



HIGH VOLUME  
GRINDING & POLISHING  
**FORCIPOL 352**

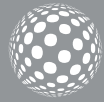




# HIGH-VOLUME GRINDING & POLISHING STATION



# 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.

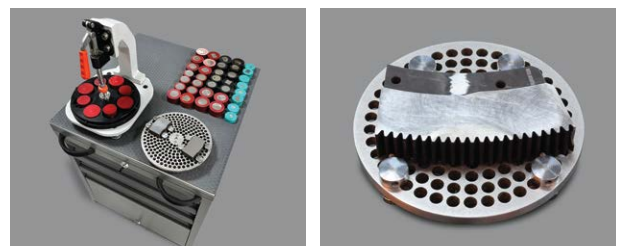
Variable motor speed makes it possible to prepare wide range of materials with different application requirements and guarantees high material removal rate.

### 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.

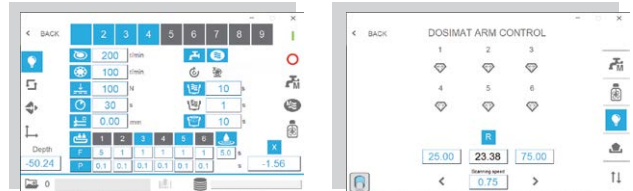
FORCIPOL 352 has advanced techniques and software with programmable HMI touch screen controls increasing the productivity, sample consistency and operator comfort.

## 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.



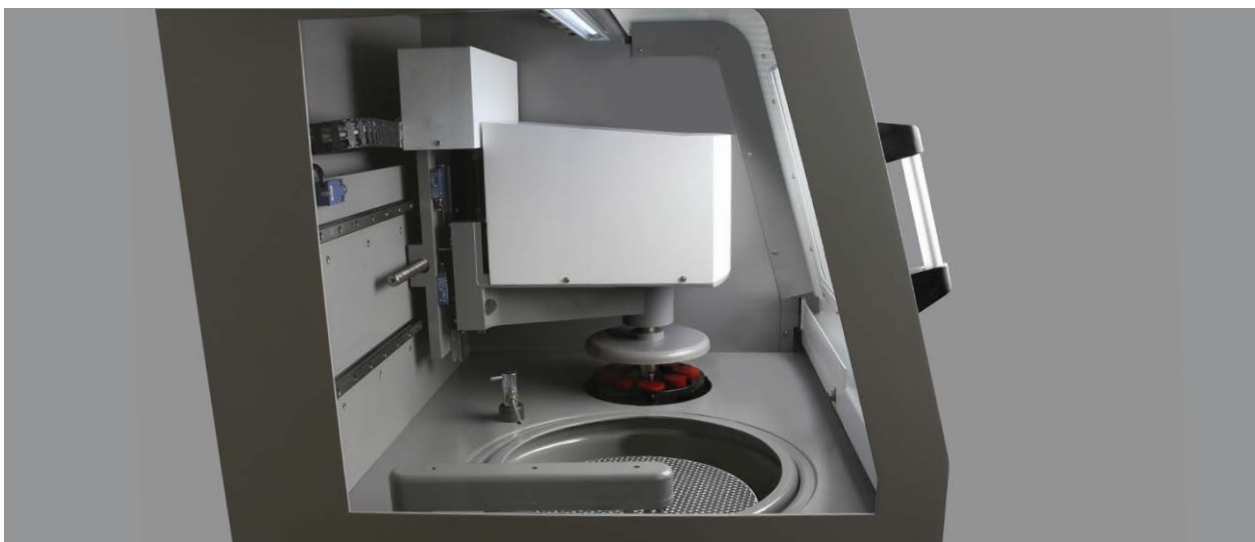
### Fully Automatic Sample Cleaning and Drying Station

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.



# SPECIFICATIONS

ORDER NO	44 10
MODEL NO	FORCIPOL 352
Grinding/Polishing Station	Standard
Automatic Sample Cleaning & Drying Station	Standard
Automatic Peristaltic Dosing Unit	Standard
Grinding/Polishing Motor Power [S1]	3 kW
Grinding/Polishing Disc Speed	50-750 RPM
Grinding/Polishing Disc Rotation Direction	CW
Grinding/Polishing Disc Diameter	Ø350/300 mm
Grinding/Polishing Disc Cleaning & Drying	Automatic
Automatic Head Motor Power	350 Watt
Automatic Head Motor Speed	50-200 RPM
Automatic Head Motor Rotation Direction	CW/CCW
Grinding Depth Measurement	Standard
Grinding Depth Range	0 - 3 mm
Sample Holder Type	Central Force
Sample Holder Diameter	Ø210/160 mm
Central Pressure Force	30 - 750 N
Sample Cleaning	Pressurized Water + Ethanol
Sample Drying	Filtered Pressurized Air Drier
Automatic Peristaltic Dosing Unit	Standard with 6 Individual Pumps
Magnetic Stirrers	Standard
HMI Touch Screen	7" Colored Touch Screen
Program Memory	35 Programs
Dimensions, WxDxH	131x84x160h mm
Weight	700 kgs
Mains	400 V, 3 phase, 50/60 Hz.

