



A Furukawa Company

Your Optical Fiber Solutions Partner®

## Crimp & Cleave Termination Instructions

for 200  $\mu$ m Harsh Environment SMA



### For Use With:

200  $\mu$ m HE SMA Termination Kit

200  $\mu$ m HCS® Fiber-Optic Cable

HE SMA 200  $\mu$ m Crimp & Cleave Connectors

## Important Safety and Warranty Information

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### Please Read First

Please make sure to READ and understand termination instructions completely. Improper assembly will cause poor termination results and cause damage to termination kit components.

Make sure you WEAR eye protection during the cleaving process. The bare fiber is sharp and may splinter; handle very carefully. Make sure fiber is disposed of properly, in a hard-sided container.

OFS WARRANTS this termination kit to be free of defects for a period of 90 days from the date of purchase. Each kit is qualified at our factory prior to shipment. OFS will, at their discretion, repair or replace any tools found to be defective due to workmanship within the stated warranty period. (Excludes damage to the fiber stripper, cleave tool, and/or diamond blade due to misuse.)

OFS recommends that all replacements or repairs be made at our manufacturing facility, except where specifically outlined. Please CONTACT the sales representative in your region or call the factory for technical support:

Mon-Friday, 8:00 am-5:00 pm EST.

**888-438-9936** [Toll free in the US and Canada]

**860-678-0371** [International]

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# Harsh Environment SMA Termination Kit Contents

## Contents

Part Numbers	Description
DT03732-23	Harsh Environment SMA Termination Kit
AP03317	Booklet: Crimp & Cleave Termination Instructions for 200 µm Harsh Environment SMA
DT03732-05	SMA Diamond Cleave Tool
AP01224	Cable Stripper
BT03865	Crimp Tool (Yellow Handles)
CP01229-02	Fiber Stripper (White Blade Insert) with Cleaning Brush and Prong Tool
AP01225	Scissors
K16248	Booklet: Importance of Cleave Tool Cleaning and Maintenance

**Other Items Required (not included in kit): Safety Glasses, Marker**



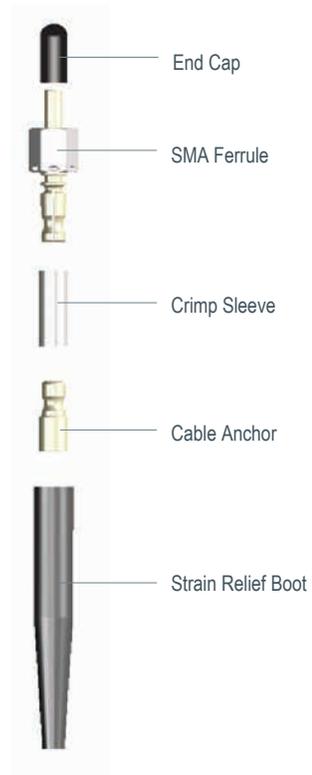
## Related Products and Accessories (Sold Separately)

Part Numbers	Description
P10188-05	Insertion Loss Test Kit for 200 $\mu\text{m}$ Harsh Environment SMA
P16247	Cleave Tool Cleaning Kit
AT03290	Diamond Blade Replacement Kit

## Harsh Environment SMA Connectors (Sold Separately)

Part Numbers	Description
BP01016-32	SMA Connectors (Bag of 25)
Harsh Environment SMA Connector Components	
	Strain Relief Boot
	Cable Anchor
	Crimp Sleeve
	SMA Ferrule
	End Cap
AP01618	SMA Splice Bushing

## Harsh Environment SMA Connector Subcomponents



## Termination Instructions steps 1 & 2

### STEP 1

#### Install Strain Relief Boot

- Slide **STRAIN RELIEF BOOT** (tapered end first) onto cable and move up and out of the way for easy stripping.



