

The powerful preparation system for high quality specimen preparation

The Tegramin preparation system elegantly combines ease of use with advanced functionality. Innovative solutions improve preparation results and help you deal with a variety of specimens or materials, or high specimen volume.

Two system sizes

Tegramin is available for two different disc sizes: Tegramin-30 for 300 mm disc and Tegramin-25 for 250 mm disc.

Variable speed of disc and specimen mover head

Tegramin is equipped with variable disc speed of 40-600 rpm and variable specimen mover head speed of 50-150 rpm. This allows for preparation of very sensitive materials at low speed, as well as fast preparation with high material removal at higher speeds.

High preparation capacity

On Tegramin-30: up to 6 single specimens of 50 mm dia. and specimen holders size 160 mm or 200 mm dia.

On Tegramin-25: up to 6 single specimens of 40 mm dia. or 3 single specimens of 50 mm dia. and specimen holders size 140 mm or 160 mm dia.

Easy insertion and removal of specimens

Intuitive user interface

Easy cleaning with removable bowl liner and bowl flush

Cover for improved safety

Perfect preparation results with precise force control

Methods database and automatic dosing ensure reproducibility

Disc cooling reduces consumables consumption

Sturdy and durable design

The entire base which is made of an AlSiMg alloy with high mechanical strength and chemical resistance, guarantees life-long durability.

Dual column construction

On the cast base, a sturdy construction carrying the specimen mover head is fixed. The up/down movement is based on two strong columns making the entire systems as solid as possible. This has a very positive effect on specimen planeness and noise during preparation.

MD-Disc with cone

It is very easy to remove the MD-Disc and it allows therefore the fast exchange of the bowl liner. It has a higher mass than the traditional MD-Disc so it also keeps the temperature of the preparation surface lower and can easier be cooled down using the disc cooling function.

Easy cleaning with removable bowl liner

A bowl liner that fits precisely into the bowl collects all debris that are not washed down the drain. When the machine has to be cleaned, the bowl liner can easily be removed. It can then either be cleaned or discarded.

Bowl flushing

To further facilitate cleaning, Tegramin is equipped with a bowl flush function. While the disc is rotating, disc cooling is activated. The water that is sprayed on the bottom of the MD-Disc is distributed to the walls of the bowl, washing away loose debris.

Spin function for cleaning and drying

By holding the disc key down the disc will spin up to maximum speed and thus all excess water after cleaning will be removed from the MD-Disc or the preparation surface.



Improved working area

Cover to encase the preparation area

As an option, a transparent cover that encloses the entire preparation area, is available. The cover offers several advantages: when alcohol-based consumables are used, all the fumes are contained within the cover. The cover can be connected to an exhaust and all fumes can be removed without any personal danger.

When the cover is closed, the user cannot get in contact with any rotating parts and personal safety is improved. When the cover is mounted, the Tegramin cannot be started when the cover is open (unless manual preparation has been selected). The machine will also stop if the cover is opened while a preparation step is running.

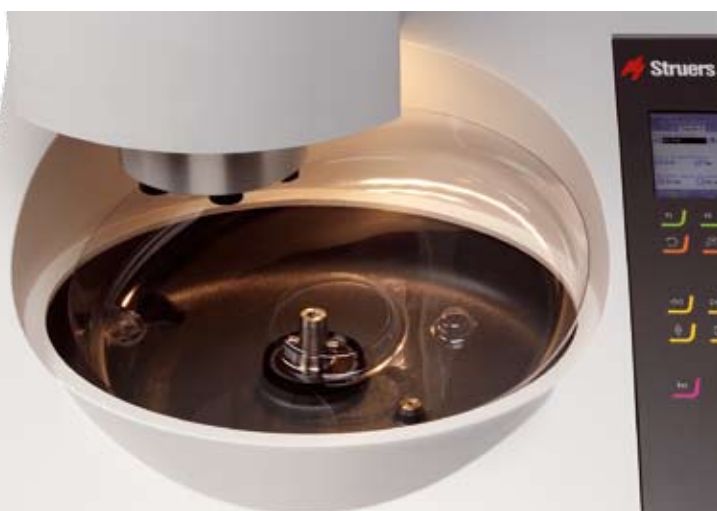
Possibility to connect a recirculation cooling unit

One of Struers' recirculation cooling systems can be connected to Tegramin. This is especially useful to collect grinding debris and to avoid blocking the draining system in the lab. It is also very useful when water is scarce or when there simply is no water connection nearby.

