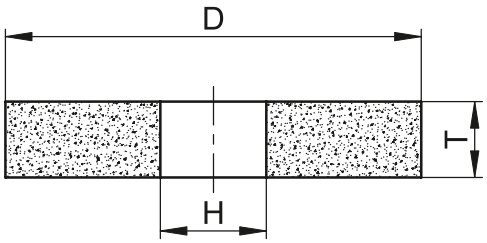
Shape 41F

Recommended stock type, shape 41F

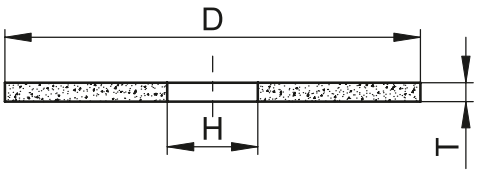
TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
167336	41F	350	2.5	32	C80-BT	10	for titanium

Cutting and saw sharpening


	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
A, 89A			●		●	●					●	



Shape 1



Shape 41N

Recommended stock type, shape 1, 41N

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
591080*	1	150	3	20	A60 O5 B68	10	
655529*	1	200	2	25	89A 60 M5 B0	10	
529392	41N	100	1	20	A 80 N4 B2	10	
202159	41N	100	1	20	A 80 N4 B68	10	
46633	41N	100	1	20	A 80 O4 B43	10	
88461*	41N	120	2	51	A 60 N4 B2	10	
1197	41N	120	2	51	A 60 O5 B43	10	
596269	41N	125	1	16	A 60 O5 B68	10	
282079	41N	125	1	20	A 60 N5 B68	10	
25590	41N	125	1	20	A 60 O5 B43	10	
35917	41N	125	1	20	A 80 O5 B43	10	
282110	41N	150	1	20	A 60 N5 B68	10	
1211	41N	150	1	20	A 60 O5 B43	10	
591103	41N	150	1	20	A 60 O5 B68	10	
282111	41N	150	1	20	A 80 N5 B68	10	
13695	41N	150	1	20	A 80 O5 B43	10	
594360	41N	150	1	20	A 80 O5 B68	10	
75306	41N	150	1	30	97A 54 P5 B71	10	
39110	41N	150	1	32	A 80 O5 B43	10	Only suitable for stationary applications (not for off-hand cutting)
8833	41N	150	1.5	20	A 60 O5 B43	10	
591104	41N	150	1.5	20	A 60 O5 B68	10	
79957	41N	150	1.5	20	A 80 O5 B43	10	
73385	41N	150	1,5	20	97A 54 Q5 B43	10	
662430	41N	150	1.5	32	A 80 N5 B68	10	
42808	41N	150	1.6	20	A 60 P4 B43	10	
227165	41N	150	1.6	32	A 60 O5 B43	10	
58158	41N	150	1.6	32	A 60 P4 B43	10	
15685	41N	150	2	20	A 60 O5 B43	10	
594362	41N	150	2	20	A 60 O5 B68	10	
594357	41N	150	2	30	A 60 Q5 B68	10	
39594	41N	150	2	30	97A 54 P5 B71	10	
223516*	41N	150	2.5	20	A 60 N4 B2	10	
591680	41N	150	2.5	30	A 60 Q5 B68	10	
47636	41N	175	1.7	16	A 60 Q5 B43	10	
596520	41N	175	2	51	A 60 P4 B68	10	
607744	41N	175	3	51	A 60 P4 B68	10	
675283	41N	180	1	32	A 60 O5 B43	10	

* also suitable for saw sharpening

STATIONARY CUT-OFF GRINDING
CONVENTIONAL RESIN

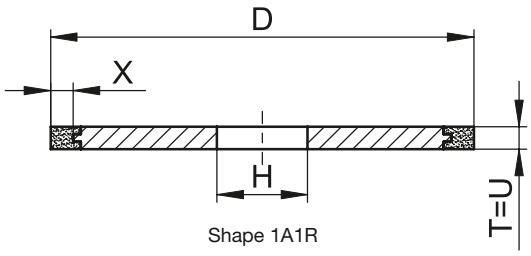
Recommended stock type, shape 41N

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
493199	41N	180	1.6	32	A 60 O5 B43	10	Only suitable for stationary applications (not for off-hand cutting)
282113	41N	200	1.5	20	A 60 N5 B68	10	
1254	41N	200	1.5	20	A 60 O5 B43	10	
282114	41N	200	1.5	32	A 60 N5 B68	10	
6718	41N	200	1.5	32	A 60 O5 B43	10	
42809	41N	200	1.6	25.4	A 60 P4 B43	10	
230691	41N	200	1.6	32	A 60 M4 B43	10	
205822	41N	200	1.6	32	A 60 P4 B43	10	
6710*	41N	200	2	20	A 60 N4 B2	10	
96205*	41N	200	2	32	A 60 N4 B2	10	
62874	41N	200	2	32	A 60 N4 B43	10	
12970*	41N	200	3	32	A 60 N4 B2	10	
863284	41N	200	3	32	A 60 P4 B68	10	
599666	41N	230	1.5	22.2	89A 60 N4 B68	10	
373520	41N	250	1.5	25.4	A 60 O5 B71	10	
834839	41N	250	1.6	32	89A 80 L4 B43	10	
549002	41N	300	2	31.75	89A 80 L4 B43	10	
60572	41N	300	2	32	A 80 O5 B71	10	
220394	41N	400	2.8	25.4	89A 60 L4 B59	10	

* also suitable for saw sharpening

Cutting HSS

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
B						●					○	●



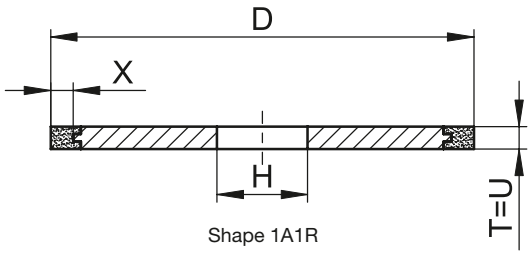
Shape 1A1R

Recommended stock type, shape 1A1R

TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
788700	1A1R	125	1	20	1	5	B126 C75 B	1	
164485	1A1R	125	1	20	1	5	B151 C100 B	1	
494701	1A1R	150	1	20	1	5	B151 C100 B	1	

Cutting cemented carbide

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
Diam.								●			○	●



Shape 1A1R

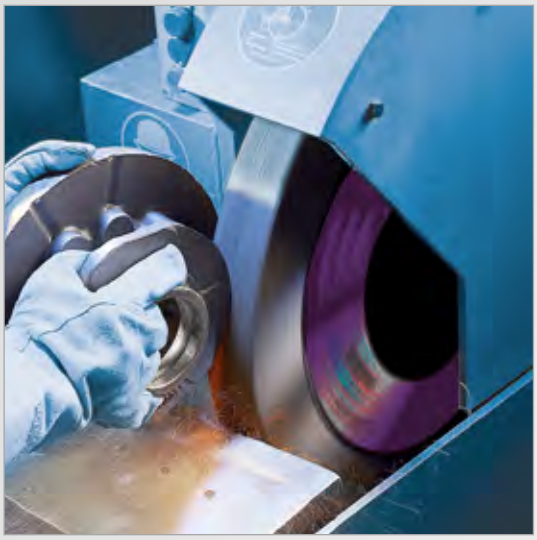
Recommended stock type, shape 1A1R

TYPE NO.	SHAPE	DIAM.	T	H	U	X	SPECIFICATION	PU	COMMENTS
157800	1A1R	75	0.8	20	0.8	5	D126 C75 B	1	
299109	1A1R	75	1	20	1	5	D151 C75 B52ST	1	
119395	1A1R	100	0.8	20	0.8	5	D126 C100 B	1	
100660	1A1R	100	1	20	1	5	D126 C100 B	1	
108728	1A1R	100	1.5	20	1.5	5	D126 C75 B	1	
101000	1A1R	125	1	20	1	5	D126 C100 B	1	
148132	1A1R	150	1	20	1	5	D126 C100 B	1	
317532	1A1R	150	1	20	1	5	D126 C75 B	1	
278979	1A1R	150	1	20	1	5	D151 C100 B	1	
667995	1A1R	200	1	22	1	5	STARTEC-BASIC DE126 3BP	1	Long life
858531	1A1R	200	1.2	20	1.2	7	D126 C100 B	1	
603284	1A1R	200	1.2	30	1.2	7	D151 C100 B	1	

PEDESTAL AND SWING FRAME GRINDING
CONVENTIONAL RESIN

Product advantages:

- High performance and optimised efficiency
- Less effort required through high cutting ability
- Individually tailored products for your grinding application
- Ultimate safety for manual grinding work
- Available in all standard sizes (on request)



Application tips:

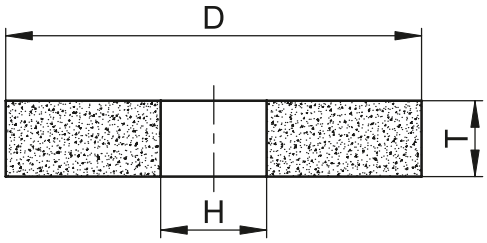
- Dressing of the grinding wheel guarantees quieter operation and freer cutting
- Use hard specifications for deburring
- Use soft specifications for large cross sections and for hard cast materials

Safety information:

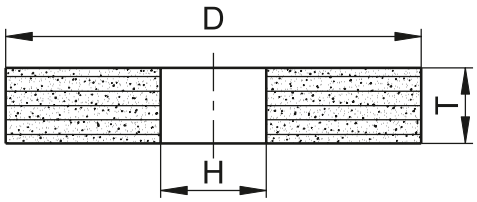
- Observe max. permissible peripheral speed
- Observe safety information
- See chapter "Safety when grinding" (page 128)

Cast materials

	Alu	Non and low-alloyed steels		High-alloyed steels		HSS	INOX	Cemented carbide	Industrial ceramics	Cast iron	Dry grinding	Wet grinding
		Unhardened	Hardened	Unhardened	Hardened							
112A, 202A		○		○			○			●	●	



Shape 1



Shape 1F63

Recommended stock type, shape 1, 1F63

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
339583	1	500	60	127	112A 16 Q4 B26 / 63	1	Automated grinding machines
662442	1F63	600	60	203.2	M202 A16 P5 BF83 / 63	1	Grey / spheroidal iron

Breadth of product range*

	Standard recommendation			Long life	
	Shape 1 63m/sec without reinforcement	Shape 1F63 63m/sec	Shape 1F80 80m/sec	Shape 1F63 63m/sec	Shape 1F80 80m/sec
Nonferrous metals	M52A20M5B59	M52A20M5BF59	M52A20M5BF88	-	-
Cast steel	M52A165O5B83	M52A165P5BF83	M52A165P5BF88	M202A165P5BF83	M52A165P5BF88
Grey iron, spheroidal iron	M202A165O5B83	M202A165P5BF83	M202A165P5BF88	M205A165P5BF83	M205A165P5BF88
Mineralised cast iron	M80AC145O5B83	M80AC145P5BF83	M80AC145P5BF88	-	-

* Delivery period 5 – 6 weeks; for production reasons, the minimum quantity ordered may differ from non-stock types.