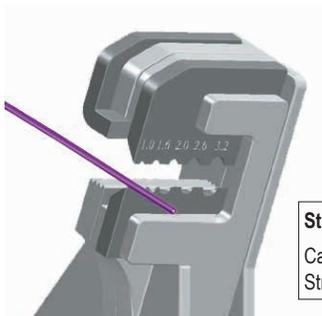
#### NOTE:

The tapered end of the boot may be trimmed with a scissors to suit larger diameter cable.

### STEP 2

#### Strip Cable Outer Jacket

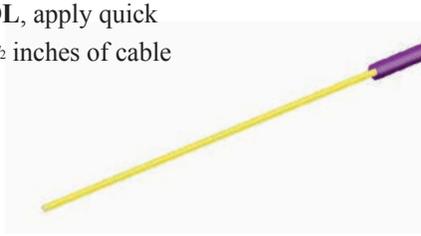
- Mark cable outer jacket  $2\frac{1}{2}$  inches from the end with a **MARKER**.
- Select appropriate hole on **CABLE JACKET STRIP TOOL** to suit cable outer jacket diameter. (Refer to strip template below).



#### Stripping Hole Guide

Cable Size 1.8 mm  
Stripping Hole 1.0

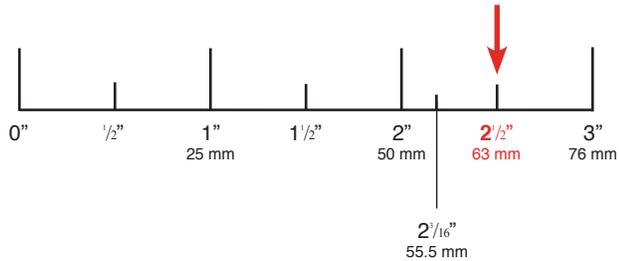
- Using the **CABLE JACKET STRIP TOOL**, apply quick squeezing action, release and remove the 2½ inches of cable outer jacket.



**NOTE:**

If the cable outer jacket is difficult to remove in one step, it may be removed in shorter sections.

- Verify proper strip length against the strip template shown below.



## Termination Instructions step 3

### STEP 3

#### Strip Fiber Buffer

##### **!** Before you start:

Make sure to use the appropriate strip tool insert for the buffer removal process: White blade inserts

Be careful while handling the fiber stripper. Handle as a precision device and do not strike on hard surfaces or drop.

Be sure to clean blades frequently using small bristle brush supplied. For more thorough cleaning, the fiber strip blade can be removed using the plastic prong tool provided with the brush.

**IMPORTANT:** Pull straight when stripping the fiber buffer. The HCS cladding can be damaged if fiber is not pulled straight.

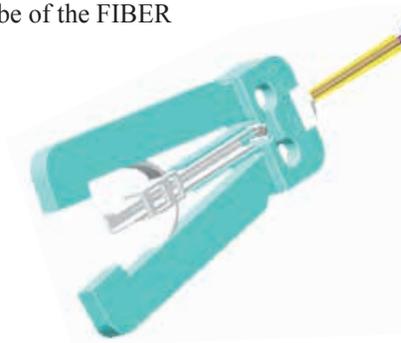
- Separate buffered fiber from yellow aramid yarn by pulling yarn back along cable.



##### **NOTE:**

Be careful not to touch the HCS fiber coating once the fiber has been stripped. The coating will retain finger oils, which can transfer to and damage gripper pads in the cleave tool during step 7 in the termination process.

- Insert the buffered fiber through the guide tube of the FIBER STRIPPER until the cable outer jacket bottoms out in the tube.



- Holding cable securely, squeeze handles to cut buffer and pull straight to remove buffer.
- Release the buffer strip tool handles.
- Inspect HCS cladding for damage from improper buffer stripping. (i.e. white dusty stripe)
- Verify proper buffer strip length to be  $2\frac{1}{16}$  inches (Refer to strip template on page 4).

