

QUALITY CONTROL FLOW CHART OF FAST CONNECTOR

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I. Purpose:

- To set up the manufacturing processes which are implemented in Fujikura Fiber Optics Vietnam
- To determine Quality control items of each process

II. Application:

- This guideline is applied for Fast connector products.
- This document concerns to Production function, Production engineering function, Quality Assurance function and Planning function.

III. Reference document

- Customer specification:

Reference document	Product name	Remark
PNJHY-0090-25-08K#1 HY-0090-008#1\$002	Fiber with FAS Connector 「R」 「F」	Apply spec OBL3
PNJHY-0090-25-08K#2	Fiber with FAS Connector 「R」 「-」	
PNJHY-0090-25-07P#1 HY-0090-007#1\$003	Fiber with FAS Connector 「K」 「F」	Apply spec OBL3
PNJHY-0090-25-07P#2	Fiber with FAS Connector 「K」 「-」	
HY-0090-026#1\$002	SR15E 2mm cord with FAS Connector Plug / SC Connector	
HY-0090-026#2\$002	SR15E 2mm cord with FAS Connector Socket / SC Connector	
4-COS-0047 ver2	PATCH CORD PRODUCT WITH FAS/SC CONNECTORS	Apply key selection process

Note: Key selection process was applied for only spec 4-COS-0047 with product name have (M) at the end.

Example product name: SR15E 2mm cord with FAS socket/SC-APC connectors L=2m (M)

- FMEA: 0-PR-012-0-FO-001-4-RC-0141 ver 12

IV. Term and definition:

FOV: Fujikura Fiber Optics Viet Nam

OCAP: Out of Control Action Plan

SIC: Section In Charge

IL: Insertion Loss

RL: Return Loss

QAE: Quality Assurance section

PRE: Production Engineering section

PRD: Production section

PLN: PLNistic section

Checked by : BanNTT Date : Follow DMS	Approved by : KienNT Date : Follow DMS
Prepared by: ChauDNB + Cross check by: TanNDD Date: 6-Aug-24	Originator: Hoang Long Date: 12-Nov-02

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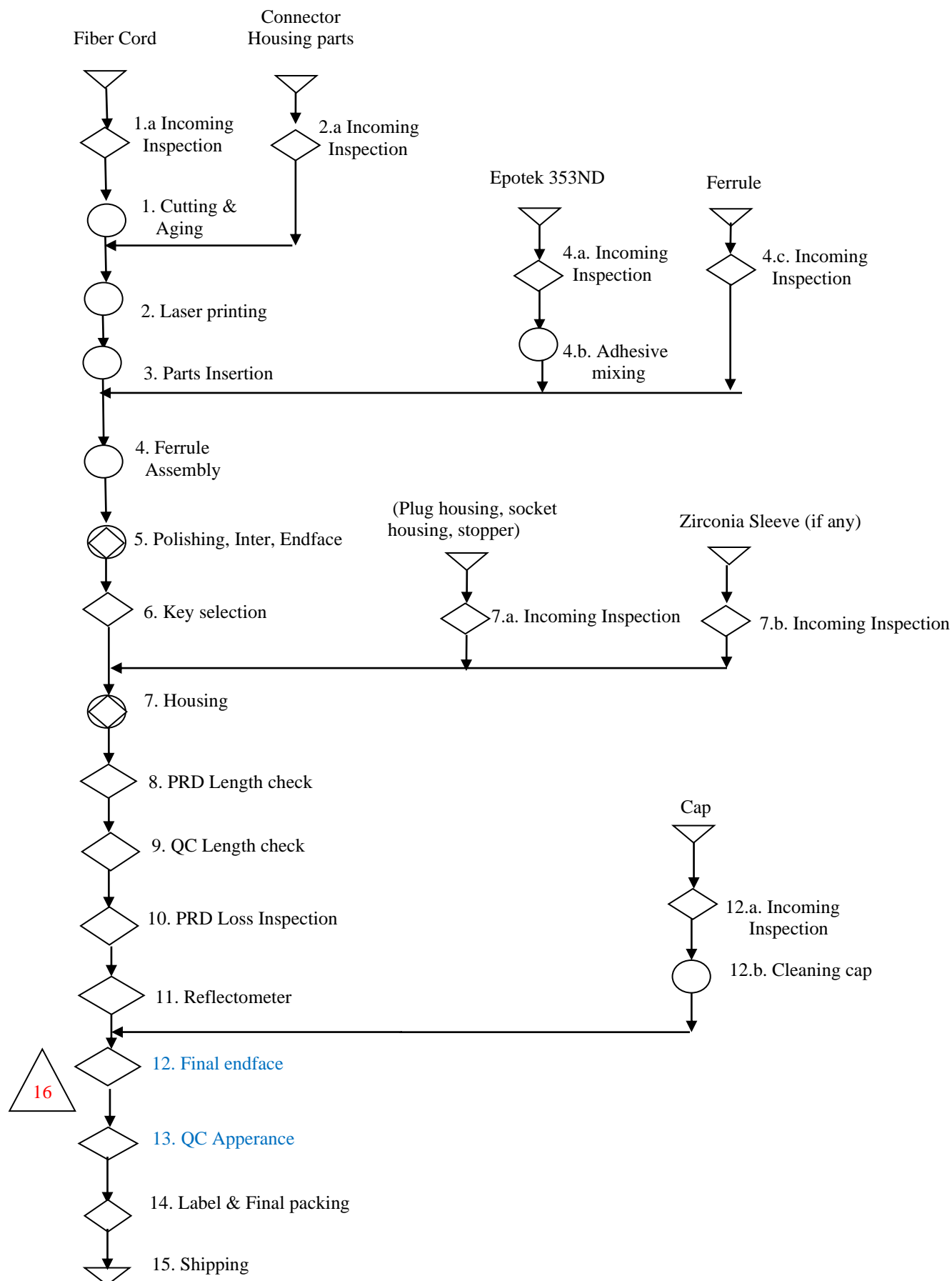
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V. Content:

