

Hot Cell System



**User-friendly equipment
for materialographic
preparation of
radioactive material in
hot cells**



To meet the demand for preparation of radioactive materials, Struers has designed a complete range of sturdy and reliable equipment, which can be operated in hot cells.

The special hot cell versions are based on the following standard equipment:

- Secotom-10 precision cut-off machine
- Minitom precision cut-off machine
- CitoPress-5 mounting press
- TegraPol-15 grinding/polishing machine
- TegraForce-1 specimen mover
- TegraDoser-5 dosing unit

Requirements

The preparation of radioactive materials takes place in so-called hot cells, which are special enclosures, where radioactive specimens are handled with manipulators. Since the radioactivity in the cells will eventually attack plastics and electric parts, their use should be cut down to a minimum. Cleaning and decontaminating the whole system should be easy, and minimal waste should be generated during use.

Also, it must be possible to repair the equipment in the cell using the manipulators only. Considering that all parts in the cell will be radioactively contaminated, the equipment should be dependable in operation, because if not repairable in the cell, it will have to be discarded as radioactive waste. The amount of waste for final disposal must be kept at a minimum.

Design principles

The special requirements when working in hot cells require a very special design. Struers hot cell equipment is produced according to the following design principles:

Easy installation in hot cell

The front panel and electronics are placed outside the hot cell. The distance between front panel and the equipment placed inside the hot cell is standard 8 m. Different cables and tubes lengths are available. The equipment is provided with rollers and handles, thus it can be moved around in the hot cell.

Easy handling by manipulators

The equipment is adapted to allow remote operation and remote handling of specimens. Changing of consumable material between preparation steps is facilitated. The apparatus operates and is controlled just like any other standard model. The use of the MD-System, magnetic fixation of grinding discs and polishing cloths, eliminates changing of grinding/polishing discs and simplifies the manipulation in the hot cell.



The tray can be detached

Efficient preparation process

Struers e-Metalog methods ensure short preparation times and the highest degree of reproducibility. With the MD-System a grinding process using very little or no water can be carried out.

Easy to clean and decontaminate

The cabinets are made of stainless steel or aluminium with a suitable shape and surface treatment for easy cleaning. On the grinding/polishing machines, the tray can be detached for well-ordered removal of contaminated debris.

Radiation resistant materials

Many parts of the standard equipment have been substituted by others more able to resist the radioactive environment:

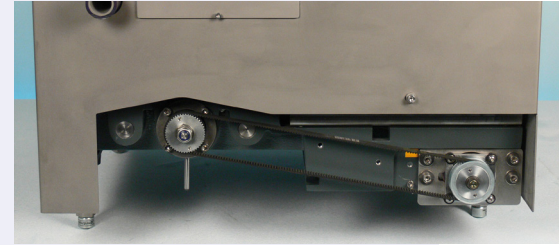
Whenever possible, plastic has been substituted by metal, and electrical parts have been placed outside the hot cell. Gear wheels and belts are as far as possible made of radiation resistant material.

Easy maintenance in hot cell

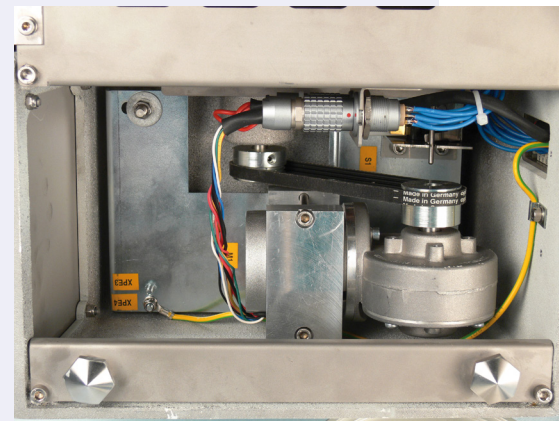
A sturdy, reliable design minimizes the need for service and repair. The equipment can be moved and turned in the hot cell for easy access. The cabinet is fastened by screws of cylindrical Allen type and is thus easy to remove. Electrical elements are connected by plugs for individual removal. Maintenance and exchange of vital parts including motors, belts and plastic tubes can be carried out in the cell using manipulators.

Minimal radioactive waste

Equipment size is as small as possible. With a preparation technique based on the MD-system, very little water is used and contaminated waste per sample prepared is minimized. The tray, being the most contaminated part of a grinding/polishing machine, can be disposed of separately.



Rear of Secotom-10 for Hot Cell



Bottom of Minitom for Hot Cell



Bottom of TegraPol-15 for Hot Cell

Design changes compared with standard equipment

General technical data stated in the brochures for the standard versions of the equipment are also valid for the hot cell versions. However, in relation to this, the hot cell versions imply following modifications:

The hot cell materiallographic lab

Though based on standard designs, all Struers hot cell equipments are made specifically for use in a radioactive environment:

- Secotom-10 for Hot Cell with its large, movable cutting table and large selection of clamping tools and specimen holders, allows precision cutting of larger and deeper samples.
- Minitom for Hot Cell is used for precision cutting of all types of materials with a specimen size up to 30 mm diameter.
- CitoPress-5 for Hot Cell is the option when hot mounting of specimens is required.
- TegraPol-15 for Hot Cell (variable speed 40-600 rpm) is equipped with TegraForce-1 for Hot Cell for automatic grinding and polishing. The use of Struers standard MD-system facilitates handling and reduces considerably the amount of radioactive waste.
- TegraDoser-5 for Hot Cell is very efficient for automatic supply of suspensions, lubricant or water.

