

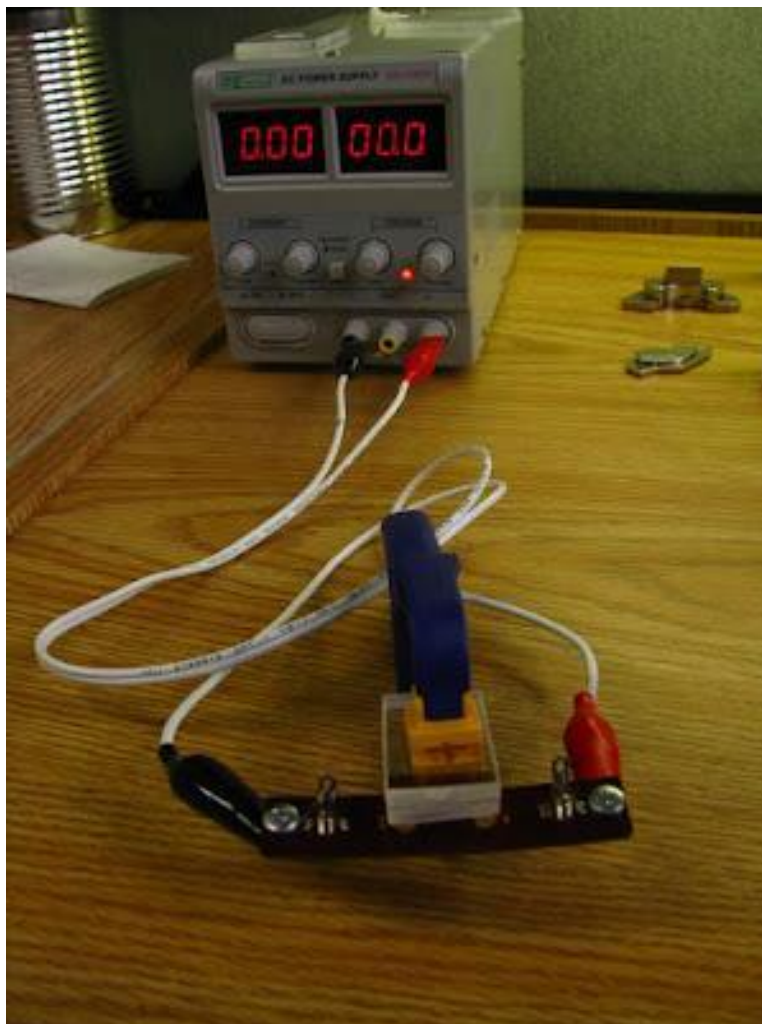


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Grooving acrylic using a hot wire

