WINTER

Stationary diamond dressers

SAINT-GOBAIN
ABRASIVES

WINTER

Stationary diamond dressers

SAINT-GOBAIN ABRASIVES

SAINT-GOBAIN Diamantwerkzeuge GmbH & Co.
Schützenwall 13-17, D-22844 Norderstedt
Postfach 2049, D-22841 Norderstedt
Tel.: +49 (0)40-52 58-0, Fax: +49 (0)40-52 58-382
Internet: http://www.winter-dtcbn.de
E-Mail: info-winter@saint-gobain.com

WINTER
stationary
diamond dressers

Contents

Introduction

WINTER diamond dressing tools have a high reputation throughout the world for quality and economics in modern grinding and dressing technology.

WINTER's many decades of experience in cooperation with industry has produced constant improvements in diamond dressers, keeping pace with the higher quality requirements for grinding and dressing today.

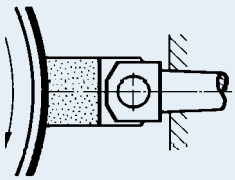
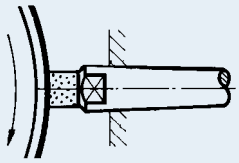
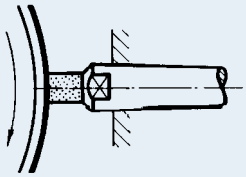
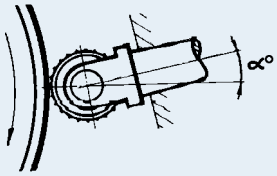
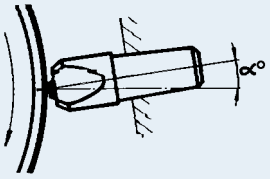
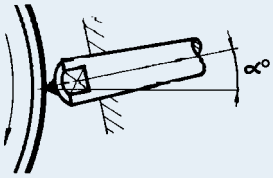
This catalogue gives an update of our range of stationary diamond dressing tools. It also gives guidance in selection of the most suitable diamond dressing tools for your specific operations, together with recommendations and guidelines for application.

If you have further technical questions on the use of diamond dressers, we are happy to provide advice and demonstrations of our tools at your premises.

We can also help you in the optimization of existing applications.

Contact us for all matters concerning diamond dressing tools.

Notes on tool selection

Tool group	Selection notes	Page
Multi-point dressers		
 **Diamond Fliese®**	A modern universal dressing tool for profiling and straight dressing. Diamond Fliese® tools feature constant operating behaviour throughout their service life. They may be used in place of single-point dressers or profile diamonds.	6
 **Igel®**	A robust tool for straight dressing of peripheral and flat surfaces. Igel® dressers are simple to use and highly economical in operation. They can replace the single-point dresser in many applications. One of their main advantages is their higher dressing feed rates.	12
 **pro-dress®**	The design of the pro-dress® is similar to that of the Igel®. It is used for straight dressing of peripheral and flat surfaces with fine and very fine wheel grits. The low cutting pressure of this dresser makes it highly suitable for ID grinding wheels and sharp-profile wheels.	14
 **Rondist**	A cost-effective multi-point dresser with the functional behaviour of a single-point dresser. It comprises a large number of individual diamonds, which can be used one after another. Simply rotate the used diamond point and use the next diamond. There are different versions available for profile dressing and straight dressing.	16
Single-point dressers		
 **Profile diamond**	Profile diamonds are tools for very high performance requirements. They are used to meet extremely high profile accuracy requirements.	18
 **Single-point dressers** **Disposable dressers**	Single-point dressers are suitable for straight grinding wheels and simple profiles. Depending on their quality, the diamonds have several usable points, which can be used in turn by resetting the diamond. Resetting is not possible with disposable diamonds which have only one working point.	20

The variety of dressing applications sometimes means that expert consultation is necessary. We are happy to provide such advice – to enable us to provide the best possible advice, please fill in the attached questionnaire (page 5) as completely as possible.

Questionnaire on application of stationary diamond dressers

Company:

Technical advice ☐

Quotation ☐

Order ☐

1. Workpiece

1.1 Workpiece description

1.2 Workpiece material

1.3 Required surface quality R_a, R_t, R_z

2. Machine

2.1 Manufacturer

2.2 Design/type

2.3 Grinding process
Inclined infeed ☐ Straight infeed ☐

2.4 Cutting fluid
(Type, flow rate, supply method)

3. Grinding wheel

3.1 Dimensions mm
(Outer diameter x width)

3.2 Specification
(Abrasive, grit size, hardness, structure, bond)

3.3 Manufacturer

4. Diamond dresser in operation

4.1 Description

4.2 Dimensions mm
(Shank / Holder dimensions)

4.3 Specification

5. Dressing method

5.1 Straight dressing
on periphery ☐ on face ☐

5.2 Copy / Profile dressing ☐

6. Present dressing parameters

6.1 Grinding wheel peripheral speed for dressing v_{sd} = m/s

6.2 Dressing infeed / stroke a_{ed} = mm

6.3 Dressing transverse feed (see p. 25) f_{ad} = mm

v_{fad} = mm/min

7. Requirement/ Problem

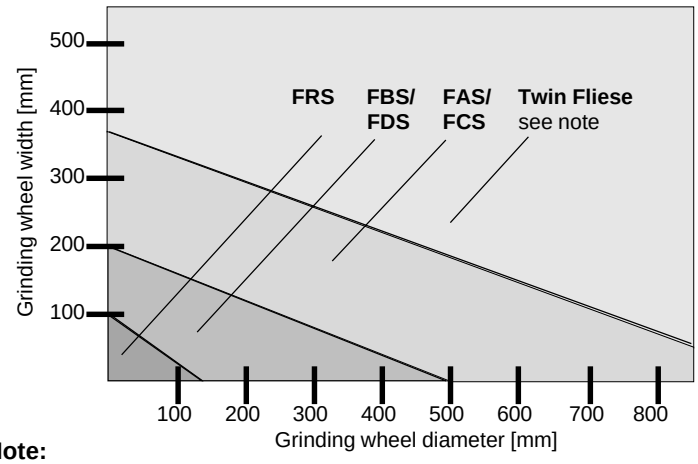
If necessary please copy this questionnaire.

WINTER diamond Fliese tools

Tool specification in four steps

Step 1 — Select appropriate Fliese size for wheel size

FAS 115-



FAS/FCS = Fliese width W = 20mm and useful length 15 or 10mm, for large wheels.

FBS/FDS = Fliese width W = 10mm and useful length 15 or 10mm, for small wheels

FRS = Minifliese, width W = 5mm and useful length 12mm, for very small wheels.

Note:
For dressing work with high wear, or for large single and ganged grinding wheels, we recommend twin mounting of Fliese tool (see p. 8) or use of a twin Fliese, e.g. 5T FAS115-20-15-36 (see also p. 11).

Step 2 — Select diamond grit for grinding wheel grain size

D1001- (Winter designation **115**)

Wheel grain	Diamond grit	Winter code	Active width b_D
120 -180	D 501	75	appr. 0.50
80 -120	D 711	90	appr. 0.70
54 - 80	D 1001	115	appr. 1.00
36 - 54	D 1181	140	appr. 1.12
46 - 80	Needles	180	appr. 1.20

Further information on grain size available on request.

Step 3 — Select Fliese bond for abrasive

T 645

Bond: T 645E **Preferred for fused alumina (Al_2O_3, including sintered Al_2O_3 = sol-gel).**

Bond: H 770J **Preferred for silicon carbide (SiC).**

Note: The bond type determines core E or J of the Fliese. Changes on request.

Step 4 — Select mount or holder, where necessary

MK1

If the Fliese is not directly clamped into the machine holder, please order the mount needed, e.g. cylindrical, tapered or square mounts.
Recommendation: brazed mount (e.g. MK1) or alternatively swivel mount (see p.8)

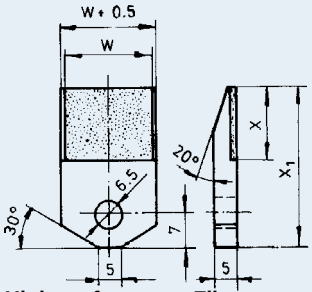
Example

FAS 115 - 20 - 15 - 33 - D1001 - T645 E - MK1				
Step 1	Dimension	Step 2	Step 3	Step 4

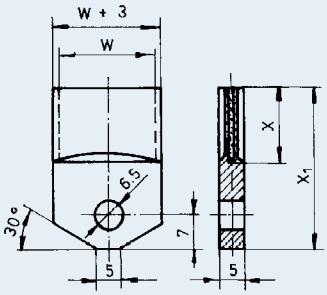
WINTER diamond Fliese tools

Order data

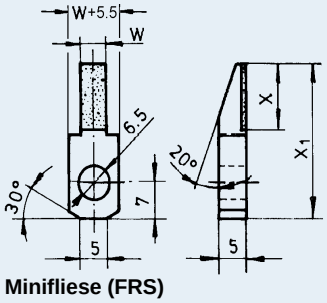
High-performance grit and needle Fliese for mounting directly in machine holder



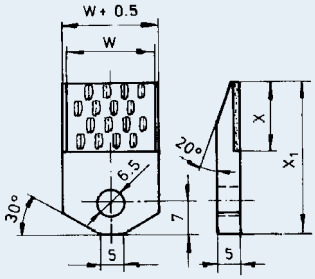
High-performance Fliese (FAS, FBS, FCS, FDS)
manufactured to a special setting scheme, with very uniform arrangement of full, uncrushed natural grit.
Bond T645, Core E



High-performance Fliese (FAS, FBS, FCS, FDS)
manufactured to a special setting scheme, with very uniform arrangement of full, uncrushed natural grit.
Bond H770, Core J

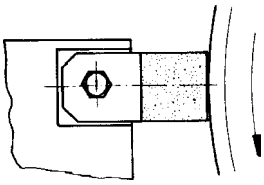


Minifliese (FRS)
Bond T645, Core E.

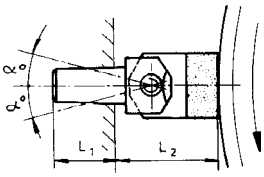


Needle Fliese (FA, FB, FC, FD)
Bond T645,
Core E.

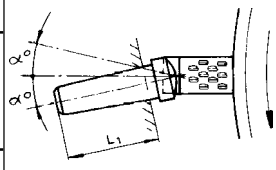
WINTER diamond Fliese							Holder or mount
Shape	W	X	X_1	Grit size	Bond/ Core	**Material No.**	Please order separately if needed (see pp. 8-9)
FAS 75	20	15	33	D501	T645 E	**89801327**	**Examples:**
FAS 90	20	15	33	D711	T645 E	**89800866**	
FAS115	20	15	33	D1001	T645 E	**89800874**	
FAS140	20	15	33	D1181	T645 E	**89800882**	
FBS 75	10	15	33	D501	T645 E	**89801335**	
FBS 90	10	15	33	D711	T645 E	**89800930**	
FBS115	10	15	33	D1001	T645 E	**89800947**	
FBS140	10	15	33	D1181	T645 E	**89800955**	
FCS 75	20	10	28	D501	T645 E	**89801343**	
FCS 90	20	10	28	D711	T645 E	**89801002**	
FCS115	20	10	28	D1001	T645 E	**89800355**	
FCS140	20	10	28	D1181	T645 E	**89800047**	
FDS 75	10	12	28	D501	T645 E	**89801351**	
FDS 90	10	12	28	D711	T645 E	**89801043**	
FDS115	10	12	28	D1001	T645 E	**89801051**	
FDS140	10	12	28	D1181	T645 E	**89801068**	
FAS 75	20	15	33	D501	H770J	**89801368**	
FAS 90	20	15	33	D711	H770J	**89800906**	
FAS115	20	15	33	D1001	H770J	**89800914**	
FAS140	20	15	33	D1181	H770J	**89800922**	
FBS 75	10	15	33	D501	H770J	**89801376**	
FBS 90	10	15	33	D711	H770J	**89800971**	
FBS115	10	15	33	D1001	H770J	**89800988**	
FBS140	10	15	33	D1181	H770J	**89800996**	
FCS 75	20	10	28	D501	H770J	**89801384**	
FCS 90	20	10	28	D711	H770J	**89801027**	
FCS115	20	10	28	D1001	H770J	**89801035**	
FCS140	20	10	28	D1181	H770J	**89800533**	
FDS 75	10	12	28	D501	H770J	**89801392**	
FDS 90	10	12	28	D711	H770J	**89801084**	
FDS115	10	12	28	D1001	H770J	**89801092**	
FDS140	10	12	28	D1181	H770J	**89801181**	
FRS 75	5	12	28	D501	T645 E	**55802720**	
FRS 90	5	12	28	D711	T645 E	**55802737**	
FRS115	5	12	28	D1001	T645 E	**55802834**	
FA 180	20	15	33	N1100	T645 E	**89801798**	
FB 180	10	15	33	N1100	T645 E	**89801481**	
FC 180	20	10	28	N1100	T645 E	**89801805**	
FD 180	10	12	28	N1000	T645 E	**89801813**	



Diamond Fliese® in machine holder



Diamond Fliese® in swivel holder



Needle Fliese with rigid soldered mount, α = ± 0...15°

Other dimensions and specifications on request.