The hot cell versions of our equipment can work with Struers standard accessories, consumables and software.

Secotom-10 for Hot Cell

Secotom-10 is controlled from outside the cell using touchpad controls and a joystick placed on the front plate of the control box. The data are shown on a LCD display. The wheel for height adjustment of the cut-off wheel unit is placed on the top of the machine and the adjustment can be carried out in the cell using manipulators. Opening/closing of splash guard takes place inside the cell with the manipulators.

The chassis is made of aluminium and the stainless steel cabinet is mounted with screws which are easy to remove. The cabinet appears with a electropolished surface. The tank for cooling water is in stainless steel with connecting pieces for easy replacement of water. It is placed underneath the cutting chamber. The main motor and feed motor are fastened by screws and equipped with cable connectors, thus it is possible to replace the motors directly in the hot cell using the manipulators. The belt for the feed motor, the pump for recirculation cooling and the standard transparent splash guard of plastic can be replaced in the same way.

Compared with our standard version, the hot cell version is about 50 mm higher, the width is about 20 mm smaller and the depth about 100 mm smaller.

All electric parts, except the motors and the cooling water pump, are placed outside the cell. Only cables need to be led into the cell. The electric parts are mounted in a control box with the normal touchpad front plate. This box is made for rack mounting, or it can stand alone.

Minitom for Hot Cell

Minitom is controlled from outside the cell with touchpad controls placed on the front plate of the control box. Operation in the hot cell can be carried out using manipulators.

The cabinet is made of painted aluminium. The tank for cooling water is in stainless steel. The main motor has been fastened with screws and mounted with cable connectors, thus it is possible to replace the main motor in the hot cell.

All electric parts, except the motor, are placed outside the cell. Just a cable needs to be led into the cell.

The electric parts are mounted in a control box with the normal touchpad front plate. This box is made for rack mounting, or it can stand alone.



Secotom-10 for Hot Cell

Minitom for Hot Cell



The machine is supplied without a water tap, solenoid valve and water hoses. Lubrication takes place through TegraDoser-5. The cabinet has been made of stainless steel and is mounted with screws which are easy to remove. The cabinet appears with an electropolished surface. The tray surrounding the disc and the drain pipe are made of stainless steel. The tray is detachable for easy removal of contaminated debris. The drain pipe is sloping and taken through the side of the machine. It is threaded at the end for easy connection. The splash ring, which protects against splashing from the rotating disc and specimen mover, is made of ABS, and the opening can be adapted to match the shape of the manipulator, reducing splashing to a minimum. The splash ring can easily be discarded, if the plastic deteriorates after long use. The bottom of the cabinet is open, so that the drive belt easily can be replaced by placing the machine on its side. The whole cabinet can be removed. The main motor has been fastened with screws and mounted with cable connectors, thus it is possible to replace the main motor directly inside the hot cell.



CitoPress-5 for Hot Cell

CitoPress-5 for Hot Cell

CitoPress-5 is controlled from outside the hot cell with touchpad controls placed on the front plate of the control box.

The operation can be carried out in the cell using manipulators.

The equipment has been prepared for various cooling options such as water recirculation or air cooling. It can be moved by simply lifting the front end. The cabinet has been designed in stainless steel and fastened with screws which are easy to remove. The cabinet appears with an electropolished surface. The tank for the hydraulic system is also of stainless steel. The top closure elevator has not been installed. Electrical elements are connected with plugs for individual removal.

The electric parts are mounted in a control box with the normal touchpad front plate. This box is made for rack mounting, or it can stand alone.

Mounting Unit for Hot Cell

The mounting unit has been redesigned to allow remote handling. Opening/closing as well as replacement of mounting unit can be carried out directly in the cell using the manipulators. Cooling can be done by water or air. The plastic parts of the top closure are made from radiation resistant plastic.

TegraPol-15 for Hot Cell

TegraPol-15 is controlled from outside the cell with touchpad controls placed on the front plate of the control box. The data are shown on a display.

The operation in the hot cell can be carried out using manipulators.

The machine can be moved by lifting the front end where a handle is placed. Three lifting eyes also facilitate the relocation.

All electric parts, except the motor, are placed outside the cell. Only a cable, supplying power to the motor, needs to be led into the cell. The electric parts are mounted in a control box with the normal touchpad front plate. This box is made for rack mounting, or it can stand alone.

TegraForce-1 for Hot Cell

The pressure and rotation are controlled from outside the cell with touchpad controls placed on the front plate of the control box for TegraPol-15. The force and other data are shown on a display.

