



STANDARD PRODUCT RANGE

FRIALIT®-DEGUSSIT® High Performance Ceramics

www.friatec.com/ceramics

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TOLERANCES IN HIGH-TEMPERATURE TECHNOLOGY

The dimensional accuracy of the size of the sintered parts essentially depends on the material and the forming method.

Tubes, multi-bore tubes and rods $\varnothing \geq 3$ mm as well as bands:

Diameter $\pm 5\%$ (but not less than $\pm 0,1$ mm); Cut length tolerance: $\pm 1\%$, < 100 mm upon request;
Straightness: maximum crescent height 0.5% of total length

Tubes, multi-bore tubes and rods $\varnothing < 3$ mm:

Diameter $\pm 5\%$ (but not less than $\pm 0,05$ mm); Cut length tolerance: $\pm 1\%$, < 100 mm upon request;
Straightness: maximum crescent height: 0.5% of total length

Crucibles, boats, combustion trays:

Tolerances $\pm 3\%$ (but not less $\pm 0,1$ mm)

Plates:

Tolerances $\pm 3\%$ (but not less $\pm 0,1$ mm); Deflection: maximum 0,5 % of the diagonal

Insulating beads and grinding bodies:

Tolerances $\pm 3\%$ (but not less than $\pm 0,1$ mm)

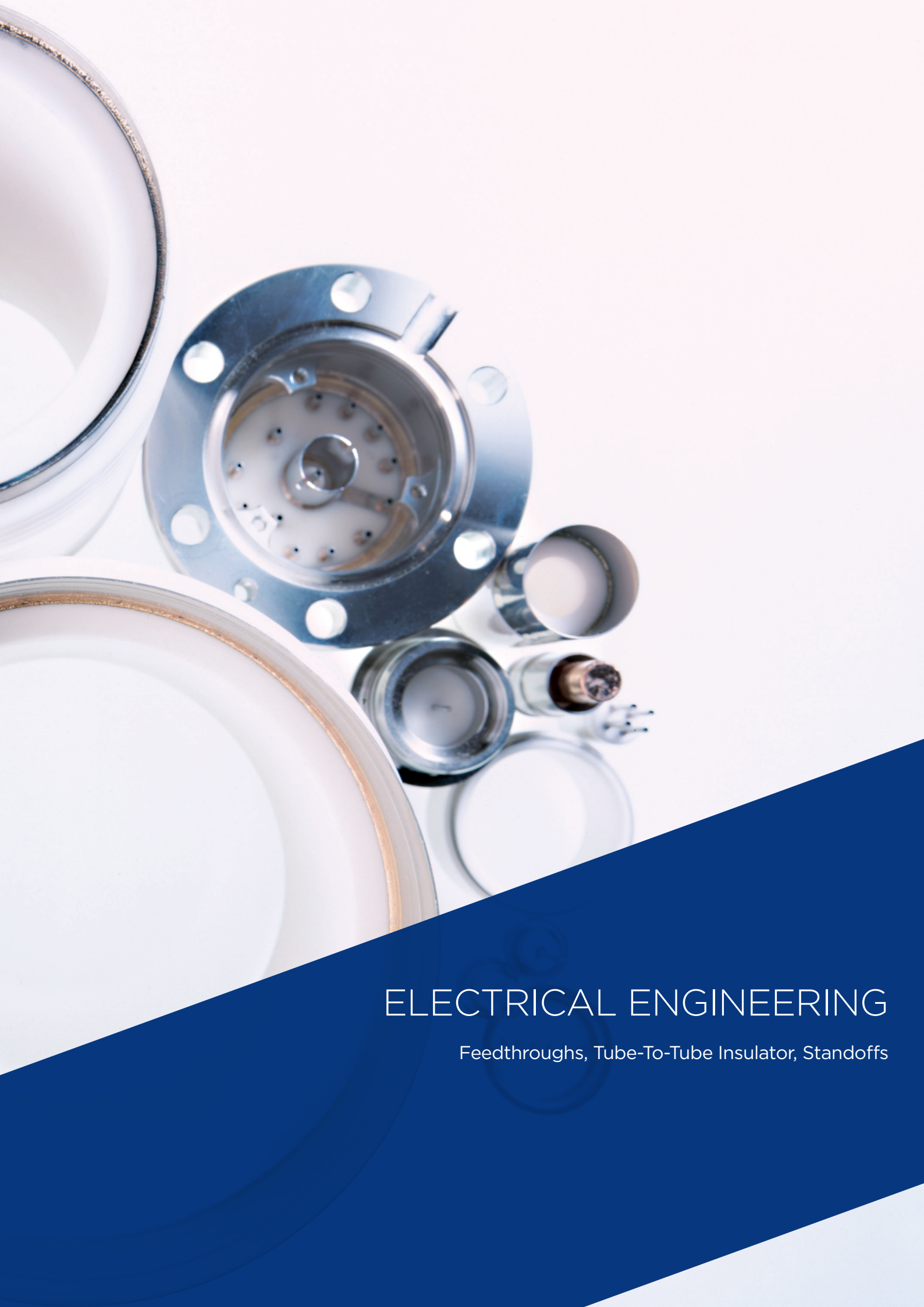
All dimensions in mm

MATERIALS

Material	FRIATEC-Brand	Characterisation
Al_2O_3 Aluminium Oxide	DEGUSSIT AL23	Pure Al_2O_3 , dense, excellent thermal and electrical resistance properties, corrosion resistant, permeable to microwaves
Al_2O_3 Aluminium Oxide	DEGUSSIT AL24	Pure Al_2O_3 , slightly porous, good resistance to thermal shock, extremely good creep strength
Al_2O_3 Aluminium Oxide	DEGUSSIT AL25	Pure Al_2O_3 , very porous, good thermal insulation, highest resistance to thermal shock of all the Al_2O_3 materials
Al_2O_3 Aluminium Oxide	DEGUSSIT DD57	Pure Al_2O_3 , dense, without any binder, red colour, wear resistant and tough, also called 'sintered ruby'
Al_2O_3 Aluminium Oxide	FRIALIT F99,7	Pure Al_2O_3 , dense, extremely resistant to wear and corrosion, very high electrical insulating properties
Al_2O_3 (+ ZrO_2) Aluminium Oxide, fine grain stabilized	FRIALIT FZT	Al_2O_3 toughened with ZrO_2 , dense, high strength, good resistance to thermal shock, extremely resistant to wear and corrosion, fine grain size
ZrO_2 Zirkonium Oxide	FRIALIT FZM	ZrO_2 partially stabilized with MgO , dense, high strength and highly wear resistant, extremely resistant to corrosion and thermal shock
ZrO_2 Zirkonium Oxide	DEGUSSIT FZY	Partially stabilized with Y_2O_3 , dense, high purity ZrO_2 , high temperature and corrosion resistance, ion conducting for measuring oxygen

Available are also parts with different dimensions, in different ceramic and metal materials as well as coated parts.

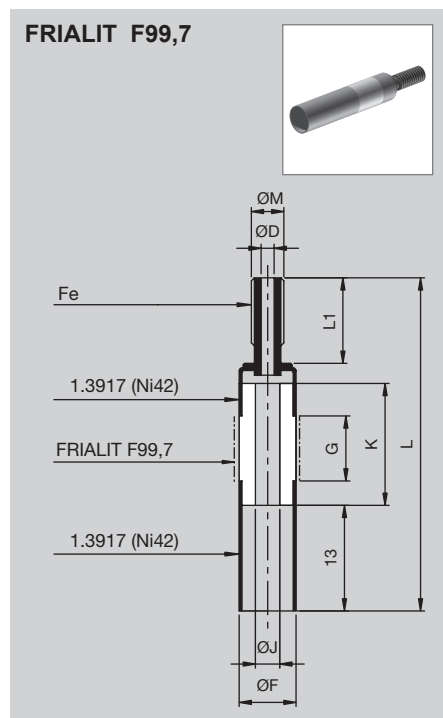




ELECTRICAL ENGINEERING

Feedthroughs, Tube-To-Tube Insulator, Standoffs

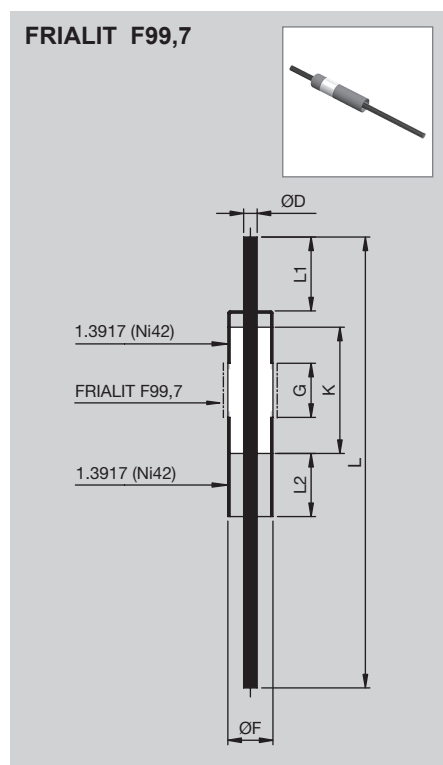
SINGLE TERMINAL FEEDTHROUGHS



Voltage (DC)	Ø M	Ø D	Ø F	Ø J	G	K	L	L1	Product No.
4 kV	M4	1,6	7	3	8	15	41	10	551-1001
6 kV	M6	2,5	9	4	13	20	47	10	551-1002
6 kV	M6	2,5	10,8	5	13	20	47	10	551-1003
6 kV	M8	3,8	13,5	6,5	13	20	54	17	551-1004

Feedthroughs are also available in other dimensions
Also available with welded-on flanges (CF, KF, etc.)

SINGLE TERMINAL FEEDTHROUGHS



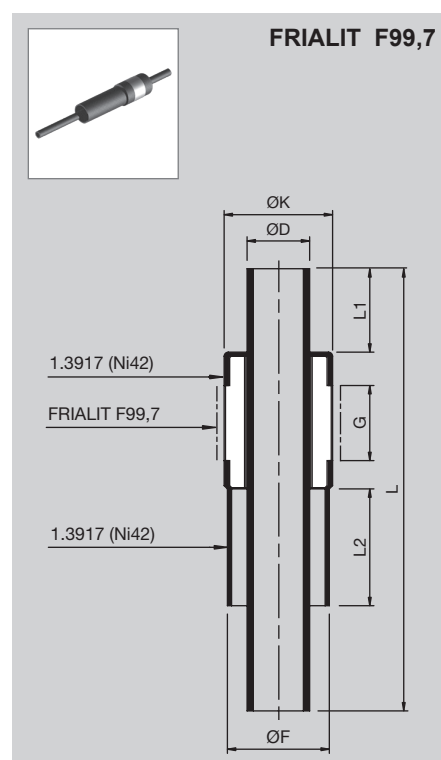
Voltage (DC)	Conductor	Current	Ø D	Ø F	G	K	L	L1	L2	Product No.
2 kV	NiFeCo	4 A	1,5x0,25	5	4	10.5	60	10	7	551-1063
2 kV	NiFeCo	5 A	1,5	5	4	10.5	60	10	7	551-1064
3 kV	NiFeCo	5 A	1,5	5	6	12.5	60	10	7	551-1066
3 kV	Cu	15 A	1,5	5	6	12.5	60	10	7	551-1066-2
4 kV	Ni42	5 A	1,5	7	8	15	57	10	13	551-0412
4 kV	Cu	15 A	1,5	7	8	15	57	10	13	551-0412-1
4 kV	Ni42	8 A	2	7	8	15	52	10	13	551-1006
4 kV	Cu	25 A	2	7	8	15	52	10	13	551-1006-1
5 kV	NiFeCo	5 A	1,5	5	10	16.5	60	10	7	551-1068
5 kV	Cu	15 A	1,5	5	10	16.5	60	10	7	551-1068-2
6 kV	Ni42	12 A	3	9	13	20	58	10	13	551-1007
6 kV	Cu	40 A	3	9	13	20	58	10	13	551-1007-1
6 kV	Ni42	20 A	4	10,8	13	20	58	10	13	551-1008
6 kV	Cu	60 A	4	10,8	13	20	58	10	13	551-1008-1
6 kV	Ni42	25 A	5	13,5	13	20	65	10	13	551-1009
6 kV	Cu	80 A	5	13,5	13	20	65	10	13	551-1009-1
8 kV	Cu	120 A	8	19,8	16	23	68	10	13	551-1010-1

Feedthroughs are also available in other dimensions
Also available with welded-on flanges (CF, KF, etc.)