Shift valve to use both recirculation and tap water

For the first time with a table top machine it is possible to connect both tap water and a recirculation cooling system at the same time. Water from the recirculation system can be used for grinding; for the OP-polishing step, where absolutely clean water is a must, tap water is used.

The shift valve is activated automatically to direct the waste water in the correct direction to avoid overflowing or emptying of the recirculation cooling unit.



180° rotation of specimen mover head
One touch of the key rotates the plate 180°
and facilitates insertion of the specimens

Easy specimen handling and operation

Preparation of single specimens and specimen holders

Tegramin is designed for preparation of both single specimens and specimens clamped in holders. Simply switch between the two possibilities and insert either a specimen holder or a specimen mover disc to run the required method. Thus all options are covered.

Specimen mover head stopping again at start position

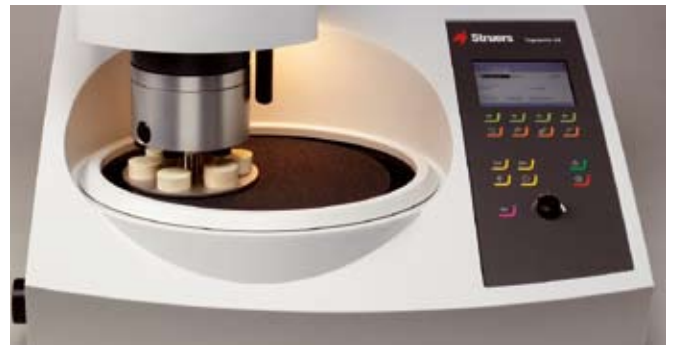
The specimen mover head is always stopping at the exact same position it was started at. This makes it easier to insert and remove the specimen holder or specimen mover disc as the black release button always is in the same position. It also makes it easier to identify individual specimens as they start and stop exactly in the same position.

Easy insertion and removal of specimens

Tegramin is equipped with a key to rotate the specimen mover plate automatically. One touch of the key rotates the plate 180° and facilitates insertion and removal of the specimens.

Motorized horizontal positioning of specimen mover head

It is possible to adjust the specimen mover head position relatively to the preparation disc. The centre lines of both discs are identical, so depending on the diameter of the specimen holder or mover disc it can be moved left or right for the best possible utilization of the preparation surface.



Emergency stop, for immediate stopping of all moving parts in case of an emergency.

LED light illuminates the entire preparation area and makes it easy to follow the preparation process. The LED's have a very long lifetime and low power consumption.

Large colour display. This allows showing all parameters of a preparation step in an easy-to-read-way and makes manoeuvring uncomplicated and user-friendly.

This turn/push knob facilitates and speeds up the entire machine operation and programming.

Keep surface temperature low

Disc cooling

Underneath the MD-Disc, a nozzle can be opened to apply water to the backside of the disc and thus reduce the temperature increase, that can occur during preparation, by up to 20°C. The thermographic images indicate some of the difference. With the disc cooling function the temperature of the preparation surface is kept low. This is particular relevant for high volume preparation and will not only improve preparation quality, but also keep consumption of suspensions and/or lubricants down.