The release handle for lifting the specimen mover plate has been extended, thus it can be operated by manipulators. The specimen mover is supplied with a handle for easy lowering of the specimen mover plate using the manipulators. The horizontal position of the specimen mover plate is fixed.

TegraForce-1 can be installed on and separated from TegraPol-15 using the manipulators.

TegraForce-1 for Hot Cell. Since the radioactivity in the hot cells will eventually attack plastics and electric parts, the use of these materials is cut down to a minimum



TegraPol-15 and TegraForce-1 for Hot Cell

The cabinet is made of stainless steel and is mounted with screws which are easy to remove. The cabinet appears with a electro-polished surface. The force on each specimen is applied with compressed air or by mechanical springs in the high-radiation edition. A belt, exchangeable with manipulators, takes care of the transmission from the motor to the shaft of the specimen holder plate. The gear motor is mounted with cable connectors and it is possible to replace the gear motor directly inside the hot cell.

All electric parts, except motor and sensors, are placed outside the cell in the control box for TegraPol-15.

TegraDoser-5 for Hot Cell

TegraDoser-5 is placed outside the hot cell. The liquids are taken into the cell through 7 plastic tubes: 6 diamond suspensions or lubricants and 1 for water. The tubes are placed in an outer flexible plastic spiral hose. The 7 tubes are connected to a nozzle block with 7 nozzles supplying the liquids to the grinding/polishing disc. The block has been manufactured in aluminium and placed on the side of TegraForce-1, thus it easily can be exchanged by manipulators together with the 7 tubes. In the hot cell version, the pumps can only supply liquid to the grinding/polishing disc. As they are not able to reverse, they will not lead the liquid back out of the hot cell.



The power supply for the TegraForce-1 is detachable. It can either be placed at the back of the TegraPol or at any other suitable place.

The TegraPol is equipped with 3 hooks for easy lifting and positioning of the machine



*TegraDoser-5.
Placed outside the hot cell*

TECHNICAL DATA

General technical data are stated in the brochures for the corresponding standard versions of the equipment.

SPECIFICATIONS

Secotom-10 for Hot Cell

Tabletop, precision cut-off machine with movable cutting table and variable speed. Automatic feeding with electronic control of feed speed. Motorised positioning system and digital read-out. Complete with control box with electric parts and controls for rack mounting outside the hot cell, recirculation cooling unit, flange set 65 mm dia. Cut-off wheels, specimen holders, additive for cooling fluid and clamping tools are ordered separately. Length of supply cable is 8 m; if other length is wanted, specify when ordering.

1/3 x 200-240 V / 50-60 Hz.

Cat. no:

05036327

Minitom for Hot Cell

Low-speed precision cut-off machine. Complete with control box with electric parts and controls for rack mounting outside the hot cell, universal specimen holder (04436901) and flange set 65 mm dia. as well as 42 mm dia. Cut-off wheels and cutting fluid are ordered separately. Length of supply cable is 8 m; if other length is wanted, specify when ordering.

1 x 100-240 V / 50-60 Hz.

04436416

CitoPress-5 for Hot Cell

Automatic, electro-hydraulic hot mounting press for one cylinder. Complete with control box with electric parts and controls for rack mounting outside the hot cell. Cooling by water or compressed air. Mounting units are ordered separately. Length of supply cable is 8 m; if other length is wanted, specify when ordering.

1 x 100-240 V / 50-60 Hz.

05776327

Mounting Unit for Hot Cell

Consisting of heating/cooling unit, lower ram and top closure with upper ram. For CitoPress-5 for Hot Cell.

Cyl. dia. 25 mm. 1 x 100-240 V / 50-60 Hz.

Cyl. dia. 30 mm. 1 x 100-240 V / 50-60 Hz.

Cyl. dia. 1 1/4". 1 x 100-240 V / 50-60 Hz.

Cyl. dia. 1 1/2". 1 x 100-240 V / 50-60 Hz.

Cyl. dia. 40 mm. 1 x 100-240 V / 50-60 Hz.

Cyl. dia. 50 mm. 1 x 100-240 V / 50-60 Hz.

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TegraPol-15 for Hot Cell

Grinding/polishing machine with variable speed (40-600 rpm in steps of 10 rpm). For disc 200 mm (8") dia. 370 W motor. Complete with control box with electric parts and controls for rack mounting outside the hot cell. Discs are ordered separately. Length of supply cable is 8 m; if other length is wanted, specify when ordering.

1/3 x 200-240 V / 50-60 Hz.

05526427

TegraForce-1 for Hot Cell

Automatic specimen mover with variable speed (50-150 rpm in steps of 10 rpm). For fine grinding and polishing of 1-3 single specimens or grinding and polishing of 3 specimens fixed in a specimen holder. Dosing unit, specimen mover plates and specimen holders are ordered separately. Length of tube for compressed air is 8 m; if other length is wanted, specify when ordering.

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TegraDoser-5 for Hot Cell

Dosing unit and database for preparation methods. With peristaltic pumps. For automatic dosing of diamond suspensions and lubricants. Can be used for supply of water. TegraDoser-5 for hot cell is placed outside the hot cell. The nozzle block is mounted on TegraForce-1 for hot cell. The peristaltic pumps cannot reverse. The built-in database contains the 10 Metalog Guide methods and has a capacity for additional 190 user-defined preparation methods. With 6 pumps for diamond suspensions or lubricants and 1 pump for water.