**NOTE:**

If unable to insert buffered fiber through guide tube, trim tip of the fiber using scissors. If a short length of cable is being terminated, wrap the cable around your finger tool prevent fiber from pulling out of cable jacket.

**NOTE:**

If damage is visible, cut off the damaged fiber and repeat the procedure from step 2: Strip Cable Outer Jacket

## Termination Instructions step 4

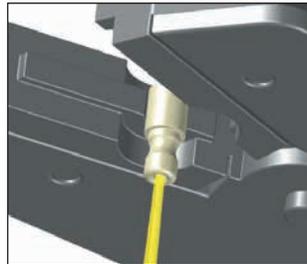
### STEP 4

#### Install Cable Anchor

- Pull aramid yarn strands back over stripped fiber.
- Holding yarn and cable at very top, feed both fiber and aramid yarn through the cable anchor until it bottoms out on the cable outer jacket using a clockwise turning motion. (i.e. screw the cable anchor onto the cable outer jacket)

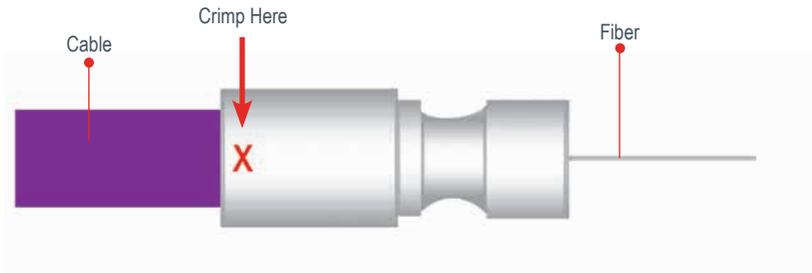


- Position anchor in crimp tool such that the end off the anchor aligns with the edge of crimp die. (i.e. crimp the cable anchor on the larger portion, towards the back of the cable anchor as shown at right)



- Squeeze crimp tool handles together until it clicks, then releases.

Crimp 1:  
Proper Crimp Location



**NOTE:**

If a connector is not crimped properly, there is potential that the glass optical fiber may move with respect to the connector when tension is applied during cleaving in step 7.

## Termination Instructions step 5

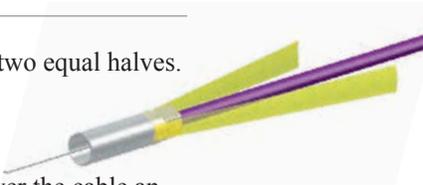
### STEP 5

#### Install Crimp Sleeve

- Divide the aramid yarn into approximately two equal halves.
- Fold both halves of the aramid yarn back over the cable anchor so that they cover the dimples created by the first crimp and are opposite one another.
- Slide the crimp sleeve over the aramid yarn and cable anchor until it bottoms out on the cable anchor and traps the aramid yarn.
- Position the crimp sleeve in crimp tool and ensure that:

Crimp tool die pins are over the aramid yarn halves.

Crimp tool die pin crimp marks will line up with the crimp marks on the cable anchor, while aligning the bottom edge of the crimp sleeve with the edge of the die.



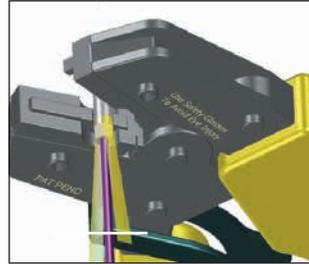
#### NOTE:

Be sure the fiber is centered in the cable anchor.

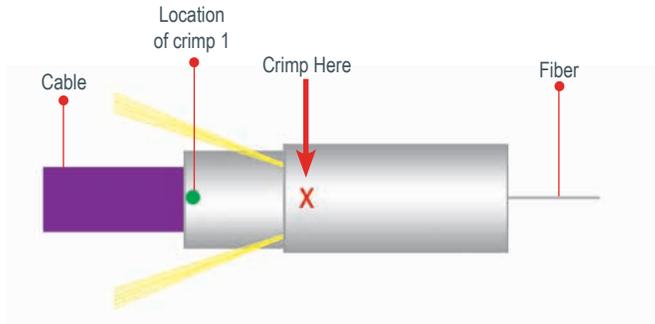
#### NOTE:

If a connector is not crimped properly, there is potential that the glass optical fiber may move with respect to the connector when tension is applied during cleaving in step 7.

