

OPERATION PROCEDURE OF MPO HOUSING ASSEMBLY

Document No: 4-OP-0393

Version: 6

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I. Purpose

- The purpose is guidance for setting up manufacturing of MPO Housing Assembly.

II. Application

- This operation procedure is applied for:

No.	Group
1	MPO Housing assembly
2	MPX Housing assembly
3	MPH Housing assembly

- This procedure concerns to PRD, PRE, and QAE section.

III. Reference documents:

- N/A

IV. Term definition:

- FOV: Fujikura Fiber Optics Vietnam Ltd.,

Checked by: BanNT Date: Follow DMS		Approved by: : Nguyen Trung Kien Date: Follow DMS
Prepared by: TienCTC Date: 28-Aug-2024	Cross check by: ThangVD Date: 28-Aug-2024	Originator: Khiem Bao Date: 24-Jun-2021

V. Content**1. Housing MT-MPO****1.1 Process Specification****1.1.1 Housing preparation**

- Housing Assembly preparation
- a) Material preparation



Coupling

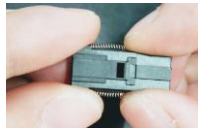


Housing N

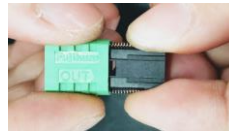


Spring (C) N

- b) Housing preparation



Step 1: Assembly two spring (C) N on the groove of Housing N.

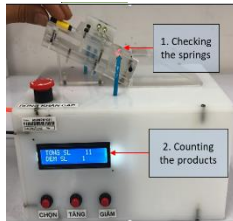


Step 2: Assembly Coupling to cover the Housing N as arrow side.



Step 3: Slide the Coupling on the Housing N after assembly completely

- c) Checking Spring (C) N in side Coupling and Housing N



Step 4: Use the semi-auto machine to check spring on both side Coupling (Do not apply step 4 for Trillian product)

1.1.2 Housing assembly – For Trillian Product

Step 1: Check Appearance on MT's surface

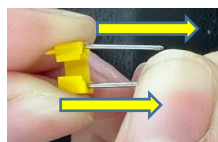
Refer to PNJHA-0038-26-02 (latest version) for App MT

Step 2: Housing MPO

- Insert Premier Pin 4 on Pin clamp



- Pulling two pieces of Premier Pin 4 to check Premier Pin 4 come out or not.



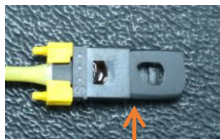
- Assemble Pin Clamp with Premier Pin 4 on MT ferrule, Pin Clamp's groove is same direction with MT window.



Pin clamp M's groove

MT window

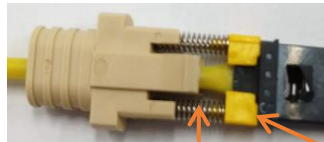
- Check appearance on MT body – Front side
- Assemble dummy MT ferrule on top of MT ferrule



MT Dummy

Step 3 :

- Assembly spring push
- Assembly spring (D) between spring push and Pin clamp M. One side of spring (D) is touch into Pin clamp M's pin, another side is touch on spring push's key



Spring (D)

Pin Clamp's Pin

- Check laser and appearance on MT body – Back side



- Laser number must be compliance with each MPO coupling color

- **For FAU – 6MPO**

Laser on MT	MT1	MT2	MT3	MT4	MT5	MT6
Coupling color						
	Green	Orange	Blue	Black	Red	Grey

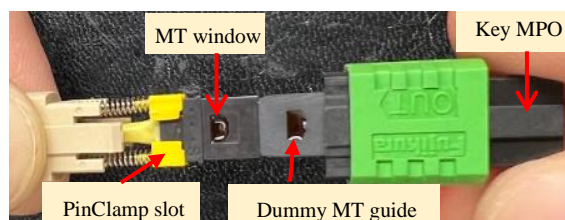
- **For FAU – 7MPO**

Laser on MT	FS1	FS2	FS3	FS4	FS5	FS6	FS7
Coupling color							
	Green	Orange	Blue	Black	Red	Grey	Aqua
Laser on Coupling	FS1	FS2	FS3	FS4	FS5	FS6	FS7

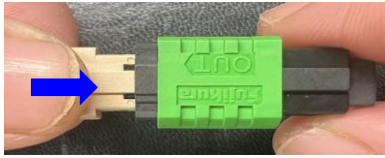
For Pigtail: check MPO color as spec requirement

Step 4 :

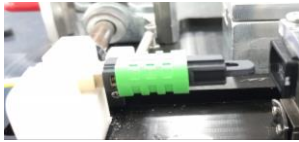
- Assembly MPO coupling: Put MT ferrule's window, Dummy MT ferrule's window, MPO Coupling's key, Pin Clamp is upper side



