Model 810

Wire Saw

Cutting and Sectioning

The Model 810 Wire Saw

The Wire Saw offers the most gentle mechanical method for cutting virtually any material using either a diamond impregnated wire blade or a plain wire blade with an abrasive slurry. In addition to traditional mechanical cutting, the saw can also be used as a string saw to cut water soluble crystals. It is most useful for cutting fragile crystals, substrates with delicate layers or any material that would be damaged when using a diamond wheel saw. Very brittle materials will cut the fastest, but even soft materials can be cut since there is not the problem of loading the blade that is inherent with diamond or abrasive wheels. The Wire Saw has sample holders available to hold virtually any shape sample including a goniometer to simplify the cutting of oriented crystals.

Operation

When used as an Abrasive Slurry Wire Saw the Model 810 offers the most gentle mechanical method for cutting a material. A sample is mounted to a sample holder and attached to the arm. An appropriate load is applied by adjusting the counterbalancing weight. Using a coarse adjustment the sample is positioned in any starting position relative to the wire blade and then a micrometer is used for precise sample positioning. With the wire rotating and about 1cc of abrasive slurry poured slowly into the funnel, the arm is gently lowered until the sample touches the wire blade. Abrasive slurry drips from the funnel onto the lower pulley thereby coating the wire. The wire blade will carry the slurry to the sample and lap its way through the material resulting in a smooth cut with minimal subsurface damage. The excess slurry will drop back into the funnel and recirculate through the system. Cutting will continue until the automatic cutoff switch is triggered.

When used as a Diamond Wire Saw the Model 810 uses a diamond impregnated wire blade and a glycerine coolant in place of the abrasive slurry. Diamond wire cutting is used for cutting hard materials or when contamination from an abrasive slurry is undesirable.

When used as a string saw the Model 810 can cut water soluble crystals, such as sodium chloride, by having a water soaked wick rub against a standard wire blade. The water is carried on the wire blade to the sample and cuts by dissolving its way through the crystal.

Wire Blades

Five different wire blades are available for the Wire Saw. .005", .010" and .015" diameter plain wires and .010" and .015" diameter diamond impregnated wires. The .010" and .015" diameter wire blades will last about .75 to 4 hours of cutting time with the average being from 1- 2 hours. The .005" diameter wires will last from .5 - 1.5 hours of cutting time. The life of the blade depends on many factors including wire speed, pressure, blade diameter, material being cut, type of abrasive slurry and the strength of the weld. It is important to note that the blades used with an abrasive slurry will decrease in diameter as they are used while the diamond impregnated wires will maintain the same diameter.

Abrasive Slurry

A slurry composed of glycerine, water and silicon carbide, boron carbide or diamond powder is typically used with the wire saw. Boron carbide is most commonly used as it is very hard and its relatively low density allows it to stay in suspension better than silicon carbide. Diamond slurry can also be used economically with the Model 810 for very hard materials as it takes only a few cc's of slurry to charge the abrasive recirculating system.

Special Features

- Self contained recirculating system requires only a few cc's of slurry which makes it economical to use diamond slurries and minimizes clean up when cutting toxic materials.
- Wire tension gauge simplifies the process of selecting the proper tension for each diameter wire.
- Easy to replace continuous loop wire blade.
- Micrometer cross-feed mechanism provides precise sample positioning.
- Automatic termination of the cutting process is controlled by an electromechanical downstop which minimizes supervision.
- All sample holders can be rotated 360° and are interchangeable with the Model 650 Low Speed Diamond Wheel Saw.
- 2-Axis Goniometer can be transferred directly from an x-ray or optical track for cutting oriented crystals.
- Compact size and simple operation makes it ideal for use in glove boxes, fume hoods and hot cells.
- Integrated recirculating system makes it ideal for cutting water soluble crystals.
- Counterbalanced arm allows for fine adjustments in cutting pressures.

ACCESSORIES

Model 65001 Single-Axis Goniometer

The Model 65001 has a graduated scale with a 0.2° vernier and can be rotated 360°. This rotational capability makes it ideal for precisely slicing single crystals. The sample is mounted to a block using a low melting point wax and the block is subsequently clamped into the Model 65001. Wax mounting of the sample ensures that the cut piece will remain attached to the holder and will not be damaged by falling after being cut.

Model 65003 Double Clamp Sample Holder

The Model 65003 is a clamp-type holder designed to clamp both ends of a round or rectangular rod while cutting between the two clamped positions. The Model 65003 can also be used as a single-clamp holder to hold encapsulated metallurgical samples up to 1.25" in diameter.

Model 65004 Petrographic Sample Holder

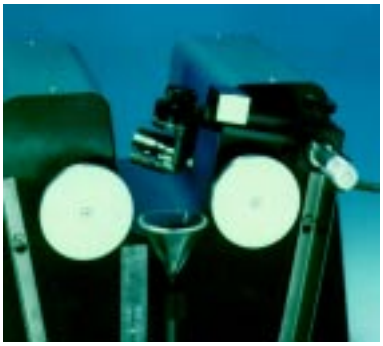
The Model 65004 is designed to hold 2.5 cm x 5.0cm glass plates, onto which petrographic or other samples are waxed, while making saw cuts parallel to the glass plate. The glass plate is held against a stainless steel support plate with vacuum and is placed firmly against 3 locating pins to maintain its position.

Model 65005
2-Axis Goniometer

The Model 65005 is a 2-axis goniometer used for orienting and cutting single crystals. The Model 65005 can be mounted on an x-ray track for orientation using the Model 65011 Track Mount and then transferred to the Model 810 for cutting. With the sample mounted to the goniometer, the vertical axis can be rotated 360° within 0.2° while the horizontal axis can be rotated ±50° from the 0.2° vernier on the arm.

