FUJIKURA FIBER OPTICS VIET NAM

Form: **0-PR-012-0-Fo-001**

POTENTIAL FAILURE MODE AND EFFECTS ANALYSIS

Ver: 13

Kind of FMEA: ○ Design FMEA ◉ Process FMEA

Product (or project) Name:
Cezanne Pump Combiner product

Product (or project) spec:
SPC3-10747(1)
SPC3-10766(1)

Members' signature: *(include 2 cross-function sections at least)*
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Customer's approval (if required):
Comment:
Signature and date:

FMEA Number: **0-PR-012-0-FO-001-4-RC-0187**
Version: 01

FMEA Original Date: 26 Feb 2024

FMEA Revision Date:

I. CONCLUSION:

By reviewing risk for manufacturing process , we see that:
- All the risks were controlled and applying current operation is enough.
===> Acceptance for mass production.

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II. ANALYSIS

Item number	Process	Requirements	Requirement classification	Potential Failure Mode	Potential Effect(s) of Failure	Severity	Potential Cause(s) / Failure Mechanism(s)	Occurrence	Current Design/ProcessControls (Prevention/Detection)	Detect	RPN	Final Decision	Responsibility & Target Completion Date	Actions Taken	Severity	Occurrence	Detect	RPN
1	Fiber cutting& bunding	Correct fiber type	(1) Customer's requirement/agreement	Swap pump fiber when preparing for signal fiber	Poor transmittance at fusion	3	Not check material code before cutting signal fiber	2	- Separate area for pump & signal fiber bobbin - Check fiber type, fiber lot by cutting plan software - Signal fiber has red mark to identify - Use red tape to identify after cutting	1	6	Risk acceptance			3	2	1	6
2	Fiber cutting& bunding	Correct fiber type	(1) Customer's requirement/agreement	Swap signal fiber when preparing for pump fiber	Possible fiber glass part heat generation failure	5	Not check material code before cutting pump fiber	2	- Separate area for pump & signal fiber bobbin - Check fiber type, fiber lot by cutting plan software - Use yellow tape to identify after cutting	1	10	Risk acceptance			5	2	1	10
3	Fiber cutting& bunding	Correct fiber length	(1) Customer's requirement/agreement	Surplus fiber cutting length	Affect to fiber bobbin stock	3	Set wrong position of marking when cutting	2	- Operator set marking position then Leader cross check - Cutting & record actual length 1 pcs/ID - Measure length and cutting length 100% at QC	1	6	Risk acceptance			3	2	1	6
4	Fiber cutting& bunding	Correct fiber length	(1) Customer's requirement/agreement	Short fiber cutting length	Can not apply in the field	3	Set wrong position of marking when cutting	2	- Operator set marking position then Leader cross check - Cutting & record actual length 1 pcs/ID - Measure length and cutting length 100% at QC	1	6	Risk acceptance			3	2	1	6
5	Fiber cutting& bunding	Bundle fiber arrangement with correct position	(1) Customer's requirement/agreement	Signal fiber & pump fiber arrange wrong position	Poor transmittance at fusion	3	Fiber is recognized wrong type	2	- Pump and signal fiber is stored in different tray to prevent swap - Signal fiber has red mark and red tape to identify - Use anti-tangle jig to separate signal fiber & pump fiber position	1	6	Risk acceptance			3	2	1	6
6	Fiber stripping	Removing all fiber coating	(2) Common standard	Fiber coating remove deeply	Reduce durablity of bare fiber	3	Gap blade (low blade height)	2	- Check bare fiber apperance after stripping - Apply proof test 100% after splicing	1	6	Risk acceptance			3	2	1	6
7	Fiber stripping	Removing all fiber coating	(2) Common standard	Can not remove completely	Possible fiber glass part heat generation failure	2	Gap blade (high blade height)	2	- Check bare fiber apperance after stripping - Check bare fiber appearance before thermal inspection	1	4	Risk acceptance			2	2	1	4
8	Fiber stripping	Stripping point cone shape	(1) Customer's requirement/agreement	Stripping point with NG shape	Possible fiber glass part heat generation failure	3	Worn blade	2	- Setting life time to replace new blade - Check apperance bare fiber before thermal inspection	1	6	Risk acceptance			3	2	1	6
9	Fiber stripping	Correct stripping length	(2) Common standard	Short stripping length	Can cut bare fiber at next process	2	Set wrong posion on stripper	1	- Make clear stripping position on process specification - Use holder to control position of fiber	1	2	Risk acceptance			2	1	1	2
10	Fiber stripping	Correct stripping length	(2) Common standard	Long stripping length	After to product total length	2	Set wrong posion on stripper	1	- Make clear stripping position on process specification - Use holder to control position of fiber - Measure length and cutting length 100% at QC	1	2	Risk acceptance			2	1	1	2
11	Bare fiber wiping & cleaving	Bare fiber cleanness	(1) Customer's requirement/agreement	Cannot remove bright spots	Possible fiber glass part heat generation failure	2	Apply weak force when cleaning	2	- Train and qualify operator before working at process - Check bare fiber cleaness before splicing	2	8	Risk acceptance			2	2	2	8
12	Bare fiber wiping & cleaving	Bare fiber cleanness	(1) Customer's requirement/agreement	Cannot remove bright spots	Possible fiber glass part heat generation failure	2	Coating is not removed completely	2	- Check bare fiber apperance after stripping - Train and qualify operator before working at process - Check bare fiber cleaness before splicing	2	8	Risk acceptance			2	2	2	8
13	Bare fiber wiping & cleaving	Bare fiber cleanness	(2) Common standard	Can not see bright spot	Fiber glass part heat generation failure	3	Red light is not stable	2	- Apply with power electric for light source to keep stable - Check bare fiber cleaness before splicing	2	12	Risk acceptance but need monitoring the result of risk			3	2	2	12

