

Cutting Encapsulated Cu Sheet using Model 850 Wire Saw



1.0: Purpose

To evaluate the effectiveness of cutting an encapsulated specimen using the Model 850 Wire Saw. This experiment will show the effectiveness of cutting a copper specimen encapsulated in a 1.25" (32 mm) diameter epoxy mount. The cutting method should provide a smooth enough surface to allow further optical analysis as well as any other analytical techniques without the need for surface preparation after cutting.

2.0: Experiment

The specimen was mounted onto a graphite mounting plate using a low melting point wax (MWH 135). The wax was used to hold the sample in place during cutting and to fix it to the mounting plate. The specimen and block was then placed onto the stage of the Model 850 Wire Saw. The specimen was oriented such that the cut was made through about half of the specimen to provide to similar sized pucks.

The specimen was cut using the Model 85015 Work Table, Model 85040 Abrasive Slurry Recirculating System, and the Model 85022 Metric Cross Feed. The abrasive slurry was pumped onto the specimen in a constant flow to ensure maximum cutting efficiency.

The specimen was cut using the following parameters:

SLURRY TYPE:	23 um boron carbide slurry (mixing ratio of 1part H2O: 4 parts glycerine: 1 part powder)
WIRE TYPE:	0.010" stainless steel wire blade
WIRE SPEED:	4 speed (~ 325 rpm)
SPECIMEN LOAD:	10 on small weight scale
CUTTING TIME:	32 minutes

3.0: Results

Below are images of the specimen both before and after the cutting process was completed with the Model 850. The image on the left shows the specimen as cut with a diamond wheel saw. The cut appears to be rough and no clear delineation of the edge can be seen due to a large amount of smearing by the cutting blade. The image on the right shows the as cut surface from the Model 850 Wire Saw. The image is somewhat duller in contrast but the edges of the specimen are clearly delineated without any smearing from the cutting wire. The specimen surface has a lapped appearance and therefore has a duller surface finish. If needed, the specimen can be polished with a few brief steps to enhance the contrast.

It is clear that the cutting surface is much cleaner with the Model 850 Wire Saw and would require less processing steps to prepare a clean, smooth, polished surface.

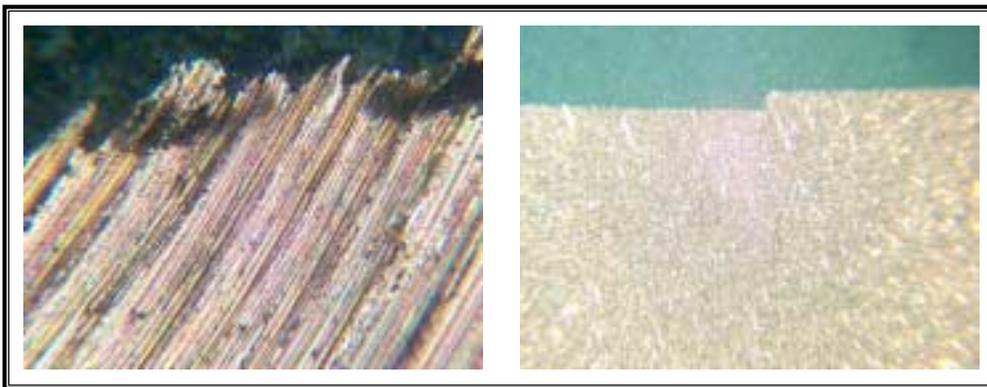


Figure 1: Images showing the difference between cutting surface. The image on the left shows the as cut surface using a diamond wheel saw, and the image on the right shows the as cut surface after cutting with the wire saw.