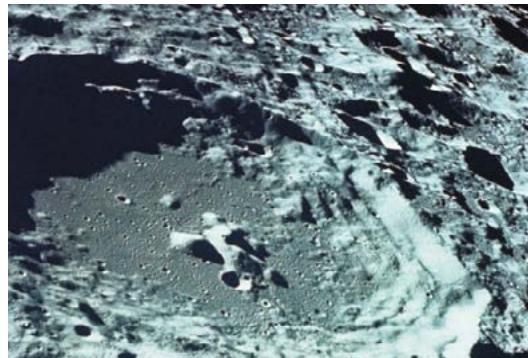


# Mineralogical Specimen Preparation



## A Complete Range of Equipment and Consumables



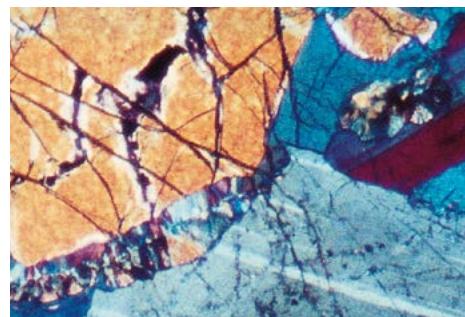
Struers' range of equipment and consumables for the preparation of mineralogical, geological and ceramic specimens covers the entire preparation process – from initial cutting to the finished thin section or polished section, ready for microscopic examination.

### Struers' approach to mineralogy is based on four key points:

- A thoroughly tested method for the production of thin sections without the need of special skills
- Equipment that is easy to handle
- Cost-efficiency
- Environmental protection

### The preparation of mineralogical, geological and ceramic specimens may be divided into two main groups:

- Preparation of thin sections or polished thin sections for microscopic examination in transmitted or reflected light
- Preparation of specimens for microscopic examination in reflected light



#### Thin Sections

The production of thin sections requires highly specialized equipment. Struers has developed the TS-Method™, a technique which provides outstanding quality and very high reproducibility - and it is very easy to use. The cornerstone of the TS-Method™ is Discoplan-TS, a combined cutting and grinding machine.

#### Polished Sections

The preparation of mineralogical specimens for microscopic examination in reflected light is basically similar to the preparation of other materials. After cutting, the specimens are normally mounted in the vacuum impregnation unit CitoVac using EpoFix resin. Lapping is carried out on LaboPol-30/LaboForce-Mi by means of a cast iron lapping disc and the composite disc MD-Largo. The abrasives used are SiC powder and diamonds. Grinding, lapping and polishing can also take place on either semi-automatic or automatic preparation equipment.

#### Discoplan-TS – combined cutting and grinding

Discoplan-TS is a versatile machine for production of mineralogical thin sections. Discoplan-TS combines the cutting and grinding processes in one machine, thus reducing investments and allowing for very fast preparation procedures.

The left hand side of Discoplan-TS takes care of the cutting. A choice of two types of diamond cut-off wheels ensures perfect cutting of all materials, with a minimum of deformations.

The cutting module of Discoplan-TS also carries out re-sectioning of the specimen (cutting off surplus material): the thin section is easily fixed in a vacuum holder controlled by a guide rail on the table of the machine.

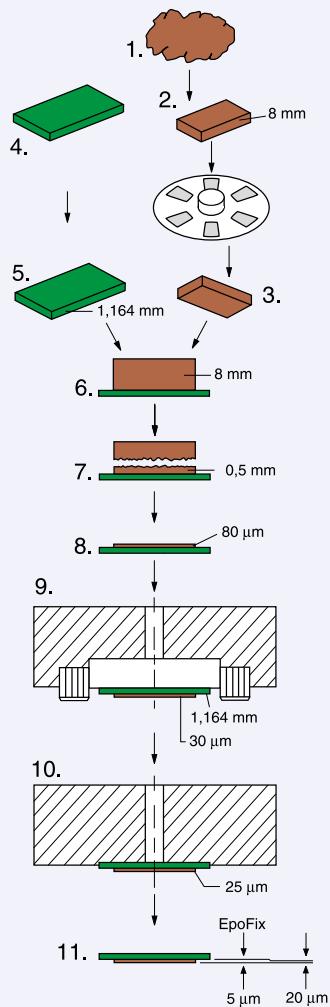
The right-hand side of Discoplan-TS is designed for precision grinding. For automatic preparation of thin sections all glass slides must have exactly the same thickness with a tolerance of a few  $\mu\text{m}$ . A built-in micrometer ensures extreme precision.



