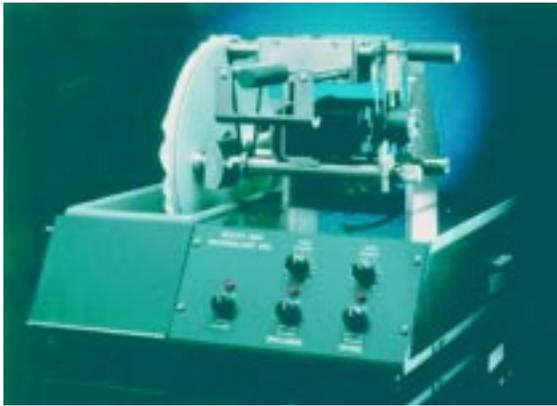


# Electrolytic Crystal Polisher



## The Model 451 Electrolytic Crystal Polisher



Model 451

The Model 451 is used for damage free machining of materials by electrolytic or chemical action to produce flat, polished and precisely oriented surfaces. It was designed for damage free surface polishing of soft materials such as copper, zinc, lead, silver and indium, but can be used to polish any material that has a solvent that will not attack the PVC or stainless steel from which the Model 451 is constructed. When used in conjunction with the Model 750 Acid Saw, damage free thin sections, cubes and parallelepipeds can be produced. Although preparation rates will vary with materials and solvents, crystals may be machined without changing their dislocation density at a typical rate of 0.001" per minute.

### Operation

A chemical or electrolytic solution is carried to the specimen surface on a cloth which is mounted to a 10" diameter, rotating stainless steel wheel. The rotating wheel passes through a tank of solution with the excess being removed by a teflon roller prior to reaching the sample. The rotating wheel can be covered with wool, cotton, teflon or any soft cloth that is compatible with the solution being used.

### Sample Positioning

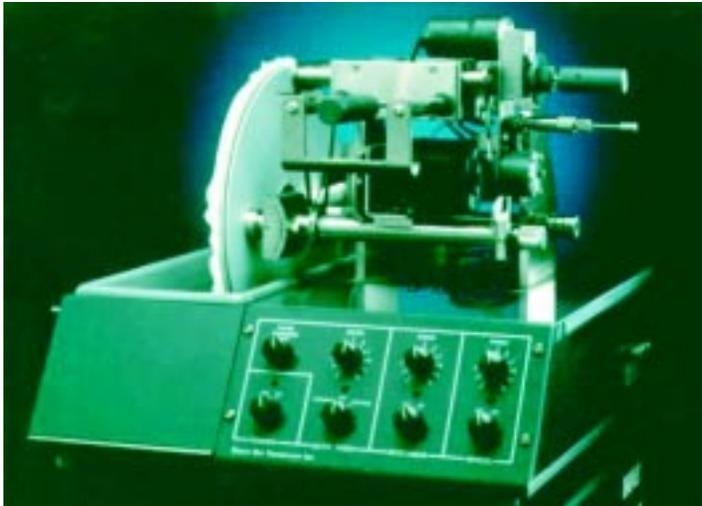
The mounted specimen is fixed to a variable speed shaft which is supported by a flexure system. The flexure system can be adjusted so the specimen will just touch the cloth covered wheel or it can be moved further toward the wheel so that the weight of the specimen assembly itself will maintain exceedingly small pressures between the rotating specimen and the cloth covered wheel.

### Sample Mounting

The specimen to be polished is mounted on a holder which is fixed to the specimen rotation assembly draw rod. A 0.75" diameter stainless steel specimen mount is included with the Model 451, but it is preferable to make a special holder made of a metal which has a thermal coefficient of expansion nearly equal to that of the specimen. Polycrystalline copper is typically used for copper crystals and monel is typically used for the basal planes of zinc. Once a specimen holder has been selected, the specimen is mounted to the holder either with a low melting point wax or, for electrolytic operations, a conductive wax.

### Oriented Specimens

Specimen surfaces of controlled orientation can be polished by using the optional Model 250 2-Axis Goniometer. The specimen holder is attached to the front face of the goniometer and the goniometer is fastened to the specimen rotation assembly. The polishing wheel is adjusted at the factory to be perpendicular to the axis of the specimen rotation assembly within 2.5 minutes of arc. With the Model 250 goniometer mounted, the face of the goniometer is parallel to the face of the polishing wheel to within 0.1°. Control of the crystallographic orientation of the polished surfaces to within 0.2° is typical.



Model 460

### Model 460 Automatic Electrolytic Crystal Polisher

The Model 460 Automatic Electrolytic Crystal Polisher differs from the Model 451 in that it has a separate drive system for automatically driving the sample toward the polishing wheel. This is desirable when removing a lot of material or to form a cylinder from a square shaped rod using the Model 45006 Lathing Accessory.

#### Specifications (Models 451/460)

Dimensions:	16" W x 14" H x 19" D
Weight:	49 Lbs.
Wheel Diameter:	10" (254mm)
Electrical Input:	100 VAC 50/60 Hz 110 VAC 50/60 Hz 220 VAC 50/60 Hz



Model 45006  
mounted on Model 451

### Model 45006 Lathing Accessory (optional)

The Model 45006 is a right angle drive that is used to rotate the axis of a rectangular bar or cylinder parallel to the polishing wheel. This can be used to polish rectangular bars or irregularly shaped rods into precisely polished cylinders. The Model 45006 can also be used to precisely polish a bar or rod into a precisely oriented cylinder. The Model 45006 can be used on either the Model 451 or the Model 460.



Close-up of standard  
mounted sample



Close-up of sample mounted on Model 250



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