

SPECIAL PROCESS

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1. Purpose:

The purpose is to establish and maintain procedures to control the special processes.

2. Application:

This procedure is applied to the special processes.

This procedure concerns to Production field (PRD, PRE) and Training field (TRN) or Quality Assurance (QA) field

Note:

The criteria listed in the following table are the additional specific requirements for listed processes. The other steps of 4M control are requested to comply with current QMS of FOV.

3. Reference documents:

- 0-QEM-001: Quality and Environmental Manual
- Operation procedures

4. Term definition:**Special process:**

- Definition A: is a process required by FOV where the resulting output cannot be verified by subsequent monitoring or measurement. This includes any process where deficiencies become apparent only after the product is in use or the service has been delivered.
- Definition B: is a process having a specific requirement from customer in 4M control.

5. Content:**5.1 Approval of special process list**

- ❖ PRE/QA Engineer make the list of special processes with approval of PRE/QA manager and/or Division manager, and communicate to the relative sections.
- ❖ This list is reviewed yearly and updated when necessary by PRE engineer or QAE engineer upward.

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5.2 Required standards/criteria of special processes

PRE engineer or QA engineer upward shall establish the required standards/criteria.

5.3 Qualification and re-evaluation

- ❖ The personnel shall pass the examinations including theory test and skill test following the procedure 1-Pr-008 Qualification program.
- ❖ The personnel shall be re-qualified/re-evaluated periodically or have not engaged in the process by period following detail guidelines as 1-PR-008.

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5.4 Record:

Follow the procedure 000-1-WI-003 (Training and awareness) , the relative Operation procedures and 0-Pr-004 (Control of records), 1-Pr-008 (Qualification program)

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6. Special process list and criteria

No.	Process Name	Product Group	Definition	Criteria
1	Ferrule assembly: + Single core connector + MT connector + Array	Connector, Module, FA, MPO, Panda, Acacia	A	* Operator: - New operator: must pass sensitive and skill test - Or, operator worked in FOV over 1 month (no need apply the test) - Verify operator's skill by applying sampling check fiber broken inside ferrule after heat shock test.
2	Polishing + Glass + Array	Panda Acacia	A	* Operator - New operator: must pass sensitive and skill test - Or, operator worked in FOV over 1 month (no need apply the test)
3	X-Talk	Panda	A	* Operator - Apply GR & R to verify & qualify training
4	Alignment	Panda	A	* Operator - Apply GR & R to verify & qualify training
5	Stripping	Cavity-FG (Submarine type only)	B	* Operator: - Qualification skill by broken test after stripping. - Verify by reliability test (broken test after stripping) in case mass production * Machine's performance control: - When changing stripping condition, this condition must be passed the reliability test (broken test after stripping and exposing at least 10pcs each) and got Customer's approval before mass production - Verify by reliability test (broken test after stripping and exposing at least 10pcs each) after manufacturing stoppage more than 1 month - Verify by reliability test (broken test after stripping) in case mass production by shift
6	Stripping	Cavity-FG (Other types)	B	* Operator: - Qualification skill by broken test after stripping. * Machine's performance control: - When changing stripping condition, this condition must be passed the reliability test (broken test after stripping and exposing at least 10pcs each) and got Customer's approval before mass production. - Verify by reliability test (broken test after stripping and exposing at least 10pcs each) after manufacturing stoppage more than 1 month - Verify by reliability test (broken test after stripping) in case mass production by shift
7	SUS Packing	Coupler	A	* Operator: - Verify by pull test samples.
8	Fusion Splicing + HRFS + Normal splicing	Coupler Module	B A	* Operator: - Verify skill by reliability test + Broken test for splicing + Broken test after re-coating : apply for coupler

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



				<ul style="list-style-type: none"> - Re-Qualification (HRFS process): must re-quality if qualified operator have not engaged in the process more than 1 month. * Operating method (manufacturing condition): apply only for Coupler - Major change affects to splicing condition must be confirmed by reliability test and approved by manager up. - Reliability test if mass production.
9	Fiber preparation (Coat removing and proof test)	Coupler	B	<ul style="list-style-type: none"> * Operator: <ul style="list-style-type: none"> - Verify by reliability test (broken test after coat removing) * Machine (Removing tool) performance control <ul style="list-style-type: none"> - Reliability test after change blade - Reliability test if mass production
10	Fuse & Elongation process	Coupler	B	<ul style="list-style-type: none"> * Operator: <ul style="list-style-type: none"> - Verify by skill by sample after completed Neoceram packing: Drop test, optical measurement (reference only). - Re-Qualification: must re-quality if qualified operator have not engaged in the process more than 1 month. * Operating method condition must be passed the reliability test (broken test after elongation and drop test) and got ODD approved. - Reliability test if mass production (Drop test, Breaking test)
11	Tube Heating process	Coupler	B	<ul style="list-style-type: none"> * Operator: <ul style="list-style-type: none"> - Verify by reliability test (drop test after heating) * Machine (Tube heater) performance control: <ul style="list-style-type: none"> - Verify actual temperature weekly by thermal camera
12	QC inspection: Appearance & Label, packing	All lines	A B	<ul style="list-style-type: none"> * Operator: <ul style="list-style-type: none"> - Have at least 3 months experience at other processes for understanding common sense rule, treatment with fiber, before assigned to work at QC inspection: Appearance & Label, packing *** Note: <ul style="list-style-type: none"> - In case of manpower shortage or cannot arrange suitable manpower, need to be considered case by case by Manager upward and inform to customer as requirement.
13	Endface process	Connector & MPO (for AFL product)	A	<ul style="list-style-type: none"> * Operator <ul style="list-style-type: none"> - Apply GR & R to verify & qualify training
14	Visual Inspection-Cavity/CPL	Cavity	A	<ul style="list-style-type: none"> * Operator <ul style="list-style-type: none"> - Apply GR & R to verify & qualify training
15	App ASN-CPL	Coupler	A	<ul style="list-style-type: none"> * Operator <ul style="list-style-type: none"> - Apply GR & R to verify & qualify training
16	App SUMI, NEC, FLC-CPL	Coupler	A	<ul style="list-style-type: none"> * Operator <ul style="list-style-type: none"> - Apply GR & R to verify & qualify training