Perfect preparation results

Precise force control

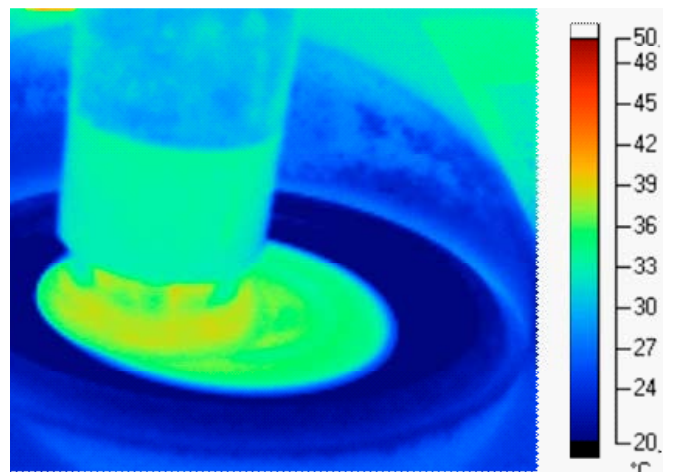
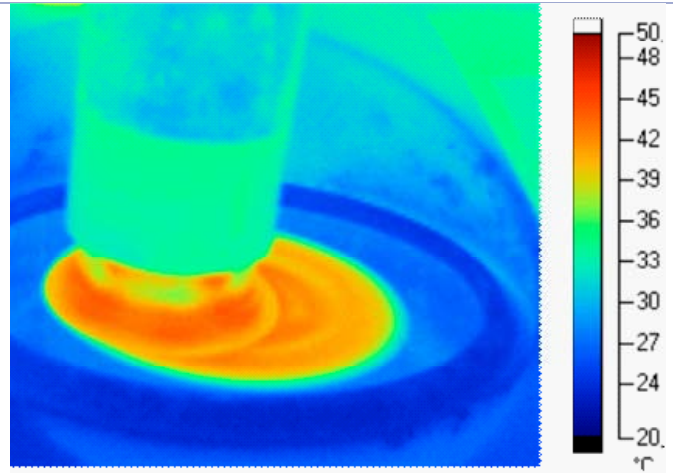
It is possible to start with a force as low as 5 N per specimen. This is used for small or sensitive specimens to avoid damage during grinding and polishing.

Automatic locking of specimen mover plates

After the specimen mover plate has been moved into the correct position over the preparation surface, the coupling is locked inside the specimen mover head. The possible small movements of the specimen mover disc are now avoided completely, and the result is a tremendous improvement in specimen planeness.

Soft start and stop

Both the start and stop sequence of a preparation step are controlled precisely. The force is increased and decreased gradually, and the speed of both preparation disc and specimen mover plate is ramped up and down at predefined "angles" to get the best possible preparation result without the risk of damaging the specimen because of preferential grinding.



Direction head

The rotational direction of the head can be set to either clockwise or to counter-clockwise. Normal preparation is always carried out using the counter-clockwise movement, i.e. same as the disc movement for the best possible dynamic relations. For special applications and for polishing with oxide polishing suspensions, the rotation is changed to clockwise to keep the suspension better on the disc.

Removal measurement on specimen holders

A built-in removal sensor allows for the measurement of material removal in the range from 50 - 5.000 μm . Instead of relying on preparation time, especially when grinding various numbers of specimens, the necessary amount of material to be removed can be specified. This guarantees the shortest possible grinding time while ensuring that sufficient material has been removed.

Slow rotation while pre-dosing

When a preparation step is started, the first few seconds are normally used for pre-dosing. During this time the disc is turning slowly for a more equal distribution of the suspension or lubricant and to avoid the liquid to be thrown off the disc.



Tegramin has an automatic level calculation that will inform the user when the level in one of the bottles gets too low.

Convenient automatic dosing

Increase reproducibility

Automatic dosing of consumables ensures that a controlled amount is applied every time. This greatly increases reproducibility and keeps consumables consumption under control.

Different dosing modules available

Two different dosing modules are available for Tegramin: One module with two pumps for DP-Suspensions or lubricants, and one module with two pumps for DP-Suspensions or lubricants and one pump with water connection for OP-Suspensions. These modules can be combined at will, opening for six different combination possibilities and up to 7 pumps in total.

Manual preparation with automatic dosing and timer function

It is possible to select manual preparation. In this menu it is possible to display the preparation surface to be used and to program the lubricant and/or suspension to be used together with the dosing level and the preparation time. After pressing start, dosing will start automatically and the disc will stop as soon as the preset time has expired. This allows e.g. for a controlled, short manual re-polishing of specimens after etching.

