

MINI OTE 200 - HMFOC

Contents

1 General	1	5 Splice feeder to splitter / point to point module	7
1.1 General Product Information	1	5.1 Organizer	7
1.2 Cable types	1	5.2 End cut	7
1.3 Symbols for this guide	2	5.3 Mid cut	8
2 Tools required	2	6 Branch cable	8
3 Part list	2	6.1 Prepare cable	8
4 Cable preparation	3	6.2 Connect branch cable to feeder cable	8
4.1 Loop capacity	3	6.3 HMFOC connectors, feeder fibers & splitter splices	9
4.2 Cable retention (TENIO CTU)	3	7 Close the closure	11
4.2.1 CTU kit content	3	8 Mounting the closure	11
4.2.2 Central strength member	3	8.1 Pole mounting	11
4.2.3 Dual strength member	4	9 Installing the HMFOC connector	12
4.2.4 Coated strength member	4	9.1 Connecting the HMFOC connector	12
4.2.5 Aramid yarn	4	9.1.1 Remove dust caps	12
4.3 Gel containment	4	9.1.2 HMFOC cleaning	12
4.3.1 Containment rings	4	9.1.3 Install the connector	12
4.3.2 Gel inlet	5	9.2 Disconnecting the HMFOC	13
4.4 Insert feeder loop to storage area	5	10 Cleaning HMFOC connector	14
4.5 Securing cable	6	10.1 Cleaning the pinned/jack/male HMFOC connector	14
4.6 Install tube guidance	6	10.2 Cleaning the non-pinned/plug/female HMFOC connector	15
		11 Disclaimer	16
		12 Contact information	16

1 General

1.1 General Product Information

CommScope's Mini-OTE200 Multifiber Splitter Node closure is a gel sealed fiber optic enclosure designed for splicing, termination and pass-through cable requirements in fiber-to-the-X (FTTx) architectures. The closure is available in 4 and 8 HMFOC ports; the housing is available in 2 colors, black and gray. The terminal is designed for use on walls, poles or handhole applications. The closure has a maximum capacity of 40 splices, 2 trays of 20 splices each and contains an additional tray for fiber storage. The terminal housing provides loop storage for microsheath or loose tube cable. The Mini-OTE200 Multifiber Splitter Node allows for butt configurations with 4 wrap-around ports for multiple combinations of looped feeder cable (Ø 4 - 15 mm) and branch-off cable (Ø 4 - 9 mm) where the feeder cables are positioned at the outside ports and the branch-off cables at the inside ports. TENIO cable attachment is included as well as an external cable fixation integrated on the housing to absorb external forces on the cable.




1.2 Cable types

The OTE200 Multifiber Splitter Node is designed for microsheath or loose tube cables with an outside diameter up to 15 mm, and flat cable:

Feeder cable	Ø 4 -15 mm
Branch off cable	Ø 4 - 9 mm and flat (4.5x8.1 mm)

Fiber types include single fiber 250micron.

1.3 Symbols for this guide

	Note	Presents useful information related to Installation Guide contents, the references and data related to the product's use, etc.
	Caution	Describes situations where data loss and incorrect product operation may occur, and provides proper actions to take in these situations.
	Warning	Describes a situation where product damage and user injury may occur, and provides proper actions to take in these situations.

2 Tools required

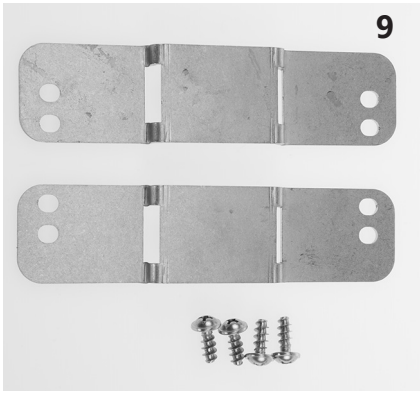
Socket wrench 8 (maximum outside Ø15mm) (mounting closure to wall)
 Socket wrench 1/4" (hose clamps)
 Phillips screw driver
 Scissors, Cutting pliers
 Stripping tools, shaving tools, cleaning alcohol and other tools required to prepare cables

3 Part list

Item #	Description
1	Mini-OTE200 Multifiber Splitter Node enclosure: 4 HMFOC adapters, and 2 splitter trays
2	2 Micro splice protector holders (16 splice protectors) 2 splice protector holders (12 splice protectors) 2 splice protector holders (4 splice protectors) (More details, check ordering guide/ kit content)
3	Raster with tube guidance + storage lip
4	Raster with 3 blind plugs
5	Raster with rings

Item #	Description
6	CTU
7	Tie Wrap
8	Foam strip
9	Pole mounting kit
10	Gel inlet seals
11	Fibre pick
12	Hose clamps





4 Cable preparation

4.1 Loop capacity

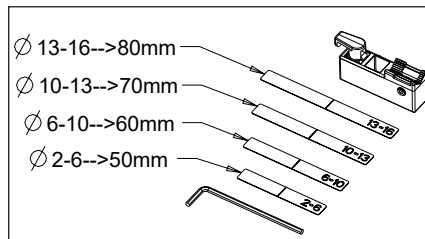
Make a window cut over the cable (see table). Make sure oscillation point is in the middle. Take out the element that will feed the splitter and store the other elements in the basket under the organizer.

It is recommended to straighten the loose buffer tubes.

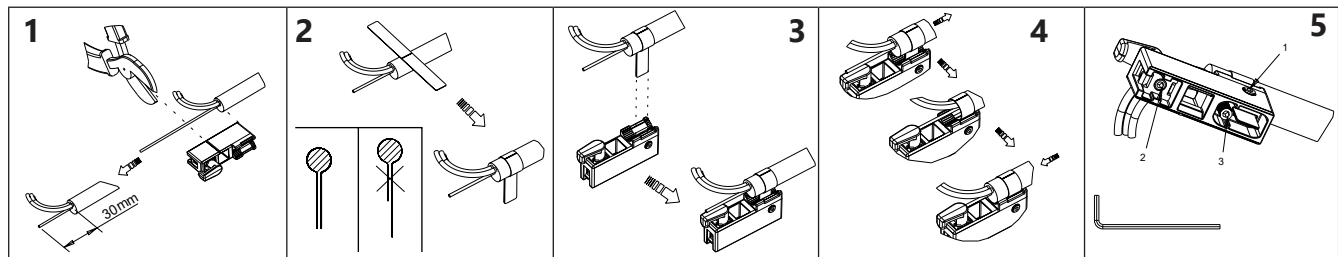
#LBT (to store)	Ø LBT (mm)	Loop Through (m)
4	3	1.35
<= 5	2.4	2.1
7	2.4	1.7
11	2.3	1.5
Microsheath	-	2.1