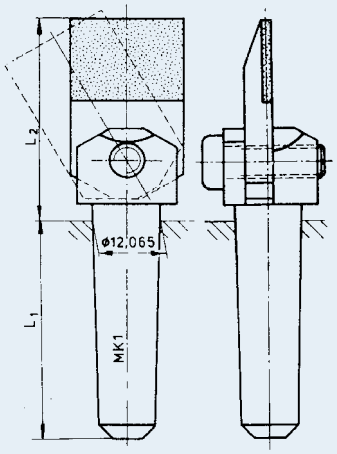
Order example: **FAS 90**-20-15-33-D711-T645 E / **89800866**
FRS 75-5-12-28-D501-T645 E / **55802720**
FD 180-10-12-28-N1000-T645 E / **89801813**

WINTER
stationary
diamond dressers

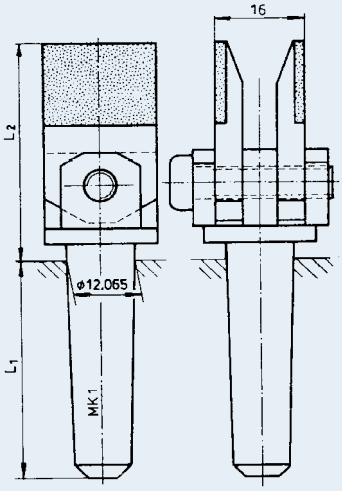
Swivel holders for WINTER diamond Fliese tools

Order data

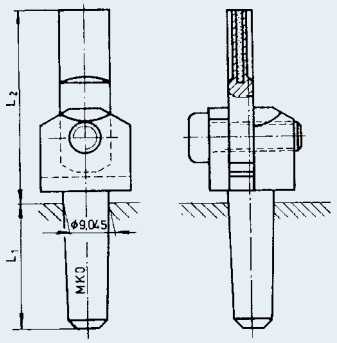
Examples:



Swivel holder MK1



Swivel holder MK1
for two Fliese tools



Swivel holder MK0

Swivel holder for WINTER diamond Fliese				
Shape and diameter mm	Clamping length L_1 mm	Inclination angle α°		
K (all tapered shanks) e.g. MK1, MK0, K1:13.5	For non-standard mounts please indicate L_1.	Self-adjustable by clamping		
Z (all cylindrical shapes)	-			
V (all shapes with square cross section)	Please attach drawing indicating dimensions			

Please order swivel holder separately

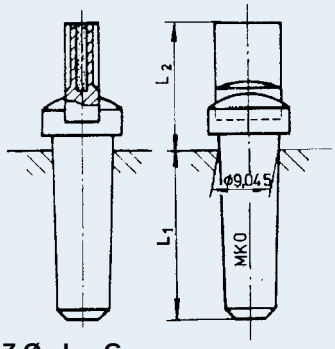
Material No.	Swivel holder for Diamond Fliese	Explanations of abbreviations
55900087 55900038	MK1 MK0	△ Standard, Morse taper
55900070	MK1-19 / M6	△ MK1 shortened plus tightening thread M 6
55900557 55900540	Z10-50 Z6-30	△ Cylindrical Ø 10 x 50mm △ Cylindrical Ø 6 x 30mm
	Swivel holder for two Fliese	
55900054 55900021	MK1 Z 12.7 - 50	△ Standard, Morse taper △ Cylindrical Ø 1/2" x 2"

Diamond Fliese®	L_1 and L_2		
	L_1 clamping length [mm]	L_2 head length [mm]	
		α = 0...5°	α =5...15°
FAS	Standard mounts, see sketches. Shortened Morse taper & cylindrical shank to specification.	37 ± 1	39.5 ± 2
FBS		37 ± 1	29.5 ± 2
FCS		32 ± 1	34.5 ± 2
FDS		32 ± 1	34.5 ± 2

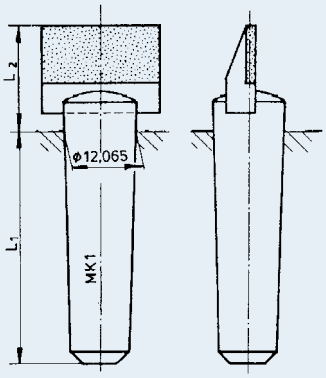
Holders for WINTER diamond Fliese tools

Order data

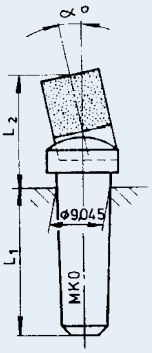
Examples:



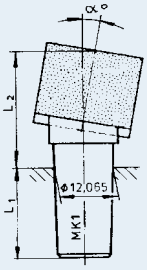
Z Ø - L_1 - G



MK1 - 40 G



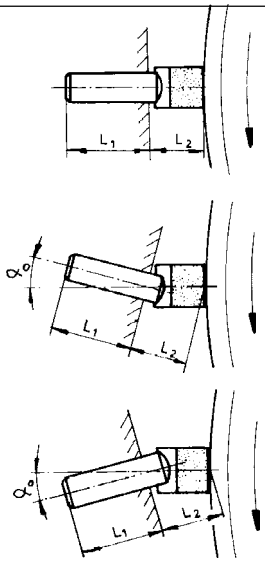
MK0 - 25.5 - 10



MK1 - 19 - 15L

Holder for WINTER diamond Fliese

Shape and diameter mm	Clamping length L_1 mm	Inclination angle α° degrees	Inclination direction L - R
K (all tapered shapes, e.g. MK0, MK1) **Z** (all cylindrical shapes)	For non-standard mounts please indicate L_1. The same applies for indications of modification, e.g. tightening thread M6	Standard mounts to table, or special designs acc. to dimension drawing.	G ≙ straight R ≙ right inclined
V All shapes with square cross section	Please attach drawing indicating dimensions	Machine dependent, available with α = 6° 8° 10° 12° 15°	L ≙ left inclined



Order example: Fliese with holder

FAS75-20-15-MK1-40-G ≙ **MK1, L_1= 40mm, straight α = 0°**
D501 - T645 E

FBS90-10-15-MK0-25.5-10 ≙ **MK0, L_1= 25.5mm, 10°**
D711 - H770 J

FCS115-20-10-Z10-30-15L ≙ **cylinder Ø 10 x 30mm, 15° left**
D1001 - T645 E

FDS140-10-12-MK1-19/M6-6R ≙ **MK1 shortened with tightening thread M6, 6° inclined to right L_1 = 19mm**
D1181 - T645 E

Diamond Fliese®	L_1 and L_2		
	L_1 clamping length [mm]	L_2 head length [mm]	
		α = 0...5°	α =5...15°
FAS	Standard holders, see sketches. Shorter Morse taper and cylindrical shank to specification.	23.5 ± 1	25 ± 2
FBS		23.5 ± 1	25 ± 2
FCS		18.5 ± 1	20 ± 2
FDS		18.5 ± 1	20 ± 2

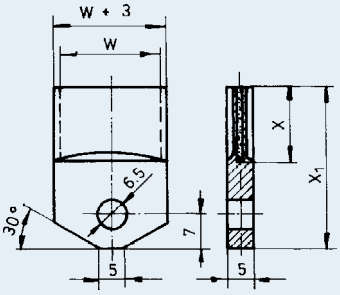
WINTER
stationary
diamond dressers

WINTER diamond Fliese tools

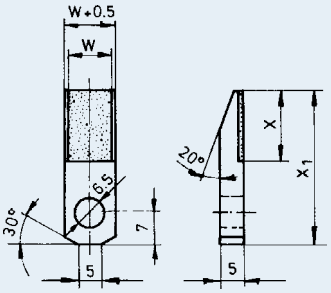
Order data

Special designs

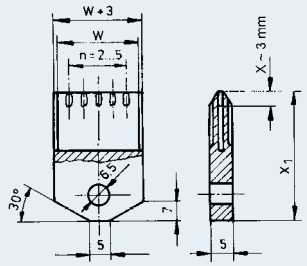
Examples:



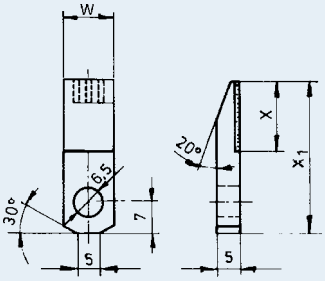
8T FA180

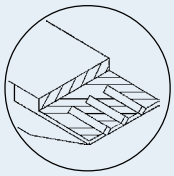


11T FB180



Depending on drawing:
e.g. 2T FD with 3 needles





WINTER diamond Fliese						Remarks
Shape	W	X	X_1	Grit size	Bond and core	
9T FB180	10	15	33	N800	T625 J	Needle Fliese for specially high requirements for active width (b_D) and constant wear behaviour. **Mat.-Nr.** 9T FB b_D = 0.8 **89802850** 1T FB b_D = 1.0 **89802826** 8T FA b_D = 0.9 **89802842**
1T FB180	10	15	33	N1000	T645 J	
8T FA180	20	15	33	N900	T625 J	
11T FB180	10	15	33	N1000	T645 E	Like 1T FB 180, but in steel core E
13T FB180	10	15	33	N800	T645 E	Like 9T FB, but in steel core E 11T FB b_D = 1.0 13T FB b_D = 0.8
6T FD180	10	12	22	N800	T645J	Single-row needle Fliese for specially high requirements for profile accuracy and constant wear. **Mat. No.** 6T FD = 2 needles **82113519** 2T FD = 3 needles **89802818** 10T FD = 4 needles **82094298** 1T FC = 5 needles **82094296**
2T FD180	10	12	22	N800	T645J	
10T FD180	10	12	28	N800	T645J	
1T FC180	20	10	28	N800	T645J	
4SN-FB180	10,5	15	33	N801	M625 E	Single row needle Fliese with synthetic diamonds (N801= 0.8 x 0.8 x 5 mm) For specially high requirements for constant wear behaviour. Diagonal diamond arrangement b_d = 1.15 mm **Mat. No.** 4SN-FB = 2 needles **82156846** 1SN-FB = 3 needles **82148119** SN-FB = 4 needles **82148036** 1SN-FA = 5 needles **82147933**
1SN-FB180	10,5	15	33	N801	M625 E	
SN-FB180	10,5	15	33	N801	M625 E	
1SN-FA180	20,5	15	33	N801	M625 E	
5SN-FB180	10,5	15	33	N601	M625 E	Single row needle Fliese with synthetic diamonds (N601 = 0.6 x 0.6 x 5 mm) For specially high requirements for constant wear behaviour. Diagonal diamond arrangement b_d = 0.8 mm **Mat. No.** 5SN-FB = 2 needles **82157681** 3SN-FB = 3 needles **82156081** 2SN-FB = 4 needles **82151139** SN-FA = 5 needles **82158735**
3SN-FB180	10,5	15	33	N601	M625 E	
2SN-FB180	10,5	15	33	N601	M625 E	
SN-FA180	20,5	15	33	N601	M625 E	

Other dimensions and specifications on request.