SINGLE TERMINAL FEEDTHROUGHS

Voltage (DC)	Conductor	Current	Ø D	Ø F	G	L	Ø K	L1	L2	Product No.
1 kV	Ni42	4 A	1,5x0,25	4	2,8	35	4,5	6	10	551-1491
1 kV	Ni42	5 A	1,5	4	2,8	35	4,5	6	10	551-1425
1 kV	Cu	5 A	1,5	4	2,8	35	4,5	6	10	551-1425-1
4 kV	Ni42	30 A	7,5x0,75	12	8	53	13	10	14	551-1633
4 kV	Cu	90 A	7,5x0,75	12	8	53	13	10	14	551-1633-1

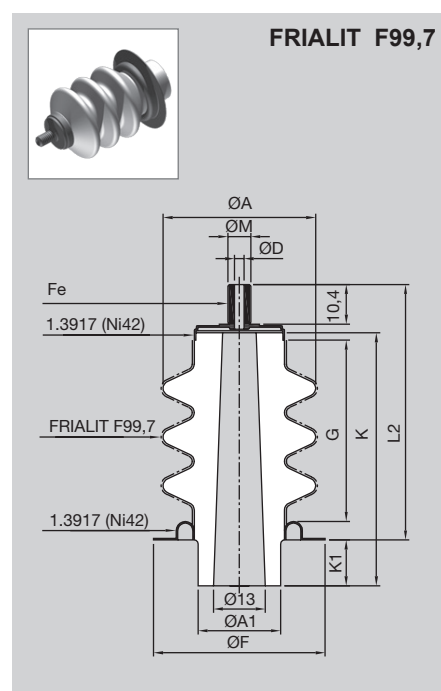
Feedthroughs are also available in other dimensions
Also available with welded-on flanges (CF, KF, etc.)



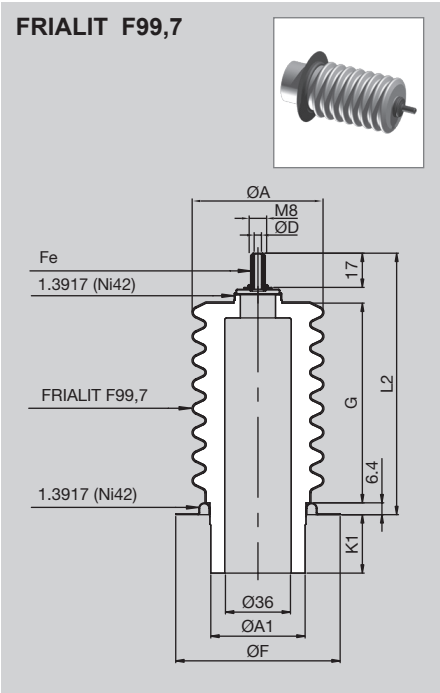
SINGLE TERMINAL FEEDTHROUGHS

Voltage (DC)	No. of Flutes	Leakage Path	Ø M	Ø D	Ø F	Ø A	Ø A1	G	K	K1	L2	Product No.
25 kV	3	54	M6	2,5	45	40	22	45	66	12	67	551-1012

This feedthrough could be adjusted with different conductors for special electrical standards
Also available with welded-on flanges (CF, KF, etc.)



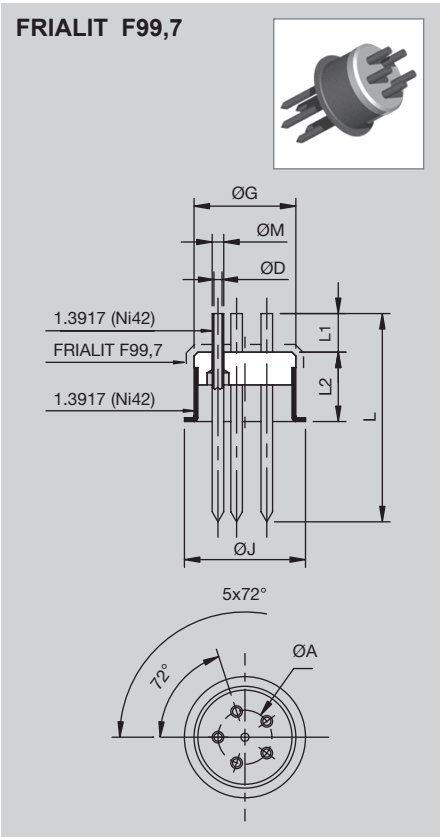
SINGLE TERMINAL FEEDTHROUGHS



Voltage (DC)	No. of Flutes	Leakage Path	Ø M	Ø D	Ø F	Ø A	Ø A1	G	K1	L2	Product No.
50 kV	8	150	M8	3,8	88,9	70	52	108	31,6	141.4	551-0970
Order-related manufacture											

This feedthrough could be adjusted with different conductors for special electrical standards
Also available with welded-on flanges (CF, KF, etc.)

MULTITERMINAL FEEDTHROUGHS



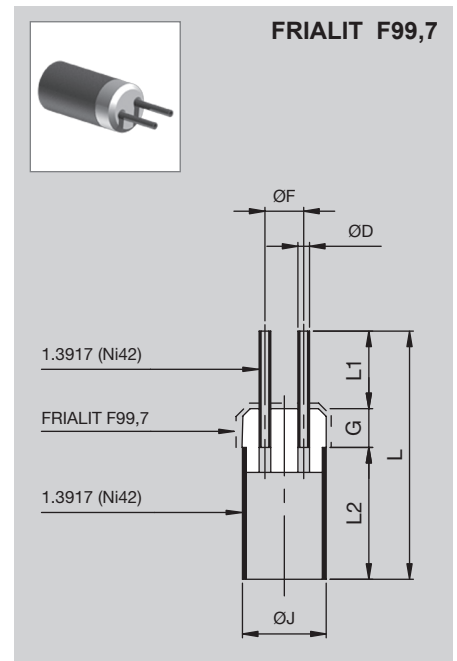
Voltage (DC)	Current	Ø D	Ø A	Ø G	Ø J	L	L1	L2	No. of Feedthroughs	Product No.
500 V Pin-Pin 1 kV Pin-Flange	4 A	1,5x0,25	7	13,2	15,7	27	5	9	5	552-2548
Order-related manufacture										

Feedthrough are also available in other dimensions
Also available with welded-on flanges (CF, KF, etc.)

MULTITERMINAL FEEDTHROUGHS

Voltage (DC)	Current	Ø D	Ø F	Ø J	G	L	L1	L2	No. of Feedthroughs	Product No.
500 V Pin-Pin	4 A	1,5x0,25	5	10,8	5	32	10	17	2	552-0861
1 kV Pin-Flange										
500 V Pin-Pin	4 A	1,5x0,25	5	10,8	5	32	10	17	4	552-0838
1 kV Pin-Flange										

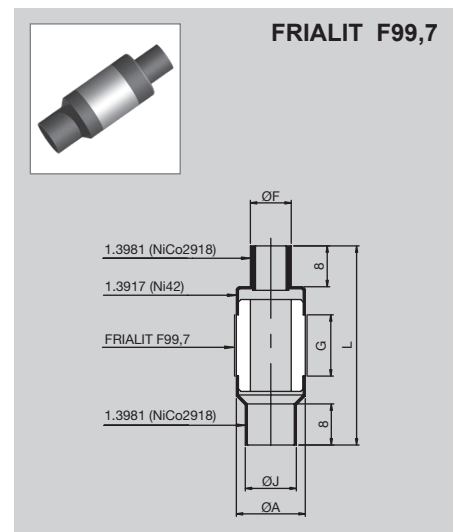
Feedthroughs are also available in other dimensions
Also available with welded-on flanges (CF, KF, etc.)



TUBE-TO-TUBE INSULATORS

Voltage (DC)	Ø F	Ø A	Ø J	G	L	Product No.
5 kV	8x6	13,5	10	12	39	559-1464

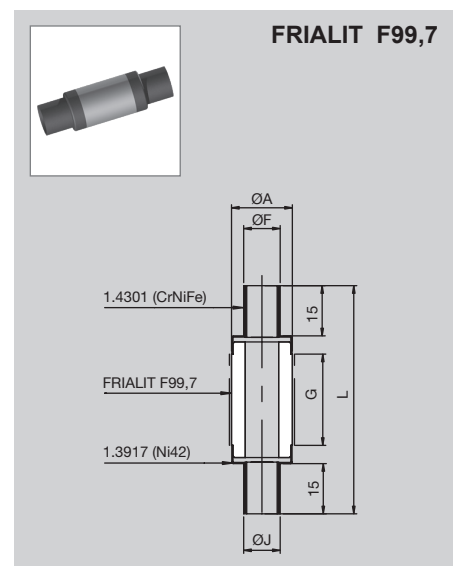
Tube-To-Tube Insulator is also available in other dimensions
Also available with welded-on flanges (CF, KF, etc.)



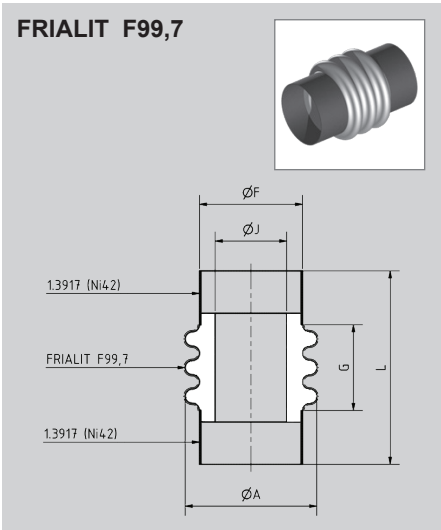
TUBE-TO-TUBE INSULATORS

Voltage (DC)	Ø F	Ø A	Ø J	G	L	Product No.
15 kV	18	23	18	30	74	559-3664-2

Tube-To-Tube Insulator is also available in other dimensions
Also available with welded-on flanges (CF, KF, etc.)



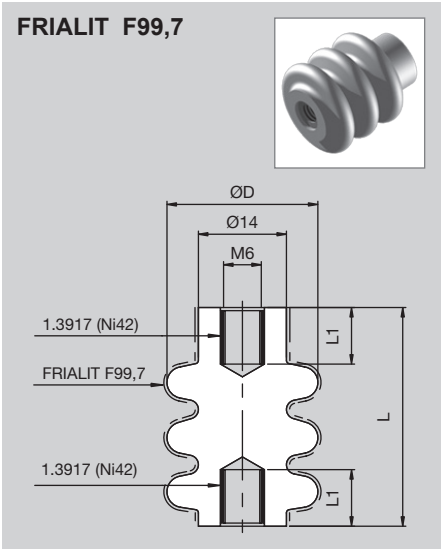
TUBE-TO-TUBE INSULATORS



Voltage (DC)	No. of Flutes	Leakage Path	Ø F	Ø A	Ø J	G	L	Product No.
15 kV	3	44	36	46	25	30	67.6	559-0654

Tube-To-Tube Insulator is also available in other dimensions
Also available with welded-on flanges (CF, KF, etc.)

STANDOFFS



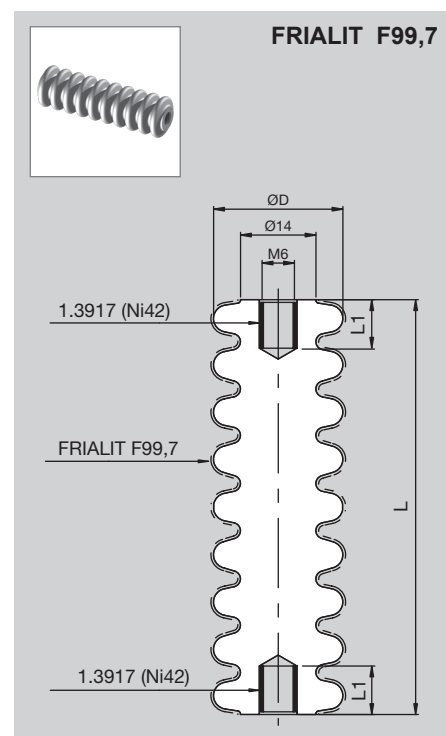
Voltage (DC)	Leakage Path	Ø D	L	L1	Product No.
15 kV	40	24	30	9	558-1162

Standoff is also available in other dimensions

STANDOFFS

Voltage (DC)	Leakage Path	Ø D	L	L1	Product No.
40 kV	130	24	80	9	558-2105

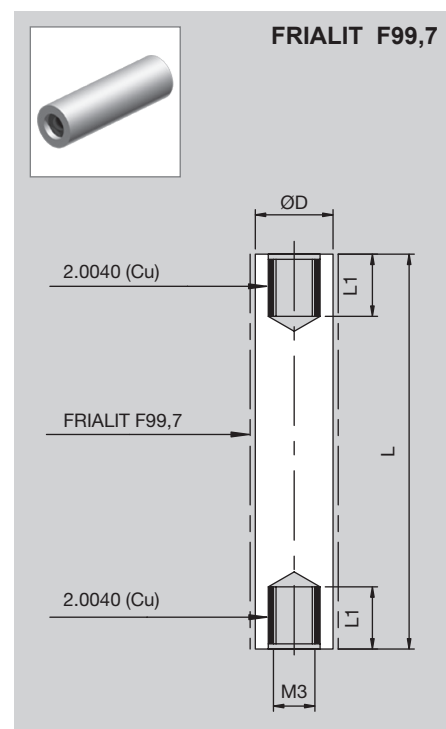
Customized parts with different lengths, different diameters or different number of flutes are also available



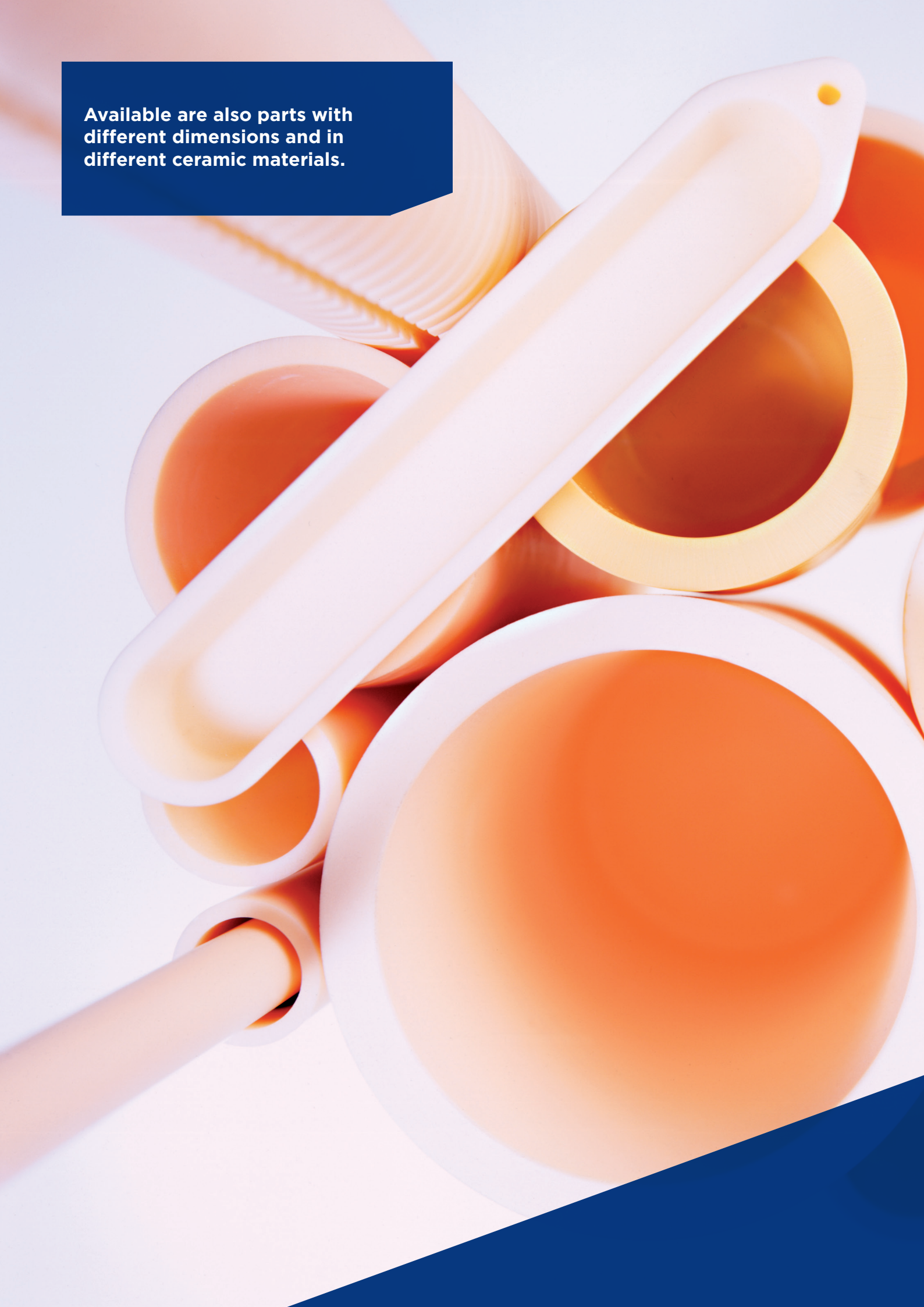
STANDOFFS

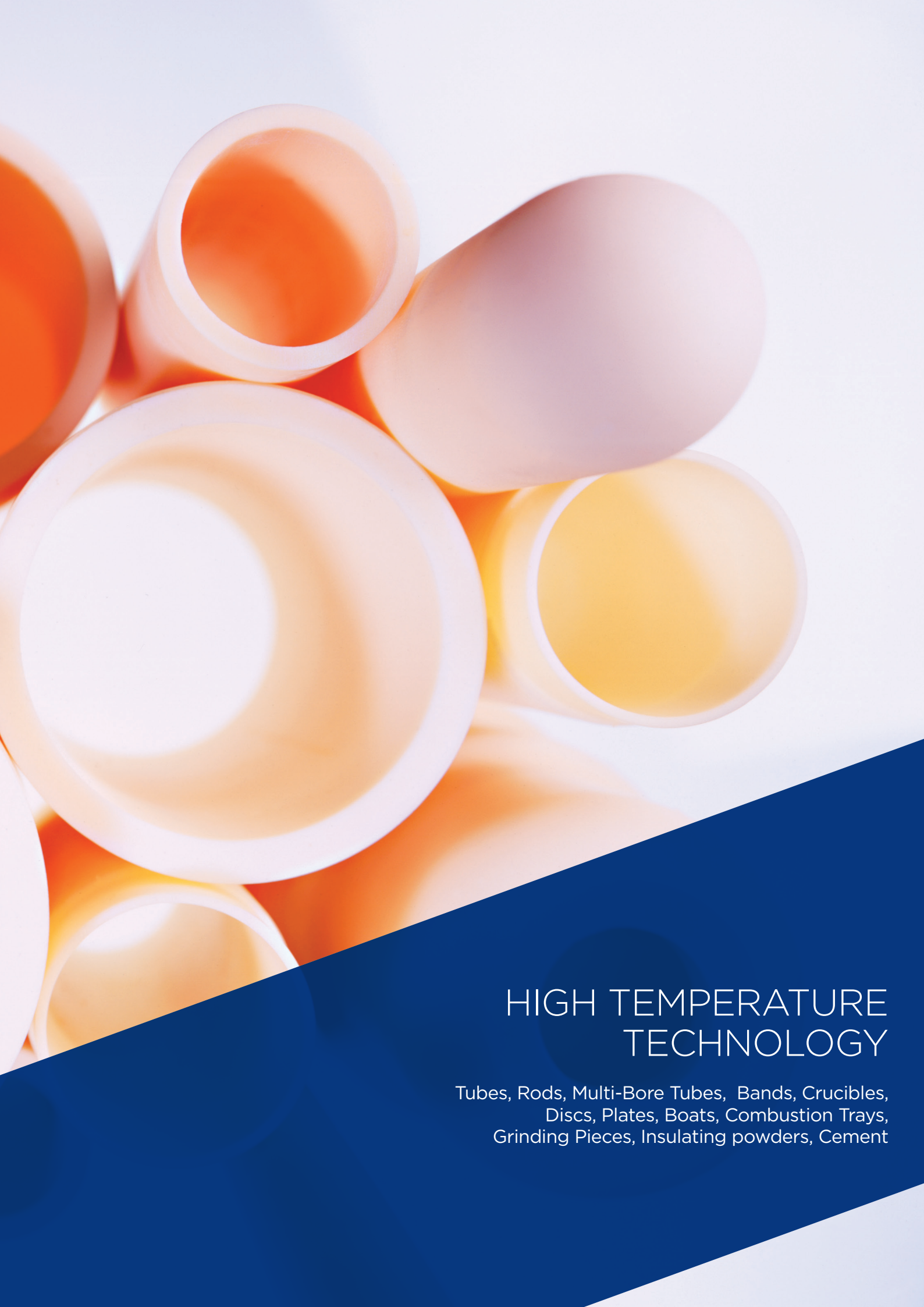
Voltage (DC)	Leakage Path	Ø D	L	L1	Product No.
10 kV	25	7,5	25	8	558-1511
15 kV	38	9,5	38.1	6	558-1984

Standoffs are also available in other dimensions



Available are also parts with
different dimensions and in
different ceramic materials.

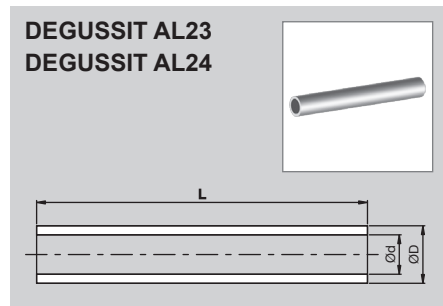




HIGH TEMPERATURE TECHNOLOGY

Tubes, Rods, Multi-Bore Tubes, Bands, Crucibles,
Discs, Plates, Boats, Combustion Trays,
Grinding Pieces, Insulating powders, Cement

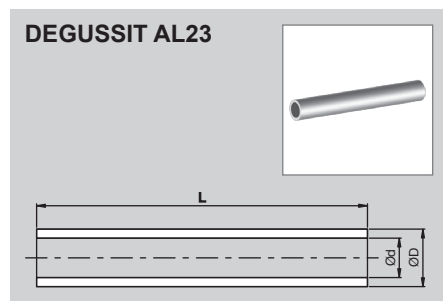
TUBES



Ø D	Ø d	L max.	Product No. DEGUSSIT AL23
3	1,6	1000	122-11003-0
4	2	1000	122-11004-0
5	3	1000	122-11005-0
6	3	2100	122-11006-0
6	4	1500	122-11006-2
7	4	2100	122-11007-0
7	5	2100	122-11007-1
8	5	2100	122-11008-0
10	6	2100	122-11010-0
10	7	2100	122-11010-3
11	7	2100	122-11011-0
12	8	2100	122-11012-0
15	10	2100	122-11015-0
16	12	2100	122-11016-0
20	15	2100	122-11020-0
24	18	2100	122-11024-0
25	20	2100	122-11025-0
30	25	2100	122-11030-0
35	29	2100	122-11035-0
40	34	2100	122-11040-0
45	38	2100	122-11045-0
48	40	2100	122-11048-0
50	42	2100	122-11050-0
55	47	2100	122-11055-0
60	50	2100	122-11060-0
65	55	2100	122-11065-0
70	60	2100	122-11070-0
80	70	2100	122-11080-0

