

What is “Filamented” Glass & Who Needs It?

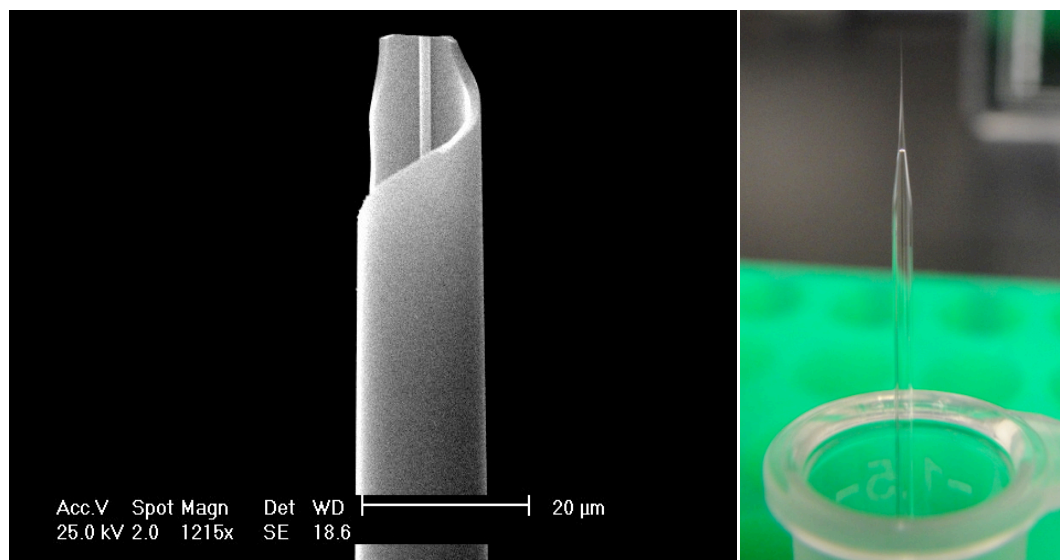
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When buying filamented glass, the "filament" refers to a ~160 micron rod of glass that is annealed to the inner wall of the tubing. This rod of glass in the lumen acts as a wick to create capillary action which allows for easy back-filling of solution into the pipette tip and taper. When back-filling a patch pipette, the tip and most of the taper will fill within 30-60 seconds. When back-filling a sharp and long microelectrode or a microinjection pipette, the tip and most of the taper will fill within 2-3 minutes.

As your capillary glass is heated and drawn out on your Sutter Micropipette Puller to create a microelectrode or microinjection pipette, the inner diameter of the glass and this filament will gradually reduce in size. If you make a pipette that has a $0.5\mu\text{m}$ tip ID, this rod (a.k.a. filament) inside the glass will end up being around 80 nanometers at the tip.

Any time you are making a micropipette that has a tip at or under $3\mu\text{m}$, as needed when performing microinjection or electrophysiology applications, it is best to buy filamented glass. Without a filament, back-filling pipettes can become difficult to impossible and this will most often cause poor filling and introduce air bubbles within the solution of the pipette.

The glass is filamented if the Sutter Item number for Borosilicate, Aluminosilicate or Quartz glass starts with BF, AF or QF. For Example, BF150-86-10 indicates the following: Borosilicate Glass with Filament, 1.5mm outer diameter, 0.86mm inner diameter and a 10cm in length.



SEM image of filamented capillary glass where the tip has been broken back to reveal the “filament” (Borosilicate glass rod) that is annealed to the inner wall of the lumen.

Back-filling microelectrode via capillary action using BF100-78-10 filamented glass.