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14	Bare fiber wiping & cleaving	Bare fiber cleanness	(2) Common standard	Can not see bright spot	Fiber glass part heat generation failure	2	Can not identify bright spot	2	- Train and qualify operator before working at process - Apply with power electric for light source to keep stable - Apply magnifier to check bare fiber apperance - Check bare fiber cleaness before splicing	2	8	**Risk acceptance**			2	2	2	8
15	Bare fiber wiping & cleaving	Remain bare fiber with correct length	(1) Customer's requirement/agreement	Short bare fiber length after cutting	Affect product structure inside neoceram	2	Set wrong position of cleaver	2	- Make clear cutting position on process specification - Check appearance product structure inside neoceram at QC 100%	2	8	**Risk acceptance**			2	2	2	8
16	Bare fiber wiping & cleaving	Remain bare fiber with correct length	(1) Customer's requirement/agreement	Long bare fiber length after cutting	Affect product structure inside neoceram	2	Set wrong position of cleaver	2	- Make clear cutting position on process specification - Check appearance product structure inside neoceram at QC 100%	2	8	**Risk acceptance**			2	2	2	8
17	Bare fiber wiping & cleaving	Fiber angle cut in criteria	(2) Common standard	Fail angle fiber endface after cutting	Can not splicing between bundle side & FBG side	2	Worn blade	2	- Setting life time to replace new blade - Check angle 100% after cutting	2	8	**Risk acceptance**			2	2	2	8
18	Bare fiber wiping & cleaving	Fiber angle cut in criteria	(2) Common standard	Fail angle fiber endface after cutting	Can not splicing between bundle side & FBG side	2	Dust on cleaver	2	- Check & clean cleaver after cutting - Check angle 100% after cutting	2	8	**Risk acceptance**			2	2	2	8
19	Fiber stacking	Correct fiber order when stacking	(1) Customer's requirement/agreement	Swap pump fiber and signal fiber	Poor transmittance at fusion	3	Lack of skill in aligning operations	2	- Apply stacking plate to sperate fiber order and indentify when stacking	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
20	Fiber stacking	Correct fiber order when stacking	(1) Customer's requirement/agreement	Swap pump fiber and pump fiber	Reduce durablity of splicing point after splicing	2	Lack of skill in aligning operations	2	- Apply stacking plate to sperate fiber order and indentify when stacking - Apply proof test 100% after splicing	2	8	**Risk acceptance**			2	2	2	8
21	Fiber stacking	Fiber is stacked in a hexagonal shape	(1) Customer's requirement/agreement	Fiber stacking is crossing	Can not splicing between bundle side & FBG side	2	Lack of skill in aligning operations	2	- Train and qualify operator before working at process - Make clear instruction in document	2	8	**Risk acceptance**			2	2	2	8
22	Fiber stacking	Fiber appearance is good	(1) Customer's requirement/agreement	Fiber dent	Affect to appearance of product	2	Fiber mis alignment in holder	2	- Make clear instruction in document - Check fiber apperance 100% at QC inspeciton	2	8	**Risk acceptance**			2	2	2	8
23	Fiber stacking	Fiber appearance is good	(1) Customer's requirement/agreement	Fiber dent	Affect to appearance of product	2	Edge of the stacking jig pushes the fiber	2	- Make clear instruction in document - Check fiber apperance 100% at QC inspeciton	2	8	**Risk acceptance**			2	2	2	8
24	FBG fiber preparation	Removing all fiber coating	(2) Common standard	Fiber coating remove deeply	Reduce durablity of bare fiber	3	Gap blade (low blade height)	2	- Check the gap of blade when replace a new one - Check bare fiber apperance after stripping - Apply proof test 100% after splicing	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
25	FBG fiber preparation	Removing all fiber coating	(2) Common standard	Can not remove completely	Possible fiber glass part heat generation failure	2	Gap blade (high blade height)	2	- Check bare fiber apperance after stripping - Check bare fiber appearance before thermal inspection	2	8	**Risk acceptance**			2	2	2	8
26	FBG fiber preparation	Removing all fiber coating	(2) Common standard	Fiber coating remove deeply	Reduce durablity of bare fiber	3	Using wrong blade type	2	- Check the gap of blade when replace a new one - Check bare fiber apperance after stripping - Apply proof test 100% after splicing	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
27	FBG fiber preparation	Removing all fiber coating	(2) Common standard	Can not remove completely	Possible fiber glass part heat generation failure	2	Using wrong blade type	2	- Check bare fiber apperance after stripping - Check bare fiber appearance before thermal inspection	2	8	**Risk acceptance**			2	2	2	8
28	FBG fiber preparation	Removing all fiber coating	(2) Common standard	Fiber coating remove deeply	Reduce durablity of bare fiber	3	Mis alignmnet of blade	2	- Check the gap of blade when replace a new one - Apply daily checksheet to check blade - Check bare fiber apperance after stripping - Apply proof test 100% after splicing	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
29	FBG fiber preparation	Removing all fiber coating	(2) Common standard	Can not remove completely	Possible fiber glass part heat generation failure	2	Mis alignmnet of blade	2	- Check bare fiber apperance after stripping - Apply daily checksheet to check blade - Check bare fiber appearance before thermal inspection	2	8	**Risk acceptance**			2	2	2	8
30	FBG fiber preparation	Correct stripping length	(2) Common standard	Short stripping length	Can cut bare fiber at next process	2	Set wrong posion on stripper	1	- Make clear stripping position on process specification - Control stripping length by ruler on soft stripper	1	2	**Risk acceptance**			2	1	1	2
31	FBG fiber preparation	Correct stripping length	(2) Common standard	Long stripping length	After to product total length	2	Set wrong posion on stripper	1	- Make clear stripping position on process specification - Control stripping length by ruler on soft stripper - Measure length and cutting length 100% at QC	1	2	**Risk acceptance**			2	1	1	2
32	FBG fiber preparation	Bare fiber cleanness	(1) Customer's requirement/agreement	Cannot remove bright spots	Possible fiber glass part heat generation failure	2	Apply weak force when cleaning	2	- Train and qualify operator before working at process - Check bare fiber cleaness before splicing	2	8	**Risk acceptance**			2	2	2	8