- Assembly MPO coupling throughout spring push. The key of MPO Coupling is upper side



- Using the MPO Housing tool to assemble MPO Coupling completely
- Take note: the yellow silicon tube must be in the middle of spring push tail

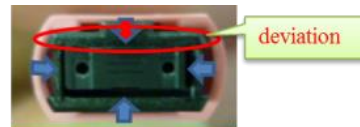


• Step 5

- Appearance inspection MT ferrule is center inside Housing SS by visual



Ferrule is in the center of Housing SS:
GOOD



Ferrule have a deviation inside
Housing SS: **NO GOOD**

• Step 6

- Covered by temporary Cap (White cap)



➤ Remove housing for MPO Trillian:

• Step a: Remove coupling



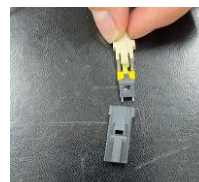
Spring C can be re-use. Scrap Coupling

• Step b: Remove spring push.

- Use Spring push remover tool to remove spring push



Use spring push remove tool to clamp
housing N to remove spring push

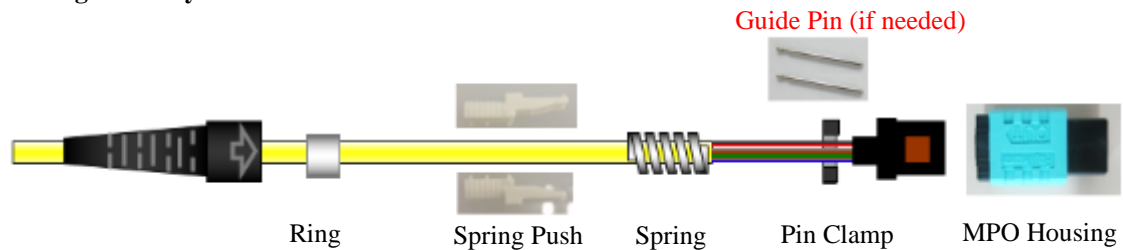


Housing N after remove

- Repeat from step 1 to step 5 of Housing assembly as above figure. Use the magnet jig to check Spring C for rework product



1.1.3 Housing assembly – For MPO Cord Product

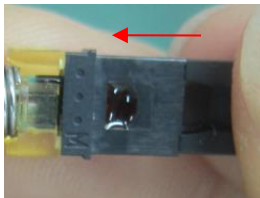


- Step 1**

- Attach the spring push and the pin clamp on MT ferrule.



- Put the dummy guide on MT ferrule.



- Step 2**

- Assembly MPO Housing: Key of MT ferrule, MPO Housing, Pin Clamp is upper side

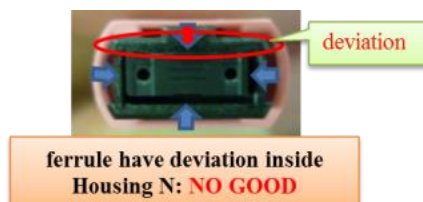
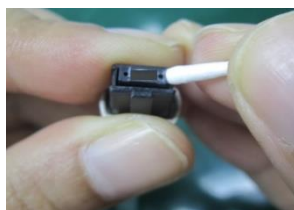


- Put the spring push on Housing tool to close the Housing.



- Step 3**

- Check MT movement.

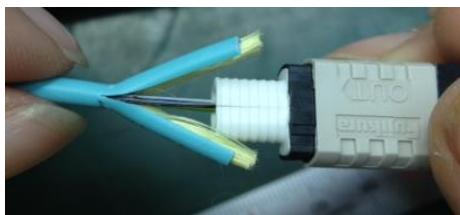


- Covered by temporary Cap (White cap)



- **Step 4**

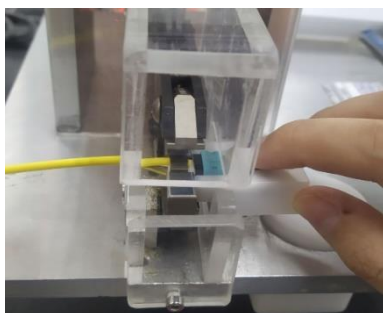
- Cut cord's coating & kevlar. Separate the kevlar become 2 parts with same length.



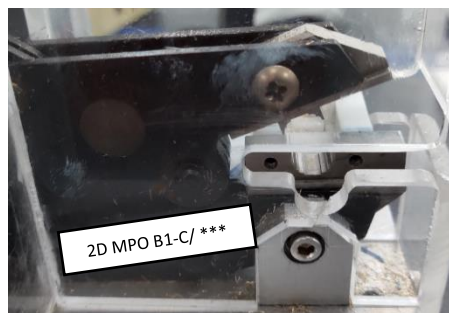
- Adjust the cord cover the Spring push tail evenly on both sides, push the Ring to position.



