CLEANING OBIS™ AND SAPPHIRE™ FIBER TIPS

To avoid optical degradation and optical or mechanical damage, the fiber connector needs to be clean. Also, the connector has to be installed in a dust-free and contamination-free environment when running the laser in your application; therefore, it is important that fiber connectors are inspected and cleaned prior to mating. The information in this document explains how to do that.

OBIS and Sapphire Fiber Tips (shown without fiber shutter caps)

Importance of Inspection and Cleaning

A clean fiber tip is required for quality connections between fiber optic equipment. One of the most basic and important maintenance procedures of a fiber optic system is to clean the equipment.

Any contamination in the fiber connection can cause failure of either the component or the whole system. Even microscopic dust particles can cause a variety of problems for optical connections. A particle that partially or completely blocks the core can generate strong back reflections, which, in turn, can cause instability in the laser system.

In addition to dust, other types of contamination must also be cleaned off the fiber tip. Such materials include:

- Oils (for example, from human hands)
- Film residues (condensed from vapors in the air)
- Powdery coatings (left after water or other solvents evaporate)

These contaminants can be more difficult to remove than dust particles and, if not removed, may also damage the equipment.
The output intensity at the fiber exit of OBIS and Sapphire lasers is so extreme that any contaminant can be burned into the fiber tip if it blocks the core while the laser is turned on. This burn might damage the optical surface enough so that it cannot be cleaned.

When you clean fiber components, always complete the steps carefully. The goal is to eliminate any dust or contamination and to provide a clean environment for the fiber optic connection.

Remember that inspection, cleaning, and re-inspection are critical steps which must be done before you make any fiber connections.

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**WARNING!**
Laser safety glasses can present a hazard as well as a benefit; while they protect the eye from potentially damaging exposure, they block light at the laser wavelengths, which prevents the operator from seeing the beam. Therefore, use extreme caution even when using safety glasses.

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**WARNING!**
Never look into a fiber while the laser is on.

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**WARNING!**
Never connect a fiber to a fiberscope while the laser is on.

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**WARNING!**
Always turn off the laser before you inspect the fiber tip.
CAUTION!
Follow all safety instructions when using isopropyl/methanol alcohol (used for wet cleaning of the fiber tip). If you do not have a copy of the safety instructions for using alcohol, contact your vendor before following the cleaning information explained in this document.

NOTICE!
Always inspect and clean the connectors before you make a connection.

NOTICE!
Never touch the tip of the fiber connectors.

NOTICE!
Never use alcohol or wet cleaning without a way to ensure that it does not leave residue on the fiber tip.

General Cleaning Process

1. Inspect the fiber tip with a fiberscope or microscope and if the tip is dirty, use the dry cleaning technique (p. 5) to clean it.

2. Re-inspect the fiber tip and if the connector is still dirty, repeat the dry cleaning technique (p. 5) a second time.

3. Inspect the fiber tip and if the connector is still contaminated, clean it with the Wet Cleaning Technique (p. 6).

4. Inspect the fiber tip again and if the contaminant is still present, repeat the wet cleaning process until the fiber tip is clean.

5. If the fiber tip is still contaminated after several attempts to clean it using the wet cleaning technique have failed, contact the Coherent Technical Support Hotline:

   1.800.367.7890 (U.S.)
   1.408.764.4557 (outside the U.S.)
Fiber Tip Inspection Technique

The inspection of the fiber tip is done with either a desktop video fiberscope or a handheld fiberscope. Both tools are customized microscopes used for inspecting optical fibers. The scope should provide at least 200x total magnification. A specific adapter is needed for the FC/APC (Fiber Connector/Angle Physical Contact) to properly inspect the fiber tip.

To inspect the connector:

1. Make sure that the laser is turned off before you begin the inspection.
2. Put the appropriate inspection adapter or probe on your equipment.
3. Unscrew/remove the dust cap.
4. Insert the fiber connector into the fiberscope adapter and adjust the focus ring so that you see a clear fiber tip image.
5. Clean the fiber tip and re-inspect, as necessary. Refer to the “General Cleaning Process” (p. 3) for an overview on fiber tip cleaning.
6. Immediately plug the clean connector into the mating clean connector to reduce the risk of re-contamination.
Fiber Tip Cleaning Techniques

No known cleaning method is 100% effective; therefore, it is imperative that inspection is included as part of the cleaning process. Improper cleaning can damage the equipment.

Dry Cleaning Technique

This section describes a dry cleaning technique that uses a cartridge cleaner.

Recommended cartridge cleaning tools:

**OPTIPOP R**

Cord: ATC-RE-02

http://www.ntt-at.com/product/optipop/

**CLETOP-S Type A**

Part Number: 14110501


1. Make sure that the laser is turned off before you begin the inspection.
2. Unscrew/remove the dust cap.
3. Inspect the connector with a fiberscope. Refer to the “Fiber Tip Inspection Technique” (p. 4).
4. If the connector is dirty, clean with a cartridge cleaner.
5. Press down and hold the thumb lever—the shutter slides back and exposes a new cleaning area.
6. Hold the fiber tip lightly against the cleaning area (slot 1).
7. Pull the fiber tip lightly down the exposed cleaning area in the direction of the arrow or from top to bottom and, at the same time, rotate the fiber 90 to 180 degrees.
**NOTICE!**

Scrubbing the fiber against the fabric or cleaning over the same surface more than once can potentially contaminate or damage the connector.

8. Repeat steps 6 and 7 (above), using slot 2 instead of slot 1.

9. Release the thumb lever to close the cleaning window.

10. Inspect the connector again with the fiberscope. Refer to “Fiber Tip Inspection Technique” (p. 4).

11. Repeat the inspection and cleaning processes, as necessary. If the contamination cannot be removed with the Dry Cleaning Technique, use the Wet Cleaning Technique (explained next).

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**Wet Cleaning Technique**

If it wasn't possible to completely remove the contamination by using the Dry Cleaning Technique:

1. Press down and hold the thumb lever of the cartridge cleaning tool. The shutter will slide back and expose a new cleaning area.

2. *Carefully* drop isopropyl/methanol on both slots (1 and 2).

3. Hold the fiber tip lightly against the cleaning area (slot 1).

4. Pull the fiber tip lightly down the exposed cleaning area in the direction of the arrow or from top to bottom and, at the same time, rotate the fiber 90 to 180 degrees.

**NOTICE!**

Scrubbing the fiber against the fabric or cleaning over the same surface more than once can potentially contaminate or damage the connector.
5. Release the thumb lever and press it down again to get an unexposed cleaning section.

6. Continue with step 8 of the “Dry Cleaning Technique” (p. 6).

**Contaminated and Clean Fiber Tips**