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33	FBG fiber preparation	Bare fiber cleanness	(1) Customer's requirement/agreement	Cannot remove bright spots	Possible fiber glass part heat generation failure	2	Coating is not removed completely	2	- Check bare fiber apperance after stripping - Train and qualify operator before working at process - Check bare fiber cleaness before splicing	2	8	**Risk acceptance**			2	2	2	8
34	FBG fiber preparation	Bare fiber cleanness	(2) Common standard	Can not see bright spot	Fiber glass part heat generation failure	3	Red light is not stable	2	- Apply with power electric for light source to keep stable - Check bare fiber cleaness before splicing	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
35	FBG fiber preparation	Bare fiber cleanness	(2) Common standard	Can not see bright spot	Fiber glass part heat generation failure	2	Can not identify bright spot	2	- Train and qualify operator before working at process - Apply with power electric for light source to keep stable - Apply magnifier to check bare fiber apperance - Check bare fiber cleaness before splicing	2	8	**Risk acceptance**			2	2	2	8
36	FBG fiber preparation	Remain bare fiber with correct length	(1) Customer's requirement/agreement	Short bare fiber length after cutting	Affect product structure inside neoceram	2	Set wrong position of cleaver	2	- Make clear cutting position on process specification - Check appearance product structure inside neoceram at QC 100%	2	8	**Risk acceptance**			2	2	2	8
37	FBG fiber preparation	Remain bare fiber with correct length	(1) Customer's requirement/agreement	Long bare fiber length after cutting	Affect product structure inside neoceram	2	Set wrong position of cleaver	2	- Make clear cutting position on process specification - Check appearance product structure inside neoceram at QC 100%	2	8	**Risk acceptance**			2	2	2	8
38	FBG fiber preparation	Fiber angle cut in criteria	(2) Common standard	Fail angle fiber endface after cutting	Can not splicing between bundle side & FBG side	2	Worn blade	2	- Setting life time to replace new blade - Check angle 100% after cutting	2	8	**Risk acceptance**			2	2	2	8
39	FBG fiber preparation	Fiber angle cut in criteria	(2) Common standard	Fail angle fiber endface after cutting	Can not splicing between bundle side & FBG side	2	Dust on cleaver	2	- Check & clean cleaver after cutting - Check angle 100% after cutting	2	8	**Risk acceptance**			2	2	2	8
40	Bundle fusion splicing	Correct FBG side	(1) Customer's requirement/agreement	Fix wrong FBG side	Wrong product length	3	Not check FBG side when working	2	- Identify side by fiber label - Train and qualify operator before working at process - Make clear requirement into process secification - Can detect at QC inpection	1	6	**Risk acceptance**			3	2	1	6
41	Bundle fusion splicing	Correct FBG type	(1) Customer's requirement/agreement	Wrong FBG type	Not meet customer requirement	3	Not check FBG type when working	2	- Make clear requirement into process secification - Input material in ECS & can detect at process by software	1	6	**Risk acceptance**			3	2	1	6
42	Bundle fusion splicing	Fiber angle cut in criteria	(1) Customer's requirement/agreement	Fail angle fiber endface after cutting	Can not splicing between bundle side & FBG side	2	Worn blade	2	- Setting life time to replace new blade - Check angle 100% before splicing	2	8	**Risk acceptance**			2	2	2	8
43	Bundle fusion splicing	Fiber angle cut in criteria	(1) Customer's requirement/agreement	Fail angle fiber endface after cutting	Can not splicing between bundle side & FBG side	2	Dust on cleaver	2	- Check & clean cleaver after cutting - Check angle 100% before splicing	2	8	**Risk acceptance**			2	2	2	8
44	Bundle fusion splicing	Fiber endface is good	(1) Customer's requirement/agreement	Fiber endface chip out	Can not splicing between bundle side & FBG side	2	Fiber touch something during stransportion	2	- Apply tray to keep product - Fix bare fiber holder inside tray for pump and signal fiber - Use sponge to keep FBG fiber	1	4	**Risk acceptance**			2	2	1	4
47	Bundle fusion splicing	Bare fiber cleanness	(1) Customer's requirement/agreement	Dust attached on bare fiber	Fiber glass part heat generation failure	3	Insufficient cleaning of half-split pipes	3	- Cleaning half-split pipes 2 times/ week by specific chemical	1	9	**Risk acceptance**			3	3	1	9
48	Bundle fusion splicing	Bare fiber cleanness	(1) Customer's requirement/agreement	Dust attached on bare fiber	Fiber glass part heat generation failure	3	Lack of skill in half-split pipe insertion	3	- Train and qualify operator before working at process	1	9	**Risk acceptance**			3	3	1	9
49	Bundle fusion splicing	Bare fiber cleanness	(1) Customer's requirement/agreement	Dust attached on bare fiber	Fiber glass part heat generation failure	3	Ultrasonic cleaning condition error	1	- Make clear condition in document	2	6	**Risk acceptance**			3	1	2	6
45	Bundle fusion splicing	Good fiber position on splicer	(2) Common standard	Not good fiber position on splicer	Can not splicing between bundle side & FBG side	2	Foreign object on V-groove	2	Check & clean V-groove daily	2	8	**Risk acceptance**			2	2	2	8
46	Bundle fusion splicing	Good fiber position on splicer	(2) Common standard	Not good fiber position on splicer	Can not splicing between bundle side & FBG side	2	Fiber holder misalignment	2	Can detect if fiber holder have gap during working	2	8	**Risk acceptance**			2	2	2	8
50	Bundle fusion splicing	Bundle fiber arrangement in criteria	(1) Customer's requirement/agreement	Bundle fiber diameter is large	Fiber broken	3	Lack of skill in aligning operations	3	- Train and qualify operator before working at process - Judgement by software	1	9	**Risk acceptance**			3	3	1	9
51	Bundle fusion splicing	Bundle fiber arrangement in criteria	(1) Customer's requirement/agreement	Bundle fiber misalignment	Can not splicing between bundle side & FBG side	3	Lack of skill in aligning operations	3	- Train and qualify operator before working at process - Judgement by software	1	9	**Risk acceptance**			3	3	1	9

