



HIGH-VOLUME SAMPLE PREPARATION



metkon
Technology behind Specimen

metkon
Technology behind Specimen

LOX 102

EMERGENCY
STOP

METKON HIGH-VOLUME SAMPLE PREPARATION SOLUTIONS

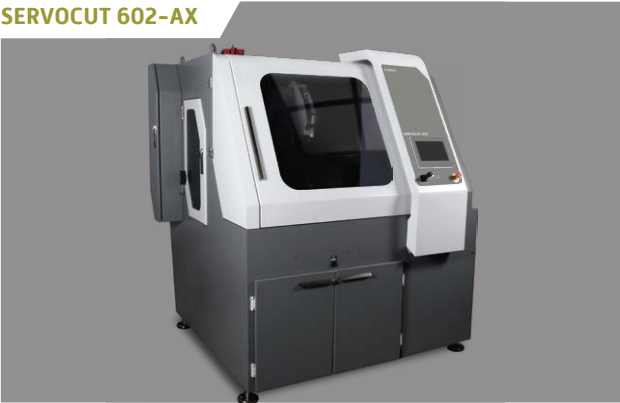
HIGH-VOLUME SAMPLE PREPARATION SYSTEMS

High-Volume Sample Preparation requires robust, high-capacity and highly automated equipment to perform high sample throughput with minimum operator intervention. Without automated or high-capacity equipment, a lot of workforce and extra time required to obtain high sample throughput levels. Repeatability is also another problem for non-automated sample preparation equipment.

Metkon offers total solutions for both High-Volume Cutting and High-Volume Grinding & Polishing to obtain high sample throughput with maximum repeatability, maximum automation and minimum operator intervention.

HIGH-VOLUME CUTTING SYSTEMS

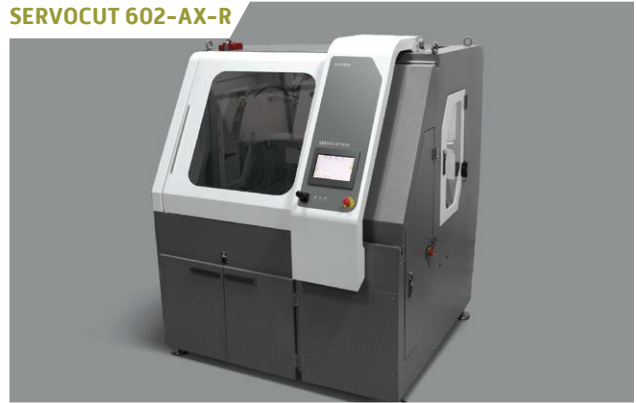
SERVOCUT 602-AX



Extremely Large Size

Cutting capacity Ø225 mm with cut-off wheel dia. of 500/600 mm

SERVOCUT 602-AX-R



Extremely Large Size

Cutting capacity Ø225 mm with cut-off wheel dia. of 500/600 mm

HIGH-VOLUME GRINDING & POLISHING SYSTEMS

FORCIPLAN 352



Semi-Automated System Combination

Ø210 (10xØ40mm)

FORCIPOL 352



Semi-Automated System Combination

Ø210 (10xØ40mm)

VELOX 102



Fully-Automated System

Ø160 (6xØ40mm)



SERVOCUT 602-AX
Multi-Target Cutting-Ø600



SERVOCUT 602-AX-R
4-Axes Multi-Target Cutting-Ø600

HIGH-VOLUME SAMPLE CUTTING SYSTEM

SERVOCUT 602 Series of Cutting Machines are perfectly suitable for high-volume sample cutting applications. The Multi-Target cutting feature allows cutting multiple sample in same operation without re-clamping of samples, therefore minimum operator intervention required to operate the machine.

Advantages of Multi-Target Cutting

SERVOCUT 602-AX model allows you to clamp and cut multiple samples in same cycle. Up to 20 different cutting positions can be programmed. No re-clamping or operator intervention is required when one sample is finished cutting and the other sample is started to be cut. Operator can start machine and leave it alone. SERVOCUT 602-AX will perform all cuts automatically.

Advantages of 4-Axes Multi-Target Cutting

SERVOCUT 602-AX-R model is equipped with a 360° rotary table. This allows you to cut samples in different angles in same operation. Therefore, the large parts can be sliced into the multiple smallest pieces without re-clamping or any operator intervention. Up to 20 different cutting angles or cutting positions can be programmed.

Avoiding Re-Clamping of Sample

Clamping of a sample takes a lot of time. SERVOCUT 602 series are aimed to eliminate this time consumption for high-volume cutting. Therefore, operator can do other task in the laboratory without interrupting.



Advantages of Multi-Target Cutting



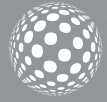
Advantages of 4-Axes Multi-Target Cutting



Avoiding Re-Clamping of Sample



SERVOCUT 602



SERVOCUT 602 is an advanced high capacity cutting machine especially designed for cutting extra-large and multiple specimens.

- Modern and sturdy design
- Extra Large Cutting Capacity
- Extraordinary access for easy handling
- Unique belt protection system
- Programmable with colored HMI touch screen controls
- X-Y-Z three axes cutting capability
- Ergonomic Joystick control offers excellent application versatility
- Cut-Off Wheel Diameter Measurement
- Inbuilt Lubrication System

DESIGN

SERVOCUT 602, an advanced high capacity cutting machine, offers advantage of combining different cutting techniques and methods to obtain superior cut surfaces for a broad range of heavy-duty cutting applications.

SERVOCUT 602 has a robust and reliable design with low noise and emission levels. The modern and sturdy design with powerful 15 kW cutting motor ensures fast and efficient cutting through the hardest and complex materials with precise servo motor driven axis controls.

SERVOCUT 602 has X-Y-Z triple axes cutting capability:

Z-axis Chop cutting

The specimen is clamped and the cut-off wheel approaches the specimen.

Y-axis Table-feed cutting

Feeding the clamped specimen into a rotating cut-off wheel using a T-slotted feed table.