Order example:

2T FD180-10-12-22 / N800 / T645J (example **without** holder) **89802818**

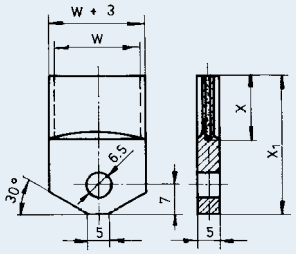
3SN-FB180-10.5-15-32 / N601 / M601 E **82156081**

WINTER diamond Fliese tools

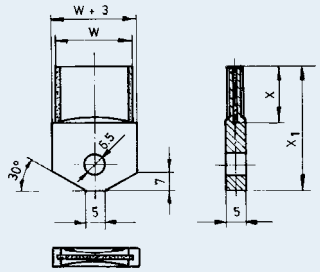
Special versions

Order data

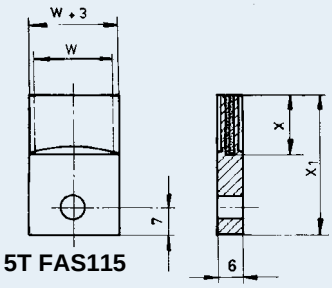
Examples:



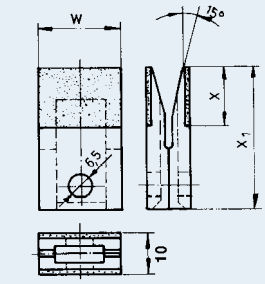
3T FAS115



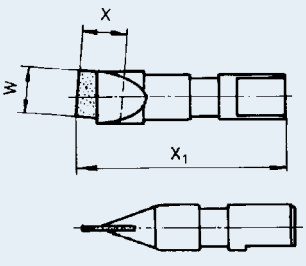
9T FAS115



5T FAS115



1T FAS115



1T FDS90

WINTER diamond Fliese						Remarks
Shape	W	X	X_1	Grit size	Bond	
3T FAS115	20	15	33	D1001	T645J	Dressing double-sided profiles, e.g. crankshaft bearings. Diamond plate centrally arranged, special core material. Constant active width (b_D) 3T FAS b_D = 1.15 $^{+0.05}_{-0}$ mm **Mat. No. 89801432**
9T FAS115	20	15	33	D1001	T645J	Dressing double-sided profiles, e.g. crankshaft bearings. Diamond plate centrally arranged, special core material and restricted core tolerance. Constant active width. 9T FAS b_D = 1.15 $^{+0}_{-0.05}$ mm Tolerance of parallelism from diamond plate to core within 0.02mm. **Mat. No. 89802242**
5T FAS115	20	15	36	D1001	T645J	Dressing double-sided profiles, e.g. crankshaft bearings. Diamond plate centrally arranged, special core material and restricted core tolerance. Constant active width. 5T FAS b_D = 1.15 ± 0.02mm x 2 = 2.3mm **Mat. No. 89801902** The high diamond content permits accurate dressing even of large grinding wheel volumes.
1T FAS90 **1T FAS115** **1T FAS140**	20 20 20	15 15 15	35 35 35	D711 D1001 D1181	T645J T645J T645J	Diamond twin Fliese with cooling duct, coolant supply necessary. For especially high demands, e.g. centerless grinding, high-speed grinding. D711: Grit range 80-120 D1001: Grit range 54-80 D1181: Grit range 36-54 D711 b_D = 0.7 mm x 2 = 1.4 mm D1001 b_D = 1.00 mm x 2 = 2.0 mm D1181 b_D = 1.12 mm x 2 = 2.24 mm
1T FDS90	10	12	45	D711	T645 E	DIAFORM Fliese for cost-effective rough profiling with DIAFORM unit. Saves the profile diamond from premature wear. 1T FDS90 b_D = 0.7 - 55802883

Other dimensions and specifications on request.

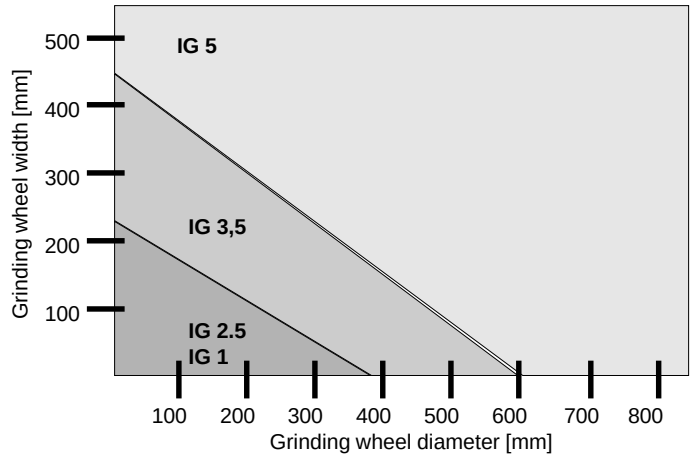
Order examples:

3T FAS115-20-15-33 / D1001 / T645J (example **without** holder) **89801432**

5T FAS115-20-15-36 / D1001 / T645J (example **without** holder) **89801902**

WINTER diamond Igel

Tool specification in four steps

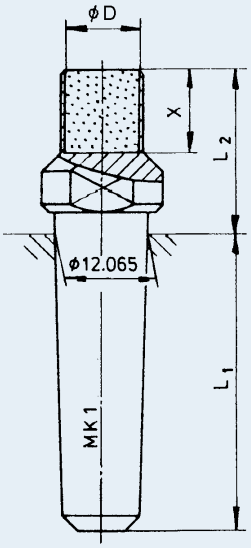
Step 1	**Select appropriate Igel size for wheel size**
IG 2.5-	 **IG 1** = Igel® with diamond content 1ct and active diameter 8mm **IG 2.5** = Igel® with diamond content 2.5ct and active diameter 8 mm **IG 3.5** = Igel ® with diamond content 3.5ct and active diameter 8mm **IG 5** = Igel ® with diamond content 5ct and active diameter 11mm **IG 3** = Igel ® set with to specially large diamonds, **IG 15** e.g. for face dressing.
Step 2	**Selection of diamond grit for wheel abrasive**
D1001-	Wheel abrasive / Diamond grit / Old Winter designation 60 - 80 / D 711 / 80 46 - 60 / D 1001 / 60 36 - 46 / D 2240 / 50 36 - 54 / D 711 / 70
Step 3	**Selection of bond for grit type**
H 710-	**Bond: H 710** **For fused alumina (Al_2O_3).** (old designation N) **Bond: H 770** **For silicon carbide (SiC).** (old designation H)
Step 4	**Selection of mount “always required”.**
MK1	**Specify depending on machine type, e.g. MK1 or MK0.** **Straight version or inclined version.** **For further mounts, see pages 9 and 22.**
Example	**IG 2.5 - 8 - 11 - D1001 - H 710 - MK1-15°** Step 1 / Dimension see page 13 / Step 2 / Step 3 / Step 4

WINTER diamond Igel

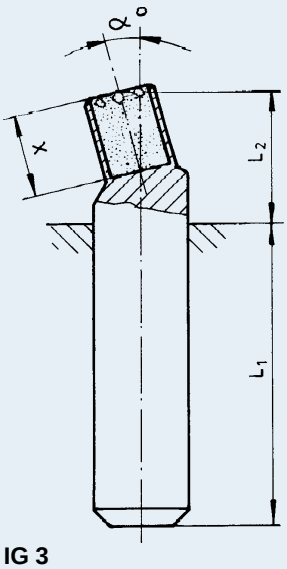
Full diamond and set version

Order data

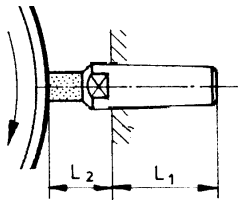
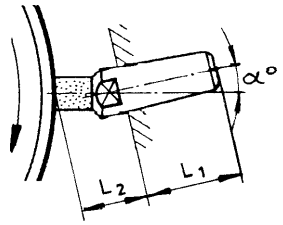
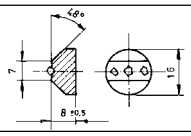
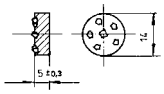
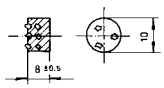
Examples:



IG 2,5



IG 3

WINTER diamond Igel, full-diamond version						**Holder selection: see page 9**
Shape	D	X	Grit size	Bond & core	Old designation	**Holder required**
IG 1	8	4	D2240 D1001 D 711	H710 H770	50/1 60/1 80/1	 L_2 = X + (6...11mm)  Please state inclination angle α when ordering.
IG 2.5	8	11	D2240 D1001 D 711	H710 H770	50/2.5 60/2.5 80/2.5	
IG 3.5 highly concentrated	8	11	D 711	H710	70/3.5	
IG 5	11	11	D2240 D1001 D 711	H710 H770	50/5 60/5 80/5	
WINTER diamond Igel, set version						**Setting pattern**
IG 3	16	8	D3700	T625	3 (single-layer)	
IG 6	14	5	D2600	T625	6 (single-layer)	
IG 6A	10	8	D2600	T625	6A (double-layer)	

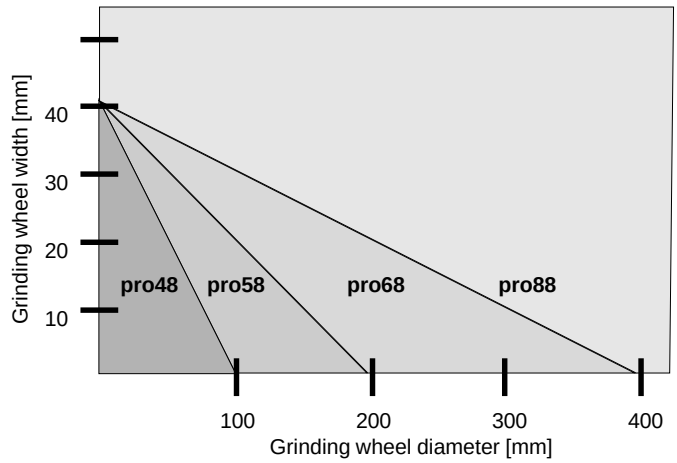
Other dimensions and specifications on request. Drawing needed for special versions.

Order example: **IG 1-**8-4 / MK1-40-G / D1001 / H710
IG 3-16-8 / Z11-50-15° / D3700 / T625

WINTER pro-dress — Tool specification in four steps

Step 1 — Select appropriate pro-dress® size for wheel size

pro58-



pro48 = pro-dress® with diamond content 0.6ct and active diameter 4mm

pro58 = pro-dress® with diamond content 1ct and active diameter 5mm

pro68 = pro-dress® with diamond content 1.3ct and active diameter 6mm

pro88 = pro-dress® with diamond content 2.4ct and active diameter 8mm

Step 2 — Selection of diamond grit for wheel abrasive

D1001-

Wheel abrasive	Diamond grit
320 - 600	D 76
220 - 320	D 107
180 - 220	D 151
120 - 180	D 213

Wheel abrasive	Diamond grit
100 - 120	D 301
80 - 100	D 426
60 - 80	D 601
54 - 60	D 711

Step 3 — Selection of bond for grit type

H 770-

H 760	**For fused alumina (Al_2O_3), D ≤ D301**	} old designation W
H 710	**For fused alumina (Al_2O_3), D > D301**	
H 770	**For silicon carbide (SiC).**	
ST 469	**For specially low cutting pressure, D optional e.g. for dressing VSS wheels**	} old designation BZ

Step 4 — Selection of mount “always required”.

