FUJIKURA FIBER OPTICS VIETNAM LTD.

TECHNICAL REPORT

Form: 4-Pr-007-4-Fo-0006	Version: 02	Page: 1/6	4-Pr-007-4-Fo-0006/2

Record No (get by EIC program): 4-Pr-007-4-Fo-0006-5-RC-0012 | Date: 04-Oct-2024

Report title: Technical report for modification of auto stripping machine

Prepared by: VuiNV	Checked by: TuanHT	Reviewed by Technical Advisor (if any)	Approved by: ThongHN
Vui 10912 04-Oct-2024	Tuan 10627 08-Oct-2024		08/Oct-24

I. Background:

1. Current

Currently, the auto stripping machine can strip fiber normally. But after amount of stripping time, the machine will not stripping smoothly. Two main issues is "Stripping fiber without peeling" and "Counter error".

2. Suggestion

Redesign the machine with a new cleaning blade method to reduce these issues

II. Conclusion:

Base of the result of testing:

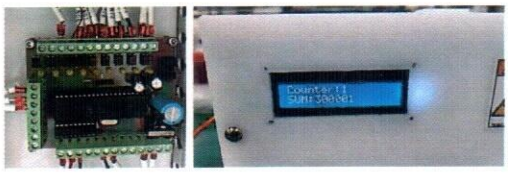
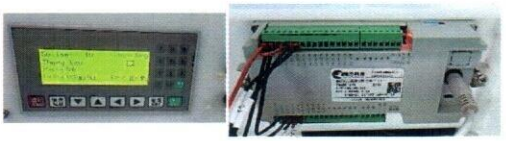
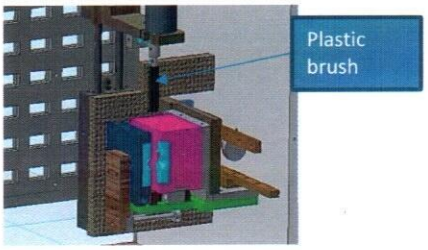
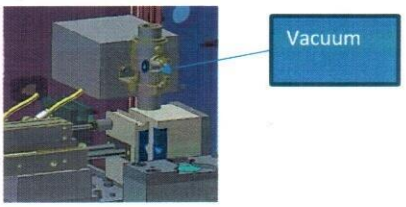
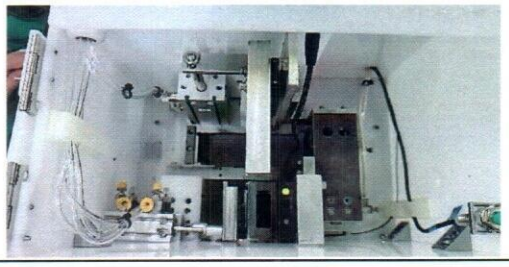
- New cleaning structure of auto strip machine doesn't affect to loss measurement result
- We can apply this method instead of current one.

III. Analysis (Yield ratio, Productivity, Cpk, Process Reliability, product's reliability...):

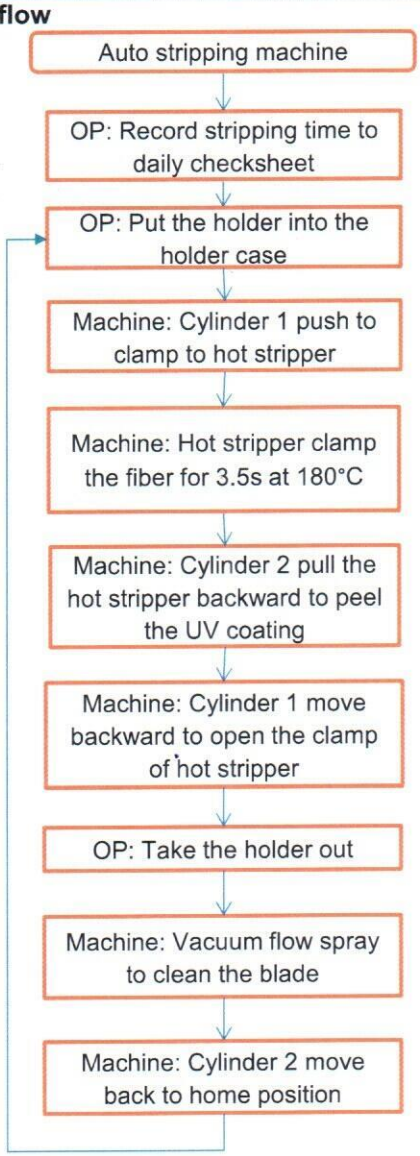
1. Machine requirement

- Input: + OP put the holder into the machine one by one manually (Similar to current machine)
  + Isolate the working space with eletrical area to eliminate UV stick on electrical component
  + Easy for OP to clean the inside space
  + Use a new effective cleaning method
- Output: + Bare fiber was stripped clearly with correct length, no have UV coating
  + The blade are cleanned better than current method