X-axis Parallel Cutting

Parallel serial sectioning in the x-axis with cutting wheel movement.

A large, stainless steel T-slotted feed table located in the cutter's generous work area can accommodate a variety of different clamping devices which need to be selected. The servo driven table provides a long travel depth making the SERVOCUT 602 ideal for cutting long or deep samples up to 100Hx500D in a single pass or 200Hx550D with optional Combined Cut feature.

The front sliding door and side cover can be completely opened for easy access and handling to all sides. Side access ports make it possible to make transverse sections on long specimens. A large window of Lexan and a sealed LED lamp in the cutting chamber allow precise observation of the cutting process at an optimum degree of safety.

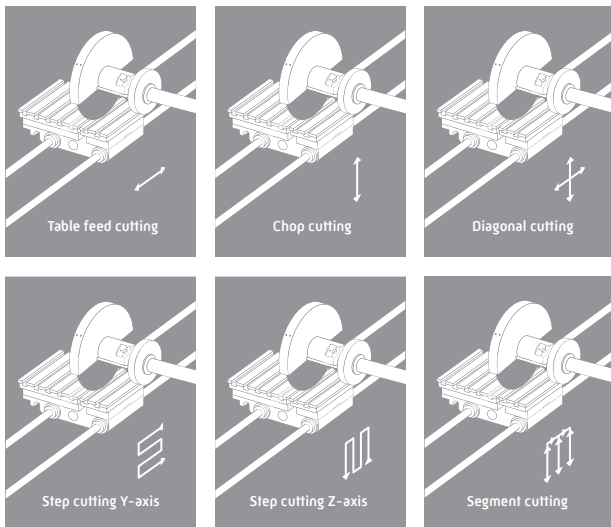


Extra large cutting chamber with easy access and handling.

Safety

SERVOCUT 602 automatic cutting machine has the highest safety standards. The interlocking safety device does not allow the motor to be started unless the sliding door or the side access ports are closed. The sliding door cannot be opened before the cutting motor is stopped. The electronic brake system, which is a standard feature, brings the cutter to a quick full stop in seconds after it has been switched off. A two-hand control feature ensures that the operator's hands are completely out during positioning and prevented from reaching into the moving components with open sliding door. A stack light is located on the top of the equipment to provide visual and audible indication of machine status. Easily accessed and operated E-stop button ensures immediate shut down.

AUTOMATIC OPERATION



SERVOCUT 602 Automatic cutting machine has advanced techniques and software with programmable HMI touch screen controls increasing the productivity, sample consistency and minimize operator intervention. Control of X/Y/Z Axis can also be performed with the ergonomic proportional Joystick control offers smooth and precise positioning.

Cutting Methods

Chop cutting [Z-axis] and Table feed cutting [Y-axis] combined with pulse cutting is standard. New cutting methods ensures easy cutting of large and complex specimens.

Multi-Slice Cutting

The movable cut off wheel on x-axis allows programmable plane parallel sectioning. Slices of equal thickness with number of slices as well as programming slices of different thickness is possible. SERVO CUT 602 has the largest cutting capacity on x-axis [cross sectioning]

Optional Cutting Methods

Optional cutting methods make SERVO CUT 602 perfect choice for a broad range of heavy-duty cutting applications.

Diagonal Cut: For increased cutting capacity.

Step Cut: For extra hard materials.

Segment Cut: For difficult and complex shaped materials.

Combined Cut: For increasing cutting capacity.

Cutting Parameters

The preselection of the cutting force level as well as the setting of cutting feed rate (0,02-5mm/sec) is possible from the touch screen LCD. The feed rate is automatically adjusted, if needed reduced, resulting in perfect cuts and eliminating sample and machine damage. Pulse cutting mode is a standard feature in all automatic models for cutting extra hard specimens. Integrated speed regulating unit is available to adjust the cut-off wheel speed between 600-2400 rpm.

Programmable Return Positions

SERVOCUT 602 has 3 different stop modes:

Stay at the end of cutting: Stops when the specimen has been cut through.

Back to starting point: Stops when it has returned to its starting point.

Back to reference point: Stops when the ultimate reset point in all axes has been reached.



HMI touch screen controls with various cutting methods and database with cutting programs and maintenance monitoring



Ergonomic Joystick Control



Two Hand Control For Safety Operation



Database

A library of 70 different cutting programs with related specimen name or number can be saved with all cutting parameters which can be recalled at any time. Data with Metkon cutting consumables is also listed for easy selection.



Easy Exchange of Cut Off Wheel



FUMEFILTER



NEW CUTTING FEATURES

Multi Target Cutting

Several clamped specimens can be cut in one step. Same or different cutting parameters can be set for each specimen. Cut off wheel moves to the predefined start position automatically for rapid and fast positioning

Table Oscillation

During chop cutting the table makes an oscillation movement to minimize the contact area to reduce the risk of specimen damage.

Instafeed

Optimizes the feedrate according to the specimen hardness and contact of cutting area.

Rapid Pulse

Reduces contact time and ensures maximum cooling of specimen.

Multi Target Cutting

Automatic Wheel Measurement

The cut off wheel diameter is measured prior to each cut for exact positioning. Also the peripheral cutting speed is automatically arranged by automatic wheel measurement system.

AutoClean

Cleaning & Maintenance is an important job and can be time-consuming. The AutoClean function provides a thorough cleaning of the entire cutting chamber. The AutoClean function reduces operator effort, saves time and lowers maintenance while improving overall operation and accuracy of the instrument. The cleaning gun which is mounted externally for easy access can be used for cleaning the remained residual on horizontal surfaces.