V.1 QC flow chart for all processes



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V.2 Quality Control Items for each process


Process		Quality control items	Instrument	Sampling size	Related document	SIC
No	Name					
1.a.	Incoming Inspection (Single fiber cord)	9-PR-012				PLN, QAE
1	Cutting and Aging	- Cord cutting - Fiber cutting	Jig/Machine	-When start machine: +Measure 3pcs if change roller status +Measure 1pc if not change roller status -When stop machine: measure last 1 pc of cutting lot	4-OP-0483	PRD, PRE
			Ruler	All		
		- Aging condition (If any): Time, temperature, Cycle.	Recorder & Chamber	All (*)	4-OP-0176	
		- Type & Color of cord	Visual/ Manual	All	4-OP-0483	
		- Quantity	Manual			
		-Appearance fiber/cord	Manual/ Visual	1pc/PO	4-OP-0483	
2.a	Incoming Inspection (Connector housing parts)	9-PR-012				PLN, QAE
2	Laser printing	- Position of printing - Content of printing - Appearance - Direction of laser printing	Visual/ Program	All	4-OP-577	PRD, PRE
3	Parts Insertion	- Correctly with type of connector (size, color, type, side of cord) -Inserting following the order /direction of parts	Parts insertion jig/manual	All	4-OP-0392	PRD, PRE
		-Outer sheath removing length.	Tool /machine			
		-Kevlar cutting length	Template	Sampling 1pc/shift		
		-Slit cord	Jig	All		
4.a	Incoming Inspection (Epotek-353ND, Part A & B)	9-PR-012				PLN, QAE
4.b	Adhesive Mixing (Expotek-353ND, Part A & B)	- Mixing Ratio	Balance	All	4-OP-500	PRD, PRE
		- Mixing Time	Timer			
		- Timer of centrifugal	Centrifugal			
		- Air bubble checking - Pot life (start at mixing time)	Visual			
4.c	Incoming Inspection (Ferrule)	9-PR-012				PLN, QAE
4	Ferrule Assembly	- Epotek injection into ferrule	Machine	All	4-OP-500	PRD, PRE
		- Fiber stripping Length check - Marking length check	Stripper/ Template		4-OP-503	
		- Fiber cleaning - Fiber screening	Visual		9-PR-008-4-WI-0001	
		- Fiber length before insert to ferrule	Template		000-5-WI-037	
		- Adhesive on ferrule	Ring Gauge			