4.2 Cable retention (TENIO CTU)

4.2.1 CTU kit content

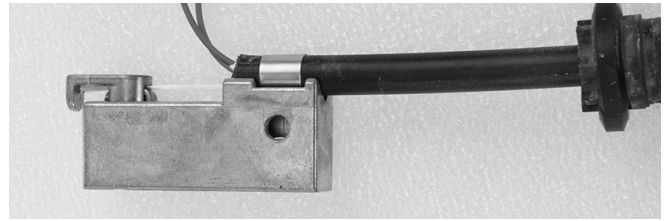


4.2.2 Central strength member



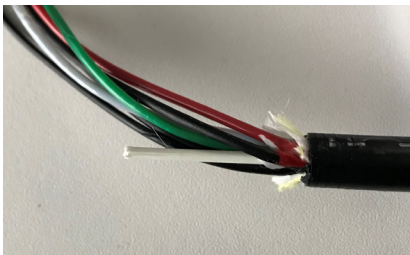
4.2.3 Dual strength member

Remove one strength member and attach CTU to the side of the remaining strength member. Follow the same instructions to attach the CTU as describe under 4.2.2 Central strength member.

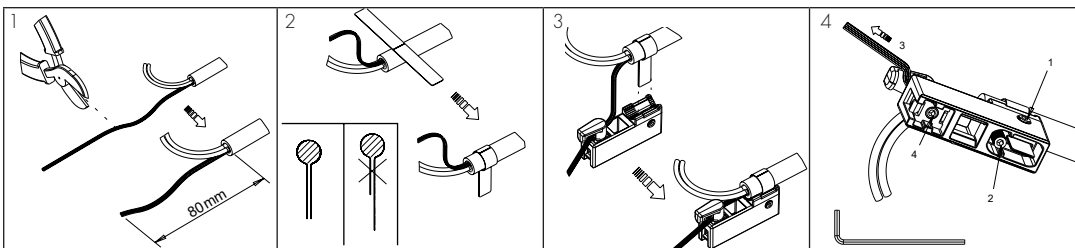


4.2.4 Coated strength member

Remove coating around strength member over a length between 15mm and 20mm and follow the same instructions to attach the CTU as describe under 4.2.2 Central strength member.



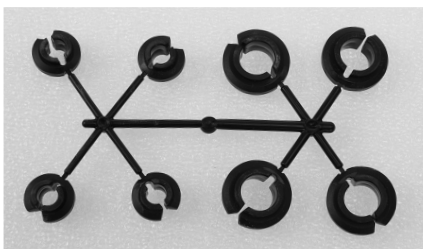
4.2.5 Aramid yarn



4.3 Gel containment

Containment rings are required to contain gel properly. If the cable is too small, the gel inlet needs to be used instead of the rings. For flat cable no containment rings nor gel inlet is required. See table to select proper containment:

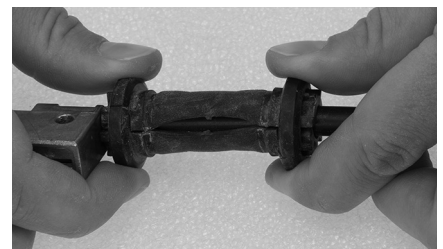
	None	Small containment rings	Large containment rings	Gel Inlet
Feeder cable (Ø 4-15 mm)	Ø 12.1 - 15 mm	-	Ø8.5 - 12 mm (COF600)	Ø4 - 8.4 mm ULW
Branch off cable (Ø 4-9 mm)	Ø 7.1 - 9 mm (COF600)	Ø 4 - 7 mm (ULW COF215)	-	-
Flat cable (4.5x8.1 mm)	4.5x8.1 mm	-	-	-



Small containment rings Large containment rings



Gel Inlet



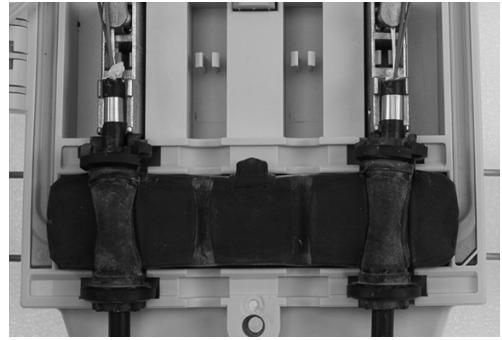
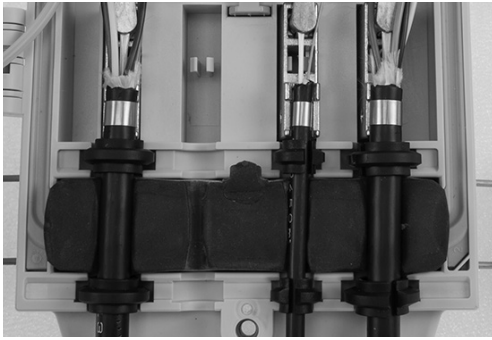
Click gel inlet installed around the cable

4.3.1 Containment rings

Break off small containment rings to contain branch off cables with a diameter of Ø 4 - 7 mm or break off large containment rings to contain feeder cables with a diameter of Ø 8.5 - 12 mm. Push ring over the cable in cavity above and under gel.

4.3.2 Gel inlet



Use gel inlet for feeder cables with diameter \varnothing 4 - 8.4 mm. Install gel inlet around the cable. Install hard plastic ring in cavity above and under gel.



4.4 Insert feeder loop to storage area

Push one CTU in the holder (left position), take out feeder tube and roll up feeder loop under organizer. Push other CTU in the holder (right position). Other option is to make a loop of \varnothing 130 mm (use tie wraps) and push loop under organizer.

 Feeder cables are positioned on the outside gel ports, branch cables on the inside gel ports.

