

## Polishing of zircon fission-track mounts

Zircons are not grinded, just polished!

To do that stick the Teflon mounts onto an epoxy cylinder dummy with double-sided tape.



*Epoxy dummy with double-sided tape and a Teflon ZFT mount. Photo: E. Enkelmann.*

### General polishing rules:

- Be very clean and always finish all samples with one polishing diamond size before you continue with the next finer suspension.
- We have 9, 6, 3, and 1  $\mu\text{m}$  diamond suspension for polishing.
- Use always the same pad for the specific suspension size, label with sharpie on the back of the pad.
- If you accidentally got a larger grain size on a pad of a smaller size (e.g., 6  $\mu\text{m}$  suspension on the 1  $\mu\text{m}$  pad), you cannot use the pad anymore for the 1  $\mu\text{m}$  polishing.
- Pads and suspension are very expensive, so be careful!
- The manual for the polishing machine is in the first drawer below the machine.

### Polishing:

- Clean all samples under water to make sure that there are no grains or dirt on the sample.
- Make sure the machine and all materials are clean. Clean with water if this is not the case.
- Switch on the polishing machine (switch on the back) and open the pressured air.
- Take the lid off the machine and place the first pad on the magnetic polishing wheel (e.g., 6  $\mu\text{m}$  MDDac pad).
- Put the doser with the 6  $\mu\text{m}$  suspension into the TegraForce. To take the doser off and on, the lower supply part needs to be moved out as far as possible, otherwise you can not disconnect/connect it with the machine.
- Use the display on the left side to go to "Einzelprobenpräparation" (single sample preparation). The last settings for the doser are saved and will be displayed.
- Swing the sample holder over the pad and lower it by pressing the yellow button.
- Place 6 mounts in the holes (make sure the sample side is on the polishing pad).
- Press the green button to start.
- Settings: 6  $\mu\text{m}$  MD Dac pad, 130 and 50 rotation per minutes for the disc and sample holder; 8 minutes; 10 N pressure; rotating synchronism; 1 drop (minimum). **Important:** polishing works best if the pressure is relatively low, rotation of the polishing disc is slow.

- After each polishing step, rinse sample and dry it with a paper towel. Check quality under the microscope and decide for each sample if it needs to be polished more with the same suspension size and for how long or if it can be polished with the next finer suspension.
- After all samples are done with 6  $\mu\text{m}$ , clean the machine, particularly the sample holder, and clean the samples in an ultrasound bath.
- To clean the sample holder, swing the TegraForce out, hold the sample holder with one hand and press the black button just above the holder with the other hand. The sample holder will come off. After cleaning, put it back in by pressing the button again.
- You can continue with the 3  $\mu\text{m}$  or directly with the 1  $\mu\text{m}$  suspension and pad (same settings as above). Repeat steps.
- After you are satisfied with the polishing, remove carefully the Teflon mounts from the sticky tape, use a scalpel or razor blade, do not kink or bend the Teflon (the grains could fall out).
- Remove the sticky tape from the epoxy dummy.
- Check the back side of the Teflon mounts that they are clean without remaining sticky tape.



*Left and middle: Polishing machine with sample holder for 6 mounts. The different pads for different polishing suspension sizes stick magnetically to the polishing wheel. The pads are kept in the drawers beneath the machine. Right: Microscope to check the polishing progress. Photos: E. Enkelmann.*