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Specimen mover plates for Hot Cell TegraForce-1

For 3 specimens 25 mm/1" dia.

For 3 specimens 30 mm dia.

For 3 specimens 1 1/4" dia.

For 3 specimens 1 1/2" dia.

For 3 specimens 40 mm dia.

Without holes

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06476901

06476902

06476903

06476904

06476905

Warranty

Not knowing the environment in the hot cell, we shall not be able to guarantee the operation of the parts in the hot cell, but of course the parts placed outside.

CE approval

The equipment is designed to be operated by manipulator in a closed compartment only. The hot cell versions are not CE approved, and they are not allowed for operation in an open laboratory. Struers refer to the CE approvals for the corresponding standard products.

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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Secotom-10



Secotom-10
Precision cut-off
machine
for cutting of larger
samples



To fulfil the need for a user-friendly precision cut-off machine specifically designed for precision cutting of larger samples, Struers introduces Secotom-10

Precision, Flexibility and User-friendliness - all in one

Features - Secotom-10:

- Very user-friendly and easy to operate - no programming required
- Spacious cutting chamber for optimal accessibility
- Large, movable cutting table allows cutting of larger and deeper samples
- Fast positioning with a joystick saves time
- Height adjustment of cut-off wheel allows for easy compensation for wheel wear
- OptiFeed ensures the fastest possible cutting speed within the set parameters
- Variable cut-off wheel speed provides optimal cutting speed with different wheel types and sizes

- Adjustable cutting length and AutoStop lets you attend to other tasks while the machine is working
- Large selection of clamping tools and specimen holders provides maximum clamping flexibility

Secotom-10 is a high performance table-top cut-off machine, which successfully combines the latest precision cutting technology with flexibility and user-friendliness.

Application areas:

Secotom-10 performs precise and deformation-free cutting of:

- Metals
- Ceramics
- Composites
- Sintered carbides
- Electronic components
- Crystals
- Biomaterials
- Minerals

Secotom-10

Cutting larger samples

One of the major features of Secotom-10 is its flexibility with regard to sectioning samples larger than previously possible in a precision cut-off machine. The cutting chamber is provided with a movable cutting table (196 x 184 mm / 7.7" x 7.2") made of corrosion resistant cast aluminium and fitted with a top surface of stainless steel bands. These steel bands are easily exchanged if damaged or worn.

By moving the cutting table instead of the cutting wheel, Secotom-10 cuts larger and deeper samples up to 60 mm / 2.3" diameter or 160 x 50 mm / 6.2" x 2". Maximum clamping flexibility is provided by multiple 8 mm T-slots, which allow a wide range of clamping tools to be used. Secotom-10 is the most universal precision cut-off machine in the Struers line.

Easy-to-use

Secotom-10 is very user-friendly. The machine is operated from a touch pad on the ergonomically designed, slanting front panel. Parameters for positioning and cutting are presented on the large graphic display. No programming is necessary - all parameters are displayed automatically and can be monitored throughout the process.

Fast positioning with a joystick

The joystick allows fast manual positioning of the sample, saving set-up time. Simply push the joystick upwards and the cutting table will move towards the wheel.



Struers vertical clamping device on the movable cutting table of Secotom-10

The speed of the cutting table varies according to how much pressure you put on the joystick. This enables fast and precise positioning of the workpiece.

Height adjustment of the cut-off wheel

The height of the cut-off wheel (in relation to the cutting table) can be adjusted in a range of 40 mm. This enables the use of a large variety of cut-off wheel sizes, and makes it easy to compensate for wheel wear. In addition, it eliminates the use of shims when the specimen is clamped directly on the cutting table.

OptiFeed - intelligent feed control

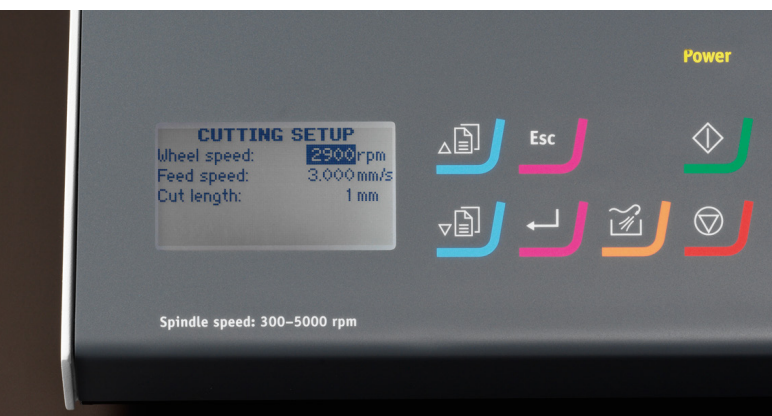
The feed speed can be pre-set and controlled in the range of 0.005 to 3 mm/sec. This wide range allows even the most delicate samples to be cut. If the feed speed is set too high, resulting in motor overload, OptiFeed automatically reduces the feed speed to an appropriate value. As soon as the load on the motor is reduced again, the feed speed is increased to the pre-set level.