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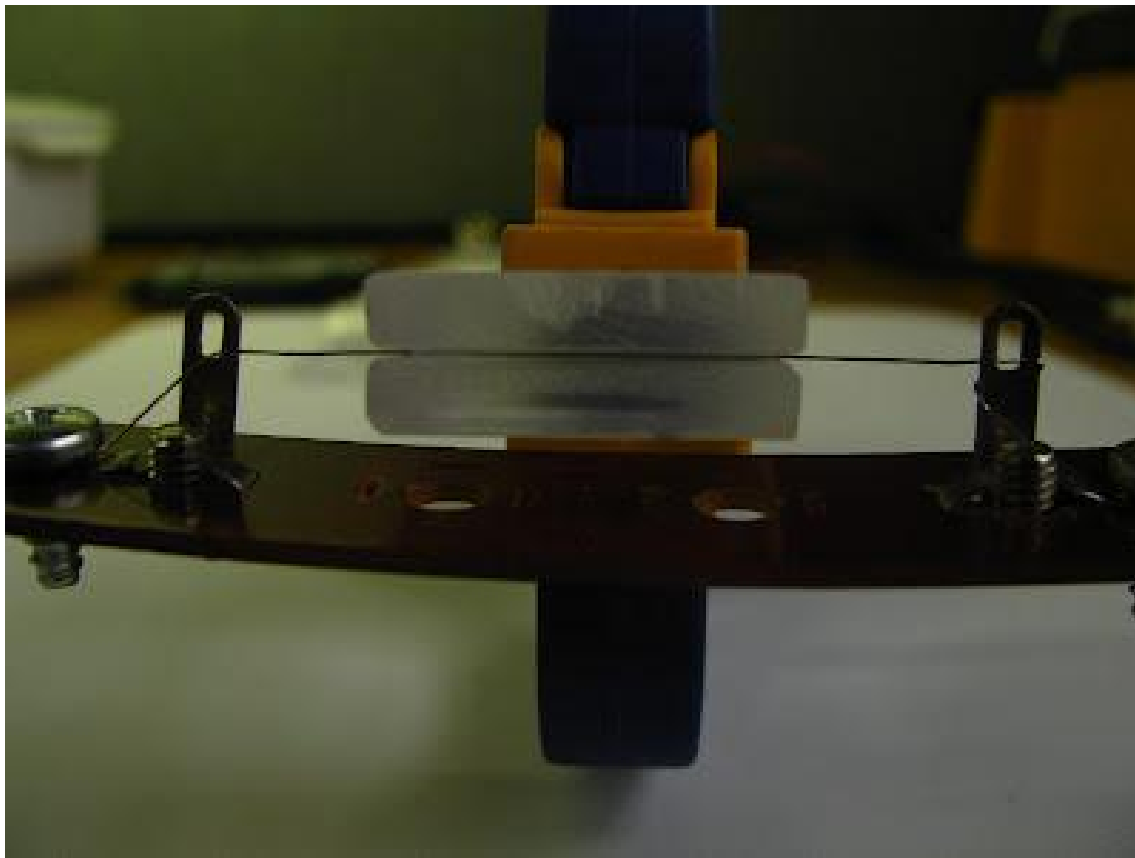
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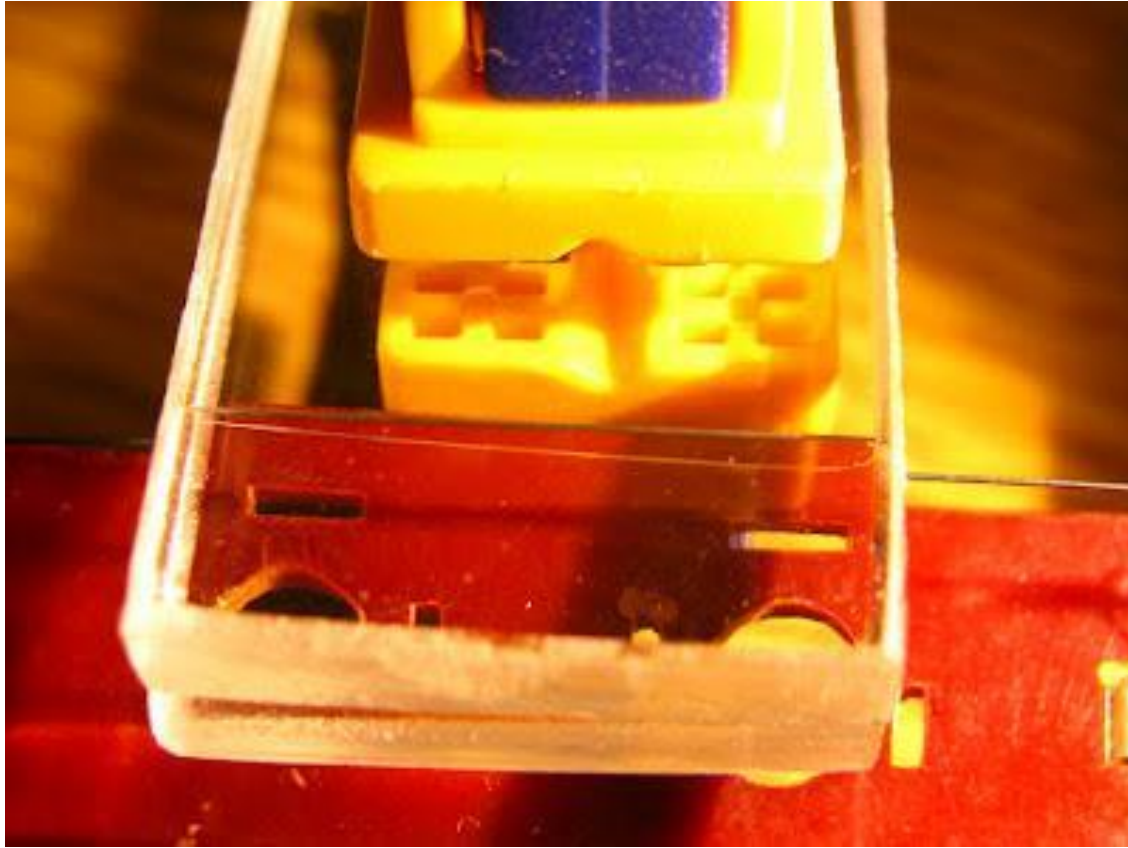
Contact Tibi for more info on this.