- Squeeze crimp tool handles together until it clicks, then releases.



## Crimp 2: Proper Crimp Location

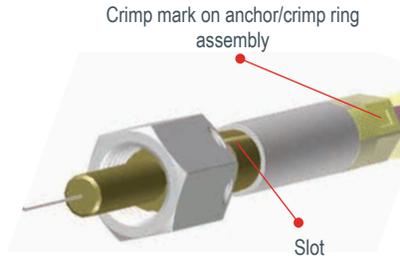


## Termination Instructions step 6

### STEP 6

#### Install Ferrule Assembly

- Slide the ferrule assembly onto the fiber until it rests securely in the crimp sleeve.



- Align the crimp sleeve in the crimp tool by:

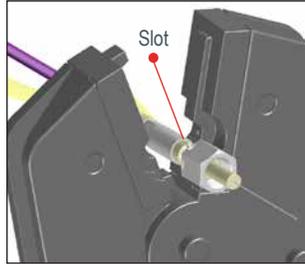
Rotating the ferrule assembly so that the slots are parallel to the face of the crimp tool die as shown.

Aligning top edge of the crimp sleeve with the edge of the die.

#### NOTE:

The slots on the side should be at a 90° angle to the crimp marks on the anchor/crimp ring assembly.

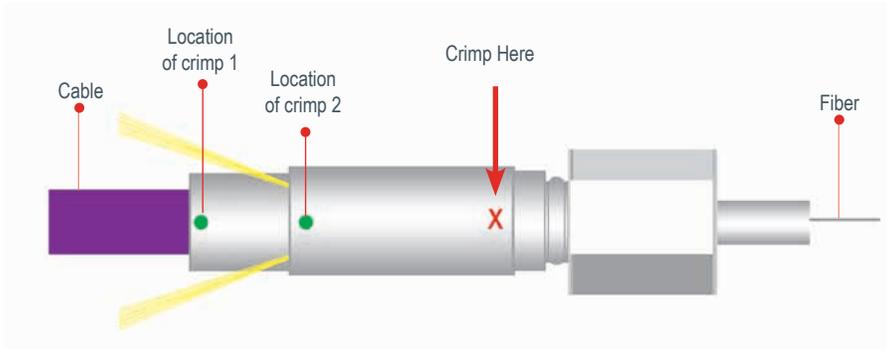
- Crimp in place by fully squeezing the handles together. All three crimp marks should be in a straight line opposite the ferrule assembly slots.



**NOTE:**

The glass optical fiber must be “seated” with respect to the connector. If a connector is not crimped properly, there is potential that the glass optical fiber may move with respect to the connector when tension is applied during cleaving in step 7.

