FUJIKURA FIBER OPTICS VIETNAM LTD.

Customer requirement break down sheet 2

Form: 4-PR-007-4-Fo-0005	Version: 02	Page 1/1	4-Pr-007-4-Fo-0005/2

Record No: 4-Pr-007-4-Fo-0005-4-RC-0037	Prepared by: Nam HA, Chau VNB	Date: 3-Jun-2024
Project (or Product) Name: Pump Combiner	Project No. (if any):	

Attendance: Nam HA, Chau VNB, Van PNT, Ly HC

Distribute to: o PRE o QAE o MDP o DES o PTE o PLN o TRC o Other: ……

Purpose of meeting: Review product specification of Pump combiner product

Comment (if any):

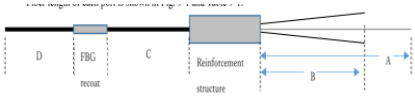
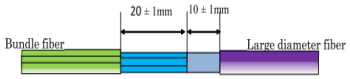
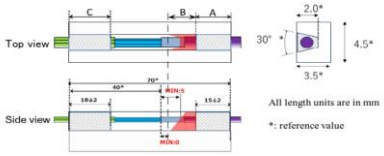
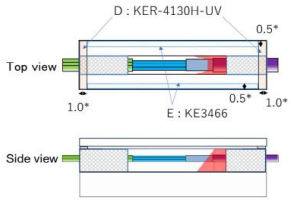
Specification no.: SPC3-10747(2)

Reference document:

1. List out all requirements from customer specification

1.1 List out all requirements from product specification, method and man (added requirement for operator's skill if any)

No.	Product specification, method and man requirement items	Action	Reference document (Spec No., page No., other source)	PIC	Due date	Status
1	Thermal inspection follow customer specification Table 5-1 Requirement of Optical specification Major Item / Minor Item / adoption / unit / Specification Min Max / Comment Temperature rise rate: Large diameter fiber Coating, Resin — common — ˚C/kW — 53.2 — [1] Fiber glass area — common — ˚C/kW — 56.8 — [1] Bundle Fiber Coating, Resin — common — ˚C/kW — 54.5 — [1] Large diameter fiber outside the reinforcement structure — common — ˚C/kW — 16.0 — [1] Bundle fiber outside the reinforcement structure — common — ˚C/kW — 21.5 — [1] Temperature: Fibers — common — ˚C — 80.0 — [1] However, local temperature rise at the location of abnormal appearance must be judged as fail. See SPC3-10749 FBG recoat — common — ˚C — 110.0 — [1] Pump Transmittance — - — common — % — 97.5 — [1] [1] Pump Light source with current 24.5 A, 95%NA 0.44 and power 1437W or higher with specified fiber optics.	- Inspection by Thermal camera system (FPL Installation) - Calculate transmittance by software - Refer item 9 into 4-OP-0507 (OPERATION PROCEDURE OF PUMP COMBINER)	SPC3-10747(2), item 5	Nam HA	21-May	Done
2	Optical test condition follow customer specification Signal Transmittance — - — MPC-I-006-H — % — 80.0 — [2] - — MPC-I-006-C — % — 97.0 — [3] Clad and Core transmitted light ΔM2 — at room temperature — MPC-I-006-H — - — 0.20 — [3] MPC-I-006-C — - — 0.13 — [3] at 100 °C at front edge of the bundle-side KE3466 — MPC-I-006-C — 0.13 — [3] Core transmitted light ΔM2 — - — MPC-I-006-C — 0.13 — [3] [2] Design guarantee [3] Wideband SLD light source with specified fiber optics with M2 1.05 or less, power of 270μW or more, and center wavelength of 1170nm	- Inspection by SLD light source system (FPL Installation) - Calculate transmittance by software - Refer item 12 into 4-OP-0507 (OPERATION PROCEDURE OF PUMP COMBINER)	SPC3-10747(2), item 5	Nam HA	10-Apr	Done
3	Machenical strength follow customer specification Table 6-1 Tensile strength & Reinforcement tension Item / unit / Specification Min typ. Max / Conditions Tensile strength of bundle fusion splicing point — gf — 270 280 290 — Guaranteed by proofing before reinforcement Applying tension for 4±1 sec Reinforcement tension of bundle fusion splicing point — gf — 30 35 40	- Apply machanical strength by Reinforcement system - Check force by load cell - Refer item 7 into 4-OP-0507 (OPERATION PROCEDURE OF PUMP COMBINER)	SPC3-10747(2), item 5	Nam HA	10-Apr	Done
4	Visual inspection follow customer specification - Fiber appearance Refer SPC3-10749 - Neoceram folllow main customer specification	- Break down and make clear into process specification	SPC3-10747(2), item 7	Chau VNB	11-Apr	Done

5	Period from inspection date to shipping date les than 12 months	- Current method: Enginer review keep stock product before shipping (form: 000-9-WI-0178-9-Fo-0001) - Improvement : Control by label soft base on set up ECS constrainst (set up process need to check waiting time at FOV, if over 1 year lable software will alarm)	SPC3-10747(2), item 8	Chau VNB	20-Sep	On progress
6	Structure specification follow product specification 	- Make length A,B,D at QC process - Make length C at Reinforcement process and inspeciton length C at QC process	SPC3-10747(2), item 9	Nam HA	2-May	Done
7	Dimension component 	- Apply cleaver (have intruction for setting position) to control length for bundle fiber & FBG fiber	SPC3-10747(2), item 10	Nam HA	10-May	Done
8	Dimension of resin 	- Apply template on jig for control at reinforcement process and resin dispensing	SPC3-10747(2), item 10	Nam HA	30-May	Done
9	Dimension of resin after sealing 	- Check appearance after sealing at assembly and Final inspection (length for only reference)	SPC3-10747(2), item 10	Nam HA	16-May	Done
10	Test report format Refer SPC3-10768 for detail	- Test report format reflect to test report form	SPC3-10747(2), item 13	Van PNT	24-May	Done
11	For areas where abnormalities in appearance are found, even though they are at the acceptable level, the location of the abnormal appearance shall be marked by attaching a specific polyimide tape to the actual fiber.	- Make clear requirement into process specificaiton	SPC3-10747(2), item 13	Chau VNB	26-Jul	Done
12	The FBG SN and fiber lot definitions listed in the Material report are shown in Table 7-1. Table 7-1. Definition of FBG SN and fiber lot Material / Definition of FBG SN or fiber lot / supplement Fiber (Made by Fujikura) / fiber lot : Fiber number on bobbin. / Post the supplier control number written on the actual item FBG (Made by Fujikura) / FBG SN : SN tagged with FBG / Post the supplier control number written on the actual item	- Reflect to incoming process specification	SPC3-10747(2), item 13	Chau VNB	26-Jul	Done
13	The packing material consists of an inner packing material and an outer packing material. The composition of the inner packing material is shown in Table 2-1, and the composition of the outer packing material is shown in Table 2-2.	Control by BOM list and apply label soft to control correct outer box	SPC3-10747(2), item 14	Chau VNB	26-Jul	Done
14	The required information of Product label is shown in Table 6-1. QR Code of label specification is shown in Table 6-2. An example of a product label is shown in Figure 6-1. FA No. | S/N Product Name Fig 6-1. Example of Product label Table 7-1. Required information of Outer box label Item / Information Customer / Customer name Customer order No. / Customer order no. P/O No. / PO no. FA number(P/N) / FA005011-001 Manufacturing Date / DD-Mmm-YYYY (Example: 10-Oct-2023) Cezanne Forward Pump CMB / Cezanne Forward Pump CMB Quantity (pcs) / xx Dimension (mm) / L x W x H of Outer Cardboard Weight (Kg) / Net and Gross weight Country of origin / MADE IN VIETNAM Order of Outer box in the PO / Outer box/Total outer box of the PO Note: Add the 3-digit revision number to the end of the FA number.	- Control by label master soft and cross check by process specification	SPC3-10747(2), item 14	Chau VNB	26-Jul	Done
15	Incoming Inspection (spec SPC3-10767) Table 2.1 Incoming Inspection item	Update to NCM for control Incoming require	SPC3-10747(2), item 15	Van PNT, Nam HA	24-May	Done

16	Requirement for quality assurance of Pump CMB (spec SPC3-10746) Item 2.4 Quality record 2-4. Quality record (Traceability) 2-4-1. Quality record Maintain records related to the items listed below and set up a management system that allows for quality audits in accordance with the preceding paragraph. ① Calibration records of measuring instruments* ② Manufacturing records (including inspection records and daily inspections) ③ Traceability of raw materials and parts ④ Defect record ⑤ Record of corrective actions ⑥ 4M change record ⑦ Records of worker education and training ⑧ Software and Program revision history ⑨ Changes in specified consumable materials	Update to FAM, ECS, BOM , ECS Incoming , E-NC system, CAPA soft, DMS , TRC soft	SPC3-10746(1), item 2.4	Nam HA	24-Jul	Done
17	Requirement for quality assurance of Pump CMB (spec SPC3-10746) List equipment no need calibration	Update status to FAM system	SPC3-10746(3), item 2.4	Hiep VV	24-Jul	Done
18	Requirement for quality assurance of Pump CMB (spec SPC3-10746) Item 6: Special process	Update to 4-Pr-006	SPC3-10746(3), item 6	Nam HA	31-Aug	On progress
19	Requirement for quality assurance of Pump CMB (spec SPC3-10746) Item 7: Table 2, Non-reusable case Table 2. Non-reusable parts/material list Parts: Non-reusable case Reinforcement structure & Lid: Any case. Resin: Any case. fiber cleaning solution: Already used. Fiber: Although it is recommended not to reuse, but if there is a risk of inventory shortages, it can be reused under the following conditions. If the fiber is reused, before reusing, it should be inspected for any defects in fiber appearance according to SPC3-10749 and whether it is expected to be longer after process flow than the length specified in the complete visual inspection. FBG: If less than the specified fiber length in FBG pretreatment process.	Update to WI - Instruction for Nonconforming	SPC3-10746(3), item 7	Nam HA, Chau VNB	23-Sep	On progress

1.2 List out all requirements from material specification

No.	Material requirement items	Action	Reference document (Spec No., page No., other source)	PIC	Due date	Status
1	Materia spec: Typical specification such as dimensions, storage conditions to be submited when required by customs or other external parties	Maker clear into document and udpate to DMS	SPC3-10747(2), item 4	Nam	26-Jul	Done

1.3 List out all requirements from machine and enviroment (if any)

No.	Machine and enviroment requirement items	Action	Reference document (Spec No., page No., other source)	PIC	Due date	Status
1	Manufacturing enviromental specification follow customer specification (Room temperater, Huminity and clean room class) Table 8-1 Manufacturing conditions Item: Room temperature; unit: °C; Specification Min 20 Max 28; Comment: Item: Humidity; unit: %; Specification Min 25 Max 80; Comment: Item: Clean room class; unit: Particles/ft³; Specification Max 100,000; Comment: Airborne particulate size 0.5μm	- Apply clean room condition , update to 4-Pr-014 - Temperature & humidity are controled by online sensor - Stopped process if fail	SPC3-10747(2), item 8	Nam HA	2-May	Done

2	Storage enviromental specification follow customer specification (Room temperater, Huminity and absolute huminity) Table 8-2 Storage conditions Item / unit / Specification Min typ. Max / Comment Room temperature / ˚C / 5.0 / 55.0 Absolute humidity / g/m³ / 29.0 Humidity / % / 90 Humidity / % / No condensation Storage period / Month / 12 / Period from inspection date to shipping date. [1]	- Apply clean room condition , update to 4-Pr-014 - Temperature & humidity are controled by online sensor - Stopped process if fail	SPC3-10747(2), item 8	Chau VNB	2-May	Done

2. Other requirements (not include in specification)

No.	Other requirement items	Action	Reference document (Spec No., page No., other source)	PIC	Due date	Status

PRE2 controlled