FIXED PERIPHERAL WHEEL SPEED

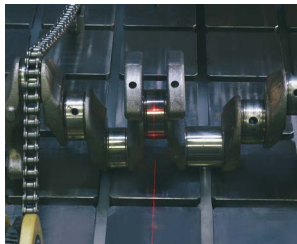
Peripheral speed changes as soon as cut-off wheel wears if motor speed is fixed. This may result inconsistent sample surface quality. SERVOCUT 602 has standard feature to keep peripheral speed consistent no matter what the wheel diameter is. Motor speed is automatically adjusted according to wheel diameter thanks to automatic cut-off wheel diameter measurement technology. The peripheral speed can be adjusted from 20 m/s to 60 m/s.

Central Lubrication System

The Central Lubrication System is optionally available to minimize maintenance and shutdowns. The system optimizes the amount of lubrication to the machine components and supplies lubrication only when it is needed, thus reducing the amount of lube required for the machine, and limiting the chance of excess lube contaminating the coolant.



Automatic Wheel Measurement



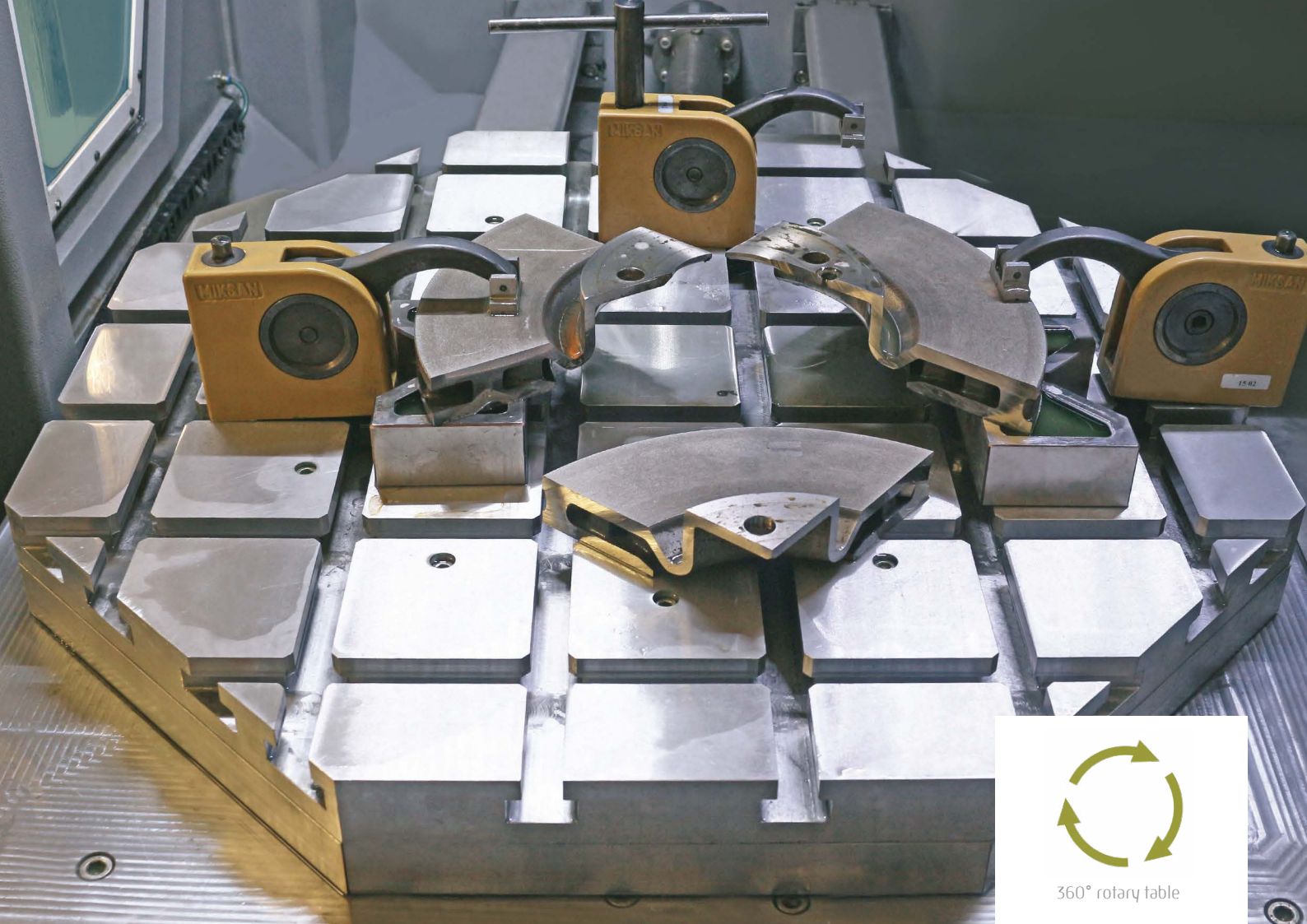
Laser Alignment Unit



Central Lubrication System



Auto Clean Function



360° rotary table

SERVOCUT 602-AX-R 4-Axis Multi-Target Cutting Machine

SERVOCUT 602-AX-R is designed for cutting complex shaped specimens in any angle without re-clamping.

- Equipped with 360° rotary table with servo motor drive
- Ability to cut specimens up to 20 different cutting lines in different angles
- Program memory for cutting lines and parameters for Multi-Target Cutting.

DESIGN & BENEFITS

SERVOCUT 602-AX-R combines the most advanced cutting techniques in the same machine. Equipped with the large automated rotary table that eliminates re-clamping, saves time and provides maximum automation. Servo motor driven rotary table allows very precise angle positioning. Save setup time by storing up to 20 cutting lines with different angles which can be recalled at any time for quick and easy loading. Different parameters and cutting techniques can be set for each cutting line, ensuring maximum accuracy with better cutting results. The cut-off wheel diameter is measured automatically and wheel wear can be compensated by optimizing the peripheral cutting speed automatically. Thus, the cut-off wheel position is automatically adjusted to the pre-set cutting lines, no matter what the wheel compensation is.

ROTARY TABLE DO EVEN MORE!

