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 µm. A built-in micrometer ensures extreme precision.
**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 1 x 3” and specimens. Including holder for cutting of rocks (75 x 75 mm), glass slides of 27 x 46 mm, 28 x 48 mm or 30 x 45 mm, or 2 glass slides of 27 x 46 mm, 28 x 48 mm or 30 x 45 mm, or 2 glass slides of 1 x 3”.

- Vacuum impregnation unit. External vacuum pump required.
- For polishing and lapping of thin sections, size 60 mm dia.
- 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. 05926219
- For polishing and lapping of thin sections. Size 60 mm dia.
- 230, 250 or 300 mm dia. disc. With automatic water valve. Supplied with splash guard and bowl liner. LaboUJ control panel (06206901) and discs are ordered separately. 06336127
- 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. 40800123
- MD-Piano 120, 300 mm dia. 40800127
- MD-Piano 200, 300 mm dia. 40800131
- MD-Piano 500, 300 mm dia. 40800135
- MD-Piano 1200, 300 mm dia. 40800139
- MD-Large
- Maintenance-free disc for one-step fine grinding, using diamonds 300 mm dia. 40500099

For further information on Accutom-100, LaboPol-30, LaboForce-Mi, CitoVac, the MD-System and 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.**
**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 ±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-100 – precision cutting and grinding**
For automatic preparation of thin sections the Accutom-100 can be used. Movement of the specimen is controlled automatically and positioning accuracy is 5 µm.

**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 or Accutom-100.

**Grinding with cup-wheel on Accutom-100.**

**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 cannot 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.

**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**
**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-Plano**
For fast removal of material, grinding can be carried out using MD-Plano, 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.
Ensuring Certainty

With offices and affiliates in 24 countries and a presence in more than 50 countries worldwide, Struers is the world’s leading materialographic solution supplier. We are dedicated to enabling our customers to ensure certainty in all aspects of materialographic preparation and testing as well as material hardness testing – wherever they are in the world. Struers offers a complete range of equipment, consumables, service and training programmes – all supported by the most comprehensive knowledge base, global applications support and a certified global service set-up.

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