- Clamp the crimping ring



Label on Crimping die



Model 2D MPO B1-

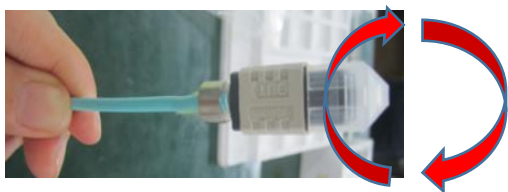
- Check Ring no crack/ deformed



- Bend the cord & checking the fiber no stuck at Spring Push position.

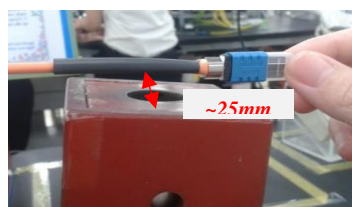


- Check cord rotation



- **Step 5**

- For MPO Housing have heat shrinkable: Heat the shrinkable tube



- Push Boot to position. Then put product to Boot Closing tool to close the boot.



➤ **Rework Housing assembly – For 12MPO Cord Product**

• **Step 1**

- Remove Coupling & Spring C.



Spring C can be re-use. Scrap Coupling

• **Step 2**

- Use tool to remove Housing N.



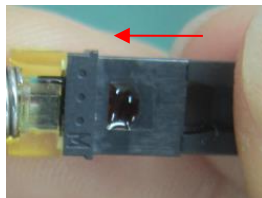
Housing can be reuse.

- Prepare new Housing Assembly follow **1.1.1**: reuse Housing N, Spring C, new Coupling

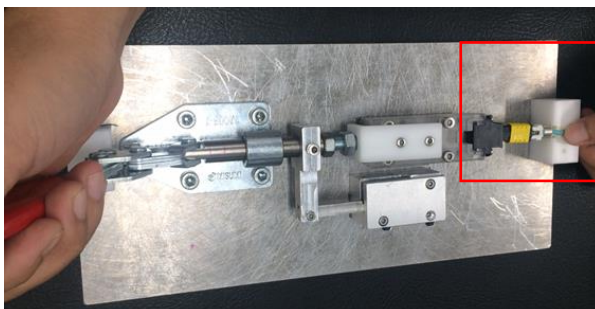


• **Step 3**

- Put dummy guide on MT ferrule



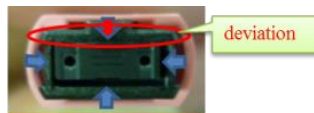
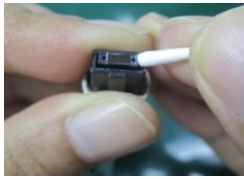
- Apply Housing tool for Rework product.



Spring Push must close to jig

- **Step 4**

- Check MT movement.

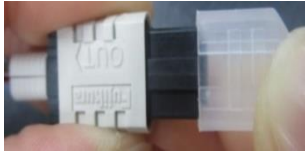


ferrule have deviation inside
Housing N: **NO GOOD**



Ferrule is center inside Housing N:
GOOD

- Covered by temporary Cap (White cap)



➤ **Rework Housing assembly – For 24MPO Cord Product**

- **Step 1**

- Cut the Ring by Cutting plier. Keep the Heat shrinkable.



- **Step 2**

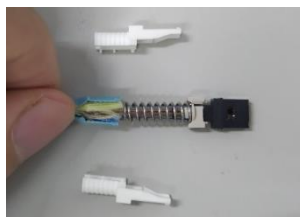
- Remove Coupling & Spring C.



Spring C can be reuse. Scrap Coupling

- **Step 3**

- Use tool to remove Housing N. Then remove Spring Push



Housing can be reuse.

- Prepare new Housing Assembly follow **1.1.1**: reuse Housing N, Spring C, new Coupling



- **Step 4**

- Attach new Ring to product need rework.

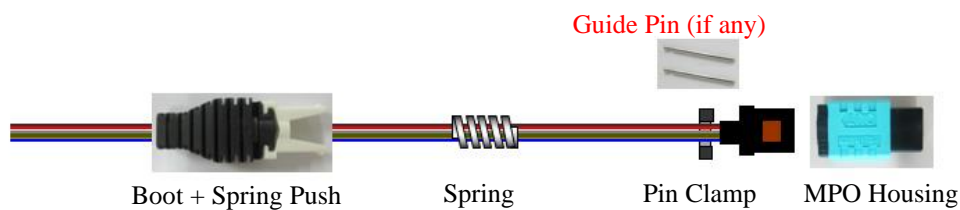


- **Step 5**

- Assembly Housing and check follow 1.1.3, Step 1 → Step 5

Note: No need to apply Heat shrinkable.

