

**INSTRUCTIONAL MANUAL
CAT. #55230-08
UniDisc Disc Punch
Model MS508**



Introduction

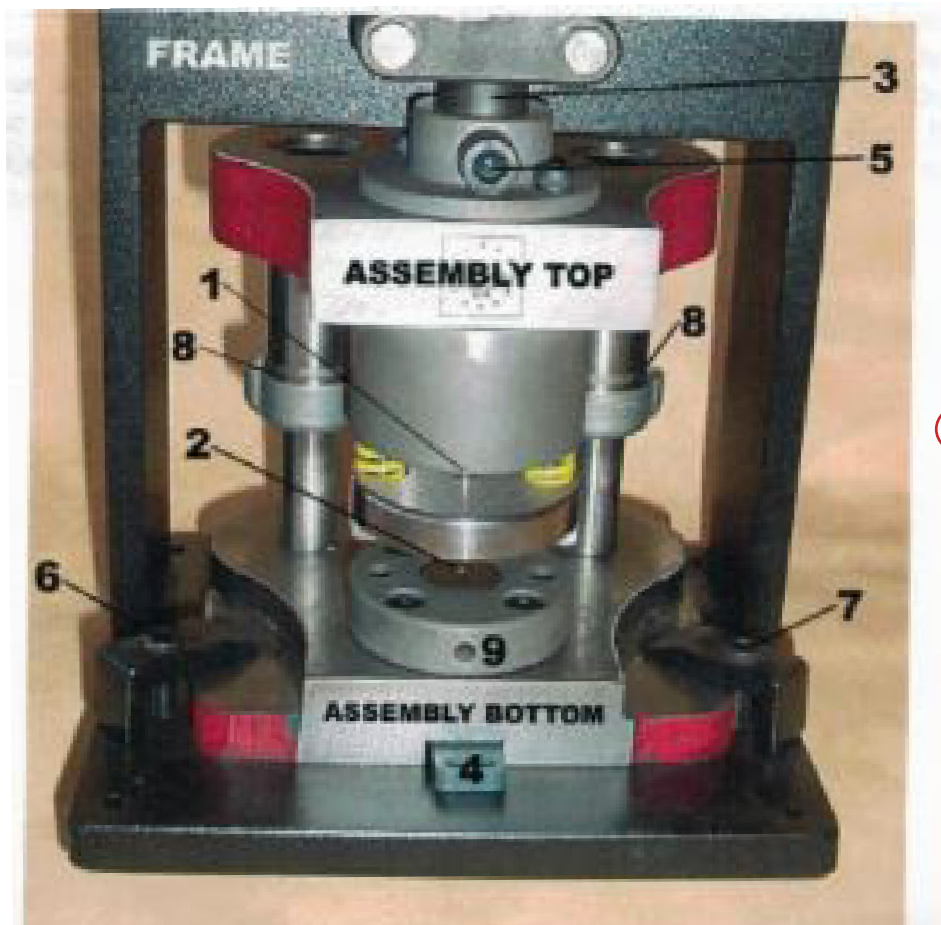
The UniDisc is designed to produce 3mm diameter discs for electropolishing, and subsequent TEM examination, from sample strips.

Sample strips are fed into the side of the Unidisc. When the handle is pulled, the strip is trapped between two rigid metal die faces. The punch then pierces the tightly held sheet and ejects the disc into the collection tray. Deformation is confined to a much localized shear zone at the edges of the disc away from the central region which is later thinned using either the twin jet electropolisher or the single jet electropolisher. The punch and die are replaceable items made from hardened tool steel and can easily be replaced in about 15 minutes without using any special tools. The standard model produces 3 mm discs for TEM from sheet/foil samples with minimum distortion.

Optional models produce discs from 1mm to 6mm in diameter. Examples of the use of these includes the production of 1mm discs of highly radioactive materials which are pressed into holes punched in non-radioactive 3 mm discs and the composite disc thinned. This reduces the radiation dose to the personnel involved. The larger disc specimens are used in SEM.

UniDisc Components

The UniDisc MS508 has a top and a bottom assembly with a punch and a die mounted in a metal frame.



- ① Punch
- ② Die
- ③ Lever-operated Plunger
- ④ Tray (for disc collection)
- ⑤ Socket Screw
- ⑥ & ⑦ Socket Screws
- ⑧ Pillar lubrication cups
- ⑨ Recessed Socket Screw

Set Up

The UniDisc MS508 will need to be screwed into a lab bench or other work surface. Secure to a suitable tabletop by using the four holes at the corners of the base.