Discoplan-TS

## The TS-Method™ for preparation of thin sections

1. Sampling.
2. Cutting of a specimen on Discoplan-TS.
3. Automatic lapping of the specimen on LaboPol-30/LaboForce-Mi lapping/polishing machine.
4. Glass slide 27 x 46 mm or 28 x 48 mm.
5. Grinding of glass slide in Discoplan-TS to a given thickness, e.g. 1.164 mm.
6. CitoVac vacuum impregnation unit: cementing of specimen to glass slide using EpoFix resin.
7. Discoplan-TS: cutting off surplus specimen material to a thickness of 0.5-2 mm.
8. Discoplan-TS: grinding of thin sections to a thickness of 80 µm (section + EpoFix resin), up to three specimens at a time.
9. Automatic lapping of thin section in BORTY thin section holder on LaboPol-30/LaboForce-Mi. Final thickness of section + resin e.g. 30 µm.
10. Automatic polishing of thin sections in TYNDS thin section holder on LaboPol-30/LaboForce-Mi. Reduction for a typical polishing: approximately 10 µm.
11. The specimen is now finished. Thickness: 20 µm.

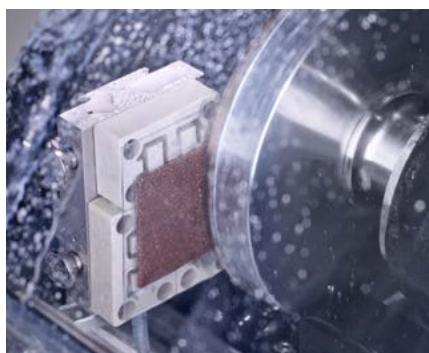


## Outstanding precision

The glass slides are placed on ceramic vacuum holders and are then moved across a cup wheel with diamonds. The slides or specimens may be ground with an accuracy of  $\pm 2$  µm in a couple of minutes. The ceramic vacuum holder allows for dressing of the cup wheel. This feature is important to ensure absolute precision.

## Accutom-10/-100 – precision cutting and grinding

For automatic preparation of thin sections the Accutom-10/-100 can be used. Movement of the specimen is controlled automatically and positioning accuracy is 5 µm.



Grinding with cup-wheel on Accutom-10/-100.

## Automatic lapping and polishing of thin sections

Sections cut to a standard size on Discoplan-TS, are lapped automatically on LaboPol-30/LaboForce-Mi – up to eight sections at a time. Subsequently, they are glued to a glass slide, then cut and ground on Discoplan-TS.



LaboForce-Mi is a semi-automatic specimen mover for the production of thin sections, polished thin sections and polished specimens of mineralogical materials. The force is applied through springs which can be individually adjusted

To achieve the final thickness (e.g. 20 µm), the sections are now lapped and polished on LaboPol-30/LaboForce-Mi: the specimens are placed either in a BORTY thin section holder for lapping or in a TYNDS thin section holder for polishing. Due to the automated preparation process the specimens are prepared with very high reproducibility.

## Thin section holders

Thin section holders are indispensable tools in rational precision lapping and polishing of thin sections. Struers' thin section holders ensure plane specimens of perfect surface quality and well defined and uniform thickness.

## Thin section holders for polishing

As diamond is used for polishing the thin sections, BORTY can not be used as diamond also removes material from the boron carbide sticks. Therefore a holder which does not touch the polishing cloth must be used. The TYNDS thin section holders are designed to solve this problem. They have the same outer dimensions as the BORTY holders. Consequently, they can be used on the same equipment with the same specimen mover disc that has already been used for precision lapping. The holders ensure excellent polishing.