Product advantages:

- CSS dressing plates achieve constant dressing results for the entire service life by virtue of precisely defined diamond cross sections
- Multi-grain dressers achieve considerably shorter dressing times in comparison to single grain dressers

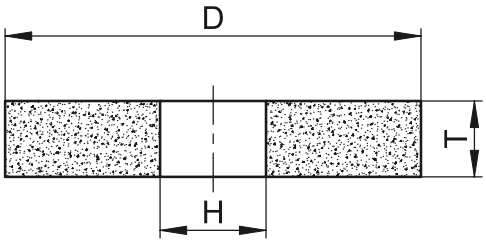
Application tips:

- Ensuring sufficient coolant supply while dressing increases lifetime (to avoid thermal overload of dressing diamonds)
- The active width (b_d) describes the effective diamond width of the dressing tools for a certain infeed depth when dressing
- With the overlap rate (Ud), surfaces and stock removal rates can be significantly affected
- The overlap rate (Ud) defines the number of grinding wheel rotations during which time the dressing tool has deployed to its active width
- An increased overlap rate will make the grinding wheel surface smoother and, as a consequence, the actual surface roughness smaller
- Standard values for the overlap rate:
  - Roughing 2 – 3
  - Standard grinding 4 – 6
  - Fine grinding ≥ 7
- The formulas specified only apply to dressers with defined effective widths b_d (single-grain dresser, dressing plate)
- $U_d = \frac{\text{Diamond effective width}}{\text{Tool feed}} = \frac{b_d \cdot n_s}{v_d}$
- $v_d = \frac{n_s \cdot b_d}{U_d}$
- b_d = Dressing tool effective width
- n_s = Wheel speed
- v_d = Traverse speed of dresser
- Further information can be found on page 124

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

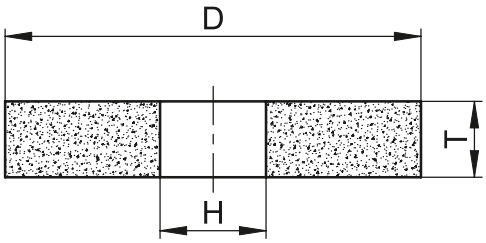
Brake Dresser



Shape 1

Recommended dressing wheels for diamond and CBN wheels, shape 1

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
786852	1	200	12	76.2	C120 K5 AV15	1	For grit sizes <= D91
413027	1	250	12	51	C120 H5 AV18	1	For grit sizes <= D91
250491	1	250	12	51	C80 H8 V15	1	Standard hardness, for grit sizes D151 – D64
619701	1	250	12	51	C80 J5 V15	1	Harder than standard, for grit sizes D151 – D64



Shape 1

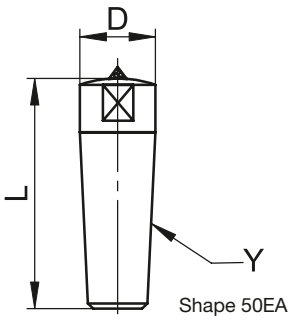
Recommended dressing wheels for diamond and CBN wheels, shape 1 (for AV500 and Agathon dressing devices)

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
473304	1	75	20	12.7	C120 J5 V15	10	For grit sizes <= D91 (Agathon)
7035	1	75	25	12.7	1C70 M5 V15	10	Long life, for wider layers, D151 – D64
443944	1	75	25	12.7	1C80 G7 V15	10	Standard hardness, for grit sizes D151 – D64
448482	1	75	25	12.7	C80 J5 V18	10	Harder than standard, for grit sizes D151 – D64

AV500 dressing device, shape 96

TYPE NO.	SHAPE	DESCRIPTION	PU	COMMENTS
96821	96	AV500	1	For concentrically trueing resin and metal-bonded diamond and CBN wheels Optimized results for wheel diameter up to 250 mm

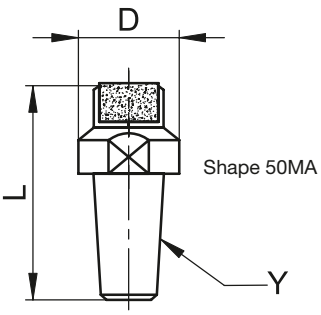
Stationary dressing



Shape 50EA

Recommended single-grain dresser, shape 50EA

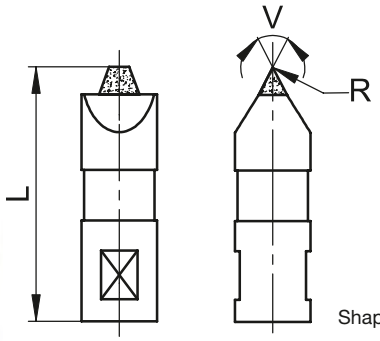
TYPE NO.	SHAPE	DIAM.	L	Y / ADAP	SPECIFICATION	ct	PU	COMMENTS
313127	50EA	8	90	8	BD5ST	0.5	1	For conventional tools; single dressers for cylindrical and surface grinding machines * wrench width for MK0 and MK1 only
611499	50EA	10	90	10	ED10ST	1.0	1	
363249	50EA	10	90	10	ED5ST	0.5	1	
856232*	50EA	9.3	31.5	MK0	DD10ST	1.0	1	
316272*	50EA	12.4	49	MK1	BD10	1.0	1	
313466*	50EA	12.4	49	MK1	BD5ST	0.5	1	
331997*	50EA	14	57	MK1	ED15ST	1.5	1	



Shape 50MA

Recommended multi-grain dresser, shape 50MA

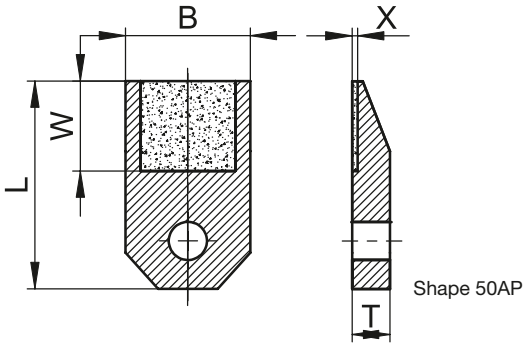
TYPE NO.	SHAPE	DIAM.	L	Y / ADAP	DIA USE	SPECIFICATION	PU	COMMENTS
446432	50MA	12	50	10	10 x 10	M65	1	For conventional tools; multi-stone dressers for quick, coarse dressing jobs, for straight profile * wrench width for MK1 only
446453	50MA	12	90	10	10 x 10	M65	1	
316286*	50MA	14	57	MK1	12 x 10	M125	1	
315877*	50MA	14	57	MK1	10 x 10	M65	1	



Shape 50PD

Recommended profile diamonds / Diaform, shape 50PD

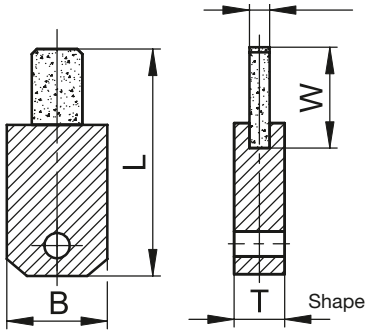
TYPE NO.	SHAPE	DIMENSIONS	SPECIFICATION	PU	COMMENTS
475960	50PD	44.5 x DF / V40 / R 0.25	D 0.4	1	For trueing complicated grinding wheel shapes
477837	50PD	44.5 x DF / V60 / R 0.75	D 0.4	1	



Shape 50AP

Recommended diamond dressing plates, shape 50AP

TYPE NO.	SHAPE	B	L	T	W-X	SPECIFICATION	PU	COMMENTS
477760	50AP	20.5	28	5	10 – 1.8	C180	1	Sintered on sides, for cylindrical and surface grinding machines, for straight and simple profile
476859	50AP	20.5	33	5	15 – 1.15	A115	1	
477746	50AP	20.5	33	5	15 – 1.4	A140	1	
477753	50AP	10.5	33	5	15 – 1.15	B115	1	
477755	50AP	10.5	33	5	15 – 1.8	B180	1	
477749	50AP	20.5	33	5	15 – 1.8	A185	1	

