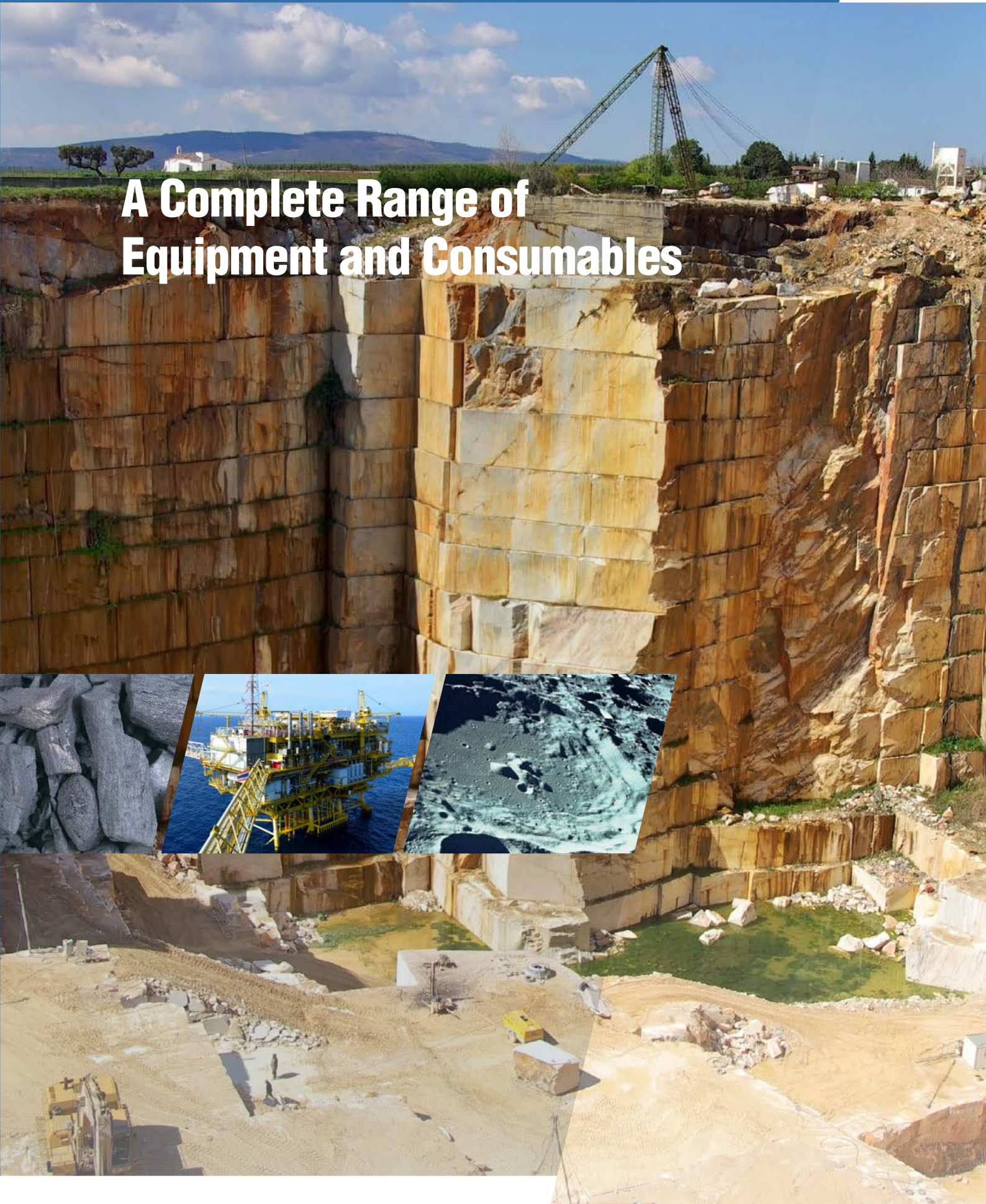


A Complete Range of Equipment and Consumables



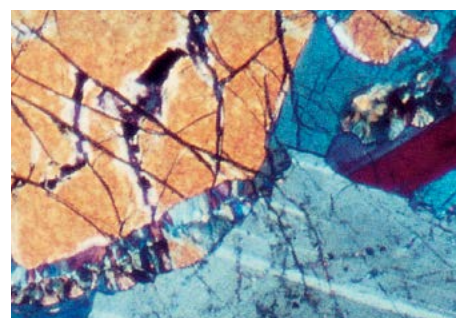
Struers' range of equipment and consumables for the preparation of mineralogical, geological and ceramic specimens covers the entire preparation process – from initial cutting to the finished thin section or polished section, ready for microscopic examination.

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.



Discoplan-TS

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. 037262xx

Table unit

With compartment for recirculation cooling unit, drawer for tools and shelves for cut-off wheels. 06266101
 Width: 930 mm, depth: 950 mm, height: 800 mm.

Extension for table unit

Can be mounted on both right and left hand side. 06266901
 Width: 400 mm, depth 950 mm

Diamond Cup Wheel MOP15

Metal bonded, for grinding of hard, brittle materials on Discoplan-TS. 40800013

Diamond Cup Wheel BOP15

Resin bonded, for grinding of hard, ductile materials on Discoplan-TS. 40800014

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. 40000029

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. 40000032

Welch Vacuum Pump

Used on Discoplan-TS, CitoVac for external pump and Accutom-100, -50, -5 and -2. Vacuum: ~907 mbar. Output: ~28 l/min. (06196133) ~34 l/min. (06196121). 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 06196121