1.1.4 Housing assembly – For MPO Ribbon Product

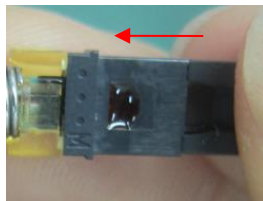


- **Step 1**

- Attach pin clamp on MT ferrule.



- Put the dummy guide on MT ferrule.

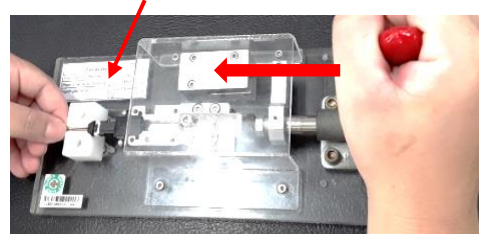


- **Step 2**

- Put MPO Housing to MT Ferrule: Key of MT ferrule, MPO Housing, Pin Clamp is upper side.



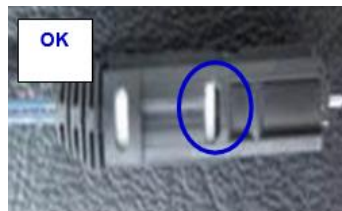
- Use Housing assembly tool for MPO Ribbon



- Check edge of Spring Push



Could not see Spring push edge



See Spring push edge

- **Step 3**

- Assembly Spring C.

Spring C

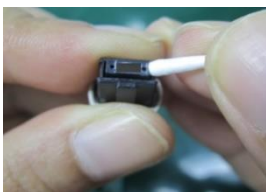


- Assembly Coupling N



- **Step 4**

- Check MT movement.



ferrule have deviation inside
Housing N: **NO GOOD**



Ferrule is center inside Housing N:
GOOD

- Covered by temporary Cap (White cap)



- Check Spring C by magnet jig



➤ **Rework Housing assembly – For MPO Ribbon Product**

• **Step 1**

- Remove Coupling & Spring C.



Spring C can be reuse. Scrap Coupling

• **Step 2**

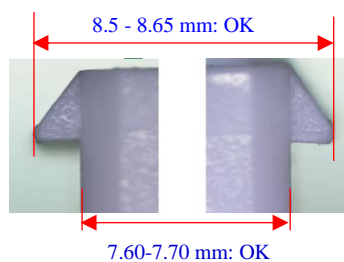
- Use tool to remove Housing N.



Housing can be reuse.

• **Step 3**

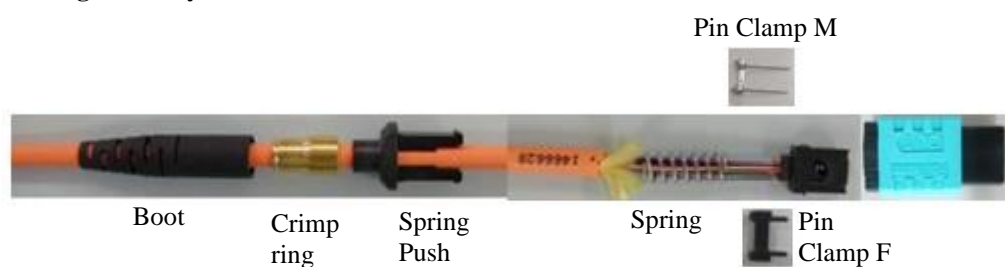
- Check Spring Push's key was assembled completely before insert Coupling



• **Step 4**

- Assembly Housing follow 1.1.4, Step 1 → Step 4

1.1.5 Housing assembly – For 16MPO & 12MPO Product



• **Step 1**

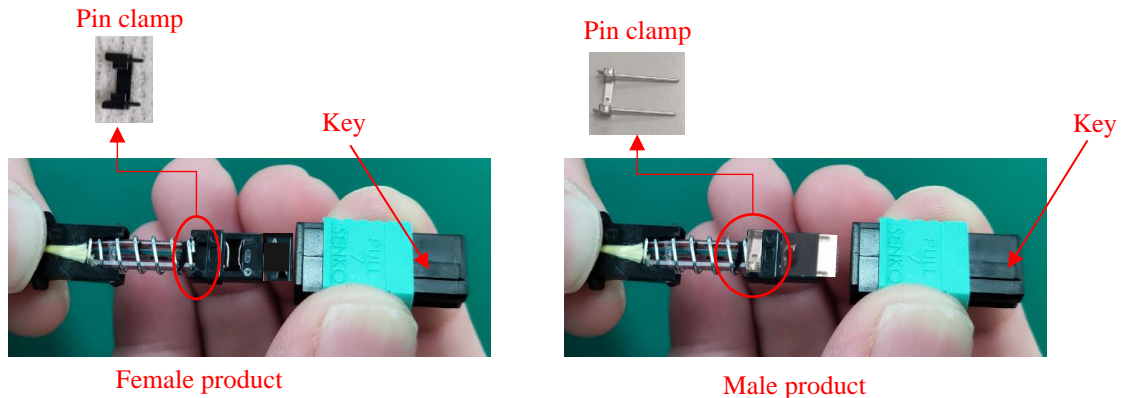
- For Female product: Put the dummy guide on MT ferrule.