\* Other voltages and frequencies available upon request. Please state when ordering. All specifications are subject to change without notice.

## 44 10 — FORCIPOL 352

High-Volume Grinding & Polishing Station  
For grinding and polishing of large size irregular shaped specimens or mounted specimens in specimen holders up to 210 mm diameter, reducing total preparation time for high-volume sample throughput, fully automatic operation, suitable for both Ø350/300 mm grinding & polishing discs, fully automatic sample cleaning station with water and ethanol, fast automatic sample drying system with filtered air, Siemens PLC control unit, programmable with colored 7" HMI touch screen control, vibration-free and robust construction, safe and quiet operation in closed housing, easy handling with sliding door, maximum safety provided with interlocking switch, large working space with powerful LED illumination, powerful 3 kW motor with 50-750 rpm variable speed for grinding/polishing discs, Soft Start/Stop, powerful 350 Watt DC head motor, 50-200 rpm variable specimen holder speed with clockwise and counterclockwise rotation direction, Motorized positioning of the Head Unit in Z and X axis, pneumatically adjustable central force loading system from 50N to 750N, automatic disc cleaning & drying function with single button, controlled material removal with digital setting of grinding depth up to 5 mm, integrated Automatic Fluid Dispenser for polishing, with 6 micro peristaltic pumps with magnetic stirrers, 5 for diamond suspensions/lubricant and 1 for alumina suspensions, with automatic liquid level calculation, with pre-dosing function and with automatic retract function at the end of every step to prevent contamination. Complete and ready for operation. Without Specimen Holders. 400V, 3-phase, 50Hz.

## GR 0801 — Accessories for FORCIPOL 352

Working Kit for Ø350 mm Applications  
Including the following standard set of accessories & consumables:

- Aluminum wheel, 350 mm dia,
- Special Magnetic Foil, 350 mm dia.
- Thin Metal Plate (5 pcs), 350 mm dia.
- Magneto grinding disc 54 mic., 350 mm dia.
- Magneto grinding disc 18 mic., 350 mm dia.
- An assortment of 5 polishing cloths, 350 mm dia.
- Diamond suspensions 1 lt of each of 6 µ, 3 µ, 1 µ and lubricant

## GR 0802 — Working Kit for Ø300 mm Applications

Including the following standard set of accessories & consumables:

- Aluminum wheel, 300 mm dia,
- Special Magnetic Foil, 300 mm dia.
- Thin Metal Plate (5 pcs), 300 mm dia.
- Magneto grinding disc 54 mic., 300 mm dia.
- Magneto grinding disc 18 mic., 300 mm dia.
- An assortment of 5 polishing cloths, 300 mm dia.
- Diamond suspensions 1 lt of each of 6 µ, 3 µ, 1 µ and lubricant

## 31 92 — Additional working wheels

- Aluminum wheel, 350 mm
- Aluminum wheel, 300 mm
- 3-lights warning beacon with audible signal  
(To be ordered simultaneously together with the machine order)

GR 0665 — Barcode Scanner for easy loading correct programs for different samples

GR 0440 — Air filtering and lubricating unit

GR 1397-00 — Water Filtering and Pressure Regulator System for city water inlet. Keeps the water pressure at the appropriate level and protects from sudden pressure spikes. Filtering out impurities in the water and prevents calcification.

YM3824-00 — Spare Siliphos Cartridge Filter  
(for Water Filtering and Pressure Regulator System [GR 1397-00])

GR 2222 — Spare Part Kit for FORCIPOL 352  
Recommended Set of Spare Parts, FORCIPOL 352

45 60 — LEVOMAT  
Specimen Loading Fixture, to level the specimens within the central force specimen holders, without specimen loading plate.

45 50 — Specimen Loading Plate Ø160 mm  
44 40 — Specimen Loading Plate Ø210 mm

Specimen Holders for FORCIPOL 352

- Clamp type specimen holder, Ø160 mm, 3 rectangular specimens with 40x70 mm.
- Clamp type specimen holder, Ø160 mm, 10 specimens with Ø25 mm.
- Clamp type specimen holder, Ø160 mm, 8 specimens with Ø30 mm.
- Clamp type specimen holder, Ø160 mm, 6 specimens with Ø40 mm.
- Clamp type specimen holder, Ø160 mm, 4 specimens with Ø50 mm.
- Clamp type specimen holder, Ø160 mm, 10 specimens with Ø1"
- Clamp type specimen holder, Ø160 mm, 8 specimens with Ø1 1/4"
- Clamp type specimen holder, Ø160 mm, 6 specimens with Ø1 1/2"
- Clamp type specimen holder, Ø160 mm, 4 specimens with Ø2"
- Universal specimen holder for large and irregular shaped specimens, Ø160 mm with 6 clamping fixture

46 78 — Universal specimen holder for large and irregular shaped specimens, Ø210 mm with 10 clamping fixtures

46 73 — Teardrop specimen holder, Ø210 mm, 10 specimens with 40 - 25 mm diameter  
46 74 — Teardrop specimen holder, Ø210 mm, 8 specimens with 50 - 25 mm diameter  
46 39 — Clamp type specimen holder, Ø220 mm, 3 specimens for irregular shaped samples (including loading plate)



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