Automatic level calculation

It can be difficult to see the level in all bottles when they are placed in the bottle tray. Tegramin has an automatic level calculation so when a lubricant or suspension is filled into a bottle, the volume that is in the bottle can be specified in the bottle configuration.

Sniff function when dosing DP-Suspensions and lubricants

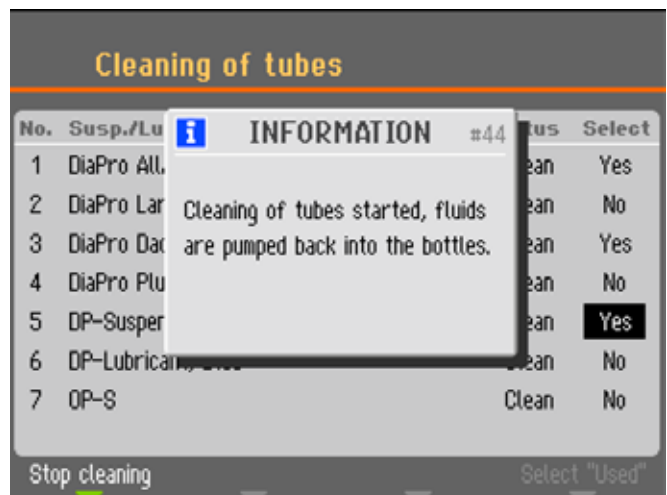
At the end of every preparation step the pump(s) used during that step reverse slightly to retract the suspension or lubricant from the dosing nozzle. This eliminates the risk of contamination at a later step from coarse abrasive on a finer grain size step.

Cleaning function for all tubes

The software contains a built-in cleaning routine for cleaning all the tubes for suspensions and lubricants. Tegramin monitors which suspensions and thus which pumps/tubes have been used and offers the possibility to clean just the tubes with the status "Used". It is also possible to select any tube for cleaning independently. Messages on the display tell exactly what to do and at the end of the operation the selected tubes are clean and ready for e.g. a change to a different grain size.

Automatic tube cleaning after OP polishing

At the end of the OP-polishing step the force is reduced to the lowest possible value, the rotation changed from counter- to co-rotation and a water valve is opened directly after the peristaltic pump. That means that the tube is flushed completely, all OP-Suspension is removed and at the same time both polishing cloth and specimens are cleaned as well. Therefore no chemical attack will take place after the OP-step is finished. At the very end of the step the pump will reverse to also replace the OP-Suspension between pump and bottle with water. Thus there is no risk of clogging tubes whatsoever.





Three different user-levels can be set: Production, Development and Configuration. This allows for the lab manager to configure the machine and develop preparation methods. When the user level then is changed to Production, only a few necessary parameters can be changed while the rest is locked to avoid changes to the preparation result.

Preparation methods ensure reproducibility and consistency

Increase reproducibility

Consistent preparation procedures are required to ensure repeatability and reproducibility. Tegramin includes a method database able to store as many as 200 preparation methods.

Start right away

Tegramin includes 10 Struers Metalog Guide methods which cover all major material groups. They are developed for maximum performance of the Tegramin and allow you to get started right away. They also provide an excellent starting point for development of your own methods.

