

## Fiber Optic Termination Kit

The Ocean Optics Fiber Termination Kit allows you to change the fiber terminations on your Ocean Optics fibers yourself. The kit is a complete, self-contained fiber polishing and termination tool kit. Through the use of this kit, you can modify or re-terminate the connector on the ends of your fibers and polish the fibers to ensure maximum transmission efficiency of the fiber after a termination change.

### Included Materials

The following items are included in the Fiber Optic Termination Kit (part numbers in parentheses):

- SMA polishing puck (DFSMA-PUCK)
- Carbide scribe (DFSCORINGTOOL)
- 12 $\mu$ m lapping film 4.5 in. x 4 in. Al Oxide 4 sheets cut (DFPOLISH-003)
- 3 $\mu$ m lapping film 4.5 in. x 4 in. Al Oxide 4 sheets cut (DFPOLISH-002)
- 1 $\mu$ m lapping film 4.5 in. x 4 in. Al Oxide 4 sheets cut (DFPOLISH-001)
- Room temperature ½ hour cure adhesive (DFEPOXY)
- Optic Wipes (DFWIPES)
- 5-cavity crimp tool (.105", .137", .151", .178", .255") (DFCRIMPTOOL)
- 6" x 6" glass with four rubber feet (DFPLATE)
- Basic inspection scope (DFMICROSCOPE)
- 9025 SMA scope adapter (DFMS SMA)
- Assortment of 50/100, 200, 400, 600, and 1000  $\mu$ m SMA connectors (4 each) (DFSMACONN)
- Blue carrying case (DF-LUNCH CASE)
- This document (DFMANUAL)

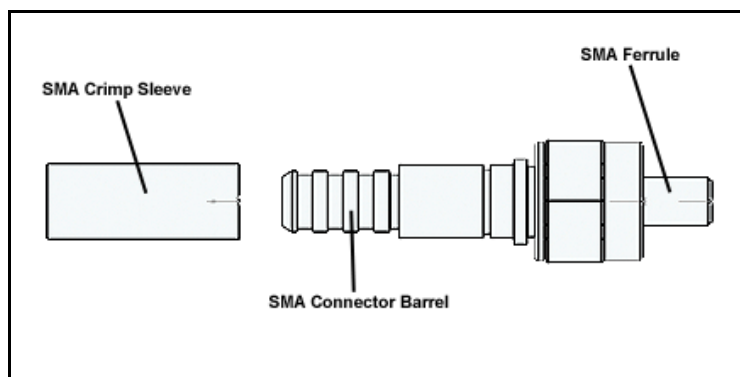
### Using the Fiber Optic Termination Kit

Polishing and finishing a fiber is a two-step process. You must first attach and crimp the SMA connector onto the fiber (if working with a jacketed fiber). Once completed, you then polish the end of the fiber to ensure that light can pass through the fiber unobstructed and enter or exit the fiber.

The following sections provide instructions on crimping fiber cables and polishing fiber ends:

#### Crimping Fiber Cables

Figure 1 below illustrates the various portions of the SMA connector that you will use when crimping a fiber cable:

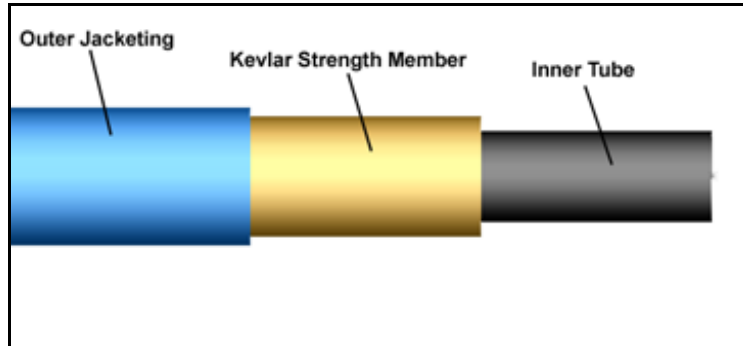


*Figure 1: Parts of the SMA Connector*

## Fiber Optic Termination Kit

The Fiber Optic Termination Kit can be used to change or repair fibers and connectors on jacketed fibers as well as bare fibers. The SMA crimp sleeve is only required when working with jacketed fibers, which are composed of an outer jacketing (typically PVC or Tefzel), a strength layer composed of durable Kevlar fibers, and a black inner tube coating that protects the fiber from damage and insulates against stray light.

Figure 2 below illustrates the composition of a typical jacketed fiber:



*Figure 2: Typical Jacketed Fiber Construction*

When working with a jacketed fiber, you must pare away the jacketing to expose the enclosed fiber. The procedures for crimping and polishing are the same. However, when working with a jacketed fiber, you will need to expose the fiber by removing a few millimeters of the black inner tube jacketing.

### Crimping Jacketed Fibers

Follow the steps below to attach and crimp an SMA connector to the end of a jacketed fiber using the Fiber Optic Termination Kit:

1. Trim the end of the fiber jacketing to the appropriate length, exposing the enough of the bare fiber so that it can thread through the hole in the SMA Ferrule. Use a razor blade or some other stripping tool to expose the appropriate length of fiber (this tool is not included with the Fiber Optic Termination Kit).
2. Place the SMA crimp sleeve (the hollow tube that accompanies the SMA connectors) into the .178 channel of the 5-cavity crimp tool and close the crimp tool so that it gently secures the crimp sleeve into place.
3. Apply some epoxy to the inside of the SMA crimp sleeve and slide the crimp sleeve onto the jacketing of the fiber.
4. Thread the exposed end of the bare fiber and the protective inner tube through the SMA connector barrel and out of the hole in the SMA ferrule.
5. Spread the Kevlar strength member so that it encloses the SMA connector barrel.
6. Apply some epoxy to the exterior of the SMA connector barrel and slide the SMA connector barrel inside the connector sleeve.
7. Firmly crimp the SMA connector barrel and the SMA crimp sleeve together so that the crimp sleeve covers the Kevlar strength member, the SMA connector barrel, and the end of the outer jacketing.
8. Apply a drop of epoxy to the tip of the SMA ferrule, directly where the bare fiber is protruding from the ferrule tip.
9. Allow the epoxy to cure for a minimum of two hours.

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### Polishing Fiber Ends

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Safety glasses should be worn when polishing short sections of fiber (12 inches or less).

Use caution when handling alcohol to avoid any spills. Apply alcohol to the SMA connector with cotton-tipped applicators.

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Once you have allowed the epoxy to cure and the SMA connector and sleeve are securely crimped to the cable, perform the steps below to polish the fiber end:

#### Polishing the Fiber End

1. Place the exposed bare fiber on the 6" x 6" glass table, and use the scoring tool to score a notch in the fiber as close as possible to the tip of the SMA ferrule.
2. Snap the excess bare fiber off at the scored point of the fiber.
3. Screw the SMA connector into the SMA polishing puck so that the tip of the bare fiber and tip of the SMA ferrule are exposed.
4. Place a sheet of the 12  $\mu\text{m}$  lapping film on the 6" x 6" glass.
5. Hold the SMA polishing puck by the fiber cable channel and place the SMA connector vertical to the lapping film.

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**Note:** Holding the SMA polishing puck in a 90° vertical manner ensures flatness on the tip of the fiber.

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6. Gently rub the bare fiber tip on the lapping film in a "figure-8" motion until the excess epoxy is removed and the fiber is flush against the tip of the SMA ferrule.
7. Place a sheet of the 3  $\mu\text{m}$  lapping film on the 6" x 6" glass.
8. Hold the SMA polishing puck by the fiber cable channel (in the vertical position) and gently rub the fiber tip on the lapping film in a "figure-8" motion approximately 50 times.
9. Repeat Steps 7-8, using the 1  $\mu\text{m}$  lapping film.
10. Wipe the fiber end with the optic wipes to remove contaminants created during polishing and to clean the end of the fiber.

#### Inspecting the Fiber End

Perform the steps below to inspect the condition of the fiber after polishing:

1. Ensure that the 9025 SMA Scope Adapter is attached to the inspection scope.
2. Connect the SMA connector and fiber to be examined to the SMA adapter on the end of the inspection scope.
3. Turn the inspection scope's light on.
4. Look through the end of the inspection scope to verify the condition of the fiber. If there are no visible cracks, grooves, or scuffs on the fiber surface, the fiber polishing procedure is complete.

If you locate cracks, grooves, scuffs, or other imperfections on the fiber surface, repeat Steps 7-10 of the *Polishing the Fiber End* section (above), then re-examine the condition of the fiber after re-polishing.

**Accessories**

You can greatly enhance the potential uses of the Fiber Optic Termination Kit by purchasing any of the following Ocean Optics products:

Product	Part No.	Description
Fiber Tinkerer Kit	FT-KIT	The Fiber Tinkerer Kit includes an assortment of randomly selected UV-VIS and VIS-NIR optical fibers. Each Fiber Tinkerer Kit has at least 1 meter of consecutive length of each fiber type.
Bare Fiber Adapter Kit	BFA-KIT	The Bare Fiber Adapter Kit includes six SMA 905 Connectors of various sizes and a connect-and-release adapter to fasten the SMA connectors onto bare optical fiber.
SMA Connector Supplies	Connector Kit	The SMA 905 Connector Kits are available in six different sizes, each with 10 SMA 905 Connectors of the same size, drilled for precise alignment with our optical fiber.  Kits vary according to the diameter size of the SMA 905 Connector. 150 µm, 270 µm, 380 µm, 490 µm, 710 µm and 1300 µm diameter connectors are available.
Zip Tube	11718-0001	Inner protection tubing for use with fiber cables. Apply to bare fiber before jacketing to protect fiber.
Red Tefzel Jacketed Cable 500 µm Low OH.	12536-001	Red Tefzel jacketing to encase fiber when jacketing a bare fiber.
Green Tefzel Jacketed Cable 500 µm Ultra-low OH.	12530-001	Green Tefzel jacketing to encase fiber when jacketing a bare fiber.
Red Tefzel Jacketed Cable 200 µm Ultra-low OH.	12536-001	Red Tefzel jacketing to encase fiber when jacketing a bare fiber.

View any of these products at <http://www.oceanoptics.com/products/fiberkits.asp> or contact an Ocean Optics Application Sales Engineer for assistance.