This document shows you a simple way to create a small and smooth groove on the surface of a piece of acrylic. We use these grooves for optical fibers alignment, you might want to use them for something else.

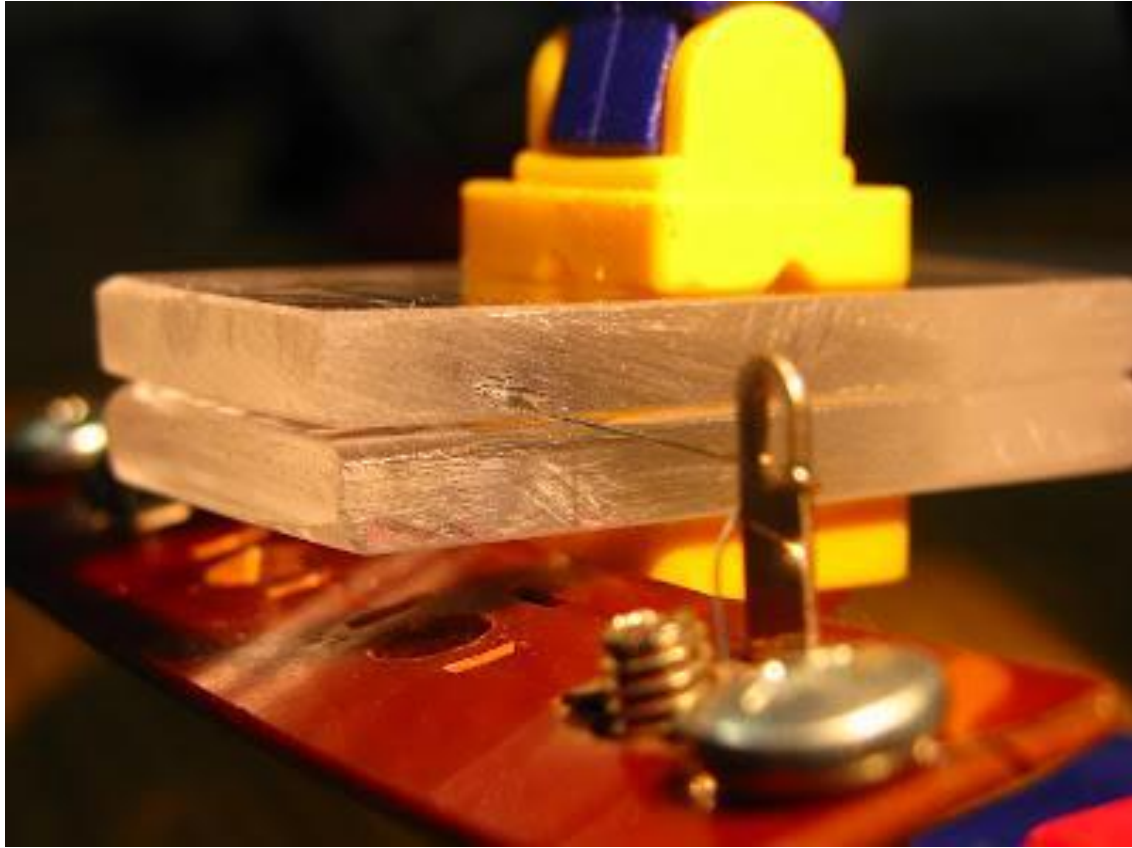
The idea is to use a hot wire to dig the groove by melting the surface of the acrylic. We'll heat the wire (nickel-chrome) by passing an electrical current through it, using an adjustable power supply (in the background of the picture).