Crimp 3:  
Proper Crimp Location



## Termination Instructions step 7

### STEP 7

#### Cleave Fiber

##### **!** Before you start:

Make sure the appropriate cleave tool positioner plate is being used: SMA

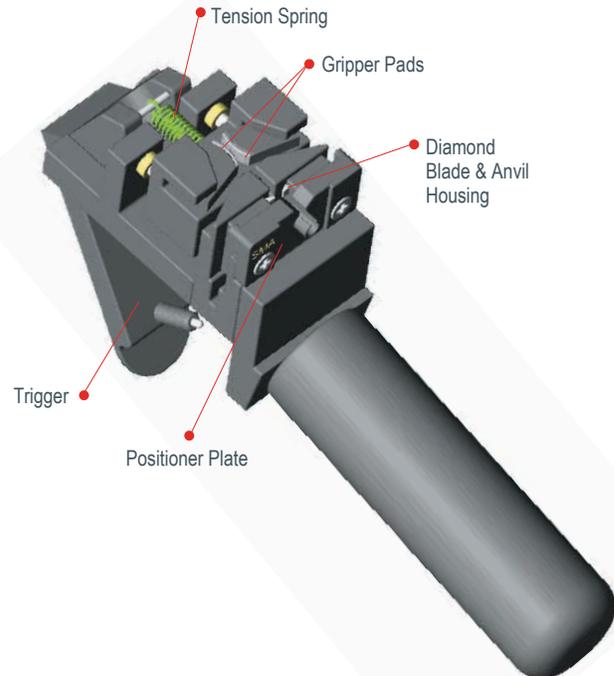
Make sure the appropriate colored tension spring is being used: GREEN

Be careful while handling the CLEAVE TOOL. Handle as a precision device and do not strike on hard surfaces or drop.

Keep the cleave tool clean and free from oils, including naturally occurring finger oils. Gripper pads, diamond blade and anvil should be cleaned after every 50 cleaves. Use the OFS Cleave Tool Cleaning Kit — Part #P16247 - available separately.

Do not use alcohol to clean the diamond blade or the gripper pads. Alcohol will chemically react with the gripper pads and ruin them.

Do not insert metal tools near the diamond blade, as it is fragile and may chip.



- Holding the cleave tool in a horizontal position, grip the handle while leaving your index finger free to actuate trigger.
- Place the ferrule into the hole of the positioner plate until it is fully inserted.

**Step 7 continues onto the next page →**

**NOTE:**

The diamond blade is very strong when it is oriented in a perpendicular direction to the fiber. However, if the glass optical fiber is allowed to drag along the sharp diamond edge, longitudinally, the diamond may be damaged severely. The most common cause of this is that the connector to be cleaved was not fully inserted and seated in the cleave tool's positioner plate. If the connector is not fully seated when the gripper pads attempt to apply tension to the glass optical fiber, the tool will first force the connector to fully seat. However, this will also drag the glass optical fiber longitudinally across the diamond blade, potentially causing catastrophic blade damage.

## Termination Instructions step 7 continued

### STEP 7

#### Cleave Fiber (continued)

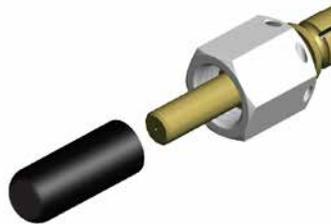
- Release the connector in the tool.



#### NOTE:

Do not hold onto the connector during the cleave process. Doing so may cause poor cleave quality.

- Using index finger, slowly and gently depress trigger to perform the cleave process. The cleave process is complete when the fiber snaps away from the connector. Do not release trigger!
- Before releasing the trigger, remove the connector from the cleave tool and grasp the top of the scrap fiber while releasing the trigger. Gently remove the scrap fiber while keeping it away from the diamond blade.
- Dispose of scrap fiber safely in a hard-sided container.
- Install protective cap onto connector to protect cleaved fiber surface.



**NOTE:**

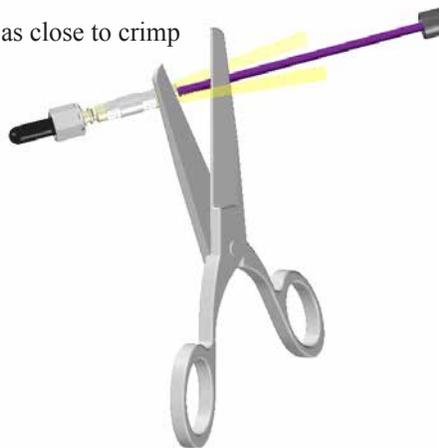
OFS' cleave tool uses a very sharp diamond as the cleaving blade. The function of the diamond blade is not to cut the glass optical fiber, but instead to simply initiate a small flaw in the glass surface. The tension provided to the glass optical fiber by the spring then causes the flaw to grow in size and propagate across the glass optical fiber, creating a smooth, cleaved surface. In order for the diamond blade to do its job as a flaw initiator, the tool operator must depress the trigger slowly. Depressing the trigger too quickly will crash the diamond into the glass fiber. This creates a situation where the diamond may create a larger flaw than necessary, and lead to large cleave marks and/or a broken diamond blade.