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5	Polishing,Inter, End-face	- Ferrule Surface Checking	Microscope	All	4-OP-563 4-OP-528 9-PR-008-4-WI-0001	PRD, PRE
		- Ferrule length before re-polishing	Micrometer			
		- Interferometer checking	Interferometer	Sampling 2pcs/jig		
6	Key selection	-Selected key at the lowest I/L -P0 value.	Key selection machine	Apply only for 4-COS-0047 for product name had (M) character at the end	4-OP-509	PRD, PRE
		- Core Position - Core Eccentricity	Key selection machine			
7.a	Incoming Inspection (Socket, Plug Housing, Stopper)	9-PR-012				PLN, QAE
7.b	Incoming Inspection (Zirconia sleeve)	9-PR-012				PLN, QAE
7	Housing 	- Sleeve and clamp ring fixing	Visual	All	4-OP-528 9-PR-008-4-WI-0001	PRD, PRE
		- Socket preparation				
		- C-sleeve fixing on socket				
		- Kevlar fixing checking	Plug checking Jig			
		- Plug fixing appearance				
		- Laser marking on housing	Visual			
		- Label position	Template			
		- Label direction	Visual			
		-Check lack of ring				
		-Checking coupling				
		-Checking knob/housing/key				
		-Check ferrule/ceramic sleeve by flashlight for Socket				
8	PRD length check	- Total length of product	Manual Ruler/ Jig	All	4-OP-130 9-PR-008-4-WI-0001	PRD, PRE
		- Control measuring cord end face	Microscope	12 cons/ time		
9	QC length check	- Total length of product	Ruler	1pcs/ID and 100% for all rework product	4-OP-130 9-PR-008-4-WI-0001	PRD, QAE
10	Loss inspection	- P ₀ & IL, RL value	Loss system	All	4-OP-506 9-PR-008-4-WI-0001 000-5-WI-037	PRD, PRE
		- Connection diagram	Loss system, Master cord			
		- End face of Master cord control	Microscope	Sampling		
	Customize test	- Random Loss Inspection	Loss system	Follow customer request		
		Insertion loss and return loss value for mechanical Reliability Test: + Axial Pull Test + Flex Test + Durability Test + Drop-off Test + Twist Test				
11	Reflectometer	- Check fiber broken inside ferrule.	Reflectometer	12con/2h	4-OP-511 9-PR-008-4-WI-0001 000-5-WI-037	PRD, PRE

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12.a	Incoming Inspection (Connector Cap)	9-PR-012				PLN, QAE
12.b	Cleaning Connector Cap	Quantity	Visual	All	000-4-WI-013	PRD, PRE
12	Final end face 	-Final connector end face check	Microscope	All	4-OP-563 9-PR-008-4-WI-0001	PRD, PRE
		- Using cap after cleaning	Visual			
		-Cap quantity	Jig			
13	QC Appearance	- Fiber cord appearance	Visual	All	4-OP-130 9-PR-008-4-WI-0001	PRD, QAE
		- Connector checking				
		- Laser marking content checking				
14	Label & Final packing	- Diameter of coil	Ruler	All	4-OP-130	PRD, QAE
		- Label No. for products - Label No. for carton box - Quantity of products - Serial No. of product (from, to) - Test report	Program			
15	Shipping	- P/O number - Product quantity	Manual	All	4-OP-130	PLN

(*) Apply aging fiber cord follow requirement in specification.

VI. Record:

No.	Record	Retention time	Responsibility for keeping
-	-	-	-

Identification, storage, protection, retrieval & disposition of these records refer to 0-PR-004 Control of record.

Note: Nonconforming product/material shall be identified & controlled according to relevant procedures: 9-PR-008.

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REVISION HISTORY

Date	Person in chart	Version	Description		Reason	Requester
			Old content	New content		
6 Aug 24	ChauDNB	16	V2.Quality control item each process Item 7: Housing None Item 12.Appearance check Item 13. Final enface check	V2.Quality control item each process Item 7: Housing Add more checking item -Check lack of ring -Checking coupling -Checking knob/housing/key -Check ferrule/ceramic sleeve by flashlight for Socket Item 12. Final enface check Item 13. Appearance check	Follow 4MC no. 4-Pr-007-4-Fo-0007-9-RC-0010	Executive. BanNT
29 Jan 24	Nguyen Thi Diem	15	Item V.2.12: Laser marking content checking the first set of every bunch of six product	Item V.2.12: Laser marking content checking 100%	Update follow CAPA : JQHC-59-22-0015(Lack of laser marking on knob)	
	Item V.2.14: - - Diameter of coil controlled by Tool		Item V.2.14: - Cancel Connector packing - Diameter of coil controlled by Ruler	Correct mistake		
	Item V.2.1. Related document:4-OP-130 for all items		Item V.2.1. Related document: 4-OP-0176 for Aging condition items 4-OP-0483 for remaining items	Follow to G.OP		
	Item V.2.1. - Fiber cutting lengths - Instrument: Machine		Item V.2.1. - Cord cutting - Fiber cutting - Instrument: Jig/Machine, Ruler	Update control item		
	-		ItemV.2.1. Add item -Appearance fiber/cord	Update control item		
	Item V.2.2. Related document:4-OP-130		ItemV.2.2. Related document: 4-OP-577	Follow to G.OP		
	Item V.2.3 - Related document:4-OP-130		Item V.2.3 Related document: 4-OP-0392	Follow to G.OP		
	Item V.2.3 -Kevlar cutting length: Sample size: Sampling		Item V.2.3 -Kevlar cutting length: Sample size: 1pc/Shift	Update sample size		
	ItemV.2.4. Related document 4-OP-503 for Epotek injection into ferrule		ItemV.2.4. Related document 4-OP-500 for Epotek injection into ferrule	Follow to G.OP		
	Item V.2.7. -Related document:4-OP-130 -Check Sleeve Cleanness		Item V.2.7 -Related document: 4-OP-528 -Remove check Sleeve Cleanness	-Follow to G.OP -Sleeve Cleanness is checked at ICM		
	-		Item V.2.8 - OTDR machine No - Control measuring cord end face	-Add machine -Add control item		