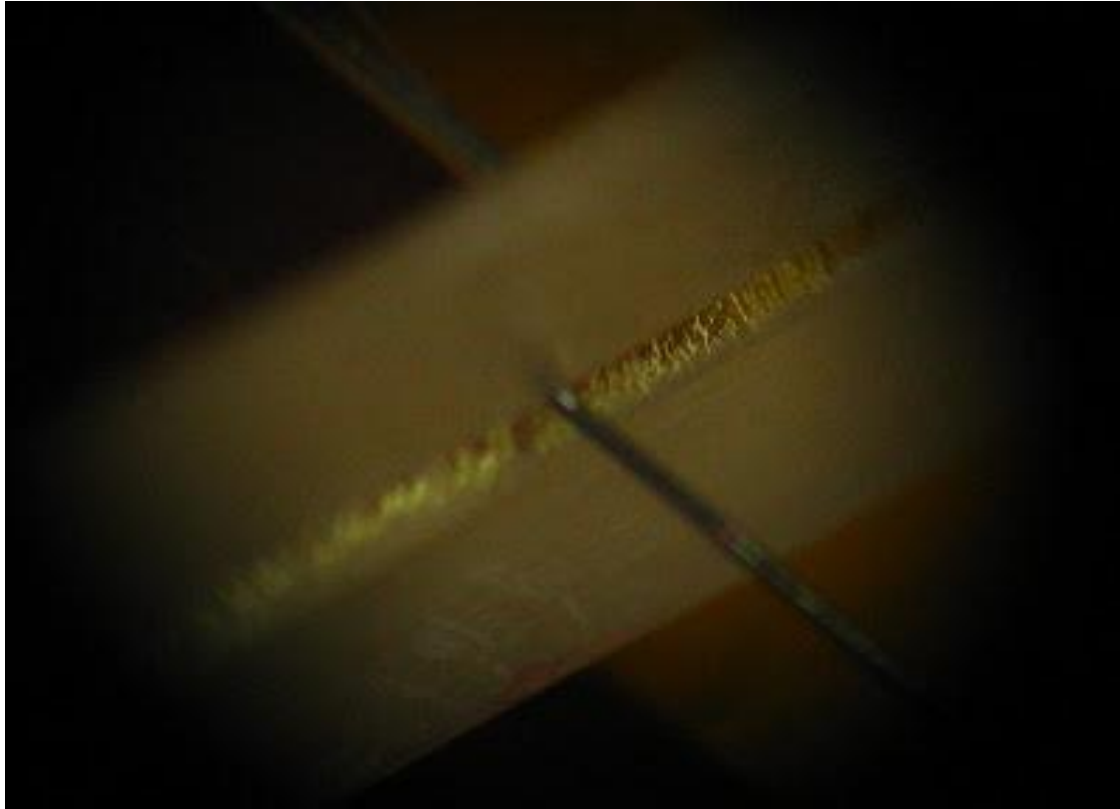
1) In this trial we used two acrylic plates with a wire sandwiched in between them. The wire was stretched on a mount