Cutting irregular sized workpieces represents a great challenge to the operator. The risk of damage to the workpiece or the cut-off wheel is high. As the contact area between the workpiece and wheel gets larger, the force increases to maintain the pre-set feed speed. This may overload the machine, but thanks to OptiFeed, the feed speed is automatically reduced. When the contact area gets smaller again, the feed speed is automatically increased to the pre-set maximum.

Adjustable cutting length and AutoStop

On Secotom-10 the cutting length can be pre-set between 0-190 mm and adjusted in steps of 1 mm. Or you can use the AutoStop function, which automatically detects when the workpiece has been cut through, returns the cutting table to its start position and stops the motor.

Height adjustment of the cut-off wheel - one of the major advantages of Secotom-10



The large graphic display of Secotom-10



This gives you the freedom to attend to other tasks while the machine is cutting.

Read-out of load

The load on the cutting motor can be monitored throughout the process on the display on the front panel of Secotom-10.

Variable cut-off wheel speed

The cut-off wheel speed on Secotom-10 can be varied from 300 rpm to 5000 rpm in 100 rpm increments. This enables a more accurate choice of wheel speed for different cut-off wheel types and sizes.

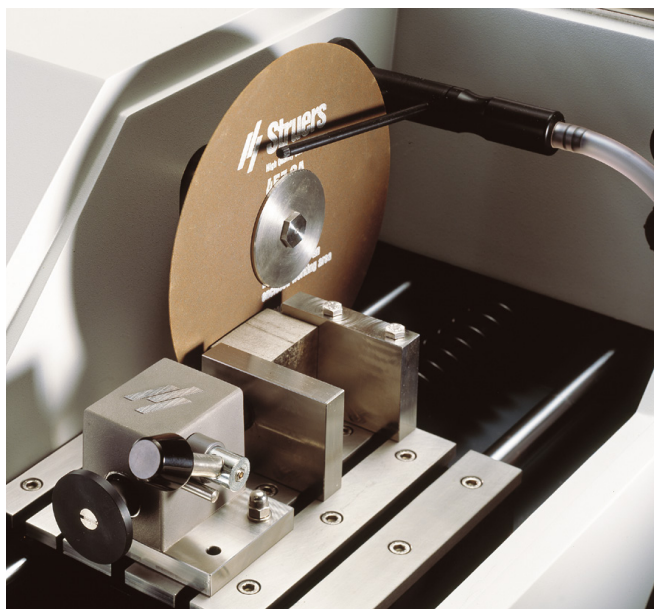
Cut-off wheels

All types of cut-off wheels from the size of 75-200 mm, including abrasive wheels, can be used on Secotom-10. Struers offer a large variety of diamond, CBN, Al_2O_3 and SiC cut-off wheels covering all possible applications.

Different flange sizes

Two additional flange sizes - 42 mm and 110 mm diameter - are available. This makes it easier to choose the correct flange in relation to different cut-off wheels, depending on whether you want maximum support of the wheel or maximum cutting capacity.

All types of cut-off wheels from 75-200 mm diameter can be used on Secotom-10



Struers quick-clamping device on the movable cutting table

Clamping tools

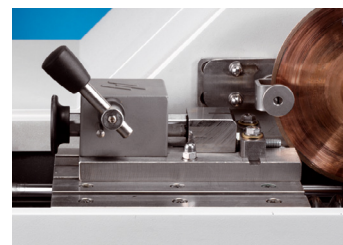
Struers quick-clamping device is particularly useful for clamping regularly shaped workpieces. For irregularly shaped workpieces or when you need to position the cut at a specific angle, the vertical clamping system is especially well-suited.

Specimen holders

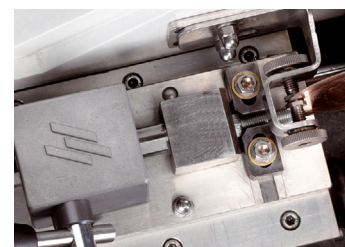
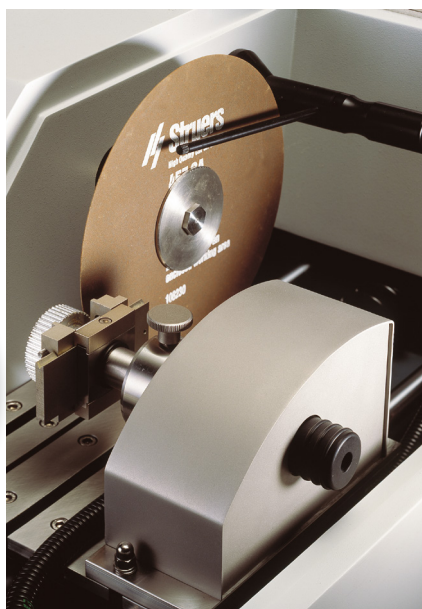
A large variety of specimen holders can be used with Secotom-10. All specimen holders are provided with a dovetail plate, which allows the sample to be clamped into the specimen holder outside the cutting chamber; it is then easily inserted into the dovetail fixture of the stand. Struers offers a comprehensive selection of specimen holders.