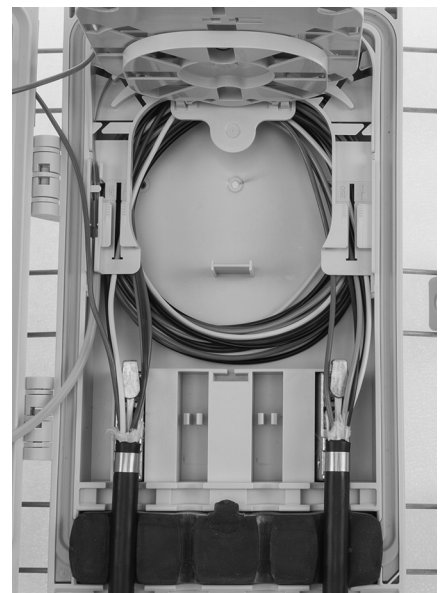
  Do not insert both CTU's before the loop is stored under the basket. Kinks in the element tubes can occur.



1. Install feeder cable (L or R side)



2. Store LBT

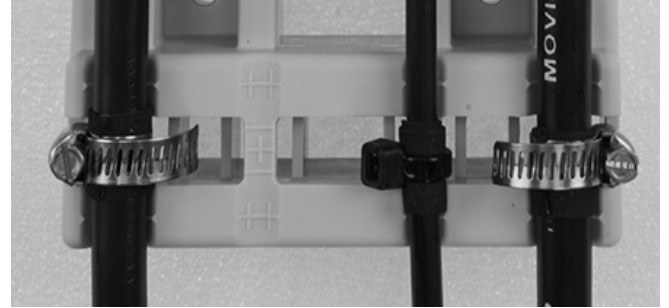
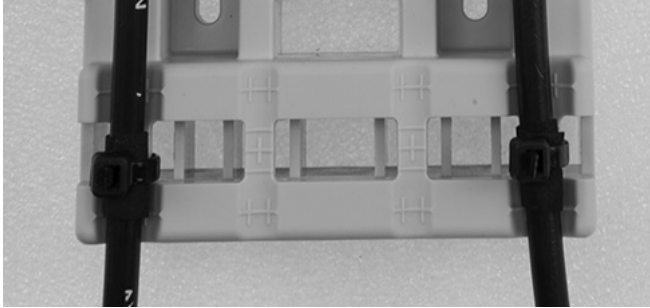


3. Install feeder cable (second portion L or R side)

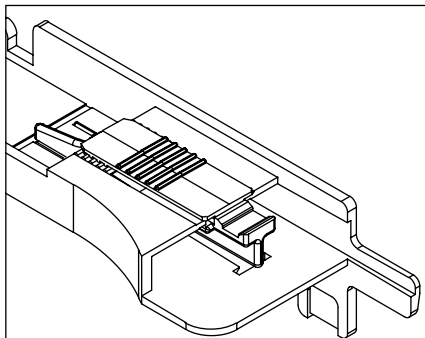
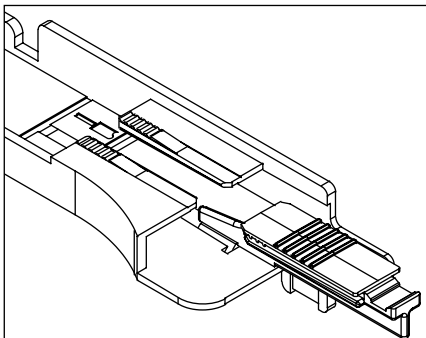
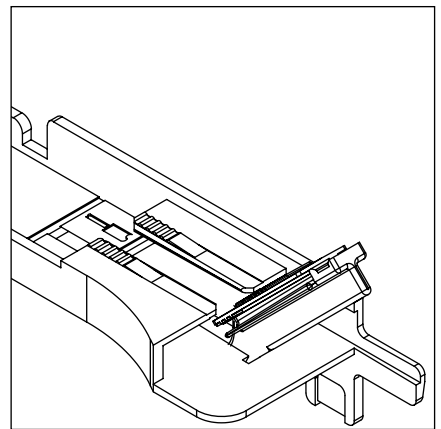
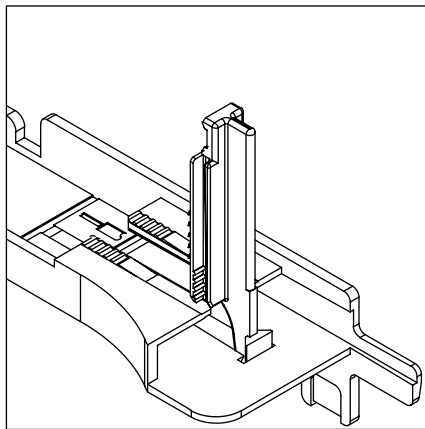
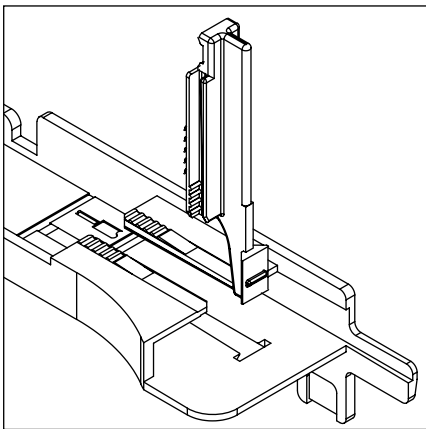
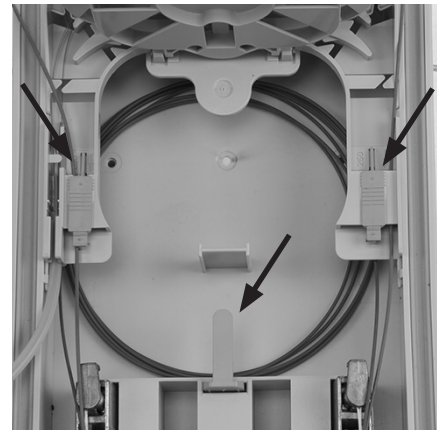
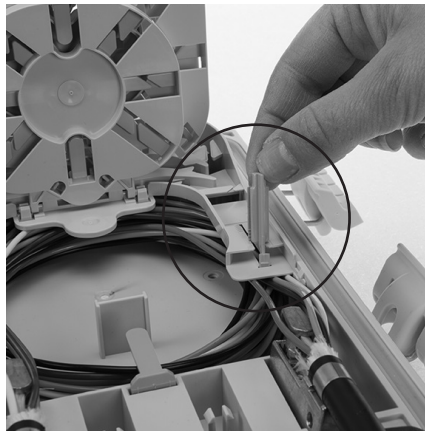
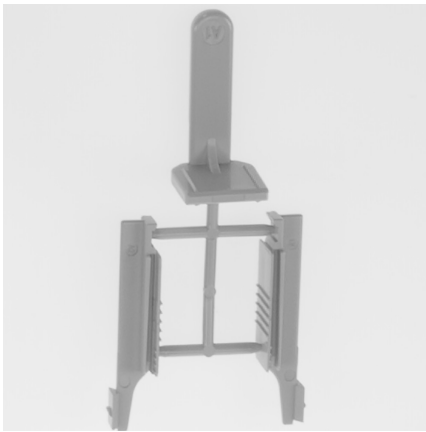
4.5 Securing cable

Cut a piece of foam (enough to make 1 tour around the cable). If cable is thicker than $\varnothing 10$ mm, secure the cable to the closure with a hose clamp, if the cable is smaller than $\varnothing 10$ or if it is a flat cable, secure the cable to the closure with a tie wrap.

