

## OPERATION PROCEDURE OF NIKON PRODUCT

Document No.: 4-OP-0515

Version: 01

Page: 1/10

**I. Purpose:**

To instruct operation method which implemented in Fujikura Fiber Optics Vietnam

**II. Application:**

This guideline is applied for Nikon Products as processes following:

No.	Process
1	Cutting & Mark strip
2	Part insertion
3	Ferrule Assembly
4	Polishing, Endface, Interferometer
5	Housing Assembly
6	Identification checking
7	Length checking
8	Loss inspection
9	Reflectometer
10	Final. Endface
11	QC Appearance
12	Packing & Labeling
13	Shipping

This procedure concerns to engineering, production, quality assurance and planning function.

Checked by: Nguyen Thanh Ban Date: Follow DMS	Approved by: Nguyen Trung Kien Date: Follow DMS
Prepared by: Chau DNB Date: 28-Aug-2024	Cross checked by: Tan NDD Originator: Chau DNB Date: 28-Aug-2024

Confidential

FOV 's property, do not take out without FOV BOM's approval

## OPERATION PROCEDURE OF NIKON PRODUCT

Document No.: 4-OP-0515

Version: 01

Page 2/11

**III. Reference Documents:**

- Customer specification:

**Table 1:**

No.	Specification	Drawing No.
1	HG-3058-1017	A3016
2	HG-3058-0497	A3342
3	HC-0572-0625	1591090.001

- Other reference doc:  
QC flow chart: 4-QC-0515

**IV. Term definition:****FOV:** Fujikura Fiber Optics Viet Nam Ltd.**Samp.:** Size of sample**P.I.C:** Person in Charge**IL:** Insertion Loss**RL:** Return Loss**QAE:** Quality Assurance section**PRE:** Production engineering section**PRD:** Production section**PLN:** Purchasing & Logistic section.**V. Traceability control:**

The requirement of traceability record for each produce shall follow the 9-PR-013 Data traceability procedure.

Type of record	Items	Record
Quality control items	Refer to QC flow chart 4-QC-0515	Related check sheet
Identification & trace-ability record	4M information (if any): -Material lot# -Machine/Tool-Jig control number -Operator code -Manufacturing/inspecting date	

## VI. Content

Wipe the all table 1time/shift with Microseal and IPA before start work.

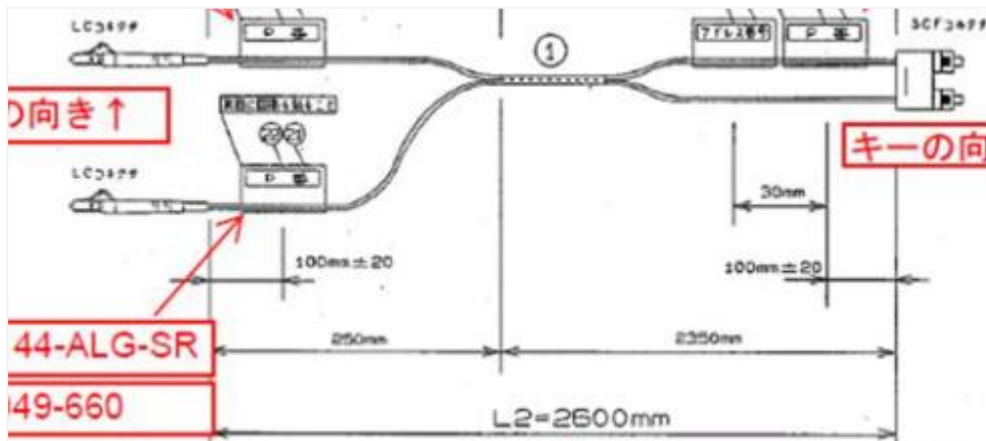
### 1. Cutting & Mark strip:

#### 1.1 Process specification

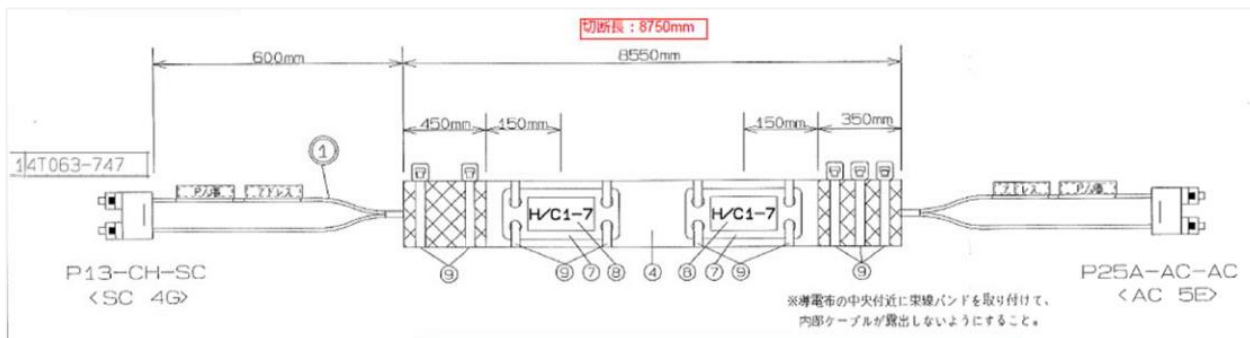
##### 1.1.1 Cutting and Aging

Note: The operator should wear gloves during the whole process.

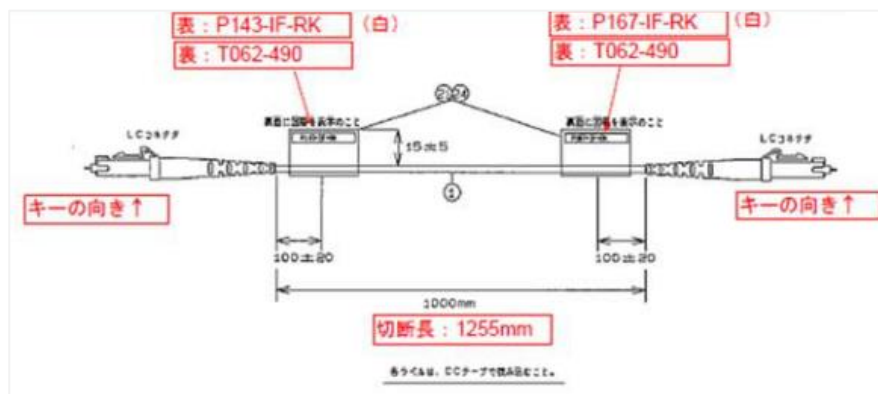
#### 1/ HG-3058-1017(drawing number A3016)



#### 2/ HG-3058-0497(drawing number A3342)



#### 3/ HC-0572-0625(drawing number 1591090.001)



## OPERATION PROCEDURE OF NIKON PRODUCT

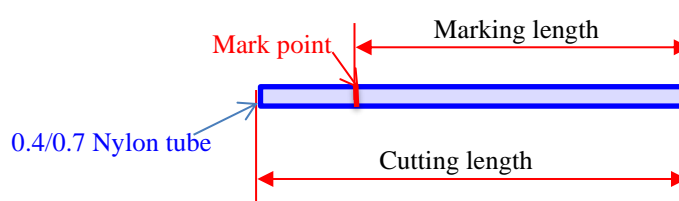
Document No.: 4-OP-0515

Version: 01

Page 4/11

**a) Cutting for cable:**

Product specification	Product Length L/product (m)	Tolerance of L (m)	Cutting length (m)	Tolerance of cutting (m)	Aging conditions	
					Temperature (°C)	Time (h)
HG-3058-1017	2.35	10%L/-0	2.95	0.01	80	24
HG-3058-0497	10	10%L/-0	10.3	0.01	80	24
HC-0572-0625	1	10%L/-0	1.255	0.005	60	24

**b) Cutting for 0.4/0.7 nylon tube:**

Type of connector	Cutting length (mm)/ connector	Marking length (mm)	Aging conditions		Remark
			Temperature (°C)	Time (h)	
SC, SCF	19 + 1	14 + 0.5	70	24	Cut tube 300mm first & round 100 tubes with paper (to keep tube straight) & put into the chamber.
LC	29 + 1	24 + 0.5	70	24	

**c) Cutting for Sumitube:**

Type of connector	1st Coating	2nd Coating	3rd Coating
SC, SCF, LC	Sumitube F 3(Z) White, 3 × 0.15 (*1)	Sumitube F 3(Z) White, 5 × 0.15	Sumitube F 3(Z) White, 5 × 0.15
	Sumitube F 4(Z) Black, 3 × 0.15 (*1)		

(\*1) In a product, white and the mixture of the black tube are prohibited.