Recirculation cooling unit

The recirculation cooling unit ensures a constant low temperature during cutting, and an efficient removal of cutting debris. The coolant is applied to both sides of the cut-off wheel, and tracks with the wheel for long cuts. For easy maintenance the coolant hose can be used as a cleaning hose and the recirculation tank can be cleaned without removing the cut-off wheel.



Bolt clamping tool



Bolt clamping tool from above

The stand for manual positioning with one of the specimen holders from the Accutom series

Technical data

	Secotom-10
Cutting motor	800 W
Cut-off wheel sizes	75-203 mm / 3-8" dia.
Dimensions and weight	Height: 356 mm / 14" Width: 610 mm / 24" Depth: 740 mm / 29" Weight: 54 kg / 119 lb b
Rotational speed:	300-5000 rpm (in steps of 100 rpm)
Cutting power	800 W
Cutting table dimensions	Width: 196 mm / 7.7" Length: 184 mm / 7.2" T-slots: 8 mm
Positioning range of cut-off wheel	0-40 mm up/down
Feed speed	0.005 - 3 mm/s (in steps of 0.005 mm)
Cutting length	0-190 mm (in steps of 1 mm)
Cutting capacity	60 mm dia. or 160 x 50 mm / 2.3" dia. or 6.2" x 2"
Recirculation cooling unit	Contents: 3.8 l Flow: 800 ml/min.

Specifications

Secotom-10

Table-top, precision cut-off machine with movable cutting table and variable speed. Automatic feeding with electronic control of feed speed. Motorized positioning system and digital read-out. Complete with recirculation cooling unit and flange set 65 mm dia. Cut-off wheels, specimen holders, additive for cooling fluid (49900002) and clamping tools are ordered separately.

Accessories, Secotom-10 Hot Cell

Please contact Struers for more information



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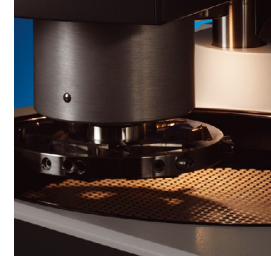
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See special brochure for more information about cut-off wheels.

Struers' equipment is in conformity with the provisions of the applicable International Directives and their appurtenant Standards. (Please contact you local supplier for details)

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



The TegraSystem is designed to fulfil your specific needs. Use a single element or several. Expand and adapt the modules to meet your developing needs.

With the TegraSystem you will gain the benefits of efficiency and reproducibility. You will enjoy the reliability of proven technology from the market leader.



High efficiency and reproducibility is ensured due to precise control of all preparation parameters

Consumable costs are reduced and specimen throughput is increased due to improved efficiency

Easy to operate with large graphical display and pre-installed preparation methods

LED light illuminates the preparation area

The emergency switch stops all moving parts in case of an emergency

Only one power, water and air connection is necessary to supply the whole system

Durable and proven technology ensures years of trouble-free operation

The TegraPol grinding and polishing machines

The TegraPol grinding and polishing machines are a series of sturdy, reliable and powerful machines, based on proven technology and designed for preparation of all types of materialographic specimens.

- Can be used for manual preparation or be equipped with specimen mover and dosing system.
- Available in 2 speed versions for standard specimen preparation and special applications
- Easy and straightforward operation
- TegraPol automatically detects connected units, no configuration is necessary
- TegraPol power supplies all connected units
- Sturdy and powerful design ensuring years of trouble-free operation

The 200 mm TegraPol-11 and -15

If you are preparing a limited number of specimens and still have high requirements to preparation quality, the 200 mm single disc machines are the perfect solution.

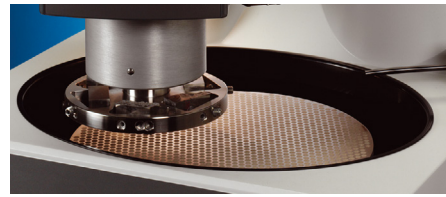
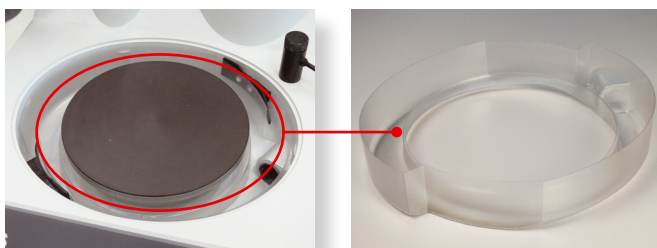
TegraPol-11 is a unit covering all basic requirements with a speed of 50-300 rpm, whereas TegraPol-15 has a higher speed range from 40-600 rpm.

Added equipment is automatically detected

As soon as a TegraForce or a TegraDoser is connected, the TegraPol automatically detects which unit has been connected and no configuration is required. The operation of the whole system is carried out on the TegraPol. A large graphical display ensures easy and straightforward operation.