Hose clamp	Tie wrap
> $\varnothing 10$ mm	< $\varnothing 10$ mm
	Flat Cable



4.6 Install tube guidance

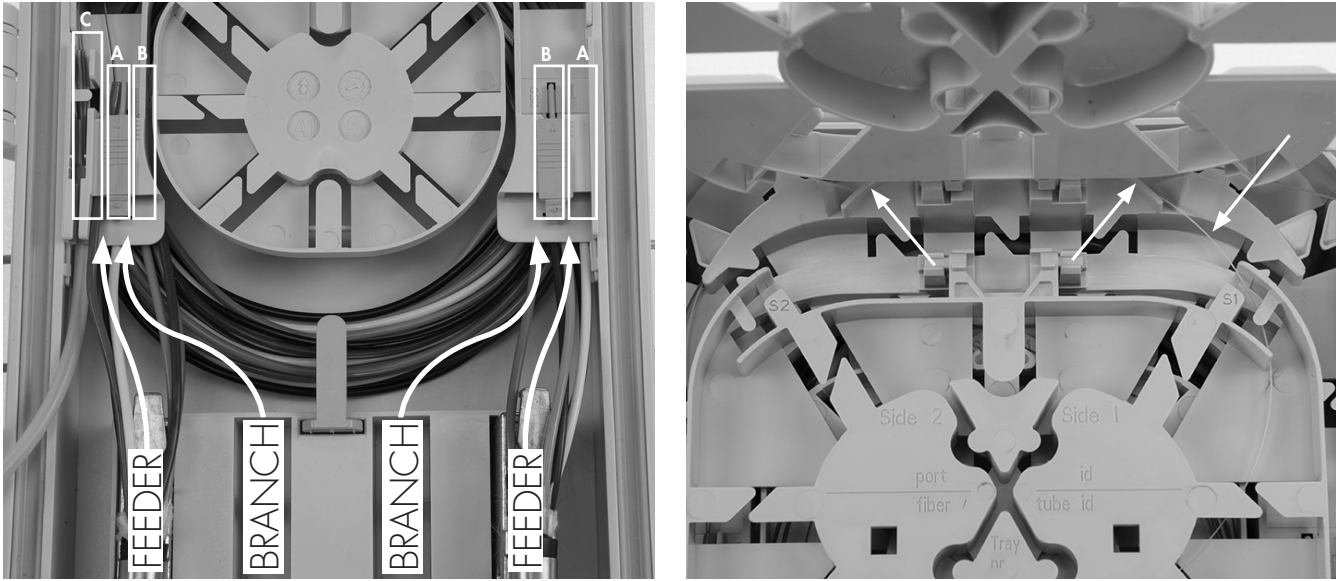



5 Splice feeder to splitter / point to point module

5.1 Organizer

Tubes from the splitter input cables are routed in the outside slots [A]. Tubes from daisy chaining cables are routed in the inside slots [B] as shown on picture below.


 Pigtailed from the SASA modules in the top cover are routed in slot [C].



 There is a possibility to route fibers from the first tray to the second and vice versa through special designed slots in the tower.

5.2 End cut

Take out 1 element before storing the remaining under the basket. Put a mark on the tube in the marking area (250 area) and strip tube to this point (10 -11cm from sheath jacket end). Bring input element fibers to the tray where the fibers from the connectors are stored and make fusion splice (leaving the spare second splitter input leg spare). Store fiber over-length and store SMOUV(S) as standard practice.

 As both fibers comes from the same side, you will need to make cross on tray (black=pigtail hardened ports, white=feeder fiber).

 You will need to Store unused fiber in small storage tray.



5.3 Mid cut

Put a mark on both sides of the tube in the marking area (250 area) and shave the tube up to both marks (10 - 11 cm from jacket end). Take out required feeder fibers and cut in the middle. Bring feeder fibers to the tray where the fibers from the connectors are stored and make fusion splice. Store fiber over-length and store SMOUV(S) as standard practice.

✎ Store uncut fibers in small storage tray. Store dark fiber on the splice tray.



6 Branch cable

6.1 Prepare cable

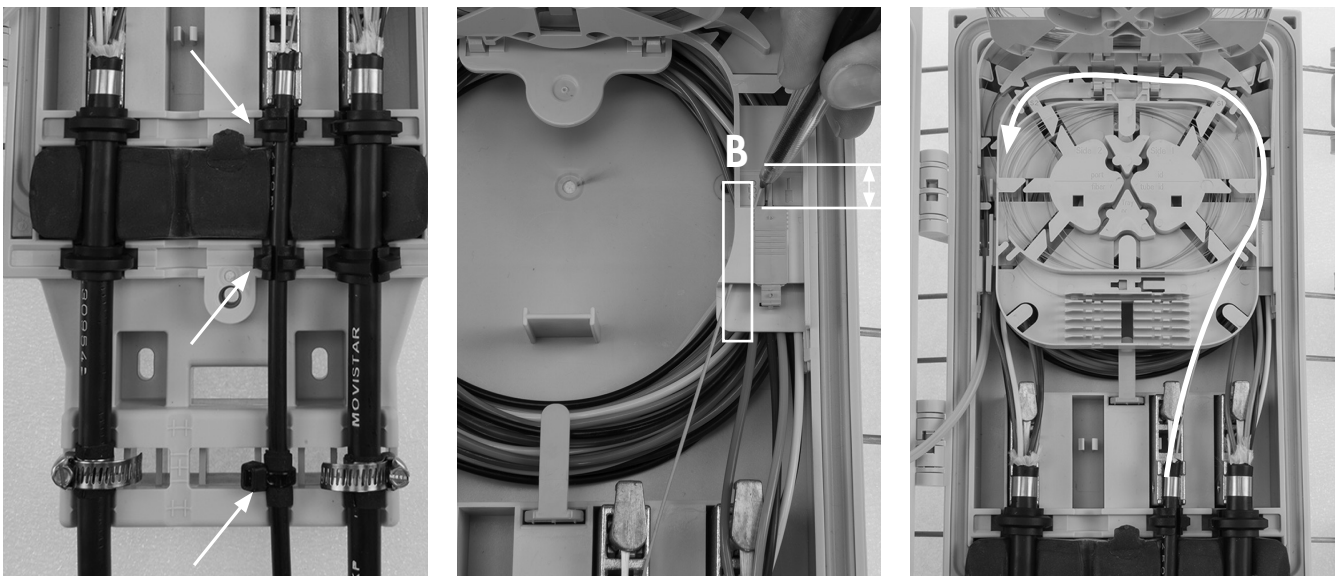
Remove jacket over 1.3m (1m fiber on tray). Install cable termination unit (CTU) as described in section 4.2 and attach in closure. Add containment following table in section 4.3. Secure cable with foam and tie-wrap or hose clamp to closure (section 4.5).