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52	Bundle fusion splicing	Bundle fiber arrangement in criteria	(1) Customer's requirement/agreement	Bundle fiber twist	Weak fusion point	2	Lack of skill in aligning operations	2	- Train and qualify operator before working at process - Check fusion strength by Reinforcement process	2	8	**Risk acceptance**			2	2	2	8
53	Bundle fusion splicing	Strong fusion point	(1) Customer's requirement/agreement	Fusion point broken	Not meet customer requirement	4	Lack of skill in aligning operations	3	- Train and qualify operator before working at process	1	12	**Risk acceptance but need monitoring the result of risk**			4	3	1	12
54	Bundle fusion splicing	Strong fusion point	(1) Customer's requirement/agreement	Fusion point broken	Not meet customer requirement	4	Handling method error when take out product	3	- Train and qualify operator before working at process	1	12	**Risk acceptance but need monitoring the result of risk**			4	3	1	12
55	Bundle fusion splicing	Strong fusion point	(1) Customer's requirement/agreement	Fusion point broken	Not meet customer requirement	4	Splicing machine is unsuitable	3	- Control by software - Check arc cablration 1 time/ week to ensure stability	1	12	**Risk acceptance but need monitoring the result of risk**			4	3	1	12
56	Bundle fusion splicing	Strong fusion point	(1) Customer's requirement/agreement	Fusion point reduce strength	Reduce product performance	3	Discharge conditions unsuitable	3	- Control by software - Check discharge power 1 time/ week - Check fusion strength by Reinforcement process	1	9	**Risk acceptance**			3	3	1	9
57	Bundle fusion splicing	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission after splicing	Reduce product performance	4	Signal fiber connection large	2	- Check angle connection by splicer	1	8	**Risk acceptance**			4	2	1	8
58	Bundle fusion splicing	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission after splicing	Reduce product performance	4	Wrong SCF winding diameter	2	- Fix SCF winding diameter by tape - Re-measure P0 when change SCF fiber	1	8	**Risk acceptance**			4	2	1	8
59	Bundle fusion splicing	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission after splicing	Reduce product performance	4	Side pressure is being applied to the SCF.	2	- Apply sub floor to have enough space to release fiber	1	8	**Risk acceptance**			4	2	1	8
60	Bundle fusion splicing	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission after splicing	Reduce product performance	4	SCF/FBG fiber fusion splicing condition error	2	- Fix splicing condition number on splicer & record instruction to document	1	8	**Risk acceptance**			4	2	1	8
61	Bundle fusion splicing	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission after splicing	Reduce product performance	4	Large loss at SCF output end face	2	- Check angle connection by splicer - Re-measure P0 when change SCF fiber	1	8	**Risk acceptance**			4	2	1	8
62	Bundle fusion splicing	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission after splicing	Reduce product performance	4	Power meter sensor surface has contamination	2	- Check & cleaning if dirty - Cover sensor when no-working	1	8	**Risk acceptance**			4	2	1	8
63	Bundle fusion splicing	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission after splicing	Reduce product performance	4	Large loss at exit end face at P0	2	Requirement: measure power multiple times at P0 and adopt the highest value.	1	8	**Risk acceptance**			4	2	1	8
64	Bundle fusion splicing	Signal transmission in criteria	(1) Customer's requirement/agreement	Signal transmission after splicing over 100%	Virtual data	3	Record P0 data wrong	2	- Re-measure P0 when signal transmission have issue	1	6	**Risk acceptance**			3	2	1	6
65	Reinforcement	Correct fiber position	(2) Common standard	Bundle fiber twist	Fiber broken	5	Lack of skill in arrangement operations	2	- Train and qualify operator before working at process - Make clear instruction in document	1	10	**Risk acceptance**			5	2	1	10
66	Reinforcement	Correct fiber position	(2) Common standard	Fiber is tilt & touch to neoceram	Not meet customer requirement	5	Fiber holder misalignment	2	- Check position of fiber holder during working	1	10	**Risk acceptance**			5	2	1	10
67	Reinforcement	Tension force in criteria	(1) Customer's requirement/agreement	Strong tension force at proof test	Fiber broken	5	Holder stuck on slides	2	- Check force value of reinforcement system when working	1	10	**Risk acceptance**			5	2	1	10
68	Reinforcement	Tension force in criteria	(1) Customer's requirement/agreement	Strong tension force at proof test	Fiber broken	5	Wrong force apply	2	- Check force value of reinforcement system when working	1	10	**Risk acceptance**			5	2	1	10
69	Reinforcement	Tension force in criteria	(1) Customer's requirement/agreement	Strong tension force at proof test	Fiber broken	5	Not check tension force	2	- Update require need check tension force to document - Train and qualify operator before working at process	1	10	**Risk acceptance**			5	2	1	10
70	Reinforcement	Tension force in criteria	(1) Customer's requirement/agreement	Weak tension force at proof test	Can not ensure reliability test	4	Weight rope is broken	2	- Check force value of reinforcement system when working	1	8	**Risk acceptance**			4	2	1	8
71	Reinforcement	Tension force in criteria	(1) Customer's requirement/agreement	Weak tension force at proof test	Can not ensure reliability test	4	Fiber holder loosen	2	- Check force value of reinforcement system when working	1	8	**Risk acceptance**			4	2	1	8
72	Reinforcement	Enough proof test time	(1) Customer's requirement/agreement	Longer time than requirement	Increase cycle time of process	2	Operation mistake	2	- Apply timer to record time	2	8	**Risk acceptance**			2	2	2	8
73	Reinforcement	Enough proof test time	(1) Customer's requirement/agreement	Shorter time than requirement	Can not ensure reliability test	3	Operation mistake	2	- Apply timer to record time	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
74	Reinforcement	Keep tension force for resin application step	(1) Customer's requirement/agreement	No apply tension force when fixing resin	Possible breakage in low temperature environment	3	Weight rope is broken	2	Checking load cell value each time before working at process	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
75	Reinforcement	Keep tension force for resin application step	(1) Customer's requirement/agreement	No apply tension force when fixing resin	Possible breakage in low temperature environment	3	Forgot to check tension	2	- Checking load cell value each time when working - Train and qualify operator before working at process - Update photo of clamp position on table	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
76	Reinforcement	Keep tension force for resin application step	(1) Customer's requirement/agreement	Apply strong tension force when fixing resin	Long-term reliability degradation	3	Forgot to check tension	2	- Checking load cell value each time when working - Train and qualify operator before working at process - Update photo of clamp position on table	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
77	Reinforcement	Good appearance of neoceram	(1) Customer's requirement/agreement	Neoceram dirty	Cause appearance defect	3	Cleaning liquid dirt	2	-Make requirement change cleaning liquid 1 time/ day	1	6	**Risk acceptance**			3	2	1	6