2. Design concept

Old version	New version
	
Use micro-controller to control the machine --> Lack of memory area --> Sometime occur "counter error" 	- Replace by PLC board intergrated HMI --> More stable --> HMI display more information --> Easy to monitor and repair 
- Machine clean the blade automactically by plastic brush --> Low performance --> Often have stripping without peeling error 	- Use a vacuum flow to spray directly to the blade automatically --> The blade is cleaned better --> Reduce bad effect to the blade by cleaning by plastic brush --> Reduce the consumtion cost of brush 
Eletrical and mechanical components in one space --> UV outer after stripping stick on components --> Difficult to clean 	Isolate electrical and mechanical components into 2 spaces --> Easy to clean inside space 

3. Workflow

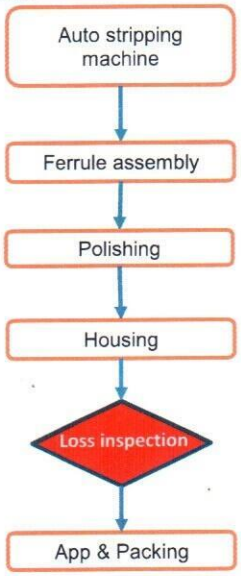


5,000 times: PTE inspect the blade and record image

10,000 times: PTE inspect the blade and pull test

4. Test result

Data



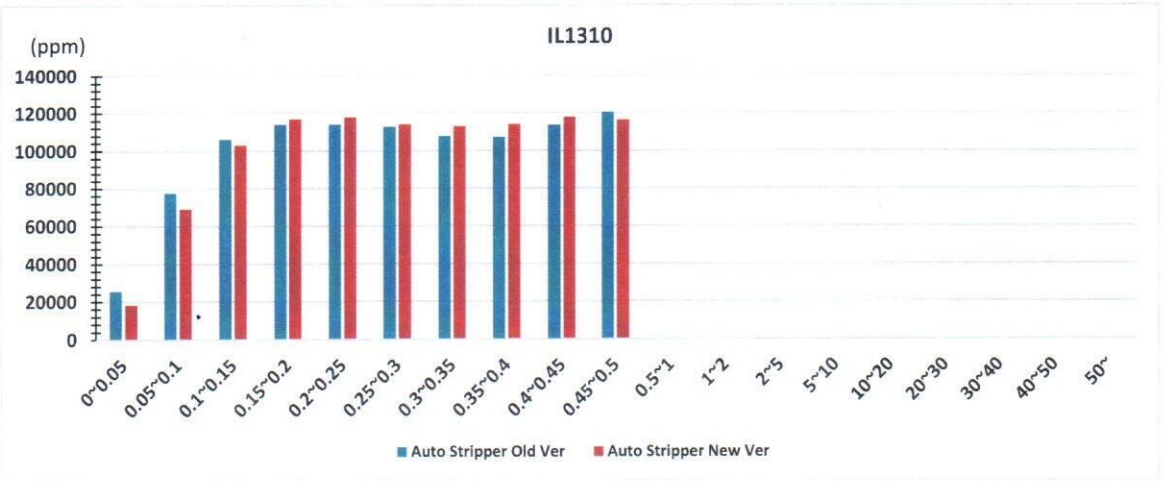
IL1310	Old version	New version
Min	0.01	0.01
Max	0.48	0.48
Average	0.27	0.28
Stdev	0.13	0.13
Cpu	0.58	0.59
Cpl	0.01	0.01
Cpk	0.58	0.59
Usl	0.50	0.50
Lsl	0.00	0.00