▶ Maximum diameter of the tube is Ø3mm.

6.2 Connect branch cable to feeder cable

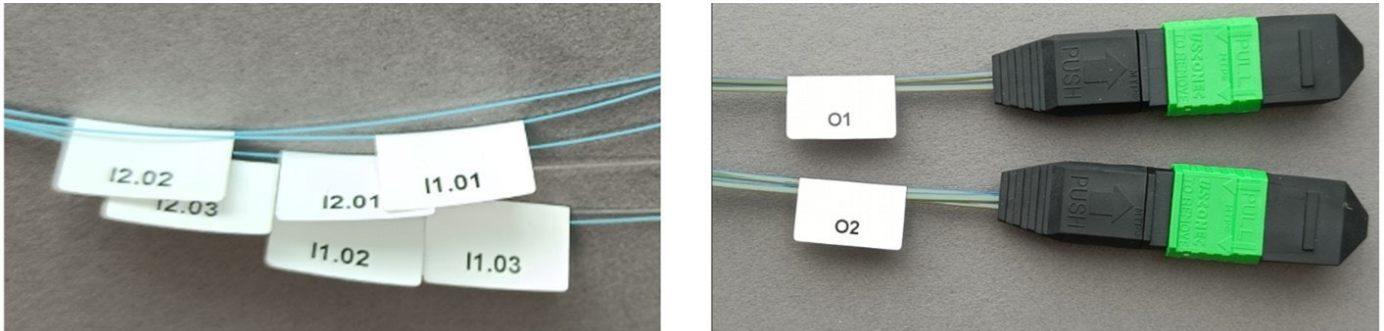
Strip tubes in marked area (250 area) and bring required fibers to second tray. Use inside slots [B] for branch cable. Bring feeder fibers (tubes already taken out before storing loop under basket) to second tray. Make fusion splice, store SMOUV(S) and over-length as standard practice.

✎ Store unused fibers in storage tray, unless uncut shaved fibers are stored on the storage tray, then unused fibers must be stored on the splice tray.

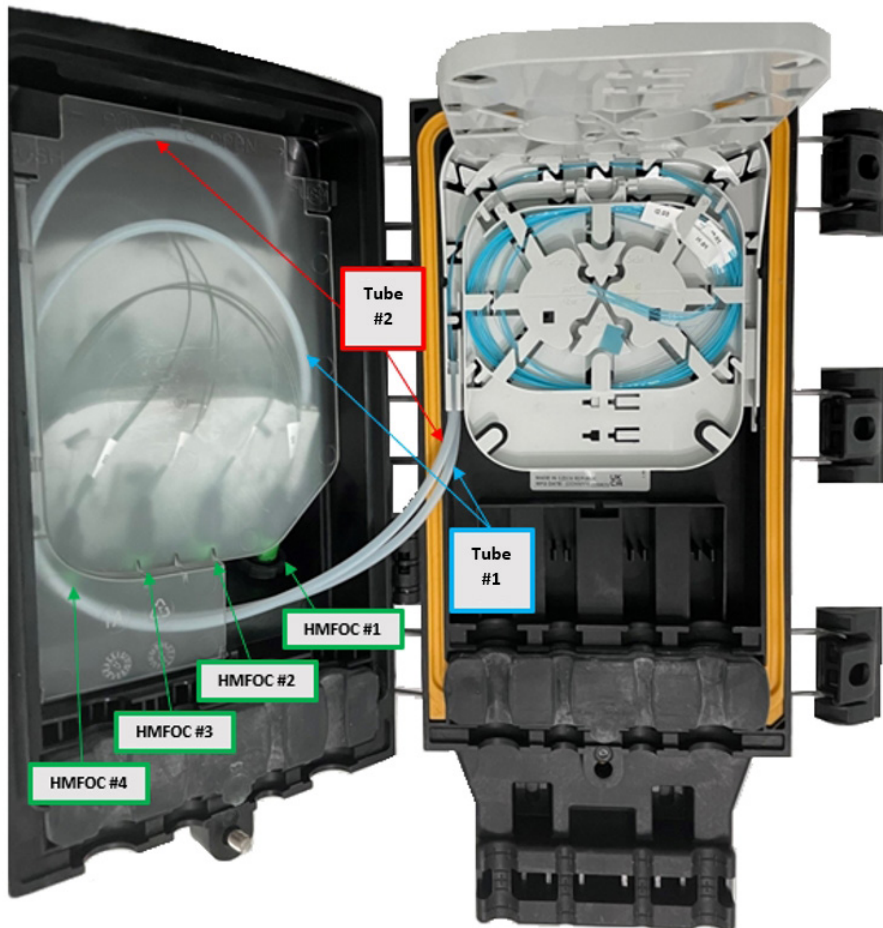


6.3 HMFOC connectors, feeder fibers & splitter splices

The Mini-OTE 200 holds 2 splitter cassettes and each cassette consists of six 1x4 splitters (6x4 = 24 fibers). The 24 splitter's output fibers are terminated into 2 HMFOC connectors with 12 fibers each. The first 6 input fibers are labeled 1.01, 1.02, 1.03; 2.01, 2.02 and 2.03 respectively. The output fibers are labeled O1 for HMFOC #1 and O2 for HMFOC #2.