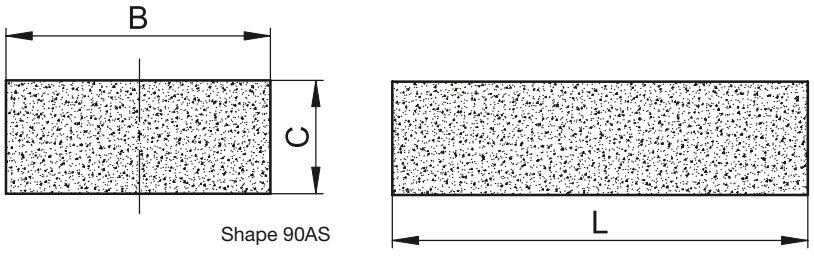


Shape 50AP

Recommended CSS dressing plates, shape 50AP

TYPE NO.	SHAPE	B	L	T	W-X	SPECIFICATION	PU	COMMENTS
853704	50AP	10	33	5	10 – 2	S3R0107042	1	For sintered aluminium oxide wheels; long life; 3 dia rods
853680	50AP	20	33	5	10 – 2	W5R071004	1	For sintered aluminium oxide wheels; long life; 5 dia rods

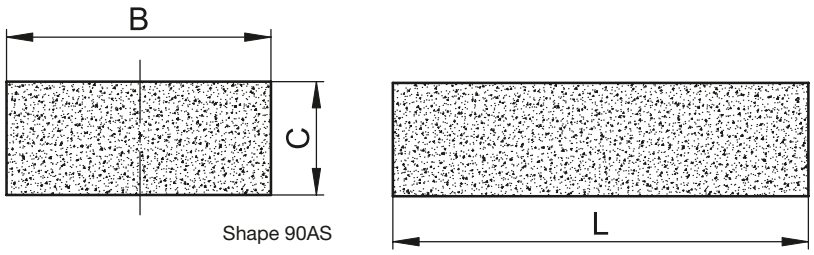
Hand-operated dressing



Shape 90AS

Recommended dressing stones for aluminium oxide and silicon carbide grinding wheels, shape 90AS

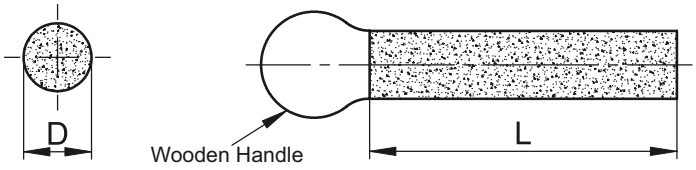
TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
43311	90AS	25	25	150	CCOARSE	10	
9009	90AS	50	20	150	CCOARSE	1	
6216	90AS	50	25	200	CCOARSE	1	
153	90AS	50	25	200	CMEDIUM	1	



Shape 90AS

Recommended dressing sticks for diamond and CBN grinding wheels, shape 90AS

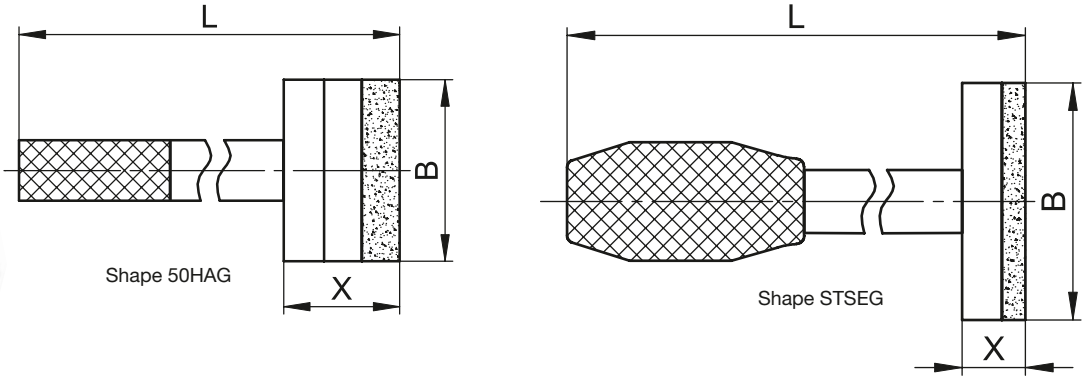
TYPE NO.	SHAPE	B	C	L	SPECIFICATION	PU	COMMENTS
845593	90AS	24	13	100	89A 120 H7 AV17	10	For grit size >= 126
845594	90AS	24	13	100	89A 120 J7 AV17	10	
395773	90AS	50	25	200	89A 120 H7 AV17	1	
460976	90AS	50	25	200	89A 120 J7 AV17	1	
845595	90AS	24	13	100	89A 240 J7 AV17	10	For grit size > 46 and < 126
932780	90AS	25	13	200	89A 240 H5 AV83	10	
391718	90AS	50	25	200	89A 240 -35 V83	1	
464290	90AS	50	25	200	89A 240 J7 AV17	1	
112055	90AS	50	25	200	50C 2208 C4 B22	1	
577953	90AS	24	13	200	89A 600 J5 AV83	10	For grit size <= 46
33531	90AS	25	13	100	89A 600 -25 V83	10	
251584	90AS	50	25	200	89A 600 -25 V83	1	
678953	90AS	24	13	200	A 240 STARTEC	10	for STARTEC XP-P and STARTEC HP



Shape 90AR

Recommended dressing tubes, shape 90AR

TYPE NO.	SHAPE	D	L	SPECIFICATION	PU	COMMENTS
351767	90AR	17	290	C16 B	1	For dressing and sharpening ceramic and resin-bonded grinding wheels



Shape 50HAG

Shape STSEG

Recommended hand-operated diamond dressers, shape 50HAG, STSEG

TYPE NO.	SHAPE	L	B	X	SPECIFICATION	PU	COMMENTS
477724	50HAG	185	20	8	D30ST	1	1 carat
477726	50HAG	185	30	10	D2ST	1	2 carat
477254	50HAG	250	40	10	D35ST	1	3 carat
195112	STSEG	185	40	8	HA_DIA	1	

Grinding wheel dresser set, shape 100AKO replacement rollers

TYPE NO.	SHAPE	SPECIFIC.	PU	COMMENTS
15321	100AKO	S3610	1	Dresser for A+C grinding wheels; D=120-250 mm; Tmax=40 mm; grit size: 24-80; hard: H-Q
74497	100AKO	S3611	1	Dresser for A+C grinding wheels; D=300-600mm; Tmax = 63mm; grit size: 16-60; hard: H-Q
117871	100AKO	S3612	1	Dresser for A+C grinding wheels; D=300-600mm; Tmax = 63mm; grit size: 16-60; hard: H-Q
126781	100AKO	S3613	1	Dresser for A+C grinding wheels; D=300-600mm; Tmax = 70mm; grit size: 16-60; hard: H-Q

Replacement rollers for grinding wheel dressers, shape 100ARO

TYPE NO.	SHAPE	B	L	T	SPECIFICATION	PU	COMMENTS
74492	100ARO	36	21	8	S3610	1	Replacement rollers
74493	100ARO	55	39	12	S3611	1	
75915	100ARO	55	65	12	S3612	1	
886902	100ARO	40	2	10	S3613	250	
132297	100ARO				S3613	1	Spare part set

Tetrabor dressers, shape 100ASB

TYPE NO.	SHAPE	B	C	L	PU	COMMENTS
26571	100ASB	12	6	75	1	Ultra-hard tool, high edge retention, for dressing and trueing conventional grinding wheels

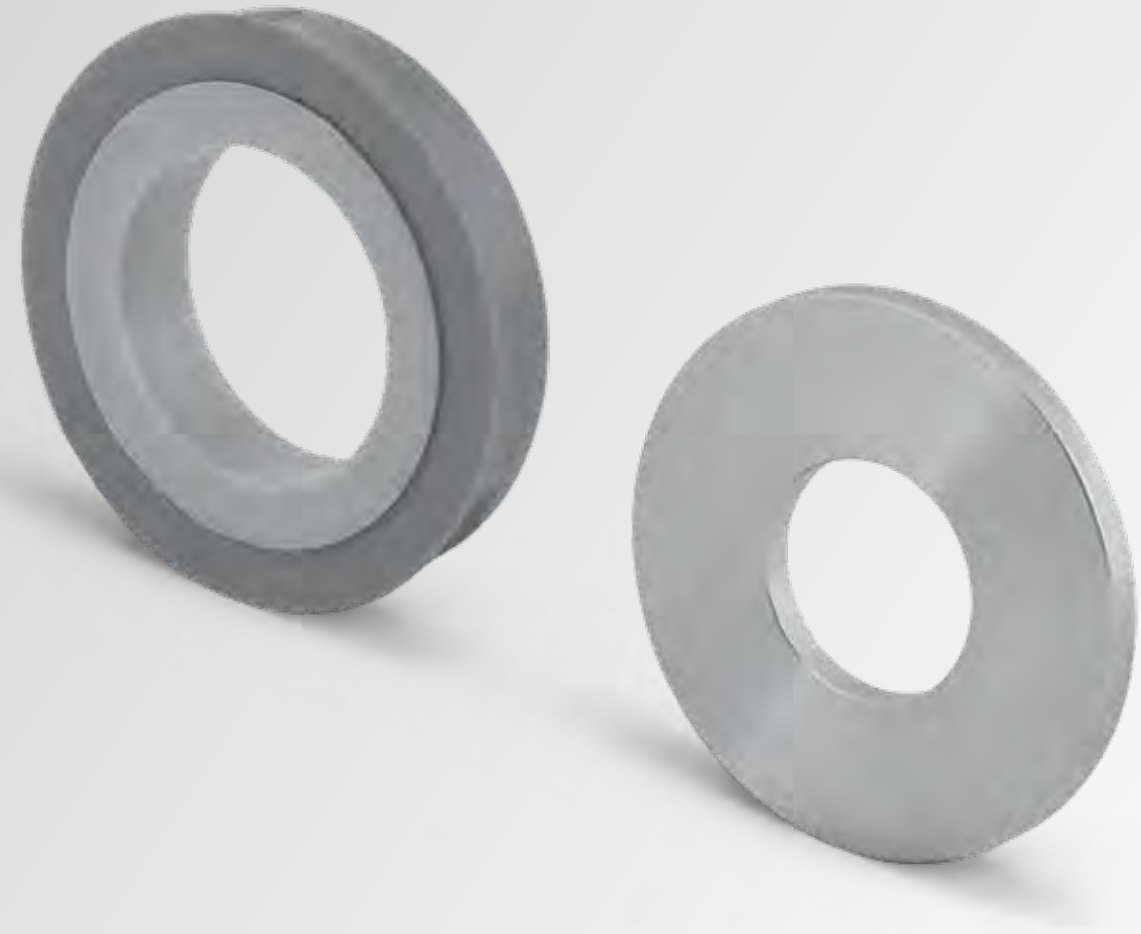
ACCESSORIES

Product advantages:

- Reducing rings are available free of charge to be used with floor stand machine wheels
- Reducing ring set included (minimises tool diversity and saves on storage space)
- Reducing rings for stationary cut-off grinding will be provided on request

Safety information:

- Observe safety information
- See chapter "Safety when grinding" (page 128)

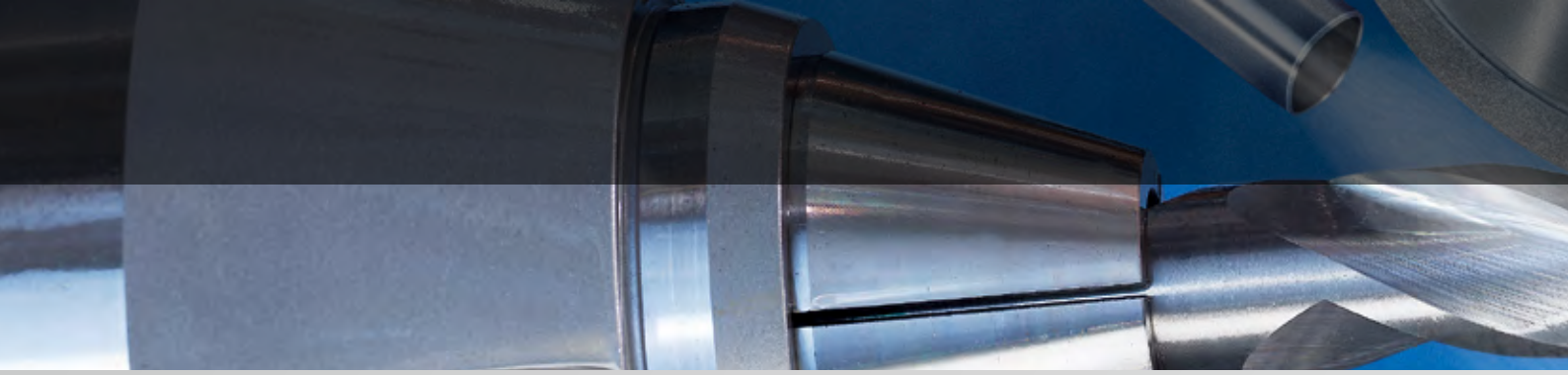


Reducing rings

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
111434	100RR	32	19	16		1	For floorstand grinding wheels
911408	100RR	51	9	32		1	
667841	100RR	51	10	31.75		1	
111436	100RR	76	9	40		1	

TYPE NO.	SHAPE	DIAM.	T	H	SPECIFICATION	PU	COMMENTS
332480	100RR	40	3	32		1	For stationary cut-off grinding
332479	100RR	40	3.2	25.4		1	
332459	100RR	60	6	40		1	

Comments:
Reducing rings with unlisted dimensions can be provided on request.

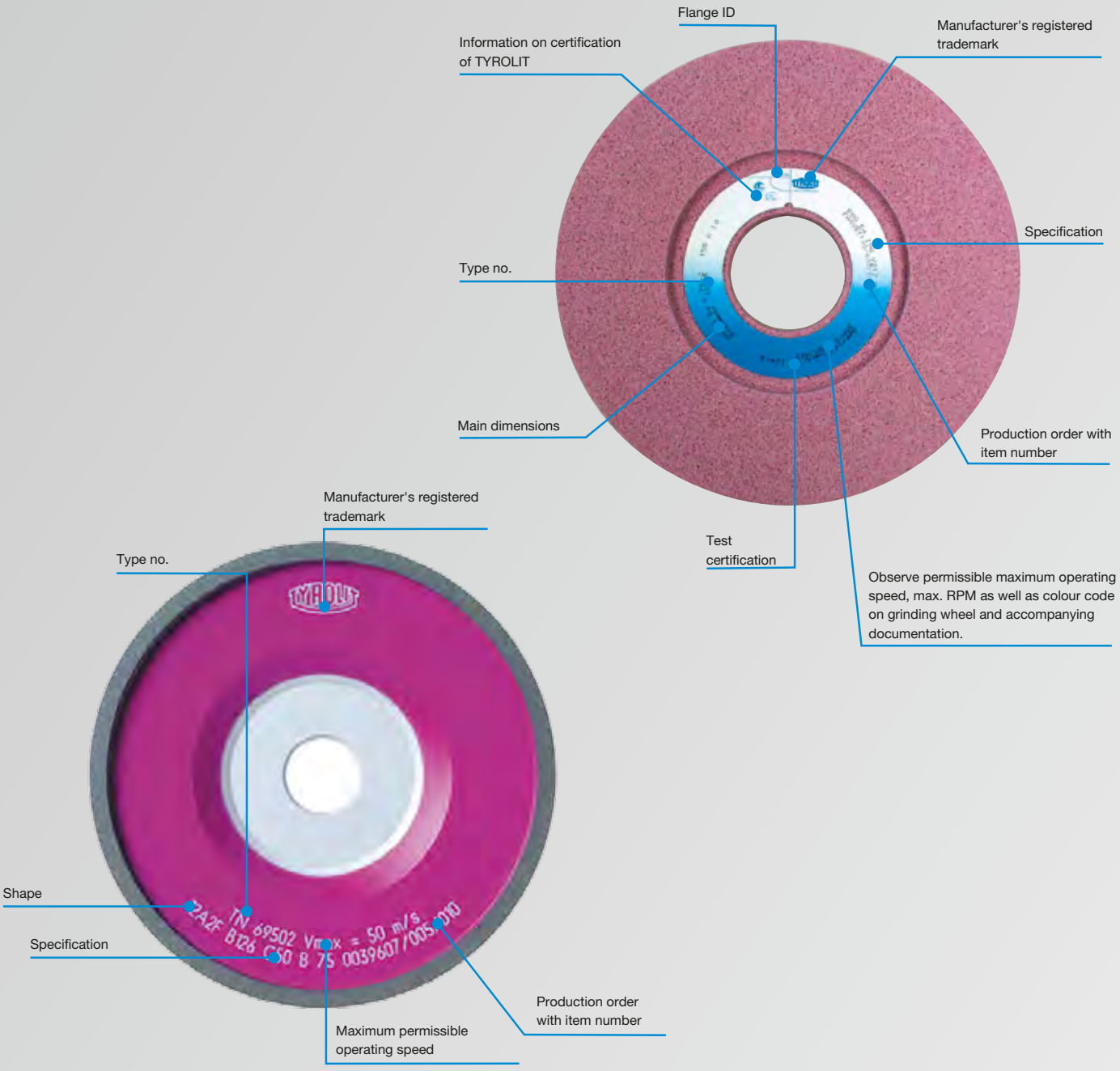


APPENDIX

Grinding wheel

Designation

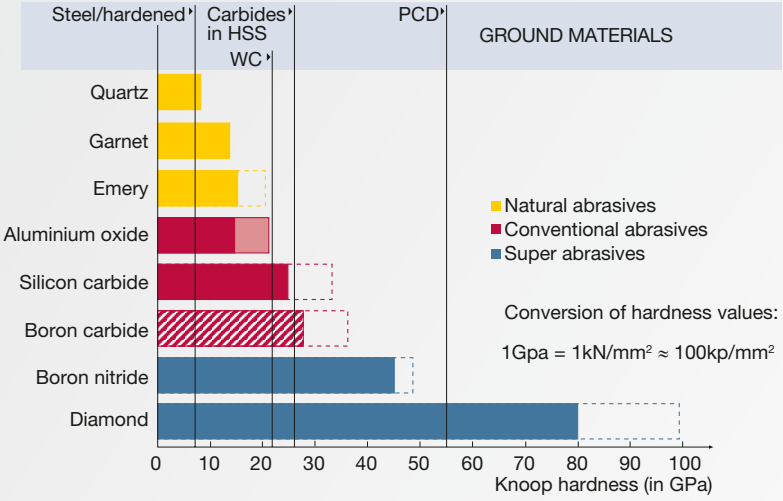
Products from TYROLIT are labelled such that all important information can be read directly from the product.



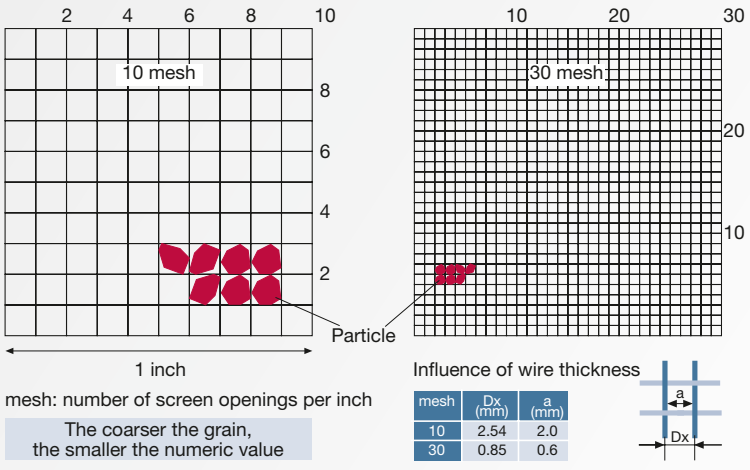
Abrasive

Classification, abbreviation and area of application of the four main types of abrasive grains used. Classification as conventional abrasive and superabrasive is generally standard.