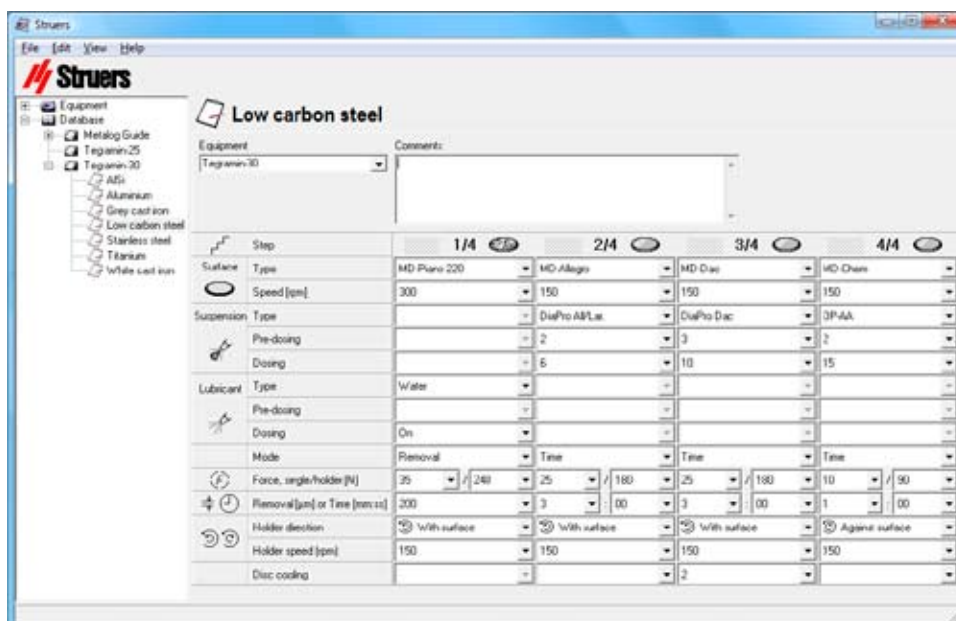
Consistent quality with network connection

Tegramin can be connected to the local area network or to a single PC. With MethodPro installed on a connected PC, preparation methods and consumables can be copied and updated at any time. Also, preparation methods from the Struers homepage can be copied and used immediately. It allows also the development of preparation methods in the central lab and their distribution to satellite facilities or suppliers.

	Surface	Suspension	Lub.	Time/pm
1	Piano 220		Water	1:00 min
2	Allegro	DiaP. All/Lar.		0:10 min
3	Allegro	DiaP. All/Lar.		2:10 min
4	Allegro	DiaP. All/Lar.		0:10 min
5	Dac	DiaP. Dac		3:00 min
6	Chem	OP-AA		2:00 min
7	New step			

Automatic combination of preparation steps with same surface and suspension/lubricant

In some cases, it can be an advantage to divide a preparation step into two or three sub-steps with e.g. different force or dosing levels for even more reliable and fast specimen preparation. Tegramin automatically recognises steps as sub-steps when the same preparation surface and lubricant / suspension are used. It will therefore run these steps in succession, without any user-intervention. This function can be un-selected when SiC Papers are used, as here often several steps are created to allow the change of worn papers.



A wide range of specimen mover plates are available for Tegramin.



Technical data		Tegramin-25	Tegramin-30
Disc	Diameter	250 mm / 10"	300 mm / 12"
	Speed	40-600 rpm, variable in steps of 10	
	Rotational direction	Counter-clockwise	
	Motor	750 W / 1.0 HP	750 W / 1.0 HP
	Torque at disc Cont. at <300 rpm Cont. at 600 rpm Max.	23.8 Nm / 17.6 ft-lbf 11.9 Nm / 8.8 ft-lbf > 40 Nm / 29.6 ft-lbf	23.8 Nm / 17.6 ft-lbf 11.9 Nm / 8.8 ft-lbf > 40 Nm / 29.6 ft-lbf
Head	Speed	50-150 rpm, variable in steps of 10	
	Rotational direction	Clockwise, counter-clockwise	
	Motor	120 W	160 W
	Torque	7.5 Nm / 5.6 ft-lbf	
Software and electronics	Controls	Touch pad and push/turn knob	
	Memory	FLASH-ROM / RAM / NV-RAM	
	LC Display	TFT-colour 320x240 dots with LED back light	
Safety	Please refer to the Declaration of Conformity		
Noise level	At idle running, at a distance 1.0 m / 39.4" from the machine	47 dBA	
	During preparation	Polishing 54 dBA, Grinding 56 dBA	
Surrounding temperature	5-40°C / 41-104°F		
Humidity	Non condensing	0-95% RH	
Supply	Voltage / frequency	200-240 V / 50-60 Hz	
	Power inlet	1-phase (N+L1+PE) or 2-phase (L1+L2+PE) The electrical installation must comply with "Installation Category II".	
	Power, nominal load	1060 W	
	Power, idle	13 W	
	Current, nom.	5.3 A	
	Current, max.	10 A	
	Pressure for tap water	1-10 bar / 14.5-145 psi	
	Water inlet	1/2" or 3/4"	
	Water outlet	ø32 mm / 1 1/4"	
	Air inlet	ø6 mm	
	Air pressure	6-10 bar / 86-145 psi	
Air quality	The air supplied must be of Class-3 or better, as specified in ISO 8573-1.		
"Exhaust" (with Cover only)	Dimension	Ø50 mm	
Dimensions and weight (without Cover)	Width	67.5 cm / 2"	
	Depth	75 cm / 26.6"	
	Height	56 cm / 29.5"	
	Weight	90 kg / 198 lb	
Dimensions and weight (with Cover)	Width	67.5 cm / 26.6"	
	Depth	75 cm / 29.5"	
	Height (cover closed/open)	58.2 cm/22.9" / 90 cm/35.4"	
	Weight	98 kg / 216 lb	