 230 V / 50/60 Hz 06196133

Accutom-100

Precision cut-off and grinding machine with variable speed (300 - 5000 rpm). Variable automatic feed speed and motorized positioning system with digital read-out with MultiCut function. Built-in specimen holder rotation and oscillation and vacuum pump connection for vacuum chuck. Cut-off wheel, cup wheel and material database and 100 optional changeable methods included. Complete with recirculation cooling unit, flange set 50 mm dia. and tray for extra filter paper and collection of cut specimens. Specimen holders, cut-off wheels, cup wheels and Corrozip (additive for cooling fluid cat. No. 49900045) are ordered separately. 06176127

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. 06336127

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. 06386130

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. 06206917

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 40701018
 27 x 46 mm 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

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. 40800123
 MD-Piano 120, 300 mm dia. 40800127
 MD-Piano 220, 300 mm dia. 40800131
 MD-Piano 500, 300 mm dia. 40800135
 MD-Piano 1200, 300 mm dia. 40800139

MD-Largo

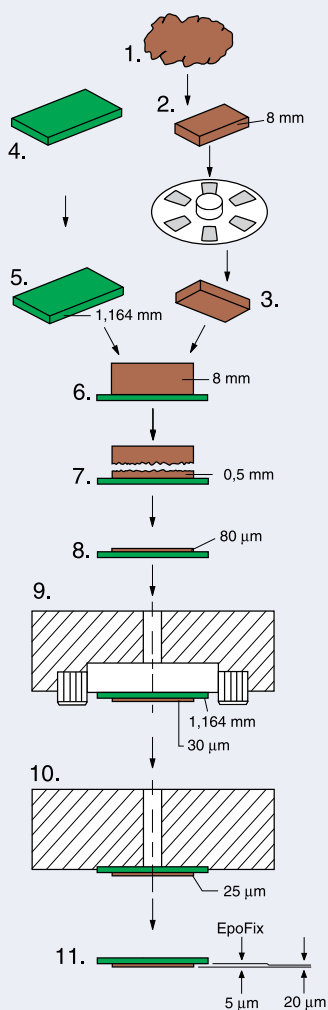
Maintenance-free disc for one-step fine grinding, using diamonds 300 mm dia. 40500099

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.