Very large rotary table with a diameter of Ø710 mm. allows to fix, position and cut very large samples easily and efficiently. 4-axis cutting is the fastest way to reduce setups, boost throughput, and increase accuracy on complex parts. The angle of rotary table can be adjusted with 0.1° accuracy. With combination of all 4-axis, the cutting can be done in any possible position without re-clamping.

CLAMP-LESS OPERATION REDUCE SETUPS AND INCREASE ACCURACY

SERVOCUT 602-AX-R enables 20 simultaneous cuts without having to unclamp, rotate and re-clamp the specimen for the next cuts. Metkon 4-Axis rotary table makes cutting easier than ever, allowing you to totally eliminate multiple re-clamping and cutting is handled easily in different angles for the area of interest.



FORCIPLAN 352
Ø350

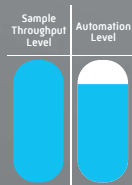


Ø210 [10xØ40mm]

FORCIPOL 352
Ø300-Ø350



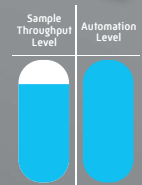
Ø210 [10xØ40mm]



VELOX 102
Ø250



Ø160 [6xØ40mm]



HIGH-VOLUME GRINDING & POLISHING SYSTEM

Grinding & Polishing is the most time consuming and workforce required step in metallographic sample preparation. Metkon offers both Semi-Automated and Fully-Automated System option for high-volume grinding & polishing applications to reduce sample preparation time and eliminate workforce required.

Many standard sample preparation operation requires total 4 or 5 grinding & polishing steps. The complete preparation time will take approximately 15-20 minutes including disc changing and sample holder cleaning time.

In traditional grinding & polishing machines, operator intervention is required between all steps. This means operator is fully busy during whole sample preparation process.

Metkon's High-Volume Grinding & Polishing Systems are designed for minimum operator intervention and maximum sample throughput.

Advantages Of FORCI System

FORCI System is combination of FORCIPLAN 352 Planar Grinder and FORCIPOL 352 Grinding & Polishing Machine. These system uses Ø350 mm grinding & polishing discs. Therefore, up to Ø210 mm sample holders can be used. This system combination provide 1.5X to 2X more sample capacity in same time.

FORCIPLAN 352 Planar Grinder provides up to 10X faster material removal rate and provides excellent planarity.

FORCIPOL 352 has automatic cleaning station for sample holders. This provides minimum operator intervention between the steps. Operator only need a few seconds to change discs between the steps.

Advantages Of Fully-Automated System

VELOX 102 is a Fully-Automated Grinding & Polishing System. VELOX 102 can perform all sample preparation steps automatically without need of operator intervention. Thus, operator can be free of time consuming preparation steps, and use his/her time for other activities on the laboratory.

Up to 6 sample holders can be queued, it means no operator intervention required during preparation all 6 sample holders.



FORCI System Combination



VELOX 102 provides lowest sample preparation cost thanks to operator freedom.

Built in planar grinding station allows up to 10x faster material removal rate and provides excellent planarity.



FORCIPLAN 352



FORCIPLAN 352 Automatic Planar Grinder is designed for first step initial planar grinding of very large specimens or a high volume of specimens in specimen holders. It is fast and efficient in providing high quality flat specimen surface thus saving time on the subsequent fine grinding and polishing steps. Specimen holders of up to 210 mm diameter having 10 specimens can be prepared in less than a minute with 350 mm diameter grinding stone.

DESIGN

FORCIPLAN 352 is an automatic planar grinder for the first step plane grinding of metallographic specimens. It can easily provide enough specimens for two or three grinding/polishing machines.

Heavy duty steel construction with precise vertical drive provides accurate control. High-torque 4 kW grinding motor with a variable speed between 500 and 1500 RPM enables quick planar grinding of the specimen surface. Powerful 350 Watt head motor can rotate both clockwise and counterclockwise direction with a variable speed between 50 and 200 RPM. Variable motor speed makes possible to prepare wide range of materials with different application requirements and guarantees high material removal rate. By using different grinding stones, ferrous as well as non-ferrous specimens can be prepared easily. Grinding depth measurement system allows you to measure the amount of material removed from the surface. The desired grinding depth can be set to grind different type of samples and also for applications that need special accuracy. All important parameters of the grinding process are preset with digital display. A variety of sample holders are available for different sample sizes. Sample holders can be removed and inserted easily with the help of quick release chuck.

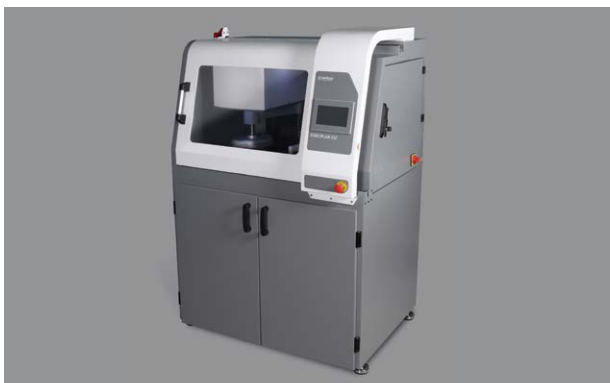
A recirculating cooling unit is strongly recommended so that a rust inhibitor can be added and the grinding swarf can be collected. The entire working area is totally enclosed. Sliding door provides easy access in the grinding area. Electronic brake is integrated to the system for a rapid stop of the grinding stone. The interlocking safety device does not allow the door to be opened before the grinding motor is stopped.



Ergonomic operation resulting in high quality planar surface, thus saving time on the next preparation steps



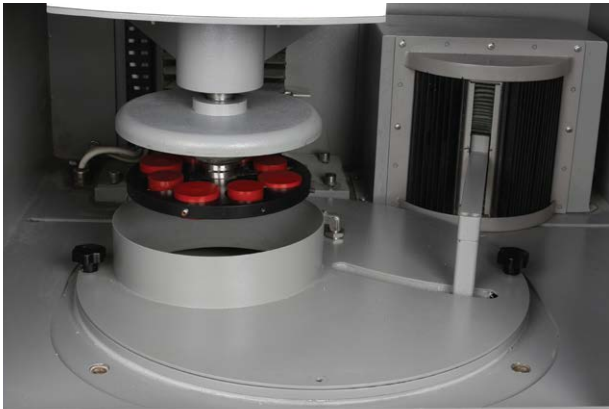
Ability to grind mounted specimens with specimen holders as well as irregular shaped unmounted samples.