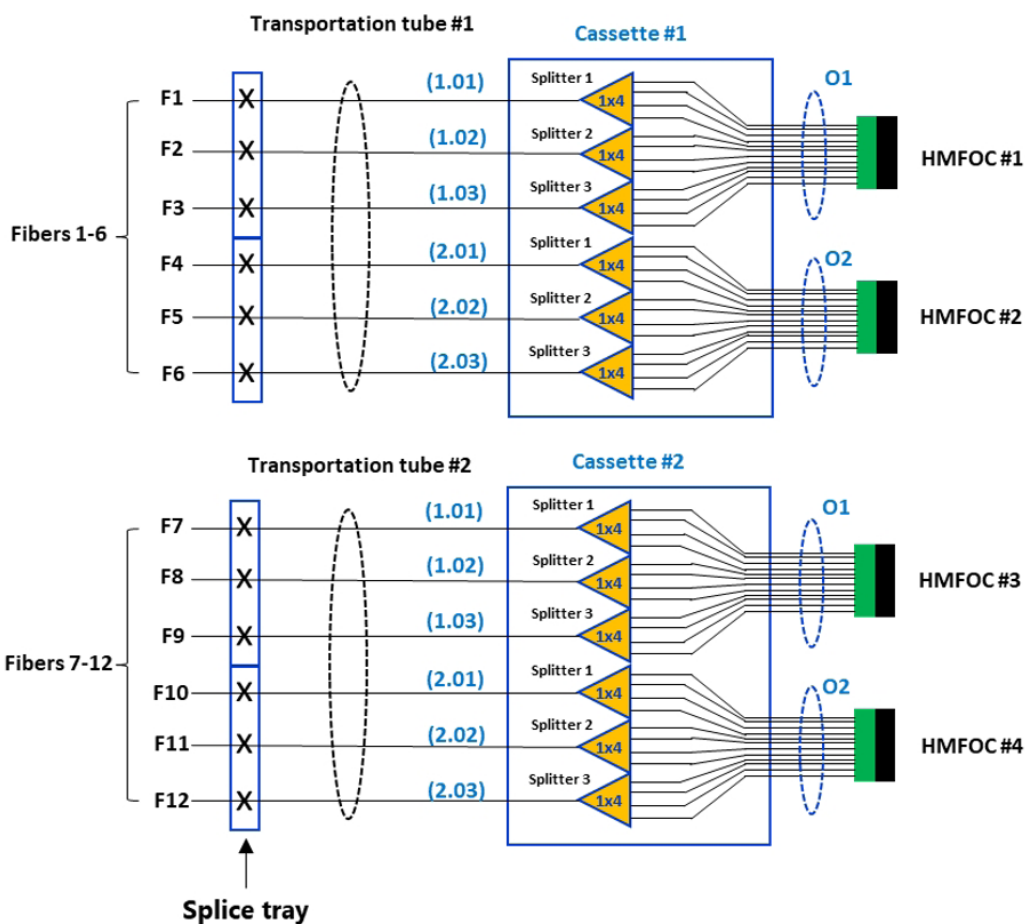
The 6 input fibers from cassette #1, are routed via transportation tube #1, to the bottom splice tray on the Mini-OTE 200 terminal. The 6 input fibers from cassette #2, are routed via transportation tube #2 to the same splice tray, for a total of 12 fibers.



The first input fiber (1.01) corresponds directly to splitter #1 in cassette #1 (Fibers 1 through 4 in HMFOC connector #1). The second input fiber (1.02) corresponds directly to splitter #2 in cassette #1 (Fibers 5 through 8 in the same HMFOC connector #1). The third input fiber (1.03) corresponds directly to splitter #3 in cassette #1 (Fibers 9 through 12 in the same HMFOC connector #1). Repeat this procedure for the remaining fibers on the Mini-OTE 200, for HMFOC connectors #2, #3 and #4.

Review charts below for a graphical representation of the fiber assignments:

Feeder fiber	Cassette	Tube	Label	MPO/Output	HMFOC	HMFOC fibers
1	#1	Tube #1	(1.01)	O1	1	1-4
2			(1.02)			5-8
3			(1.03)			9-12
4			(2.01)	O2		1-4
5			(2.02)			5-8
6			(2.03)			9-12
7	#2	Tube #2	(1.01)	O1	3	1-4
8			(1.02)			5-8
9			(1.03)			9-12
10			(2.01)	O2		1-4
11			(2.02)			5-8
12			(2.03)			9-12



7 Close the closure

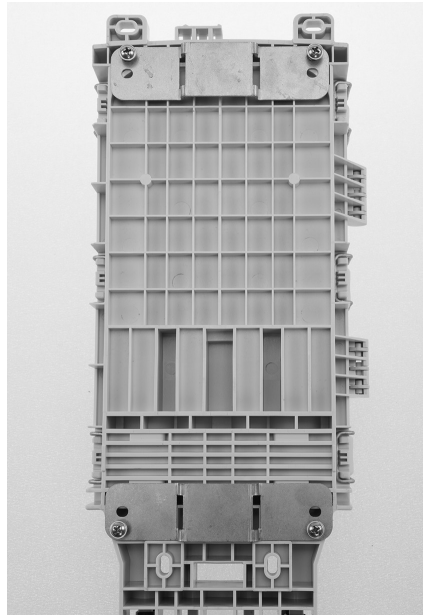
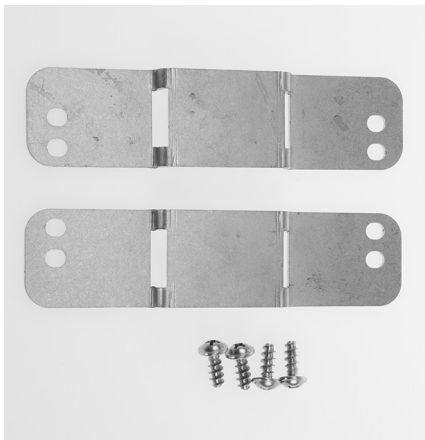
Insert cable port plugs in empty gel ports. Small cable plugs are for branch cable port in the middle section. Large cable port plugs are for empty main cable ports.
Store fiber picker back at location in protection cover.
Make sure the seal area is clean and close the 6 latches.
Secure bolt between cables.



8 Mounting the closure

8.1 Pole mounting

Use supplementary pole mounting kit for pole mounting. Secure brackets with a Phillips screw driver. Pull a strap through the openings and mount the closure to the pole.