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78	Reinforcement	Good appearance of neoceram	(1) Customer's requirement/agreement	Neoceram dirty	Cause appearance defect	3	Forgot cleaning neoceram before input at process	2	- Update cleaning step to document	1	6	**Risk acceptance**			3	2	1	6
79	Reinforcement	Good appearance of neoceram	(1) Customer's requirement/agreement	Scratches or chips inside of neoceram	Cause appearance defect	3	Can not identify defect	2	- Apply magnifier to support - Train and qualify operator by sample	1	6	**Risk acceptance**			3	2	1	6
80	Reinforcement	Good resin application	(1) Customer's requirement/agreement	Foreign object in resin	Cause appearance defect	2	Syringe needle have contamination	2	- Check appearance before using - Remove first resin amount before apply to product	1	4	**Risk acceptance**			2	2	1	4
81	Reinforcement	Good resin application	(1) Customer's requirement/agreement	Insufficient resin hardening	Cause fiber broken at process	5	Forget turn on heater and removed from the reinforcer within a short period of time	2	- Train and qualify operator before working at process - Update instruction in document - Add label to identify curing time	1	10	**Risk acceptance**			5	2	1	10
82	Reinforcement	Good resin application	(1) Customer's requirement/agreement	Insufficient resin hardening	Cause fiber broken at process	5	Wrong temperature setting	2	- Fix temperature setting on system - Update instruction in document	1	10	**Risk acceptance**			5	2	1	10
83	Reinforcement	Good resin application	(1) Customer's requirement/agreement	Resin attached to bare fiber	Failure to generate heat	3	Lack of skill in resin application	2	- Train and qualify operator before working at process	1	6	**Risk acceptance**			3	2	1	6
84	Reinforcement	Good resin application	(1) Customer's requirement/agreement	Resin amount not enough	M2 data may be affect	3	Lack of skill in resin application	2	- Apply template to control resin length	1	6	**Risk acceptance**			3	2	1	6
85	Reinforcement	Good resin application	(1) Customer's requirement/agreement	Resin amount over criteria	Coating length out of specification	3	Lack of skill in resin application	2	- Apply template to control resin length	1	6	**Risk acceptance**			3	2	1	6
86	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Hard resin is not enough	Resin flow into fusion point side	3	Mixing ratio not correct	2	- Apply balancer to control resin amount of resin	1	6	**Risk acceptance**			3	2	1	6
87	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Hard resin is not enough	Resin flow into fusion point side	3	Resin over expired date	2	- Add label to identify expired date on syringe	1	6	**Risk acceptance**			3	2	1	6
88	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Hard resin is not enough	Resin flow into fusion point side	3	Forget to turn heater ON	2	- Train and qualify operator before working at process - Can detect by checking temperature display	1	6	**Risk acceptance**			3	2	1	6
89	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Hard resin is not enough	Resin flow into fusion point side	3	Wrong temperature setting	2	- Fix temperature setting on system - Update condition in document	1	6	**Risk acceptance**			3	2	1	6
90	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Hard resin is not enough	Resin flow into fusion point side	3	Time for resin curing not enough	2	Apply timer to control	1	6	**Risk acceptance**			3	2	1	6
91	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Foreign object in resin	Cause appearance defect	3	Forget to attach cover to prevent contamination during process	2	- Train and qualify operator before working at process - Apply cleanbench	1	6	**Risk acceptance**			3	2	1	6
92	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Foreign object in resin	Cause appearance defect	3	Cup use for mixing has contamination	2	Not recycle cup Check cup appearance before using	1	6	**Risk acceptance**			3	2	1	6
93	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Foreign object in resin	Cause appearance defect	3	Syringe needle contamination	2	- Check appearance before using - Remove first resin amount before apply to product - Apply cleanbench	1	6	**Risk acceptance**			3	2	1	6
94	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Foreign object in resin	Cause appearance defect	3	Forget check appearance after resin application	2	- Train and qualify operator before working at process - Make clear requeirement in document - Apply cleanbench	1	6	**Risk acceptance**			3	2	1	6
95	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Resin not cover all bare fiber	Failure to generate heat	3	Not see resin cover all bare fiber or not	2	- Train and qualify operator before working at process - Check apperance resin 100% after curing	1	6	**Risk acceptance**			3	2	1	6
96	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Resin not cover all bare fiber	Failure to generate heat	3	Lack of skill in resin application	2	- Train and qualify operator before working at process - Check apperance resin 100% after curing	1	6	**Risk acceptance**			3	2	1	6
97	Resin dispensing	Good resin application	(1) Customer's requirement/agreement	Resin amount over criteria	M2 data may be affect	3	Lack of skill in resin application	2	- Train and qualify operator before working at process - Check apperance resin 100% after curing	1	6	**Risk acceptance**			3	2	1	6
98	Thermal Inspection	Bare fiber cleanness	(1) Customer's requirement/agreement	Dust attached on bare fiber	Fiber glass part heat generation failure	3	Red light is not stable	2	- Apply to change battery of red light daily	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
99	Thermal Inspection	Bare fiber cleanness	(1) Customer's requirement/agreement	Dust attached on bare fiber	Fiber glass part heat generation failure	3	Can not identify bright spot	2	- Train and qualify operator before working at process - Apply magnifier to support	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
100	Thermal Inspection	Fiber no damage	(1) Customer's requirement/agreement	Fiber crack before setting up step	Fiber glass part heat generation failure	4	Fiber touch to edge of base, jig	2	- Apply red light to check defect before inspection	2	16	**Risk acceptance but need monitoring the result of risk**			4	2	2	16
101	Thermal Inspection	Fiber no damage	(1) Customer's requirement/agreement	Fiber crack after setting up step	Fiber glass part heat generation failure	4	Fiber touch to edge of base, jig	2	- Check at inspection & found defect position with high temperature	1	8	**Risk acceptance**			4	2	1	8
102	Thermal Inspection	Fiber angle cut in criteria	(1) Customer's requirement/agreement	End face angle failure	Angle cut with high value	2	Worn blade	2	- Setting life time to replace new blade	2	8	**Risk acceptance**			2	2	2	8
103	Thermal Inspection	Fiber angle cut in criteria	(1) Customer's requirement/agreement	End face angle failure	Angle cut with high value	2	Fiber slippage due to sebum adhesion to grooves	2	Check & clean cleaver daily	2	8	**Risk acceptance**			2	2	2	8
104	Thermal Inspection	Correct P0 measurement	(1) Customer's requirement/agreement	Light source LDM failure	Light source LDM failure, production capacity reduced	3	Chiller water temperature out of specification	2	Check chiller water temperature before inspection	1	6	**Risk acceptance**			3	2	1	6
105	Thermal Inspection	Correct P0 measurement	(1) Customer's requirement/agreement	Light source LDM failure	Light source LDM failure, production capacity reduced	3	Insufficient LD cooling water	2	Alarm functions for flow meters and measurement software	1	6	**Risk acceptance**			3	2	1	6