Insert MT guide



- Step 2**

- Assembly MTP Housing: Key of MT ferrule, MTP Housing, Pin Clamp is upper side



- Put the spring push on Housing tool to close the Housing.



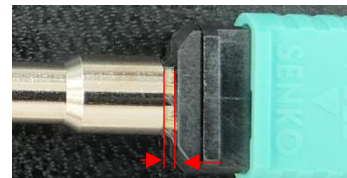
- Step 3**

- Covered by temporary Cap



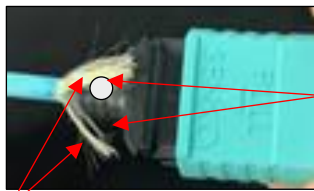
- Step 4**

- For 16 MPO: Burst Kevlar around Spring Push and push clamping to keep the kevlar on the Spring push.



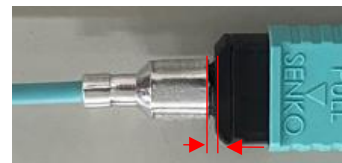
See kevlar and kevlar
length < 1mm mm

- For 12 MPO: Divide Kevlar into 2 side attach takpak on srping push and push clamping to keep the kevlar on the Spring push.



Attach takpak on
Spring push

Divide kevlar into 2 side on takpak position



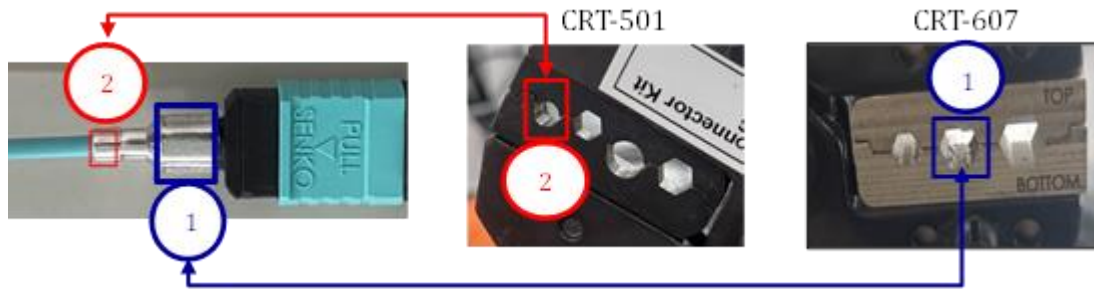
See kevlar and kevlar
length < 1 mm

- Step 5**

- For 16 MPO: Use Crimping tool CRT-607



- For 12 MPO: Use Crimping tool CRT-607 & CRT-501

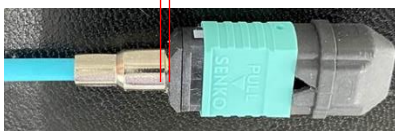


Check Crimp Ring no crack/ deformed.

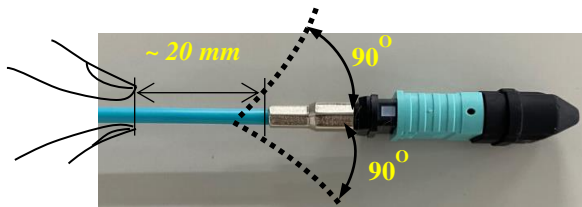


- **Step 6**
- Check kevlar & cord rotate, inset boot.

kevlar < 1 mm



Check cord rotate



Check cord rotate



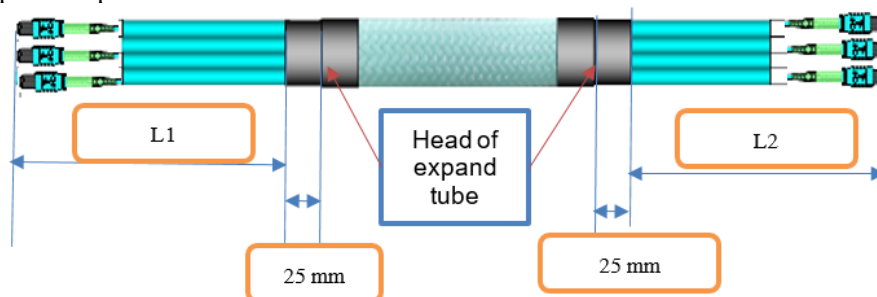
Insert boot

5

- **Step 7 Measure length of L1, L2 and heat the shrinkable tube**

* Apply for AFL google have expando

- L1, L2 follow product spec:



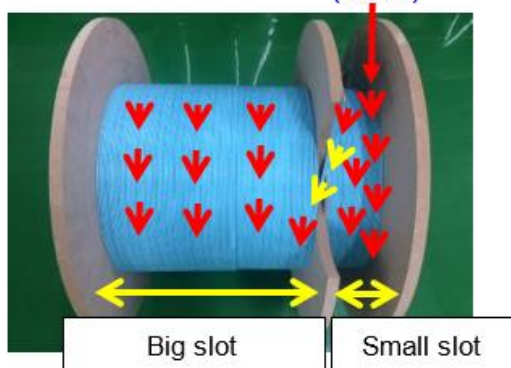
- Measure correct position as above drawing and Heat shrink tube by air gun

- **Step 8 Winding Bobbin**

* Apply for AFL google

- Side start winding cable into the small lot of bobbin follow customer specification.
- Start winding cable into bobbin as direction below

Start position
(side x)

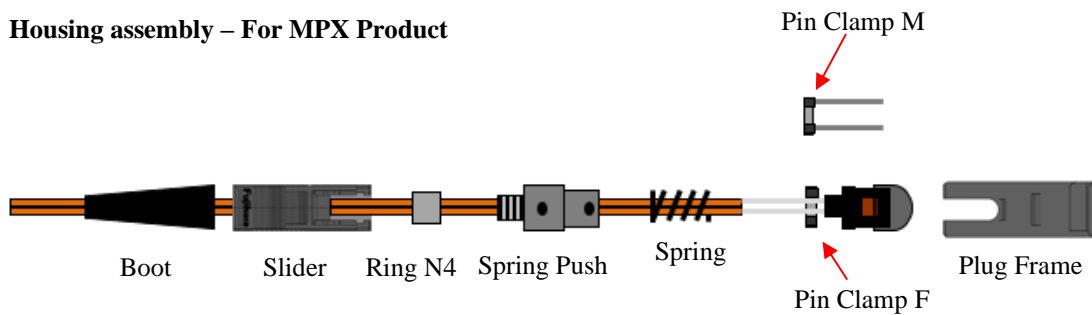


- **Step 9. Attach label (if have)**

- Attach labels on cord (refer product specification to collet content, length and direction of label).



1.1.6 Housing assembly – For MPX Product



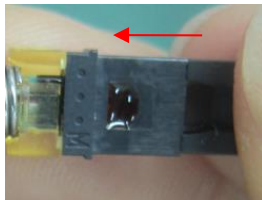
- **Step 1**

- Attach pin clamp on MT ferrule.



Pin Clamp

- Put the dummy guide on MT ferrule



- **Step 2**

- Attach Plug Frame into Spring Push.

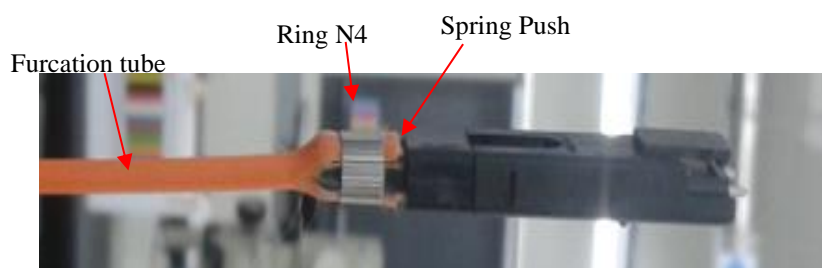


- Check the edge of Spring Push completely insert into Plug Flame at 2 side



- **Step 3**

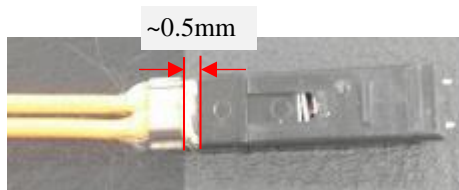
- Burst Kevlar around Furcation tube, push Ring N4 to keep Kevlar on Spring Push.