In the TegraSystem, the TegraPol is the only machine connected to the power mains. All other units are supplied directly from the TegraPol. The advantage here is of course the limited need for power outlets at your facilities. The power supply for all connected equipment is only 24 V.

For TegraPol-11 / -15 a disposable bowl liner is available to facilitate cleaning of the machine considerably.



The oval opening on the TegraPol machines grants easy access when exchanging consumables. At the same time it allows to place the specimen holder or specimen mover disc in the best possible position over the preparation disc to achieve optimum preparation results



Emergency stop

All TegraPol machines are equipped with an emergency stop, for immediate stopping of all moving parts in case of an emergency.

Environmentally-friendly recirculation system

A recirculation cooling unit can be connected to the TegraPol grinding/polishing machines. Controlled from the TegraPol, it is started and stopped automatically. Polluted debris from the preparation can be collected safely and the cooling water is utilised repeatedly. This reduces pollution and waste of water and eliminates the risk of corrosion of specimens by ordinary tap water.



Recirculation System

The TegraForce specimen mover

Mounting a specimen mover on the TegraPol is the first step towards automatic preparation. The precise control of all preparation parameters including the force is necessary to ensure reproducible preparation results. This is only obtained by electronic force control and, on TegraForce; the force on the specimens can be exerted very precisely, and the advantages are many:

- High reproducibility through precise control of preparation parameters
- Preparation of single specimens with individual force applied – flexibility is maintained and there is no need for dummy specimens

Preparation of single specimens

When single specimens are inserted in a specimen mover plate, the force is applied individually to each specimen. With this outstanding feature there is no need for dummy specimens. If your workflow demands short response-times you will benefit greatly from the individually applied force and maintain maximum flexibility. The preparation of individual specimens starts with grinding using fine grain sizes. There is no need for coarse pre-grinding since each specimen is levelled and ground independently. Very low force (10 N) can be applied on the individual specimen allowing for preparation of very fragile materials.

TegraForce-1

TegraForce-1 is designed to be mounted on a TegraPol-11 or TegraPol-15 and is suitable for preparation of both single specimens and specimens clamped in a specimen holder. 1, 2 or 3 specimens of up to 40 mm/1½" diameter can be fine ground and polished individually. For high removal rate or when plane grinding is required, the 120 mm diameter specimen holder where 3 specimens are prepared simultaneously is used.

To avoid damage when the preparation is started, the specimen holder or the pressure feet are lowered at reduced force. After a few seconds, the force applied to the specimens is slowly raised to the pre-set value.

On TegraForce the force can be reduced automatically towards the end of the preparation, resulting in lower material removal and smaller scratches. This saves time on the following preparation steps, since the amount of deformation to be removed is minimised.

TegraForce is equipped with LED illumination. While providing extra light to the preparation area, LED's grant very long life-time and minimum power consumption, making them most environmentally-friendly.



TegraForce-1

Accessories

Struers offers a wide range of accessories to the TegraForce-1 specimen mover. For TegraForce-1 both specimen mover plates and specimen holders are available, enabling the preparation of many different sizes and shapes of specimens. For the manufacture of your own special specimen holder designs, Struers can deliver specimen mover plates without holes.



LED illumination

The TegraDoser-5 dosing system

Adding an automatic dosing system to your TegraSystem gives you complete control of the entire preparation process and thus the quality of your preparation results and the costs involved.

- Built-in database with 10 preprogrammed Metalog Guide methods
- Built-in database with up to 200 methods leaves you in complete control
- Easy programming and large graphic display
- Excellent reproducibility
- Cost saving specimen preparation
- High-quality peristaltic pumps guarantee exactly the same dosing every time
- No vaporization or spray mist
- Automatic recalculation of method parameters when exchanged between different machines
- Automatic dosing of Oxide Polishing Suspensions
- Configuration according to your needs

Control the quality of your results

Manual dosing always implies certain variations in the amounts of abrasives and lubricants being dosed, and in the intervals between each dosing. TegraDoser-5 ensures that exactly the same amount is dosed each time – no matter how many times a preparation sequence is carried out.

But TegraDoser-5 is much more than just a dosing system. The built-in database can contain up to 200 preparation methods that can be stored and recalled at any time. This gives you full control of all preparation parameters and methods, regardless of which technician, machine or laboratory performs the job. Exactly repeatable settings give reliably reproducible results and frees resources from routine checks and repeats.

On a large graphical display preparation methods can easily be programmed and edited, whereas the method is selected and started from the TegraPol.

No vaporization or spray mist

The peristaltic pumps on the TegraDoser transport both suspensions and lubricants to the polishing cloth. In other dosing systems the suspension is vaporized and sprayed onto the cloth, resulting in an unhealthy spray mist. With the TegraDoser the liquid is dosed exactly where you want it on the cloth, improving preparation quality and improving the working environment.

Control your consumables costs

With the help of TegraDoser the dosing of suspensions and lubricants can be adjusted to the exact amount necessary for the preparation method in question. This will result in substantial savings on the consumables account. And TegraDoser also enables the operator to attend to other tasks during the preparation process – the dosing is automatically taken care of.