Hardness comparison of abrasives and materials. The following generally applies: The greater the hardness difference between the abrasive grain and the ground workpiece, the higher the grinding power.



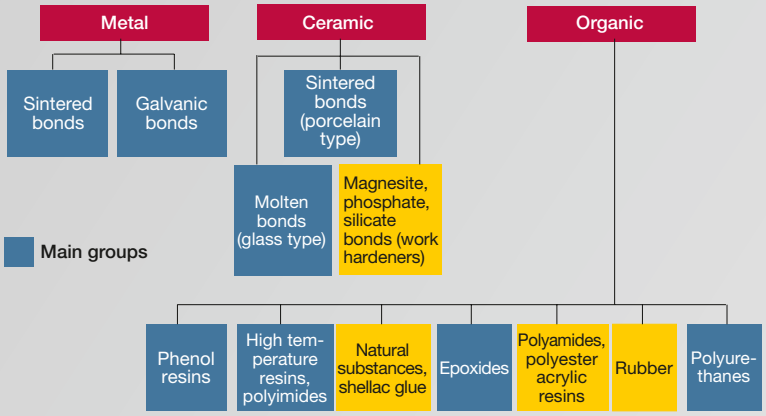
Grit sizes in "mesh" in accordance with FEPA standard. The number of sieve openings (mesh) per inch is used as the grit size. The reduction of the openings as a result of the wire thickness is also considered by the standard.



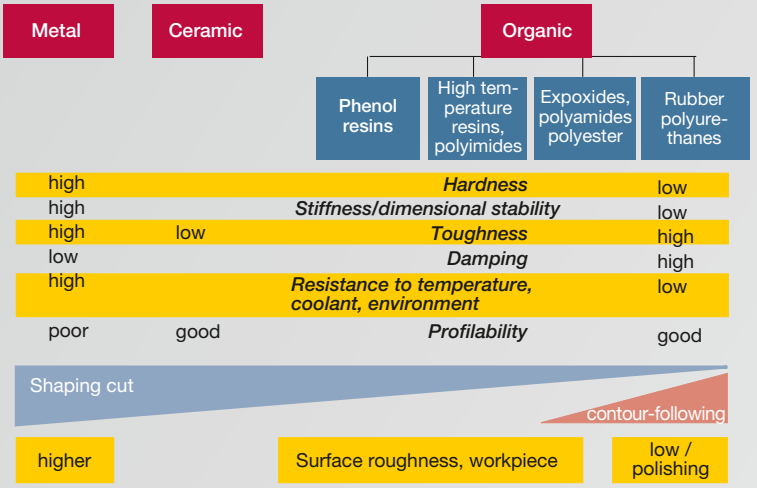
mesh	Dx (mm)	a (mm)
10	2.54	2.0
30	0.85	0.6

Bond

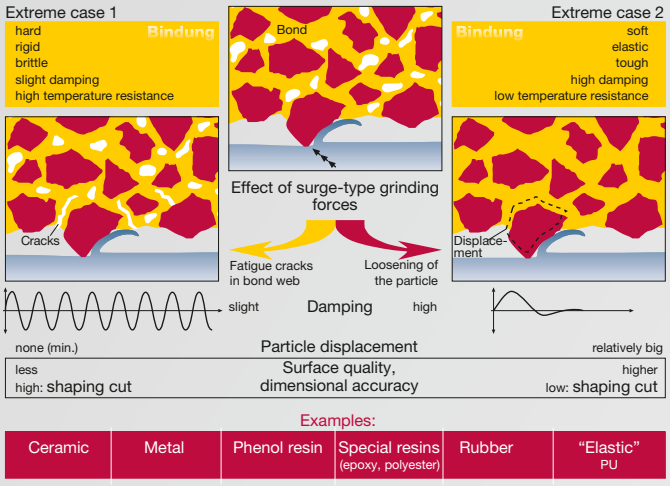
Important bond types for grinding tools. The choice of bonding type depends on the grinding task, the selected grain type and the machine conditions.



The extremes of our bonds are represented by the metal bonds on one side of the table and organic bonds on the other.



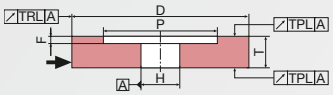
In the case of rigid bonds the grains remain in place and oscillate with elastic bonds they barely oscillate and are displaced.



Description of wheel shapes

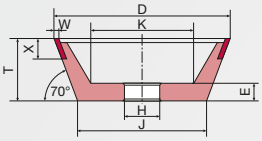
Examples of different grinding tool groups: Conventional grinding wheels, grinding wheels with superabrasives.

Conventional grinding wheel recessed on one side



Form 5
Order details: D x T x H - P x F

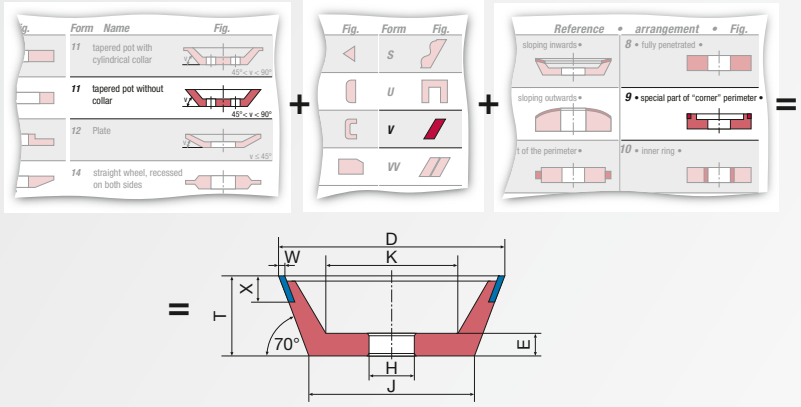
Tool grinding wheel with super abrasive/cup wheel, *e.g. TYROLIT Amigo or Diago*



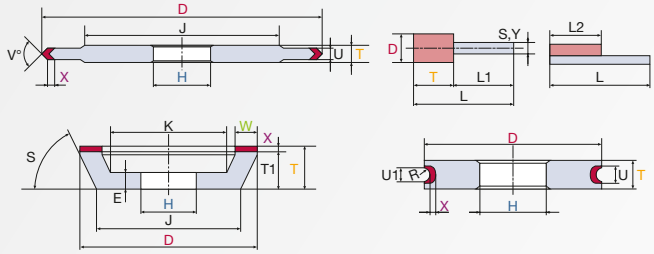
Form 11V9 Order details: D x T x H
D - W - X

An example of the designation of grinding wheels with superabrasives:
Tool grinding wheel 11V9

Basic form 11 *Abrasive coating V* *Arrangement of abrasive coating 9*



Designation of dimensions of grinding tools for precision and rough grinding.



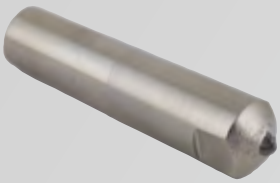
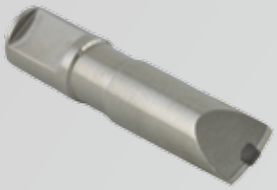
D	**Outside diameter**	R	Radius	V	Abrasive coating angle
E	Floor thickness	S	Outer body angle/shank diameter	**W**	**Grinding wheel width**
H	**Bore diameter**	**T**	**Total width**	**X**	**Abrasive coating thickness**
J	Diameter of hub	T1	Reduced width	Y	Shank diameter
K	Diameter of face	U	Abrasive coating width (if smaller than T or T1)		
L	Total length	U1	Reduced abrasive coating width		
L1	Shank length				
L2	Abrasive coating length				

Dressing – the basics

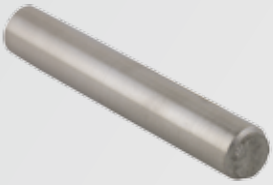
Dressing with stationary dressers

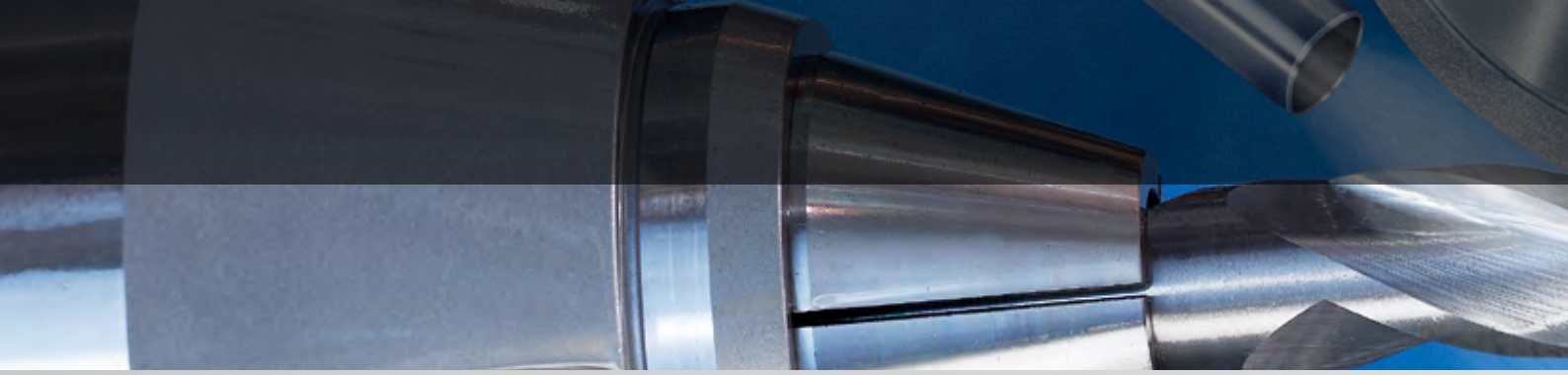
As a result of the changes in the bond, the abrasive grain and the shape of the grinding wheel stemming from the wear of the grinding wheel, grinding is an ever changing process. The changes affect grinding forces, workpiece surfaces and geometric accuracy. To ensure the grinding wheel is always able to provide optimum grinding results, a periodic conditioning cycle must be maintained. This cycle enables the grinding capability of the grinding wheel to be reproduced. By "conditioning" a grinding wheel correctly, the subsequent grinding process can be optimised in terms of performance, efficiency and surface finish.