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106	Thermal Inspection	Correct P0 measurement	(1) Customer's requirement/agreement	Light source fiber burnout	Fiber burnout in light source, production capacity reduced	3	Fiber crack when working	2	Re-check fiber temperature before storing in light source	1	6	**Risk acceptance**			3	2	1	6
107	Thermal Inspection	Correct P0 measurement	(1) Customer's requirement/agreement	Light source fiber burnout	Fiber burnout in light source, production capacity reduced	3	Bundle fiber position with close distance	2	Re-check bundle fiber position before storing in light source	1	6	**Risk acceptance**			3	2	1	6
108	Thermal Inspection	Correct P0 measurement	(1) Customer's requirement/agreement	Insufficient light source output	Increase cycle time of process	3	Large fusion point loss	2	Check splicing condition (program number) before splicing	1	6	**Risk acceptance**			3	2	1	6
109	Thermal Inspection	Correct P0 measurement	(1) Customer's requirement/agreement	Insufficient light source output	Increase cycle time of process	3	Large loss at final end face	2	Check angle cut before splicing	1	6	**Risk acceptance**			3	2	1	6
110	Thermal Inspection	Correct P0 measurement	(1) Customer's requirement/agreement	Insufficient light source output	Increase cycle time of process	3	Distance from light-receiving surface set error	2	Update setting distance to document	1	6	**Risk acceptance**			3	2	1	6
111	Thermal Inspection	Pump transmission in criteria	(1) Customer's requirement/agreement	Poor pump transmission	Reduce product performance	4	Large fusion point loss	2	Check splicing condition (program number) before splicing	2	16	**Risk acceptance but need monitoring the result of risk**			4	2	2	16
112	Thermal Inspection	Pump transmission in criteria	(1) Customer's requirement/agreement	Poor pump transmission	Reduce product performance	4	Large loss at final end face	2	Check angle cut before splicing	2	16	**Risk acceptance but need monitoring the result of risk**			4	2	2	16
113	Thermal Inspection	Pump transmission in criteria	(1) Customer's requirement/agreement	Poor pump transmission	Reduce product performance	4	Distance from light-receiving surface set error	2	Update setting distance to document	2	16	**Risk acceptance but need monitoring the result of risk**			4	2	2	16
114	Thermal Inspection	Pump transmission in criteria	(1) Customer's requirement/agreement	Poor pump transmission	Reduce product performance	4	Error in selection of light source cart No.	2	- Re-check cart no beofore selection - Re-measure in case wrong selection	2	16	**Risk acceptance but need monitoring the result of risk**			4	2	2	16
115	Thermal Inspection	Pump transmission in criteria	(1) Customer's requirement/agreement	Pump transmission over 100%	Virtual data	3	Record P0 data wrong	2	- Check cart no is correct or not - Re-measure P0 when pump transmission have issue	1	6	**Risk acceptance**			3	2	1	6
116	Thermal Inspection	Correct temperature range measurement	(1) Customer's requirement/agreement	Measure temperature have gap with actual	Reduce product performance	3	Thermal inspection system not good	2	- Check stability of thermal inspection system daily	1	6	**Risk acceptance**			3	2	1	6
117	Thermal Inspection	Correct temperature range measurement	(1) Customer's requirement/agreement	Measure temperature have gap with actual	Reduce product performance	3	Thermal camera not good	2	- Check stability of thermal camera monthly	1	6	**Risk acceptance**			3	2	1	6
118	Thermal Inspection	Correct temperature range measurement	(1) Customer's requirement/agreement	Measure temperature have gap with actual	Reduce product performance	3	Thermal coefficient not correct	2	- Check & record data in checksheet	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
119	Thermal Inspection	Identify abnormal point before inspection	(2) Common standard	Bright spot location not measured	Possible fiber burnout during inspection	4	Forget check appearance before inspection	2	- Train and qualify operator before working at process	1	8	**Risk acceptance**			4	2	1	8
120	Thermal Inspection	Identify abnormal point before inspection	(2) Common standard	Wrong position for fiber , neoceram	Misjudgment	3	Not check position after setting	2	- Update diagram setting to document & intruct operators	1	6	**Risk acceptance**			3	2	1	6
121	Thermal Inspection	Identify abnormal point before inspection	(2) Common standard	Cover plate remain on checking desk	Cover plate burn out	3	Forget to remove cover plate	2	After setting, confirm cover plate remain by thermal imaging	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
122	Thermal Inspection	Identify abnormal point before inspection	(2) Common standard	Neoceram Chips	Cause appearance defect	3	Strong force when fixing neoceram in groove	2	- Train and qualify operator before working at process	1	6	**Risk acceptance**			3	2	1	6
123	Assembly	Good appearance of resin	(1) Customer's requirement/agreement	Dust attached on resin	Cause appearance defect	3	Can not identify defect	2	- Train and qualify operator before working at process	1	6	**Risk acceptance**			3	2	1	6
124	Assembly	Good apperance of lid	(1) Customer's requirement/agreement	Glass lid scratch, chipping	Cause appearance defect	3	Can not identify defect	2	- Train and qualify operator before working at process	1	6	**Risk acceptance**			3	2	1	6
125	Assembly	Correct glass lid position	(1) Customer's requirement/agreement	Wrong setting position on gripping jig	Cause appearance defect	3	Loosen fixing screw	2	Can detect when check function during working at process	1	6	**Risk acceptance**			3	2	1	6
126	Assembly	Correct glass lid position	(1) Customer's requirement/agreement	Wrong fixing of neoceram	Cause appearance defect	3	Low pressing of vacuum pump	2	Checking daily for vacuum pump	1	6	**Risk acceptance**			3	2	1	6
127	Assembly	Good resin application	(1) Customer's requirement/agreement	UV resin amount not enough	Contamination can go inside reinforcement structure	3	Lack of skill in resin application	2	- Train and qualify operator before working at process - Check resin appearance after fixing lid & neoceram	1	6	**Risk acceptance**			3	2	1	6
128	Assembly	Good resin application	(1) Customer's requirement/agreement	UV resin amount over criteria	Cause appearance defect	3	Lack of skill in resin application	2	- Train and qualify operator before working at process - Check resin appearance after fixing lid & neoceram	1	6	**Risk acceptance**			3	2	1	6
129	Assembly	Good resin application	(1) Customer's requirement/agreement	UV resin uncured	Resin flow into fiber glass part	3	Short UV irradiation time	2	- Set time in UV system & check function daily	1	6	**Risk acceptance**			3	2	1	6
130	Assembly	Good resin application	(1) Customer's requirement/agreement	UV resin uncured	Resin flow into fiber glass part	3	Wrong UV light head setting	2	- Fixing screw to control height from UV light head to surface jig - Update control requirement to document - Re-measure length & fix screw again in case we change it	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12