Ø D	Ø d	L max.	Product No. DEGUSSIT AL24
10	6	2100	122-21010-0
12	8	2100	122-21012-0
15	10	2100	122-21015-0
20	15	2100	122-21020-0
24	18	2100	122-21024-0
30	24	1500	122-21030-0
40	32	1500	122-21040-0
50	40	1500	122-21050-0
60	50	1500	122-21060-0
70	54	1500	122-21070-0

LARGE-DIAMETER TUBES



Ø D	Ø d	L max.	Product No.
90	80	1600	122-11090-0
95	85	1500	122-11095-1
100	85	1500	122-11100-0
105	90	1500	122-11105-0
115	100	1600	122-11115-1
117	105	1700	122-11117-0
120	105	1700	122-11120-0
130	110	1800	122-11130-0
140	120	1800	122-11140-0
150	130	1100	122-11150-1
170	150	1500	122-11170-0

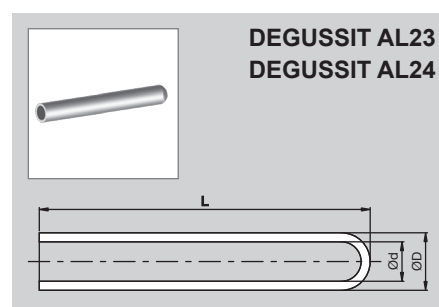
Order-related manufacture

TUBES - ONE END CLOSED

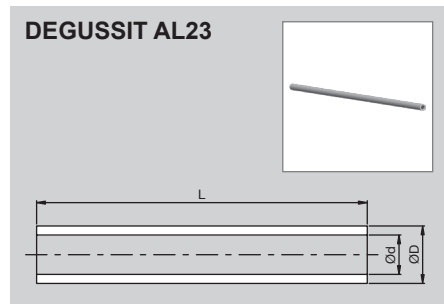
Ø D	Ø d	L max.	Product No. DEGUSSIT AL23
3	1,6	1000	101-11003-0
4	2	1000	101-11004-0
5	3	1000	101-11005-0
6	3	2100	101-11006-0
6	4	2100	101-11006-1
7	4	2100	101-11007-0
7	5	2100	101-11007-1
8	5	2100	101-11008-0 *
10	6	2100	101-11010-0 *
10	7	2100	101-11010-1
11	7	2100	101-11011-0
12	8	2100	101-11012-0 *
15	10	2100	101-11015-0 *
16	12	2100	101-11016-0
20	15	2100	101-11020-0 *
24	18	2100	101-11024-0 *
25	20	2100	101-11025-0
30	25	800	101-11030-0
35	29	800	101-11035-0
40	34	800	101-11040-0
45	38	800	101-11045-0
50	42	800	101-11050-0
55	47	800	101-11055-0
60	50	800	101-11060-0
65	55	800	101-11065-0
70	60	800	101-11070-0
80	70	800	101-11080-0

Ø D	Ø d	L max.	Product No. DEGUSSIT AL24
10	6	2100	101-21010-0
12	8	2100	101-21012-0
15	10	2100	101-21015-0
20	15	2100	101-21020-0
24	18	2100	101-21024-0

* standard size for thermocouple
 (see chapter: protective tubes for standard length one end closed)
 Available with flange (Surcharge: +10% of Price per Metre)

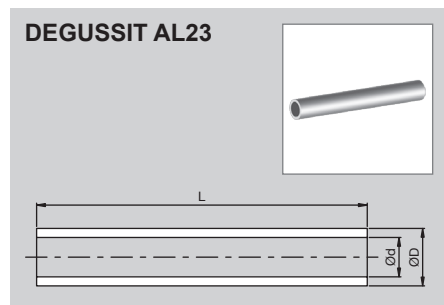


THIN INSULATING TUBES



Ø D	Ø d	L max.	Product No.
0,5	0,2	400	121-11050-0
0,6	0,3	400	121-11060-0
0,8	0,4	400	121-11080-0
1	0,5	400	121-11100-0
1	0,6	400	121-11100-1
1,1	0,6	400	121-11110-0
1,2	0,8	400	121-11120-0
1,5	0,5	400	121-11150-1
1,5	1	400	121-11150-0
1,6	0,8	400	121-11160-0
1,7	1,1	400	121-11170-0
2	0,7	400	121-11200-5
2	1	400	121-11200-0
2	1,2	400	121-11200-1
2	1,5	400	121-11200-2
2,5	1,3	400	121-11250-0
2,7	1,7	400	121-11270-0
2,8	2,2	400	121-11280-1

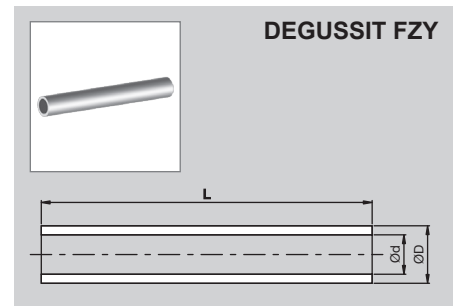
TUBES - THIN WALLED



Ø D	Ø d	L max.	Product No.
3	2	400	123-11003-0
4	3	400	123-11004-0
5	4	400	123-11005-0
6	5	400	123-11006-0
7	6	400	123-11007-0
8	7	400	123-11008-0
10	9	400	123-11010-0
12	11	400	123-11012-0
16	15	400	123-11016-0
20	19	400	123-11020-0

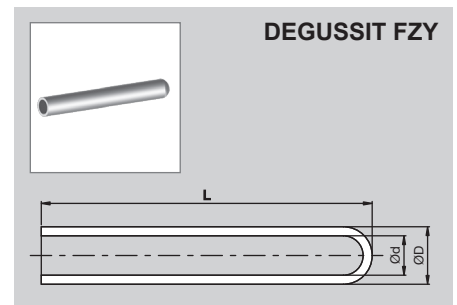
TUBES FOR OXYGEN SENSORS

Ø D	Ø d	L max.	Product No.
6	3	1000	122-56006-0
6	4	1000	122-56006-1
8	5	1000	122-56008-0
10	6	1000	122-56010-0
10	7	1000	122-56010-1
13	9	1000	122-56013-0
15	10	1000	122-56015-0
Order-Related Product			



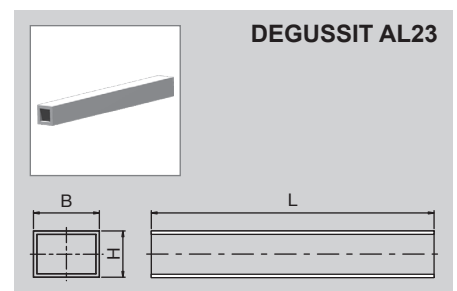
TUBES FOR OXYGEN SENSORS - ONE END CLOSED

Ø D	Ø d	L max.	Product No.
6	3	1000	101-56006-0
6	4	1000	101-56006-1
8	5	1000	101-56008-0
10	6	1000	101-56010-0
10	7	1000	101-56010-1
13	9	1000	101-56013-0
15	10	1000	101-56015-0
Order-Related Product			



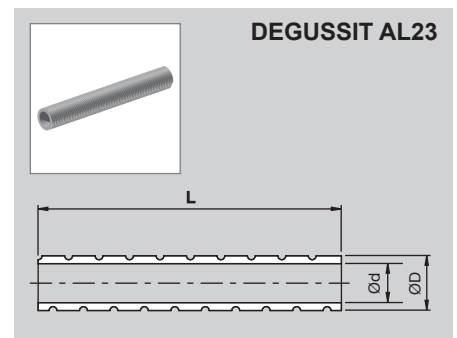
RECTANGULAR TUBES

B	H	Wall Thickness	L max.	Product No.
15	15	2,5	2150	191-11015-0
16	12	2,5	2150	191-11016-0
20	20	3	2150	191-11020-0
Order-Related Product				

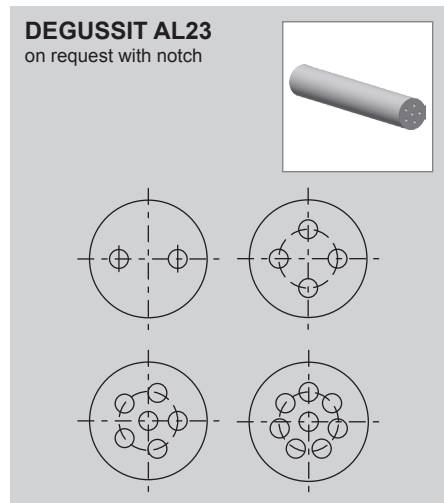


RIBBED TUBES

Ø D	Ø d	L max.	Thread breadth	Thread depth	Thread pitch	Product No.
21	15	500	1	1	1.5	281-11021-0
27	20	500	1	1	1.5	281-11027-0
33	25	500	1	1	1.5	281-11033-0
38	29	500	1.5	1.2	2	281-11038-0
44	34	500	2	1.6	2.5	281-11044-0
50	38	500	2	2	2.5	281-11050-0
60	47	500	2.5	2	5	281-11060-0



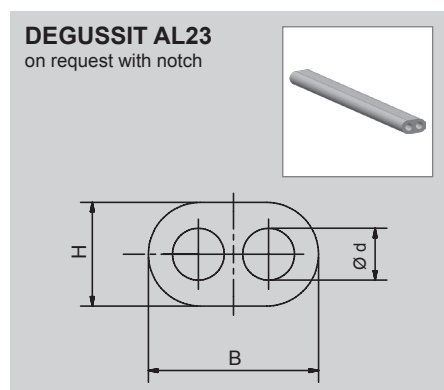
MULTI-BORE TUBES - ROUND



Ø D	Ø d	Number of bores	L max.	Product No.
0,9	0,2	2	400	141-11090-0
1,2	0,3	2	400	141-11120-0
1,2	0,2	4	400	142-11120-0
1,55	0,4	2	400	141-11155-0
2	0,5	2	400	141-11200-0
2	0,4	6	400	142-11200-0
2,35	0,5	4	400	142-11235-0
2,5	0,7	2	1200	141-11250-0
2,8	0,7	4	800	142-11280-0
3	0,8	2	2100	143-11030-0
4	0,8	2	2100	143-11040-0 *
4	0,8	4	2100	144-11040-0 *
4	1,2	2	2100	143-11040-1
5	1,2	2	2100	143-11050-0
5	1	4	2100	144-11050-0
5,5	1,2	4	2100	144-11055-0 *
6	1,5	2	2100	143-11060-0 *
8	0,8	6	2100	144-11080-0
8	0,8	8	2100	144-11080-1
8	1,6	2	2100	143-11080-0 *
8,5	1,5	4	2100	144-11085-0 *

* standard size for thermocouple
(see chapter: multi-bore tubes for standard-length thermocouples)

MULTI-BORE TUBES - OVAL

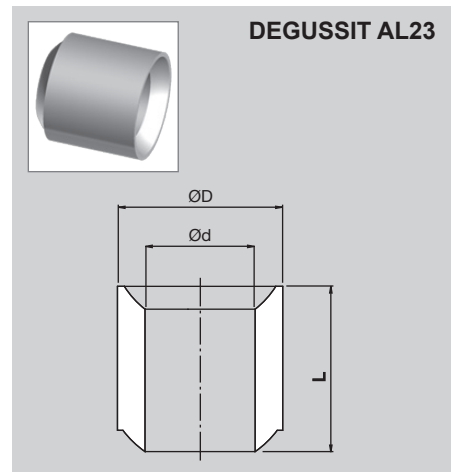


B	H	Ø d	Number of bores	L max.	Product No.
1.55	0,9	0,25	2	400	145-11155-0
2.3	1,4	0,7	2	400	145-11230-0
3	1,5	0,8	2	400	145-11030-0
4.2	2,2	1,2	2	400	145-11042-0

INSULATING BEADS

Ø D	Ø d	L	Product No.
3,5	1	3	160-11035-00003
4	1,5	4,7	160-11040-00004
5	2,5	5	160-11050-00005
7	3,8	7	160-11070-00007
8,5	5	10	160-11085-00010

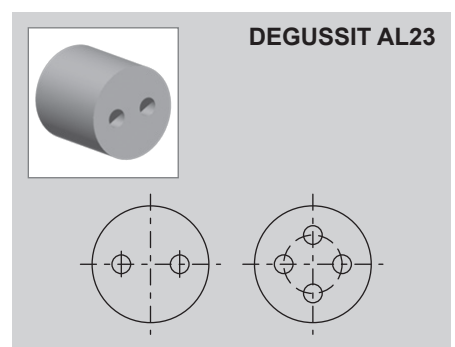
Packing unit: 100 pcs.



