

An Easy Crosssectioning Technique*

by Stephen A. Skrius

A forensic scientist uses fiber cross-sections to obtain valuable fiber characterization information. The cross-section of a human hair can help in determining race as well as show pigment size, color and distribution across the width of the hair. Cross-sectioning man-made fibers yields clues to the type of fiber, the manufacturing process, and the source of the fiber. Although there is a place for expensive microtomes, there is a much less expensive alternative available to the forensic scientist. This procedure is fast, reliable and costs less than one dollar for thirty-six crosssections.

Insulfab Plastics, Inc.¹ sells a one-by-three inch, thin plastic sheet (Figure 1) produced as an electrical insulator for circuitry. This sheet contains thirty six one-millimeter holes. (Also available through McCrone Accessories and Components.) This plastic sheet, along with a thread-puller, razor blade and embroidery thread, is all you need.

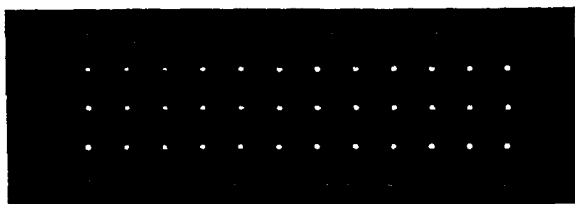


Figure 1.

Proceed as follows:

1) Push the wire loop of the thread-puller through one of the holes of the insulating sheet. A needle-threader can be used as a thread-puller or one can easily be made by inserting thin piano wire (or guitar wire) in the tip of a

plastic wall-anchor and holding it in place with a screw inserted in the bottom end.

2) Six strand embroidery floss is an ideal choice as a filler thread. It comes in a variety of colors and has a constant diameter. Also, the diameter can easily be changed by removing the strands as needed. If you are going to crosssection a fiber (or a few fibers), remove one strand, double the floss, and insert it through the loop of the thread-puller (Figure 2).

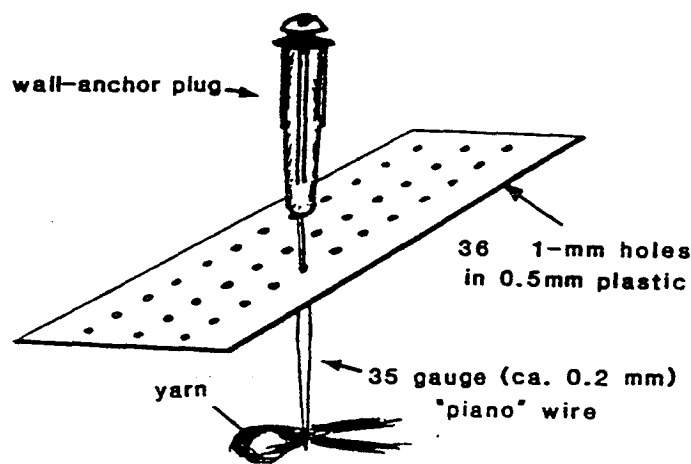


Figure 2.

This will give you just enough filler thread so the sample is held firmly in place but will not pucker the board. Use filler thread of contrasting color to your sample. This will make your fiber much more visible when the cross-section is viewed.

3) Carefully pull the strands into and partly through one of the holes in the plate.

4) Separate the entering strands and insert therein the test fiber(s)

*Editor's Note: This article appeared in *Microscope* 34, 26-27 (1986) and is being reprinted with the kind permission of the editor.

1. Insulfab Plastics, Inc., 150 Union Ave., East Rutherford, NJ 07073.

(Figure 3).

5) Pull more of the floss and the test fiber(s) into the hole, but not through.

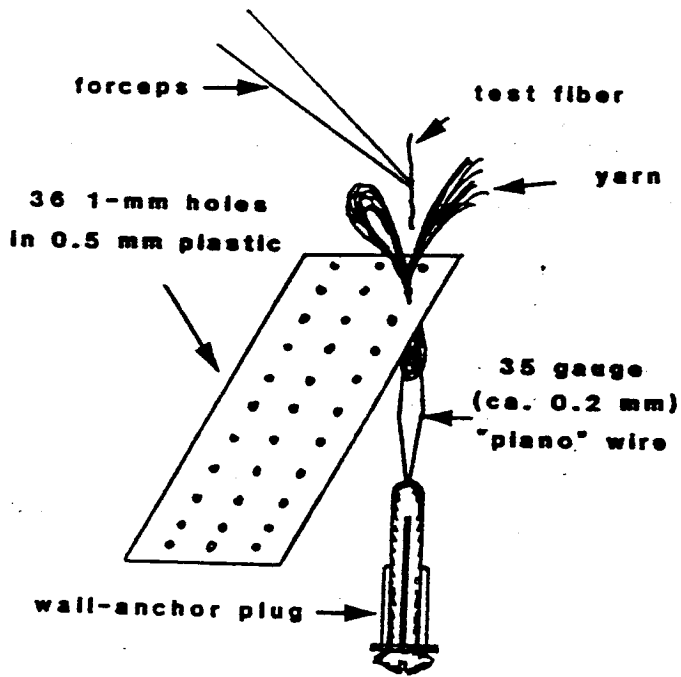


Figure 3.

6) With a fresh razor blade held parallel to the board, cut the excess fibers from each side. It is best to cut the fibers attached to the thread-

puller first.

7) Observe the cross-section with the light microscope (Figure 4). Each fiber illuminated from below acts like a light pipe to show excellent cross-sectional shapes.



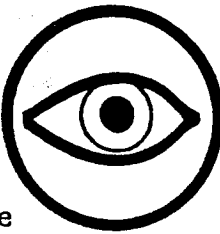
Figure 4. Crosssection of a fiber (325X)

8) A small square of the plastic, a few mm on edge, can be cut out and mounted on the prepared slide for storage and future examination.

Some of this information resulted from helpful discussions with, and ideas from, Thom Hopen and Skip Palenik

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