

The unique consumables for grinding and polishing of materialographic specimens

**A better way to grind and
polish materialographic
specimens:**

Ready-to-use

**Easy handling makes your
job easier**

Constantly high removal

Fewer preparation steps

Reduced preparation time

Reduced preparation costs

Low maintenance



Introducing the MD-System to your lab

MD-Disc

The MD-Disc is the supporting disc for all preparation surfaces. It is available for most of your existing grinding and polishing equipment. The MD-Disc is equipped with a magnetic layer and is designed to provide the magnetic attraction required. Simply place the MD-grinding and polishing surfaces of your choice on the magnetic disc, the magnet will hold the preparation surface in place during the preparation. One disc is sufficient to support all preparation surfaces, so both space and money can be saved.

MD-System grinding discs and polishing cloths

MD-System is a line of metal-backed coarse and fine grinding discs as well as polishing cloths available in 200, 250, 300 and 350 mm / 8", 10", 12" and 14" diameters.

Common features

A thin and flexible steel plate

MD-preparation surfaces are all based on a thin flexible steel plate which makes positioning, removal and storage easy. Disc flatness is maintained throughout the life of the disc.

A patterned segment

All MD-grinding discs have a patterned segmented surface, specifically designed for the actual grinding phase, which minimizes build up of abraded material, allowing consistently high material removal rates, very short grinding time and optimum planeness.

Anti-slip backing

The coarser grinding discs are equipped with an anti-slip backing to ensure safe attachment to the MD-Disc even when there is high friction during the grinding process.

Reduced preparation time

Plane and fine grinding are reduced to two steps, shortening the preparation process consistently. As the specimens are totally flat after grinding on MD-Grinding discs, the time spent on the following Fine Grinding step can be reduced to about 50%. The succeeding polishing steps can also be carried out in a shorter time thanks to the outstanding planeness achieved in the fine grinding steps.

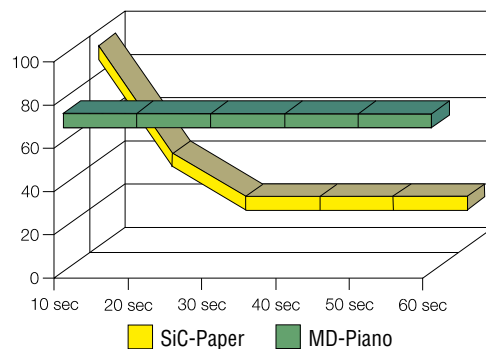
Longer lifetime

MD-Grinding discs have a much longer lifetime than any SiC-Paper.

Reduced preparation cost

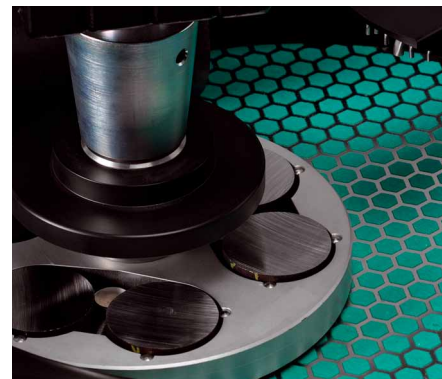
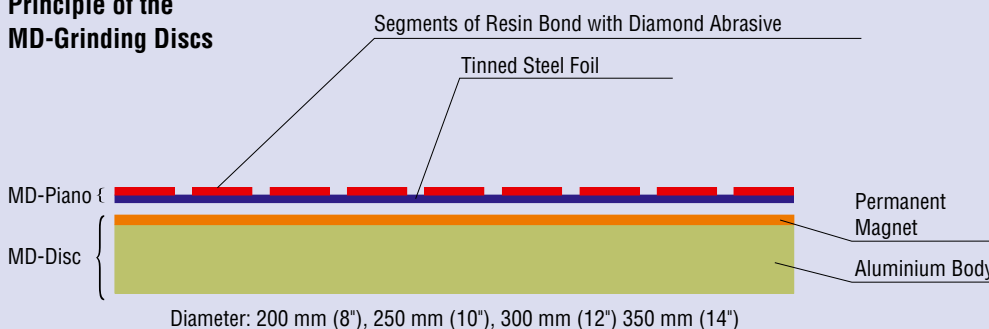
The MD-System produces better quality specimens, reduces maintenance and preparation time and has a longer lifetime than SiC-Paper; thus it potentially reduces preparation costs.

Removal Rate



When using conventional grinding techniques with SiC paper, the removal rate decreases dramatically right from the beginning of the preparation. As shown on the graph, by contrast, the MD-Piano diamond grinding disc has a substantially higher and longer lasting removal rate, ensuring better quality specimens.

Principle of the MD-Grinding Discs



The MD-System

MD-Consumables are available for every step in the preparation process:

Plane Grinding

MD-Primo

- For plane and fine grinding
- Particularly suitable for SOFT ferrous and non ferrous materials, HV 20-250
- High, constant removal during entire lifetime
- For all materials where SiC would normally be best choice
- Use for both manual and automatic grinding

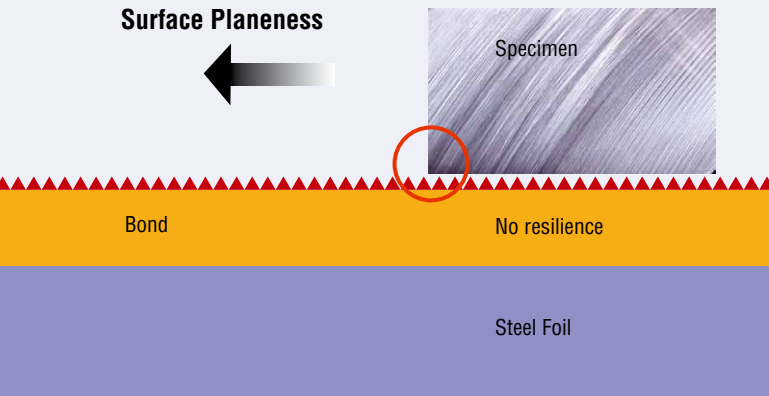
MD-Piano

- For plane and fine grinding of materials >150 HV
- Particularly suitable for ferrous materials
- High, constant removal during entire lifetime
- Alternative to diamond pads for larger ceramic /sintered carbide specimens
- Bar-pattern provides optimal support for moving specimen, meaning optimal planeness
- Water cooled, no need for additives
- Not suitable for ductile materials (low removal, excessive wear)

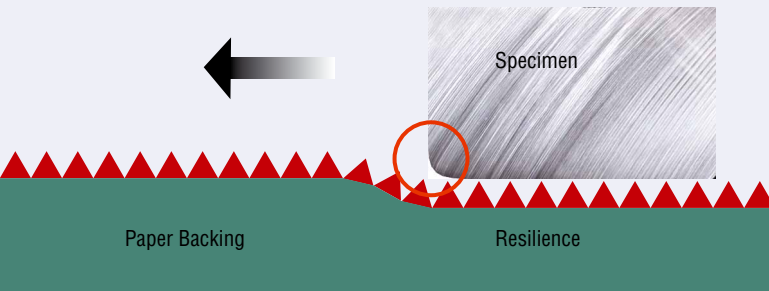
MD-Forte

- For plane grinding
- With nickel bonding permitting protruding diamonds for highest removal rate
- Longer lifetime than other MD-Grinding discs due to stronger nickel bond

Surface Planeness



MD-Piano: No edge-rounding



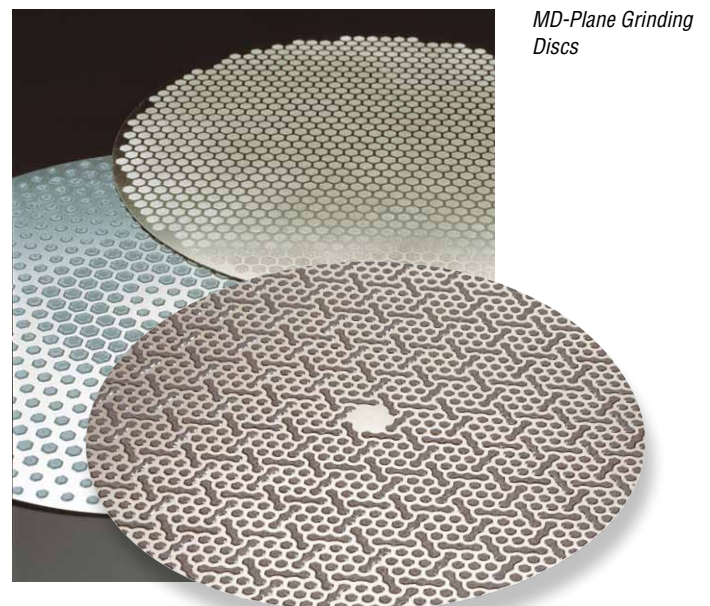
SiC paper: Edge rounding

Low maintenance

Except from occasional dressing the MD-Grinding discs need practically no maintenance, making them very easy to use.

