



Using the Ceramic Tile
(Sutter Catalog #CTS)
To Create 20 μ -200 μ Pipette Tips

Creating micropipettes with a tip size over 20 μ is often difficult without using a mechanical device to score and break the glass. Microforges are often used to create a tip size between 5 μ to 20 μ , but once a larger tip is needed, the delicate filament on a Microforge is often too fragile to effectively break the glass back cleanly. It is in these circumstances that we recommend using a ceramic tile to create a tip between 20 μ and 200 μ with a clean 90-degree break.

The front of the ceramic tile is the surface that has the Sutter logo on it. The front edges of the tile are rough and should be used for scoring the glass. You can use a microscope at 100 to 400x magnification to examine the taper of the pipette and determine where the pipette needs to be scored to create a specific tip size. You can also “blindly” score the glass: starting high and moving down the taper, using a little “trial and error” to find the proper location. You will find that the flexibility of the glass decreases as the diameter of the taper increases, and this tactile feedback can sometimes help one determine where the glass should be scored to achieve a specific tip size.

To create a tip size between 20 μ to 200 μ , first pull the glass capillary out to create a long taper using parameter settings (on a P-87 or P-97) similar to the following:

Heat = Ramp + 15 Pull = 30 Vel = 120 Time = 200 Pressure = 200

Remove the pipette and hold it vertically up to the light. Using a front edge of the ceramic tile, score the glass in a perpendicular fashion and then use the tile to push on the glass just above the location of the “score” to break back the glass. You might find that it takes a number of trials to be able to consistently break the glass cleanly at the proper location. **IMPORTANT:** We recommend you use protective eyewear and break the glass in an outward direction and away from you.

If you find the glass is too flexible to effectively score and break the glass cleanly, or if you want to score the glass at tip sizes under 20 μ , you will need to provide some physical counterforce to stabilize the glass. You can use a clean bench top, a glass slide, or a cover slip upon which to score the glass. It might be helpful to use a dissection scope to score the glass in the proper location. It can also be difficult to score and break the glass if the taper is too long or the glass is too thin. To resolve this matter, you can choose to pull the glass out with a shorter taper (by increasing the pressure or by decreasing the heat, the velocity, or the pull settings) or you can switch to thick walled glass (i.e. 1mm x 0.5mm, 1.2mm x 0.69mm, 1.5mm x 0.86mm). The Sutter catalog numbers for these glass sizes are: B100-50-10, B120-69-10, and B150-86-10 respectively.