

# POF Tool Kit

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**Model Number:**

**IF-TK4**

**INDUSTRIAL FIBER OPTICS**

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# INTRODUCTION

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Congratulations on your purchase of Industrial Fiber Optics' latest *POF Tool Kit*. This kit and enclosed instruction sheet contain all the information you need to complete the most common procedures required for plastic optical fibers, even if you are new to fiber optics and fiber termination procedures. Please read carefully.

As soon as you receive this tool kit, inspect it and its shipping container. Besides this instruction sheet, the kit consists of:

- Professional Fiber Cutter
- 4 Extra-KEEN razor blades
- 10 sheets of 2000-grit polishing paper
- 10 sheets of 3  $\mu$ m polishing film
- 30-watt hot knife
- AMP Instruction Sheet 2974
- Soldering iron cutting tip attachment
- 2-oz. water dispenser
- Glass polishing table
- Fiber Optic/Wire stripper
- ST polishing puck
- Storage container

If parts are missing please contact us immediately for replacement. If any component has been damaged during shipping, immediately notify the shipping carrier.

Industrial Fiber Optics makes every effort to incorporate state-of-the-art technology, highest quality and dependability in its products. We constantly explore new ideas and products to best serve the rapidly expanding needs of industry and education. We encourage comments that you may have about our products, and we welcome the opportunity to discuss new ideas that may better serve your needs.

Thank you for selecting this Industrial Fiber Optics product. We hope it meets your expectations and provides many hours of productive activity.

## GENERAL INFORMATION

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*The POF Tool Kit* contains tools designed exclusively for use with plastic optical fiber/cable.

**Do not attempt to cut or process glass fiber.** With the contents of this kit you will be able to complete the following procedures with plastic optical fiber.

- Cut jacketed and unjacketed plastic optical fibers
- Use a hot knife to cut or terminate AMP DNP connectors
- Remove the jacket from the most common jacketed plastic optical fibers
- Polish a fiber end installed in a fiber connector

# CUTTING JACKETED AND UNJACKETED OPTICAL FIBERS

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For cutting any plastic optical fiber we recommend the use of our *POF Cutter Block*. This cutter uses “Extra KEEN” razor blades that cut through the fiber easily and produce as superior a cut as can be obtained with any other cutting device. This cutter also precisely holds the fiber at right angles to the cutting blade for creating fiber ends that allow for maximum coupling efficiency with any LED or photodetector. For operational information see the instruction sheet contained in the fiber cutter package.

## USING THE HOT KNIFE

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**To ready the hot knife for use, complete the following steps:**

1. Screw the cutting tip attachment into the heating end of the soldering iron about two complete turns.
2. Insert the Exacto® knife blade into the slot located in the cutting tip attachment. Turn the cutting tip attachment until finger tight. **Do not tighten further with the pliers, or when the knife is hot as this could damage the cutting tip attachment.**
3. Insert the plug at the end of the soldering iron electrical cord into a standard 110 VAC outlet.
4. Let the hot knife heat up for about five minutes.

***The knife blade can be dangerous if not handled cautiously. It is hot like a soldering iron tip and very sharp. Be careful.***

The hot knife is commonly used for cutting plastic optical fibers or those with AMP's DNP fiber optic terminations/connections. For information about using the hot knife with AMP DNP fiber terminations see the AMP Instruction sheet, **IS 2974**, enclosed.

**To cut optical fiber with the hot knife, complete the following steps:**

1. Check the Exacto® knife blade to make sure it is clean, sharp and free of nicks.
2. Place the optical fiber you wish to cut flat on the enclosed glass polishing table.
3. Align the hot knife blade at right angles (90°) to the length of the optical fiber and about one-half inch (1 cm) above the fiber. Hold the hot-knife blade's cutting edge so it is parallel to the surface of the glass plate.
4. Lower the hot knife blade slowly while maintaining the knife position at 90° to the fiber's central axis.
5. Once the hot knife has cut through the optical fiber remove it quickly from the fiber cut, trying to avoid touching the hot tip to any other part of the fiber.

# FIBER STRIPPING PROCEDURE

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Many applications of fiber optics require that the optical fiber be jacketed to protect the fiber core and cladding from physical abrasion, UV light exposure, and/or chemicals. These same applications often require the jacket to be removed from the end to make a splice between two fibers or install a fiber optic connector. The wire stripper included with this kit will allow you to strip the jacket from the most common plastic optical fibers with ease and speed. This stripper will remove the jacket up to 7/8 of an inch (22 mm) from the fiber end.

The first step in stripping the jacket from an optical fiber is to select the proper clearance diameter from the following table. When stripping the jacket from the fiber, always insert the fiber into the recommended setting. Using a numbered setting smaller than recommended may cause the fiber to be nicked, which can cause fiber breakage or scratching of the fiber's cladding. Using a setting larger than suggested may result in the jacket not being pulled and properly removed from the fiber core/cladding.

