

## Cleaning the Fiber Cleavers, Thermal Stripper and Fusion Splicers

Vladimir Grozdanovic

***Note: One should not attempt cleaning a fusion splicer or other equipment without having directions from the manufacturer. Extreme care should be taken since improper procedures may damage the equipment.***

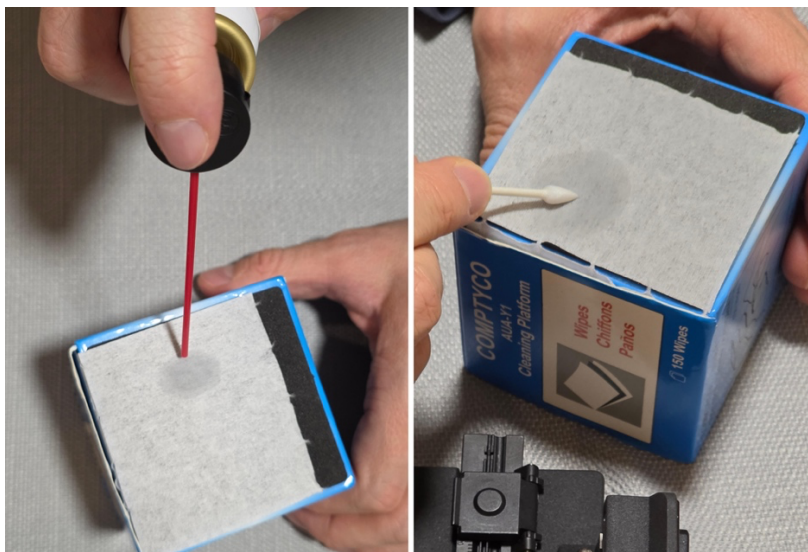
Regular cleaning of fiber cleaver and the fusion splicer is essential for a longer equipment lifespan, proper fiber preparation, and high-quality splicing. Choosing the right cleaning equipment is very important. For this reason, special attention should be paid to the selection of cleaning liquids and cleaning materials such as wipes and swabs.

Today, IPA is still widely used worldwide, even though it has proven to be insufficient for cleaning connectors. The problem is that IPA is not a universal cleaning agent for all types of dirt. It is, for example, good for removing fingerprints, chewing gum, and tree sap. Furthermore, IPA should be in the range of 95–99.9%, which is extremely difficult to maintain because moisture penetrates the containers in which it is stored, quickly reducing the alcohol concentration. Some recommend avoiding the use of IPA even for cleaning splicing equipment. Various special agents are therefore recommended for this purpose, such as HFE 7100 x/IPA/CZ, precision hydrocarbon formulations, and aqueous (glycol esters), each of which has its advantages and disadvantages.

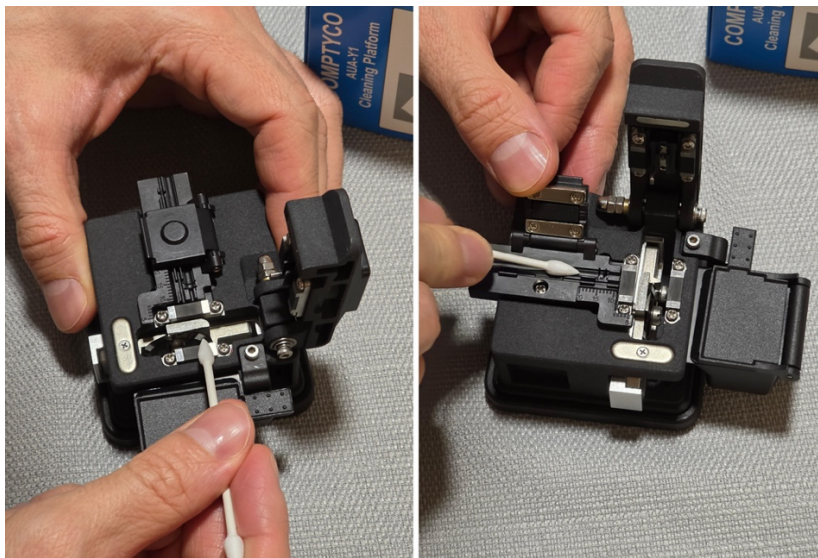
The choice of swabs and wipes is also very important. It is not allowed to use 100% cotton swabs and wipes, as they can contaminate various parts of the equipment. Using paper (100% cellulose) is also not recommended because it is highly absorbent, lacks strength, and tears easily. It is recommended to use lens-grade and hydroentangled non-woven cellulose/polyester blends.

High-quality swabs and wipes are intentionally white so that contamination can be easily seen after use. This way, we know that the surface has been successfully cleaned, and we also avoid reusing them, which could lead to cross-contamination.