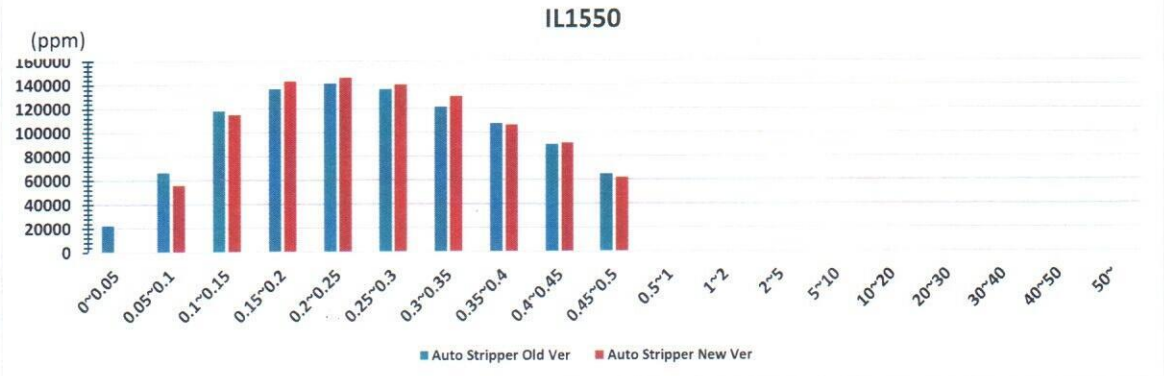
RL1310	Old version	New version
Min	50.10	50.10
Max	78.00	73.10
Average	54.65	55.01
Stdev	1.86	2.03
Cpu	4.36	3.93
Cpl	0.83	0.82
Cpk	0.83	0.82
Usl	79.00	79.00
Lsl	50.00	50.00

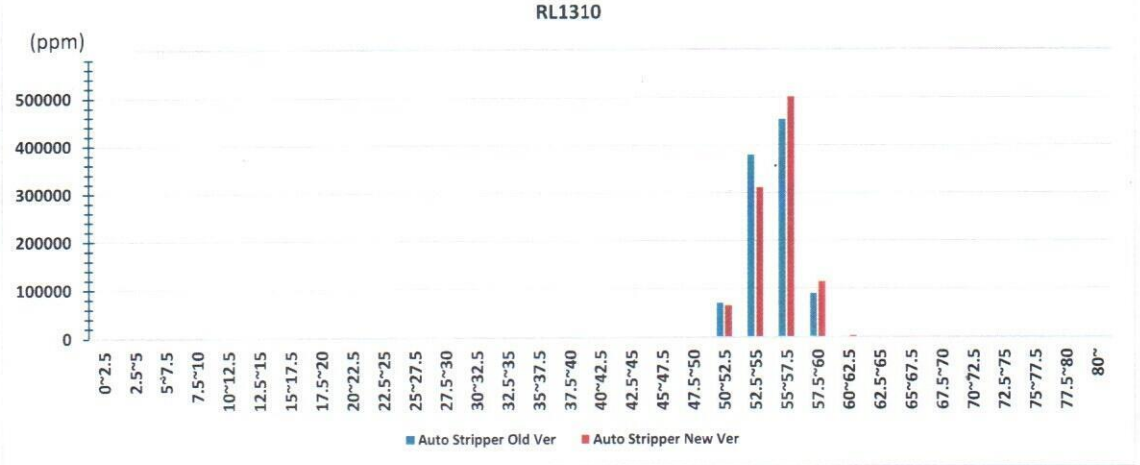
IL1550	Old version	New version
Min	0.01	0.01
Max	0.48	0.48
Average	0.26	0.26
Stdev	0.12	0.11
Cpu	0.69	0.70
Cpl	0.73	0.76
Cpk	0.69	0.70
Usl	0.50	0.50
Lsl	0.00	0.00

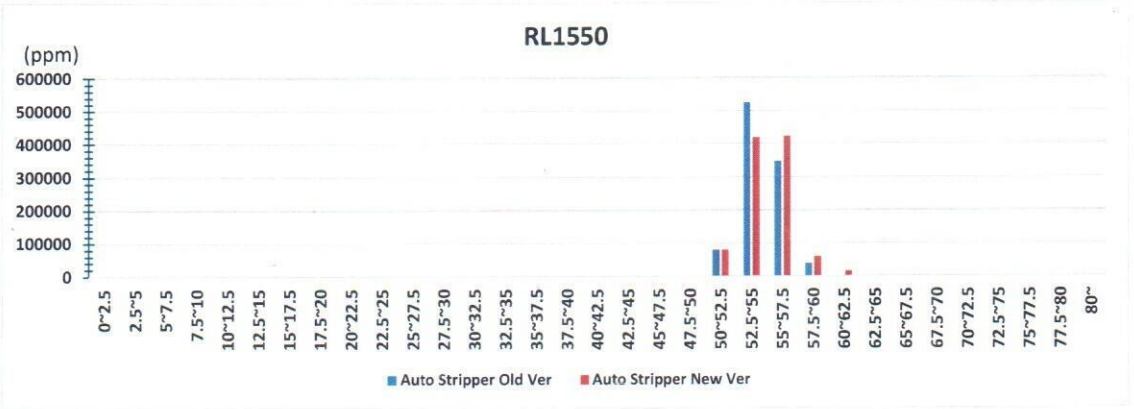
RL1550	Old version	New version
Min	50.10	50.10
Max	77.70	78.40
Average	55.23	55.46
Stdev	1.92	2.00
Cpu	4.12	3.92
Cpl	0.91	0.91
Cpk	0.91	0.91
Usl	79.00	79.00
Lsl	50.00	50.00