Fiber type	Clearance Diameter (mm)
750 $\mu\text{m}$ jacketed	1.0
1000 $\mu\text{m}$ jacketed	1.6
1500 $\mu\text{m}$ jacketed	2.0
2000 $\mu\text{m}$ jacketed	2.0
16 265 $\mu\text{m}$ fiber light guide	1.6
32 265 $\mu\text{m}$ fiber light guide	2.0
48 265 $\mu\text{m}$ fiber guide	2.0
64 265 $\mu\text{m}$ fiber guide	2.0

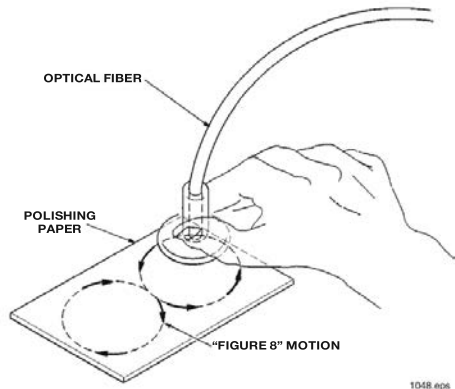
***Because fiber is much more prone to scratching than wire, when stripping the jacket from an optical fiber be sure to fully compress the handles of the wire stripper before beginning the release sequence. Doing so will reduce the possibility of scratching or nicking the fiber cladding surface.***

# POLISHING

Polishing is the most common fiber optic procedure. Although this procedure is well known, it is not always required for plastic optical fiber. The need for polishing depends upon your termination choice. Examples of fiber connectors that recommend polishing are the proprietary Hewlett Packard (HP) and “industry-standard” SMA and ST connectors. The AMP DNP termination devices and the fiber optic LEDs and photodetectors produced by Industrial Fiber Optics do not require fiber end polishing.

With plastic optical fiber the most common termination for which polishing is recommended is the ST connection. This connection is an industry standard and has been adapted as the preferred choice in the medium-price, quick-disconnect terminations for plastic fiber. Items that are provided in this kit for polishing optical fiber include the polishing table, polishing films, water dispenser and a low-cost ST polishing puck. The following steps start with a fiber installed in an ST connector and ready for polishing.

1. Fill the 2-oz. water dispenser provided.
2. Using water from the dispenser bottle, moisten the top of the glass polishing table. (This will keep the polishing paper from moving on top of the table.)
3. Place the 2000-grit polishing paper on top of the glass polishing table.
4. Wet the top of the 2000-grit paper with water from the dispenser.
5. Place the ST connector inside the polishing puck.
6. Polish the fiber in a gentle “figure 8” motion as shown in the illustration here, for about 20 strokes.
7. After 20 strokes, examine the end of the fiber. (A microscope or magnifying glass is helpful, although not required.) If the fiber end is cloudy, not flat, or has scratches, go back and repeat steps 4 through 6.
8. Place the 3  $\mu\text{m}$  polishing film on the glass polishing table and wet the top of the film with water. Polish the end of the fiber in the same “figure 8” pattern as Step 6 for 20 more strokes.
9. After 20 strokes, wipe the end of the fiber off with tissue paper, then examine the end of the fiber. The fiber should have a nice gloss with a flat fiber end. (A microscope or magnifying glass is helpful, but not required.)



# REPLACEMENT COMPONENTS

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This kit has several replenishable items. Use the part numbers listed below to find the items that we sell on [i-fiberoptics.com](http://i-fiberoptics.com).

Description	Part Number
Extra KEEN edge razor blades (package of 100) <i>For cutting fiber cores 2.0 mm or less in diameter</i>	IF-FC1-RP1
Standard edge razor blades (package of 100) <i>For cutting fiber cores 2.0 mm or greater in diameter</i>	IF-FC1-RP2
#11 Exacto® knife blades	local hobby or art store
2000-grit and 3 µm polishing film (10 sheets each)	IF-TK4-RP1

## WARRANTY

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Industrial Fiber Optics products are warranted against defects in materials and workmanship for 90 days. The warranty will be voided if internal or external components have been damaged, mishandled, or altered by the buyer.

Warranty liability is limited to repair or replacement of any defective unit at the company's facilities, and does not include attendant or consequential damages. Repair or replacement can be made only after failure analysis at the factory. Authorized warranty repairs are made at no charge, and are guaranteed for the balance of the original warranty.

Industrial Fiber Optics will pay the return freight and insurance charges for warranty repair within the continental United States, by United Parcel Service or Parcel Post. Any other delivery means must be paid for by the customer.

The costs of return shipments for a product no longer under warranty must be paid by the customer. If an item is not under warranty, repairs will not be undertaken until the cost of such repairs has been prepaid by the customer.

When returning items for analysis and possible repair, please do the following:

- In a letter, describe the problem, name of the person whom we should contact, phone number and return address.
- Pack the product, instruction sheet and your letter carefully in a strong box with adequate packing material to prevent damage in shipment.
- Ship the package to:

**INDUSTRIAL FIBER OPTICS**

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