Fit grooved end of the handle into the socket of the lever mechanism.

Tighten the grub screw using the 4 mm hexagonal key included to secure the handle.

Operation

1. Raise the lever so the platens separate and expose the die face hole.
 2. Place desired sample ROI (region of interest) over the die face hole.
 3. Pull lever down to close the platens ... then pull down further to punch out the disc.
 4. The disc will fall into the tray.
 5. Pull tray out to retrieve disc.
- NOTE: If disc is not in tray, replace tray and pull lever again to dislodge disc from end of punch.

Replacing Parts of the Assembly

Replacing the Punch and/or Die

Tool needed: 6 mm hexagonal key

Time to accomplish task: about 15 minutes for both

1. Using the 6 mm hexagonal key, partly unscrew the #5 socket screw (# 5) and pull lever upwards to take the plunger out of the assembly top.
2. Still using the key, *partly* unscrew socket screws #6 and #7, in order to release the clamps holding the assembly bottom.
3. (Figure B) Take whole assembly out from the frame and place it on the bench.
4. (see Figure C) Grip the top and the bottom of the assembly and pull apart>.



Figure B



Figure C

Die Replacement

Tool needed: 2.5 mm hexagonal key

1. Using the 2.5 mm hexagonal key, partly unscrew the recessed socket screw #9 (front of the assembly) to release the die..
2. (Figure D) Use a small rod or the hexagonal key supplied to push the die out of the recess.
3. (Figure E) Put replacement die into the recess in the bottom of the assembly. Press into place manually.
4. Gently tighten the socket screw #9 to secure the die.



Figure D



Figure E

Replacing Parts of the Assembly, *cont'd*

Punch Replacement

Tool needed: 5 mm and 6 mm hexagonal keys

1. (Figure F) Using the 5 mm hexagonal key insert it into the socket screw in the top of the assembly. Unscrew it completely.
2. (Figure G) Use a small rod or the hexagonal key supplied to push the punch out of the recess. NOTE: The rod/key needs to have a smaller diameter than the punch.
3. Put replacement punch into the top of the assembly. Tap it into place position and secure it with the socket screw, using the 5 mm hexagonal key
4. (Figure H) Fit assembly top into the bottom.
5. Place whole assembly in the frame. Finalize its position by bringing the plunger down into the assembly top.
6. Secure by tightening screw #5, and then screws #6 and #7, with the 6 mm hexagonal key.



Figure F



Figure G



Figure H

Maintenance

Put a few drops of light machine oil into the pillar lubrication cups located at #8 on Figure 1. This does not need to be done very often.

Replacement/Spare Punches and Dies

In order to make good, flat discs without any flash around the edges:

- Ensure that the clearance between the punch and the die is correct for the thickness and the type of material being punched.

NOTE: The punch and/or die must not be worn nor chipped.

See "Ordering Accessories" below if you are interested in finding out about non-standard dies.

Ordering Accessories

The standard UniDisc is used for making 3mm disc from samples 0.004 to 0.006" (0.10 to 0.15mm) thick i.e. the optimum for electro polishing. If the thickness of the sample is outside the 0.004 to 0.006" range, the same punch is used but the die has to be changed because a different clearance between the punch and the die is required to make good flat discs without any flash around the edges.

Discs can be made from materials up to and including 1mm thick stainless steel. To order non-standard 3mm die quote: the source material and thickness.

Punch and die sets and/or individual punches and dies can be supplied to produce discs in the range of 1 to 6mm in diameter. To obtain advice on the feasibility of your project quote: the diameter of the disc required, the thickness and type of the source material.

For your convenience, we carry the following accessories for the UniDisc MS508:

55232-1	1mm Disc Die Set
55232-2	2mm Disc Die Set
55231-2P	Replacement Standard Punch (3mm)
55231-2D	Replacement Standard Die (3mm)

**Electron
Microscopy
Sciences**

For any questions or for ordering information,
please contact Customer Service at
1-800-523-5874

Thank you for choosing
Electron Microscopy Sciences!

www.emsdiasum.com
sgkcck@aol.com

Tel: 215-412-8400 ♦ *Fax:* 215-412-8450

Electron Microscopy Sciences
P.O. Box 550
1560 Industry Road, Hatfield, PA 19440