Verrillon®
Handling Procedures for Polyimide Fibers

Stripping

Polyimide fiber typically can't be stripped using mechanical means. It is most frequently burned off (which can weaken the fiber) or be chemically removed.

However, for polyimide-only fibers (NO CARBON), AFL has the PCS-100 Polyimide Coating Stripper, an automated mechanical stripper that uses a blade stripping method. This provides a safe, consistent, strong and quick stripping solution with programmable strip lengths. Proof test is performed on the fiber after stripping to show that no damage was done to the fiber.

For carbon-coated fiber, however, Window Maker™ by Microsolv is the easiest solution. It contains a replaceable, round, heating element. Push the red button, get the element hot, then insert the fiber (straight) through the heating element so that coated fiber is on either side. By looking through the top of the element, you can see the polyimide being removed or you can count to three (3) and remove it. Try not to inhale the fumes. The fiber should be removed from the element as soon as the window appears, as heat will weaken the fiber. The carbon gets removed at the same time. As shipped, it comes with a 2 mm window maker. We highly recommend that you purchase the 4 mm window maker, as that makes larger windows that will be easier to see.

If not equipped with any of the above tools, one can remove polyimide with a lighter, but it will not remove the polyimide evenly and could do additional heat damage and result in very weak glass. This is not recommended.

Using chemicals to remove polyimide will preserve the strength of the fiber. Carbon will not be removed by using chemicals.

Concentrated Sulfuric Acid (95% - 98%)

CAUTION: Ensure proper exhaust and safety precautions when handling H_2SO_4!

Heat concentrated sulfuric acid in a glass beaker to 150°C. Dip the section of the fiber to be stripped of the polyimide coating in the acid. The polyimide coating will start to visibly dissolve in the acid in approximately 45 seconds and will be completely removed in 2 to 5 minutes. Rinse the stripped fiber in water and wipe clean with a lint free tissue soaked with 99% isopropyl alcohol.

Cleaning/Cleaving

If Window Maker was used, you need to make sure that the window lines up with the cleaving blade. This could be difficult if you are using the 2 mm window size; a magnifying lens might be handy. It is not recommended to wipe the stripped fiber with isopropyl alcohol when using the Window Maker because you could break the fiber; when using other methods, a lint-free tissue lightly moistened with 99% isopropyl alcohol should be used to clean the exposed glass. This will remove any excess coating, and will extend the life of your cleaver. There is no difference between cleaving a carbon versus a non-carbon coated fiber.

When cleaving fiber which has the polyimide burnt off, it is not uncommon to have the fiber break at either side of the window instead of at the position where the blade was. When removing the fiber from the cleaver, pay close attention to the cleave point to avoid frustration when splicing.

Fusion Splicing

Fiber alignment can be problematic when splicing fibers produced using Window Maker. When Window Maker is burning a window, a pile of debris is created on both sides of the window. Depending on your fusion splicer, these piles could end up in an alignment groove, causing fiber alignment issues and frustration. This issue could dictate which window size to use. For example, when using the Fujikura FSM-60S fusion splicer, the 2 mm window must be used, otherwise the debris end up in an alignment groove.

Once a standard single-mode or multimode fiber splicing program has been chosen, ensure that the pre-fuse portion ("cleaning arc") of the program is performed at an early stage, before the fiber alignment step takes place. Generally, there is no need to change the detailed current settings of the pre-fuse step; however, the pre-fuse portion must remove the carbon from the fiber ends. If it does not, you will need to change the pre-fuse step time. The rest of the splicing process proceeds exactly as for non-carbon coated fibers. Because some of the vaporized carbon re-deposits on the surface of the electrodes, frequent cleaning of the electrodes is advised in order to have low-loss, high-strength, spliced fibers.