Choosing the right dresser

Dressing tool		Grinding wheel profile	Grinding process / production type
Photo	Detailed description		
single-edge	Single-grain dresser 	Linear (cylindrical, conical) single profile (convex, concave radii)	External cylindrical, surface, internal cylindrical and centreless grinding, individual and small-lot production
	Profile diamond 	Multi-profile (complex profiles with narrow flanks and radii)	External cylindrical, surface and centreless grinding, individual to small-lot production
multi-edge	Multi-set diamond dresser 	Linear (cylindrical, conical)	Surface and external cylindrical grinding, individual and small-lot production

Choosing the right dresser

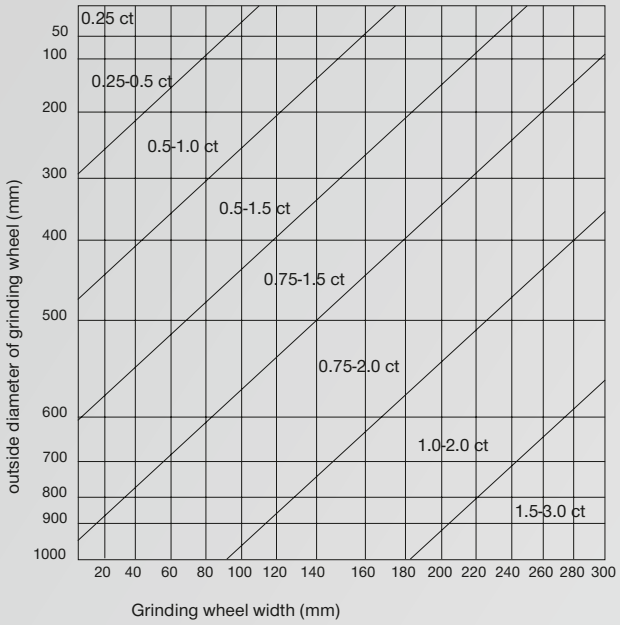
Dressing tool		Grinding wheel profile	Grinding process / production type
Photo	Detailed description		
multi-edge	Multi-grain dresser 	Linear (cylindrical, conical)	Surface and external cylindrical grinding, individual and small-lot production
	Diamond grain dressing plate 	Linear (cylindrical, conical) single profile (convex, concave radii)	External cylindrical, surface and centerless grinding, individual to large-scale production
	Needle dressing plates 	Linear (cylindrical, conical) single profile (convex, concave radii)	External cylindrical, surface and centerless grinding, individual to large-scale production
	Dressing plates with MKD rods 	Linear (cylindrical, conical) single profile (convex, concave radii)	External cylindrical, internal cylindrical, surface and centreless grinding, individual to large-scale production



Common errors when dressing:

- If the dressing tool is driven over the (a_e = 0) grinding wheel without infeed, the wheel becomes blunt and clogs. This results in a greater risk of overheating when grinding.
- If the free clamping length of the dresser is too large. Vibrations arise and the grinding wheel surface becomes irregular. This face is reproduced on the workpiece in the subsequent grinding process.
- When the dressing infeed selected (ae>0.03) is too high. This causes a fracture in the bond bridges in the grinding wheel and the grains to come out too soon. This results in a poorer workpiece surface due to formations of comma-shaped scratches.
- The cooling system is not switched on in time. As a result of thermal overload, the diamond is destroyed because of quenching or because temperatures are too high. Remedy: The cooling system should be switched on before the grinding wheel first comes into contact with the dresser.
- The cooling system is switched off too soon after dressing. The grain and bond residue that has come out through dressing cannot be sufficiently removed (rinsed out). This can lead, amongst other things, to the formation of comma-shaped scratches on the workpiece surface.
- The single-grain diamond is ground down too much, meaning that implementation of the diamonds is no longer possible.

Diamond size (carat) in relation to grinding wheel dimensions



Interrelationship: surface roughness / grit size

The table below will help you select the right grit size to achieve the surface roughness result required. Variable process parameters (e.g. the dressing method) have a significant effect as to which surface roughness can be achieved with a grit size. Therefore, the table below also lists the surface areas / grit size.
You should take into account that large grit sizes remove slivers (material) more simply. It is not necessary to select the finest for each initial selection of the grit size.

Interrelationship: surface roughness / grit size										
Surface		Grit size								
micro inch CLA	µm Ra	36	46	60	80	100	120	150	180	220
42	1.1	*								
32	0.8	*	*							
26	0.7		*							
21	0.5		*	*						
16	0.4			*						
14	0.35			*	*					
11	0.25				*					
8	0.2				*	*				
7	0.17					*				
6	0.14					*	*			
5	0.12						*	*		
4	0.1							*	*	
3	0.08								*	*
2	0.05									*

Interrelationship: profile radius / grit size

The table below provides an overview of which grit size can achieve a minimum profile radius. As a standard value, it can be assumed that three abrasive grains are required to maintain a minimum profile radius. To achieve a profile radius of 0.3 mm, an approximate grit size diameter of 0.1 mm is required.

Interrelationship: profile radius / grit size										
Grit size		36	46	60	80	100	120	150	180	220
Min. profile Radius	mm	1	0.8	0.6	0.45	0.3	0.2	0.15	0.12	0.1
	inches	0.04	0.03	0.03	0.02	0.1	0.01	0.01	0.01	0.00

Safety when grinding

Examples of identifying wheel orientation

The following play an equal part when it comes to safety when grinding
- Machine manufacturer
- grinding wheel producer and
- User

Grinding wheels are subject to a high load during the grinding process. This is why
- Grinding machines
- Grinding wheels
- Handling and application

must be optimally harmonised to ensure safe grinding. For the grinding machines, it is generally important to observe the machine conditions and the stipulation of the machine guard.

Whereas the manufacturer implements the safety measures in line with regulations in relation to the grinding machine and grinding wheels, the user is responsible for safety when grinding through the use of the grinding machine for its intended purpose, as well as through correct handling and application of the grinding wheels.

The following must be observed:
- Checking of grinding wheels on delivery
- Handling and storage of grinding wheels
- Labelling, synchronisation with machine data
- Checking of grinding wheels prior to clamping
- Clamping methods for grinding wheels
- Test run of grinding wheels prior to start-up
- Eye protection and protective clothing

(Also see FEPA Safety Code)

Checking of grinding wheels on delivery

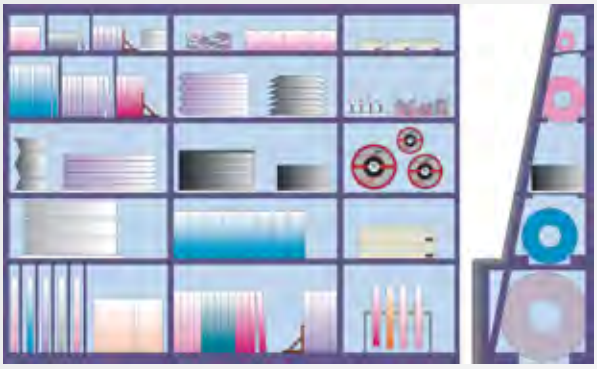
Checking packaging on delivery. If damage is visible on the packaging, the grinding wheel should be checked particularly thoroughly for any possible transport damage.

Storage of the grinding wheels

Grinding wheels are to be stored in suitable racks or containers so that they are not damaged and so that it is easily possible to remove wheels without disturbing the storage setup. Older stock should be used first.

During storage, the following must be noted:

- Store the grinding wheels in a dry, rust-free condition
- Do not expose grinding wheels to large temperature fluctuations



Storage for different types of grinding wheel:

- Store cut-off wheels on a level underlay without intermediate layers, and weight them down with a steel or cast metal plate
- Store large straight grinding wheels in an upright position and make sure they cannot roll away
- Stack cylinder wheels, cylindrical grinding discs and grinding plates using soft intermediate layers
- Stack grinding discs, shape 11, in each case faces or bases together
- Store small grinding wheels in suitable containers

Identification of the grinding wheels

The purpose of the identification is to give persons, in particular those who carry out the mounting of the grinding wheels, information for safe use and proper application.

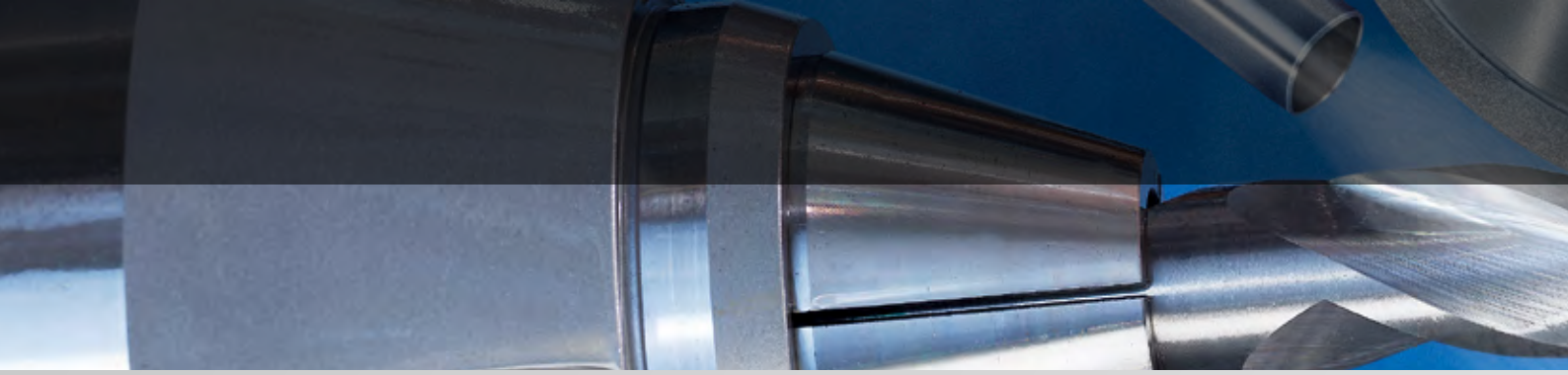
Grinding wheels may only be used if they are identified with the following minimum information:

- Manufacturer
- Dimensions of grinding wheel
- Material (at least the type of bond)
- Maximum permissible RPM of new grinding wheel
- Maximum operating speed in m/s.

