

LAPPING THE ENDS OF FUSED SILICA TUBING

Technical Note 621

Normal methods of cutting fused silica leave a high spot, sabotaging efforts to minimize dead volume with fittings that make up on the face of the tube. The VICI Fused Silica Prep Kit includes everything needed for a simple lapping procedure which polishes the burred end into a clean, perfectly square-cut surface.

Items required:

- Fused silica tubing (not supplied)
- Fused Silica Prep Kit (product number FS-KIT)

Kit Includes:

DESCRIPTION	QUANTITY	PRODUCT NUMBER
Food grade CO ₂ cartridge	2	FS-CC
Manual on/off valve for CO ₂ cartridge	1	FS-MV
CO ₂ cartridge stand	1	FS-CB
Stainless adapter with 2 µm frit, valve to 360 µm fittings	1	FS-VA
Ceramic wafer for cutting FS	1	FS-CW
Lapping guide	1	FS-LG
9 µm lapping pads, 2" diameter	4	FS-LP
Lapping pad base	1	FS-LB
Care Touch alcohol prep pads	20	FS-AP
Loupe, 40x	1	FS-40X

CLEAVING THE FUSED SILICA TUBE

Note that the ceramic FS cutting wafer has a smooth, sharp edge and a serrated edge. Use the smooth edge to score the fused silica tube at the required length, and break it at the score.

LAPPING PROCEDURE

1. Remove the backing from one of the lapping pads and attach it to the flat, square, white lapping pad base.
2. The lapping guide is a small white cylindrical object with a through-hole for the tube. Note the grooves cut into the bottom to collect the fine particles generated in the lapping process.
Place the lapping guide on the lapping pad with the grooved end on the pad, and insert the cut end of the FS tube into the guide to align it perpendicular to the pad.
3. Hold the lapping guide with a light downward force on the tubing, and make a circular motion on the lapping paper. Depending on the unevenness of the cleave, how much pressure is applied, and the amount of wear on the lapping pad, lapping could take from 2 to 15 seconds.
The grooves on the lapping guide will require blowing out occasionally.
4. Inspect the end of the tube with the loupe to see if a completely flat, perpendicular lap has been achieved. (The bore will be clogged with particulates, but that will be addressed in the next section.)
5. If the tube is not completely flat and perpendicular, repeat step 3. When the inspection reveals a satisfactory result, proceed to the next section.

REMOVING PARTICULATES FROM THE LAPPED TUBE

1. After ensuring that the red knob on the on/off valve is in the off position (clockwise), screw one of the CO₂ canisters into the bottom of the valve (clockwise) until hand-tight.
2. Insert the base of the CO₂ cartridge into the round white cartridge stand. If this is the first use of the kit, remove the protective red band from the finger-tight fitting in the on/off valve.
3. Insert the tube end opposite the one just lapped into the finger-tight fitting, and tighten the fitting using only your fingers.
4. Open the valve slightly (counterclockwise), check for flow, and close the valve.
5. As the gas continues to flow, use an alcohol prep pad to wipe the end clean. It will take a few seconds for the flow to stop because of the volume of gas in the valve assembly and the small bore of the tube.
6. Use the loupe to determine if all the fine particulates have been blown away. If not, repeat steps 4 and 5. If the end is clean, loosen the fitting, remove the tube, and repeat the lapping and cleaning process with the other end of the tube. (If you are proficient, a single prep pad can be used to clean both ends before it dries out.)

A NOTE ABOUT CONSUMABLES

Order replacement parts from VICI using the part numbers on the first page. If you decide to buy some of the parts from another source, be aware of the following considerations:

Alcohol Prep Pads

We recommend that you buy only the Care Touch brand. We have found that other brands are not as saturated, and do not work as well.

CO₂ Cartridges

A minimal amount of CO₂ is consumed with each end prepped, so a single canister will provide many cleanouts. If you purchase additional cylinders from a vendor other than VICI, be sure to purchase products designated as food grade. Non-food grade canisters contain oils which will contaminate the tubing bore during cleanout.