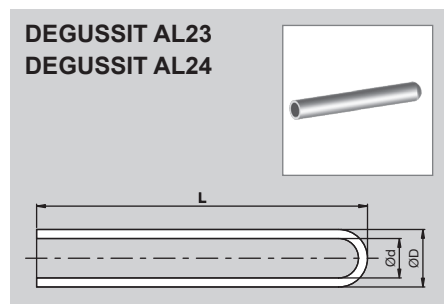
INSULATING BEADS

Ø D	Ø d	L	Number of bores	Product No.
4	0,8	4	2	161-11040-00004
4	0,8	10	2	161-11040-00010
4	0,8	4	4	162-11040-00004
4	0,8	10	4	162-11040-00010

Packing unit: 100 pcs.



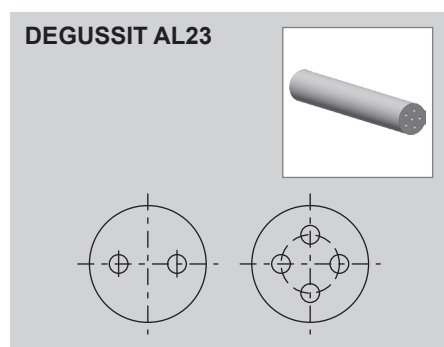
PROTECTIVE TUBES FOR STANDARD-LENGTH THERMOCOUPLES ONE END CLOSED



Ø D	Ø d	L max.	Product No. DEGUSSIT AL23
8	5	2100	100-11008-0
10	6	2100	100-11010-0
12	8	2100	100-11012-0
15	10	2100	100-11015-0
20	15	2100	100-11020-0
24	18	2100	100-11024-0

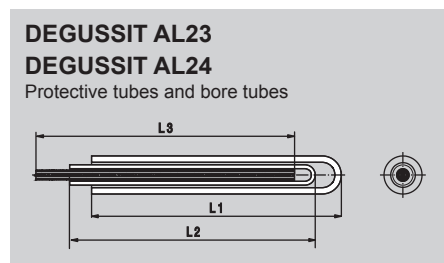
Ø D	Ø d	L max.	Product No. DEGUSSIT AL24
15	10	2100	100-21015-0
20	15	2100	100-21020-0
24	18	2100	100-21024-0

MULTI-BORE TUBES FOR STANDARD-LENGTH THERMOCOUPLES



Ø D	Ø d	Number of bores	L max.	Product No.
4	0,8	2	2100	140-11040-0
6	1,5	2	2100	140-11060-0
8	1,6	2	2100	140-11080-0
4	0,8	4	2100	140-11040-1
5,5	1,2	4	2100	140-11055-0
8,5	1,5	4	2100	140-11085-0

THERMOCOUPLES

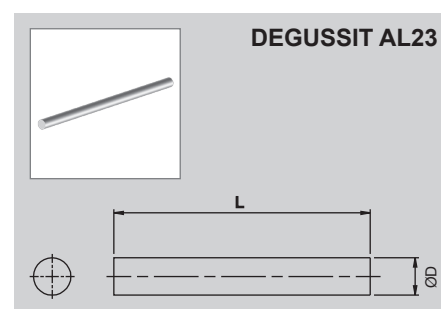


Length outer protective tube L1	Length inner protective tube L2	Length bore tube L3
180	200	205
250	270	275
355	375	380
500	530	560
710	740	770
1000	1030	1060
1400	1430	1460
2000	2030	2060

For a standard thermocouple with an outer protective tube 180 you need an inner protective tube 200 and bore tube 205.

RODS

Ø D	L max.	Product No.
0,5	400	181-11050-0
0,6	400	181-11060-0
0,8	400	181-11080-0
1	400	181-11100-0
1,2	400	181-11120-0
1,5	400	181-11150-0
1,7	400	181-11170-0
2	400	181-11200-0
2,5	400	181-11250-0
3	1000	182-11003-0
4	1000	182-11004-0
5	1000	182-11005-0
6	1000	182-11006-0
7	1000	181-11007-0
8	1000	182-11008-0
10	1000	182-11010-0
12	1000	182-11012-0



BARS

Ø D	L max.	Product No.
15	400	625-13015-0
16	400	625-13016-1
20	400	625-13020-1
25	400	625-13025-1
30	400	625-13030-0
35	400	625-13035-0
40	400	625-13040-0
45	400	625-13045-0
50	400	625-13050-0
55	400	625-13055-0
60	400	625-13060-0
65	400	625-13065-0
70	400	625-13070-0
75	400	625-13075-0
80	400	625-13080-0
90	400	625-13090-0

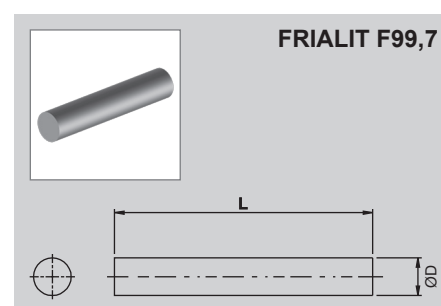
Order-Related Product

Tolerances

Diameter: +1 / +4 mm

Length: +/- 5 mm

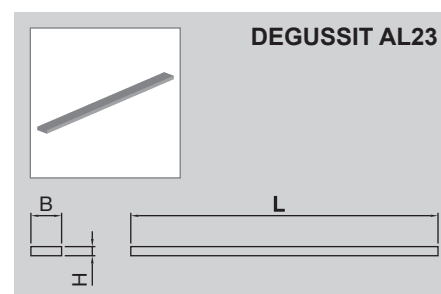
Deflection: max. 0,5 % of the total length



BANDS

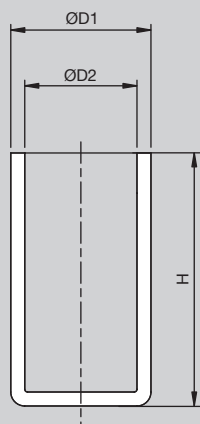
B	H	L max.	Product No.
1	1	400	183-11010-0
6	3	400	183-11060-1
7	2	400	183-11070-2
8	4	400	183-11080-2
10	1	400	183-11100-1
10	2	400	183-11100-6
10	3	400	183-11100-0
11	3	400	183-11110-0
15	3	400	183-11150-0
16	8	400	183-11160-3

Order-Related Product



CRUCIBLES - CYLINDRICAL, FLAT BASE

DEGUSSIT AL23
DEGUSSIT AL24
DEGUSSIT AL25
DEGUSSIT FZY



Ø D1	Ø D2	H	Approx. Vol. ml	Product No. DEGUSSIT AL23
10	8	15	0.7	201-11010-0150
20	16	30	6	201-11020-0300
30	26	40	20	201-11030-0400
35	30	50	40	201-11035-0500
40	36	60	60	201-11040-0600
50	44	75	110	201-11050-0750
65	55	100	225	201-11065-1000
85	73	150	600	201-11085-1500
110	100	150	1,100	201-11110-1500

Ø D1	Ø D2	H	Approx. Vol. ml	Product No. DEGUSSIT AL24
20	16	30	6	201-21020-0300
30	26	40	20	201-21030-0400
35	30	50	40	201-21035-0500
40	36	60	60	201-21040-0600
50	44	75	110	201-21050-0750
65	55	100	225	201-21065-1000
85	73	150	600	201-21085-1500

Ø D1	Ø D2	H	Approx. Vol. ml	Product No. DEGUSSIT AL25
145	125	160	1,760	201-22145-1600
120	100	200	1,500	201-22120-2000

Ø D1	Ø D2	H	Approx. Vol. ml	Product No. DEGUSSIT FZY
10	8	15	0.7	201-56010-0150
20	16	30	6	201-56020-0300
30	26	40	20	201-56030-0400
35	30	50	40	201-56035-0500
40	36	60	60	201-56040-0600
50	44	75	110	201-56050-0750
65	55	100	225	201-56065-1000
85	73	150	600	201-56085-1500

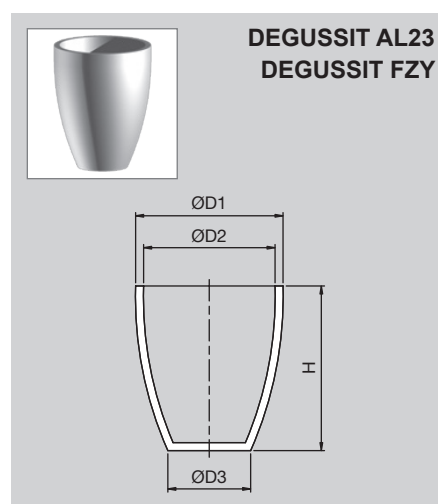
Order-Related Product

CRUCIBLES CONICAL HIGH FORM

Ø D1	Ø D2	Ø D3	H	Approx. Vol. ml	Product No. DEGUSSIT AL23
20	17	11	25	3	202-11020-0250
25	21	13	30	6	202-11025-0300
30	26	15	38	12	202-11030-0380
35	31	18	45	19	202-11035-0450
45	40	22	55	37	202-11045-0550
60	53	30	65	76	202-11060-0650
73	67	35	90	190	202-11073-0900

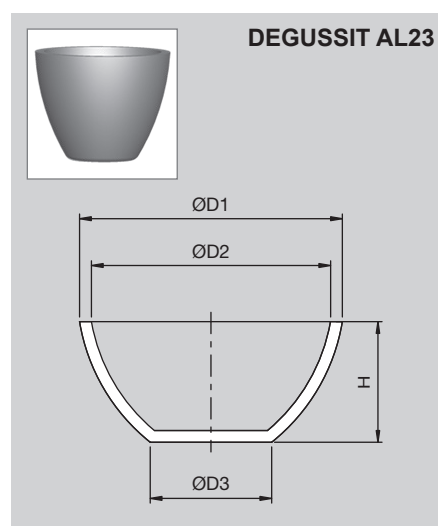
Ø D1	Ø D2	Ø D3	H	Approx. Vol. ml	Product No. DEGUSSIT FZY
20	17	11	25	4	202-56020-0250
60	53	30	65	76	202-56060-0650
65	55	32	100	150	202-56065-1000
73	67	35	90	190	202-56073-0900
85	78	35	100	400	202-56085-1001
100	91	50	120	500	202-56100-1200

Order-Related Product



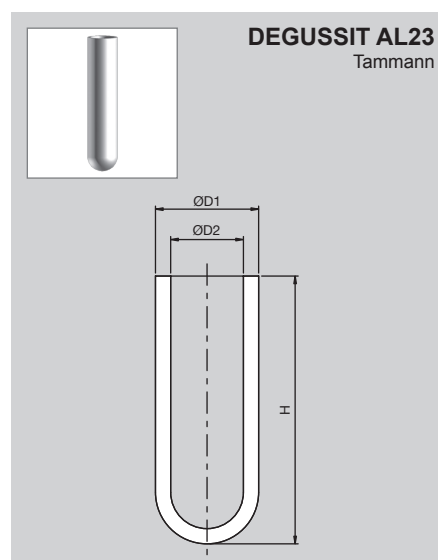
CRUCIBLES CONICAL WIDE FORM

Ø D1	Ø D2	Ø D3	H	Approx. Vol. ml	Product No.
25	22	13	20	4	203-11025-0200
30	26	15	24	6.5	203-11030-0240
40	36	20	32	16	203-11040-0320
43	38	22	37	22	203-11043-0370
50	45	25	40	34	203-11050-0400
65	59	33	55	88	203-11065-0550
88	80	44	60	170	203-11088-0600



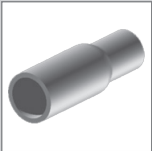
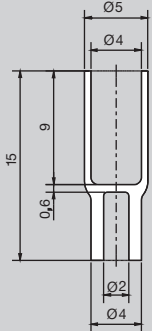
CRUCIBLES - CYLINDRICAL, ROUND BASE

Ø D1	Ø D2	H	Approx. Vol. ml	Tammann No.	Product No.
6	3	30	0.2	-	204-11006-0300
8	5	50	1	-	204-11008-0500
10	6	80	2.3	-	204-11010-0800
12	8	100	5	-	204-11012-1000
15	10	100	8	-	204-11015-1000
20	15	100	17	-	204-11020-1000
25	20	100	30	-	204-11025-1000
16	12	190	22	I a	204-11016-1900
24	20	190	60	I b	204-11024-1900
34	28	190	123	I c	204-11034-1900
24	20	280	90	II a	204-11024-2800
34	28	280	180	II b	204-11034-2800
44	38	280	300	II c III a	204-11044-2800
55	47	280	490	III b	204-11055-2800
68	58	280	790	III c	204-11068-2800
68	58	390	1,070	IV a	204-11068-3900



SLIP-ON CRUCIBLES

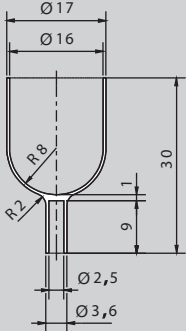
DEGUSSIT AL23

Approx. Vol. ml	Product No.
0.11	209-11000-0063
Order-Related Product	

SLIP-ON CRUCIBLES

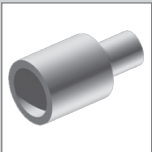
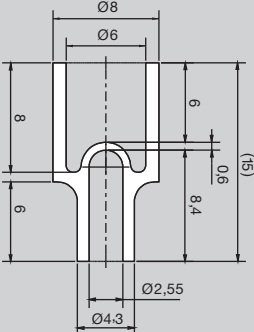
DEGUSSIT AL23

Approx. Vol. ml	Product No.
3.5	209-11000-0064
Order-Related Product	

SLIP-ON CRUCIBLES

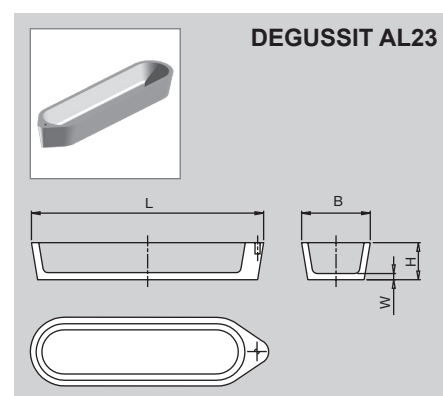
DEGUSSIT AL23

Approx. Vol. ml	Product No.
0.2	209-11000-0068
Order-Related Product	

BOATS

L	B	H	W	Approx. Vol. ml	Product No.
32	9	6	2	0.2	221-11032-0090
48	9	6	2	0.4	221-11048-0090
69	9	6	2	0.7	221-11069-0090
50	15	8	2,5	1.7	221-11050-0150
87	15	8	2,5	2.8	221-11087-0150
112	15	8	2,5	4.7	221-11112-0150
92	18	10	3	5.5	221-11092-0180
118	18	10	3	7	221-11118-0180
58	23	13	3	5.2	221-11058-0230
92	23	13	3	9.5	221-11092-0230
124	23	13	3	13.5	221-11124-0230
102	31	17	3	20	221-11102-0310
130	31	17	3	27	221-11130-0310



L	B	H	W	Approx. Vol. ml	Product No.
50	25	20	3	12	222-11050-0250
50	50	20	3	26	222-11050-0500
75	50	20	4	35	222-11075-0500
100	50	30	4	95	222-11100-0500

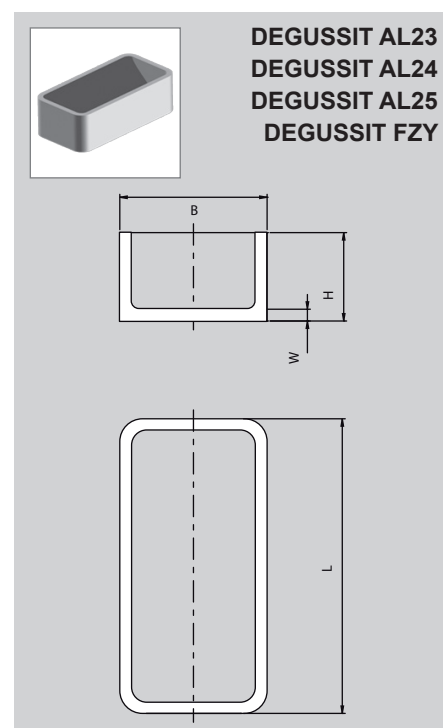
L	B	H	W	Approx. Vol. ml	Product No.
145	85	30	5	212	222-21145-0850

L	B	H	W	Approx. Vol. ml	Product No.
205	125	50	10-15	660	222-22205-1250 *

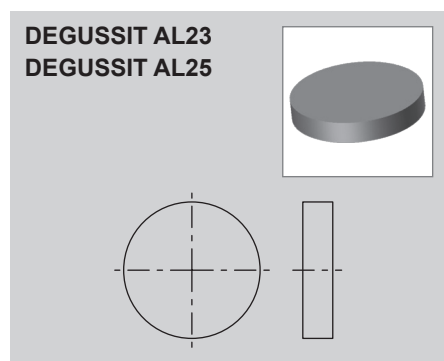
L	B	H	W	Approx. Vol. ml	Product No.
50	25	20	3	12	222-56050-0250
50	50	20	3	26	222-56050-0500
75	50	20	4	35	222-56075-0500
100	50	30	4	95	222-56100-0500
Order-Related Product					

* W 10-15 conical

COMBUSTION TRAYS



PLATES - ROUND

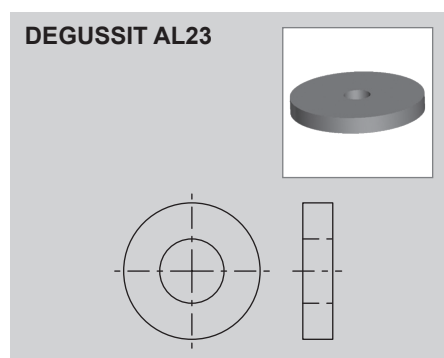


Ø D	H	Product No. DEGUSSIT AL23
10	3	211-11010-0300
15	3	211-11015-0300
20	3	211-11020-0300
25	4	211-11025-0400
30	5	211-11030-0500
35	5	211-11035-0500
40	6	211-11040-0600
45	6	211-11045-0600
50	6	211-11050-0600
52	6	211-11052-0600
55	6	211-11055-0600
60	7	211-11060-0700
70	7	211-11070-0700
80	8	211-11080-0800

Ø D	H	Product No. DEGUSSIT AL25
130	15	211-22130-1500
150	20	211-22150-2000
200	25	211-22200-2500

Plates sizes of plates up to approx. Ø 350 x 20 upon request

PLATES - ROUND WITH HOLE



Ø D1	Ø D2	H	Product No.
20	6	3	212-11020-0300
25	6	4	212-11025-0400
30	6	5	212-11030-0500
35	6	5	212-11035-0500
40	8	6	212-11040-0600
45	8	6	212-11045-0600
50	10	6	212-11050-0600
52	10	6	212-11052-0600
55	10	6	212-11055-0600
60	10	7	212-11060-0700
70	10	7	212-11070-0700
80	10	8	212-11080-0800

Plates sizes of plates up to approx. Ø 350 x 20 upon request

PLATES - RECTANGULAR

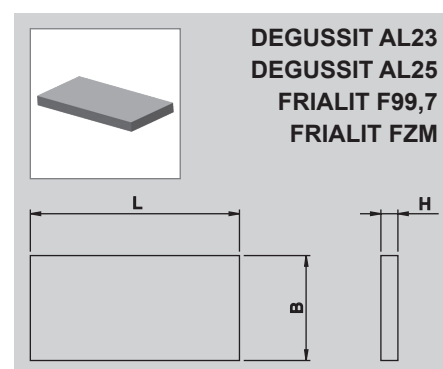
L	B	H	Product No. DEGUSSIT AL23
50	25	4	215-11050-0400
50	50	4	215-11050-0401
75	50	4	215-11075-0400
100	50	4	215-11100-0400

L	B	H	Product No. DEGUSSIT AL25
105	50	10	215-22105-1000
115	115	15	215-22115-1500
145	70	15	215-22145-1500
145	85	15	215-22145-1501

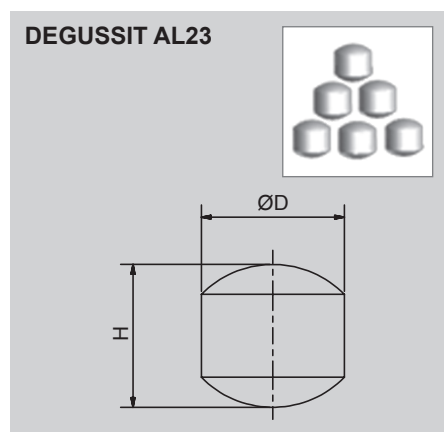
L	B	H	Product No. FRIALIT F99,7
90	90	9	690-13090-6
102	17	9,3	690-13102-2
103	66.5	9,3	690-13103-0
103	37.5	9,3	690-13103-2

L	B	H	Product No. FRIALIT FZM
90	90	9	790-55090-9
99.8	17.4	9,1	790-55099-0

Plates sizes of plates up to approx. 700 x 350 x 20 upon request



GRINDING BODIES



Ø D	H	pcs./l	pcs./kg	kg/l	Product No.
5	5	8325	3540	2,35	230-11000-0505
10	10	1020	440	2,3	230-11000-0510
15	15	350	157	2,25	230-11000-0515
20	20	120	53	2,25	230-11000-0520
30	30	34	15	2,2	230-11000-0530

INSULATING POWDER - CALCINED

Aluminium oxide
Al₂O₃ >99,5 %

Type	Crystal size	Product No.
VM	99% < 10 µm	251-11000-1025

Primarily for **electrical insulation** of cathode heaters and as fillers of casting resins.

INSULATING POWDER - FUSED

Aluminium oxide
Al₂O₃ >99,7%

Type	Crystal size	Product No.
E No. 100	~ 150 µm	251-11000-1100
E No. 250	~ 40 µm	251-11000-1250

Primarily in dry filling for **thermal insulation** of electrical furnaces.

CEMENT

Aluminium oxide
Al₂O₃ >95%

Type	Crystal size	Product No.
AL2O3	~ 150 µm	251-15000-1010

For sealing thermocouples in furnace linings, embedding heating coils or platinum crucibles, etc.
The cement is diluted with water to the required consistency. Since it is not cold-hardening, it contains 0.5% organic binder in order to increase its dry strength. This binder is burned off completely during the heating process. Above 1200 °C progressive hardening of the cement begins, as a result of sintering.

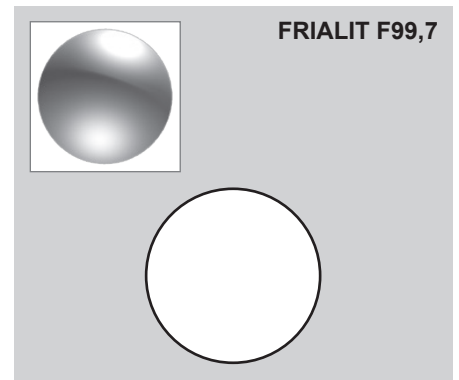
PRECISION BALLS

Ø D	Product No.
1,0000	610-13100-0
1,5000	610-13150-0
2,0000	610-13200-0
2,3810	610-13238-1
2,5000	610-13250-0
3,0000	610-13300-0
3,1750	610-13317-5
3,5000	610-13350-0
4,0000	610-13400-0
4,7625	610-13476-3
5,0000	610-13500-0
6,0000	610-13600-0
6,3500	610-13635-0
7,0000	610-13700-0
8,0000	610-13800-0
8,7320	610-13873-2
9,0000	610-13900-0
9,5250	610-13952-5
10,0000	611-13010-0
12,0000	611-13012-0
12,7000	611-13012-7
13,0000	611-13013-0
14,0000	611-13014-0
16,0000	611-13016-0
17,0000	611-13017-0
18,0000	611-13018-0
19,0000	611-13019-0
20,0000	611-13020-0
22,0000	611-13022-0
26,0000	611-13026-0
29,0000	611-13029-0
30,0000	611-13030-0
32,0000	611-13032-0
35,0000	611-13035-0
40,0000	611-13040-0
45,0000	611-13045-0
50,0000	611-13050-0
54,0000	611-13054-0
60,0000	611-13060-0
65,0000	611-13065-0
70,0000	611-13070-0
90,0000	611-13090-0
100,0000	611-13100-0

Quality: Grade 25, polished surface

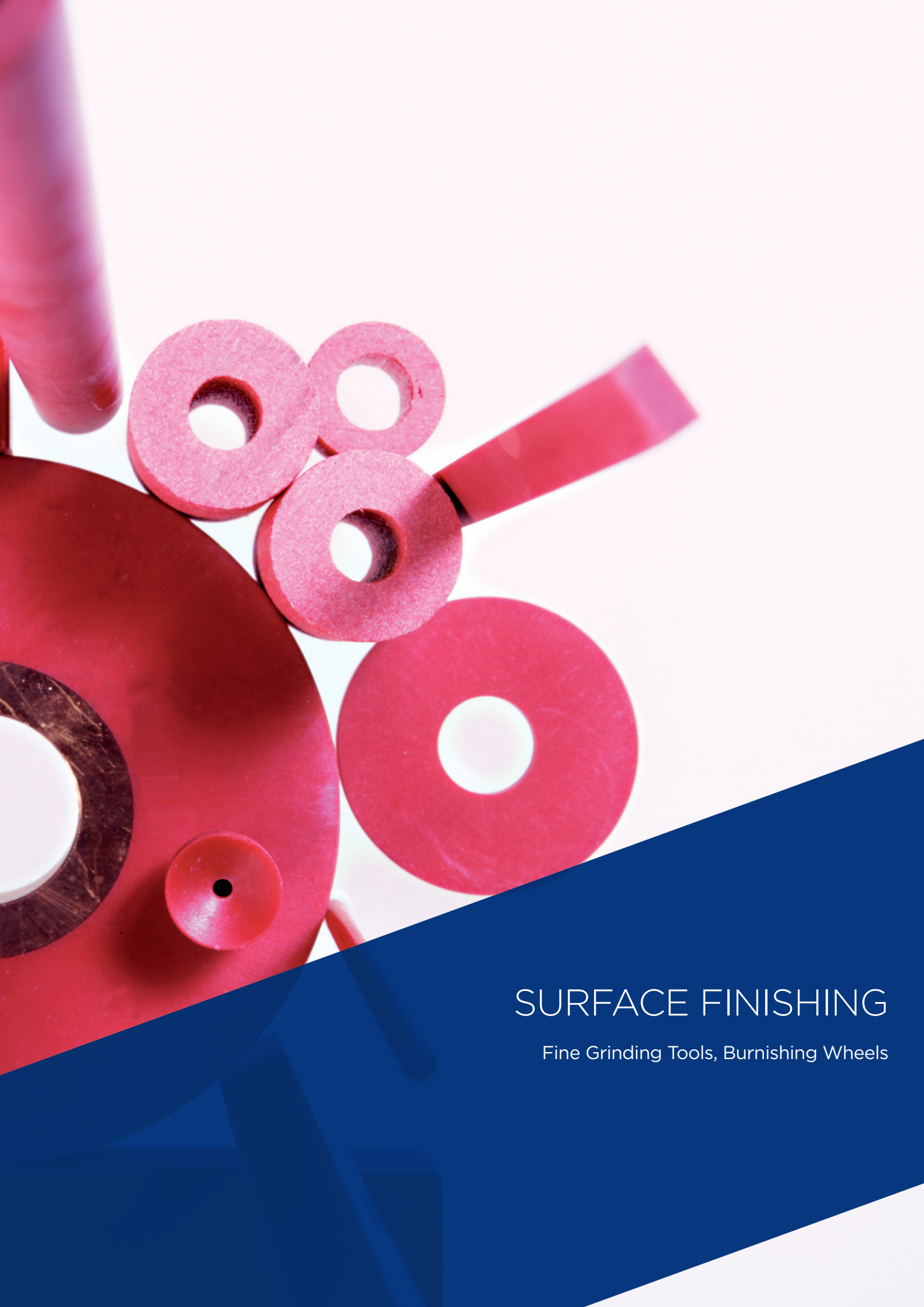
Sphericity: 0,6 µm

Diameter Tolerance: 2,5 µm



Available are also parts with different dimensions and in different ceramic materials.

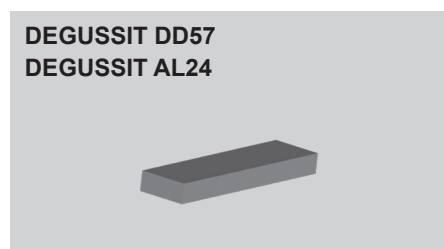




SURFACE FINISHING

Fine Grinding Tools, Burnishing Wheels

FINE-GRINDING TOOL - BENCHSTONE



Dimensions	Colour	Type	Product No. DEGUSSIT DD57
100 x 25 x 10	ruby red	fine	901-41100-0
100 x 25 x 10	ruby red	medium	902-41100-0
150 x 25 x 15	ruby red	fine	901-41101-0
150 x 25 x 15	ruby red	medium	902-41101-0
200 x 50 x 12	ruby red	fine	901-41102-0
200 x 50 x 12	ruby red	medium	902-41102-0

Dimensions	Colour	Type	Product No. DEGUSSIT AL24
100 x 25 x 10	white	coarse	903-21100-0
150 x 25 x 15	white	coarse	903-21101-0

FINE-GRINDING TOOL - BENCHSTONE IN WOODEN CASE, REMOVABLE



Dimensions	Colour	Type	Product No.
120 x 50 x 10	ruby red	fine / medium	904-41111-0

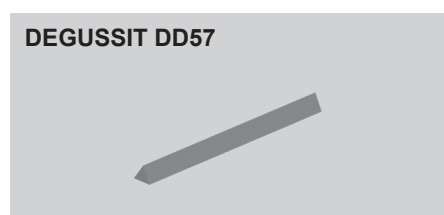
FINE-GRINDING TOOL - BENCHSTONE IN WOODEN CASE, GLUED IN



Dimensions	Colour	Type	Product No. DEGUSSIT DD57
100 x 25 x 10	ruby red	fine	901-41110-0
100 x 25 x 10	ruby red	medium	902-41110-0
120 x 50 x 10	ruby red	fine	901-41111-0
120 x 50 x 10	ruby red	medium	902-41111-0
200 x 50 x 12	ruby red	fine	901-41112-0
200 x 50 x 12	ruby red	medium	902-41112-0

Dimensions	Colour	Type	Product No. DEGUSSIT AL24
100 x 25 x 10	white	coarse	903-21110-0

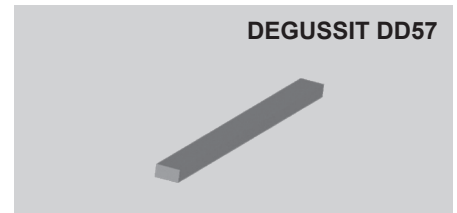
FINE-GRINDING TOOL - TRIANGULAR



Dimensions	Colour	Type	Product No.
100 x 4	ruby red	fine	901-41200-0
100 x 4	ruby red	medium	902-41200-0
100 x 6	ruby red	fine	901-41201-0
100 x 6	ruby red	medium	902-41201-0
100 x 6	ruby red	coarse	903-44201-0
100 x 8	ruby red	fine	901-41202-0
100 x 8	ruby red	medium	902-41202-0
100 x 8	ruby red	coarse	903-44202-0
100 x 10	ruby red	fine	901-41203-0
100 x 10	ruby red	medium	902-41203-0
100 x 10	ruby red	coarse	903-44203-0
120 x 13	ruby red	fine	901-41205-0
120 x 13	ruby red	medium	902-41205-0
120 x 13	ruby red	coarse	903-44205-0

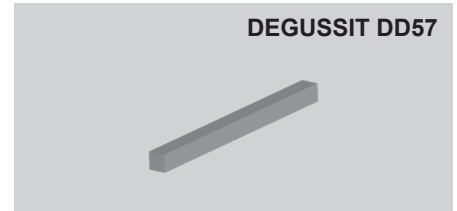
FINE-GRINDING TOOL - RECTANGULAR

Dimensions	Colour	Type	Product No.
100 x 6 x 3	ruby red	fine	901-41220-0
100 x 6 x 3	ruby red	medium	902-41220-0
100 x 8 x 6	ruby red	fine	901-41221-0
100 x 8 x 6	ruby red	medium	902-41221-0
100 x 8 x 6	ruby red	coarse	903-44221-0



FINE-GRINDING TOOL - SQUARE

Dimensions	Colour	Type	Product No.
100 x 4	ruby red	fine	901-41210-0
100 x 4	ruby red	medium	902-41210-0
100 x 6	ruby red	fine	901-41211-0
100 x 6	ruby red	medium	902-41211-0
100 x 6	ruby red	coarse	903-44211-0
100 x 8	ruby red	fine	901-41212-0
100 x 8	ruby red	medium	902-41212-0
100 x 8	ruby red	coarse	903-44212-0
100 x 10	ruby red	fine	901-41213-0
100 x 10	ruby red	medium	902-41213-0
100 x 10	ruby red	coarse	903-44213-0
120 x 13	ruby red	fine	901-41214-0
120 x 13	ruby red	medium	902-41214-0
120 x 12	ruby red	coarse	903-44216-0



FINE-GRINDING TOOL - SEMI-CIRCULAR

Dimensions	Colour	Type	Product No.
100 x 10	ruby red	medium	902-41231-0
100 x 10	ruby red	coarse	903-44231-0



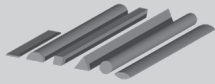
FINE-GRINDING TOOL - CIRCULAR

Dimensions	Colour	Type	Product No.
100 x 4	ruby red	fine	901-41270-0
100 x 4	ruby red	medium	902-41270-0
100 x 6	ruby red	fine	901-41271-0
100 x 6	ruby red	medium	902-41271-0
100 x 6	ruby red	coarse	903-44271-0
100 x 8	ruby red	fine	901-41272-0
100 x 8	ruby red	medium	902-41272-0
100 x 8	ruby red	coarse	903-44272-0
100 x 10	ruby red	fine	901-41273-0
100 x 10	ruby red	medium	902-41273-0
100 x 10	ruby red	coarse	903-44273-0



ASSORTMENT OF FILES

DEGUSSIT DD57



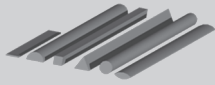
Type	Product No.
Assortment	900-00700-0

Shape	Dimensions	Colour	Type	Product No.
	100 x 10	ruby red	medium	902-41203-0
	100 x 10	ruby red	medium	902-41213-0
	100 x 8 x 6	ruby red	coarse	903-44221-0
	100 x 6	ruby red	medium	902-41271-0
	100 x 10	ruby red	coarse	903-44231-0

The **assortment of files**, Product No. **900-00700-0**, contains one of each file listed above.
The Files are also available separately

ASSORTMENT OF FILES - MIDGET FILES

DEGUSSIT DD57



Type	Product No.
Assortment	900-41420-0

Shape	Dimensions	Colour	Type	PU pcs.	Product No.
	50 x 2	ruby red	fine	20	901-41402-0
	100 x 3	ruby red	fine	10	901-41413-0
	50 x 1	ruby red	fine	20	901-41400-0
	100 x 2	ruby red	fine	10	901-41403-0
	50 x 3 x 0,3	ruby red	fine	20	901-41406-0
	50 x 1	ruby red	fine	20	901-41401-0
	100 x 2	ruby red	fine	10	901-41404-0
	100 x 3	ruby red	fine	10	901-41405-0
	100 x 4	ruby red	fine	10	901-41407-0
	100 x 5 x 1,5	ruby red	fine	10	901-41409-0
	100 x 4 x 1,5	ruby red	fine	10	901-41411-0

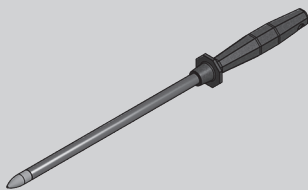
The **assortment of midget files**, Product No. **900-41420-0**, contains 1 holder and 2 collets as well as one of each midget file listed above.

PU= packing unit

The files are also available separately

BLADE SHARPENER

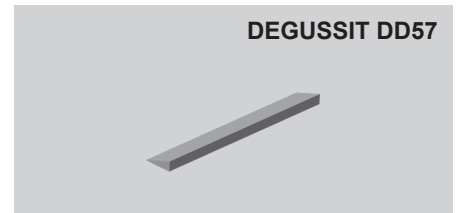
DEGUSSIT DD57



Dimensions	Colour	Type	Product No.
10 x 200	ruby red	fine	991-41273-3

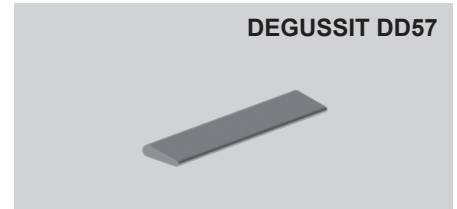
FINE-GRINDING TOOL - BLADE

Dimensions	Colour	Type	Product No.
100 x 15 x 3/0,5	ruby red	fine	901-41291-0
100 x 15 x 3/0,5	ruby red	medium	902-41291-0



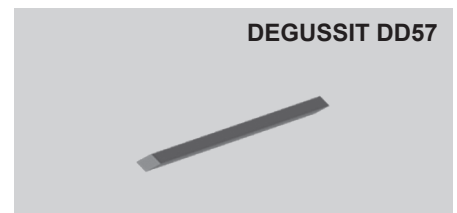
FINE-GRINDING TOOL - TAPERED

Dimensions	Colour	Type	Product No.
100 x 30 x 7/2	ruby red	medium	902-41105-0



FINE-GRINDING TOOL - RHOMBOID

Dimensions	Colour	Type	Product No.
100 x 13 x 5	ruby red	coarse	903-44240-0



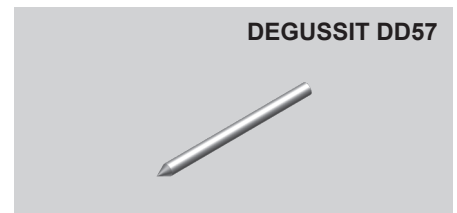
FINE-GRINDING TOOL - CONICAL

Dimensions	Colour	Type	Product No.
100 x 5 x 2	ruby red	fine	901-41255-0
100 x 5 x 2	ruby red	coarse	903-44255-0



FINE-GRINDING TOOL - PENCIL

Dimensions	Colour	Type	Product No.
100 x 5	ruby red	fine	901-41261-0



FINE-GRINDING TOOL - MOUNTED POINT, CYLINDRICAL



Ø D1	Ø D2	H	Type	Product No.
2	2.35	4	fine	921-41002-1
2	3	4	fine	921-41002-0
3	2.35	6	fine	921-41003-1
3	3	6	fine	921-41003-0
4	2.35	8	fine	921-41104-1
4	3	8	fine	921-41104-0
5	3	10	fine	921-41110-0
6	6	12	fine	921-41116-0
8	6	10	fine	921-41128-0
8	6	16	fine	921-41136-0
10	6	12	fine	921-41150-0
2	2.35	4	medium	922-44002-1
2	3	4	medium	922-44002-0
3	2.35	6	medium	922-44003-1
3	3	6	medium	922-44003-0
4	2.35	8	medium	922-44104-1
4	3	8	medium	922-44104-0
5	3	10	medium	922-44110-0
6	6	12	medium	922-44116-0
8	6	10	medium	922-44128-0
8	6	16	medium	922-44136-0
10	6	12	medium	922-44150-0
Order-Related Product				

FINE-GRINDING TOOL - MOUNTED POINT, CYLINDRICAL-CONICAL



Ø D1	Ø D2	H	Type	Product No.
4	2.35	8	fine	921-41204-1
4	3	8	fine	921-41204-0
5	3	10	fine	921-41210-0
6	6	12	fine	921-41216-0
8	6	16	fine	921-41236-0
10	6	20	fine	921-41255-0
4	2.35	8	medium	922-44204-1
4	3	8	medium	922-44204-0
5	3	10	medium	922-44210-0
6	6	12	medium	922-44216-0
8	6	16	medium	922-44236-0
10	6	20	medium	922-44255-0
Order-Related Product				

Length of the shaft 30 upto 35 mm

Ø D1: Ceramics

Ø D2: Metal Shaft

H: Ceramics

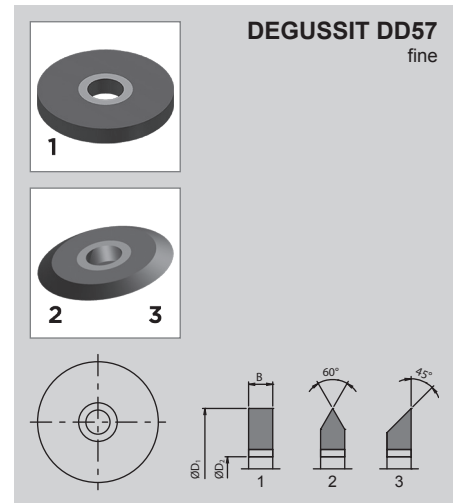
FINE-GRINDING WHEELS

Ø D1	Ø D2	B	Design	Product No.
75	20	3	with metal bushing	911-41373-0
75	20	4	with metal bushing	911-41374-0
75	20	6	with metal bushing	911-41376-0
75	20	8	with metal bushing	911-41378-0
75	20	10	with metal bushing	911-41380-0
100	32	8	with metal bushing	911-41488-0
100	32	10	with metal bushing	911-41490-0
75	30	3	without metal bushing	911-41373-7
75	30	4	without metal bushing	911-41374-7
75	30	6	without metal bushing	911-41376-7
75	30	8	without metal bushing	911-41378-7
75	30	10	without metal bushing	911-41380-7
100	42	8	without metal bushing	911-41488-7
100	42	10	without metal bushing	911-41490-7
Order-Related Product				

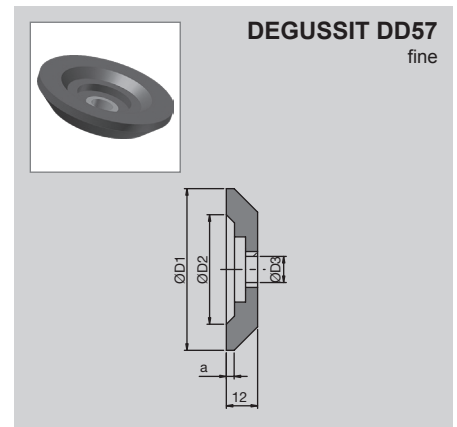
Profile 2 and 3 upon request

Ø D1	Ø D2	Ø D3	a	Product No.
62	42	10	3	931-41906-1
62	42	10	4	931-41906-2
62	42	10	6	931-41906-3
Order-Related Product				

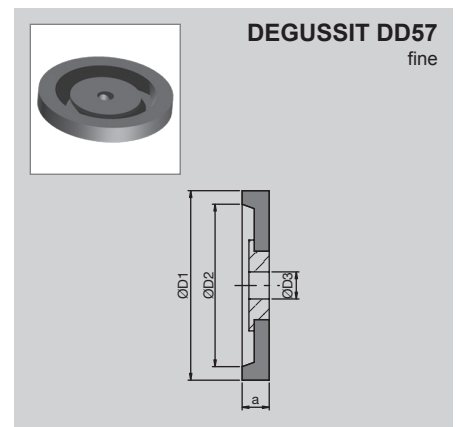
Ø D1	Ø D2	Ø D3	a	Product No.
70	60	10	8	931-41970-4
70	60	10	10	931-41970-5
70	60	10	12	931-41970-6
70	60	10	15	931-41970-7
80	60	10	8	931-41980-4
80	60	10	10	931-41980-5
80	60	10	12	931-41980-6
80	60	10	15	931-41980-7
Order-Related Product				



BURNISHING WHEELS



BURNISHING WHEELS



COMPETENCE PLUS RESPONSIBILITY

Our customers rightly expect first-class performance with lasting value. Besides the competence to achieve this, we also undertake the responsibility for it. Ask for the evidence: FRIATEC is the technological and market leader in ceramic materials for the 21st Century.



- 01 Image-intensifier for radiology
- 02 X-Ray tube for radiology
- 03 Pressure sensor for aerospace
- 04 Camera housing for aerospace
- 05 Accelerator tube for radiology
- 06 Feedthroughs for high-vacuum applications
- 07 High-voltage feedthroughs for vacuum technology
- 08 Insulating tubes for high-vacuum technology
- 09 High current feedthroughs for energy systems
- 10 Wafer carrier for the semiconductor industry
- 11 Test plates for the semiconductor industry
- 12 Sensor elements for the semiconductor industry

- 13 Guide strip for the printing industry
- 14 Isolator for the printing industry
- 15 Square tubes for the printing industry
- 16 Tubes, rods and capillaries for high temperature applications
- 17 Thermal protection tubes for the glass and metallurgical industries
- 18 Crucibles and boats for industry and research
- 19 FZY-probes for oxygen measurement in gases
- 20 Dielectric elements for fuel cells
- 21 Dielectric elements for fuel cells
- 22 Thermal protection tubes for high temperature applications
- 23 Shaping roller for the glass industry
- 24 Glow-block for heat treatment of lamp filaments



- 25 Ozone generator for the semiconductor industry
- 26 Control discs for production and laboratory processes
- 27 Dosing pistons with control edge for the food-processing and pharmaceutical industries
- 28 Pump inserts for medical technology
- 29 Float body for flow-measurement in the chemical industry
- 30 Electrode holder for flow-measurement in the chemical industry
- 31 Flow meters for the food-processing industry
- 32 Welding pins for automotive-body manufacture
- 33 Centring pin for automotive-body manufacture
- 34 Metal-forming tools for automotive-body manufacture
- 35 Isolation shells for magnetically-coupled pump in the chemical industry
- 36 Pump impeller for the chemical industry

- 37 Stirrers for the chemical industry
- 38 High-pressure pump piston for the chemical industry
- 39 Adhesive nozzle for the paper industry
- 40 Valve disc for pulp-processing
- 41 Vacuum plate for paper-making
- 42 Protection tubes for the glass industry
- 43 Midget file for the glass-processing industry
- 44 Hand lappers for the glass-processing industry
- 45 Grinding wheel for the glass-processing industry
- 46 Grinding tools for metal working
- 47 Bench-stones for metal working
- 48 Mounted points for metal working