Specifications

	Cat. no:
Tegramin-30 Automatic plane grinding machine for specimens in specimen holders 160 mm / 6.3" and 200 mm / 8" diameter. With automatic diamond dresser and removal rate sensor. Recirculation cooling unit (05766xxx), grinding stone and specimen holders are ordered separately.	06036127
Tegramin-30 with cover Automatic, microprocessor controlled machine for grinding and polishing of specimens on 300 mm MD-Disc with cone. With transparent cover. Dosing modules, MD-Disc with cone and specimen holders are ordered separately.	06036227
Tegramin-25 Automatic, microprocessor controlled machine for grinding and polishing of specimens on 250 mm MD-Disc with cone. Dosing modules, MD-Disc with cone and specimen holders are ordered separately.	06026127
Tegramin-25 with cover Automatic, microprocessor controlled machine for grinding and polishing of specimens on 250 mm MD-Disc with cone. With transparent cover. Dosing modules, MD-Disc with cone and specimen holders are ordered separately.	06026227
Tegramin Dosing Module with two DP pumps To be installed on Tegramin-30 or -25. With two pumps for diamond suspensions or lubricants.	06036901
Tegramin Dosing Module with two DP and one OP pump To be installed on Tegramin-30 or -25. With pumps for diamond suspensions or lubricants and one pump for OP suspensions.	06036902
Bottle tray	06036910
Preparation Discs MD-Disc with cone for Tegramin-30, 300 mm dia. MD-Disc with cone for Tegramin-25, 250 mm dia.	06086403 06086402
Cover Transparent cover for Tegramin-25/-30	06036903
Shift valve for Tegramin for recirculation cooling unit (05766xxx) or drain.	
Struers Cooling Unit, System 3 With 50 l tank, small pump, Cooli-1, 50 l static filter with filter paper. 1 x 100 V / 50 Hz 1 x 220-240 V / 50 Hz 1 x 100-120 V / 60 Hz 1 x 220-240 V / 60 Hz 1 x 100-120 V / 50-60 Hz CSA	05766516 05766522 05766523 05766524 05766616
Levelling device for levelling of specimens in specimen holders (ø 140 mm)	05256903
Levelling device, Uniforce for levelling of specimens in specimen holders ø 140, 160 and 200 mm. With pressure foot for positioning of specimens for levelling of specimens in specimen holders ø 140, 160 and 200 mm.	04886102 04886101
Specimen mover plates For single specimens. 4 mm thick. Coupling (06086901) is ordered separately.	
	For Tegramin-25 For Tegramin-30
Without holes	06086906 06086936
For 6 specimens 25 mm dia.	06086902 06086932
For 6 specimens 1" dia.	06086909 06086939
For 6 specimens 30 mm dia.	06086903 06086933
For 6 specimens 11/4" dia.	06086910 06086940
For 6 specimens 11/2" dia.	06086911 06086941
For 6 specimens 40 mm dia.	06086904 06086934
For 3 specimens 50 mm dia.	06086905 -
For 6 specimens 50 mm dia.	- 06086935
For Accustop 30	06086907 06086937
For Accustop 40	- 06086938

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