Thin section holders for lapping and polishing

## Precision lapping holders

The BORTY thin section holders are provided with very hard sticks of boron carbide ( $B_4C$ ) which stop any further material removal when they make contact with the lapping disc.

## SystemAbele accessories

For fast and easy manual preparation of thin sections LaboPol-20 can be used together with SystemAbele accessories. The unique thickness control system provides users with a simple and efficient preparation process. Also included are patented UV bonding accessories and resins which significantly reduce curing time. *See separate brochure for more details.*



LaboPol-20 with SystemAbele adapter kit.



SystemAbele accessories.

## Preparation discs and lapping powders

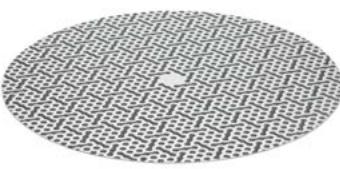
### Cast iron lapping disc

A cast iron disc (300 mm) for lapping is available. The disc is made of a special cast iron alloy which will resist long-term influence from SiC grains, regardless of grain size.



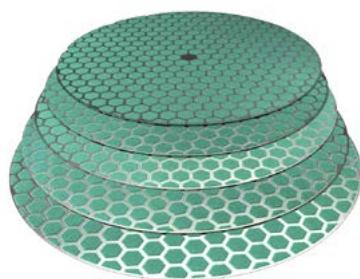
### MD-Piano

For fast removal of material, grinding can be carried out using MD-Piano, a diamond grinding disc.



### MD-Largo

MD-Largo is a composite disc for fine grinding. The special formulation of the composite material together with the use of diamonds as abrasive guarantees a uniform removal of material from different phases without smearing, deformation or chipping. The specimens will maintain a perfect planeness.



### Lapping powders

Lapping on cast iron discs is carried out with SiC powder. A wide range of grain sizes is available.



### CitoVac

CitoVac is a vacuum impregnation unit, especially designed for mounting and impregnating of porous materials. It is also very well suited for gluing specimens to glass slides for the production of thin sections.



A special lid has to be used when gluing specimens to glass slides with the CitoVac.



Easy filling of mounting cups.

## TECHNICAL DATA

### Discoplan-TS

1- or 3-phase  
Rotational speed: 1400 rpm at 50 Hz, 1700 rpm at 60 Hz  
Diamond cut-off wheel: 203 mm dia. 0.5-1.5 mm thickness  
Diamond cup wheel: max 180 mm dia.  
Precision scale including vernier: 1 µm  
Vacuum chucks: 3 pieces, 30 x 50 mm  
Dimensions: W x D x H: 700 x 370 x 320 mm

## SPECIFICATIONS

### Discoplan-TS

Precision thin section machine. With 3 vacuum chucks for grinding of 3 glass slides of 27 x 46 mm, 28 x 48 mm or 30 x 45 mm, or 2 glass slides of 1 x 3" and specimens. Including holder for cutting of rocks (75 x 75 mm), holder for cutting of standard specimens (8 x 20 x 30 mm), dial gauge and recirculation cooling unit (025361xx). Diamond cut-off wheels, diamond cup-wheels and vacuum pump are ordered separately.

### Table unit

With compartment for recirculating cooling unit.

### Diamond Cup Wheel MOP15

Metal bonded, for grinding of hard, brittle materials on Discoplan-TS.

### Diamond Cup Wheel BOP15

Resin bonded, for grinding of hard, ductile materials on Discoplan-TS.

### Diamond Cut-off Wheel M4D20

For cutting of minerals and ceramics (HV 800). Metal bond. 202 mm dia. x 1.0 mm x 22 mm dia.

### Diamond Cut-off wheel B4D20

For cutting of sintered carbides and ceramics (HV 800). Bakelite bond. 202 mm dia. x 1.1 mm x 22 mm dia.