The user is obliged to match the machine speed to the maximum permissible speed given in the identification.

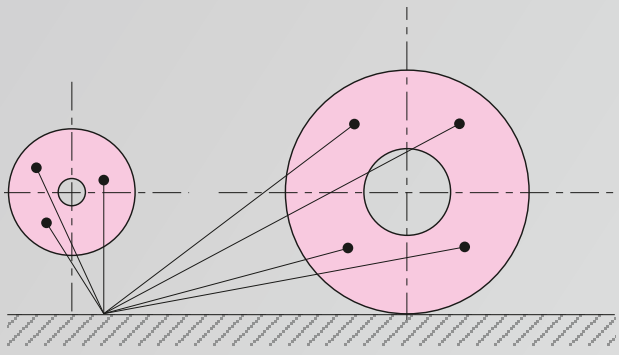
Additional identification markings are as follows:

- Colour strips – they are assigned to certain maximum operating speeds:
  - blue 50 m/s
  - yellow 63 m/s
  - red 80 m/s
  - green 100 m/s
  - blue with yellow 125 m/s
- Use restrictions – they are assigned to certain grinding processes and application methods.

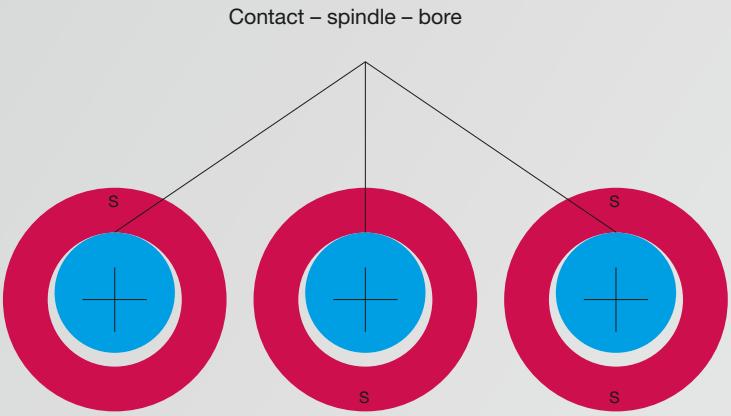


Checking of ceramic and resin-bonded conventional grinding wheels before clamping

Each time before clamping, the grinding wheels must be cleaned and checked for damage by means of a visual inspection.
The ring test should be repeated. Damaged grinding wheels must not be clamped.
For the ring test, lightweight grinding wheels are pushed onto a mandrel or shaft; heavy grinding wheels are placed on a firm floor.
The grinding wheel is tapped with a non-metal object at several points.
An undamaged grinding wheel gives a clear ring, while a damaged one gives a dull or clanking sound.
All contact surfaces on grinding wheels, intermediate layers and wheel flanges must be level (flat) and be free from foreign bodies. Foreign particles between grinding wheels and wheel flanges create pressure points and stresses, which can lead to breakage of the grinding wheel.



Examples of tapping points during the sound test

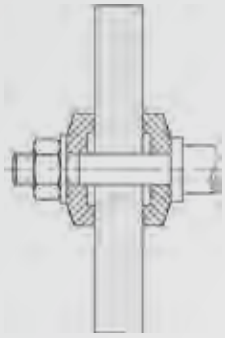


Examples of identifying wheel orientation

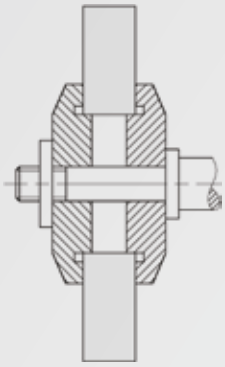
Clamping methods for grinding wheels

The clamping of the grinding wheels must be carried out and supervised by a qualified person.
Depending on the type of machine and grinding method, as well as the grinding wheel shape, a distinction can be made between the following clamping methods:

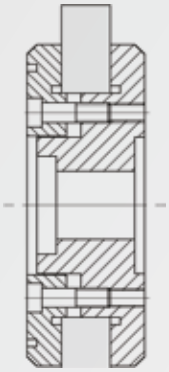
- Mounting in the central bore using wheel flanges
- Mounting using embedded fixing elements
- Mounting using support plates
- Mounting using clamping head



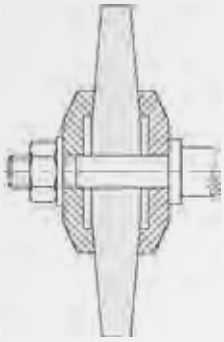
Recessed wheel flange



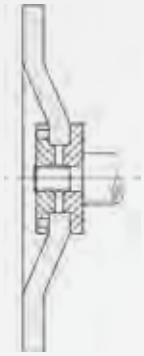
Stepped flange



Locating flange



Tapered wheel flange



Straight wheel flange

Mounting in the central bore using wheel flanges

A distinction should be made between the following wheel flange types for central bores:

- Recessed wheel flange
- Straight wheel flanges for portable grinding machines
- Special flanges
- Stepped flanges
- Locating flanges
- Tapered wheel flanges

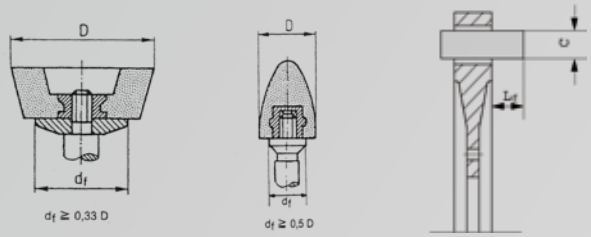
The purpose of the wheel flanges is to transfer drive forces. They must therefore be in such a condition that there is no deformation of the wheel flange during clamping.
The contact surfaces must be level (flat) and must not show any burring, and the run-out of the grinding wheel must be safeguarded.

Only wheel flanges that have the same external diameter and the same shape on both sides may be used. They must be recessed so that only a ring-shaped area of the wheel flange is on the surface.

Example of the correct way to use reducing rings

CLAMPING USING EMBEDDED FIXING ELEMENTS

The grinding wheels are fixed using embedded fixing elements on the grinding machine.



Figure, left: Clamping of taper cup wheels with a thread insert
Figure, centre: Clamping of a grinding cone, shape 16, with a thread insert
Figure, right: Clamping of grinding segments in clamping heads Lf = 1.5 C

Examples of this are the clamping of cylindrical and taper cup wheels, or the fixing of mounted points with embedded steel shafts in collets on portable grinding machines.

CLAMPING OF GRINDING WHEELS ON SUPPORT PLATES

The grinding wheels are either cemented to the support plates or held captive using the inserted nuts.

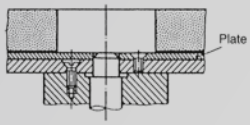


Figure 1

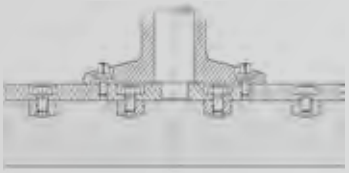


Figure 2

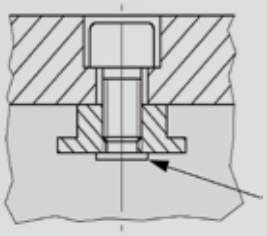


Figure 3

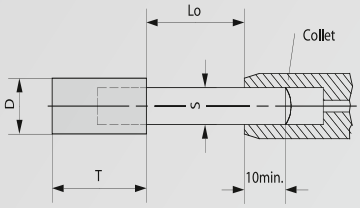


Figure 4

Fig. 1: Grinding wheel, cemented
Fig. 2: Grinding wheel with inserted nuts
Fig. 3: Correct bolt connection, bolt end must not touch the base of the grinding wheel
Fig. 4: Clamping of mounted points

CLAMPING OF GRINDING SEGMENTS IN CLAMPING HEADS

Grinding segments are clamped to one grinding unit (segment head) in clamping heads.
On the contact surfaces between the grinding segments and the clamping pieces, adhesive strips can be placed on the grinding segments to avoid stresses in the grinding segments.

Test run prior to start-up

Every standard grinding wheel (D greater than 80 mm) must undergo a test run at maximum operating speed before being used for the first time and after every re-mounting.

The duration of a test run for grinding wheels is:
- on portable grinding machines 1/2 minute
- on all other grinding machines 1 minute

The test run may only be carried out once the danger zone has been secured and – if the grinding wheel must be used with a guard – this is in place and secure. The grinding wheel can only be used for the intended work once the test run has been passed without problem.