MK1

Specify depending on machine type, e.g. MK1 or MK0.
Straight version or inclined version.
For further mounts, see page 9.

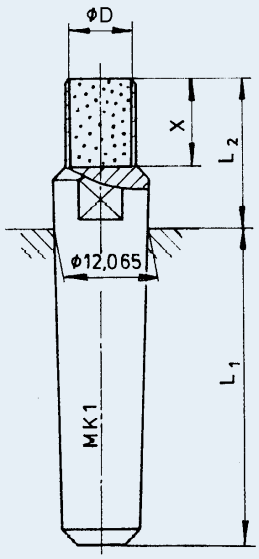
Example

pro58	**-**	**5**	**-**	**8**	**-**	**D151**	**-**	**H 770**	**-**	**MK0**
Step 1		Dimension see page 15				Step 2		Step 3		Step 4

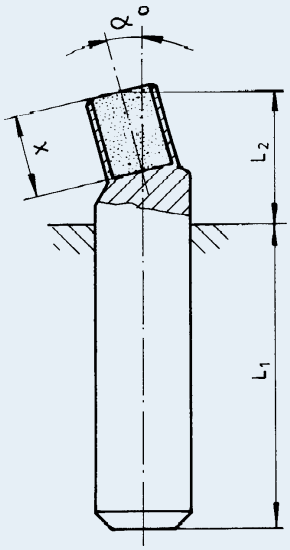
WINTER pro-dress

Order data

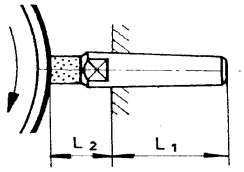
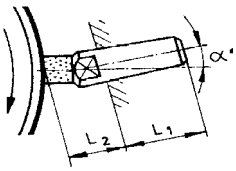
Examples:



pro48



pro58

WINTER pro-dress						**Holder selection: see page 9**
Shape	D	X	Grit size	Bond *)		**Holder required**
pro48	4	8	D76 D107 D151 D213 D301 D426 D601 D711	H 710 H 760 H 770 ST 469		 L_2 = X + (6...11 mm) 
pro58	5	8		H 710 H 760 H 770 ST 469		
pro68	6	8		H 710 H 760 H 770 ST 469		
pro88	8	8		H 710 H 760 H 770 ST 469		

Other dimensions and specifications on request.. Drawing required for special mounts.

*) Bond: = **H 710** (old designation W from D426)
H 760 (old designation W for ≤ D301)
H 770 (old designation H)
ST 469 (old designation BZ)

Order examples:

pro48-4-8 / MK0-25.5-0° / D76 / H 710 with holder MK0, 0° = straight

pro58-5-8 / K1:20-18-G-17.5 / D151 / H 770 with holder taper 1:20, L_1 = 18, L_2 = 17.5, 0°

Diamond tips kept in stock = X

Grit size	Bond	pro48	pro58	pro68	pro88
D76	H 770				
D107	H 770				
D151	H 770				
D213	H 770				
D301	H 770				
D426	H 770		X		X
D601	H 770	X			X
D711	H 770				
D76	H 760		X		
D107	H 760		X	X	
D151	H 760				
D213	H 760		X	X	X
D301	H 760	X	X		X
D426	H 710	X	X	X	
D601	H 710	X	X	X	
D711	H 710		X	X	
D76	ST469				
D107	ST469				
D151	ST469				
D213	ST469		X		
D301	ST469	X			
D426	ST469				
D601	ST469				
D711	ST469				

For diamond tips not kept in stock, the minimum order size is 12 units per dimension.

WINTER Rondist

Tool specification in two steps

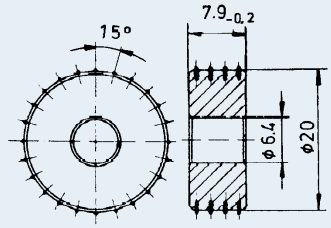
Step 1	Select appropriate type
Ro 2096	For straight dressing cylindrical wheels, for diameter < 600mm and/or grit size 46-80.
Ro 5096	For straight dressing cylindrical wheels, for diameter > 600mm and/or grit size 36-60.
Ro 1008	For profile-truing of wheels, universal application for wheel grits from 46-100.
Ro 15/5	For straight dressing cylindrical wheels, for diameters from 5-40mm, e.g. for ID grinding.
Step 2	**Selection of clamping holder (multiple use)**
MK1	Specify depending on machine type, e.g. MK1 or MK0. Shank designs: see pages 8 and 22.
Example	Ro 2096 - MK1
	Step 1 | Step 2 (Clamping holder, see p.8)

WINTER Rondist

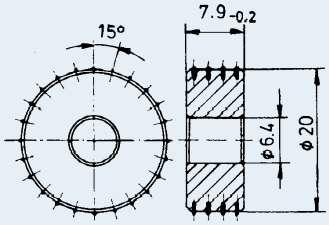
Order data

Set version, electroplated layer

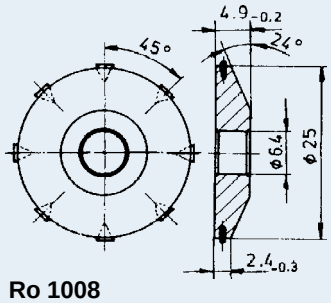
Examples:



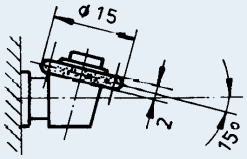
Ro 2096



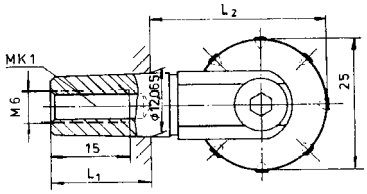
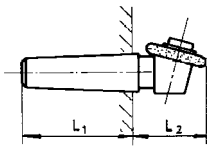
Ro 5096



Ro 1008



Ro 15/5

WINTER Rondist			**Order clamping holder if needed.**	
Type	Carats	Diamond grade	Material No.	
Ro 2096	2	Needle diamonds	**89900058**	
Ro 5096	5	Needle diamonds	**89900074**	
Ro 1008	1	Maccles	**89900017**	
Ro 15/5	-	D501 electroplated bond	**89900041**	

Please order clamping holder separately

Holder	L_1 mm	Rondist	L_2 mm
MK0 **MK1** **MK1** shortened Cyl. mount Square or to drwg.	25.5 40.0 e.g. 19 to be specified	Ro2096 and Ro5096	24 + 1.5
		Ro1008	31 + 1.5
		Ro15/5	18

Special holder on request (drawing required)

Order example: **Ro 2096**
Clamping mount MK1-19 / M6

Ro 15/5
Clamping mount MK0

WINTER profile dressing diamonds, ground — Tool specification in three steps

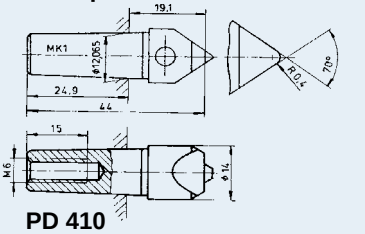
Step 1	**Select appropriate tool type for machine**
PD 410-types.	**The machine manufacturers have defined typical designs for the various machine** **The appropriate tool for each type of machine is given in the overview on page 19.** **Example: SCHAUDT machine = shape PD 410** **DIAFORM unit = shape PD 414.** **Other variants on request.**
Step 2	**Select carat weight**
Carat-	**The carat weight of the rough diamond to be used should be appropriate for the desired angle and radius.** **We normally use diamonds weighing approximately 1 carat.** **For DIAFORM diamonds: approx. 0.33 carats.** **On request, we can also manufacture types with other carat weights.** **Quality: WINTER uses only first-class maccles, to meet the highest standards.**
Step 3	**Select angle α and radius R**
55°-R = 0.2	**If not determined by machine type, angle and radius should be specified as large as possible, taking account of the required wheel profile.**

Example	**PD 410**	**-**	**1.0**	**-**	**55°**	**-**	**0.2**	**-**	**Holder**
	Step 1		Step 2 Carat weight		Step 3 Angle		Radius		Is defined by designation 410

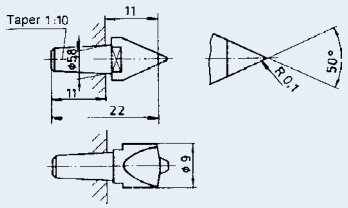
WINTER profile dressing diamonds, ground
with holder

Order data
(standard examples)

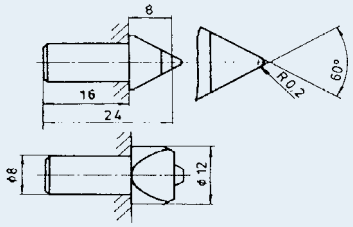
Examples:



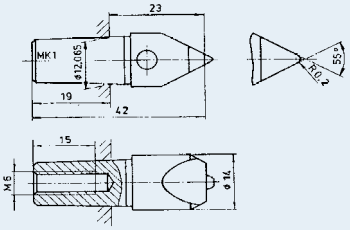
PD 410



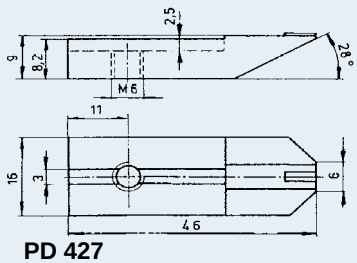
PD 428



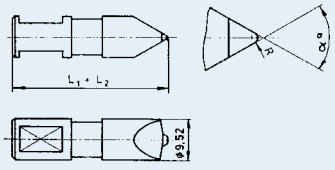
PD 426



PD 425



PD 427



PD 414

WINTER profile dressing diamonds

Shape	Carat weight	Nose angle α °	Nose radius R mm	Holder	Total length $L_1 + L_2$	Note on machine
PD 410	Standard appr. 1ct, but dependent on shape and processing	70°	0.4	Part of shape, otherwise acc. to dimension drawing	44	SCHAUDT
PD 425		55°	0.2		42	FORTUNA
PD 426		60°	0.2		24	MSO
PD 428		50°	0.1		22	JUNG RA38-53
PD 427	0.5 ct.		-	To drawing	-	REISHAUER
PD 414 suitable for DIA-FORM units	0.33 0.25 or 0.5ct. on request	40° / 60° or as specified	0.125 0.250 0.500 or as specified	Part of shape, otherwise acc. to dimension drawing	36≙K 45.5≙L 58≙EL Dependent on unit K/L/EL code for total length	DIAFORM Unit models: see table below. Also available in unground type as "spur diamond". **Tolerance group 5.** Tolerance group 2 is possible on request. For cost-effective rough profiling, we recommend the DIAFORM Fliese, see p.10.

Other dimensions and specifications on request. Drawing required for special holders.

Order examples: **PD 410-**1.0-55-0.2
(shank / holder is part of order designation PD410.)