- ▶ Use the holes in the bracket that are out of the center.
Use plastic rib on the closure as guidance to fix the bracket to the closure.

9 Installing the HMFOC connector

9.1 Connecting the HMFOC connector

▶ **Danger:** Exposure to laser radiation can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not assume the laser power is turned-off or that the fibre is disconnected at the other end.

9.1.1 Remove dust caps

9.1.1.1 Field personnel must take care when proceeding to remove dust caps at the HMFOC at the adapter plugs or cables, to prevent contaminated particles entering to the adapters or connector end-face.

9.1.1.2 Before removing dust cap, be sure to turn the terminal to a position where adapters are protected (i.e. for aerial application, adapters will face down), helping to prevent any particle/ dust to fall down and contaminate the adapter. Before removing the terminal's optical port dust cap, clean any debris from around the terminal optical ports to minimize the risk of introducing contaminants into the optical port.

9.1.1.3 Use a 11mm spanner to unscrew the dust cap from the optical port.



9.1.1.4 For the cables, before taking out the dust cap, take into consideration all possible precautions to prevent any particles to contact the end-face connector and, keep the terminal with the adapters facing down to insert and tighten the drop cable. Before removing the cable's connector dust cap, clean any debris from around the cable connector housing, to minimize the risk of introducing contaminants onto the ferrule.

9.1.1.5 Unscrew the coupling nut from the cable connector dust cap in the direction of the arrow.

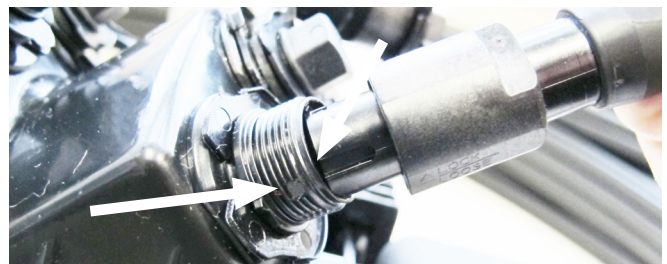
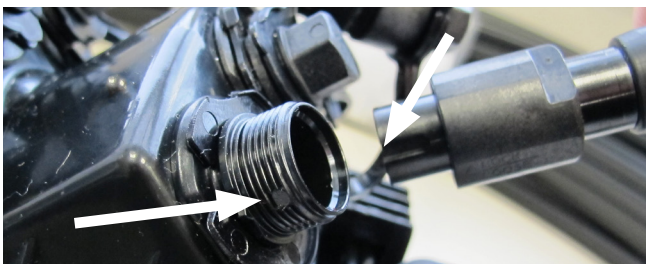


9.1.2 HMFOC cleaning

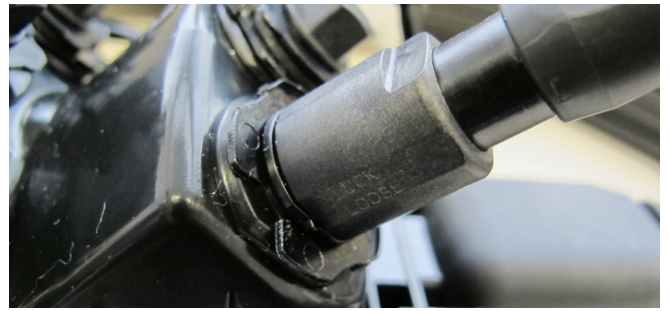
Note: The connector and adapter come clean from the factory and should not require additional cleaning before the first connection. If cleaning is required before installing the connector, follow procedure as described in section 11.

9.1.3 Install the connector

9.1.3.1 Find the alignment keys on the adapter port (square notch in the thread area) and on the connector (groove). And push the plug connector in the jack of the adapter port.



9.1.3.2 Thread the cable connector's coupling nut onto the thread of the adapter port until it is finger tight



9.1.3.3 Thread the optical port dust cap into the drop cable dust cap and tighten both dust caps finger tight. This ensures that both dust caps will stay clean when not in use.



9.2 Disconnecting the HMFOC

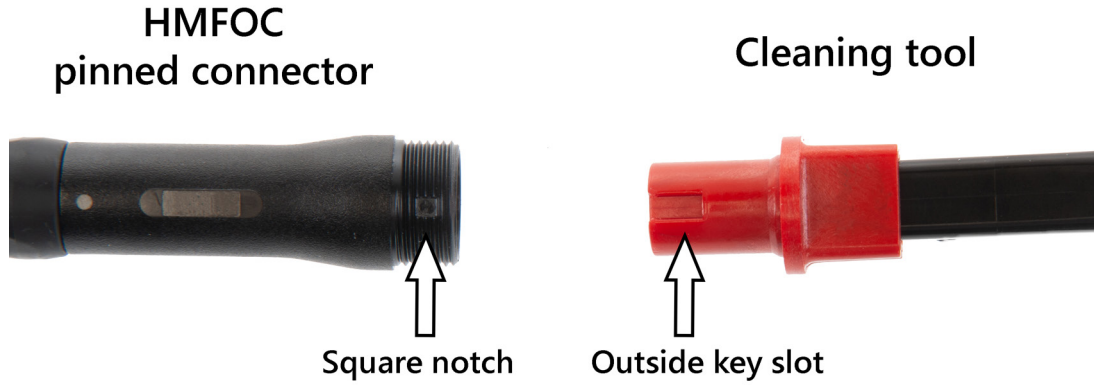
► **Danger:** Exposure to laser radiation can seriously damage the retina of the eye. Do not look into the ends of any optical fiber. Do not assume the laser power is turned-off or that the fiber is disconnected at the other end.

- 9.2.1 Before removing the connector dust cap, clean any debris from around the dust cap, to minimize the risk of contaminants being introduced onto the ferrule. Unscrew the optical port dust cap from the drop cable dust cap.
- 9.2.2 Before removing the drop cable connector, clean any debris from around the connector housing and the terminal optical port, to minimize contaminants from being introduced onto the connector ferrule or into the optical port.
- 9.2.3 Unscrew the drop cable connector coupling nut until the thread of the adapter port is completely free.
- 9.2.4 Grasp the connector and pull it straight out of the adapter. The pull out force to remove the connector should be minimum once the coupling nut is fully disengaged.
- 9.2.5 Uncouple the two dust caps.
- 9.2.6 Thread the optical port dust cap into the optical port and tighten until finger tight.
- 9.2.7 Thread the drop cable connector coupling nut into the drop cable dust cap and tighten until finger tight.