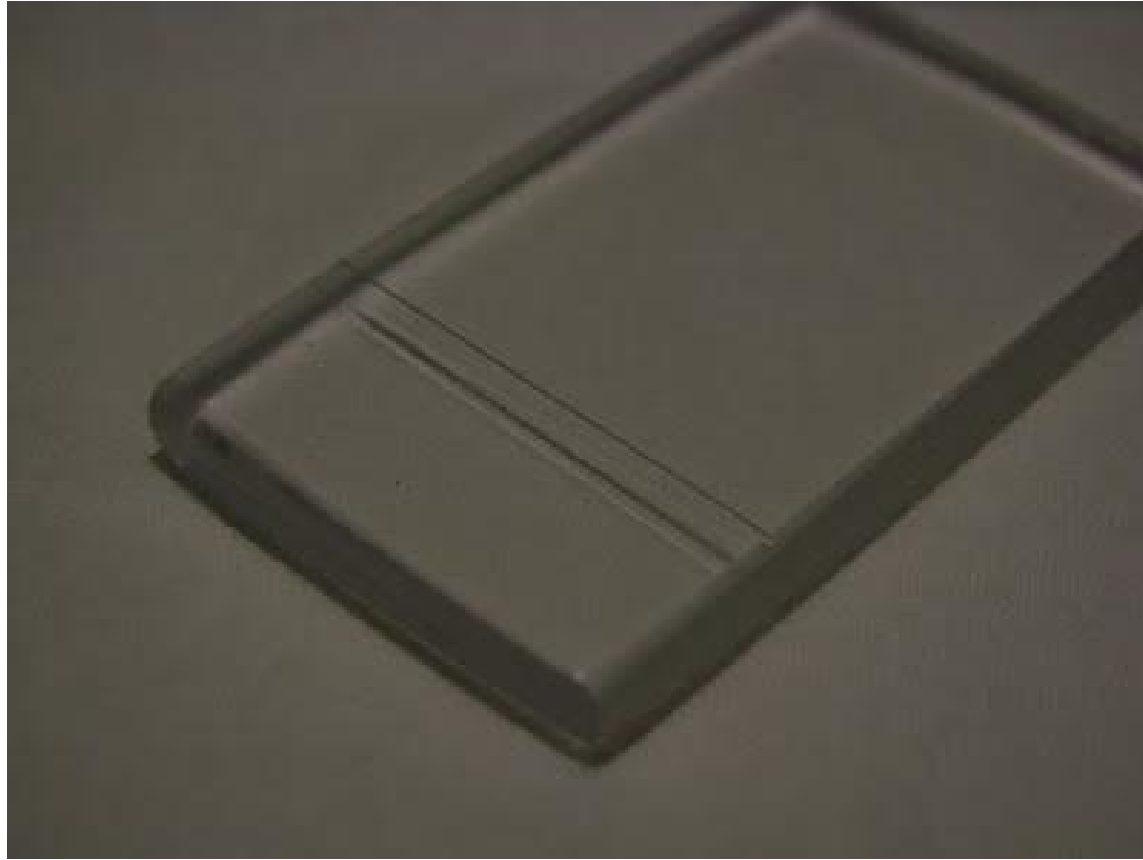
2) Oil was introduced in between the plates in order to avoid gluing of the two plates. In the picture below you can see the oil line right next the the wire, in between he plates.



3) Pressure is applied to the plates using a clamp.



4) The temperature of the wire is raised by increasing the current into the wire. ATTENTION: increase the current very slowly until you see that the wire starts melting the surface. If the temperature is too high the acrylic will make bobbles. You need to keep the temperature right above the melting point. Monitor the edge of the plates to know when to stop the process.



5) When you think it's done, stop the power supply and apply some force to separate the two plates. This is the result we obtain.

NOTE: the wire melts the surface and digs itself into the surface of the two plates. But material is NOT removed. Excess material is transported outward. Therefore, as you apply pressure while heating the wire the two plates will never close completely.

See all picture from this experiment