FORCIPLAN 352

The FORCIPLAN 352 uses the same central force specimen holders with FORCIMAT 102 Automatic Head and ACCURA 102, therefore the additional grinding and/or polishing steps can be carried out without transferring to a new specimen holder.

AUTOMATIC OPERATION



FORCIPLAN 352 has advanced techniques and software with programmable HMI touch screen controls increasing the productivity, sample consistency and operator comfort.

Controlled Material Removal

FORCIPLAN 352 allows you to preset the amount of material to be removed very accurately. The desired grinding depth can be set from 0.01 – 5.00 mm. The vertical movement of the grinding head is motorized with digital positioning and display on the touch screen LCD. The robust design of the column guarantees high reproducibility. The material to be removed from the specimen can be preset in increments of 10 microns

Grinding Parameters

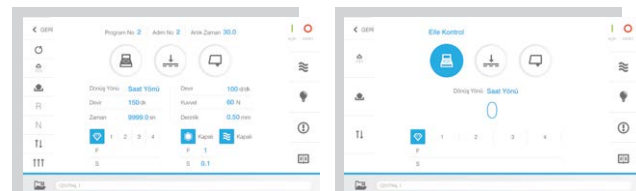
All preparation parameters can be stored in memory under a specific program number. Each program can be saved for a material specific name such as "Cast Iron, Bronze, A-Si Alloy, etc." The parameters which can be saved are; Force, Wheel speed, Head speed, Rotation direction, Mode of operation (Time or Removal Rate). These parameters are entered and stored in memory and displayed on the LCD screen as preset values. All the operator needs to do is to call up a specific program and press the "Start" button.

Barcode Scanner

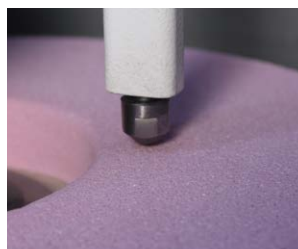
Optional Barcode Scanner allows easy and quickly loading of correct parameters for different samples. This will eliminate the risk of loading wrong programs due to operator error and increases efficiency. You can simply develop a barcode system for your each specimen on your laboratory to enable fast data entry with less errors.



Programmable HMI touch screen controls



FORCIPLAN 352, Grinding chamber



Automatic dressing of the grinding stone



Integration with Forcimat 102 and Accura 102



Barcode Scanner

Automatic Dressing Unit

FORCIPLAN 352 is equipped with a precise automatic dressing unit to provide a flat grinding surface and maintain the performance of the grinding stone at an optimum. Dressing depth can be set 10 µm to 100 µm with 1 µm increments.

The Dressing Unit moves across the grinding stone surface to return the stone to its original by removing the embedded material and expose fresh grains to increase removal rates. Dressing is done at a pre-set periodic intervals during each grinding cycle. Also with pre-dressing function, automatic dressing is processed before each operation to start with a fresh grinding stone surface.

The HMI Screen gives a visual pop-up message to notify the operator when the grinding stone has to be replaced.



High Sample Capacity

FORCIPLAN 352 can accommodate sample holders up to $\varnothing 210$ mm. 8 pieces of $\varnothing 50$ mm samples or 10 pcs of $\varnothing 40$ mm samples can be prepared at the same time. As well as irregular shaped or larger size samples can also be prepared. Special sample holders can be designed by Metkon according to application requirements.

Cost Effective Grinding

FORCIPLAN 352 has $\varnothing 350$ mm flat grinding stone. Comparing with traditional SiC papers, the flat grinding stone offers faster preparation times and higher removal rates.

Reduces Total Preparation Time

With extremely high material removal performance and reducing several grinding steps without changing paper, the FORCIPLAN 352 increases the productivity and total sample preparation time reduces significantly.

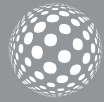
Final Grinding Feature

The final grinding parameter can be set after each grinding operation with a lower force and with a pre-set time.





FORCIPOL 352



FORCIPOL 352 is designed for grinding and polishing of very large specimens or a high volume of specimens in specimen holders. It reduces total preparation time for high-volume sample throughput. Uses the same sample holders with FORCIPLAN 352 Planar Grinder. Therefore, it can be combined with FORCIPOL 352 to increase sample throughput. Specimen holders up to 210 mm diameter having 10 specimens can be prepared at the same with 350 mm diameter grinding discs.

- Up to 2X More Sample Throughput
- Ideal for Very Large or High Number of Specimens
- Perfectly Polished and Planar Specimen Surfaces
- Robust Steel Construction for Heavy-Duty Operations
- Avoid Contamination with Integrated Automatic Cleaning & Drying Station
- Safe Operation with Totally Enclosed Working Area

DESIGN

FORCIPOL 352 is a High-Volume Grinding & Polishing Station that provides up to 2X more sample throughput at the same time comparing with regular grinding & polishing machines.

It can accommodate both Ø350 and Ø300 mm grinding/polishing discs which allow to be able to use large specimen holders.

Heavy duty steel construction with precise vertical drive provides accurate control.

High-torque 3 kW motor with a variable speed between 50 and 750 RPM enables high material removing of the specimen surface.

Powerful 350 Watt head motor can rotate both clockwise and counterclockwise direction with a variable speed between 50 and 200 RPM.