- Clamping once times at Ring N4 by Crimping tool-MPX

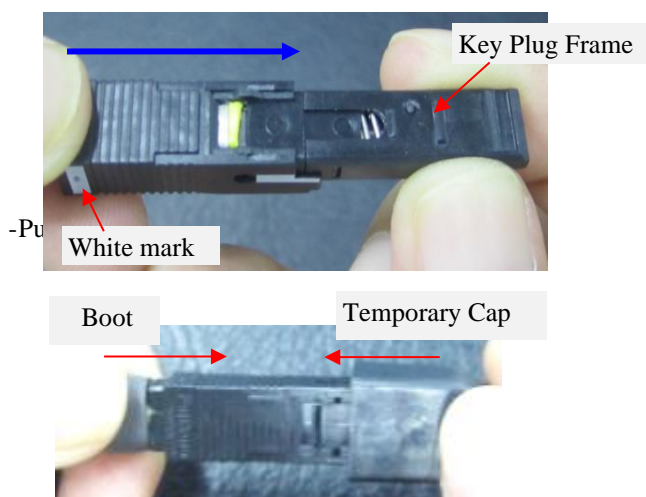


- Check Ring after clamp: no crack



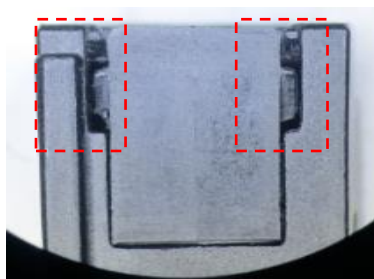
- **Step 4**

- Push Slider into Plug Frame

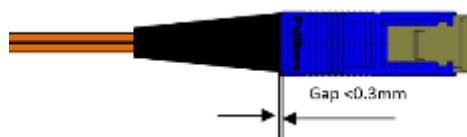


- **Step 5**

- Check Housing edges are no deformed.



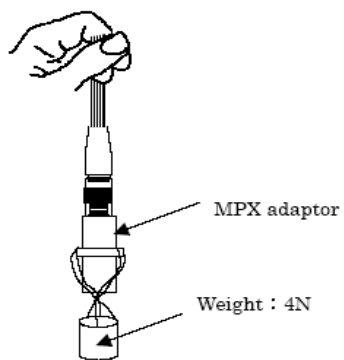
- Check gap between boot and Spring Push is < 0.3mm.



- **Step 6**

- Pull test (100% MPX Housing)

Connect connector through adapter with the weight **4N**, Hold Furcation and waiting in 3s.



+ Flug Frame does not slip out -> OK.

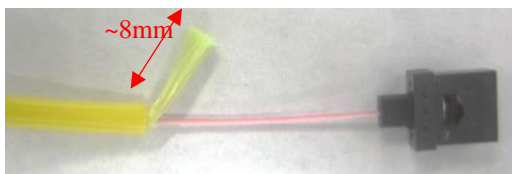
+ If Flug Frame slips out → Stop using crimping tool → change new crimping die.

1.1.7 Housing assembly – For MPH Product



- **Step 1**

- Cut the Kevlar.

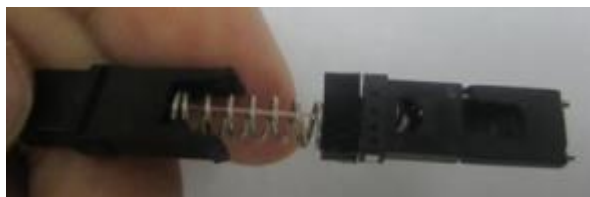


- **Step 2**

- Attach pin clamp on MT ferrule

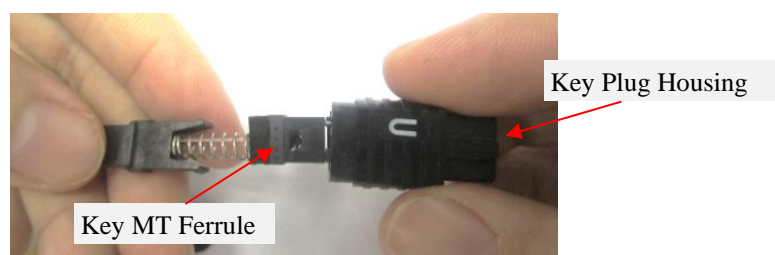


- Put the MT guide on the top of ferrule.

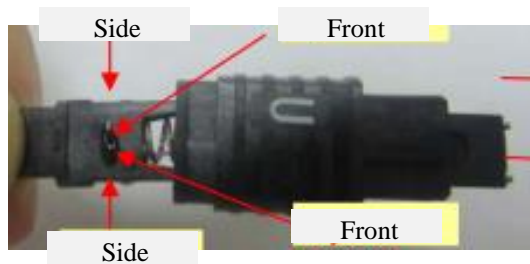


- **Step 3**

- Assembly Plug Housing U: Key of MT ferrule, Key of Plug Housing is upper side



- Add Stycast at 4 positions of Spring push.