Cutting length for 1st Coating					
Product specification	Side S		Side E		Cutting Tolerance (mm)
	Cutting length (mm)	Cutting qty / product	Cutting length (mm)	Cutting qty / product	
HG-3058-1017	305	2	255	2	±2
HG-3058-0497	305	2	305	2	±2

## OPERATION PROCEDURE OF NIKON PRODUCT

Document No.: 4-OP-0515

Version: 01

Page 5/11

## Cutting length for 2nd Coating

Product specification	Side S		Side E		Cutting Tolerance (mm)
	Cutting length (mm)	Cutting qty / product	Cutting length (mm)	Cutting qty / product	
HG-3058-1017	93	1	93	1	±2
HG-3058-0497	93	1	93	1	±2

## Cutting length for 3rd Coating

Product specification	Side S		Side E		Cutting Tolerance (mm)
	Cutting length (mm)	Cutting qty / product	Cutting length (mm)	Cutting qty / product	
HG-3058-1017	68	1	68	1	±2
HG-3058-0497	68	1	68	1	±2

## 1.1.2 Mark strip:

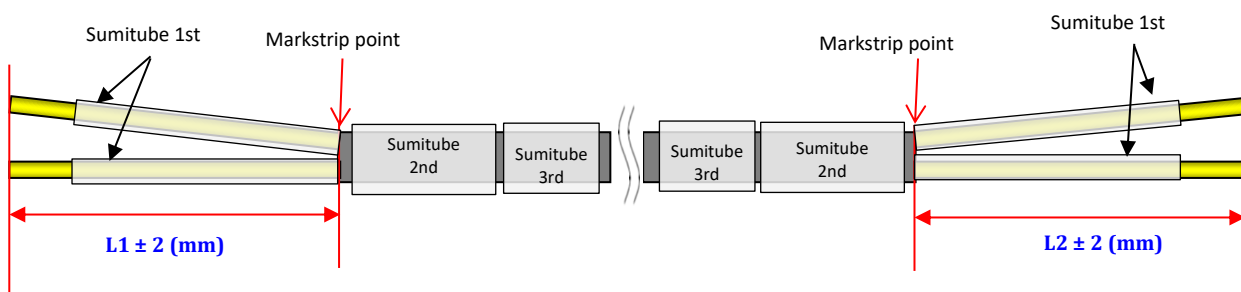
Note: The operator should wear gloves during the whole process.

## For spec HG-3058-1017 &amp; HG-3058-0497

- Insert sumitube 2<sup>nd</sup> & 3<sup>rd</sup> for Start & End side.
- Mark & remove outer jacket:

Product specification	Markstrip length (mm)		Tolerance (mm)
	Side S (L1)	Side E (L2)	
HG-3058-1017	360	300	±2
HG-3058-0497	350	350	±2

- Insert sumitube 1<sup>st</sup> for Start & End side.



## OPERATION PROCEDURE OF NIKON PRODUCT

Document No.: 4-OP-0515

Version: 01

Page 6/11

**1.2 Process conditions**

Items		Conditions
Cut cable, tube		Jig/Ruler/Machine
Cut Shrinkable tube		Jig/Ruler/Machine
Jacket remove		Tool/Template
Cut Kevlar		Scissors
Measure lengths	By machine	- When start machine: + Measure 3 pcs if change roller status. + Measure 1 pc if not change roller status. - When stop machine: measure 1 lasted pc.
	By manual	Ruler
Heat shrinkable tube		Heat gun

**2. Part insertion**

Note: The operator should wear gloves during the whole process.