DIAFORM units

Shank	$L_1 + L_2$	Models
K	36	AT, ATR, BT, BTR
L	45.5	2A - 2AR - 2B - 2BR 3A - 3AR - 3B - 3BR 4A - 4AR - 4B - 4BR 5/1 - 5/2 - 10/2 6/1 - 6/2 - 12/1 - 12/2 8/1 - 8/2 - 14/1 - 14/2
EL	58	5/4 - 6/4 12/4 - 14/4

Rush repair service:
Saint-Gobain Diamantwerkzeuge GmbH & Co. KG
Am Redder 1
22941 Bargteheide
Telefon: +49 (0) 4532 40 40-0
Fax: +49 (0) 4532 40 40-65

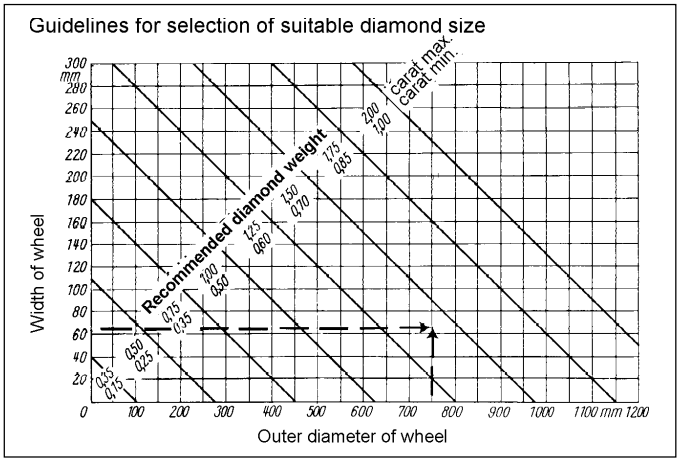
WINTER
stationary
diamond dressers

WINTER single-point diamond dressers
with natural points

Tool specification in three steps

Step 1 — **Select appropriate diamond size for wheel size**

0.5 carats



Step 2 — **Select diamond quality**

Vatom

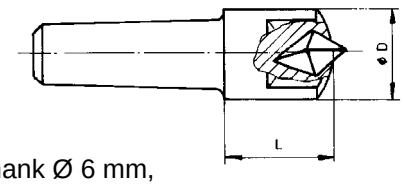
Industry	**Simple industrial quality. At least 2 working points.**
ZA	**Standard quality. At least 2 working points, few inclusions/cracks permissible.**
Vatom	**Standard quality. At least 3 working points, irregularities of shape permitted within certain limits only. Few inclusions, no cracks.**
Diacar	**Good industrial quality. At least 3-4 working points, regular octahedron. No inclusions, no cracks.**
Basram	**Top quality. At least 4-6 working points, regular octahedron. No inclusions, no cracks.**

Step 3 — **Select mount depending on machine type and diamond grit size**

MK1

Carat weight	D	L
0.18	> 4	6
0.25 / 0.33	> 5	6
0.4	> 6	8
0.5 / 0.6	> 7	10
0.7 / 0.8	> 8	10
1.0	> 9	10
1.25	>10	10
1.5	>11	12
< 2.5	>12	12

A certain holder is required, depending on machine, e.g. MK1 or MK0.
Diamond weight must be specified in accordance with the table.
If necessary, a head is to be provided, examples:



Cylindrical shank Ø 6 mm,
Carat weight 0.5 ct.: without head
Carat weight 0.7 ct.: with head D x L = 8 x 10 mm

Example

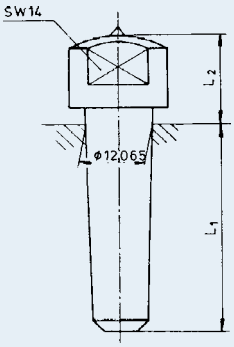
EA	**-**	**0.5**	**-**	**Vatom**	**-**	**MK1**
Type		Step 1		Step 2		´Step 3 (see p.22)

0.5ct D = 5
This means that no head is needed.

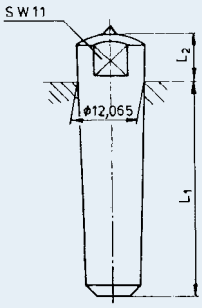
WINTER single-point diamond dressers

Order data

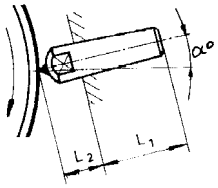
Examples:



EA



EA

WINTER single-point diamond dressers				**Notes**
Shape	Carats	Quality	Notes on selection of single-point diamonds	Notes on mount: see page 22.
EA	**0.25**			
EA	0.33		See page 20	
EA	0.40			
EA	**0.50**	**Industry** ZA **Vatom** **Diacar** Basram	*) For reasons of rapid availability the items shown in **bold** print should be preferred.	
EA	0.60			
EA	**0.70**			
EA	**1.00**			
EA	1.25			
EA	**1.50**			
WINTER disposable diamond dressers				
EW	≤ 0.1	Depending on application, sharp diamonds for low dressing forces or blockly tip.	Disposable diamond dressers with one working point, first-class small natural octahedrons. Maintenance-free, no repairs. Highly suited to fine-grain grinding wheels and for small grinding wheel diameters.	

Single-point dressers available with other weights on request.
Special mounts with dimensioned sketch available on request.

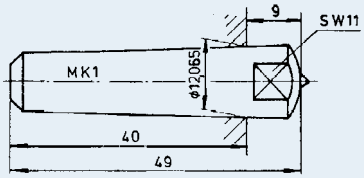
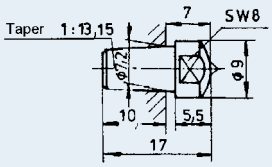
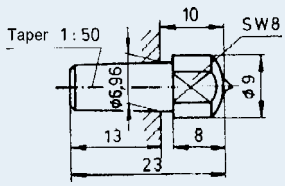
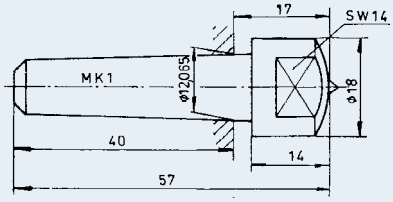
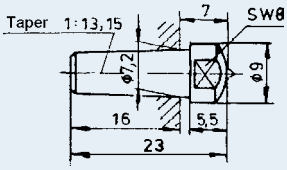
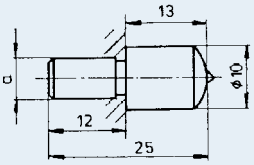
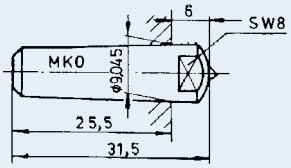
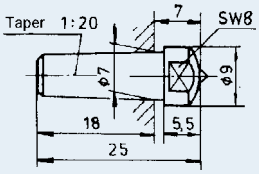
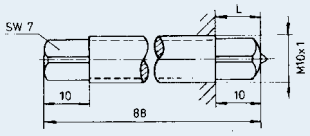
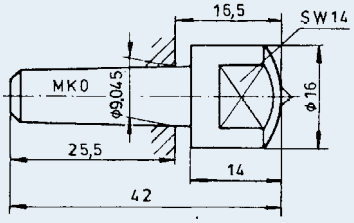
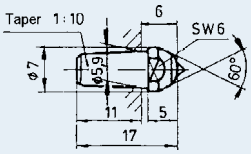
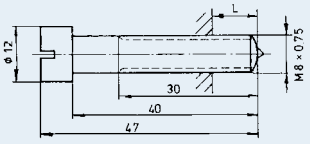
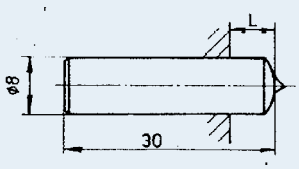
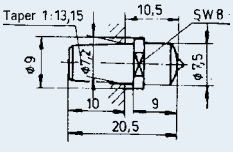
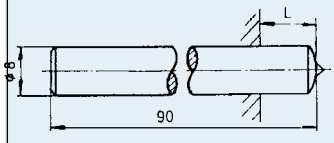
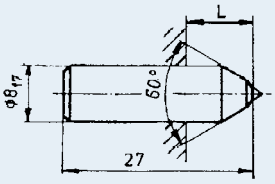
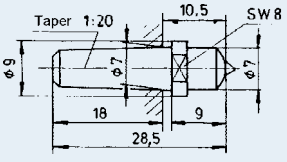
Disposable dressers, minimum order:
for standard inserts available ex stock = 5 pieces
for special mounts = 50 pieces

Order example: **EA** 0.5 - Diacar - MK1
EW 01 - Mount to sketch.

Rush repair service:
Saint-Gobain Diamantwerkzeuge GmbH & Co. KG
Am Redder 1
22941 Bargteheide
Telefon: +49 (0) 4532 40 40-0
Fax: +49 (0) 4532 40 40-65

WINTER
stationary
diamond dressers

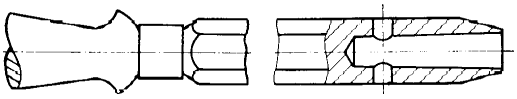
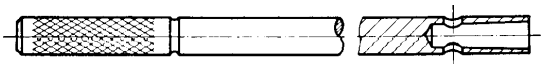
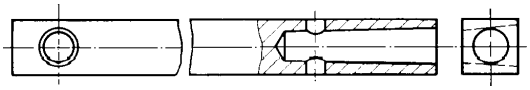
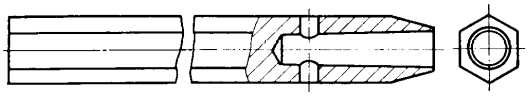
Diamond holders to DIN 228
and to WINTER standard

Diamond holders to DIN 228		Other diamond holders			
Cat.No.		**Cat.No.**		**Cat.No.**	
400		**407**	 Jung NT 65 taper 1:13,15	**422**	 Kolb KZ 1 + 2 taper 1:50
400K		**409**	 Jung JgN 1751 taper 1:13,15	**405**	 Landis a = Ø 6; Ø 6.5;Ø 8
402		**411**	 Jung JgN 1751 taper 1:20	**420**	 Niles
402K		**412**	 Jung FA 42-12 taper 1:10	**421**	 Niles
403		**413**	 Jung C 8 taper 1:13,15	**424**	 Deckel
406	 D (Diamond tip) central	**417**	 Jung C 8 taper 1:20		

Other products

Hand dressers, hand holders, loose diamond grit

Order data

	Article	Selection options
Igel-P  **Igel-T** 	**Hand dresser**	**Igel-P 1.25 carats** **Mat. No. 82178489** **Igel-T 1.25 carats** **Mat. No. 82178488**
No. 445  **No. 440** 	**Hand holder for mounted dressers**	**No. 445** **for MK1 or MK0** Hexagon with wooden handle **MK1 = Mat. No. 55900113** **MK0 = Mat. No. 55900143** **No. 440** **for MK0** **Cylindrical holder** **Ø 12 x 200 mm** **MK0 = Mat. No. 55900110**
No. 435  **No. 430** 	**Machine holders for mounted dressers**	**No. 435** **for MK1 or MK0** **Square** **18 x 18 200 mm** **MK1 = Mat. No. 55900168** **MK0 = Mat. No. 55900135** **No. 430** **for MK1 or MK0** **Hexagon** **Width a/f 20 x 200 mm** **MK1 = Mat. No. 55900151** **MK0 = Mat. No. 55900110**

Technical notes

1. History and benefits of multi-point dressers

Up to the end of the fifties, single-point diamond dressers were practically the only type of dressing tool; after that the first multi-point diamond tools were made with small diamonds, and were used with great success for straight dressing of grinding wheels. Thus WINTER produced the Igel® dresser. Later the range was expanded to include pro-dress® with fine grit sizes for dressing fine-grained wheels.

Cylindrical multi-point dressers cannot be used for profile dressing, so the next development step was to sinter a flat plate instead of the cylindrical Igel shape. The was a precursor of the WINTER Fliese. The diamond Fliese® combines the benefits of the multi-point diamond dresser with those of the single-point diamond dresser. It is appropriate for universal dressing, of straight wheels and profiled wheels. The technical and commercial benefits of multi-point dressers:

- Igel®, pro-dress® and diamond Fliese® tools can be used universally for straight dressing.
- Diamond Fliese® tools are also universally capable of use for profile dressing.
- These tools can be used up completely without any requirement for maintenance, and are rugged in operation.
- There is less change in active width b_D compared with single-point diamond dressers, giving more constant dressing results and more constant behaviour of the grinding wheel, i.e. more precision in grinding.
- Multi-point dressers are available in different grit sizes, diamond qualities and concentrations, and as diamond needles; this permits versatile adaptation to the special requirements of a dressing and grinding operation.
- The diamond material used in multi-point tools is much lower-priced and thus more economical compared with the same carat weight in single-point dressers.
- Alongside the single-point dressers, there is also the Rondist programme, with a number of diamonds per tool that are used one after the other.
- Rotary diamond dressers, e.g. diamond profile and copy roller dressers. A separate catalogue is available for these tools. We will be glad to make recommendations for dressing diamond and CBN wheels on request.

2. Dressing with stationary diamond dressers

An optimal grinding process can only be achieved by proper preparation of the wheel by dressing (also known as conditioning). This means not only creating or restoring true running and the correct profile of the wheel, but above all generating the free cutting capability of the wheel which is needed for the grinding process. Thus the term “dressing” covers trueing and/or sharpening of the wheel.

The wheel topography can be controlled over a wide range by varying the dressing parameters. This has considerable effects on the characteristics of the wheel in the grinding process, and on the results of the grinding operation.

Diamond dressing tools may be classified as follows:

- “Stationary diamond dressers”, e.g. single-point and multi-point dressers, and
- “Rotary diamond dressers”, e.g. diamond profile and form dressers.

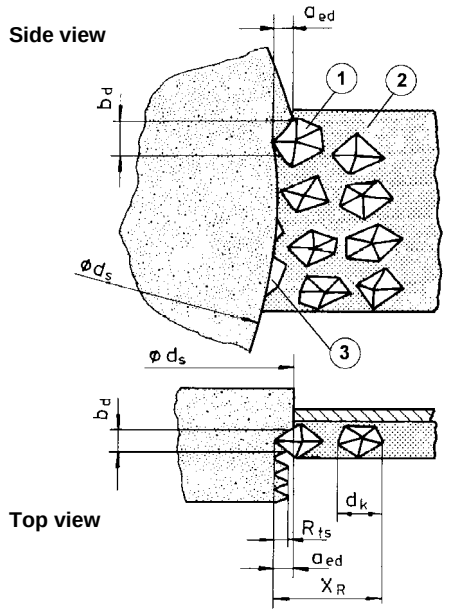
The dressing techniques used for stationary diamond dressers are considered in this catalogue.

There is a separate catalogue available for WINTER diamond roller dressers. We will be glad to send you this catalogue on request. We will also be pleased to give you recommendations for dressing diamond and CBN wheels.

The result of dressing is determined by the parameters feed v_{fd}, infeed a_{ed} and the type of dresser used. One important parameter is the active width b_D, i.e. the shape of the diamond as apparent in the surface of the wheel to be dressed. These parameters are summarized in Fig. 1.

All dressing tools are subject to wear, dependent on the parameters set, on cooling, on the wheel volume dressed V_{sd} and on wear resistance. If a single-point diamond dresser is used, the active width b_D increases with increasing duration of operation, i.e. the original point is progressively used up, and the active width b_D changes at the same time, with a corresponding change in the dressing result. Multi-point dressers have much more consistent wear behaviour.

Technical notes



a_{ed}	(mm)	:	Infeed per stroke
b_D	(mm)	:	Active width of diamond
d_s	(mm)	:	Grinding wheel diameter
①		:	Active diamond grit
②		:	Bond T or H
③		:	Pulled out, used grit
d_k	(mm)	:	Diamond grit diameter
R_{ts}	(µm)	:	Active roughness of grinding wheel
X_R	(mm)	:	Residual layer depth of diamond Fliese®
n_{sd}	(rpm)	:	Spindle speed for dressing
v_{fad}	(mm/min)	:	Axial feed rate for dressing
f_{ad}	(mm/rev)	:	Axial feed for dressing

$$U_d = \frac{b_d}{f_{ad}} = \frac{b_d \cdot n_{sd}}{v_{fad}} \quad (1)$$: Overlap factor for dressing

V'_w	(mm³/mm)	:	Wheel (workpiece) removal volume per mm wheel width in grinding process

Fig. 1: Mode of operation of a diamond Fliese® and formation of active roughness depth R_{ts} as a function of b_D and f_{ad}.

The overlap factor U_d provides a link between the parameters feed v_{fd}, active width b_D and wheel spindle speed n_{sd} during dressing. This overlap factor U_d influences the number of cutting points on the grinding wheel surface. In practice, the overlap factor U_d is between 2 and 8. The figures 2 to 8 characterize the surface topography, i.e. 2 = coarse, 8 = extremely fine. It is important to note that with coarse dressing (e.g. $U_d = 2$), the wheel topography is comparable, regardless of the wheel grain. With finer wheels, there are more cutting points involved in the cutting process, and this means higher cutting forces. However, the finer wheel topography causes greater wear resistance, i.e. higher removal ratios (v_{wd} / v_{sd}) can be achieved at higher overlap factors. U_d factors of more than 8 are uneconomical, as no change can be achieved in process behaviour, and there is no improvement in surface quality.

The following overlap factors U_d are recommended as a function of grinding wheel grain size:

Wheel grain size	**60:**	**U_{dmax} = 4**
	80:	**U_{dmax} = 6**
	120:	**U_{dmax} = 8**
Or simplified:		**U_{dmax} = (US mesh : 15)**

3. Ways of improving results

The possible ways of improving a specific working result are shown in Figs. 2 and 3. The block diagram (Fig. 2) shows the settings that can be adjusted to improve the result. The left-hand block shows symbolically the grinding wheel to be dressed; the middle sections show the parameters that can be adjusted to achieve a specific result, i.e. machine, dressing tool and operating parameters.

These three possibilities can and must be used to achieve the desired topography on the grinding wheel, as shown symbolically in the right-hand block. Fig. 3 supplements Fig. 2 by a systematic overview of the possible ways of influencing the dressing parameters. In individual cases, the decision must be made on the basis of the capabilities of the specific machine with the dressing tool and the setting parameters.

Practical mounting and operating recommendations are given in Section 4. Section 5 shows how to cost an operation, which may permit savings. Section 6 gives a series of test results with true figures, for comparison of results and to help specify operating parameters.

Technical notes

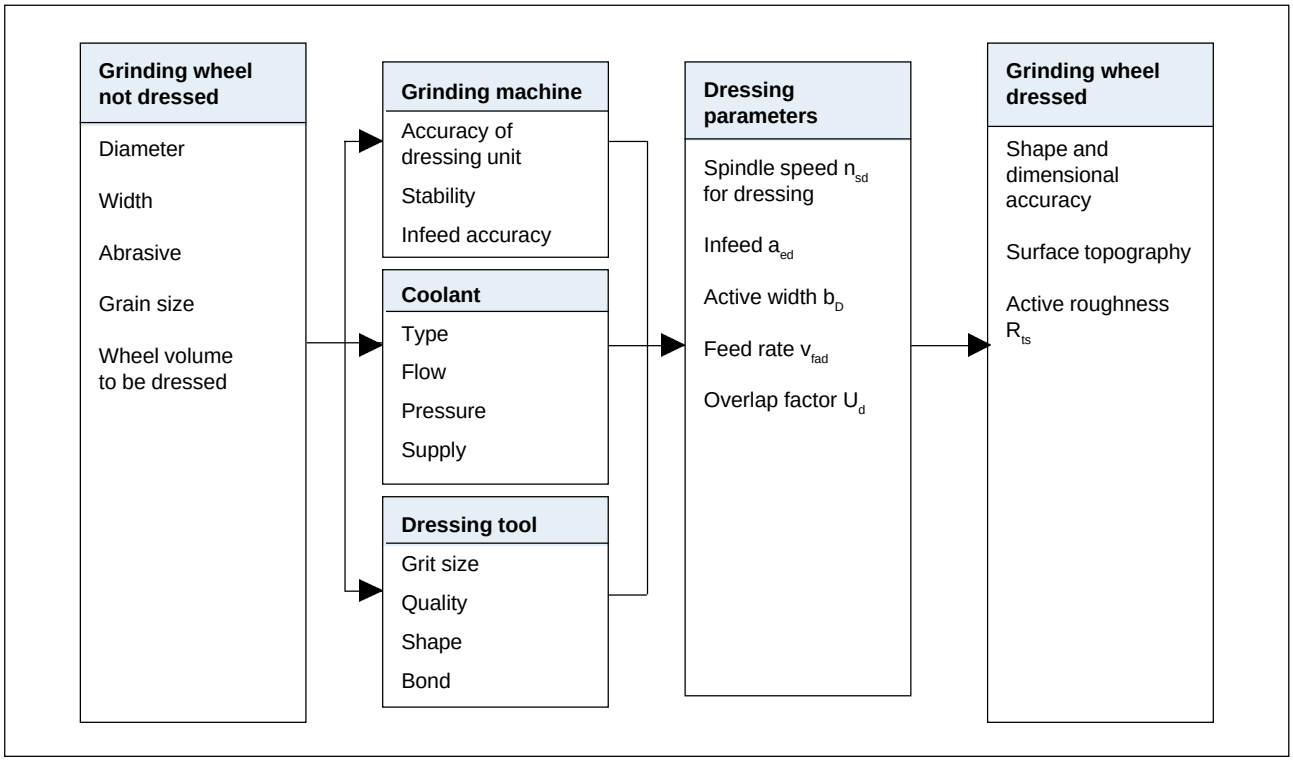


Fig. 2: Block diagram: dressing a grinding wheel with stationary diamond dressers and their variables such as grinding machine, coolant, dresser and operating parameters with the major influencing variables.

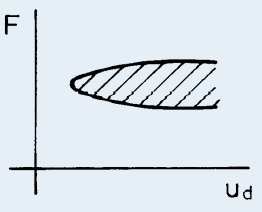
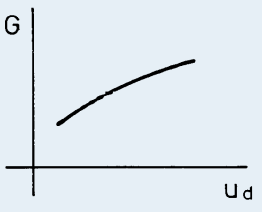
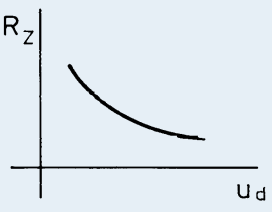
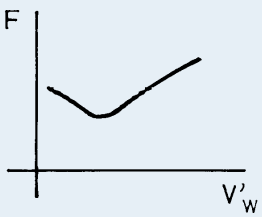
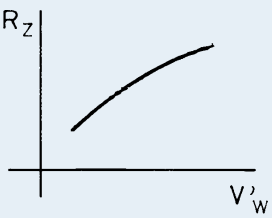
Assessment criteria / Influencing variables	Geometrical and dimensional accuracy		Surface roughness
	Cutting forces $F = f(U_d, V'_w)$	Removal ratio $G = f(U_d, V'_w)$	Average roughness $R_z = f(U_d, V'_w)$
Overlap factor $U_d = \frac{b_D \cdot n_{sd}}{v_{fad}} = \frac{b_D}{f_{ad}}$			
Specific material removal rate V'_w (cm^3/mm)			

Fig. 3: Systematic diagram showing the influence of technical grinding result as a function of dressing parameters and specific material removal volume V'_w (cm^3/mm) of grinding wheel in the grinding process (acc. to Messer)

Technical notes

4. Mounting and operating recommendations (overview see pages 28-29)

5. Cost-effectiveness calculation

For comparison between different dressing tools, it is necessary to look not only at the technical dressing result, but also to make a cost comparison.

Total dressing cost K_{dtot} is calculated from two blocks of cost:

1. Costs related to the service life of the dressing tool, calculated from:

   - Cost of dressing tool K_w
   - Life (no. of dressings) of dressing tool i_d, i.e.

   $$K_{wd} = K_w : i_d \quad \text{(DM : no. of dressings)}$$

2. Costs related to the dressing operation K_{zd}, calculated from:

   - Machine rate K_M (incl. labour and ancillary labour cost)
   - Dressing duration t_d, i.e.

   $$K_{zd} = K_M : t_d \quad \text{(DM : no. of dressings)}$$

Thus the total dressing cost K_{dtot} can be calculated from the two blocks (1 and 2), as follows:

$$K_{dtot} = K_{wd} + K_{zd} \quad \text{(DM : no. of dressings)}$$

6. Test data and parameters

Practical data and research results are shown graphically on pages 30, 31 and 32 to help specify operating parameters and to enable comparison of results.

7. Recommended literature on dressing technology

I. Appun: Einfluß des Abrichtvorganges und der Kühlverfahren auf Verschleiß und Oberflächengüte beim Rundschleifen. Dissertation TH Braunschweig 1953.

D. M. Busch: Abrichten von Schleifscheiben mit Diamantwerkzeugen. MM Maschinenmarkt, Würzburg, Jahrgang 75 (1969) Nr. 82, Seiten 1807-1810.

H. Frank: Das Abrichten von Schleifscheiben mit Diamanten und der Einfluß auf das Schleifergebnis beim Außenrundeinstechschleifen. Dissertation RWTH Aachen, 1963.

R. Gauger: Diamantwerkzeuge zum Abrichten von Schleifscheiben. IDR 1 (1967) 3, Seiten 141-151.

W. König u. J. Messer: Einstellbedingungen beim Abrichten von Schleifscheiben. Schweizer Maschinenmarkt Nr.49/1991, Seiten 26-29.

W. König u. J. Messer: Abrichten von Korundschleifscheiben mit Stehenden Abrichtwerkzeugen. Jahrbuch Schleifen, Honen, Läppen und Polieren, Vulkan-Verlag Essen, 1982, 51. Ausgabe, Seiten 307-317.

J. Messer: Abrichten konventioneller Schleifscheiben mit Stehenden Werkzeugen. Dissertation RWTH Achen, 1983.

E. Salje: Abrichtverfahren mit unbewegten und rotierenden Abrichtwerkzeugen. Jahrbuch Schleifen, Honen, Läppen und Polieren, Vulkan-Verlag Essen, 1981, 50. Ausgabe, Seiten 284-298.

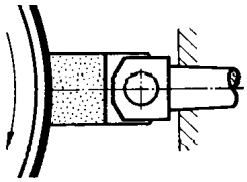
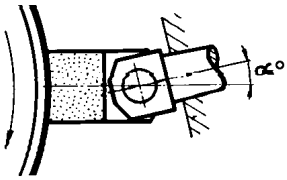
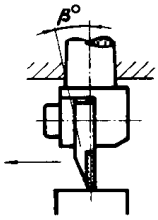
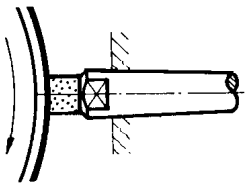
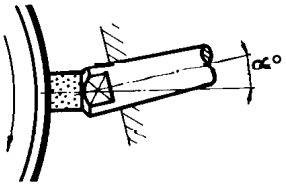
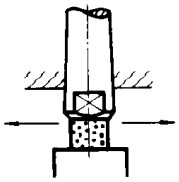
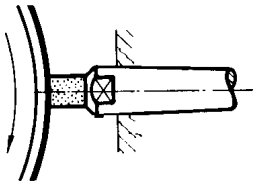
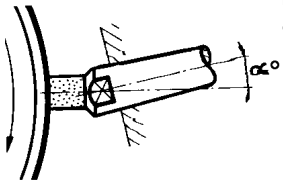
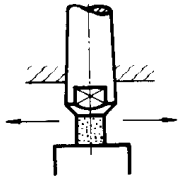
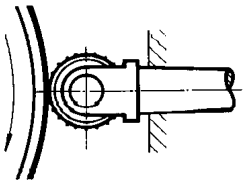
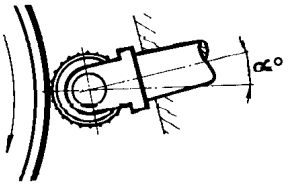
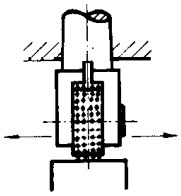
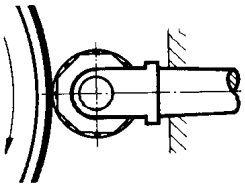
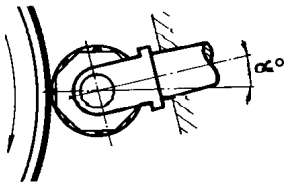
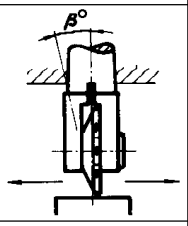
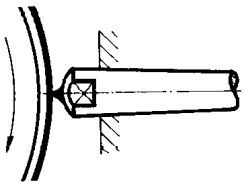
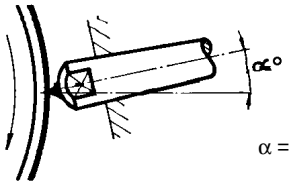
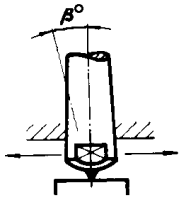
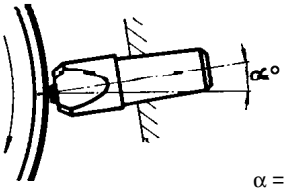
W. Thöing: Untersuchungen über das Abrichten von Schleifscheiben mit Diamantwerkzeugen. Dissertation TH Braunschweig, 1956.

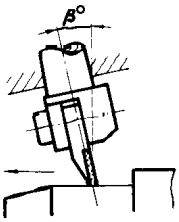
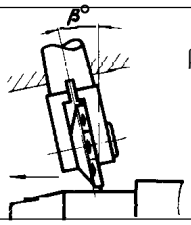
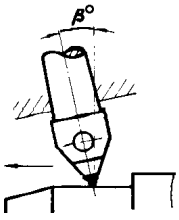
R. Völler: Feinschleifen - heute und morgen. Trennkompendium, Band 1, 1978, ETF Bergisch-Gladbach, Seite 309.

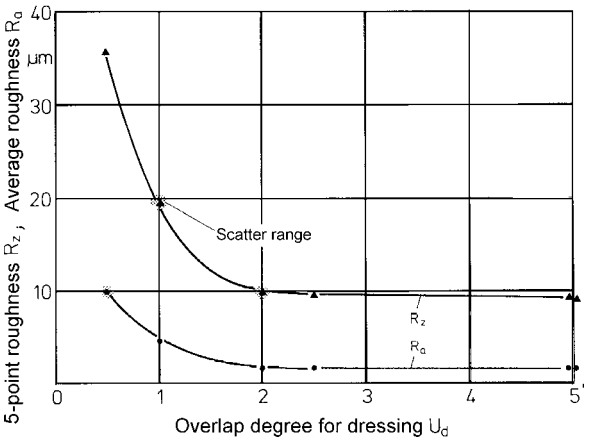
R. Völler: Abnutzung von Abrichtwerkzeugen. Jahrbuch Schleifen, Honen, Läppen und Polieren. Vulkan-Verlag Essen, 1981, 50. Ausgabe, Seiten 249-266.

Technical notes

4. Installation and operating recommendations

Diamond dressing tool	**Working positions of diamond dressers**			
	for **straight** mount	for **inclined** mount	for **straight** dressing	
Diamond Fliese®		 Inclination is compensated by swivelling the Fliese in the swivel holder α = 0...30° or rigid brazed.		Vertical to β = 30°
Igel®		 For inclined position of mount, please indicate inclination angle α°		Vertical
pro-dress®				Vertical
Diamond Rondist 2096/5096				Vertical
Diamond Rondist 1008				Vertical or α = 30°
Single-point diamond dresser		 α = 5...45°		Vertical or α = 15° to main dressing direction
Profile diamond dresser		 α = 5...10°		

Dressing position for **profile** dressing	Active width b_D mm	Overlap factor U_d 1	Dressing infeed a_{ed} mm	Dressing cross feed f_{ad} mm/rev	**Remarks**	
 β = 30...45°	~ 0.8 · d_K d_K = theoretical diamond grit diameter	2-8 see page 25	0.01 to 0.03	0.05-0.5	For straight dressing, slight diagonal position possible = drag-cut effekt = finer surface quality	For **first operation** of dressing tool, do several dressing strokes with increased infeed if possible, so that the dresser can adjust to the grinding wheel radius.
			0.01 to 0.05	0.3-1.0	Due to large number of active diamonds during dressing, the dressing feed f_{ad} and feed rate v_{fad} must be correspondingly increased.	
			0.005 to 0.03	0.05-0.5		
	~ 0.8 · d_K per active grit		0.01 to 0.05	0.3-1.0	Due to four active diamonds, the dressing feed f_{ad} and feed rate v_{fad} must be correspondingly increased.	
 β = 30...45°	~ 0.8 · d_k	2-8 see page 25	0.01 to 0.03	0.05-0.5		
	Corresponds to degree of wear	2-8 see page 25	0.01 to 0.03	0.05-0.15	When sharpness decreases, turn diamond insert approx. 60° around its own axis, remount in good time. Do not allow wear flats to become larger than approx. 1 mm².  **Stop!** **Too late**	
 β = 30...45°	Corresponds to profile of diamond (angle/ radius)	2-8 see page 25	0.01 to 0.02	0.03-0.10	Please note instructions of equipment and machine manufacturer.	

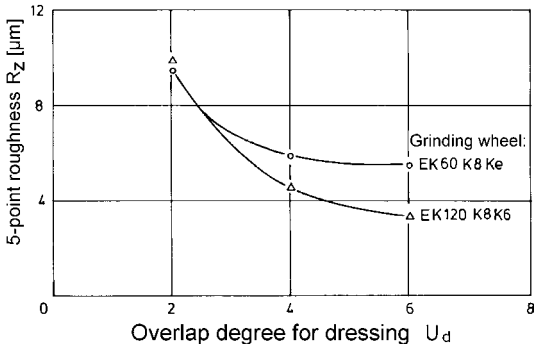


Material: Ck 45N (1.1191)
Grinding wheel: EK60 K8 Ke
Cutting fluid: Emulsion 3%

Grinding parameters:
v_c = 45 m/s
v_w = 0.75 m/s
Q'_w = 3.0 mm³/mm · s
V'_w = 800 mm³/mm

Dressing tool: WINTER needle Fliese FB180
Dressing infeed: a_{ed} = 0.02 mm

Fig. 4: Roughness on ground workpiece is influenced by overlap factor U_d (acc. to Messer).

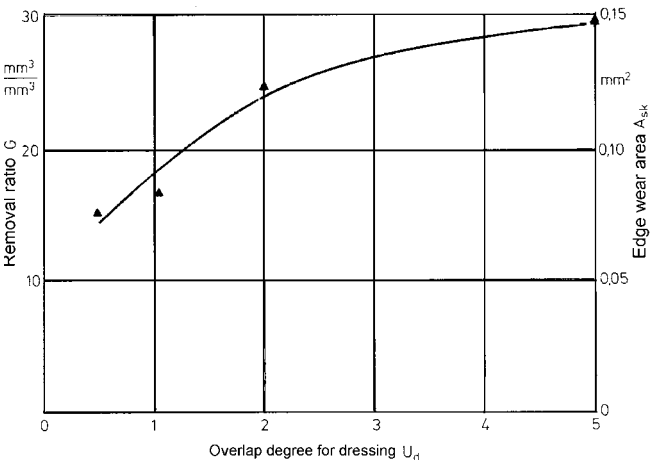


Material: Ck 45N (1.1191)
Grinding wheel: EK60 K8 Ke
EK120 K8 Ke
Cutting fluid: Emulsion 3%

Grinding parameters:
v_c = 45 m/s
v_w = 0.75 m/s
Q'_w = 3.0 mm³/mm · s
V'_w = 200 mm³/mm

Dressing tool: WINTER needle Fliese FB180
Dressing infeed: a_{ed} = 0.03 mm

Fig. 5: Workpiece roughness R_z is influenced by overlap factor U_d and wheel grit (acc. to König, Messer).

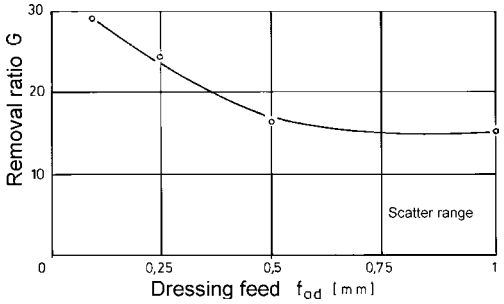


Material: Ck 45N (1.1191)
Grinding wheel: EK60 K8 Ke
Cutting fluid: Emulsion 3%

Grinding parameters:
v_c = 45 m/s
v_w = 0.75 m/s
Q'_w = 3.0 mm³/mm · s
V'_w = 800 mm³/mm

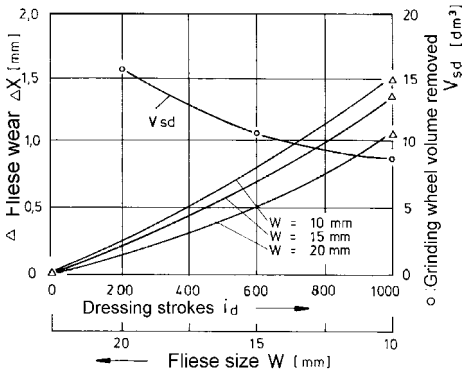
Dressing tool: WINTER needle Fliese FB180
Dressing infeed: a_{ed} = 0.03 mm

Fig. 6: Dressing ratio G of the grinding wheel is influenced by overlap factor U_d (acc. to Messer)



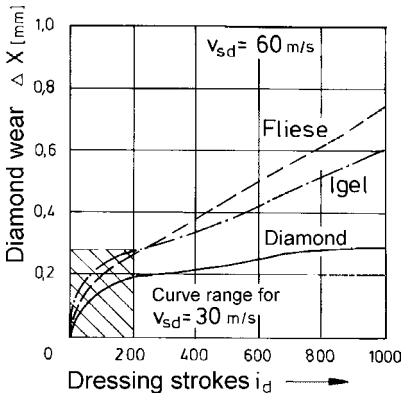
Material:	Ck 45N (1.1191)		
Grinding wheel:	EK60 K8 Ke		
Cutting fluid:	Emulsion 3%		
Grinding parameters:	v_c	=	45 m/s
	v_w	=	0.75 m/s
	Q'_w	=	3.0 mm³/mm · s
	V'_w	=	800 mm³/mm
Dressing tool:	WINTER needle Fliese FB180		
Dressing infeed:	a_{ed}	=	0.02 mm

Fig. 7: Dressing ratio G (life of grinding wheel) is influenced by dressing feed f_{ad} (acc. to Messer).



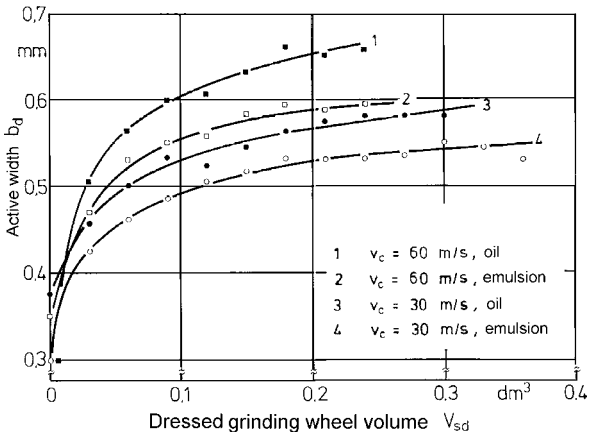
Material:	Centerless grinding wheels Ø 500 x 300 mm, HK28-80a L6 VXM		
Machine:	Lidköpping Centerless 4 B		
Cutting fluid:	Emulsion 2%		
	Q_l	=	4.4 l/min
Parameters:	v_{sd}	=	60 m/s
	n_{sd}	=	2293 rpm
	f_{ad}	=	0.237 mm
	v_{fad}	=	540 mm/min
	a_{ed}	=	0.02 mm
	U_d	=	appr. (0.8 · 2293):540=3.4
Dressing tool:	WINTER needle Fliese		
	W	=	20, 15, 10 mm

Fig. 8: Fliese wear is influenced by Fliese width W and number of dressing strokes i_d, grinding wheel volume removed V_{sd} (acc. to Völler).



Grinding wheel:	Ø 750 x 60 mm 6A2 543 M 6 VAZ		
Cutting fluid:	Emulsion 2% and oil		
Parameters:	2% Emulsion		oil (BP CFL 5171)
	Q_l	= 4 l/min	Q_l = 4 l/min
	v_{sd}	= 30 m/s	v_{sd} = 60 m/s
	a_{ed}	= 0.02 mm	a_{ed} = 0.02 mm
Dressing tool:	WINTER needle Fliese W=10 mm Igel IG 5 Single-point diamond dresser EK 1.0 Basram		

Fig. 9: Diamond wear Δx of Fliese, Igel and single-point dresser are influenced by operating parameters (acc. to Völler).



Grinding wheel:	EKw 70 Jot 7 Ke		
Cutting fluid:	Emulsion 3%		
	oil (18 mm²/s)		
	Free jet Q_{xss} = 5 l/min		
Dressing parameters:	v_c	=	30 m/s
			60 m/s
	a_{ed}	=	0.03 mm
	f_{ad}	=	0.10 mm
			0.05 mm
Dressing tool:	Single-point diamond		
Basram, 1 carat			
Dressing infeed:	a_{ed}	=	0.03 mm

Fig. 10: Change in active width b_D for dressing with various cutting fluids and at various cutting speeds (acc. to König, Vits)

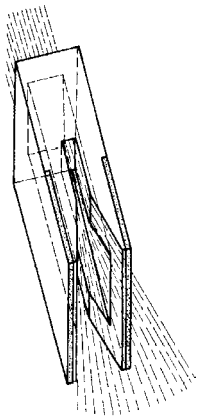


Fig. 11: Twin Fliese with coolant duct

Cutting fluid for dressing

The results of temperature measurements on dressing tools have shown that the cutting fluid nozzles must be large enough and must be directed so as to ensure that even under unfavourable conditions, there is sufficient supply to the contact zone between the dressing tool and the grinding wheel. This is achieved, for example, by WINTER's "Twin Fliese with integrated coolant duct".

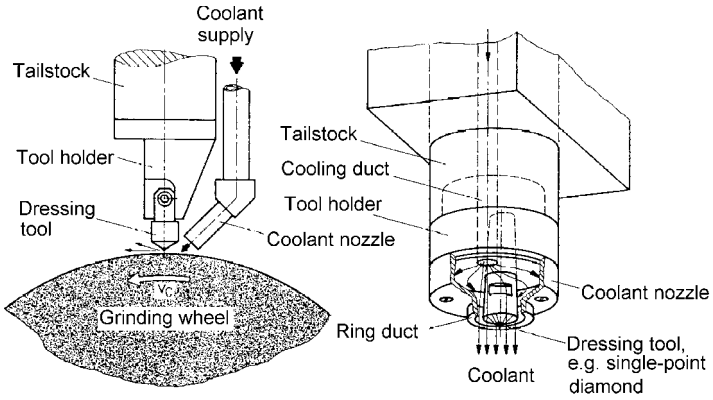


Fig. 12: Dressing tool cooling by jet nozzle and ring nozzle (acc. to König, Vits)

Jet nozzle and ring nozzle

The fluid jet of the jet nozzle is supported by the direction of rotation of the grinding wheel and hits the contact zone at an angle of approx. 45°. If the exit velocity of the coolant is not similar to the peripheral speed of the grinding wheel, there is a danger that the coolant jet will be deflected by the air cushion of the grinding wheel.
The ring nozzle is a proven system for controlled supply of coolant to the contact zone.

WINTER MANUFACTURING PROGRAMME

Grinding	Diamond grinding wheels Diamond grinding pins Diamond hand laps
	Diamond pellets and pads for the optical industry Diamond grinding wheels for the optical industry, flat glass, crystal glass, ceramics and semi-conductor machining
	CBN grinding wheels CBN grinding pins
Files	Diamond files for hand and machine use
Sawing	Diamond and CBN sawblades -continuous rim and segmented cutting edge- Diamond bandsaws and wire saws Diamond ID sawblades
Honing	Diamond and CBN honing tools
Dressing and truing	Single point diamond dressers "Throw away" diamond dressers Diamond-Igel® (hand set multipoint diamond dressers) Diamond-Fliese® (blade type diamond dressers) pro-dress® (randomly set multipoint diamond dressers) WINTER Rondiste and other multi point dressers Ground profile and form diamonds Diamond form rollers Diamond profile rollers Diamond roller dressers and sets Diamond gear-type dressers
Polishing	WINTER-Diaplast® WINTER-Diaplast®-suspension Diamond and CBN micron powders
Other	Diamond grit Unprocessed diamonds Dressing units and sharpening sticks
Inquiries to:	SAINT-GOBAIN Diamantwerkzeuge GmbH & Co. KG Schützenwall 13-17, D-22844 Norderstedt, Tel. +49 40/5258-0, Fax +49 40/5258-381
	Stuttgart office: SAINT-GOBAIN Diamantwerkzeuge GmbH & Co. KG POB 30 12 69, D-70452 Stuttgart, Tel. +49 711/81009-0, Fax +49 711/8100940

	Repair of mounted diamond dressers and ground profile diamonds
Inquiries to:	SAINT-GOBAIN Diamantwerkzeuge GmbH & Co. KG Am Redder 1, 22941 Bargteheide, Telefon: +49 (0) 4532 40 40-0, Fax: +49 (0) 4532 40 40-65

Turning and milling:	Diamond lathe tools for external and internal machining with cutting edges made of: WINTER-Polybloc Typ 1 (polycrystalline) or natural diamond (monocrystalline)
Inquiries to:	SAINT-GOBAIN Diamantwerkzeuge GmbH & Co. KG Unstrutweg 1, D-07743 Jena, Tel. +49 3641/4531-0, Fax +49 3641/4531-25

SAINT-GOBAIN
ABRASIVES

SAINT-GOBAIN
Diamantwerkzeuge
GmbH & Co. KG
Schützenwall 13-17,
D-22844 Norderstedt
P.O.Box 2049,
D-22841 Norderstedt
Tel.: +49 (0)40-52 58-0
Fax: +49 (0)40-52 58-215
Internet:
http://www.winter-dtcbn.de
E-mail:
info-winter@saint-gobain.com

Certified acc. to
DIN EN ISO 14001
Certifcate No.
EM-2129 HH

Certified acc. to
DIN EN ISO 9001
Certifcate No.
QS-453 HH

Organization
for the Safety
of Abrasives (oSa)

LG-Nr. 32 /02 e