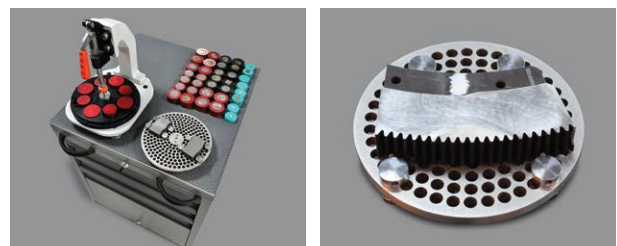
Variable motor speed makes it possible to prepare wide range of materials with different application requirements and guarantees high material removal rate.

Maximum Operator Safety

FORCIPOL 352 offers the highest level of safety standards. The entire working area is totally enclosed. Several safety circuits guarantee optimum protection for the operator. Equipped with numerous safety features to provide maximum operator and machine safety.



Perfectly polished and planar specimen surfaces



Ability to grind & polish mounted specimens with specimen holders as well as irregular shaped unmounted samples.



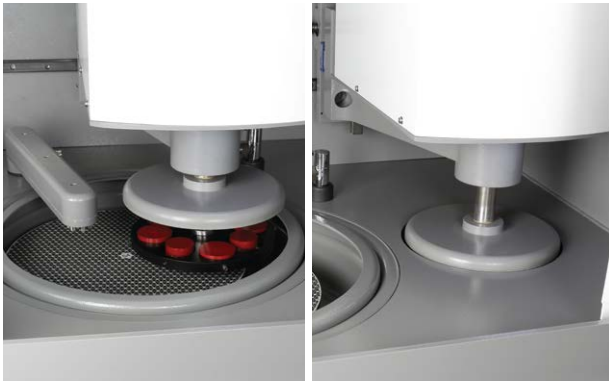
FORCI System Combination

FORCI System Combination

FORCI System is combination of FORCIPLAN 352 Planar Grinder and FORCIPOL 352 Grinding & Polishing Machine. These system uses Ø350 mm grinding & polishing discs. Therefore, up to Ø210 mm sample holders can be used. This system combination provide 1.5X to 2X more sample capacity in same time. FORCIPLAN 352 Planar Grinder provides up to 10X faster material removal rate and provides excellent planarity.

FORCIPOL 352 has automatic cleaning station for sample holders. This eliminates contamination of samples and provides minimum operator intervention between the steps. Operator only need a few seconds to change discs between the steps.

AUTOMATIC OPERATION



Automatic Head Movement to Cleaning Station

Grinding & Polishing Parameters

All preparation parameters can be stored in memory under a specific program number. Each program can be saved for a material specific name such as "Cast Iron, Bronze, A-Si Alloy, etc." The parameters which can be saved are; Force, Wheel speed, Head speed, Rotation direction, Mode of operation [Time or Removal Rate]. These parameters are entered and stored in memory and displayed on the LCD screen as preset values. All the operator needs to do is to call up a specific program and press the "Start" button.

Barcode Scanner

Optional Barcode Scanner allows easy and quickly loading of correct parameters for different samples. This will eliminate the risk of loading wrong programs due to operator error and increases efficiency. You can simply develop a barcode system for your each specimen on your laboratory to enable fast data entry with less errors.



Automatic Peristaltic Dosing System with Easy Insert Mechanism



Movable Dosing Arm

Movable Dosing Arm

FORCIPOL 352 is equipped with a movable dosing arm that automatically moves during dosing period to distribute suspension on the Ø350 mm polishing cloth equally. It also distributes water equally on the grinding disc during grinding operation to provide better cooling on the sample surface. At the end of operation, the dosing arm automatically goes the side and allows easy change of grinding/polishing disc.

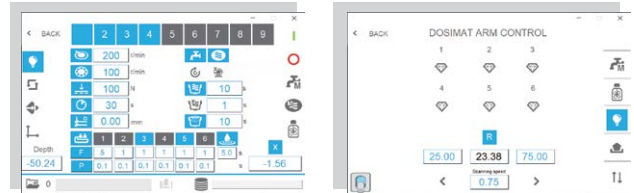
FORCIPOL 352 has advanced techniques and software with programmable HMI touch screen controls increasing the productivity, sample consistency and operator comfort.

Controlled Material Removal

FORCIPOL 352 allows you to preset the amount of material to be removed very accurately. The desired grinding depth can be set from 0.01 – 3.00 mm. The vertical movement of the grinding head is motorized with digital positioning and display on the touch screen LCD. The robust design of the column guarantees high reproducibility. The material to be removed from the specimen can be preset in increments of 10 microns



Programmable HMI touch screen controls



Automatic Peristaltic Dosing System

FORCIPOL 352 is equipped with automatic peristaltic dosing system with 6 peristaltic pumps (5 for diamond suspensions/lubricant and 1 for aluminum oxide suspensions). The automatic peristaltic dosing system is used in combination to obtain consistent specimens and to save time and consumables. Both diamond suspensions/lubricants and aluminum oxide suspensions can be fed.

Dispensing parameters like; frequency, fluid selection etc. are controlled through the LCD screen of the FORCIPOL 352. High quality peristaltic pumps guarantee exactly the same dosing every time.

Pre-dosing function lubricates the polishing cloth before each operation to increase the life of polishing cloth and obtain perfectly polished specimen surfaces. The suspensions and lubricants that are remained in the dosing tubes retract back at the end of every step to eliminate the risk of contamination from coarse abrasive on a finer grain size with auto retract function.

Automatic Liquid Level Calculation of suspensions and lubricants is also available and can be monitored through the LCD screen of the VELOX 102. The calibration can be carried out when a lubricant or suspension is filled. The operator will be informed to refill the bottle when the suspension/lubricant level is below the critical value.

All bottles have a magnetic stirrer inside to prevent sedimentation of suspensions and make more homogenous abrasive distribution inside the suspension.