Maximum flatness

The diamond bond used in MD-Piano and MD-Forte ensures a uniform material removal from both hard and soft phases during cutting action thus resulting in absolutely plane specimens with no relief between different phases. It also ensures that there will be no smearing in soft phases or chipping in brittle phases. Edge rounding at the interface between resin and specimen material is completely eliminated thus giving high quality specimens. See Surface Planeness graph.



Fine Grinding

- For single step fine grinding
- Both discs can be used with diamond suspension or spray
- Recommended for use with all-in-one DiaPro diamond products

MD-Allegro is used for materials with a hardness higher than HV 150.

MD-Largo is designed for soft materials in the range HV 40-250, or for composites with a soft matrix. MD-Largo gives very good results where MD-Allegro tends to be too aggressive, for example grey cast iron.

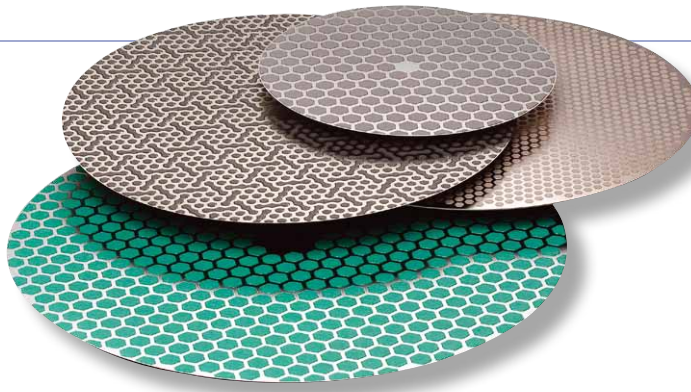
MD-Allegro and MD-Largo can be used to replace two different types of preparation routines.

- Both MD-Allegro and MD-Largo offer Fine Grinding in one step with DiaPro-Allegro/Largo instead of the normal grinding steps with SiC-Paper 500, 1000 and 4000#.
- MD-Allegro and MD-Largo can also be used instead of fine grinding cloths.
- For very fragile materials or high requirements on planeness, MD-Largo can also be used with DiaPro Largo that is equivalent to a 3 µm diamond suspension.

MD-Piano 500/1200

MD-Piano 500/1200 is used for Fine Grinding. MD-Piano 500 will reduce grinding time when grinding larger specimens. A specimen finished on MD-Piano 500 can be used directly for electrolytic polishing or micro-hardness testing.

MD-Piano 1200 can be used instead of MD-Allegro for both manual Fine Grinding and automatic specimen preparation.



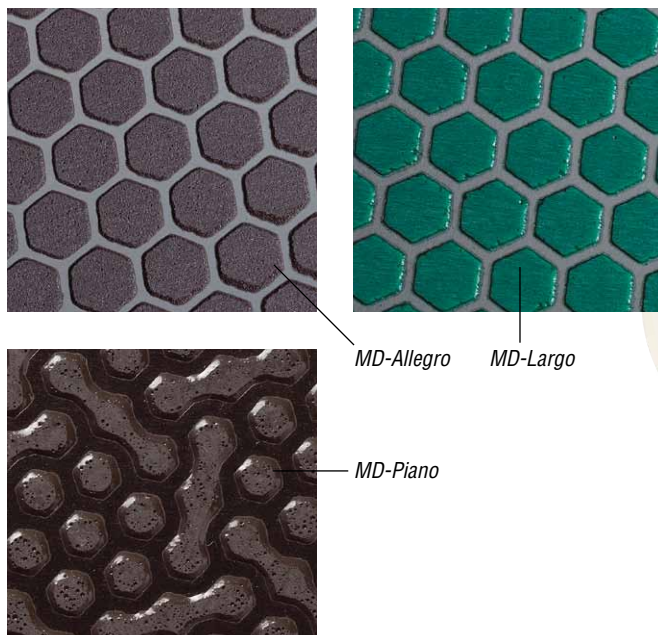
MD-Fine Grinding Discs

Advantages:

- Shorter preparation time. Thanks to the perfect planeness of the specimens after grinding on MD-Piano 80, 120 or 220, it is possible to go directly to MD-Piano 500 or 1200.
- Automatic fine grinding is also possible.
- Grinding times are shorter than 1 minute.
- Easier cleaning if MD-Piano 1200 is used instead of MD-Allegro as the black swarf is avoided.
- Very long lifetime compared to SiC-Paper. MD-Piano 500 and 1200 can replace up to 100 pieces of SiC-Paper.

Polishing

The MD-Polishing Cloths is a line of cloths suitable for all final polishing procedures. The MD-Polishing cloths are equipped with a magnetic backing for the supporting layer and an intermediate layer which keeps the diamond grains in the active layer.



MD-Allegro

MD-Largo

MD-Piano



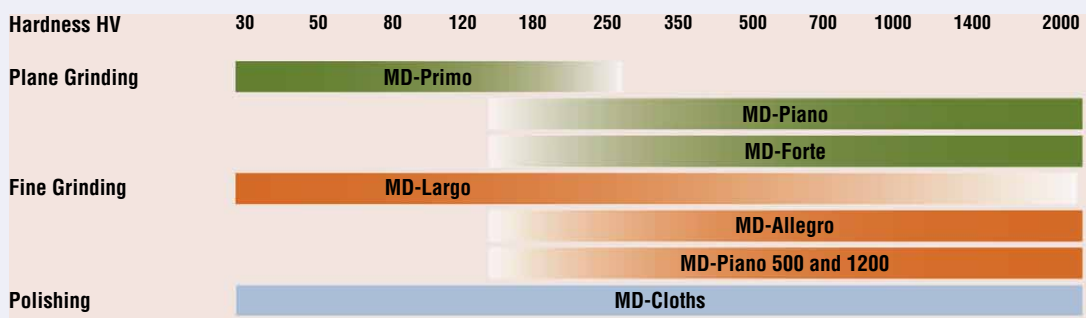
MD-Polishing Cloths

Selection Guide

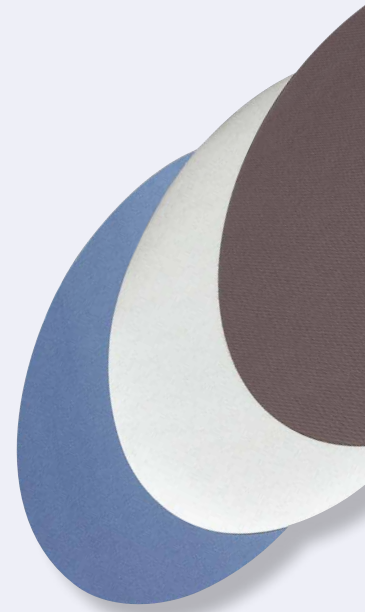
Plane Grinding									
Disc	Application areas	Hardness range	FEPA grit size equivalent	US grit size equivalent	Grain size equivalent (µm)	Abrasive (embedded)	Abrasive Bond	SiC paper equivalent	Pre-dressed/ Ready-to-use
MD-Primo 120 220	Non-ferrous + soft materials	40-250 HV	120	120	125	SiC	Resin	50-60 pcs	Yes
	Non-ferrous + soft materials	40-250 HV	220	220	68	SiC	Resin	50-60 pcs	Yes
MD-Piano 80 120 220	Ferrous + hard materials Specimens clamped in holder	150-2000 HV	80	80	200	Diamond	Resin	100	Yes
	Larger specimens (>30mm)	250-400 HV	120	120	125	Diamond	Resin	100	Yes
	Single, smaller specimens (<30mm)	150-2000 HV	220	220	68	Diamond	Resin	100	Yes
MD-Forte	Medium hard to hard, brittle materials	150-2000 HV	120	120	125	Diamond	Nickel		Yes

Fine Grinding									
Disc	Application areas	Hardness range	FEPA grit size equivalent	US grit size equivalent	Grain size equivalent (µm)	Abrasive (embedded)	Abrasive Bond	Lifetime equivalent	Pre-dressed/ Ready-to-use
MD-Piano 500 1200	Ferrous + hard materials	150-2000 HV	500	360	30	Diamond	Resin	100	Yes
	Ferrous + hard materials	150-2000 HV	1200	600	15	Diamond	Resin	100	Yes
Disc	Application areas	Hardness range	Abrasive (added)	Abrasive (µm)	Lifetime equivalent	Pre-dressed/ Ready-to-use			
MD-Allegro	Fine grinding of materials harder than 150 HV	>150 HV	Suspension/spray	15-6	900-1000	Yes			
MD-Largo	Soft materials, composites with soft matrix	40-250 HV	Suspension/spray	15-3	900-1000	Yes			

Polishing						
Disc	Application areas	Resilience	Hardness range	Abrasive (µm)	Material	
MD-Plan	Fine grinding of soft material Pre-polishing of hard materials	Very low	Hard	15-3	Coated, woven polyester	
MD-Sat	Fine grinding and polishing of ferrous metals, non ferrous metals, coatings and plastics	Medium	Hard	9-3	Woven acetate	
MD-Dur	Fine grinding and polishing of ferrous metals, non ferrous metals, coatings and plastics	Medium	Hard	9-1	Satin woven natural silk	
MD-Dac	Polishing of all materials	Medium	Hard	9-3	Satin woven acetate	
MD-Mol	Polishing of ferrous and non ferrous metals and polymers	High	Soft	≤ 3	Taffeta woven 100 % wool	
MD-Plus	One step polishing for sintered carbides and steels	High	Soft	≤ 3	Synthetic nap	
MD-Floc	Polishing of all materials	High	Soft	≤ 3	Synthetic nap	
MD-Nap	Final polishing of all materials	Very high	Very soft	≤ 1	Synthetic short nap	
MD-Chem	Final polishing of all materials	High	Soft	<1	Porous neoprene	



Maintenance	Product	Maintenance
The MD-Consumables are practically maintenance-free which makes them very easy to use.	MD-Primo	A brief dressing of the SiC layer is necessary from time to time
	MD-Piano for PG	A brief dressing of the diamond layer is necessary from time to time
	MD-Forte	A brief dressing of the diamond layer is necessary from time to time
	MD-Allegro	Are virtually maintenance-free though occasional cleaning is recommended.
	MD-Largo	Are virtually maintenance-free though occasional cleaning is recommended.
	MD-Piano for FG	A brief dressing of the diamond layer is necessary from time to time
	MD-Cloths	No maintenance





Other consumables

MD-Gekko is an adapter disc with a high friction foil that makes consumables with a glossy back stick

very well, yet at the same time very easy to remove again. Also self adhesive consumables stick safely and can be removed again effortlessly without leaving even a trace of adhesive on the MD-Gekko surface.

MD-Gekko is ideal for the use with SiC Foil. Based on a strong PET film, the SiC Foil, due to its glossy surface sticks safely to the MD-Gekko. It can easily be removed and reapplied. Because of MD-Gekko, SiC Foil is superior to both plain and self-adhesive SiC Paper.

MD-Rondo is an alternative to MD-Gekko for use with self-adhesive consumables like polishing cloths.

Adaptability and multi-functionality

Both MD-Gekko and MD-Rondo extend the product range of the MD-System. They allow the use of any self-adhesive consumables and with MD-Gekko also all consumables with a glossy back. Thereby they are adding all the advantages of the MD-System to your favourite grinding discs or polishing cloths.

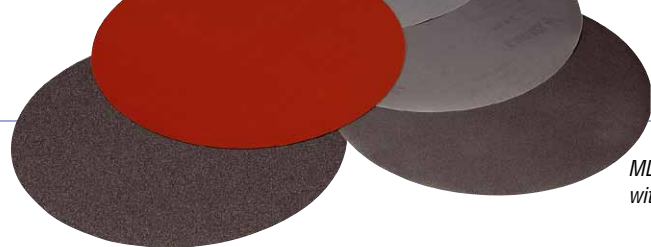
A dual-adhesion surface

MD-Rondo makes the polishing cloths or self adhesive grinding papers stick safely but also easy to remove. The top surface is covered with two different coatings with dissimilar properties, thus dual-adhesion: a 2 cm wide outer rim with higher adhesion properties which makes the cloth stick safely; and the centre which is coated with a low adhesion coating, allowing for very easy removal of the consumables. The combination of these two coatings ensures that the edges of the cloth does not lift up from MD-Rondo, and that at the same time, removal towards the centre, where the contact area gets larger, is very easy.

A surface with a three dimensional topography

The three dimensional surface makes it very easy to apply a polishing cloth or grinding paper without trapping air bubbles underneath. The coating that is printed on the surface of MD-Rondo is in a hexagon pattern. Between these hexagons are small air channels. When the polishing cloth is applied on the surface of MD-Rondo, air can easily escape thereby completely avoiding air bubbles.

It is virtually impossible to trap air under a polishing cloth applied to this unique surface.



MD-Gekko
with SiC Foil

Magnetic Foil

Magnetic Foil is a self-adhesive, magnetic foil that allows you to use your MD-consumables onto a standard aluminium-supporting disc.

Magnetic Foil comes as a square sheet and with a knife so it can be cut to the exact size of your aluminium supporting disc. Magnetic Foil is a soft foil which is easy to apply and should be used only on aluminium supporting discs.

Storage

MD-Concert is a storage cabinet for 200 mm / 8", 250 mm / 10" and 300 mm / 12" MD-Consumables. It has 10 identical compartments and is easy to clean.

MD-Concert consists of a steel spindle on which the compartments are stacked.

The compartments can be turned to the left and the right, so that they can be accessed from both sides, no matter where the MD-Concert is placed.

The storage cabinet allows the consumables to dry effectively, and protects the preparation discs from contamination.

MD-Concertino is a storage cabinet with 8 identical compartments. for 200 mm / 8" MD-Consumables.

MD-Concertino has the same structure and is used the same way as MD-Concert. It takes up less storage room than the larger MD-Concert.

For **350 mm** MD-Consumables a **storage cabinet** is available. It holds 10 MD-Consumables and allows the consumables to dry effectively, and protects the preparation discs from contamination.



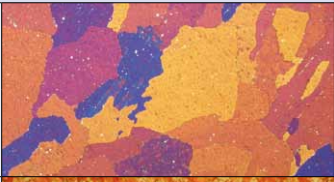





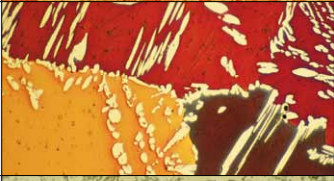


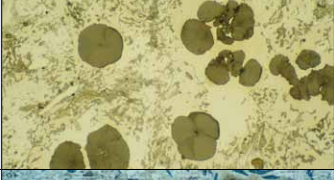


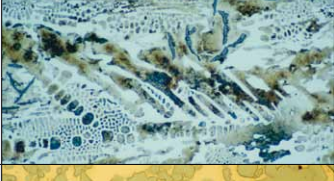


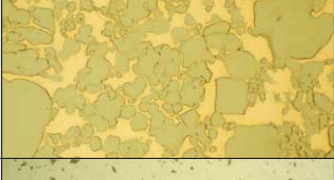


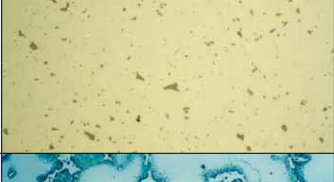


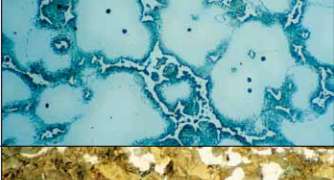


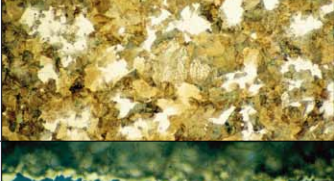





350 mm storage cabinet



MD-Concert and MD-Concertino for easy storage and immediate identification of MD-Consumables

Preparation methods overview

10 Metalog Guide preparation methods

			PG	FG	DP	OP
Method A Al 99,5 sand cast		 Surface	SiC-Foil (on MD-Gekko)	MD-Largo	MD-Mol	MD-Chem or MD-Nap
		 Abrasive, Grit/Grain	SiC # 320	DiaPro AllegroLargo	DiaPro Mol	OP-U or OP-S
Method B Cu pure		 Surface	MD-Primo 220	MD-Largo	MD-Mol	MD-Chem or MD-Nap
		 Abrasive, Grit/Grain	SiC	DiaPro AllegroLargo	DiaPro Mol	OP-U or OP-S
Method C Cu 58 Zn 42		 Surface	MD-Primo-220	MD-Largo	MD-Dac	MD-Chem or MD-Nap
		 Abrasive, Grit/Grain	SiC	DiaPro AllegroLargo	DiaPro Dac	OP-U or OP-S
Method D Nodular cast iron		 Surface	MD-Piano 220	MD-Allegro	MD-Dac	MD-Chem
		 Abrasive, Grit/Grain	Diamond	DiaPro AllegroLargo	DiaPro Dac	OP-AA
Method E White cast iron		 Surface	MD-Piano 220	MD-Allegro	MD-Dur	MD-Chem MD-Nap
		 Abrasive, Grit/Grain	Diamond	DiaPro AllegroLargo	DiaPro Dur	OP-U or DiaPro Nap B
Method F WC in Cu matrix		 Surface	MD-Piano 120	MD-Allegro	MD-Dac	MD-Chem
		 Abrasive, Grit/Grain	Diamond	DiaPro AllegroLargo	DiaPro Dac	OP-U or OP-S
Method G Al ₂ O ₃		 Surface	MD-Piano 220	MD-Plan		MD-Chem
		 Abrasive, Grit/Grain	Diamond	DiaPro Plan		OP-U or OP-S
Method X MgAl alloy		 Surface	SiC-Foil (on MD-Gekko)	MD-Largo	MD-Mol	
		 Abrasive, Grit/Grain	SiC # 320	DiaPro AllegroLargo	DiaPro Mol	
Method Y Medium carbon steel		 Surface	MD-Piano 220	MD-Allegro	MD-Plus	
		 Abrasive, Grit/Grain	Diamond	DiaPro AllegroLargo	DiaPro Plus	
Method Z Sintered carbide with coatings		 Surface	MD-Piano 120	MD-Allegro	MD-Dac	
		 Abrasive, Grit/Grain	Diamond	DiaPro AllegroLargo	DiaPro Dac	

Specifications

Magnetic supporting disc

Name	Disc dia. 350 mm (14")	Disc dia. 300 mm (12")	Disc dia. 250 mm (10")	Disc dia. 200 mm (8")
MD-Disc	02426933	02426918	02426919	02426920

Grinding surfaces for plane grinding

Name	Application	HV	Abrasive/ Bond	Grit	Disc dia. 350 mm (14")	Disc dia. 300 mm (12")	Disc dia. 250 mm (10")	Disc dia. 200 mm (8")
MD-Primo 120	Soft materials	40-250	SiC/Resin	120	40800118	40800087	40800086	40800085
MD-Primo 220	Soft materials	40-250	SiC/Resin	220		40800090	40800089	40800088
MD-Piano 80	Non ductile materials	>150	Diamond/ Resin	80	40800124	40800123	40800122	40800121
MD-Piano 120	Non ductile materials	>150	Diamond/ Resin	120	40800128	40800127	40800126	40800125
MD-Piano 220	Non ductile materials	>150	Diamond/ Resin	220	40800132	40800131	40800130	40800129
MD-Forte 120	Non ductile materials	150- 2000	Diamond/ Nickel	120		40800103	40800102	40800101

Grinding surfaces for fine grinding

Name	Application	HV	Abrasive/ Bond	Grit Grain size	Disc dia. 350 mm (14")	Disc dia. 300 mm (12")	Disc dia. 250 mm (10")	Disc dia. 200 mm (8")
MD-Piano 500	All materials	>150	Diamond/ Resin	500	40800136	40800135	40800134	40800133
MD-Piano 1200	All materials	>150	Diamond/ Resin	1200	40800140	40800139	40800138	40800137
MD-Allegro	All materials	>150	*	From 9 to 6 µm	40500140	40500067	40500066	40500065
MD-Largo	Soft materials and composites	>40	*	From 9 to 3 µm	40500141	40500099	40500098	40500097

Polishing cloths

Name	Disc dia. 350 mm (14")	Disc dia. 300 mm (12")	Disc dia. 250 mm (10")	Disc dia. 200 mm (8")
MD-Plan	40500147	40500088	40500087	40500086
MD-Sat		40500408	40500407	40500406
MD-Dur	40500149	40500076	40500075	40500074
MD-Dac	40500150	40500073	40500095	40500071
MD-Mol	40500152	40500079	40500078	40500077
MD-Plus	40500151	40500091	40500090	40500089
MD-Floc		40500405	40500404	40500403
MD-Nap	40500153	40500082	40500081	40500080
MD-Chem	40500154	40500094	40500093	40500092

Other consumables

Name	Application	Disc dia. 350 mm (14")	Disc dia. 300 mm (12")	Disc dia. 250 mm (10")	Disc dia. 200 mm (8")
MD-Gekko	Adapter disc for use with SiC-Foil	49900050	49900049	49900048	49900047
MD-Rondo	Adapter disc for use with self-adhesive polishing cloths	40503082	40503002	40503001	40503000
Magnetic Foil	Self-adhesive magnetic foil		40800115	40800114	40800113

Storage

Name		
MD-Concert	Storage cabinet for 9 MD-Cosnumables in 200/8", 250/10" and 300 mm/12"	05306101
MD-Concertino	Storage cabinet for 7 MD-consumables in 200 mm (8") dia.	05306102
Storage cabinet	Storage cabinet for 10 MD-consumables in 350 mm (14") dia.	05666001

* Abrasive has to be added

** Self-adhesive polishing cloths are glued on the disc

Struers' products are subject to constant product development. Therefore, we reserve the right to introduce changes in our products without notice.



AUSTRALIA & NEW ZEALAND

Struers Australia
27 Mayneview Street
Milton QLD 4064
Australia
Phone: +61 7 3512 9600
Fax: +61 7 3369 8200
info.au@struers.dk

BELGIQUE (Wallonie) Struers S.A.S.

370, rue du Marché Rollay
F- 94507 Champigny
sur Marne Cedex
Téléphone +33 1 5509 1430
Télécopie +33 1 5509 1449
struers@struers.fr

CANADA Struers Ltd.

7275 West Credit Avenue
Mississauga, Ontario L5N 5M9
Phone +1 905-814-8855
Fax +1 905-814-1440
info@struers.com

CHINA

Struers Ltd.
Rm. 702 Hi-Shanghai
No. 970 Dalian Road
Shanghai 200092, P.R. China
Phone +86 (21) 5228 8811
Fax +86 (21) 5228 8821
struers.cn@struers.dk

CZECH REPUBLIC Struers GmbH

Organizační složka
Havlíčková 361
CZ-252 63 Roztoky u Prahy
Phone +420 233 312 625
Fax: +420 233 312 640
czechrepublic@struers.de

DEUTSCHLAND Struers GmbH

Carl-Friedrich-Benz-Straße 5
D-47877 Willich
Telefon +49 (0) 2154 486-0
Fax +49 (0) 2154 486-222
verkauf@struers.de

FRANCE Struers S.A.S.

370, rue du Marché Rollay
F-94507 Champigny
sur Marne Cedex
Téléphone +33 1 5509 1430
Télécopie +33 1 5509 1449
struers@struers.fr

IRELAND Struers Ltd.

Unit 11 Evolution@ AMP
Whittle Way
Catcliffe
Rotherham S60 5BL
Tel: +44 0845 604 6664
Fax: +44 0845 604 6651
info@struers.co.uk

ITALY

Struers Italia
Via Monte Grappa 80/4
20020 Arese (MI)
Tel. +39-02/38236281
Fax +39-02/38236274
struers.it@struers.dk

JAPAN

Marumoto Struers K.K.
Takara 3rd Building
18-6, Higashi Ueno 1-chome
Taito-ku, Tokyo 110-0015
Phone +81 3 5688 2914
Fax +81 3 5688 2927
struers@struers.co.jp

NETHERLANDS/BELGIUM

Struers GmbH Nederland
Elektraweg 5
NL-3144 CB Maassluis
Tel. +31 (0) 10 599 72 09
Fax +31 (0) 10 599 72 01
netherlands@struers.de

ÖSTERREICH Struers GmbH

Zweigniederlassung Österreich
Ginzkeyplatz 10
A-5020 Salzburg
Telefon +43 662 625 711
Fax +43 662 625 711 78
austria@struers.de

POLAND

Struers Sp. z o.o.
Oddział w Polsce
ul. Jasnoworska 44
31-358 Kraków
Phone +48 12 661 20 60
Fax +48 12 626 01 46
poland@struers.de

ROMANIA

Struers GmbH
Sucursala Sibiu
Str.Scoala de Inot, nr. 18
RO-550005 Sibiu
Phone +40 269 244 558
Fax +40 269 244 559
romania@struers.de

SCHWEIZ

Struers GmbH
Zweigniederlassung Schweiz
Weissenbrunnstraße 41
CH-8903 Birmenstorf
Telefon +41 44 777 63 07
Fax +41 44 777 63 09
switzerland@struers.de

SINGAPORE

Struers Singapore
627A Aljunied Road,
#07-08 BizTech Centre
Singapore 389842
Phone +65 6299 2268
Fax +65 6299 2661
struers.sg@struers.dk

SUOMI

Struers A/S, Sivuliike Suomessa
Kalevankatu 43
00180 Helsinki
Puhelin +358 0207 919 430
Faksi +358 0207 919 431
finland@struers.dk

SWEDEN

Struers Sverige
Ekbacksvägen 22
168 69 Bromma
Telefon +46 (0)8 447 53 90
Telefax +46 (0)8 447 53 99
struers@struers.dk

UNITED KINGDOM

Struers Ltd.
Unit 11 Evolution @ AMP
Whittle Way
Catcliffe
Rotherham S60 5BL
Tel: +44 0845 604 6664
Fax: +44 0845 604 6651
info@struers.co.uk

USA

Struers Inc.
24766 Detroit Road
Westlake, OH 44145-1598
Phone +1 440 871 0071
Fax +1 440 871 8188
info@struers.com

Struers A/S

Pederstrupvej 84
DK-2750 Ballerup, Denmark
Phone +45 44 600 800
Fax +45 44 600 801
struers@struers.dk
www.struers.com