10 Cleaning HMFOC connector

10.1 Cleaning the pinned/jack/male HMFOC connector

1. Inspect the pinned HMFOC connector with a low-resolution microscope and inspect the complete ferrule surface including the area around the pins for dirt or guide pin damage. If dust, dirt or contaminants are detected, proceed to step 2.
2. The following are directions for cleaning a HMFOC pinned connector, using IBC cleaning tool - MT Series (PN 15639)

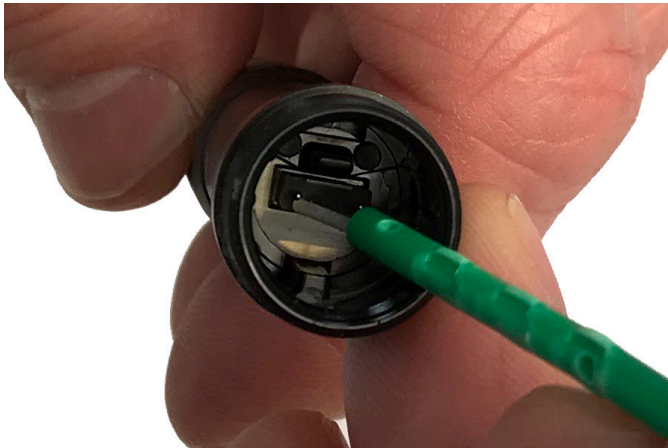


Locate the red adapter on the cleaning tool and place it on the tip of the cleaning tool. Orientate the red adapter on the cleaning tool so that the outside key slot is on the top. Locate the square notch on the threaded portion of the pinned HMFOC connector. Hold the connector so the square notch is facing up.



Insert the cleaning tool into the pinned HMFOC until the cleaning tool is flush against the connector end face. Push the cleaning tool forward into the HMFOC connector until a click is heard, then release the tool. Repeat this cleaning motion as required.

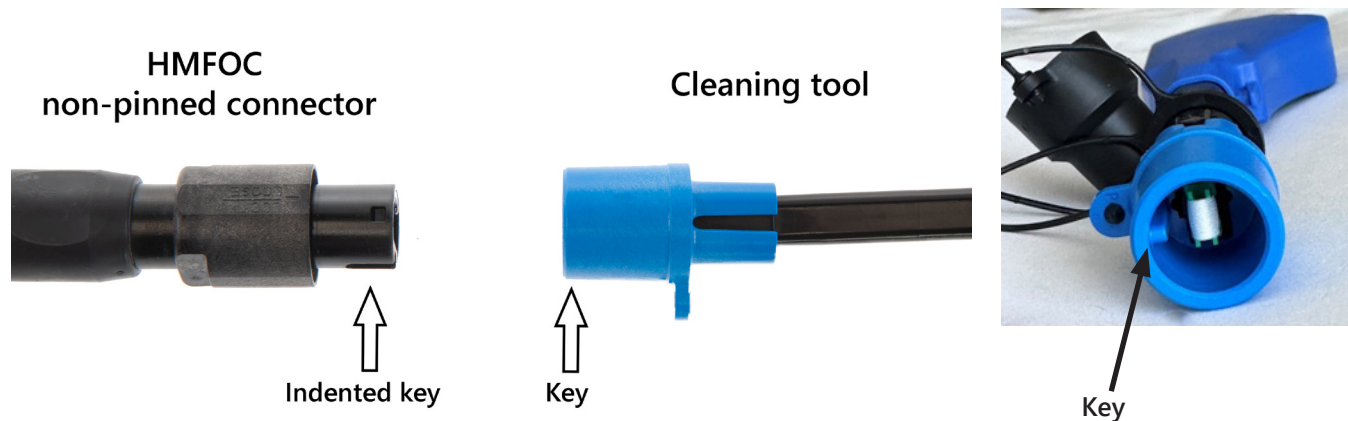
Note: Always follow the cleaning tool manufacturer's cleaning instructions for best results.



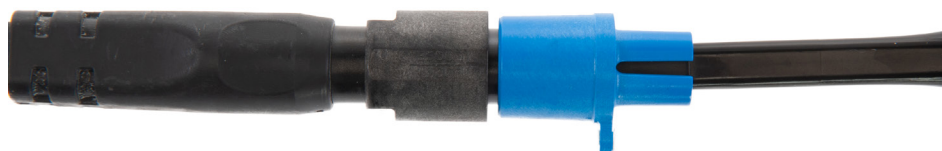
3. Inspect the connector. If there are still contaminants, use a small amount of non-isopropyl alcohol solvent on one or more 2.5mm fiber optic swabs to remove any remaining dust, dirt or contaminants from the ferrule end face and/or from around the guide pins. Always use a new swab for each connector and always follow-up with a dry clean using the cleaning tool procedure.
4. Connect the pinned connector to a non-pinned HMFOC or assemble the dust cap back on to the pinned connector until ready to install.

10.2 Cleaning the non-pinned/plug/female HMFOC connector

1. Inspect the non-pinned HMFOC connector with a low-resolution microscope and inspect the complete ferrule surface including the area around the pins for dirt or guide pin damage. If dust, dirt or contaminants are detected, proceed to step 2.
2. The following are direction for cleaning a non-pinned HMFOC connector, using the IBC cleaning tool - MT Series (PN 15639).



Locate the blue adapter on the cleaning tool and place it on the tip of the cleaning tool. Orientate the blue adapter so that the key on the bottom inside is facing downward. Locate the outside indented key on the non-pinned HMFOC connector and hold the connector so this indent is also facing downward.



Insert the cleaning tool over the non-pinned connector until it stops. Push the cleaning tool forward into the HMFOC connector until a click is heard, then release the tool. Repeat this cleaning motion as required.

Note: Always follow the cleaning tool manufacturer’s cleaning instructions for best results.

3. Inspect the connector. If there are still contaminants, use a small amount of non-isopropyl alcohol solvent on one or more 2.5mm fiber optic swabs to remove any remaining dust, dirt or contaminants from the ferrule end face and/or from around the guide pins. Always use a new swab for each connector and always follow-up with a dry clean using the cleaning tool procedure.
4. Connect the non-pinned connector to a pinned HMFOC or assemble the dust cap back on to the pinned connector until ready to install.

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