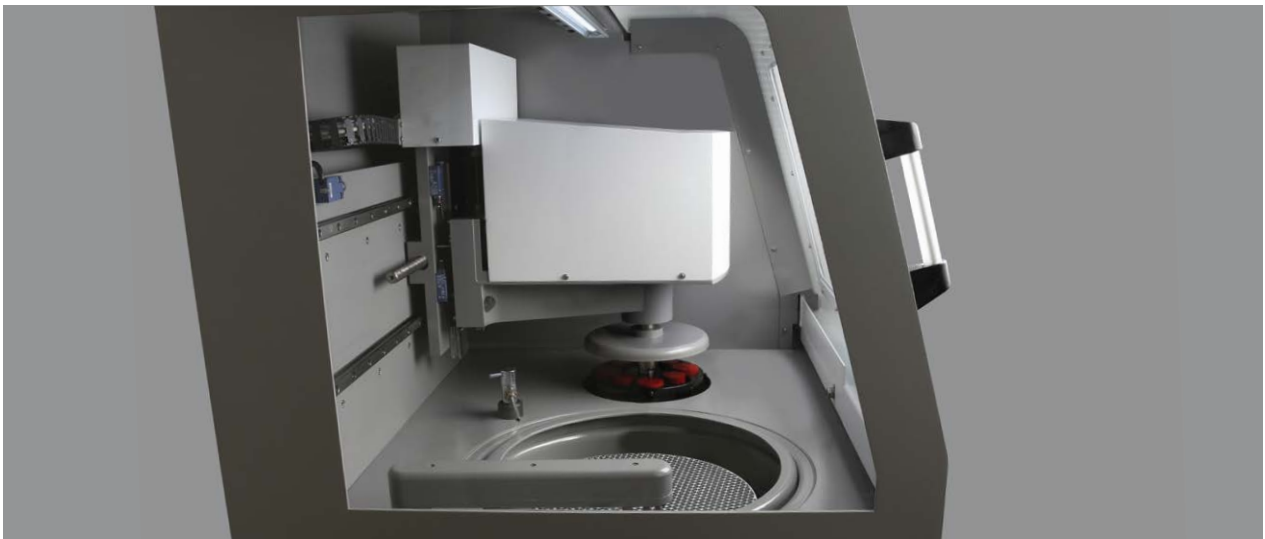
Fully Automatic Sample Cleaning and Drying Station

FORCIPOL 352 is equipped with a Fully automatic sample cleaning and drying station is able to make:

- Pressurized water cleaning
- Ethanol cleaning
- Fast drying with filtered air

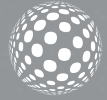
It can be programmed for each grinding/polishing steps with same or different parameters. After grinding or polishing step is completed, operator only needs to change grinding or polishing disc for the next step. No need to remove the sample holder for cleaning.

Automatic cleaning of the specimen holder after each step avoids contamination.





VELOX 102



VELOX 102 Fully Automatic Programmable Grinding/Polishing System is developed for operator free sample preparation for high volume sample throughput starting from Planar Grinding to Fine Grinding/Polishing/Fine Polishing/Cleaning and Drying. You only need to place the sample holders in the auto-feed system, select the program number for your specific application and depress the "Start" button. That's it! Your samples will be ready for analysis fully automatically. Possibility to queue up to 6 sample holders during operation for non-stop sample preparation.

DESIGN

VELOX 102 Automatic programmable grinding and polishing system has a compact design with:

- Planar grinding station
- Fine grinding/polishing station
- Fully automatic sample cleaning and drying station
- Fast automatic grinding/polishing disc replacement system
- Automatic sample holder replacement & feeding system (Velox 102 with Auto Feed)
- Automatic peristaltic dosing unit.

Planar Grinding Station

The planar grinding station has 4 kW powerful motor with adjustable variable wheel speed from 500 RPM to 2000 RPM with soft start-stop enabling quick planar grinding of the specimen surface. It can accommodate 300 mm diameter flat grinding stones. Automatic dressing unit allows high material removal rate and maximum flatness on the sample.

Fine Grinding/Polishing Station

The fine grinding/polishing station has 1.1 kW powerful motor with adjustable variable wheel speed from 50 to 600 RPM with soft start-stop. It can accommodate 250 mm grinding/polishing discs. Automatic disc cleaning feature keeps the grinding/polishing discs ready for next use.

Fully Automatic Sample Cleaning and Drying Station

Fully automatic sample cleaning and drying station is able to make pressurized water cleaning, ethanol cleaning, ultrasonic cleaning and fast drying with filtered air. It can be programmed for each grinding/polishing steps with same or different parameters.

Automatic Grinding/Polishing Disc Exchange System

Velox 102 has a built in Automatic grinding/polishing disc exchange system which can store up to 10 different grinding/polishing discs. During the cleaning operation, the grinding or polishing discs are exchanged automatically according to the selected preparation recipe. The software automatically informs the operator to replace the disc if one of the disc has reached the end of life cycle.



Automatic Sample Holder Feeding Unit

Automatic Sample Holder Replacement Unit

Automatic Sample Holder Replacement & Feeding System (Available on "VELOX 102 with AutoFeed" model)

Automatic sample holder replacement and feeding system can store and queue up to 6 specimen holder. Each specimen holder can be programmed with same or different grinding/polishing parameters. The sample holder is taken from the rack automatically for grinding/polishing operation. After operation is completed, the sample holder returns back and the next sample holder is taken for operation. No operator intervention is required. During the grinding/polishing operation, the completed sample holders can be taken from the rack and new sample holders can be placed for non-stop grinding/polishing operation for high sample throughput.



Automatic Head

Servo-motor driven Head proceeds from one step to the next automatically securing the highest level of accuracy and reproducibility. Automatic Head can apply "Central" force adjustable from 30 N to 750 N pneumatically. A built-in encoder allows you to measure the amount of material removed from the surface. The desired grinding depth can be set to grind different type of samples and also for applications that needs special accuracy. The automatic head is equipped with high torque 350 W motor with adjustable variable speed from 50 RPM to 200 RPM with soft start-stop. Clockwise and counterclockwise is possible. It can accommodate Ø160 mm sample holders.