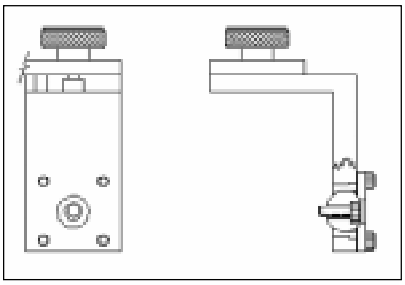
Model 65006
Vise

The Model 65006 Vise is designed to hold flat, round and irregularly shaped samples without the need of a mounting wax. The entire vise can rotate 360° in the horizontal plane. An extended v-notch jaw enables the mounting of cylindrical samples up to 1.25" in diameter including encapsulated metallurgical samples.



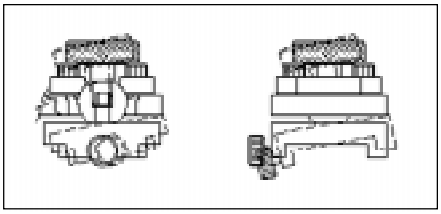
Model 65007
Right Angle Holder

The Model 65007 Right Angle Holder is designed to hold mounting blocks parallel to the saw blade. The Model 65007 accommodates stainless steel mounting blocks up to 1.5" in diameter which are directly transferable to the South Bay Technology series of lapping and polishing fixtures.



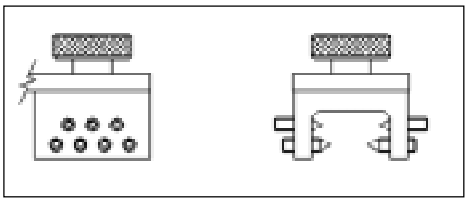
Model 65008
Ball Joint Holder

The Model 65008 Ball Joint Holder is designed to allow a wide range of motion to position the specimen for cutting. The Model 65008 is mounted similar to the Model 65007 Right Angle Holder and consists of a specimen mounting block which is mounted to the ball joint holder. The ball joint allows the specimen to be adjusted in any direction up to 10° maximum. This provides a wide range of motion and flexibility to cut oddly shaped specimens.



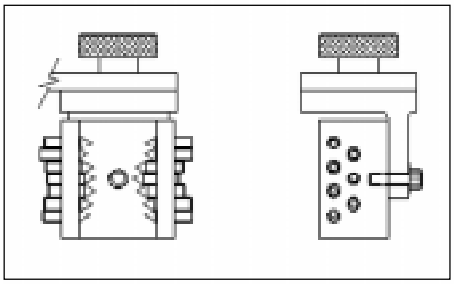
Model 65016
Ball Joint
Work Arm

The Model 65016 is a new arm that incorporates a ball joint at the point where the sample holders attach to the arm. This allows the use any of our standard sample holders and provides the ability to swivel them up to 10° in any direction. The ball joint work arm simplifies the specimen mounting process as cutting plane adjustments can easily be made after the specimen has been attached to a sample holder.



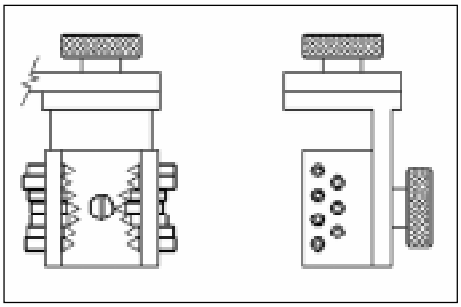
Model 65017
Bone Chuck

The Model 65017 allows you to hold the sample utilizing a series of 10 independently adjustable mounting screws. These mounting screws make it possible to hold irregularly shaped specimens and rotate them 360 degrees in a horizontal plane. The Model 65017 Bone Chuck attaches to the standard work arm in place of the standard sample holders.



Model 65018
Right Angle
Bone Chuck

The Model 65018 attaches to our Model 65007 right angle holder. The 65018 includes a 65007 Right Angle Holder and a 65017. It holds the bone at a right angle relative to the 65017. It can still rotate 360 degrees in the horizontal plane (although the 65017 is now at a right angle), but the 65017 is held in a fixed position within the 65007 utilizing a set of locating pins. The 65017 can be rotated in 90 degree increments as there are multiple sets of pin holes for the locating pins.



Model 65019 Adjustable Right Angle Bone Chuck

The Model 65019 uses the 65017 holder and it mounts into a specially designed right angle holder. As there are no locating pins in this design, you can rotate the sample 360 degrees in both a horizontal and a vertical plane.

Specifications

Dimensions:	14.5" W x 16.5" H x 11.0" D
Net Weight:	38 lbs
Wire Speed:	0-700 SFM
Wire Types / Diameters:	Stainless Steel: .005", .010" & .015" Diamond: .010" & .015"
Max Sample Diameter:	2"
Motor:	1 / 15 HP DC
Cross-Feed Range:	2" total (1" coarse + 1" micrometer)
Micrometer Feed:	0 - 1.000", .001" increments or 0 - 25mm, 0.01mm increments
Electrical Input:	100 VAC 50 / 60 Hz 115 VAC 50 / 60 Hz 220 VAC 50 / 60 Hz

Model 65011 Track Mount

The Model 65011 Track Mount is designed to mount the Model 65005 2-Axis Goniometer onto a 1.99" or 2.19" wide x-ray or optical track for crystal orientation.

Model 81099 Starter Kit for Model 810

Includes a supply of commonly used consumable items and spare parts.

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