Eye protection and protective clothing

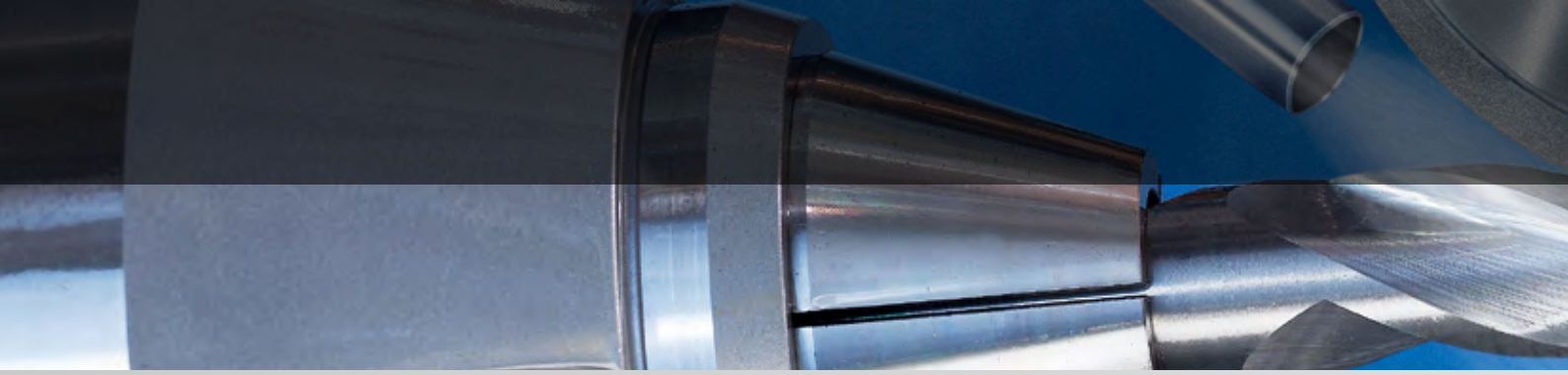
All grinding tasks where persons are at risk from flying particles (from grinding wheels or workpieces) must only be carried out using eye protection (protective goggles) and when necessary, other protective clothing (e.g. leather apron and leather gloves).

Summary

The most important points for safe use of grinding wheels are summarised again below:

- Adjustment of the machine data to the identification data
- Checking of grinding wheels prior to mounting
- Mounting carried out by qualified persons
- Checking of the functionality of the machine guard
- Test run of grinding wheels prior to grinding work
- Personal safety

Example of the use of protective tape on resin-bonded wheels



Safety

DOs

- Handle and store grinding tools carefully; use the oldest tools first.
- Prior to mounting or use, grinding wheels must be cleaned and undergo a visual check for cracks or possible damage.
- Ceramic bonded grinding tools must undergo a sound check or "ring test" before mounting.
- Make sure that the speed of the machine (RPM) does not exceed the maximum operating speed specified on the packaging or on the abrasive.
- Ensure that the bore of the grinding tool — with or without thread — fits the shaft of the machine perfectly; and that the wheel flanges are clean, flat, the same size and suitable for the grinding tool to be clamped.
- Use as intended or supplied, intermediate layers (blotters) between the grinding wheel and wheel flanges.
- Only use machines with protection/guards and ensure their proper condition and fixture before the machine is switched on.
- After each mounting, carry out a test run for at least one minute at the operating speed and ensure protection hood is mounted correctly. In doing so, ensure that any fragments would not be able to hit you or someone else in the event of a possible breakage.
- Eye protection is always recommended for all grinding processes. For off-hand grinding, protective goggles or a safety mask is recommended.
- When working with cut-off or roughing wheels, ensure that the air supply and protective measures correspond with the material to be processed. Suitable extraction systems should be fitted for all dry grinding processes.
- Only use machines that are also suitable for grinding tools with hub.
- Before stopping the machine, cut off the supply of cooling lubricant and remove the excess cooling lubricant from the grinding wheel.

Safety

DON'Ts

- Do not use abrasives that are exposed to particularly humid/wet conditions or high temperatures prior to mounting.
- Never use abrasives that have been dropped, damaged or that look like they would not be fit for purpose.
- Never exceed the maximum permissible operating speed specified.
- Do not use wheel flanges with surfaces that are not free of foreign bodies (e. g. grinding swarf), flat or burr-free.
- Do not tighten the clamping device or wheel flange too much.
- Do not use recessed wheel flanges or flanges with recesses for grinding discs or cones.
- Never use force when clamping and do not make any changes to the grinding tool.
- Only use a one-way adapters (hubs) once.
- Only switch on the machine when the guard is correctly and securely fixed (guard or covers should be set in such a way that they divert sparks and grinding particles away from the body).
- Only start the machine if there is no contact between the workpiece and the grinding tool.
- Never work with grinding tools without sufficient air supply (never without breathing apparatus and ear protection, particularly in enclosed spaces) and without personal safety equipment (see pictogram).
- Use a suitable grinding tool – an unsuitable product can create excessive grinding particles and dust.
- Avoid mechanical damage to the grinding wheel as a result of force effects, jolting or heating.
- Never use grinding machines in an improper condition or that contain faulty components.
- Do not use cut-off wheels for grinding work (do not exert a lateral load on any cut-off wheels of shape 41 or 42).
- Never mount more than one grinding tool on one shaft.

Speed recommendations

Rotational speeds and peripheral speeds depending on the external diameter Ø = D of the grinding wheels.

	Rotations n per minute min^{-1} depends on external diameter D of grinding wheel and the maximum operating speed V_S										
D in mm	Maximum operating speed V_S in m/s										
	16	20	25	32	35	40	50	63	80	100	125
3											
4	75.300	95.400									
5	61.100	76.300	95.400								
6	50.900	63.600	79.500								
8	38.100	47.700	59.600	76.300	83.500	95.400					
10	30.500	38.100	47.700	61.100	66.800	76.300	95.400				
13	23.500	29.300	36.700	47.000	51.400	58.700	73.400	92.500			
16	19.000	23.800	29.800	38.100	41.700	47.700	59.600	75.200	95.400		
20	15.200	19.000	23.800	30.500	33.400	38.100	47.700	60.100	76.300	95.400	
25	12.200	15.200	19.000	24.400	26.700	30.500	38.100	48.100	61.100	76.300	95.400
32	9.540	11.900	14.900	19.000	20.800	23.800	29.800	37.600	47.700	59.600	74.600
35	8.730	10.900	13.600	17.400	19.000	21.800	27.200	34.300	43.600	54.400	68.200
40	7.630	9.540	11.900	15.200	16.700	19.000	23.800	30.000	38.100	47.700	59.600
50	6.110	7.630	9.540	12.200	13.300	15.200	19.000	24.000	30.500	38.100	47.700
63	4.850	6.060	7.570	9.700	10.600	12.100	15.100	10.000	24.200	30.300	37.800
80	3.810	4.770	5.960	7.630	8.350	9.540	11.900	15.000	19.000	23.800	29.800
100	3.050	3.810	4.770	6.110	6.680	7.630	9.540	12.000	15.200	19.000	23.800
115	2.650	3.320	4.150	5.310	5.810	6.640	8.300	10.400	13.200	16.600	20.700
125	2.440	3.050	3.810	4.880	5.340	6.110	7.630	9.620	12.200	15.200	19.000
150	2.030	2.540	3.180	4.070	4.450	5.090	6.360	8.020	10.100	12.700	15.900
175	1.740	2.180	2.720	3.490	3.810	4.360	5.450	6.870	8.730	10.900	13.600
180	1.690	2.120	2.650	3.390	3.710	4.240	5.300	6.680	8.480	10.600	13.200
200	1.520	1.900	2.380	3.050	3.340	3.810	4.770	6.010	7.630	9.540	11.900
225	1.350	1.690	2.120	2.710	2.970	3.390	4.240	5.340	6.790	8.480	10.600
230	1.320	1.660	2.070	2.650	2.900	3.320	4.150	5.230	6.640	8.300	10.300
250	1.220	1.520	1.900	2.440	2.670	3.050	3.810	4.810	6.110	7.630	9.540
300	1.010	1.270	1.590	2.030	2.220	2.540	3.180	4.010	5.090	6.360	7.950
350	870	1.090	1.360	1.740	1.900	2.180	2.720	3.430	4.360	5.450	6.820
400	760	950	1.190	1.520	1.670	1.900	2.380	3.000	3.810	4.770	5.960
450	670	840	1.060	1.350	1.480	1.690	2.120	2.670	3.390	4.240	5.300
500	610	760	950	1.220	1.330	1.520	1.900	2.400	3.050	3.810	4.770
600	500	630	790	1.010	1.110	1.270	1.590	2.000	2.540	3.180	3.970
700	430	540	680	870	950	1.090	1.360	1.710	2.180	2.720	3.410
750	400	500	630	810	890	1.010	1.270	1.600	2.030	2.540	3.180
800	380	470	590	760	830	950	1.190	1.500	1.900	2.380	2.980
900	330	420	530	670	740	840	1.060	1.330	1.690	2.120	2.650
1000	300	380	470	610	660	760	950	1.200	1.520	1.900	2.380
1060	280	360	450	570	630	720	900	1.130	1.440	1.800	2.250
1250	250	310	390	500	550	630	790	1.000	1.270	1.590	1.980
1500	200	250	310	400	440	500	630	800	1.010	1.270	1.590

Precision data sheet			Attachment by: On:	
Customer	ATDB no.		**Country:**	
	Target group:		**Product family:**	
	Item requirement:			
	Customer: *		Classification:	
	Department:		Customer no.	
	Contact:		Tel. / Fax	
Customer	**Shape: ***		**1 set = item:**	
	Dimensions (mm): *			
	Dimensions (mm):		Tolerance:	
	Specification:			
	Manufacturer:		**Current price:**	
	Vs max. (m/s) *		Quantity required:	
Customer	**Grinding process:**			
	Machine manufacturer:			
	Vs (m/s):			
	Cooling lubricant:			
	Dressing tool:			
	Dressing cycle:		Dressing amount:	
Workpiece	**Workpiece: ***		**Dimensions (mm): ***	
	Material group: *		**Stock (to be removed) (mm):**	
	Condition: *		**Hardness: ***	
Aim	**Surface roughness:**		**Contact time:**	
	Lifetime:			
	Additional:			
Probe	Specification:			
	Specification:			
	Specification:			
Info			Drawing:	
Distributor:				

* COMPULSORY fields are marked in grey

TYPE INDEX

TYPE INDEX

TYPE INDEX

TYPE INDEX

TYPE INDEX

TYPE INDEX

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