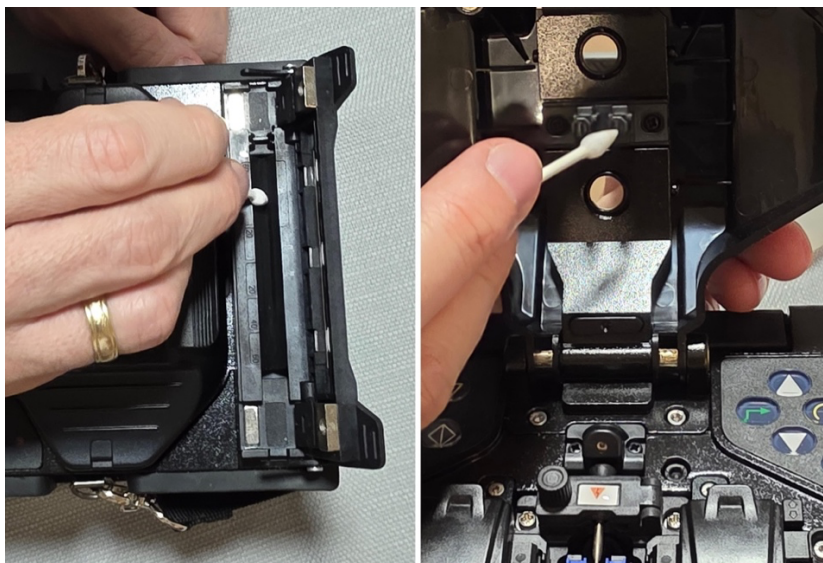
Some people suggest using canned air for cleaning, but it is not recommended for any part of the splicer, as chemicals in the propellant can damage the microscope lens, which would then need to be replaced.



When applying liquid to swabs or wipes, it should be done in a controlled manner. This means, for example, applying a certain amount of liquid to a wipe and then holding the swab on it for 3 to 5 seconds before using the swab for cleaning. Direct application of liquid onto equipment parts is not allowed because it cannot be controlled.



Cleaning most tools is straightforward and can be done using IPA or special chemical liquid (hereinafter referred to as the chemical) and wipes. Cleaning the fiber cleaver is slightly more complex and requires lint-free swabs with the chemical to wipe all blade surfaces and the rubber pads on the cleave tool and blade.



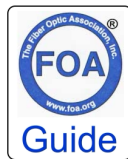
The thermal jacket remover for ribbon splicing should also be cleaned. Use a medium brush for the heat tray and lint-free swabs with the chemical for the rubber pads.

Fusion splicer cleaning includes large surfaces, the splicing area, and the heater oven. Cleaning large surfaces on the fusion splicer is done using the chemical and wipes without opening the wind protector or heater oven. When cleaning large surfaces of the splicer, there should be a specific order, for example wiping from left to right. Wiping randomly in all directions is not recommended. For cleaning the heater, dry swabs or swabs lightly moistened with the chemical can be used.

The splicing area requires cleaning of the LED light source, fiber holders and clamps, V-grooves, and lenses. The chemical and swabs can be used for all these components.

V-grooves should be cleaned only with a special soft or medium brushes. Some splicers have V-groove tray which is coated with a Teflon-like material that can be damaged by hard or metal brushes. When cleaning the grooves, care must be taken not to touch the electrodes. Thorough cleaning also includes running a prepared glass fiber back and forth through the V-groove to remove debris. In some ribbon splicers, the V-groove tray can be removed, allowing easier access for more thorough cleaning and for cleaning the lenses.

To clean the lenses, the electrodes must be removed. There are different recommendations for cleaning lenses. Some recommend cleaning only with dry swabs to avoid possible damage to the lenses or using swabs lightly moistened with “purified water”. Others suggest using swabs lightly moistened with the chemical, followed by dry swabs to remove any remaining the chemical. Both methods require wiping the lens in a circular motion, from the center toward the edges. The same method is used for cleaning mirrors.



After cleaning, inspect the area with and without a loupe to ensure that all debris has been removed. Repeat the procedure if necessary.

Touching the electrodes is not permitted, as it may cause damage, contamination with grease off your skin, or injury. During fusion splicer operation, silicate residue, oxidation, and environmental contamination can accumulate on the electrodes. Cleaning electrodes using a material with a fine abrasive layer, which is intended to gently remove contaminants without damaging the electrodes, is practiced in some companies. After micro-polishing, it is necessary to wipe with a wipe lightly moistened with the chemical. IPA is not allowed here because it can cause corrosion of the electrodes.

However, this method of maintenance is not recommended by many companies; instead, old electrodes should be replaced with new ones. Cleaning may damage the electrodes, can be uneven, and may cause thinning of certain parts of the electrode.

If electrode replacement is required — typically after about 4,000 splices or more splices, or as needed — both electrodes must be replaced with the correct model. Power off the splicer before beginning the procedure. Carefully remove the old electrodes and install the new ones while the unit remains powered off. After replacement, run the “Conditioning Arc” or “Stabilize Electrodes” program to properly condition the new electrodes.

***Note: Fusion splicers and other tools are unique. One should not attempt cleaning a fusion splicer or other equipment without having directions from the manufacturer. Extreme care should be taken since improper procedures may damage the equipment. This article provides general guidelines on cleaning only. The FOA provides this publication for information only. The Fiber Optic Association does not assume any obligation or liability for the user of this publication.***

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