Refer to 4-OP-0392 Operation procedure part insertion

**3. Ferrule Assembly**

Refer to:

4-OP-500 for Adhesive mixing

4-OP-524 for Operation procedure LC ferrule assembly

4-OP-503 for Operation procedure SC ferrule assembly

**4. Polishing, Endface & Interferometer**

Refer to:

**4-OP-526** for LC polishing

**4-OP-528** for SC polishing

**4-Pr-007-4-F0-001-4-RC-1023.** Interferometer checking: Sampling 2cons/shift.

- Endface geometry specification: Refer to 4-OP-0397

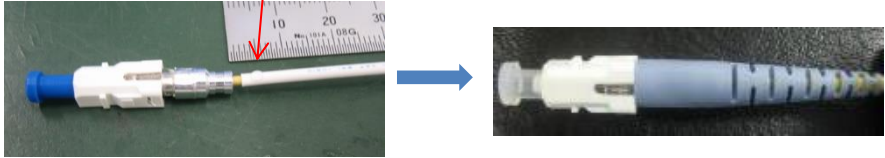
**5. Housing Assembly**

Follow to 4-OP-523 for LC connector assembly.

Follow to 4-OP-0484 for SC connector assembly.

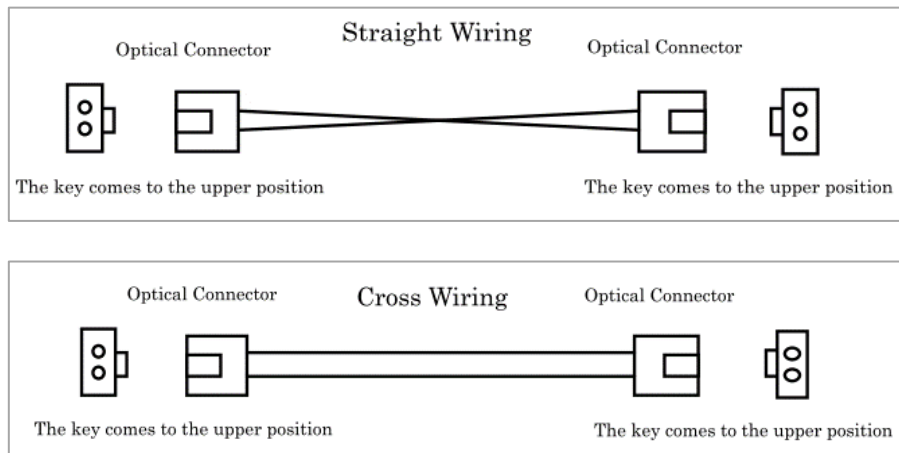
Note: Boot insertion for SC connector Ø2.0 using cord 1.5mm.

After crimp Clampring, applying adhesive (Cyanon 722) on the shrinking tube then insert boot.

Apply for product specification	Figure
HG-3058-1017	
HG-3058-0497	

**\*\*\*Attach label:**

## 1/ Recognition of the wiring type:



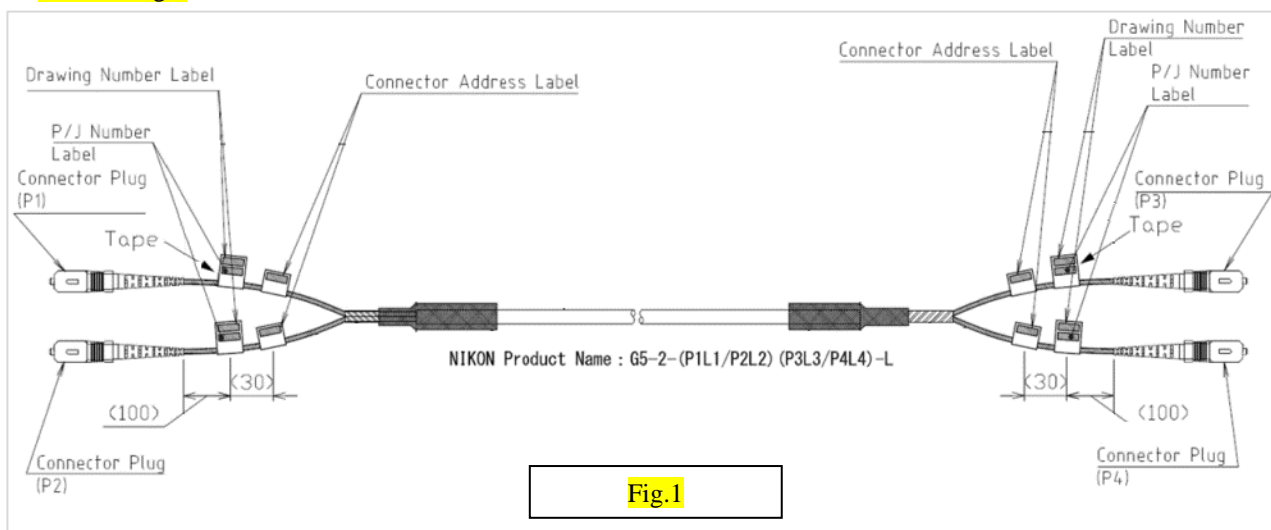
2/ The product should be indicated the drawing number label, the P/J number label and the connector address label designated by the customer.