Item number	Process	Requirements	Requirement classification	Potential Failure Mode	Potential Effect(s) of Failure	Severity	Potential Cause(s) / Failure Mechanism(s)	Occurrence	Current Design/ProcessControls (Prevention/Detection)	Detect	RPN	Final Decision	Responsibility & Target Completion Date	Actions Taken	Severity	Occurrence	Detect	RPN 5
131	Assembly	Good resin application	(1) Customer's requirement/agreement	Resin not attached to bare fiber	Failure to generate heat	3	Lack of skill in resin application	2	- Train and qualify operator before working at process - Check resin appearance after fixing lid & neoceram	1	6	**Risk acceptance**			3	2	1	6
132	Assembly	Resin cover all gap between lid & neoceram	(1) Customer's requirement/agreement	Lack of heat dissipation resin (1 side)	Contamination can go inside reinforcement structure	3	Forget to rotation to other side for neoceram	2	- Train and qualify operator before working at process - Can detect when check appearance after lid closing	1	6	**Risk acceptance**			3	2	1	6
133	Assembly	Resin cover all gap between lid & neoceram	(1) Customer's requirement/agreement	Lack of heat dissipation resin (2 side)	Contamination can go inside reinforcement structure	3	Forget application step	1	- Train and qualify operator before working at process - Can detect when check appearance after lid closing	1	3	**Risk acceptance**			3	1	1	3
134	Assembly	No dust attached on bare fiber	(1) Customer's requirement/agreement	Dust attached on bare fiber	Heat generation failure	3	New dust attached before lid closing	2	- Check contamination on bare fiber before lid closing - Check dust history record	1	6	**Risk acceptance**			3	2	1	6
135	Optical measurement	Correct ΔM2 data	(1) Customer's requirement/agreement	ΔM2 data has worse value	Increase cycle time of process	3	There's side pressure in the fiber routing.	2	- Layout working table with enough space to release fiber	1	6	**Risk acceptance**			3	2	1	6
136	Optical measurement	Correct ΔM2 data	(1) Customer's requirement/agreement	ΔM2 data has worse value	Increase cycle time of process	3	Large fusion splicing angle for light source and signal fiber	2	Check angle cut before splicing	1	6	**Risk acceptance**			3	2	1	6
137	Optical measurement	Correct ΔM2 data	(1) Customer's requirement/agreement	ΔM2 data has worse value	Increase cycle time of process	3	Wrong light source and signal fiber fusion splicing conditions	2	- Fix splicing condition to program number on splicer & update instruction to document	1	6	**Risk acceptance**			3	2	1	6
138	Optical measurement	Correct ΔM2 data	(1) Customer's requirement/agreement	ΔM2 data has worse value	M2 Defective product outflow	3	Light source M2 is measured higher.	2	- Re-measure MS0 daily or when change SCF fiber	1	6	**Risk acceptance**			3	2	1	6
139	Optical measurement	Correct temperature apply	(1) Customer's requirement/agreement	Temperature special ΔM2 failure	Increase cycle time of process	3	Forgot to check heater temperature	2	Apply sensor to display temperature	1	6	**Risk acceptance**			3	2	1	6
140	Optical measurement	Correct temperature apply	(1) Customer's requirement/agreement	Temperature special ΔM2 failure	M2 Defective product outflow	3	Forgot to turn heater ON	2	Check & confirm temperature at this step when working	1	6	**Risk acceptance**			3	2	1	6
141	Optical measurement	Correct temperature apply	(1) Customer's requirement/agreement	Temperature special ΔM2 failure	M2 Defective product outflow	3	Insufficient contact between neoceram and copper components	2	Check by visual before measurement	1	6	**Risk acceptance**			3	2	1	6
142	Optical measurement	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission	Reduce product performance	4	Signal fiber connection large	2	- Check angle connection by splicer	2	16	**Risk acceptance but need monitoring the result of risk**			4	2	2	16
143	Optical measurement	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission	Reduce product performance	4	Wrong SCF winding diameter	2	- Fix winding diametr by tape - Update instruction for winding diameter to document	2	16	**Risk acceptance but need monitoring the result of risk**			4	2	2	16
144	Optical measurement	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission	Reduce product performance	4	Side pressure is being applied to the SCF.	2	- Layout working table with enough space to release fiber	2	16	**Risk acceptance but need monitoring the result of risk**			4	2	2	16
145	Optical measurement	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission	Reduce product performance	4	SCF/FBG fiber fusion splicing condition error	2	- Fix splicing condition to program number on splicer & update instruction to document	2	16	**Risk acceptance but need monitoring the result of risk**			4	2	2	16
146	Optical measurement	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission	Reduce product performance	4	Power meter sensor surface has contamination	2	- Check & cleaning when dirty - Cover sensor when no-working	2	16	**Risk acceptance but need monitoring the result of risk**			4	2	2	16
147	Optical measurement	Signal transmission in criteria	(1) Customer's requirement/agreement	Poor signal transmission	Reduce product performance	4	Large loss at exit end face at P0	2	- Measure power multiple times at P0 and adopt the highest value.	1	8	**Risk acceptance**			4	2	1	8
148	Optical measurement	Signal transmission in criteria	(1) Customer's requirement/agreement	Signal transmission after splicing over 100%	Virtual data	3	Record P0 data wrong	2	- Re-measure P0 when signal transmission have issue	1	6	**Risk acceptance**			3	2	1	6
149	Final Inspection	Correct fiber length	(1) Customer's requirement/agreement	Surplus fiber length	Inconvenience for operation in final customer	1	Wrong cutting instruction	2	OP cut length follow template which is created and cross-checked by two different person	3	6	**Risk acceptance**			1	2	3	6
150	Final Inspection	Correct fiber length	(1) Customer's requirement/agreement	Lack of fiber length	Affect to rework number of final product	2	Wrong cutting instruction	2	- Specify the maximum rework times in PS	3	12	**Risk acceptance but need monitoring the result of risk**			2	2	3	12
151	Final Inspection	Correct fiber length	(1) Customer's requirement/agreement	Lack of fiber length	Affect to rework number of final product	2	Rework many times at process before	2	- Specify the maximum rework times in PS	3	12	**Risk acceptance but need monitoring the result of risk**			2	2	3	12

Item number	Process	Requirements	Requirement classification	Potential Failure Mode	Potential Effect(s) of Failure	Severity	Potential Cause(s) / Failure Mechanism(s)	Occurrence	Current Design/ProcessControls (Prevention/Detection)	Detect	RPN	Final Decision	Responsibility & Target Completion Date	Actions Taken	Severity	Occurrence	Detect	RPN 5
152	Final Inspection	Overlap area of recoating resin is sufficient	(1) Customer's requirement/agreement	Exposure of recoating resin	heat generation failure	3	Overlook defect	2	Defect description clearly in PS	3	18	**Must take countermeasure and then evaluate the risk again**			3	2	3	18
153	Final Inspection	No dust attached on bare fiber	(1) Customer's requirement/agreement	Dust attached on bare fiber	heat generation failure	3	Overlook defect	2	- Check dust history record - Qualified OP with actual sample of NG/OK - Inspection under microscope	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
154	Final Inspection	Good appearance of resin	(1) Customer's requirement/agreement	Dust attached on resin	heat generation failure	3	Overlook defect	2	- Check dust history record - Qualified OP with actual sample of NG/OK - Inspection under microscope	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
155	Final Inspection	Good appearance of neoceram	(1) Customer's requirement/agreement	Dust inside neoceram	Maybe cause heat generation failure (low risk)	2	Overlook defect	2	- Check dust history record - Qualified OP with actual sample of NG/OK - Inspection under microscope	2	8	**Risk acceptance**			2	2	2	8
156	Final Inspection	Good apperance of lid	(1) Customer's requirement/agreement	Glass lid is chipping	Break lid, insufficiently protect fusion splicing point	3	Overlook defect	2	- Inspection under magnifier - Qualified OP with actual sample of NG/OK	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
157	Final Inspection	Good appearance of neoceram	(1) Customer's requirement/agreement	Neoceram is chipping (Groove area)	Break neoceram	3	Overlook defect	2	- Inspection under magnifier - Qualified OP with actual sample of NG/OK	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
158	Final Inspection	Good appearance of neoceram	(1) Customer's requirement/agreement	Neoceram is chipping (except for Groove area)	Break neoceram	3	Overlook defect	2	- Inspection under magnifier - Qualified OP with actual sample of NG/OK	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
159	Final Inspection	Good appearance of fiber	(1) Customer's requirement/agreement	Fiber damaged	heat generation failure	3	Overlook defect	2	- Green light inspection - Qualified OP with actual sample of NG/OK	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
160	Individual packing	Good appearance of packing tray	(3) FOV internal requirement	Tray are dust	Dust attached to product	2	Re-use packing tray	2	- Air gun/ Cleaning by paper before using	2	8	**Risk acceptance**			2	2	2	8
161	Individual packing	Good appearance of packing tray	(3) FOV internal requirement	Tray are scratch, deform	May cause appreance defect on fiber	3	Re-use packing tray	2	Check before using	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
162	Individual packing	Enough quantity of sponge	(1) Customer's requirement/agreement	Lack of sponge	Insufficiently protect product	3	OP mistake	2	Quantity control by Jig	2	12	**Risk acceptance but need monitoring the result of risk**			3	2	2	12
163	Individual packing	Good appearance of sponge	(3) FOV internal requirement	Sponge deform	Insufficiently protect product	2	Re-use sponge	2	Check before using	2	8	**Risk acceptance**			2	2	2	8
164	Individual packing	Correct Pigtail winding diameter	(3) FOV internal requirement	Wrong Pigtail winding diameter	Cause packing into tray difficultly	2	OP mistake	2	Winding by jig	2	8	**Risk acceptance**			2	2	2	8
165	Individual packing	FBG label existence	(1) Customer's requirement/agreement	Lack of FBG label	Unsatisfied customer	3	OP overlook	1	- Don't remove label throughout PRD proces - QC check	2	6	**Risk acceptance**			3	1	2	6
166	Individual packing	Content of product label is correct	(1) Customer's requirement/agreement	Wrong content	Wrong identification/Inconvenience for customer	2	Overlook defect	1	Check before pasting	3	6	**Risk acceptance**			2	1	3	6
167	Individual packing	Good Appearance of label	(3) FOV internal requirement	Dust/unclear information on lable	Inconvenience for customer	1	Overlook defect	1	Check before pasting, readable level is acceptable	3	3	**Risk acceptance**			1	1	3	3
168	Individual packing	Correct position of label	(1) Customer's requirement/agreement	Wrong label position	Inconvenience for customer	1	OP mistake	1	Specify pasting position in PS	3	3	**Risk acceptance**			1	1	3	3
169	Outer packing	Correct type of carton box	(1) Customer's requirement/agreement	Wrong carton box type	Insufficiently protect product	2	OP mistake	1	Check before packing, only one kind of packing box	2	4	**Risk acceptance**			2	1	2	4
170	Outer packing	Good Apprearance of carton box	(3) FOV internal requirement	Carton box is defom	Insufficiently protect product	2	Overlook defect	1	Check before packing	2	4	**Risk acceptance**			2	1	2	4
171	Outer packing	Correct product quantity in carton box	(1) Customer's requirement/agreement	Wrong product quantity	Unsatisfied customer	3	OP mistake	1	Control quantity by label software	1	3	**Risk acceptance**			3	1	1	3
172	Outer packing	Content of carton box label is correct	(1) Customer's requirement/agreement	Wrong content	Wrong identification/Inconvenience for customer	2	Overlook defect	1	Check before pasting	3	6	**Risk acceptance**			2	1	3	6
173	Outer packing	Good Appearance of carton box label	(3) FOV internal requirement	Dust/unclear information on lable	Inconvenience for customer	1	Overlook defect	1	Check before pasting, readable level is acceptable	3	3	**Risk acceptance**			1	1	3	3
174	Outer packing	Correct position of label	(1) Customer's requirement/agreement	Wrong label position	Inconvenience for customer	1	OP mistake	1	Specify pasting position in PS	3	3	**Risk acceptance**			1	1	3	3
175	Outer packing	Storage condition is in specification	(1) Customer's requirement/agreement	Storage condition over specification	May cause dow level of product quality	3	Storage product incorrectly	1	- Thermal & humidity recorder - Thermal & humidity monitoring by system	1	3	**Risk acceptance**			3	1	1	3
176	Shipment	Pick up correct P/O number	(3) FOV internal requirement	Wrong product ship to customer	Unsatisfied customer	3	OP mistake	1	Control by software	1	3	**Risk acceptance**			3	1	1	3

Noted:

Severity: An assessment of the seriousness of the effect (as listed in the previous column) of the potential failure mode to the next components, subsystem, system, or customer if it occurs. Severity applies to the effect only.

Occurrence: This is the likelihood that a specific cause/mechanism (as listed in the previous column) will occur. Like severity, occurrence uses a ranking number.

Item number	Process	Requirements	Requirement classification	Potential Failure Mode	Potential Effect(s) of Failure	Severity	Potential Cause(s) / Failure Mechanism(s)	Occurrence	Current Design/ProcessControls (Prevention/Detection)	Detect	RPN	Final Decision	Responsibility & Target Completion Date	Actions Taken	Severity	Occurrence	Detect	RPN 5

Detect: Assessment of the ability of the current design controls to detect a potential design weakness.

Requirement classification: sellect 1 of 3 options: (1)Customer's requirement/agreement, (2)Common standard, (3)FOV internal requirement

FUJIKURA FIBER OPTICS VIETNAM LTD.

POTENTIAL FAILURE MODE AND EFFECTS ANALYSIS

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FMEA'S REVISION HISTORY

Preparing Date	PIC	Ver	Old content	New content		
				Description	Reason of change	Change requester
26-Feb-24	Nam HA	1	-	New content	-	-