Automatic Peristaltic Dosing System

VELOX 102 is equipped with automatic peristaltic dosing system with 8 peristaltic pumps [6 for diamond suspensions/lubricant and 2 for aluminum oxide suspensions]. The automatic peristaltic dosing system is used in combination to obtain consistent specimens and to save time and consumables. Both diamond suspensions/lubricants and aluminum oxide suspensions can be fed. Dispensing parameters like; frequency, fluid selection etc. are controlled through the LCD screen of the VELOX 102. High quality peristaltic pumps guarantee exactly the same dosing every time. Pre-dosing function lubricates the polishing cloth before each operation to increase the life of polishing cloth and obtain perfectly polished specimen surfaces. The suspensions and lubricants that are remained in the dosing tubes retract back at the end of every step to eliminate the risk of contamination from coarse abrasive on a finer grain size with auto retract function. Automatic Liquid Level Calculation of suspensions and lubricants is also available and can be monitored through the LCD screen of the VELOX 102. The calibration can be carried out when a lubricant or suspension is filled. The operator will be informed to refill the bottle when the suspension/lubricant level is below the critical value. All bottles have a magnetic stirrer inside to prevent sedimentation of suspensions and make more homogenous abrasive distribution inside the suspension.



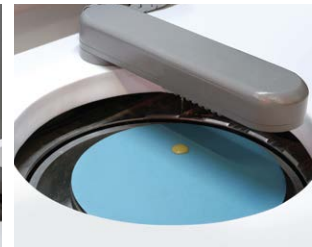
Grinding/Polishing Disc Storage for Automatic Disc Replacement



Automatic Disc Replacement Unit



Automatic Fluid Dispenser



Precise Dosing



Programmable HMI touch screen controls

User Friendly HMI Touch Screen

VELOX 102 has advanced techniques and software with programmable 9.7" large colored HMI touch screen controls increasing the productivity, sample consistency and operator comfort. It is used to prepare high volumes of metallographic, ceramic and mineralogical specimens with consistent and reproducible quality.

All preparation parameters [Force, Cycle time, Wheel speed and direction, Grinding/Polishing disc, Dispensing frequency, Cleaning drying parameters] can be stored in memory under a specific program number. All the operator needs to do is to call up a specific program and press the "Start" button. That's it! Your samples will be ready for analysis without any operator intervention. A library of 20 different preparation programs with related specimen name or number can be saved with all parameters of each grinding/polishing steps which can be recalled at any time. Upon completion of the cycle, an acoustic signal lets the operator know that the cycle is over and the samples are ready for analysis. When required, it is also possible to intervene in the program and change the parameters without stopping the instrument.



BENEFITS

- **COMPACT**
- **OPERATOR-FREE**
- **NON-STOP SAMPLE PREPARATION**
- **FAST**
- **PRECISE**
- **REPETABLE RESULTS**
- **COST EFFECTIVE**
- **SAFETY**
- **RELIABILITY**

The Most Compact Design In It's Class

VELOX 102 consist of many systems inside as below:

- Planar grinding station
- Fine grinding/polishing station
- Automatic sample cleaning and drying station
- Automatic disc replacement system
- Automatic sample holder replacement system (Velox 102 with Auto Feed)
- Automatic peristaltic dosing unit

VELOX 102, which includes all these systems, takes up only 204 cm wide. Thus, it can fit most of the laboratories.

Fast Sample Preparation

VELOX 102 uses the time with maximum efficiently. Since all sample preparation steps are automatic, there is no waiting time between the preparation steps like manual preparation. As soon as an operation step is completed, the next operation step starts immediately. In addition, the finished sample holder is immediately replaced with the new one for a new sample preparation cycle. The planar grinding station allows very fast material removal from the sample surfaces and provides very planar sample surfaces in a short time. Thus, it saves time on the subsequent fine grinding and polishing steps.

Cost Effective

VELOX 102 reduces the sample preparation costs significantly comparing with the traditional sample preparation machines. It significantly shortens the sample preparation time and eliminates the need of operator workforce. In addition, automatic peristaltic dosing unit reduces the consumption of polishing suspension during polishing operation. The planar grinding station allows extremely fast material removal with very long grinding stone life, reducing the several subsequent fine grinding steps and time

Operator-Free Sample Preparation

VELOX 102 can perform all sample preparation steps automatically without need of operator intervention. Thus, operator can be free of time consuming preparation steps, and use his/her time for other activities on the laboratory.

Precise Sample Surfaces

VELOX 102 has vibration-free robust construction. The automatic head is directly mounted on a strong platform on top of the machine instead of traditional C-Type design. Thus, there is no bending or tilting on the automatic head while force application. The force is transferred perfectly uniform and perpendicular on all samples. In addition that, the planar grinding station provides very flat and planar sample surfaces. This will increase the quality of surface on subsequent fine grinding and polishing steps. Scratch free mirror-like polished surfaces can be obtained on even hard complex materials.

Safety

VELOX 102 has the highest safety standards. The equipment is provided with safety light curtain allowing easier process monitoring and easier access to the preparation area. It prevents access to moving or rotating parts during operation. When operator fingers, hand and ankles approaches to the operation area, the equipment stops immediately. A stack light is located on the top of the equipment to provide visual and audible indication of machine status.

Non-Stop Sample Preparation

Operator can feed up to 6 sample holders at the same time to VELOX 102. All sample holders are prepared automatically one by one subsequently. During the operation, the operator can take out the completed sample holders and feed in the new sample holders. Operator can evaluate the prepared sample while Velox 102 is still running.

Repetable Results

VELOX 102 guarantees repeatable results on prepared samples. Once you determine the correct consumables and correct parameters for your sample, you will obtain the same result everytime. You can download the proven sample preparation recipes from Metkon Website according to material type or you can ask support from Metkon Laboratory according to your specific application.

Reliability

VELOX 102 is designed for 24/7 operation and low maintenance. All mechanical parts assembled on robust steel construction to eliminate vibration and stretch. Long life reliable mechanical parts, Siemens PLC control unit and modern electronics allow 24/7 operation.