The character style of alphanumeric characters and symbols should be written in **MS Gothic**.

## 3/ When pasting the label:

- Hold the product with the connector key positioned upper.
- Tilt the product 90° to the back side.

Refer to Fig.1



## 4/ EXCEPTION : Products with LC connector

For the products above, the pasting position of the labels should be in the same direction as the connector key.

If the direction of the connector key and the labeling position differs from that of the customer drawing, instructions written on this specification should be prior.

When the instructions for the pasting point of the drawing number label, the P/J number label and the connector address label written in the spec (Fig.1) differs from that of Nikon drawing, the Nikon drawing should be applied.

If there aren't any information of the pasting point on the Nikon drawing, follow the instructions on this specification (Fig.1)

If the label is ever to reach the 2nd coating of the shrinking tube when pasting, the case must be informed Suzuki-Giken in advance.

The label printing format will follow the below table:

The label content (all letter should be confirmed and check result must be recorded in check sheet, when label preparation and attaching on the product and QC appearance. It is 300% checking, since it promised by customer Nikon), label quantity and label color for each product follows the requirement of spec.

For example, as the product of 4T056-540(1) defines the length of L3 and L4 from the tip of the connector, the label would reach the 2nd coating of the shrinking tube.

In this case, Suzuki-Giken will give out instructions on where to paste the label.

Note:

※1 Only R-300 (DIC Corporation) or FSR-III (Fujicopia) should be used for the printing ink. Printing machines appointed by these manufacturers should be used as well.

※2 The color of the connector address label should be White or Red or Green or Brown

(It should be used the designed color by customer drawing number.).

※3 Follow the instructions on the specification if the height of the tape is designated.

## 6. Identification checking

**Note:** The operator should wear gloves during the whole process.

Refer 4-OP-510 (Identification) to check the order of connectors.

Note: Using ID Checker and ID jig

Label checking:

Specifications	Condition
Correct label order, content, color, quantity and scanning function	Visual/Template

## 7. Length checking

**Note:** The operator should wear gloves during the whole process.

Check total length of product that specification required (refer to spec) by ruler/ template.

Check branching length, different length between 2 connectors by ruler/ template.

### 7.1 Process Specification

Check and record 100% for L, L1, L2....(The all length must be measured by ruler and mentions in TR)

### 7.2 Process condition

Items	Conditions
Total Length	Ruler/ template
Branching length	Ruler
Difference between 2 connectors	Ruler

## 8. Loss inspection checking

### 8.1 Process specification

Refer to 4-OP-506 (Insertion Loss Inspection)

Spec loss: follow the requirement of each spec, wavelength must be 850nm for cable and 1310nm for cord.



## OPERATION PROCEDURE OF NIKON PRODUCT

Document No.: 4-OP-0515

Version: 01

Page 9/11

**8.2 Process condition**

Measuring of loss IL, RL: Loss system

Measuring method: first, the master connector shall be inserted an adapter. Second, the product's connector shall be inserted an adapter and mated with master connector.

Control master cord end face: End face system.

**9. Reflectometer**

Apply common procedure 4-OP-511 to check fiber broken inside ferrule.

**4-PR-007-4-FO-001-4-RC-0221.** Sampling check 2cons/shift.**10. Final Endface****10.1. Connector cap cleaning**Refer to **000-4-WI-013** for to cleaning connector cap. This cap will be delivered to the end face process of PRD.**10.2. End face**

Refer to 4-OP-527 for the judgement standard.

Cover cleaning cap after checking final end face.

**11. QC Appearance****11.1. Process specification**

Note:

The operator should wear gloves during the whole process.

The operator must not wear makeup when packing. This is to prevent siloxane contained in the cosmetics to adhere to the product.

Check all label content against to the drawing and record "check mark" on check sheet.