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			Item V.2.10 - -Connection diagram: check by Visual	Item V.2.10 -Add machine no -Connection diagram: check by Loss system, Master cord	-Add machine -Add control item	Manager TienDT
			ItemIII. FMEA: 0-PR-012-0- FO-001-4-RC-0141 ver 9	ItemIII. FMEA: 0-PR-012-0-FO-001- 4-RC-0141 ver 11	Update version	
			-	ItemV.2.4,5,7~13, add 9-PR- 008-4-WI-0001 Item V.2.4,10,11, add 000-5- WI-037	Update related documents	
			-	Item VII. Add Required record and Retention time no 1, 2, 3	Follow to 0-PR- 004	
			Item V.2.1 Material lot no Cutting Machine no.	-	Follow to 9-PR- 013	
			Item V.2.2 Laser machine no	-		
			Item V.2.3 Material Lot no.	-		
			Item V.2.4b Epotek-353ND lot No (Part A & B) Expiry date of Adhesive (Part A & B)	-		
			Item V.2.4. - Epotek Lot No. - Ferrule Lot No. - Stripper No. - Heater No.	-		
			Item V.2.4. - Heating Temperature - Heating time	-	Follow to 5-PR- 007	
			Item V.2.5 - Polishing Condition	-		
			Item V.2.5 -Polisher no, Inter machine no, -End-face system no	-	Follow to 9-PR- 013	
			Item V.2.6 -Machine no.	-		
			Item V.2.7 Housing tool no	-		
			Item V.2.8. OTDR machine No.	-		
			Item V.2.10 - Loss machine No - End-face system No	-		
			Item V.2.11 -Reflectometer machine No.	-		
			Item V.2.13b - Lot No.	-		
			Item V.2.13 - End-face system No	-		
			Item V.2.13b - Cleaning time (by ultrasonic) - Heating: time, temp.	-	Follow to 5-PR- 007	

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01 Jun 23	Chau Thi Cam Tien	14	Item III: - PNJHY-0090-25-08K PNJHY-0090-25-07P	Add new spec Update spec: PNJHY-0090-25-08L PNJHY-0090-25-07R	Update spec	Manager Dinh Tan Tien
			Item 1. QC flow chart for all process	Add Key selection process and make clear scope apply (Page 1, 2)	Update for new spec	
			-	Add control item for Key selection (page 4)		
			Item 2: process 7: (page 4)	Add control item for label		
			Item 3: -	Update FMEA	Update	
5 Mar 21	Do Thuy Tien	13	11. Plug assembly checking by jig	Cancel plug assembly checking by jig at QCS Appearance process	Follow 4-Pr-007-4-Fo-001-9-RC-0315	Dept. Manager Nguyen Trung Kien
			11. Laser marking content checking: checking 100%	Add sample q'ty laser checked: check the first set of every bunch of six product, check 100% for rework product	Follow 4-Pr-007-4-Fo-001-9-RC-0321	
			11. "Cord rotate"	Cancel cord rotate at QCS Appearance process	Follow 4-PR-007-4-FO-001-9-RC-0223	
			QCE section	QAE section	Update SIC	
			None	Housing: add Plug fixing appearance by jig	Update	
			PNJHY-0090-25-07O PNJHY-0090-25-08I	PNJHY-0090-25-07P PNJHY-0090-25-08K	Update Spec	
26 Oct 18	Pham Thai Bao Trung	12	2.13. Housing Socket stopper direction	2.13. Housing Cancel socket stopper direction	Material was improved	Dept. Manager Nguyen Trung Kien
			PRD, QCS	V.2 Update PIC in process (PRD, PRE, QCE, QAE)	Updated	
			None	Add item 3: Reference additional control items from FMEA	Updated	
19 Sep 17	Tuyet Anh	11	QC packing label by manual Diameter of coil by manual	QC packing label by program Diameter of coil by tool	Correction	Asst. Manager Nguyen Thanh Ban