

IsoMet Buehler Saw Manual

Introduction

In order to perform tests on the Instron or DSC, samples must be cut from the epoxy cylinders on the IsoMet Buehler saw in 130B. This manual details how to safely and precisely operate this piece of equipment for this purpose.



The IsoMet Buehler saw

Safety Information

- Personal protection equipment is required. Consult the ‘Materials’ section for specifics.
- Keep your hands and fingers away from the saw while it is running. Avoid flailing movements.
- The glass of the fume hood can serve as a valuable barrier while the saw runs, and may be lowered down as far as is practical during cutting or sharpening (keep in mind that relatively easy access to the buttons of the saw must be maintained).
- Long hair should be worn up, and loose, hanging sleeves rolled back.

Procedure

This manual contains the following sections:

- A. Preparation (2 steps)
- B. Loading, Measuring, and Cutting (6 steps)
- C. Cleanup (2 steps)

Materials

- Personal Protection Equipment: Safety glasses (stored in 130B)
- Cured epoxy cylinders
- Allen wrench
- Sharpie or other marker
- Digital Calipers
- Aluminum oxide block
- Sandwich bags
- Paper Towels

Cutting Epoxy Samples:

Preparation:

1. Fill the bath beneath the saw blade about two-thirds full with water- enough so that a decent piece of the blade is covered by the water when the bath is in the ready position.

Once this is completed, the bath can be jiggled back up into the ready position and propped by the aluminum block.



The water bath beneath the saw

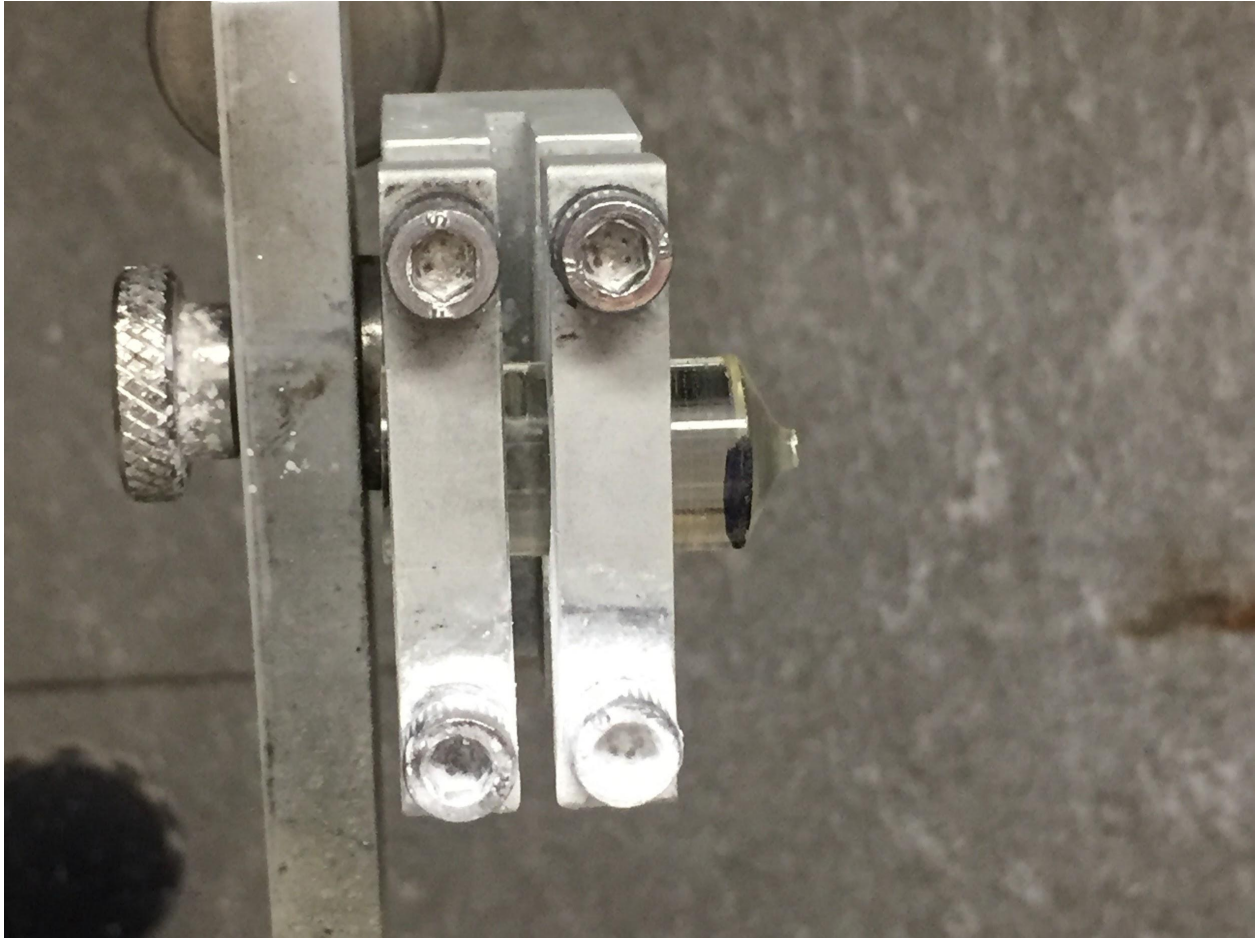
2. The blade must be sharpened next. During cutting, the blade is slowly run through the white, pressed aluminum oxide blocks on the front end of the saw. The sharpening blocks can be moved by the attached knobs. Run the blade about halfway through the block and as close to the other cut marks as possible to preserve the life of the sharpening block. The blade must be sharpened every three cuts, and the water in the bath must be changed every other sharpening to keep particle debris to a minimum.

Loading, Measuring, and Cutting:

1. To mount the epoxy cylinders, use the blue nut driver or an appropriately sized allen wrench to loosen the screws on the arm above the saw blade. Loosen them just enough to slide the cylinder into the arm, then tighten them enough so that the cylinder is stable. Make sure that the end with the spout is facing out, as removing that end will be the first cut.



Saw arm with sample loading mechanism



Loaded cylinder

2. Lower the cylinder onto the (still off!) saw blade. Make any necessary final adjustments to the position of the cylinder using the knob behind the saw. The initial spout cut should be as small as possible in order to maximize the amount of remaining usable epoxy.
3. Ensure that the speed is set to the seven position before starting. Start the saw with the black start button.



The control panel of the saw

4. Stop the saw using the red “stop” button as soon as any cut is completed. The samples have a tendency of falling into the bath once severed, and can jam the saw if it continues to run. Recover any of these fallen samples from the bath after stopping the saw.

5. Once its spout has been removed, the cylinder can be cut into samples. There are two types of samples one could create:

Instron Sample: This sample should be exactly 1 inch long. Use a digital caliper and a sharpie to mark the cylinder at this length. Draw your mark across the full circumference of the cylinder. Do not mark several sample lengths on a single cylinder at one time; measurements should be made only from the site of a fresh cut to ensure maximum accuracy.

DSC Sample: This sample should be only a few millimeters thick- about the thickness of a nickel. This measurement can be visually approximated; the use of a caliper and/or a sharpie is unnecessary. Keep in mind that, in this case, it is best to err on the thicker side of a cut.

6. Repeat the process of loading the cylinder, positioning the cut, and running the saw. Don't forget to periodically sharpen the blade and change the bath water as specified.

Cleanup:

1. When you are done using the saw, clean up after yourself: dump the bath water, wipe down the counter, and lower the glass of the fume hood, leaving a bit of a gap in order to facilitate air circulation. Put your safety glasses back on the shelf by the door.
2. Samples should be stored in appropriately labeled bags separated by epoxy type, batch, and sample type. The scraps of the epoxy cylinders can be stored either with the usable samples, or in a separate labeled bag in a designated scrap container.