Items	Specification
Appearance	<ul style="list-style-type: none"> <li>- Connector appearance checking: No crack, no damage, no dirty.</li> <li>- Enough cap to cover all connector and cover firmly.</li> <li>- Cord appearance: No break, dirty, scratch, crack, deformity.</li> <li>- Label checking: Content, direction, position &amp; color of label.</li> </ul> Label has no dirty, deform, wrinkle, lack of content or any abnormal.

**11.2. Process condition:**

Other items checked by visual.

**12. Packing & Labeling**

Note:

The operator should wear gloves during the whole process.

The operator must not wear makeup when packing. This is to prevent siloxane contained in the cosmetics to adhere to the product.

Wipe the all product surface with Micro seal and IPA before packing.

The packing method should be followed packing procedure indicated by SG.

Item	Specification
Check the appearance of label	Refer to relevant spec No. for detail
Inner coil	
Packing type	
Carton size	
Qty/carton	

## 12.1 Packing product

### a. Cable product.

Wrapping connector part together with winding cable.

Winding the cable and connector part must be protected by wrapping air bubble (antistatic type).

1product pack into 1PE bag then heater sealing.

### b. Cord product.

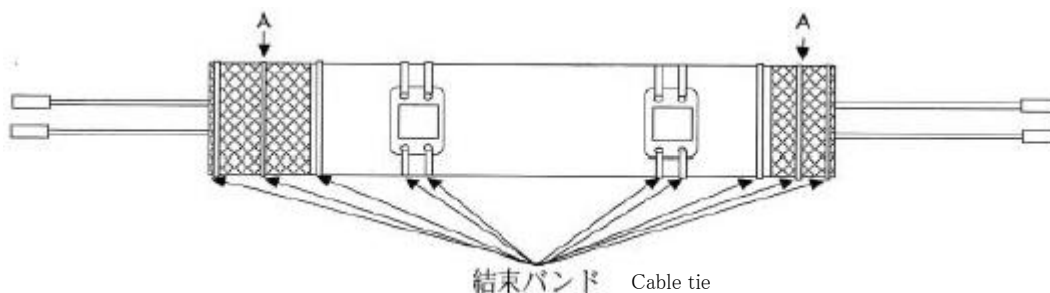
The product length over 1m must be winding then fix by vinyl tie.

1product pack into 1PE bag then heater sealing.

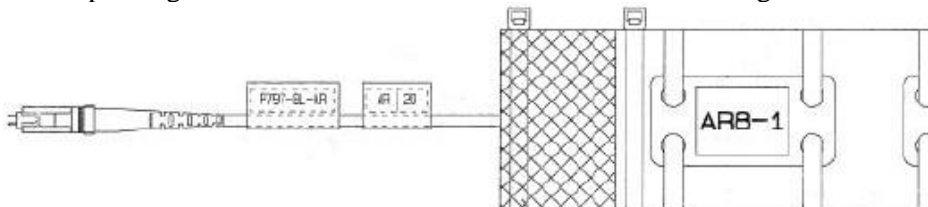
### c. SS assembly

Bundle chemical clean fiber optic cables with connectors at both ends with shield zipper tubes according to the manufacturing instruction drawings.

Fasten the 10 positions shown in the figure below with a Cable tie; for A, the center of the shield section and the position of the Marked band shall be in accordance with the manufacturing instruction drawings.



Attach the label (Item No.: 16302200, Product name: Aluminum coated label for non-CC) to the marked band according to the manufacturing instruction drawings. Follow the manufacturing instruction drawings for the printing contents of the label and the direction for affixing the label.



Wrap the connector part by air bubble (antistatic type) and fix end by transparent tape (have a folding part) then heater sealing. \*Transparent tape must around 1time at least.

## 12.2. Packing product to inner box and outer box

Put every product into inner box.

Use bubble wrap in the box and adjust it so that the contents would not rattle.

Stick box label on box.

## 15. Shipping

### Apply in logistic function.

Note: Attach label outside carton box to indicate: Specific of product type, Specification Number and serial No.

OPERATION PROCEDURE OF NIKON PRODUCT

Document No.: 4-OP-0515	Version: 01	Page 11/11
-------------------------	-------------	------------

REVISION HISTORY

Preparing date	Person	Version	Description		Reason	Requester
			Old contents	New contents		
28 Aug 2024	Chau DNB	1	-	Established	Established	Manager Dinh Tan Tien