- Push Plug Housing and Spring push to complete Housing.

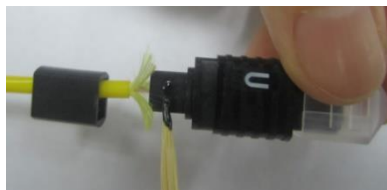


- Covered by temporary Cap (White cap)



• Step 4

- Apply Stycast on both side of spring push tail



- Push the stopper to cover spring push



• Step 5

- Apply Stycast on both side of Stopper



- Push the Boot to cover Stopper



- **Step 6**

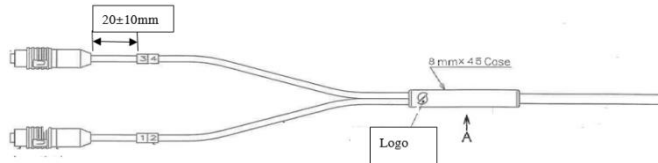
- Apply Takpak at the end of Boot



- Wait 8h for Stycast and Takpak dry.

- **Step 7**

- Attach numbering & stick labels on the wire (refer product specification to collet label & content length)



1.2 Process condition

Items	Conditions
Lot No., Type, Color, Quantity	Manual
Housing tool No.	Manual
Spring quantity inside Coupling N	Semi auto machine or jig
Key direction and coupling color	Visual
Ferrule movement check	Toothpick
Premier Pin check (for Male connector)	Manual
Correct position heat tube	Ruler/template
Correct direction of winding	Visual

1.3 Checking item

Type of record	Items	Record
Quality control items	Refer to relating QC Flow Chart	Related check sheet
Identification & trace-ability record	-Product No -Operator name -Operation date	

VI. Record

- Identification, storage, protection, retrieval and disposition of these records refer to 0-Pr-004
- Note: Nonconforming product, material shall be identified & controlled according to relevant procedures: 5-Pr-001 & 9-Pr-008

VII. Review

- This document will be reviewed yearly by engineering function or when there is any change concerning to this operation procedure. (Refer to 0-Pr-001: Control of internal origin documents).

OPERATION PROCEDURE OF MPO HOUSING ASSEMBLY

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REVISION HISTORY

Date	Person	Ver	Description		Reason	Requester
			Old contents	New contents		
28-Aug-24	TienCTC	6	1.1.5 Housing assembly – For 16MPO & 12MPO Product	1.1.5 Housing assembly – For 16MPO & 12MPO Product - Add step 7 Measure length of L1, L2 and heat the shrinkable tube. Step 8 Winding Bobbin Step 9. Attach label	Combine Housing for AFL product of 4-OP-0368 to general OP: 4-OP-0393	TienDT
31-Jan-24	ThanhNC	5	1.1.5 Housing assembly – For MTP Product	1.1.5 Housing assembly – For 16MPO & 12MPO Product	Update Housing for AFL product combine change order: 4-Pr-007-4-Fo-0007-4-RC-0198	TienDT
8-Aug-23	KhiemB	4	Item V 1.1.2 Housing assembly for Trillian product - Step 1: N/A -Step 3: N/A	Item V 1.1.2 Housing assembly for Trillian product - Step 1: Combine App MT in Housing process - Step 3: Check laser on MT compliance with MPO Coupling color	-Apply as 4-PR-007-4-FO-001-4-RC-0112 -Document review	Ban NT
26-May-23	DienDC	3	Item V 1.1.2 Housing assembly for Trillian product - Step 4: Use cotton stick to push slightly four side of ferrule to check ferrule movement.	Item V 1.1.2 Housing assembly for Trillian product - Step 4: Appearance inspection MT ferrule is in the center of Housing SS by visual	-Apply as 4M 4-Pr-007-4-Fo-0007-4-RC-0051	Ban NT
20-Jun-22	Bảo Khiêm	2	Item V 1.1.1 Housing preparation Step 4: Use the semi-auto machine to check spring on both side Coupling 1.1.2 Housing assembly for Trillian product Step 1: Non Step 5: Pull the Premier Pin lightly. If it do not fall out MT ferrule, It's good	Item V 1.1.1 Housing preparation Step 4: Use the semi-auto machine to check spring on both side Coupling (Do not apply step 4 for Trillian product) 1.1.2 Housing assembly for Trillian product Step 1: Pull the Premier Pin 4 after assembling Premier Pin 4 on Pin clamp Step 5: Non	-Apply as 4M 4-PR-007-4-FO-001-4-RC-1083 -Apply as 4M 4-PR-007-4-FO-001-4-RC-1234	Ban NT