## Termination Instructions step 8

### STEP 8

#### Position Strain Relief Boot

- Using scissors, trim exposed aramid yarn as close to crimp sleeve as possible.



- Slide strain relief boot onto connector (up to rear of coupling nut) to complete termination.



# Maintenance & Trouble Shooting Guide

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## Importance of Cleave Tool Cleaning and Maintenance

The Cleave Tool supplied with OFS's Termination Kits contains movable parts, wear items, and a diamond blade that require regular maintenance, care, or replacement after useful life in order to perform satisfactorily. Damage and parts replacement expense can result if recommended procedures are not followed.

- ~ The diamond blade must be cleaned; the gripper pads must be cleaned, kept oil-free, and replaced after wear.
- ~ The cleave-tool trigger must be depressed slowly.
- ~ Fiber must be kept perpendicular to the diamond blade.

## Cleave Tool Cleaning Kit

For cleaning your cleave tool, please order the OFS Cleave Tool Cleaning Kit (part #P16247) which includes recommended cleaning fluid, swabs, and complete instructions.

## Diamond Blade Replacement Kit

For replacing the diamond blade/anvil assembly, please order the Diamond Blade Replacement Kit (Part #AT03290.) The kit includes a new diamond blade, anvil, replacement screws, and complete instructions for performing this simple procedure at your facility.

**Continues onto the next page →**

## Maintenance & Trouble Shooting Guide continued

### Trouble Shooting Guide

Problem	Dim-light termination/ no light termination	Poor cleave quality / High insertion loss	Fiber does not cleave	Fiber protrudes or recesses after cleave
Possible Explanations	<p>Improper strip technique <i>Refer to Steps 2 &amp; 3</i></p> <p>Improper crimp position <i>Refer to Steps 4 - 6</i></p>	<p>Improper crimp position <i>Refer to Steps 4 - 6</i></p> <p>Improper cleave techniques <i>Refer to Step 7</i></p> <p>Incorrect tooling for fiber size or connector type <i>Refer to Page 1</i></p> <p>Diamond blade needs to be cleaned or replaced <i>Refer to Page 18</i></p> <p>Gripper pads worn and need to be replaced <i>Call Tech Support to place a purchase order for service.</i></p>	<p>Fiber has not been first thoroughly stripped <i>Refer to Step 3</i></p> <p>Improper cleave techniques <i>Refer to Step 7</i></p> <p>Incorrect tooling for fiber size or connector type <i>Refer to Page 1</i></p> <p>Diamond blade needs to be cleaned or replaced <i>Refer to Page 18</i></p> <p>Gripper pads worn and need to be replaced <i>Call Tech Support to place a purchase order for service.</i></p>	<p>Improper crimp position <i>Refer to Steps 4 - 6</i></p> <p>Improper cleave techniques <i>Refer to Step 7</i></p> <p>Incorrect tooling for fiber size or connector type <i>Refer to Page 1</i></p> <p>Gripper pads worn and need to be replaced <i>Call Tech Support to place a purchase order for service.</i></p>

## Termination and Test Kits Available

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OFS offers a specialized Termination Kit—and associated Insertion Loss Test Kit—for each type of Crimp & Cleave connector we support. These kits are available in various combinations of sizes and/or connector types. Customer Relations at our factory can help you select the correct kit for your purposes.

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04/17



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**AP03317 Rev. P**

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