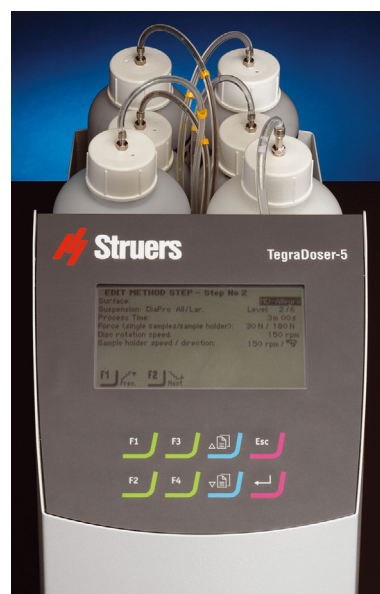
Automatic recalculation of preparation methods

A preparation method always needs to be adapted to the disc size of the grinding and polishing machine employed. As an example, the amount of suspension and lubricant that has to be applied on a 200 mm disc system is much less than the amount needed for a 300 mm disc system, simply because the surface area is smaller. The TegraSystem takes complete care of these required adjustments. Since the TegraSystem automatically detects the connected machines and units it can also automatically recalculate preparation methods to fit all system sizes. This ensures that preparation quality and reproducibility is maintained when preparation methods are being exchanged between machines, colleagues and labs.

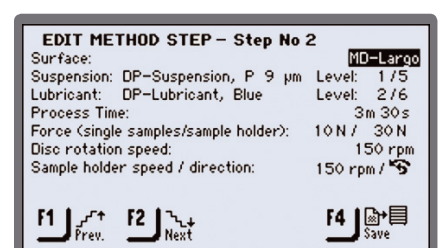
Automatic dosing of Oxide Polishing Suspensions

The use of peristaltic pumps also makes it possible to include the dosing of oxide polishing suspensions in an automatic dosing unit. No other separate dosing units offer this feature. In addition, when working with oxide polishing suspensions, water is automatically applied onto the polishing cloth before and after the preparation. This ensures that the cloth is prepared prior to the polishing and that both specimens and cloth are cleaned afterwards.

TegraDoser-5 can be equipped with up to 7 peristaltic pumps, 6 for diamond suspensions or lubricants and 1 for Oxide Polishing Suspensions.



Choose between 3, 4, 5 or 6 pumps for diamond suspensions/lubricant both with and without the pump for Oxide Polishing Suspensions



Data management and method details on TegraDoser-5

Grinding/Polishing machine	TegraPol-15
Disc diameter	200 mm / 8"
Disc speed	40 - 600 rpm
Rotational direction	CCW
Power supply	1/3 200-240 V / 50-60 Hz
Motor Power continuous / max	370 / 555 W
Automatic torque control	Yes
Emergency stop	Yes
Touch Pad control	Yes
Graphical display for easy selection of preparation methods	Yes
Soft start with pre-dosing	Yes
Controlled acceleration and deceleration	Yes
High speed drying of preparation disc, Spin Function @ 600 rpm	Yes
Max. torque at disc	>20 Nm
Compatible with Struers MD-system	Yes
Automatic detection of connected equipment	Yes
Connection of a polishing head	TegraForce-1
Maintenance management	Diagnostic and time used
Service features	Machine test and self diagnostic
Width, Depth, Height and Weight	410 mm / 670 mm / 315 mm / 25 kg

Polishing head	TegraForce-1
Single specimens	Yes, 1 - 3 specimens
Specimen holder	Yes, 3 specimens
Rotational speed	50 - 150 rpm
Rotational direction	CCW + CW
Motor Power continuous / max (power supplied from TegraPol)	35 / 53 W
Force per specimen, single specimens / specimen holder	10 - 50 N / 30 - 150
LED lighting	Yes
Lifting capacity for specimen holders	-
Connection of dosing system	TegraDoser-5 or TegraDoser-1
Identical Start and Stop position of polishing head	Yes
Soft start function	Yes
Force reduction	Yes
Automatic lift-off after preparation	No
Locking of polishing head	Manual
Push button for quick release of specimen holders	No
Guide for positioning of polishing head	Yes
Fixed stop position of polishing head	Yes
Service features	Machine test and self diagnostic
Width, Depth, Height and Weight	140 mm / 311 mm / 445 mm / 7 kg

Dosing unit	TegraDoser-5
Precise dosing with peristaltic pumps	Yes
Number of pumps	Up to 7 pumps
Handles lubricant, suspension and all-in-one suspensions	Yes
Handles OP-suspension	Yes
Integrated automatic cleaning function	Yes
Graphical display for programming of preparation methods	Yes
Integrated database	10 Metalog Guide methods and 200 user methods
ID switch for parameter step control	-
Download of preparation methods from Internet (Struers e-Metalog)	Yes
Possibility to program methods via PC	Yes
Access to consumables list	Yes
Width, Depth, Height and Weight	200 mm / 210 mm / 380 mm / 8.5 kg (excl. bottle tray)


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