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17	Coupler 2in1 Assembly	Coupler	B	* Operator: - Have at least 1 months experience at other processes for understanding common sense rule, treatment with fiber - Verify by reliability test (drop test after assembly)
18	Reinforcement	Fiber Laser	B	* Operator: - Have at least 2 months experience at other processes for understanding common sense rule, treatment with fiber
19	Etching	Fiber Laser	B	* Operator: - Verify skill by 3 samples after completed process pass proof test and transmittance (Required: Level 10W for FLU-CMS type)
20	Resonator inspection (M2 measurement)	Fiber Laser	B	* Operator: - Have at least 2 months experience at other processes for understanding common sense rule, treatment with fiber
21	Bundle fusion splicing 	Pump Combiner	B	* Operator: - Have at least 2 months experience at other processes for understanding splicing machine - Verify skill by 3 samples (no breakage during insertion & removal of half-split pipe)
22	Reinforcement 	Pump Combiner	B	* Operator: - Have at least 2 months experience at other processes for understanding common sense rule, treatment with fiber - Verify by 3 samples after completed process (check signal port pull-out test at 150g)
23	OF600 dispensing 	Pump Combiner	B	* Operator: - Verify skill by 3 samples (No flow-in, no lack of cover at the end of the coating)
24	Thermal inspection 	Pump Combiner	B	* Operator: - The focus check of the thermo viewer must be performed correctly and the focus must be just right. (3 times) - No forgetting to remove the cover before measurement (3 times)
25	Complete optical inspection 	Pump Combiner	B	* Operator: - No difference of more than ± 0.03 compared with the M2 result measured by a trained operator. (3 samples)
26	Complete visual inspection 	Pump Combiner	B	* Operator: Verify skill by checking samples as below: - Check & identify 5 pcs Neoceram of chipping NG or OK (mix samples) - Check & identify 5 pcs Neoceram of dust NG or OK (mix samples) - Check & identify 10 pcs fiber damage NG or OK (mix samples)

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REVISION HISTORY

Preparing date	Person	Ver	Old content	New Content		Requester
				Description	Reason	
Jul 8 th , 2024	TungDD 10745	50	5.1 Approval of special process list PRE/QA Engineer make the list of special processes with approval of PRE/QA manager and/or Department manager, and communicate to the relative sections.	5.1 Approval of special process list PRE/QA Engineer make the list of special processes with approval of PRE/QA manager and/or Division manager, and communicate to the relative sections.	Update as new company Org. chart	PRE2 manager TrungDN
	ThangVD 10284		5.3 Qualification of personnel 5.4 Re-qualify or re-evaluate:	Combine into 5.3 Qualification and Re-evaluation	1) Standardize (to link) the requirement with 1-PR-008. 2) Move detail requirement to process #8 and #10 for Re-Qualification	
			6. Special process list and criteria Process: #2 Prizm assembly & #18 App Prizm-IBM	6. Special process list and criteria Remove process #2: Prizm assembly and #18 App Prizm-IBM	Product was end of life	
			6. Special process list and criteria #2 Polishing process:	6. Special process list and criteria #2 Polishing process: remove line CHFA/P	Product was end of life	
	NamHA 10536	N/a	6. Special process list and criteria Add new process #21 -> #26 for Pump combiner	New production line follow: SPC3-10746(3)		
Mar 20 th , 2024	PRE3 TungDD 10745	49	-	Add new process #20,#21,#22 for Fiber Laser	New production line follow: SPC3-10711(3)	PRE2 manager TrungDN
Dec 27 th ,2022	PRE3 Thang 10641	48	-	Add new process #19 Coupler 2in1 Assembly	New process for 2in1 Coupler project	PRE2 manager TrungDN
Nov 11 th ,2022	PRE1 Thang PRE3 Trung QAE Duc	47	-	Item 6: define special process with require GR&R - Add #14 Endface process in Connector & MPO group (only for AFL product) - Add #15 Visual Inspection-Cavity/CPL (for Cavity product) - Add #16 to #18 Appearance for ASN-CPL, SUMI,NEC,FLC-CPL, Prizm-IBM	Review & standardize requirement to increase product reliability	Production Division Manager KienNT
Nov 25 th ,2021	QAE NhungNTC	46	-	6. Special process list and criteria Add requirement for No.13: QC inspection: Appearance & Label, packing	Requirement from customer (SG) after 3 onsite period and consideration from FOV.	QAE Manager DucTNM