### Welch Vacuum Pump

Used on Discoplan-TS, CitoVac for external pump and Accutom-100, -50, -5 and -2. Vacuum: ~907 mbar. Output: ~34 l/min. Dimensions L x W x H, cm (in): 37.5 x 21 x 25.5 (14.8 x 8.3 x 10.0)

115 V / 60 Hz

230 V / 50 Hz

### LaboPol-20

Grinding/polishing machine with variable speed (50-500 rpm) for 200 mm dia. disc. Supplied with manual splash guard and bowl liner. LaboUI control panel and discs are ordered separately. Specimen mover LaboForce-50 can be mounted.

### LaboPol-30

Grinding/polishing machine with variable speed (50-500 rpm) for 230, 250 or 300 mm dia. disc. With automatic water valve. Supplied with splash guard and bowl liner. LaboUI control panel (06206901) and discs are ordered separately.

### LaboForce-Mi

Semi-automatic specimen mover for the preparation of mineralogical specimens. For use with LaboPol-30. Specimen mover plates and dosing unit (LaboDoser-10, 06376901) are ordered separately.

### LaboPol adapter kit and rinsing device

Kit for adapting LaboPol-20 (06326127) for use with Diamond Ring Grinding Discs (SA0522XX). Includes adapter plate, tools, water connector, rinsing device and holding fixture for Thin Section Mouse (SA0521XX)

### Cast Iron disc for mineralogy, 300 mm dia.

Concentrically grooved, cone-type disc for lapping mineralogical specimens on LaboPol-30/-60 (06336127/06346127). Made of special SiC-resistant cast iron alloy.

## SPECIFICATIONS

### Specimen Mover Plates for LaboForce-Mi

For 8 specimens, 25 mm dia. 05236901  
For 8 specimens, 30 mm dia. 05236902  
For 4 specimens, 40 mm dia. 05236903  
For 4 specimens, 60 mm dia. 05236904  
For 8 specimens 20 x 30 mm. 05236905

### Thin Section Holder BORTY

For lapping of thin sections. With Boron Carbide Sticks. 60 mm dia. Including 4 foils of 25 µm and 3 foils of 8 µm. 02686xxx

### Set of Copper Foils

Extra set of 4 pcs. 25 µm and 6 pcs. 8 µm. 02686901

### Thin Section Holder TYNDS

For polishing and lapping of thin sections, size 60 mm dia. 02686xxx

### CitoVac

CitoVac with built-in vacuum ejector vacuum impregnation unit. Compressed air supply 4.5 - 6 bar required. 1 x 100-240 V / 50-60 Hz.

05926119

### CitoVac for external pump

Vacuum impregnation unit. External vacuum pump required. 1 x 100-240 V / 50-60 Hz.

05926219

### Lid for gluing

Complete with pressing rod and support ring for gluing specimens on glass slides for making thin sections.

05926904

### Standard Slides

Standard Slides for thin sections, with ground edges. 100 pcs. 28 x 48 mm  
27 x 46 mm

40701018

80100001

### Microcover Glass

To be used for covering thin sections. 24 x 32 mm. Abt. 100 pcs.

40701020

### Eukitt

Synthetic thermoplastic resin for mounting of cover glasses on thin sections. 500 ml.

41000004

### Cast Iron Lapping Disc

Concentrically grooved disc, for lapping of mineralogical specimens, 300 mm dia.

40800059

### SiC Powder

For lapping of mineralogical specimens. To be used on cast iron lapping disc. Grit: 120, 220, 320, 400, 600, 800, 1000, 1200

407010xx

### MD-Disc

Disc for magnetic fixation, 300 mm dia.

02426918

### MD-Piano

Diamond grinding disc for grinding of materials HV 150 - 2000  
MD-Piano 80, 300 mm dia.  
MD-Piano 120, 300 mm dia.  
MD-Piano 220, 300 mm dia.  
MD-Piano 500, 300 mm dia.  
MD-Piano 1200, 300 mm dia.

40800123

40800127

40800131

40800135

40800139

### MD-Largo

Maintenance-free disc for one-step fine grinding, using diamonds 300 mm dia.

40500099

For further information on CitoVac, EpoFix, the MD-System and DP Diamond Products please see separate brochures.

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



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## Ensuring Certainty

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