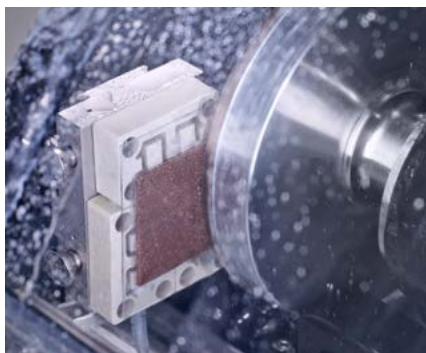


Outstanding precision

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 $\pm 2 \mu\text{m}$ 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.



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



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

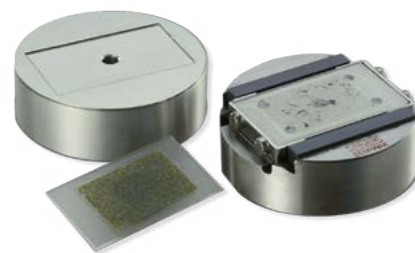
To achieve the final thickness (e.g. 20 µm), the sections are now lapped and polished on LaboPol-30/LaboForce-Mi: the specimens are placed either in a BORTY thin section holder for lapping or in a TYNDS thin section holder for polishing. Due to the automated preparation process the specimens are prepared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

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.



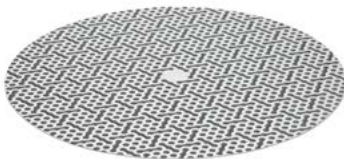
Lapping powders

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



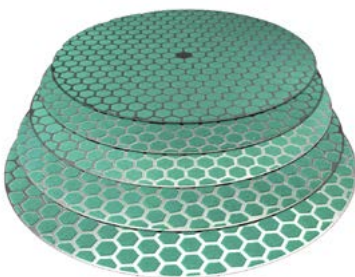
MD-Piano

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.



CitoVac

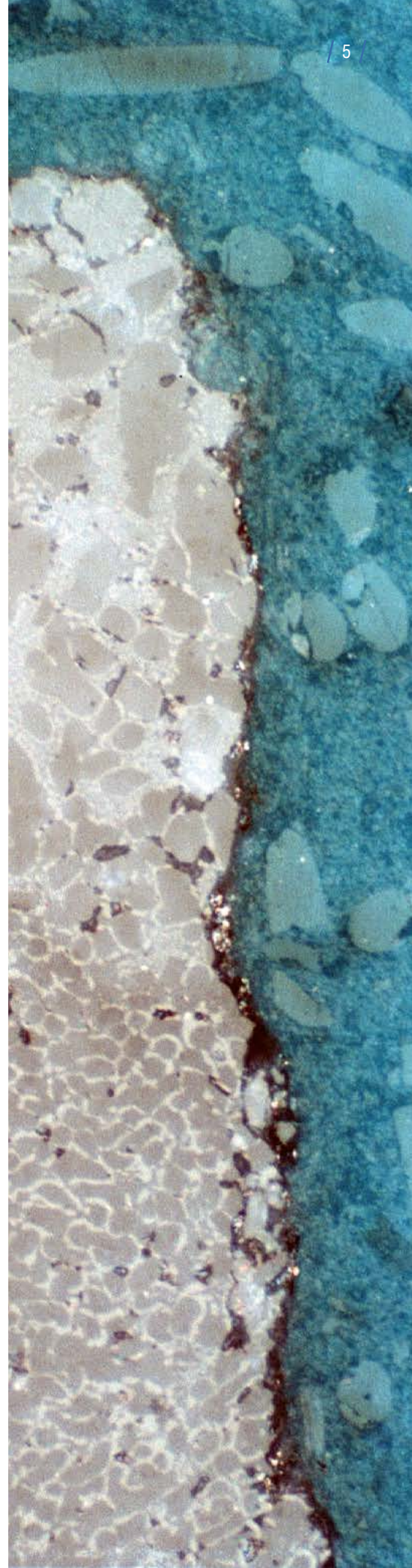
CitoVac is a vacuum impregnation unit, especially designed for mounting and impregnating of porous materials. It is also very well suited for gluing specimens to glass slides for the production of thin sections.



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



Easy filling of mounting cups.





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