--> Value of insert loss and return loss of before modify and after modify are similar









IV. Appendix standardization (revised quality documentation):

Raw data

IL1310spec	IL1310Rng	Old version	New version
0	0~0.05	25545	18262
0.05	0.05~0.1	77599	68954
0.1	0.1~0.15	106474	103129
0.15	0.15~0.2	114035	116758
0.2	0.2~0.25	114001	117833
0.25	0.25~0.3	112802	113938
0.3	0.3~0.35	107940	113133
0.35	0.35~0.4	107507	114006
0.4	0.4~0.45	113735	117766
0.45	0.45~0.5	120362	116221
0.5	0.5~1	0	0
1	1~2	0	0
2	2~5	0	0
5	5~10	0	0
10	10~20	0	0
20	20~30	0	0
30	30~40	0	0
40	40~50	0	0
50	50~	0	0

IL1550Spec	IL1550Rng	Old version	New version
0	0~0.05	23054.562	0
0.05	0.05~0.1	66775.461	55928.56184
0.1	0.1~0.15	118230.87	115079.8979
0.15	0.15~0.2	136614.93	143010.6083
0.2	0.2~0.25	141144.34	145830.5358
0.25	0.25~0.3	136115.37	140123.5397
0.3	0.3~0.35	121428.1	130253.7935
0.35	0.35~0.4	107340.31	106150.1276
0.4	0.4~0.45	89788.85	91110.5143
0.45	0.45~0.5	65043.629	62105.54586
0.5	0.5~1	0	0
1	1~2	0	0
2	2~5	0	0
5	5~10	0	0
10	10~20	0	0
20	20~30	0	0
30	30~40	0	0
40	40~50	0	0
50	50~	0	0

RL1310Spec	RL1310Rng	Old version	New version
0	0~2.5	0	0
2.5	2.5~5	0	0
5	5~7.5	0	0
7.5	7.5~10	0	0
10	10~12.5	0	0
12.5	12.5~15	0	0
15	15~17.5	0	0
17.5	17.5~20	0	0
20	20~22.5	0	0
22.5	22.5~25	0	0
25	25~27.5	0	0

RL1550Spec	RL1550Rng	Old version	New version
0	0~2.5	0	0
2.5	2.5~5	0	0
5	5~7.5	0	0
7.5	7.5~10	0	0
10	10~12.5	0	0
12.5	12.5~15	0	0
15	15~17.5	0	0
17.5	17.5~20	0	0
20	20~22.5	0	0
22.5	22.5~25	0	0
25	25~27.5	0	0

27.5	27.5~30	0	0
30	30~32.5	0	0
32.5	32.5~35	0	0
35	35~37.5	0	0
37.5	37.5~40	0	0
40	40~42.5	0	0
42.5	42.5~45	0	0
45	45~47.5	0	0
47.5	47.5~50	0	0
50	50~52.5	79997	79361
52.5	52.5~55	525944	418424
55	55~57.5	348365	423056
57.5	57.5~60	39166	59353
60	60~62.5	1599	14838
62.5	62.5~65	1798	1477
65	65~67.5	1432	1410
67.5	67.5~70	766	1477
70	70~72.5	400	403
72.5	72.5~75	266	201
75	75~77.5	167	0
77.5	77.5~80	100	0
80	80~	0	0

27.5	27.5~30	0	0
30	30~32.5	0	0
32.5	32.5~35	0	0
35	35~37.5	0	0
37.5	37.5~40	0	0
40	40~42.5	0	0
42.5	42.5~45	0	0
45	45~47.5	0	0
47.5	47.5~50	0	0
50	50~52.5	70039.299	66134.0137
52.5	52.5~55	379937.39	311870.5519
55	55~57.5	453506.96	500805.6936
57.5	57.5~60	90454.939	114744.1923
60	60~62.5	1765.1369	2618.504096
62.5	62.5~65	1365.4832	1342.822613
65	65~67.5	1065.743	1007.11696
67.5	67.5~70	965.82961	469.9879146
70	70~72.5	499.56704	335.7056533
72.5	72.5~75	199.82682	402.8467839
75	75~77.5	166.52235	134.2822613
77.5	77.5~80	33.304469	134.2822613
80	80~	0	0

- PTE will make WI and CS for apply.
- PRE will make 4M change and initial control for mass production.

V. Others: