



WATERS Weekly FPY review (WW26 – 2018)

04 Jul 2018

Agenda

- 1. Scope of review and Alert Level.**
- 2. Open issues for discussion / follow up**
- 3. First Pass Yield (eAlliance and BSM/QSM)**
 - **Weekly FPY trending.**
 - **Hard failures review.**
- 4. Others**
 - **AOB**

Scope of review and Alert Level

Description

1) Scope of review

- Last week data, to look out for 'surge' and 'new failures' for Hard Failures (or Faulty Component).
- 13 weeks rolling data to be reviewed, including past actions.
- 20 Dec: To review the Event Log of all failures of previous week.
- 20 Dec: To focus on last week failure during weekly review (For info)
- 14 Mar: To include In-Process FPY for review, starting WW12'18.

2) Alert Level

- If exceeds average failure plus one Standard Deviation.
- New failures – 3 pieces and above in the same week or continuous for 3 weeks.

Open issues for discussion / follow up

Description	Owner	To complete by	Status
<u>1) Failure Analysis for Alliance GPV (PN WAT270524)</u> • 13Dec: 3pcs failures in WW47 and WW49, to peruse Failure Analysis reports from Parker • 23Jan: Parker has requested for time to react as they are re-locating. • 07 Feb: Flex can continue to peruse outstanding issues and push for RTV and FA. • 01 Mar: Flex reported seeing 3 x QSM GPV (PN 279001810) failure in WW09'18. Flex already provided Tracker for the 2 x GPV PN, and the email included Edwin, Randy in the loop • 14 Mar: to review the FA report urgently. Afternote- Flex compiled a power point on recent and outstanding FA and send on 27 Mar 2018. This report was also share during WW12 data review. • 03 Apr: Parker proposed to forward any reporting of faiures for returned product to Waters instead of Flex. • 01 May: Latest advise from WPPL: PPM for triggering an investigation would be anything greater than 15,000. • 08 May: Flex provided PPM, up to Apr 2018 usage. See next slide. • 18 May: Parker asked to screen SN 142125 to 142174, shipped in Mar'18. • 22 May: Flex responded already used up in early Apr'18. • 05 Jun: May 18 is 12,700 PPM	Flex - CFT	on going	Open

Open issues for discussion / follow up

PPM for Alliance GPV (PN WAT270524) (Aug 17 to May 18)

Month	186269505 and 186269506 Qty Build	Qty GPV Failure	% Failed	PPM (trigger if >15,000)	GPV SN	Instrument SN	Remarks
Aug-17	336	0	0.00%	-			Started to use Improvement lot from Parker
Sep-17	318	1	0.31%	3,145	(1) 128368	(1) J17SM7292A	(1) Sep 2017 : Solvent Inlet Plumbing Verification, Solvent A no water flow
Oct-17	416	0	0.00%	-			
Nov-17	340	2	0.59%	5,882	(1) 130412 (2) 130378	(1) L17SM4550A (2) L17SM4567A	(1) Nov 2017 : Solvent Inlet Plumbing Verification, Solvent B no water flow (2) Nov 2017 : Solvent Inlet Plumbing Verification, Solvent C and D no water flow
Dec-17	376	1	0.27%	2,660	(1) 130612	(1) L17SM4667A	(1) Dec 2017 : BD Chemistry test failed at final test
Jan-18	462	1	0.22%	2,165	(1) 131069	(1) A18SM4243A	(1) Jan 2018 : Solvent Inlet Plumbing Verification, Solvent A no water flow
Feb-18	361	3	0.83%	8,310	(1) 141457 (2) 141632 (3) 141671	(1) B18SM4522A (2) B18SM7778A (3) B18SM4588A	(1) Feb 2018 : Solvent Inlet Plumbing Verification, Solvent D no water flow (2) Feb 2018 : Solvent Inlet Plumbing Verification, Solvent C & Solvent D water flow in reverse direction (3) Feb 2018 : Solvent Inlet Plumbing Verification, Solvent B no water flow
Mar-18	400	5	1.25%	12,500	(1) 141980 (2) 142062 (3) 142045 (4) 141795 (5) 142078	(1) C18SM7836A (2) C18SM4732A (3) C18SM7877A (4) C18SM4682A (5) C18SM4839A	(1) Mar 2018 : Solvent Inlet Plumbing Verification, Solvent A no water flow (2) Mar 2018 : Chemistry Test, AC chemistry test failed (3) Mar 2018 : Solvent Inlet Plumbing Verification, Solvent B no water flow (4) Mar 2018 : Chemistry Test, BD chemistry test failed (5) Mar 2018 : BD Presicion Test, Failed at final test
Apr-18	352	7	1.99%	19,886	(1) 142173 (2) 142169 (3) 142168 (4) 142161 (5) 142167 (6) 142241 (7) 142303	(1) C18SM4947A (2) C18SM4902A (3) C18SM7906A (4) C18SM7915A (5) C18SM7913A (6) D18SM4994A (7) D18SM4021A	(1) Apr 2018 : Solvent Inlet Plumbing Verification, Solvent C & Solvent D water flow in reverse direction (2) Apr 2018 : Solvent Inlet Plumbing Verification, Solvent C & Solvent D water flow in reverse direction (3) Apr 2018 : Solvent Inlet Plumbing Verification, Solvent C & Solvent D water flow in reverse direction (4) Apr 2018 : Solvent Inlet Plumbing Verification, Solvent C & Solvent D water flow in reverse direction (5) Apr 2018 : Solvent Inlet Plumbing Verification, Solvent C & Solvent D water flow in reverse direction (6) Apr 2018 : BD Presicion Test, Failed at final test (7) Apr 2018 : Carryover test failed, No reading
May-18	394	5	1.27%	12,690	(1) 142823 (2) 143126 (3) 143191 (4) 143286 (5) 143201	(1) E18SM4309A (2) E18SM7010A (3) E18SM4387A (4) E18SM7035A (5) E18SM4424A	(1) May 2018 : Solvent C & Solvent D water flow in reverse direction (2) May 2018 : Solvent C no water flow (3) May 2018 : Solvent C no water flow (4) May 2018 : Solvent B no water flow (5) May 2018 : Solvent C no water flow

Note: Apr 2018 PPM exceed 15000

Open issues for discussion / follow up

Description	Owner	To complete by	Status
3) Ethernet Cable (PN 441001280) – reopen this issue • Background: WW52 – one cable found damaged and failed Final Test. • Proposal for improvement from CMTI – refer to next slides. • 01 May: To jointly review if to go ahead with this proposal. • 23 May: CMTi to provide samples in Mid Jun • 03 Jul: 2 x samples received. To send Milford with a current cable?	Flex	20 Jun 2018	Open

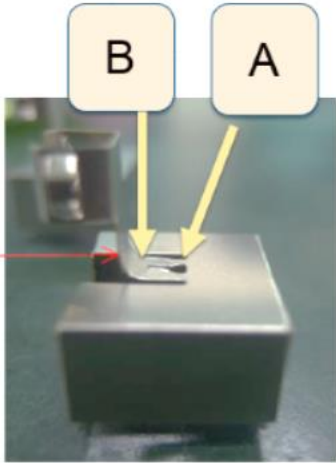
Quick Over view of proposal:



Failed part



Raw part before bent



A – current bending point
B – proposed bending point

03 Jul: Sample received:



Bending at "B"

2 samples - proposed method



Bending at "A"

1 sample - current method



WAT-441001280 (Ethernet Cable, supplier CMTi)

02 Apr 2018

WAT-441001280 (Ethernet Cable, supplier CMTi)

Problem Statement:

- WW52'18: one instrument (PN 186299800) failed Communication error. Investigation: after replace PN 441001280 (Ethernet Cable), the Instrument has passed.
- Further Investigation: it was found that the Grounding was broken (damaged)

Further Action:

- Flex invited supplier (CMTi) to Flex for discussion and to look into ways to improve the current situation.

WAT-441001280 (Ethernet Cable, supplier CMTi)

Information and Summary of Proposal from CMTi:

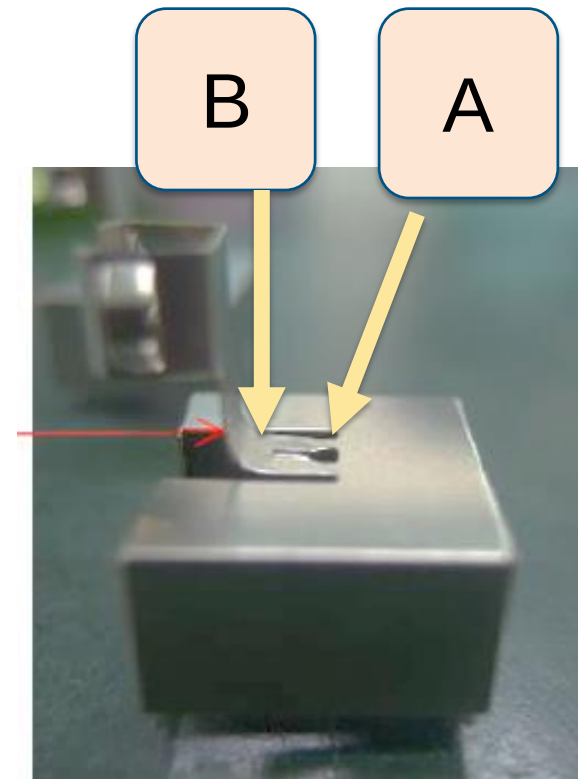
- CMTi reported that there is no failure reported at their outgoing since May 2017 (Qty tested: 9200 pcs)
- CMTi proposed to change the bending point.
- See Appendix A for more detail



Failed part



Raw part before bent



A – current bending point
B – proposed bending point

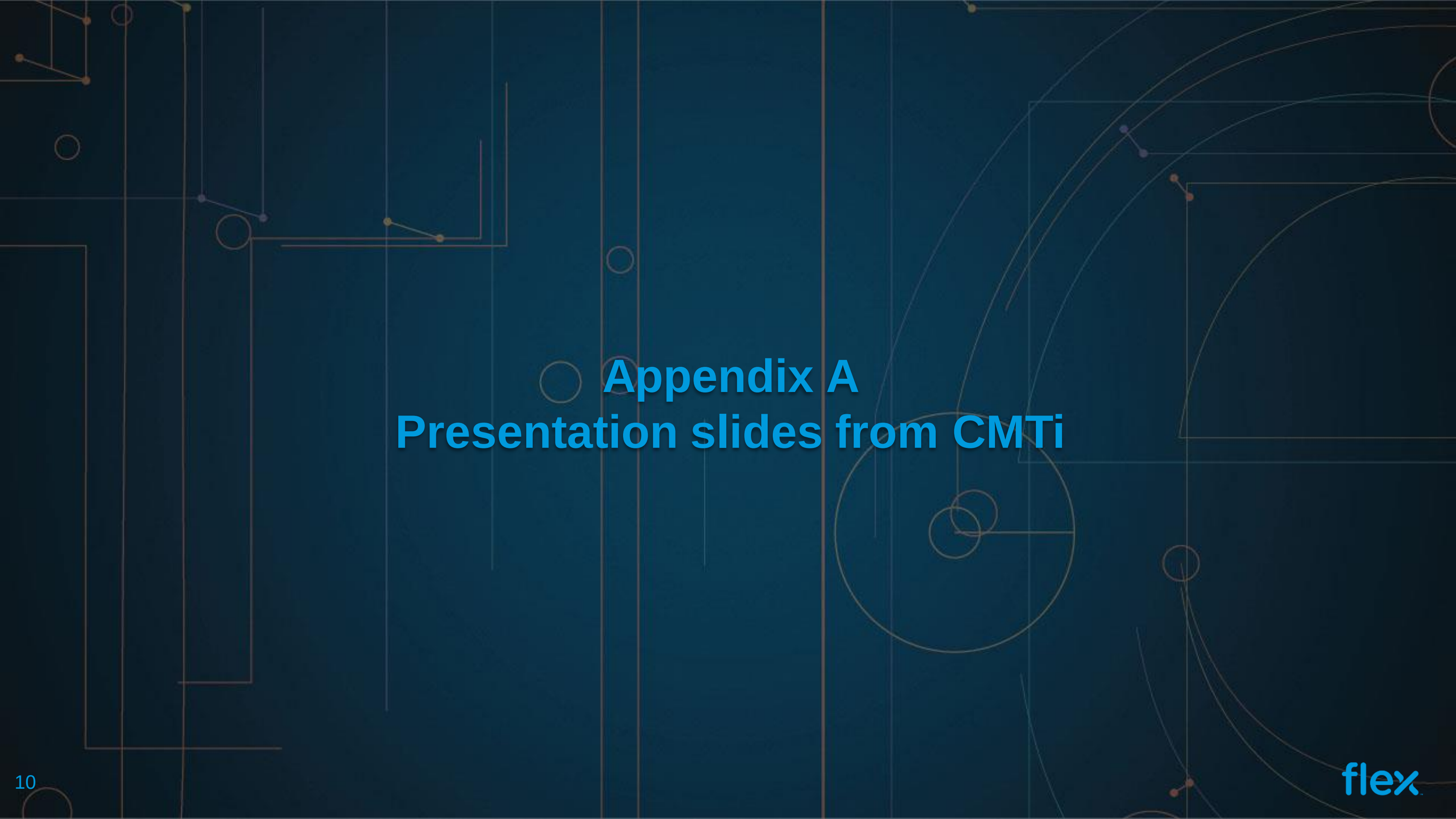
WAT-441001280 (Ethernet Cable, supplier CMTi)

Options:

- Option A – if we were to proceed with this change, CMTi will have to raise a PCN (Process Change Notice). A small qty for trail is proposed before implementation in mass production.
- Option B – no change is needed. Based on the performance the failure rate is relatively low.

Flex Comment:

- There is no failure in Feb 2018 and Mar 2018 (Total > 600 instrument build)
- As the occurrence (Ethernet cable failing) is low and random, Flex does not recommend to go ahead with this change (Option A).
- Flex recommends to further monitor the yield and keeping this proposal as an option for future discussion.

The background is a dark blue gradient with a complex pattern of thin, light blue lines and circles. Some lines are straight and vertical, while others are curved or form geometric shapes like rectangles and triangles. Small circles of various sizes are scattered throughout, some with dots inside them. The overall effect is a technical or architectural drawing style.

Appendix A

Presentation slides from CMTi

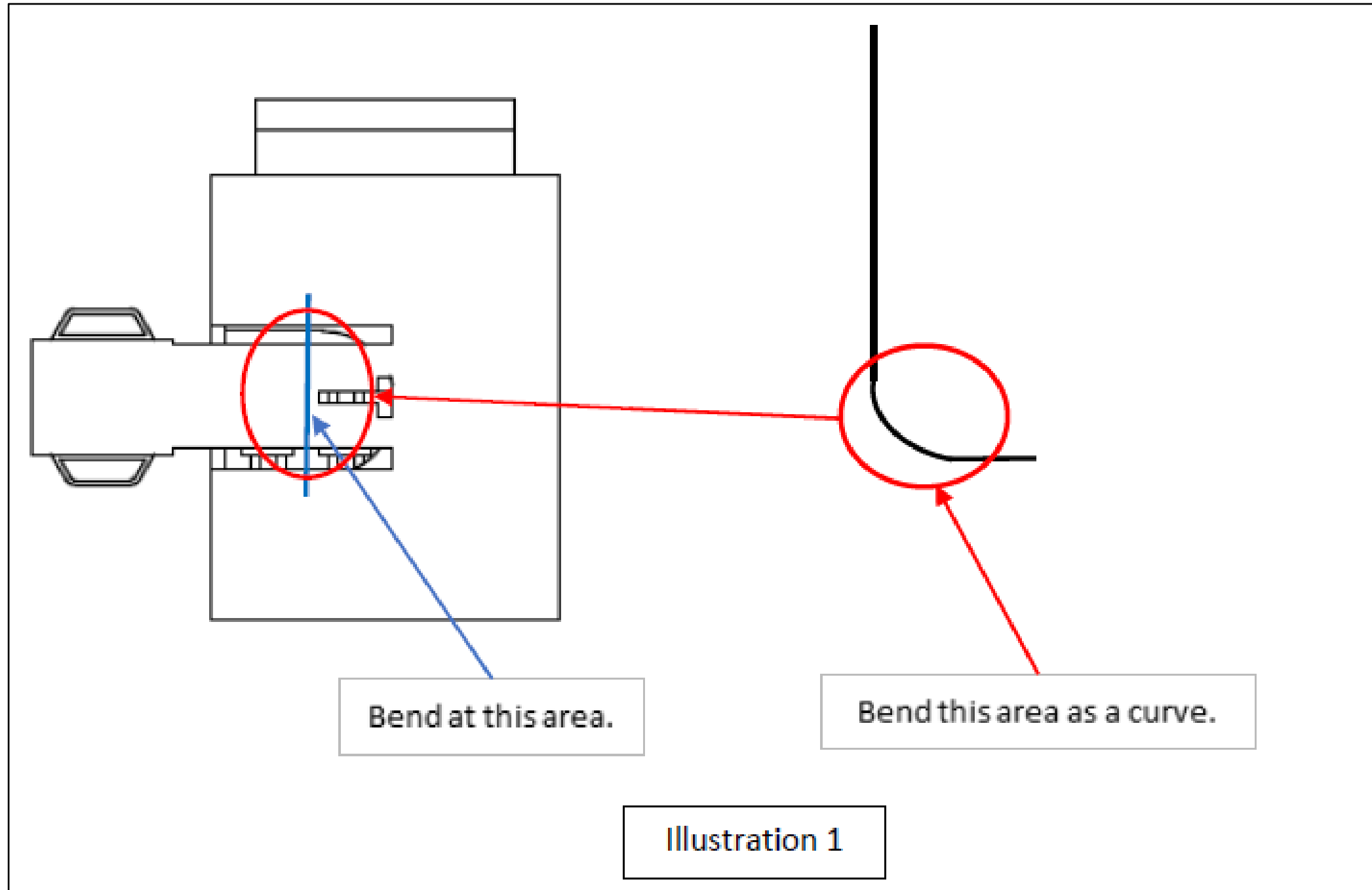
IMPROVEMENT PROPOSAL

CUSTOMER : FLEXTRONICS
PRODUCT NO. : 441001280 REV B
PART NAME : ASSY, CABLE, ETHERNET, 16 INCH
RE : Improvement proposal of bending position of RJ110C5S2

PROPOSAL:

Background :

Customer request to study and improve on the bending method to increase strengthen of RJ Connector according to below illustration 1.



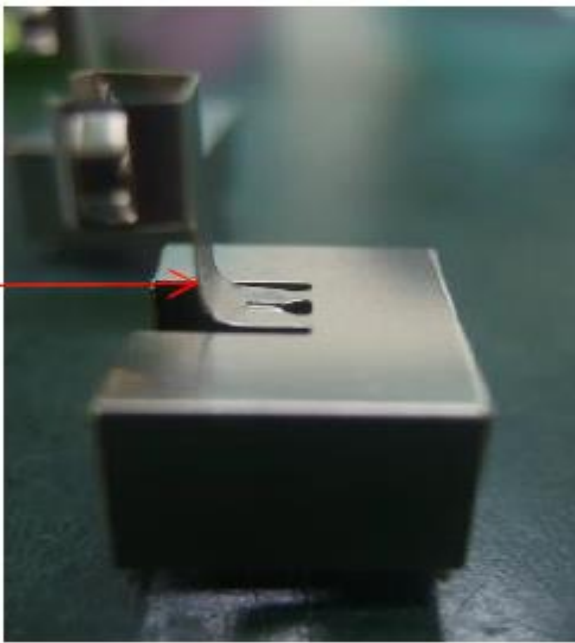
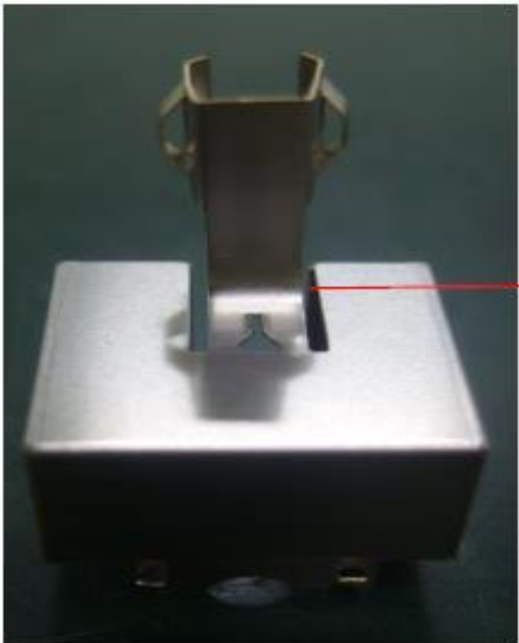
Study & Simulation Result :

Current bending area :

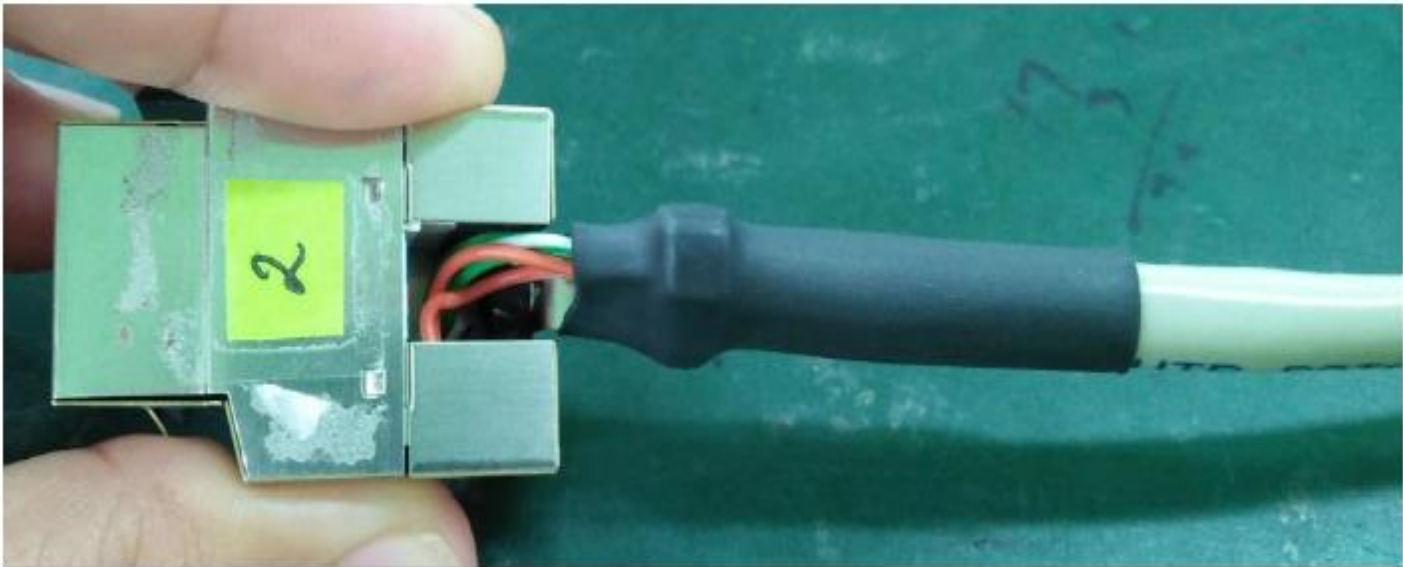


Bend area

1. Simulation for bending condition as illustration 1 as below :

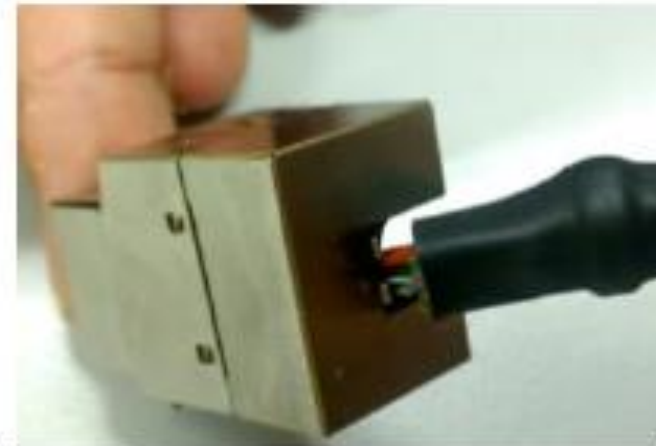
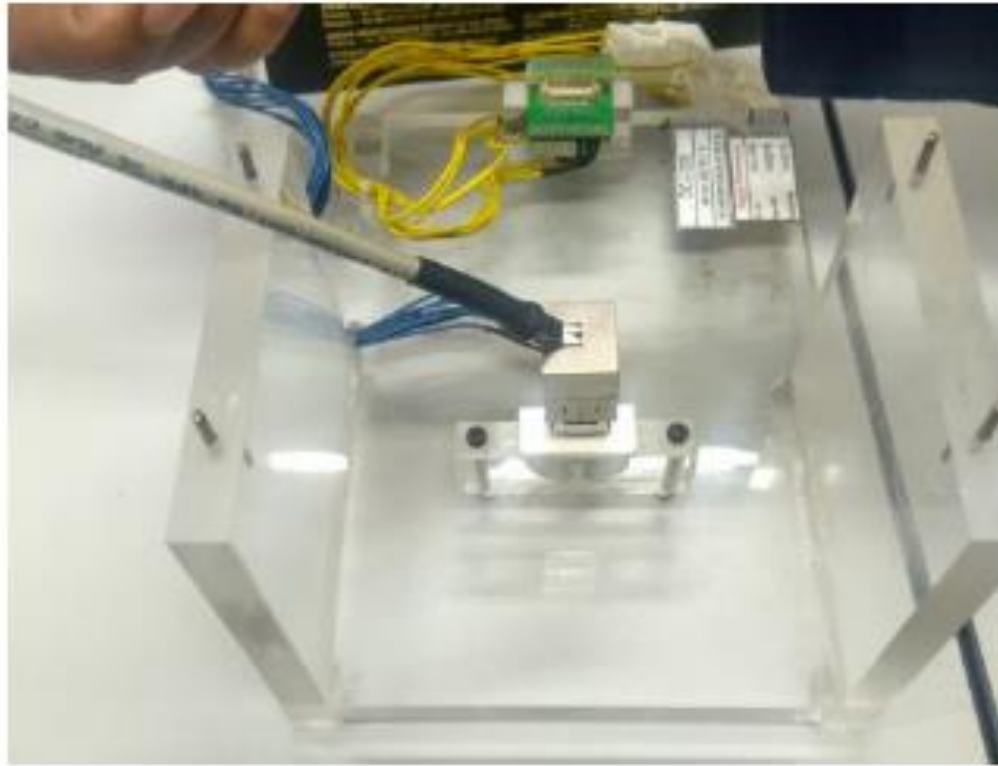


After assy in
connector

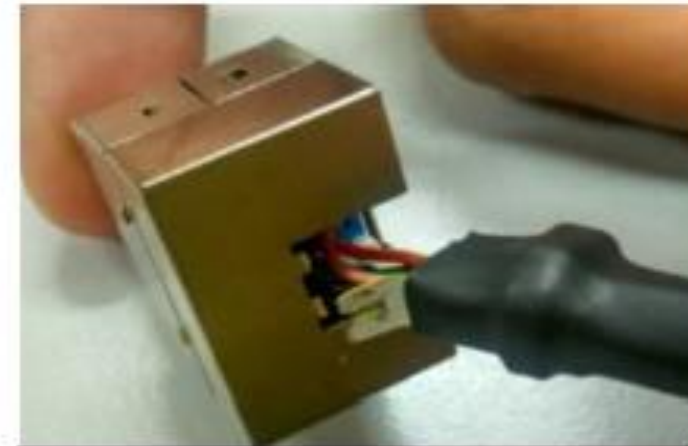


Overall condition of simulation part

2. Conduct bending test for current bending method and propose bending method as below :



Current bend method



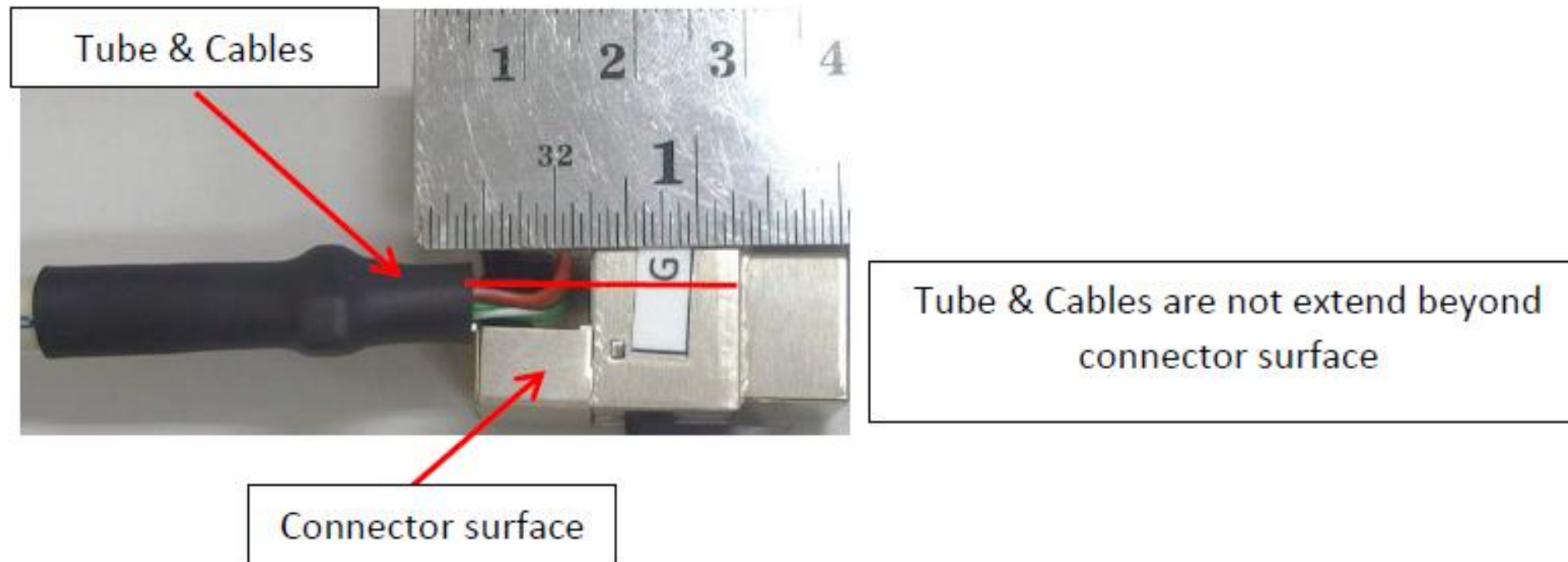
Propose bend method

- ✓ Current bending method : Connector broken after 22 times bending
- ✓ Propose bending Method : Connector broken after 64 times bending

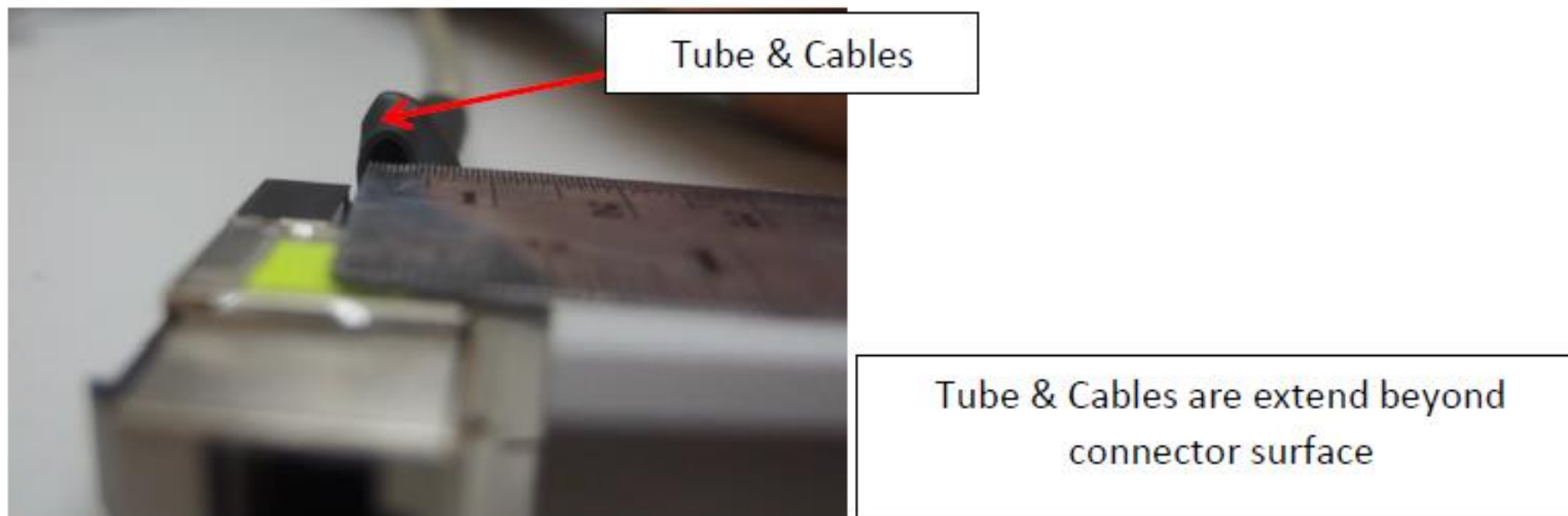
Result :

1. Propose bending method strength result is better than current bending method
2. Cable position of propose bending method is out of connector surface (refer to below picture for comparison)

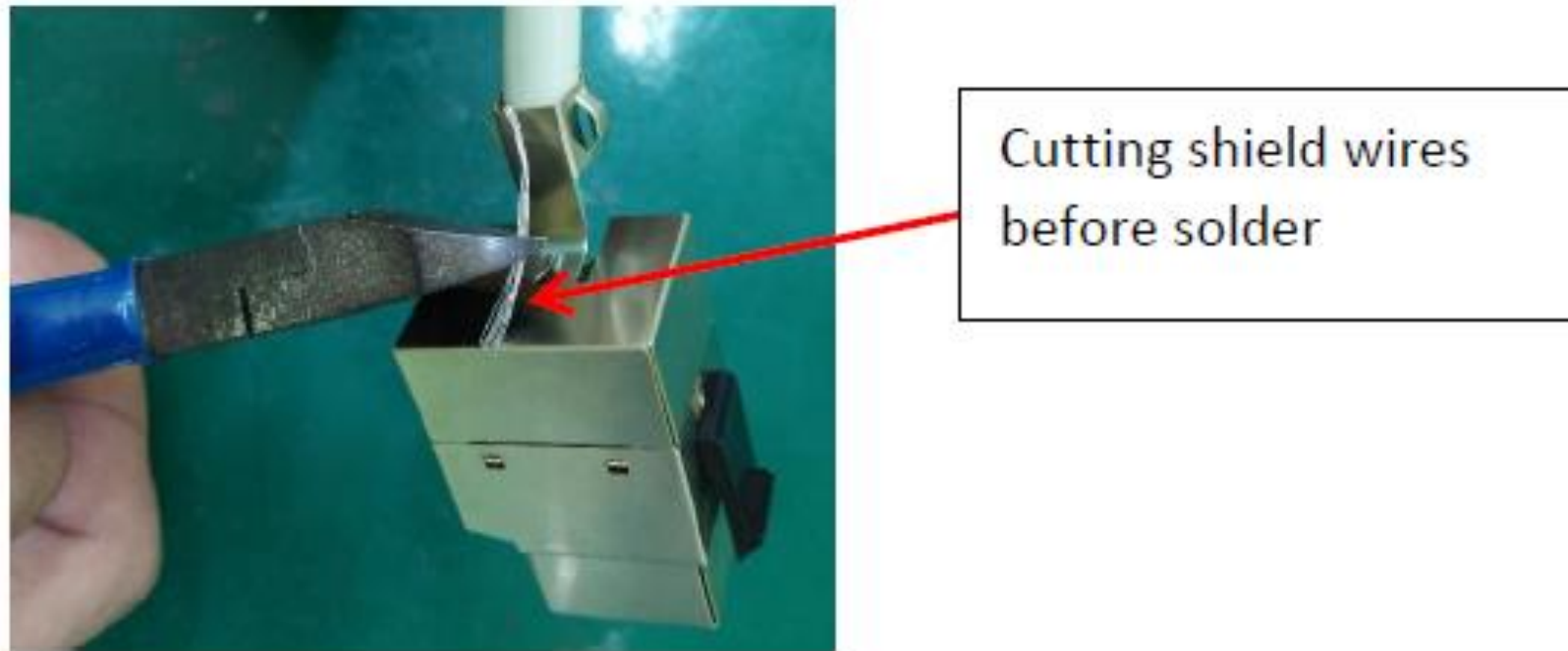
Current bending method



Propose bending method



3. There's additional cutting process for shield wire before solder to metal shield



4. Total Length of cables might sorter than current bending method. Therefore, we will conduct another simulation with actual product requirements when it's required.

Conclusion,

Based on above simulation and comparison result between current bending and propose bend method, we conclude as followings :

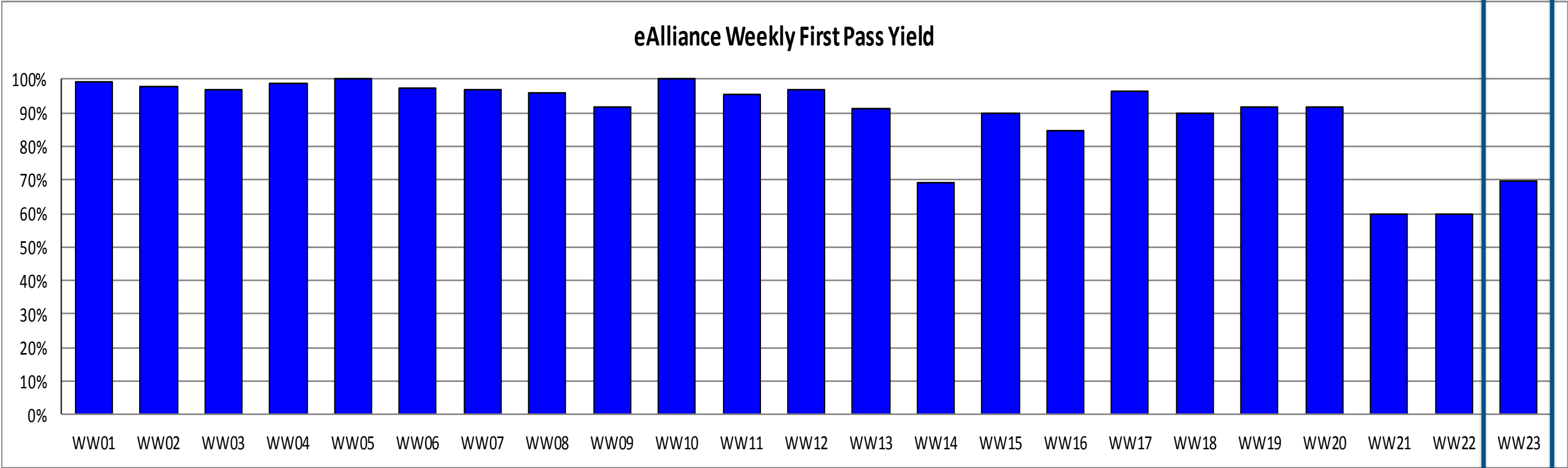
- Propose bending method strength result is better than current bend method
- Cables & tube position are extend beyond connector surface might effect to form, fit
- There has additional cutting process for shield wire before solder
- Next simulation for total length of cables shall study if it's required.

Delivery Data from January 2017 to Mid of February 2018

Delivery DATE	PO No.	Delivery Qty
5/1/2017	J1BJ07795	200
6/1/2017	J1BJ07795	200
6/1/2017	J1BJ08026	400
20/1/2017	J1BJ08026	200
23/1/2017	J1BJ08269	30
17/2/2017	J1BJ08269	570
7/3/2017	J12G04881	600
28/3/2017	J12G05038	600
25/4/2017	J12G04920	400
9/5/2017	J12G04920	200
9/5/2017	J1BJ09055	200
9/6/2017	J1BJ09055	400
23/6/2017	J1BJ09167	200
4/7/2017	J1BJ09167	200
18/7/2017	J1BJ09167	200
18/7/2017	J1BJ09506	400
1/8/2017	J1BJ09506	200
8/8/2017	J1BJ09733	400
15/8/2017	J1BJ09733	200
26/9/2017	J1BJ09988	600
10/10/2017	J1BJ10186	400
31/10/2017	J1BJ10186	200
28/11/2017	J1BJ10406	400
1/12/2017	J1BJ10406	200
5/1/2018	J1BJ10678	600
9/1/2018	J1BJ10887	200
2/2/2018	J1BJ10887	400
13/2/2018	J1BJ11134	400

- Total delivery qty: 9200 pcs
- No RMA return during this period
- No NG found at final electrical test process for above delivery lots

Weekly First Pass Yield



	29-Dec	5-Jan	12-Jan	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	11-May	18-May	25-May	1-Jun	8-Jun	15-Jun	22-Jun
Problem Category	WW01	WW02	WW03	WW04	WW05	WW06	WW07	WW08	WW09	WW10	WW11	WW12	WW13	WW14	WW15	WW16	WW17	WW18	WW19	WW20	WW21	WW22	WW23	WW24	WW25	26'18
First Pass Yield	99%	98%	97%	99%	100%	97%	97%	96%	92%	100%	95%	97%	91%	69%	90%	85%	96%	90%	92%	92%	60%	60%	70%	85%	95%	95%
Total Units Tested	113	94	106	104	45	115	95	51	100	89	86	99	126	39	91	92	82	79	110	108	90	87	126	128	94	140
Total Units Passed	112	92	103	103	45	112	92	49	92	89	82	96	115	27	82	78	79	71	101	99	54	52	88	109	89	133
Hard Failures	1	2	3	1		3	3	2	8		4	3	11	12	9	14	3	8	9	9	36	35	38	19	5	7

Weekly First Pass Yield

Alert Level crossed

13 Weeks Rolling Yield Review (eAlliance)
(WW37 '17 – WW49 '17)

	29-Dec	5-Jan	12-Jan	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	11-May	18-May	25-May	1-Jun	8-Jun	15-Jun	22-Jun	
Row Labels	01'18	02'18	03'18	04'18	05'18	06'18	07'18	08'18	09'18	10'18	11'18	12'18	13'18	14'18	15'18	16'18	17'18	18'18	19'18	20'18	21'18	22'18	23'18	24'18	25'18	26'18	AL
Replaced 279003915 (Injector subassembly)																		4	7	4	9	9	19	2	1	1	TBA
Carry over test fail. Replaced WAT033276 (Seal)															3	11	1										TBA
Re-aligned 279003915 (Injector subassembly)																5	20	12									TBA
430001336 (Tubing)			1										2								7	1	2			1	2
WAT078565(Tubing)																					8	7	2	2		1	2
WAT270409 (Tubing)																					6	11	5	3		2	2
430001194 (Tubing)																					4	3	2	1	1	1	2
WAT270172 (Transducer)														1					1	1					1	1	2
WAT271815 (Tubing)																						1	1				2
430000105 (tubing)																					1		1				2
WAT270524 (GPV)				1				1	2		2	1	2	2	4	1				1	2	2	4	2			3
WAT073109 (Syringe)		1										1						1					2	4	2		2
210000411 (CPU PCBA)	1					1					2		1						1	2				2			2
210000425 (Pump tray PCBA)																1								2			5
WAT270621 (Cable)																								1			2
210000444 (H/C PCBA)		1	1				2		3				4	6	1												2
210000416 (Fluidics PCBA)			2										1	2	1			1				1					2

- Alert limit TBA – for Carry Over Test Failures (new requirement wef Apr '18)
- Keypoints Tubings – WW21'18 onwards encounter high leakage. Working with WPPL and Keypoint for resolution
- GPV (WAT270524) has triggered above Alert Level for WW15'18, WW23'18
- PCBA 210000444 has triggered above Alert Level for WW09'18, WW13'18 and WW14'18
- PCBA 210000425 has triggered above Alert Level for WK 42'17, WW24'18.

Weekly First Pass Yield

Current : WW26'18 and previous data

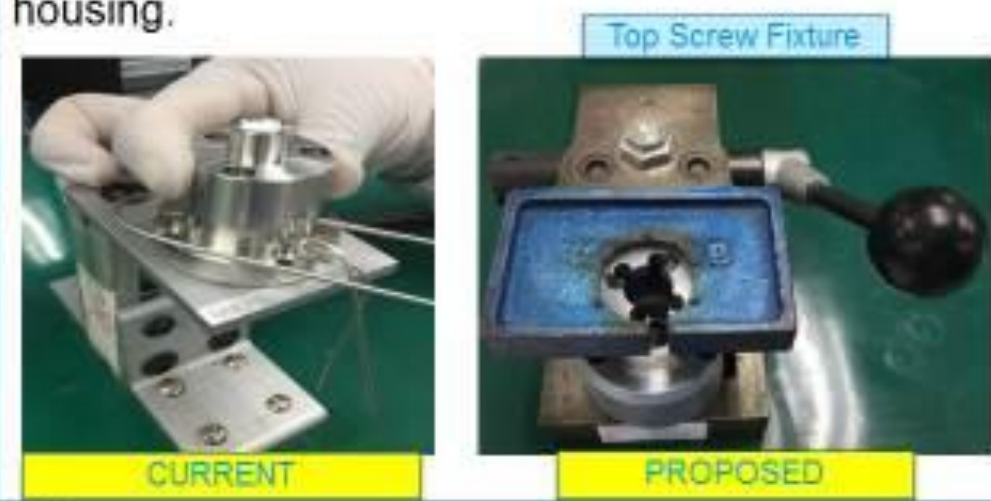
Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement																																																				
Reported Date: 07 May 2018 Instrument Part Number: 186269505 and 186269506 Problem: Carry over test failed. Action take: Replace Seal and Re-alignment Injector Assy (initial) . Replaced injector (current) <table><tr><th>Week</th><th>Replace Seal</th><th>Realign Injector</th><th>Replaced Injector</th></tr><tr><td>15</td><td>03</td><td>00</td><td>00</td></tr><tr><td>16</td><td>11</td><td>05</td><td>00</td></tr><tr><td>17</td><td>01</td><td>20</td><td>00</td></tr><tr><td>18</td><td>00</td><td>12</td><td>04</td></tr><tr><td>19</td><td>00</td><td>00</td><td>07</td></tr><tr><td>20</td><td>00</td><td>00</td><td>04</td></tr><tr><td>21</td><td>00</td><td>00</td><td>09</td></tr><tr><td>22</td><td>00</td><td>00</td><td>09</td></tr><tr><td>23</td><td>00</td><td>00</td><td>19</td></tr><tr><td>24</td><td>00</td><td>00</td><td>02</td></tr><tr><td>25</td><td>00</td><td>00</td><td>01</td></tr><tr><td>26</td><td>00</td><td>00</td><td>01</td></tr></table> Date of Manufactured: Apr and May 2018 Reported site: Flex Kallang	Week	Replace Seal	Realign Injector	Replaced Injector	15	03	00	00	16	11	05	00	17	01	20	00	18	00	12	04	19	00	00	07	20	00	00	04	21	00	00	09	22	00	00	09	23	00	00	19	24	00	00	02	25	00	00	01	26	00	00	01	Investigation: Technician visual checked all Connections –no visual issue. Containment Actions: Refer to power point slide “Assy on New Seal Pack (289012412) “ Root Cause Still under investigation. Refer to power point slide “4M review for New Seal Pack (289012412)” on proposal actions. Milford help Flex send 2 x Injector Assy (removed from Alliance failing carry over test (high blank), to help identify root cause. Pend WPPL feedback on Milford finding	Corrective Action: Flex Kallang: NA Supplier: NA
Week	Replace Seal	Realign Injector	Replaced Injector																																																			
15	03	00	00																																																			
16	11	05	00																																																			
17	01	20	00																																																			
18	00	12	04																																																			
19	00	00	07																																																			
20	00	00	04																																																			
21	00	00	09																																																			
22	00	00	09																																																			
23	00	00	19																																																			
24	00	00	02																																																			
25	00	00	01																																																			
26	00	00	01																																																			

4M review for New Seal Pack (289012412)

Seal Pack Assembly 4M Review

Review Team: Gary, David and Phani

Review Date : 31 May 18

Category	Possible Causes	Verification	Possible cause (Y/ N)	Proposed Actions
Man	1) Untrained/ Uncertified operator	Verified trained/ certified operators are performing Sub Assy and Injector Test. No change in people observed.	N	NA
	2) Operators not following the MPI defined steps.	Verified that operators performing the tasks as per Work instructions. No abnormality found.	N	NA
Method	Assembly method not repeatable and inconsistent	1)Assembly methods like Press operation, chemical wetting, screw tightening processes were reviewed and found ok. 2)It was suggested to put few more drops of methanol during press operation in-addition to current wetting of seals with methanol	N	Briefed Operator to pour methanol during both press operations in-addition current methanol wetting to seals.
Machine	No manufacturing Aids/Fixtures/Jigs.	1)Press fixtures were ok and no abnormality found. 2)Current Holding Fixture 999044874 does not allow to hold and press down Top, Middle and Bottle housing assembly into holding fixture before screwing assembly.	Y	Propose to purchase new fixture with top cover plate to hold and press down the Top, middle and bottom housing.  Top Screw Fixture CURRENT PROPOSED
Material	Part dimensions not meeting specs.	Parts dimensions were meeting specs as per respective IPC	N	NA

Weekly First Pass Yield

Current : WW26'18
and Previous

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement																																			
Reported Date: 19 May 208 onwards Instrument Part Number: 186269505, 186269506 Problem: Leak Detection Procedure. Tubings were replaced during the troubleshooting as shown below: <table><tr><th>WW</th><th>43000 1194</th><th>WAT078 565</th><th>WAT270 409</th><th>43000 1336</th></tr><tr><td>WW21</td><td>4</td><td>8</td><td>6</td><td>7</td></tr><tr><td>WW22</td><td>3</td><td>7</td><td>11</td><td>1</td></tr><tr><td>WW23</td><td>2</td><td>2</td><td>5</td><td>2</td></tr><tr><td>WW24</td><td>1</td><td>2</td><td>3</td><td>0</td></tr><tr><td>WW25</td><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td>WW26</td><td>1</td><td>1</td><td>2</td><td>1</td></tr></table>	WW	43000 1194	WAT078 565	WAT270 409	43000 1336	WW21	4	8	6	7	WW22	3	7	11	1	WW23	2	2	5	2	WW24	1	2	3	0	WW25	1	0	0	0	WW26	1	1	2	1	Investigation: The technicians verified the tubings with torque wrench (36 in/ib). Replace the tubing if Instrument still leak. The raw tubing before use, found the Ferrule is tight to the SS tube. Tubing Assy date: Feb 2018 Tube Assy Supplier: Keypoint. Root Cause Suspected staking pressure is too high at supplier side. Note: WPPL and Flex joint visit to Keypoint on 27 May: to use staking pressure around 108psi. These New tubing evaluation is still on-going. Scope: 4 tubings for Main Line and 5 tubings for Pump Tray Assy.	Corrective Action: Flex Kallang: Evaluation and data collection is still on-going Supplier: using lower staking pressure. Evaluation and data collection is still on-going Inventory with high stake pressure will be return under RMA# WA-001/18
WW	43000 1194	WAT078 565	WAT270 409	43000 1336																																	
WW21	4	8	6	7																																	
WW22	3	7	11	1																																	
WW23	2	2	5	2																																	
WW24	1	2	3	0																																	
WW25	1	0	0	0																																	
WW26	1	1	2	1																																	

Weekly First Pass Yield

Previous : WW25'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 14, 19 Jun 2018 Instrument Part Number: 186269505, 186269506 Instrument SN: F18SM7128A, F18SM4727A Affected Qty: 2u Problem: Failed no value during Compression test. Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> Technician replaced Syringe (PN: WAT073109). Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) Offline verification pending. Syringe Supplier: MK Fluidic Systems LLC The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW24'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 07, 11 and 13Jun 2018 Instrument Part Number: 186269505, 186269506 Instrument SN: F18SM4637A, F18SM4673A, F18SM7106A, F18SM7108A Affected Qty: 4u Problem: Failed no value during Compression test. Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> Technician replaced Syringe (PN: WAT073109). Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (24606, 836410) Offline verification pending. Syringe Supplier: MK Fluidic Systems LLC The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW24'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 11 Jun2018 Instrument Part Number: 186269505 Instrument SN: F18SM7089A Affected Qty: 1u Problem: AC Precision failed during complete test Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 11 Jun: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 11 Jun Technician replaced GPV (PN: WAT270524) SN: 143569 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) Offline verification pending. GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW24'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 12 Jun 2018 Instrument Part Number: 186269506 Instrument SN: F18SM4689A Affected Qty: 1u Problem: Solvent leakage during solvent inlet Plumbing verification Date of Manufactured: June 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 12 June: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 12 June, Technician replaced GPV (PN: WAT270524) SN: 143501 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) Offline verification pending. GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW24'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 07 Jun 2018 Instrument Part Number: 186269505 Instrument SN: F18SM7082A Affected Qty: 1u Problem: Plunger homing fault (1) during rear panel test Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 07 Jun, Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 07 Jun, Technician replaced Pump PCB (PN: 210000425) from SN 110518241M to SN 110518128M. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (847839) On 09 Jun 2018, Offline verification, retest Pump tray failed. Findings: Unable to home, F1-OK, C311 capacitor measured OK, 5V, 15V, 12V, 24V all Ok. Verified : TE Joel Pump PCB Supplier: Flex Senai The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW24'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 02 Jun 2018 Instrument Part Number: 186269506 Instrument SN: E18SM4503A Affected Qty: 1u Problem: Plunger homing (0) failed during rear panel test Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 02 Jun, Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 02 Jun, Technician replaced Pump PCB (PN: 210000425) from SN 300418015M to SN 300418120M. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (927989) Offline verification pending. Pump PCB Supplier: Flex Senai The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Current : WW23'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 04 Jun2018 Instrument Part Number: 186269505 Instrument SN: E18SM7065A Affected Qty: 1u Problem: BD Precision failed during complete test Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 04 Jun: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 04 Jun Technician replaced GPV (PN: WAT270524) SN: 143393 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) Offline verification pending. GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW23'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 30 May 2018 Instrument Part Number: 186269506 Instrument SN: E18SM4535A Affected Qty: 1u Problem: Solvent inlet "B" no water flow during Solvent inlet Plumbing verification Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 30 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 30 May, Technician replaced GPV (PN: WAT270524) SN: 143367 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (836410) On 31 May: Offline verification of GPV (PN: WAT270524), result failed. Findings: No solvent purging out from inlet "B" and "D" during nitrogen purge. (Performed by: EA Shamsul) GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW23'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 30 May 2018 Instrument Part Number: 186269506 Instrument SN: E18SM4518A Affected Qty: 1u Problem: Solvent inlet "A", "B" and "D" no water flow during Solvent inlet Plumbing verification Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 30 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 30 May, Technician replaced GPV (PN: WAT270524) SN: 143365 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (836410) On 31 May: Offline verification of GPV (PN: WAT270524), result failed. Findings: No solvent purging out from inlet "A", "B" and "D" during nitrogen purge. (Performed by: EA Shamsul) GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA requested on 07 June 18. RMA# 14925 received on 07 June 18. RTV in progress.

Weekly First Pass Yield

Previous : WW23'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 30 May 2018 Instrument Part Number: 186269505 Instrument SN: E18SM4524A Affected Qty: 1u Problem: Solvent inlet "D" no water flow during Solvent inlet Plumbing verification Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 30 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 30 May, Technician replaced GPV (PN: WAT270524) SN: 143352 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (836410) On 31 May: Offline verification of GPV (PN: WAT270524), result failed. Findings: No solvent purging out from inlet "D" during nitrogen purge. (Performed by: EA Shamsul) GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA requested on 07 June 18. RMA# 14925 received on 07 June 18. RTV in progress.

Weekly First Pass Yield

Previous : WW22'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 22 May 2018 Instrument Part Number: 186269505 Instrument SN: E18SM7035A Affected Qty: 1u Problem: Inlet B no flow during Solvent Inlet Plumbing Verification. Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 22 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 22 May Technician replaced GPV (PN: WAT270524) SN: 143286 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 24 May: Offline verification of GPV (PN: WAT270524), result failed. Findings: No nitrogen blowing out from inlet “B” and “D” during nitrogen purge (Performed by: EA Shamsul) GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14925 received 07 June 18. RTV in progress.

Weekly First Pass Yield

Previous : WW22'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 26 May 2018 Instrument Part Number: 186269506 Instrument SN: E18SM4424A Affected Qty: 1u Problem: Inlet C no flow during Solvent Inlet Plumbing Verification. Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 26 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 26 May Technician replaced GPV (PN: WAT270524) SN: Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) Offline verification pending GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14925 received 07 June 18. RTV in progress.

Weekly First Pass Yield

Previous: WW21'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 18 May 2018 Instrument Part Number: 186269505 Instrument SN: E18SM7010A Affected Qty: 1u Problem: Inlet C no flow during Solvent Inlet Plumbing Verification. Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 18 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 18 May Technician replaced GPV (PN: WAT270524) SN: 143126 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 21 May: Offline verification of GPV (PN: WAT270524) using KGU SN E18SM7046A, result failed. Findings: No solvent flowing through solvent “C” inlet during priming. (Performed by: EA Shamsul) GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14913 received on 25 May 2018. Shipped out 06 June 18.

Weekly First Pass Yield

Previous : WW21'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 18 May 2018 Instrument Part Number: 186269506 Instrument SN: E18SM4387A Affected Qty: 1u Problem: Inlet C no flow during Solvent Inlet Plumbing Verification. Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 18 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 18 May Technician replaced GPV (PN: WAT270524) SN: 143191 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 21 May: Offline verification of GPV (PN: WAT270524) using KGU SN E18SM7046A, result failed. Findings: No solvent flowing through solvent “C” inlet during priming. (Performed by: EA Shamsul) GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14913 received on 25 May 2018. Shipped out 06 June 18.

Weekly First Pass Yield

Previous : WW20'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 11 May 2018 Instrument Part Number: 186269506 Instrument SN: E18SM4309A Affected Qty: 1u Problem: Inlet C and D reverse during Solvent Inlet Plumbing Verification. Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 11 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 11 May Technician replaced GPV (PN: WAT270524) SN: 142823 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 11 May: Offline verification of GPV (PN: WAT270524), result failed. Findings: Same failure as the problem stated. (Performed by: EA David) GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA# 14886 received on 11 May 2018. FedEx no.: 772265343274. Part delivered to Parker on 21 May 2018.

Weekly First Pass Yield

Previous– WW16'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 13 Apr 2018 Instrument Part Number: 186269506 Instrument SN: D18SM4021A Affected Qty: 1u Problem: Carry over test failed (No reading) Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 13 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 13 Apr, Technician replaced one GPV (PN: WAT270524) SN 142303 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (1037617) On 19 Apr: Offline verification of GPV (PN: WAT270524), using KGU SN D18SM4024A, result failed. Findings: Retention time shifted off at 1.4xxx, purge with Nitrogen (Performed by: EA David) The Defective part is to be RTV to Supplier. GPV Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14855 provided on 26 Apr 18. FedEx 772141318560. Part to be deliver on 9 May 18 Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000“

Weekly First Pass Yield

Previous– WW16'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 14 Apr 2018 Instrument Part Number: 186269506 Instrument SN: D18SM4036A Affected Qty: 1u Problem: Plunger Homing Fault (0) during Carry over test. Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 14 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 14 Apr, Technician replaced Pump tray PCB (PN: 210000425) from SN 130318538M to SN 130318498M. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246426) On 19 Apr: Offline verification of Pump tray PCB (PN: 210000425) using KGU SN D18SM4062A, result failed. Confirm not related to C111. (Performed by: EA David) Pump tray PCB Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: pend RMA-SEN-00000187 received on 7 May 18. Return to supplier on 15 May 2018. Pending analysis from Senai.

Weekly First Pass Yield

Previous – WW15'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 06 Apr 2018 Instrument Part Number: 186269505 Instrument SN: C18SM7906A Affected Qty: 1u Problem: Failed due to GPV 'C' and 'D' reverse during Solvent Inlet Plumbing Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 06 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 06 Apr, Technician replaced one GPV (PN: WAT270524) SN 142168 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (1037617) On 06 Apr: Offline verification of GPV (PN: WAT270524), using KGU SN D18SM4964A, result failed. Findings: Inlet C and D reverse. (Performed by: EA Shamsul) The Defective part is to be RTV to Supplier. GPV Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: pend RMA# 14835 received on 9 Apr 18. FedEx 771978177074 Part was delivered on 16 Apr 18 Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000

Weekly First Pass Yield

Previous - WW15'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 06 Apr 2018 Instrument Part Number: 186269505 Instrument SN: C18SM7913A Affected Qty: 1u Problem: Failed inlet C and Inlet D reverse during Solvent Inlet Plumbing Verification. Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 06 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 06 Apr, Technician replaced one GPV (PN: WAT270524) SN 142167 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 06 Apr: Offline verification of GPV (PN: WAT270524), using KGU SN C18SM7913A, result failed. Findings: Inlet C and D reverse during verification. (Performed by: EA Shamsul) The Defective part is to be RTV to Supplier. GPV Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: pend RMA# 14835 received on 9 Apr 18. FedEx 771978177074 Part was delivered on 16 Apr 18 Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000

Weekly First Pass Yield

Previous - WW15'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 06 Apr 2018 Instrument Part Number: 186269505 Instrument SN: C18SM7915A Affected Qty: 1u Problem: Failed inlet C and Inlet D reverse during Solvent Inlet Plumbing Verification. Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 06 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 06 Apr, Technician replaced one GPV (PN: WAT270524) SN 142161 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 06 Apr: Offline verification of GPV (PN: WAT270524), using KGU SN D18SM4964A, result failed. Findings: Inlet C and D reverse during verification. (Performed by: EA Shamsul) The Defective part is to be RTV to Supplier. GPV Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: pend RMA# 14835 received on 9 Apr 18. FedEx 771978177074 Part was delivered on 16 Apr 18 Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000

Weekly First Pass Yield

Previous - WW15'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 11 Apr 2018 Instrument Part Number: 186269506 Instrument SN: D18SM4994A Affected Qty: 1u Problem: BD Precision test failed during Final test Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 11 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 11 Apr, Technician replaced one GPV (PN: WAT270524) SN 142241 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 19 Apr: Offline verification of GPV (PN: WAT270524), using KGU SN D18SM4026A, result failed. Findings: No caffeine peak found, purge with Nitrogen. (Performed by: EA David) The Defective part is to be RTV to Supplier. GPV Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: pend RMA# 14855 received on 26 Apr 18. FedEx 772141318560. Part to be deliver on 9 May 18 Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000“

Weekly First Pass Yield

Previous - WW14'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 03 Apr 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4902A Affected Qty: 1u Problem: Failed due to inlet C and D reverse during Solvent Inlet Plumbing Verification. Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 03 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 03 Apr, Technician replaced one GPV (PN: WAT270524) SN 142169 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (1037617) On 03 Apr: Offline verification of GPV (PN: WAT270524), using another KGU SN C18SM7901, result failed Findings: Failed due to inlet C and D reverse during Solvent Inlet Plumbing Verification (Performed by: EA Shamsul) The Defective part is to be RTV to Supplier. GPV Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14835 received on 10 Apr 18. FedEx 771978177074 Part was delivered on 16 Apr 18 Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000“

Weekly First Pass Yield

Previous - WW14'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 02 Apr 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4947A Affected Qty: 1u Problem: Failed due to inlet C and D reverse during Solvent Inlet Plumbing Verification. Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 02 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 02 Apr, Technician replaced one GPV (PN: WAT270524) SN 142173 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246426) On 03 Apr: Offline verification of GPV (PN: WAT270524), using another KGU SN C18SM7901, result failed Findings: Failed due to inlet C and D reverse during Solvent Inlet Plumbing Verification (Performed by: EA Shamsul) The Defective part is to be RTV to Supplier. GPV Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14835 received on 10 Apr 18. FedEx 771978177074 Part was delivered on 16 Apr 18 Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000"

Weekly First Pass Yield

Previous – WW13'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 06 Mar 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4682A Affected Qty: 1u Problem: Chemistry test, BD failed during final test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 06 Mar: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 06 Mar, Technician replaced one GPV (PN: WAT270524) SN 141795 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 08 Mar: Offline verification of GPV (PN: WAT270524), using another KGU SN C18SM7807A, result failed Findings: BD Chemistry failed (Performed by: EA David) The Defective part is to be RTV to Supplier. GPV Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA# 14825 received on 2 Apr 18. FedEx 771930277782 Part was delivered on 9 Apr 18 Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000"

Weekly First Pass Yield

Previous – WW13'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 24 Mar 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4839A Affected Qty: 1u Problem: BD Precision test failed during final test. Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 24 Mar: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 24 Mar, Technician replaced one GPV (PN: WAT270524) SN 142078 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 26 Mar: Offline verification of GPV (PN: WAT270524), using another KGU SN C18SM4886A, result failed Findings: Fail on Chemistry BD test (Performed by: EA David) The Defective part is to be RTV to Supplier. GPV Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA# 14824 received on 2 Apr 18 FedEx 771930277782 Part was delivered on 9 Apr 18 Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000“

Weekly First Pass Yield

Previous – WW12'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 19 Mar 2018 Instrument Part Number: 186269505 Instrument SN: C18SM7877A Affected Qty: 1u Problem: Inlet B no flow during Solvent Inlet Plumbing Verification Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 19 Mar: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 19 Mar, Technician replaced one GPV (PN: WAT-270524), Part SN 142045. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (921568) On 26 Mar: Offline verification of GPV (PN: WAT-270524), using another KGU SN C18SM4897A, result failed Findings: No solvent flow on channel “B” during Solvent Plumbing Verification (Performed by: EA David) The Defective part is to be RTV to Supplier. GPV Assy Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA request on 29 Mar 18 RMA#14824 received on 2 Apr 18. Arrange to ship out by 5 Apr 18 Email dated 2 Apr 18. On 29 Mar 18, Parker and Water discussed the different reasons for the returns and whether there is a need for reporting on the failure or not. Parker also propose to send report to Waters directly. To be confirm and advise later Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000“

To monitor till
closure

Weekly First Pass Yield

Previous - WW09'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 23 Feb 2018 Instrument Part Number: 186269505 Instrument SN: B18SM7778A Affected Qty: 1u Problem: Solvent C and Solvent D water flow in reverse direction during Solvent Inlet Plumbing verification. Date of Manufactured: Feb 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 23 Feb: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 23 Feb, Technician replaced one GPV Assembly (PN: WAT270524) SN 141632. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (836410) On 27 Feb: Off Line verification of GPV Assembly (PN: WAT270524) using KGU SN B18SM4620A, result failed. Findings: No solvent flow on “D” when pressing “D” channel instead solvent flow on “C”. Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. GPV Assembly Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14805 received 21 Mar. Part delivered from Flex on 30 Mar 18 Pending Supplier’s FA Report, Target 2 May 18 Email dated 2 Apr 18. On 29 Mar 18, Parker and Water discussed the different reasons for the returns and whether there is a need for reporting on the failure or not. Parker also propose to send report to Waters directly. To be confirm and advise later Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000“

To monitor till
closure

Weekly First Pass Yield

Previous - WW08'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 14 Feb 2018 Instrument Part Number: 186269506 Instrument SN: B18SM4522A Affected Qty: 1u Problem: D no water flow during solvent inlet plumbing verification test. Date of Manufactured: Feb 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 14 Feb: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 14 Feb, Technician replaced one GPV (PN: WAT270524), GPV SN 141457 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (928459) On 27 Feb: Off Line verification of GPV (PN WAT270524) using KGU s/n: B18SM4620A result failed, no solvent flow on “D” during solvent inlet plumbing verification. Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. GPV Assembly Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14805 received 21 Mar. Part delivered from Flex on 30 Mar 18 Pending Supplier's FA Report, Target 2 May 18 Email dated 2 Apr 18. On 29 Mar 18, Parker and Water discussed the different reasons for the returns and whether there is a need for reporting on the failure or not. Parker also propose to send report to Waters directly. To be confirm and advise later Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000“ To monitor till closure

Weekly First Pass Yield

Previous - WW09'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 27 Feb 2018 Instrument Part Number: 186269506 Instrument SN: B18SM4588A Affected Qty: 1u Problem: Inlet B no flow during solvent inlet plumbing verification Date of Manufactured: Feb 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 27 Feb: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 27 Feb, Technician replaced one GPV(PN 270524) SN 141671. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (1037617) On 28 Feb: Off Line verification of GPV (PN 270524) using KGU SN B18SM4620A, result failed. Findings: No Solvent flow on “B” during solvent inlet plumbing verification. Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. GPV Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14805 received 21 Mar. Part delivered on 30 Mar 18 Pending Supplier's FA Report, Target 2 May 18 Email dated 2 Apr 18. On 29 Mar 18, Parker and Water discussed the different reasons for the returns and whether there is a need for reporting on the failure or not. Parker also propose to send report to Waters directly. To be confirm and advise later Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000“

To monitor till
closure

Weekly First Pass Yield

Previous – WW04'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 18 Jan 2018 Instrument Part Number: 186269506 Instrument SN: A18SM4243A Affected Qty: 1u Problem: During solvent inlet plumbing verification, inlet valve A no water flow Date of Manufactured: Jan 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 18 Jan: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 18 Jan, Technician replaced one GPV (PN: WAT270524). Part SN 131069. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (928459) On 29 Jan: Off Line verification using another KGU (SN A18S4373A) – No solvent Flow at Valve 'A' Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. Supplier: Parker <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA #14749 provided. Part delivered on 2 Mar 18. Target FA report by 2 Apr 18.(30days upon receipt) Email dated 2 Apr 18. On 29 Mar 18, Parker and Water discussed the different reasons for the returns and whether there is a need for reporting on the failure or not. Parker also propose to send report to Waters directly. To be confirm and advise later Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000" To monitor till closure

Weekly First Pass Yield

Previous – WW49'17
(Sub-Assy)

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 06 Dec 2017 Component : Pump Tray (Sub Assy) Instrument Part Number: NA Instrument SN: NA Affected Qty: 1u Problem: Pump unable to home Date of Manufactured: Dec 2017 Reported site: Flex Kallang	<u>Investigation:</u> On 06 Dec: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 06 Dec, Technician replaced Pump tray (PN: WAT-210000425) from SN 170417257M to SN 271117081M. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246298) On 07 Dec: Off Line verification of Pump tray (PN: WAT-210000425) Findings: F1 fuse good, no visible defective component or solder bridge (board may need to go to ICT test). Performed by: EA (Shamsul) The Defective part is to be RTV to Supplier. Pump tray Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA <u>Supplier:</u> On 20 Dec, RMA-RF006987 provided by Senai. Supplier finding: Visual inspection found J1 having improper lead insert. Q-Alert has been raised. This is an isolated case.

To monitor till
closure

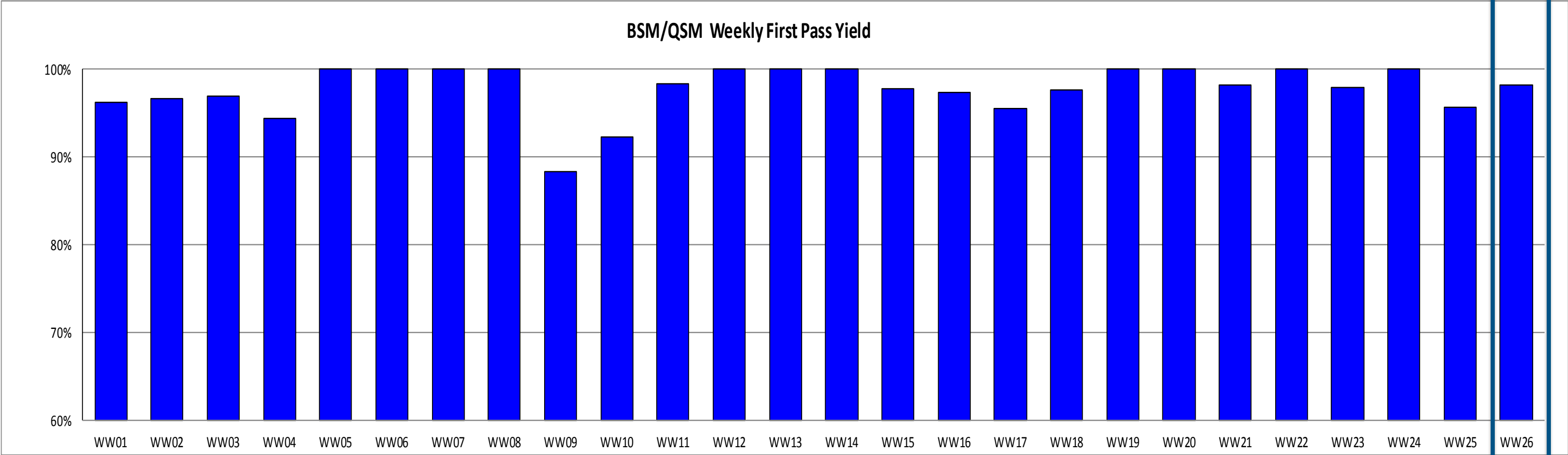
Weekly First Pass Yield

Previous – WW01'18
(Sub-Assy)

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 29 Dec 2017 Component : Pump Tray (Sub Assy) Instrument Part Number: NA Instrument SN: NA Affected Qty: 1u Problem: Pump unable to home Date of Manufactured: Dec 2017 Reported site: Flex Kallang	<u>Investigation:</u> On 29 Dec: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 29 Dec, Technician replaced Pump tray (PN: WAT-210000425) from SN 061217641M to SN 061217728M. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246298) On 02 Jan: Off Line verification of Pump tray (PN: WAT-210000425) Findings: F1 fuse ok. C111 measurement passed. Performed by: EA (Shamsul) The Defective part is to be RTV to Supplier. Pump tray Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: 22 Jan 2018, RMA-RF007121 provided by Senai. Supplier findings : U8 & U5-Component Failure

To monitor till
closure

Weekly First Pass Yield



	29-Dec	5-Jan	12-Jan	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	11-May	18-May	25-May	1-Jun	8-Jun	15-Jun	22-Jun
Problem Category	WW01	WW02	WW03	WW04	WW05	WW06	WW07	WW08	WW09	WW10	WW11	WW12	WW13	WW14	WW15	WW16	WW17	WW18	WW19	WW20	WW21	WW22	WW23	WW24	WW25	WW26
First Pass Yield	96%	97%	97%	94%	100%	100%	100%	100%	88%	92%	98%	100%	100%	100%	98%	97%	95%	98%	100%	100%	98%	100%	98%	100%	96%	98%
Total Units Tested	26	60	65	54	18	46	61	31	43	52	59	53	45	39	46	38	66	42	29	49	56	44	49	63	46	54
Total Units Passed	25	58	63	51	18	46	61	31	38	48	58	53	45	39	45	37	63	41	29	49	55	44	48	63	44	53
Hard Failures	1	2	2	3					5	4	1				1	1	3	1			1		1		2	1

Weekly First Pass Yield

 Alert Level crossed

13 Weeks Rolling Yield Review (BSM/QSM)
(WW37 '17 – WW49 '17)

	29-Dec	5-Jan	12-Jan	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	11-May	18-May	25-May	1-Jun	8-Jun	15-Jun	22-Jun	
Row Labels	01'18	02'18	03'18	04'18	05'18	06'18	07'18	08'18	09'18	10'18	11'18	12'18	13'18	14'18	15'18	16'18	17'18	18'18	19'18	20'18	21'18	22'18	23'18	24'18	25'18	26'18	AL
289003207 (Assy Cartridge)									1								1								1	1	1
210000345 (PCBA Analytical)		2							1							1									1		2
279001810 (GPV)	1								3															1			2
279001056 (PUMP Degasser)				1											1							1					2
279001817																		1									2
210000422 (PCBA PUNP)																	1										2
279000916 (Vent Valve)																	1										2
289001940 (Check Valve)			1								1																2
441000968 (ethernet Cable)										2																	2
WAT270594 (SOLENOID)										1																	2
441000974 (Cable)										1																	2
210000520 (PCBA CPU)				1																							2
405010508 (MANIFOLD)				1																							2

- No parts has triggered above Alert Level WK 26'18.
- Part in focus on 210000520 PCBA (PDA Detector WW47'17 has triggered the Alert Limit)
- Part in focus on 279001810 GPV (WW09'18 has triggered the Alert Limit)

Weekly First Pass Yield

Previous : WW23'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 05 Jun 2018 Instrument Part Number: 186015080 Instrument SN: E18QSP552A Affected Qty: 1u Problem: Test input B prime with MeOH failed. Actual is 60 failures Good spec >1 failure is failed Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 05 Jun, Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 05 Jun, Technician replaced Dual Channel GPV (PN: 279001810). Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246025) On 05 Jun: Offline verification of Dual Channel GPV (PN: 279001810), result failed. Findings: Same issue encountered, no solvent flow in indicated area. (Performed by: EA David) Dual Channel GPV Supplier: Parker The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

GPV Failure in QSM

Previous – WW09'18

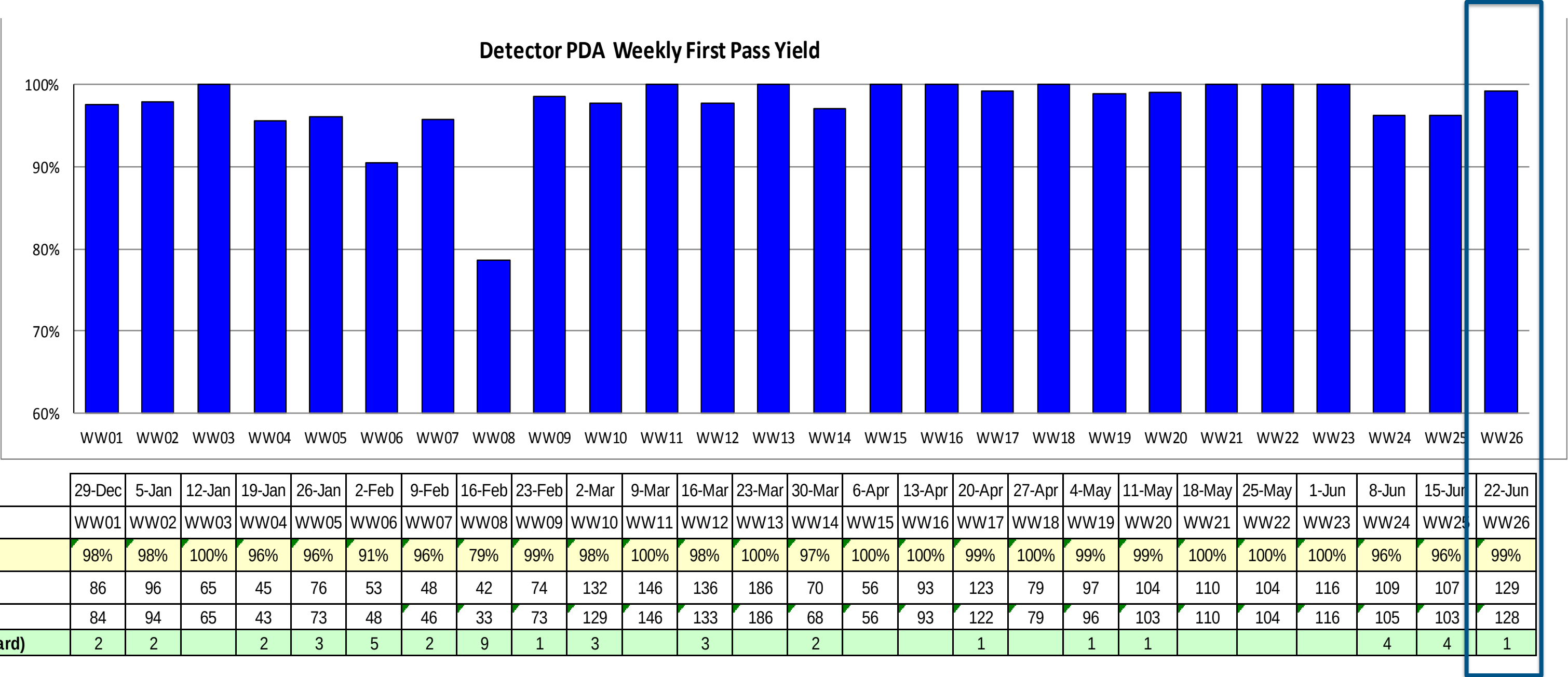
Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement																
Part Number: WAT-279001810-L (ASSY, GPV, DUAL CHANNEL, QSM) Supplier: Parker Reported Date: 22, 26 and 27 Feb 2018 Instrument PN: 186015018 Instrument SN: B18QSM841A, B18QSM806A, B18QSM861A Affected Qty: 3u Problem / Failure at Final Test: Please refer to Event Log under “Investigation” on the Right Side Date of Manufactured: Feb 2018 Reported site: Flex Kallang	Investigation: <table><tr><th>GPV SN (Instrument SN)</th><th>Event log</th><th>Reverification on the Failed component</th><th>Resolution by CFT</th></tr><tr><td>1) GPV SN: 53782 (Instrument SN B18QSM841A)</td><td>On 22 Feb 2018: Instrument failed Test input A prime with MeOh failed due to no solvent flow. Technician visual checked all Connections – no visual issue. Technician replaced one GPV. Retest Intrument: Passed Remedy by Tech #927989</td><td>On 27 Feb 2018: Verification using another KGU (SN B18QSM871A), Result failed, no solvent flow on "A" during test input A prime with MeOH. Verified by David Kee (Test EA)</td><td>To RTV</td></tr><tr><td>2) GPV SN: 53698 (Instrument SN B18QSM806A)</td><td>On 26 Feb 2018: Instrument failed Test input B prime with MeOH failed due to no solvent flow. Technician visual checked all Connections – no visual issue. Technician replaced one GPV. Retest Intrument: Passed Remedy by Tech #927989</td><td>On 26 Feb 2018: Verification using another KGU (SN B18QSM807A), Result failed, no solvent flow on "B" during test input B prime with MeOH. Verified by David Kee (Test EA)</td><td>To RTV</td></tr><tr><td>3) GPV SN: 53936 (Instrument SN B18QSM861A)</td><td>On 27 Feb 2018: Instrument failed Test input C prime with MeOH failed due to no solvent flow. Technician visual checked all Connections – no visual issue. Technician replaced one GPV. Retest Intrument: Passed Remedy by Tech #927989</td><td>On 27 Feb 2018: Verification using another KGU (SN B18QSM870A), Result failed, no solvent flow on "C" during test input C prime with MeOH. Verified by David Kee (Test EA)</td><td>To RTV</td></tr></table> The Defective part is to be RTV to Supplier (Parker) Root Cause It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Event Log	GPV SN (Instrument SN)	Event log	Reverification on the Failed component	Resolution by CFT	1) GPV SN: 53782 (Instrument SN B18QSM841A)	On 22 Feb 2018: Instrument failed Test input A prime with MeOh failed due to no solvent flow. Technician visual checked all Connections – no visual issue. Technician replaced one GPV. Retest Intrument: Passed Remedy by Tech #927989	On 27 Feb 2018: Verification using another KGU (SN B18QSM871A), Result failed, no solvent flow on "A" during test input A prime with MeOH. Verified by David Kee (Test EA)	To RTV	2) GPV SN: 53698 (Instrument SN B18QSM806A)	On 26 Feb 2018: Instrument failed Test input B prime with MeOH failed due to no solvent flow. Technician visual checked all Connections – no visual issue. Technician replaced one GPV. Retest Intrument: Passed Remedy by Tech #927989	On 26 Feb 2018: Verification using another KGU (SN B18QSM807A), Result failed, no solvent flow on "B" during test input B prime with MeOH. Verified by David Kee (Test EA)	To RTV	3) GPV SN: 53936 (Instrument SN B18QSM861A)	On 27 Feb 2018: Instrument failed Test input C prime with MeOH failed due to no solvent flow. Technician visual checked all Connections – no visual issue. Technician replaced one GPV. Retest Intrument: Passed Remedy by Tech #927989	On 27 Feb 2018: Verification using another KGU (SN B18QSM870A), Result failed, no solvent flow on "C" during test input C prime with MeOH. Verified by David Kee (Test EA)	To RTV	Current Action: Flex Kallang: NA Supplier: RMA #14805 received 21 Mar 18. Part delivered on 30 Mar 18 Pending Supplier’s FA Report, Target 2 May 18 Email dated 2 Apr 18. On 29 Mar 18, Parker and Water discussed the different reasons for the returns and whether there is a need for reporting on the failure or not. Parker also propose to send report to Waters directly. To be confirm and advise later Latest advise from Eugene date 30 Apr 18 The PPM for triggering an investigation would be anything greater than 15,000“
GPV SN (Instrument SN)	Event log	Reverification on the Failed component	Resolution by CFT															
1) GPV SN: 53782 (Instrument SN B18QSM841A)	On 22 Feb 2018: Instrument failed Test input A prime with MeOh failed due to no solvent flow. Technician visual checked all Connections – no visual issue. Technician replaced one GPV. Retest Intrument: Passed Remedy by Tech #927989	On 27 Feb 2018: Verification using another KGU (SN B18QSM871A), Result failed, no solvent flow on "A" during test input A prime with MeOH. Verified by David Kee (Test EA)	To RTV															
2) GPV SN: 53698 (Instrument SN B18QSM806A)	On 26 Feb 2018: Instrument failed Test input B prime with MeOH failed due to no solvent flow. Technician visual checked all Connections – no visual issue. Technician replaced one GPV. Retest Intrument: Passed Remedy by Tech #927989	On 26 Feb 2018: Verification using another KGU (SN B18QSM807A), Result failed, no solvent flow on "B" during test input B prime with MeOH. Verified by David Kee (Test EA)	To RTV															
3) GPV SN: 53936 (Instrument SN B18QSM861A)	On 27 Feb 2018: Instrument failed Test input C prime with MeOH failed due to no solvent flow. Technician visual checked all Connections – no visual issue. Technician replaced one GPV. Retest Intrument: Passed Remedy by Tech #927989	On 27 Feb 2018: Verification using another KGU (SN B18QSM870A), Result failed, no solvent flow on "C" during test input C prime with MeOH. Verified by David Kee (Test EA)	To RTV															

Weekly First Pass Yield

Previous – WW04'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 18 Jan 2018 Instrument Part Number: 186015018 Instrument SN: A18QSM659A Affected Qty: 1u Problem: 18 Jan: Test loader download failed Date of Manufactured: Jan 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 18 Jan: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 18 Jan, Technician replaced new CPU board (PN: 210000520) from SN 221217183C to 221217224C Defective part transferred to Non Conformance Area Performed by: Technician (847838) On 18 Jan: Off Line verification using another KGU (SN A18QSM656A) – unable to initialize and continuous buzzing sound hence unable to proceed downloading firmware. Remarks: CPU 2K note not able to carry out as failed to initialized. Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. Supplier: CEI <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: On 6 Apr, RMA 25766 provided. Board were collected by CEI on 19 Apr 18. Report Target by 11 May 18(3 weeks upon receipt) Supplier's Investigation : Boot up verification fail. Then board able to boot up after ICT reset the program loaded on the board. Conclusion is Request Flex to investigate on the program loaded to the board that was caused board unable to boot up. To monitor till closure

Weekly First Pass Yield



Weekly First Pass Yield

 Alert Level crossed

13 Weeks Rolling Yield Review (Detector PDA)
(WW37 '17 – WW49 '17)

	29-Dec	5-Jan	12-Jan	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	11-May	18-May	25-May	1-Jun	8-Jun	15-Jun	22-Jun	
Row Labels	01'18	02'18	03'18	04'18	05'18	06'18	07'18	08'18	09'18	10'18	11'18	12'18	13'18	14'18	15'18	16'18	17'18	18'18	19'18	20'18	21'18	22'18	23'18	24'18	25'18	26'18	AL
210000520 (PCBA CPU)				2	2		1	1																	1	1	2
210000404 (PCBA Pers)		1																							1		2
210000415 (PCBA Pers)		1				1						1								1					1		3
279000852 (Power supply)																									1		2
210000477 (PCBA Charge Amp)																			1						1		2
279001105 (lamp power supply)						1						1		1			1								1		2
210001164 (PCBA Charge Amp)														1										1			2
402000351 (Lamp)																								1			2
279001871 (cable temp sensor)												1															2
441000986 (Cable)										2																	2
279002655 (Optic Bench) with new Grating (PN 402000198)								8	1	1																	2
400003664 (Partition)																											2
400003642 (Chassis)																											2
441001280 (cable)					1																						2

- No parts has triggered above Alert Level WK 26'18.
- Part in Focus: PCBA, CPU (210000520) – (PDA Detector WW43'17 has triggered the Alert Limit)
- Part in Focus: 279001105 (Lamp Power Supply) – 3 failures in Jan 2018 for TUV Detectors
- WW08'18 - Replacing old lot of Grating because of Wave Length Verification fail – investigation is still on-going

Weekly First Pass Yield

Current : WW26'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 26 Jun 2018 Instrument Part Number: 186002998 Instrument SN: F18998687A Affected Qty: 1u Problem: Communication error when downloading Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 26 Jun, Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 26 Jun, Technician replaced CPU (PN: 210000520) from SN 090518044C to SN 210518869C. Retest Instrument – passed Defective part transferred to Non Conformance Area Performed by: Technician (246112) Offline verification pending. CPU Supplier: CEI LIMITED The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement..	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW25'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 22 Jun 2018 Instrument Part Number: 186002998 Instrument SN: F18998624A Affected Qty: 1u Problem: Communication error when downloading . Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 22 Jun, Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 22 Jun, Technician replaced CPU (PN: 210000520) from SN 090518633C to SN 210518194C. Retest Instrument – passed Defective part transferred to Non Conformance Area Performed by: Technician (246112) Offline verification pending. CPU Supplier: CEI LIMITED <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW24'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 06 Jun 2018 Instrument Part Number: 186015032 Instrument SN: F18UPD437A Affected Qty: 1u Problem: Failed to power ON. Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 06 Jun, Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 06 Jun, Technician replaced PCB Lamp power supply (PN: 279001105) from SN 107753 to SN 107757. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) Offline verification pending. PCB Lamp power supply Supplier: HAMAMATSU CORPORATION The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW17'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 19 Apr 2018 Instrument Part Number: 186299800 Instrument SN: D18898148A Affected Qty: 1u Problem: Lamp Power unable to power up. Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 19 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 19 Apr, Technician replaced new Lamp Power Supply (PN: 279001105), from SN 106185 to SN 106204. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246112) Offline verification - pending The Defective part is to be RTV to Supplier if off line verification is failed. Lamp Power Supply Supplier: HAMAMATSU CORPORATION <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: FA received. Currently Flex internal review. Is in-progress. FA shared to WPPL on 11 June 18. Currently pending on analysis report from transistor manufacturer.

Weekly First Pass Yield

Previous – WW10'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 03, 05, 07, 08, 09, 12 and 14 Feb 2018 Instrument Part Number: 186002998 Affected Qty: 9u (1) Instrument SN: A18998632A (Optics Bench SN: 03J6P009) (2) Instrument SN: B18998663A (Optics Bench SN: 03J6P049) (3) Instrument SN: B18998664A (Optics Bench SN: 03J6P050) (4) Instrument SN: B18998667A (Optics Bench SN: 03J6P052) (5) Instrument SN: B18998668A (Optics Bench SN: 03J6P047) (6) Instrument SN: B18998670A (Optics Bench SN: 03J6P054) (7) Instrument SN: B18998673A (Optics Bench SN: 04J6P024) (8) Instrument SN: B18998675A (Optics Bench SN: 04J6P028) (9) Instrument SN: B18998665A (Optics Bench SN: 03J6P055) (10) Instrument SN: B18998669A (Optics Bench SN: 03J6P065) Problem: Final test passed. Wavelength verification failure during cycle power Date of Manufactured: Feb 2018 Reported site: Flex Kallang	<u>Investigation:</u> Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> • Suspected related to certain batch of Grating (PN 402000198) • Replaced the optics bench with new lot of Grating (PO# J12K54853-20) • After Final test passed, performed Recycle Power up – Passed. Off Line verification and investigation: still on-going Grating supplier : Horiba <u>Root Cause</u> Horiba reported workmanship issue and requested old Grating to the returned.	<u>Corrective Action:</u> Flex Kallang: Those on-hold old Grating qty 151pcs to arrange RTV Supplier: request supplier to provide FA results when completed the 151pcs of sorting and analysis. Ww26: Supplier has returned the RTV parts back to Flex for use. To monitor till closure

Weekly First Pass Yield

Previous - WW08'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 02 Feb 2018 Instrument Part Number: 186002998 Instrument SN: B18998668A Affected Qty: 1u Problem: (1) PCB, CPU (210000520) found with battery holder contact issue Date of Manufactured: Feb 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 02 Feb: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> (1) On 02 Feb, Technician replaced PCB, CPU (PN 210000520) from SN 231217533C to SN 231217517M. Retest Instrument – passed. Performed by: Technician (842185) Defective part transferred to Non Conformance Area On 05 Feb: Off Line verification of PCB, CPU (PN 210000520) using KGU s/n : BE7UPD008N result failed, able to perform CPU 2K, unable to auto download firmware and able to download manually but failed “shutter failed to home”. Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. PCB, CPU Supplier: CEI Limited <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA# 25670 received on 21 Mar 18 Arranging supplier to collect the board. Target by 29 Mar 18. Supplier collected on 4 Apr 18 Result : NTF. Boot up Verification ok, Retested ICT 3X – PASSED. Board was produced on Dec 2017, it was before corrective action for battery holder soldering issue implemented. Board return to Flex on 4 May 18. To monitor till closure

Weekly First Pass Yield

Previous – WW05'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 17 Jan 2018 Instrument Part Number: 186002998 Instrument SN: A18998602A Affected Qty: 1u Problem: Communication failure. Fail to download Date of Manufactured: Jan 2018 Reported site: Flex Kallang bosh	<u>Investigation:</u> On 18 Jan: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 18 Jan, Technician replaced PCB, CPU board (PN: 210000520) from SN 221217007C SN 221217632C. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) On 23 Jan: Off Line verification using KGU s/n : B13998443N result failed unable to download firmware auto and continuous beep Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. CPU board Supplier: CEI <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: On 20 Feb, RMA 25539 provided. Board were collected by CEI on 8 Mar 18. Report Target by 29 Mar 18(3 weeks upon receipt) Report received : NTF Boards no fault found. Verification conducted : *Visual inspection – No visual defect found. *Boot verification – shows that Application program was loaded by user, IP address present. *U12 transformer Resistance Check – Good *ICT test verification – PASSED NTF board reach Flex, to arrange for TE verification

To monitor till
closure

Weekly First Pass Yield

Previous – WW05'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 23 Jan 2018 Instrument Part Number: 186017003 Instrument SN: A18VPD091A Affected Qty: 1u Problem: Communication failure. Date of Manufactured: Jan 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 23 Jan: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 23 Jan, Technician replaced new PCB, CPU board (PN: 210000520) from SN 221217449C to 221217065C Defective part transferred to Non Conformance Area Performed by: Technician (842185) On 05 Feb: Off Line verification using another KGU (SN BETUPD008N) – able to perform CPU 2k but not able to ‘auto’ download firmware. Perform ‘manual’ firmware downloading, but during initialization, “shutter failed to home”. PCBA has to be RTV to supplier. Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. CPU Board Supplier: CEI <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA# 25670 received on 21 Mar 18 Arranging supplier to collect the board. Target by 29 Mar 18. Supplier advise to collect on 4 Apr 18 Result : NTF. Boot up Verification ok, Retested ICT 3X Board return to Flex on 4 May 18.

To monitor till
closure

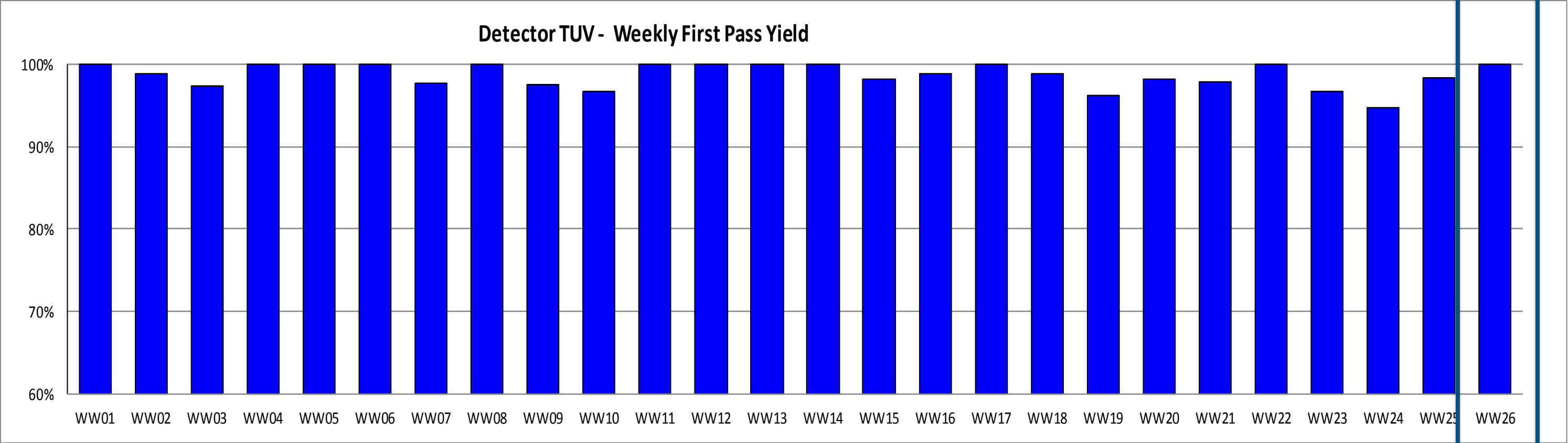
Weekly First Pass Yield

Previous – WW04'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 22 Jan 2018 Instrument Part Number: 186017013 Instrument SN: A18BPD010A Affected Qty: 1u Problem: Communication failure. Date of Manufactured: Jan 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 22 Jan: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 22 Jan, Technician replaced PCB, CPU (PN: 210000520) from SN: 221217506C to SN: 221217651C. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) On 24 Jan: Off Line verification using another KGU (B13998443N) - Fatal error. add application hardware. Unit continuous beeping sound. Remarks: CPU 2K note not able to carry out as failed to initialized. Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. PCB, CPU Board Supplier: CEI <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: On 20 Feb, RMA 25539 provided. Board were collected by CEI on 8 Mar 18. Report Target by 29 Mar 18(3 weeks upon receipt) Report received : NTF Boards no fault found. Verification conducted : *Visual inspection – No visual defect found. *Boot verification – shows that Application program was loaded by user, IP address present. *U12 transformer Resistance Check – Good *ICT test verification – PASSED NTF board reach Flex, to arrange for TE verification

To monitor till
closure

Weekly First Pass Yield



	29-Dec	5-Jan	12-Jan	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	11-May	18-May	25-May	1-Jun	8-Jun	15-Jun	22-Jun
Problem Category	WW01	WW02	WW03	WW04	WW05	WW06	WW07	WW08	WW09	WW10	WW11	WW12	WW13	WW14	WW15	WW16	WW17	WW18	WW19	WW20	WW21	WW22	WW23	WW24	WW25	WW26
First Pass Yield	100%	99%	97%	100%	100%	100%	98%	100%	98%	97%	100%	100%	100%	100%	98%	99%	100%	99%	96%	98%	98%	100%	97%	95%	98%	100%
Total Units Tested	69	94	114	119	50	118	132	64	80	93	93	79	92	119	118	95	40	90	108	110	144	82	61	116	60	104
Total Units Passed	69	93	111	119	50	118	129	64	78	90	93	79	92	119	116	94	40	89	104	108	141	82	59	110	59	104
Total Units Failed (Hard)		1	3		1		3		2	3					2	1		1	4	2	3		2	6	1	

Weekly First Pass Yield

 Alert Level crossed

13 Weeks Rolling Yield Review (Detector TUV)
(WW37 '17 – WW49 '17)

Row Labels	01'18	02'18	03'18	04'18	05'18	06'18	07'18	08'18	09'18	10'18	11'18	12'18	13'18	14'18	15'18	16'18	17'18	18'18	19'18	20'18	21'18	22'18	23'18	24'18	25'18	26'18	AL
	29-Dec	5-Jan	12-Jan	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	11-May	18-May	25-May	1-Jun	8-Jun	15-Jun	22-Jun	
279000852 (pwr supply)																								1	1		2
210000355 (PCBA, PERSO, 2489 TUV)										1									1					2			2
279001105 (Lamp Power Supply)		1	1		1																		1	1			2
210000520 (PCBA, CPU)									1	1					1	1				1				1			2
420000129 (KEYPAD)																								1			2
279002660 (PCBA PRE-AMP 2489)									1						1				2		1		1				2
210000414 (PCBA, PERSO, TUV)																		1			1						2
279001846 (cable)																					1						2
279002842 (DISPLAY, LCD)			2				2												1	1							2
279001098 (PCBA, PRE-AMP, TUV)										1																	2
402000351 (LAMP)							1																				2

- No parts failure for WK 26'18.
- Part in Focus: 21000520 (CPU PCBA)
- Part in Focus: 279001105 (Lamp Power Supply) – 3 failures in Jan 2018.

Weekly First Pass Yield

Previous : WW24'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 13 Jun 2018 Instrument Part Number: 186248900 Instrument SN: F1887E853A Affected Qty: 1u Problem: Lamp lighting failure Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 13 Jun, Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 13 Jun, Technician replaced Lamp Power Supply (PN: 279001105) from SN 107799 to SN 107964 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) Offline verification pending. Keypad Supplier: EASTPRINT INCORPORATED The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW24'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 07 Jun 2018 Instrument Part Number: 186017002 Instrument SN: F18VTU253A Affected Qty: 1u Problem: Communication failure. Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 07 Jun, Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 07 Jun, Technician replaced PCB, CPU (PN: 210000520) from SN 040518329C to SN 040518181C Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) Offline verification pending. PCB, CPU Supplier: CEI LIMITED The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW23'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 02 Jun 2018 Instrument Part Number: 186015031 Instrument SN: E18TUV745A Affected Qty: 1u Problem: Fail to power ON Date of Manufactured: Jun 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 02 Jun, Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 02 Jun, Technician replaced Lamp Power Supply (PN: 279001105). Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) Offline verification pending. Lamp Power Supply Supplier: HAMAMATSU CORPORATION The Defective part is to be RTV to Supplier. <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW20'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 09 May 2018 Instrument Part Number: 186248900 Instrument SN: E1887E523A Affected Qty: 1u Problem: Fail to initialize. Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 09 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 09 May, Technician replaced PCB, CPU (PN: 210000520) from SN: 221217506C to SN: 040418635C Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) Offline verification pending PCB, CPU Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: Pending to be returned back to CEI for analysis. NOTE: RMA board. 11 Apr 18 verified pass. Release to line 24 May 18.

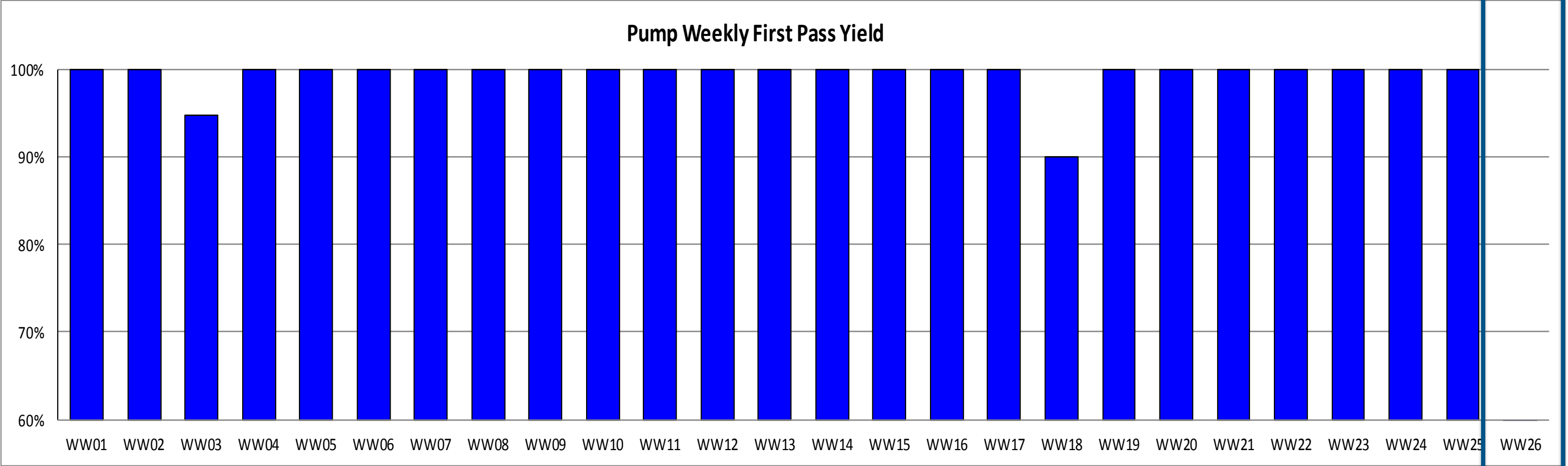
Weekly First Pass Yield

Previous – WW16'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 12 Apr 2018 Instrument Part Number: 186002487 Instrument SN: D1887E243A Affected Qty: 1u Problem: Instrument fail to initialize Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 12 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 12 Apr, Technician replaced one PCB, CPU (PN: 210000520), from SN 090318079C to SN 090318239C. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) On 16 Apr : Offline verification of PCB, CPU (PN: 210000520), using KGU SN D1387E763A, result failed. Findings: Continuous beep when powered ON, unable to download firmware manually. (Performed by: EA David) The Defective part is to be RTV to Supplier. PCB, CPU Supplier: CEI LIMITED <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA 25919 received on 4 May 18. 30 May 18 board collected by supplier. Analysis in progress.

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 11 Apr 2018 Instrument Part Number: 186248900 Instrument SN: D1887E318A Affected Qty: 1u Problem: Solder residue found at socket pin (J2) Date of Manufactured: Apr 2018 Reported site: Flex Kallang	Investigation: On 11 Apr: Technician visual checked all Connections – no visual issue. Containment Actions: On 11 Apr, Technician replaced one PCB, CPU (PN: 210000520), from SN 160318582C to SN 160318221C. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) The Defective part is to be RTV to Supplier. PCB, CPU Supplier: CEI LIMITED Root Cause It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement.	Corrective Action: Flex Kallang: NA Supplier: RMA 25918 received on 4 May 18. 30 May 18 board collected by supplier. Analysis in progress. 

Weekly First Pass Yield



	29-Dec	5-Jan	12-Jan	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	11-May	18-May	25-May	1-Jun	8-Jun	15-Jun	22-Jun
Problem Category	WW01	WW02	WW03	WW04	WW05	WW06	WW07	WW08	WW09	WW10	WW11	WW12	WW13	WW14	WW15	WW16	WW17	WW18	WW19	WW20	WW21	WW22	WW23	WW24	WW25	WW26
First Pass Yield	100%	100%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	90%	100%	100%	100%	100%	100%	100%	100%	#DIV/0!
Total Units Tested	10	20	19	19	11	8	11	10	16	16	17	5	13	9	4	11	13	10	12	13	12	9	12	6	4	
Total Units Passed	10	20	18	19	11	8	11	10	16	16	17	5	13	9	4	11	13	9	12	13	12	9	12	6	4	
Total Units Failures (Hard)			1															1								

Weekly First Pass Yield

 Alert Level crossed

13 Weeks Rolling Yield Review (PUMP)
(WW37 '17 – WW49 '17)

	29-Dec	5-Jan	12-Jan	19-Jan	26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	11-May	18-May	25-May	1-Jun	8-Jun	15-Jun	22-Jun	
Row Labels	01'18	02'18	03'18	04'18	05'18	06'18	07'18	08'18	09'18	10'18	11'18	12'18	13'18	14'18	15'18	16'18	17'18	18'18	19'18	20'18	21'18	22'18	23'18	24'18	25'18	26'18	AL
210000562 (PCBA pump controller)			1															1									2
210000548 (PCBA pump rear panel)																											2
210000520 (PCBA CPU)																											2

- No parts failure for WK 26'18
- Part in Focus: 21000520 (CPU PCBA)

Weekly First Pass Yield (in process failure)

#	Part Number / Description	Supplier	10'18	11'18	12'18	13'18	14'18	15'18	16'18	17'18	18'18	19'18	20'18	21'18	22'18	23'18	24'18	25'18	26'18	Grand Total	AL
			2-M	9-M	16-M	23-M	30-M	6-A	13-A	20-A	27-A	4-M	11-M	18-M	25-M	1-Jul	8-Jul	15-Jul	22-Jul		
1	405001338(Needle injector)	WATERS					3	1		2			2		7	2	4	3	3	21	TBA
2	WAT270279 (ASSY,MOTOR CARRIAGE DRIVE)	NIDEC MOTOR							1	1	3	1		1	1		1			9	TBA
3	289000144(check Valve)	IDEX		40	35		17		4						4		1			101	TBA
4	WAT270403 (TUBE ASSY., ACC PUMP TO TOP XD)	KEY POINT												8	16	14	2	1	1	38	TBA
6	WAT270404 (TUBE ASSY., ACC PUMB TO BOT. X)	KEY POINT												12	22	17	6	2	2	51	TBA
8	WAT270405-01 (TUBE ASSY, XDUCER TO VENT VALV)	KEY POINT												8	7	11	2	1		26	TBA
10	WAT270406-02 (TUBING ASSY., PRIMARY PUMP TO)	KEY POINT												6	9	4		3		19	TBA
12	430000101-01 (ASSY,TUBING, VALVE TO FILTER)	KEY POINT												48	30	25	2	2	1	103	TBA
18	WAT-402000198-M (GRATING, PDA)	HORIBA INSTRUMENTS INC													151					151	TBA
19	WATH-279002643(ASSY, LIMIT SENSOR GRATING DR)	CMTI PTE LTD													1					1	TBA
20	WATH-279000881-K (X-DUCER ASSY, HEAD MOUNTED)	DJ INSTRUMENTS													1					1	TBA
21	WAT271289 (MOTOR LINEAR ACTUAT)	HAYDON KERK MOTION SOLUTIONS INC											1		1					2	TBA
22	210000477 (ASSY, PCB 2998 CHARGE AMP 3.12)	Flex Senai											1							1	TBA
23	279001049 (ASSY,STEP MOTOR CAROUSEL DRIVE)	LIN ENGINEERING, INC											1							1	TBA
24	289001892 (ASSY, BARBED SEAL WASH HOUSING)	ACHB ENTERPRISE CO.,LTD.									1									1	TBA
25	279002755 (GEAR MOTOR, FILTER FLAG, BRASS)	HAYDON KERK MOTION SOLUTIONS INC									1									1	TBA
26	289003308 (ASSEMBLY, BODY FLOW CELL ANALY)	WATERS TECHNOLOGIES CORP.									1									1	TBA
27	420002695 (KEYPAD, ALLIANCE X)	EASTPRINT INCORPORATED									2	1								3	TBA
33	405002598 (FILTER FLAG)	B & E					2													2	TBA
37	279001055 (Vacuum pump assy)	IDEX	2			2	1		1											6	TBA
38	210000565 (CHARGE AMP PCBA)	Flex Senai					2													2	TBA
39	WAT045264(Stepper Motor)	LIN ENGINEERING		2																2	TBA
40	210000429 (ASSY,PCB,DUAL,OPTICAL,SENSOR)	Flex Senai					1													1	TBA
41	210000548 (ASSY, PCB, 1500 PUMP REAR PANE)	Venture International Pte. Ltd.						1												1	TBA
42	210001164 (ASSY, PCB HAMAMATSU 518 PIX PD)	Flex Senai							1											1	TBA
43	279002643 (ASSY, LIMIT SENSOR GRATING DRI)	CMTI PTE LTD							1											1	TBA
44	279002660 (PRE-AMP WITH CABLE 2489)	Flex Senai						1												1	TBA
45	289002084 (ASSY, BODY, SEAL WASH)	KEY POINT						1												1	TBA
46	400007148 (ASSY, CHASSIS, DETECTOR 2998 W)	BAITENG						1												1	TBA
47	402000351 (ASSY, HB DEUTERIUM LAMP)	HAMAMATSU					1													1	TBA
48	405006788 (OPTICS BENCH,MACHINING)	JEP						1												1	TBA
49	441001453 (ASSY, CABLE, THERMAL SWITCH)	CMTI							1											1	TBA
50	WAT270202 (Encoder)	MRPC	1																	1	TBA

Weekly First Pass Yield

Current : WW26'18 and previous data

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement																														
Reported Date: 19 May 208 onwards Instrument Part Number: 186269505, 186269506 Problem: Tubing leaking unable to ramp up 5000psi.Tubings were replaced during the trouble shooting as shown below: Pump Tray Reject: <table><tr><th></th><th>WAT2704 03</th><th>WAT270 404</th><th>WAT270 405</th><th>WAT270 406</th><th>430000 101</th></tr><tr><td>WW21-23</td><td>38</td><td>51</td><td>26</td><td>19</td><td>103</td></tr><tr><td>WW24</td><td>2</td><td>6</td><td>2</td><td>0</td><td>2</td></tr><tr><td>WW25</td><td>1</td><td>2</td><td>1</td><td>3</td><td>2</td></tr><tr><td>WW26</td><td>1</td><td>2</td><td>0</td><td>0</td><td>1</td></tr></table>		WAT2704 03	WAT270 404	WAT270 405	WAT270 406	430000 101	WW21-23	38	51	26	19	103	WW24	2	6	2	0	2	WW25	1	2	1	3	2	WW26	1	2	0	0	1	Investigation: Technicians verified the tubings with torque wrench (36 in/ib). Technician replace the tubing if Pump Tray Testing still leak. The raw tubing before use, found the Ferrule is tight to the SS tube. Tubing Assy date: Feb 2018 Tube Assy Supplier: Keypoint. Root Cause Suspected staking pressure is too high at Keypoint. Note: WPPL and Flex joint visit to Keypoint on 27 May: to use staking pressure around 108psi. These New tubing evaluation is still on-going. Scope: 4 tubings for Main Line and 5 tubings for Pump Tray Assy. Update WW23: Flex working with Keypoint to supply new tubings crimp around 108psi, and putting older tubings crimp around 140psi one side.	Corrective Action: Flex Kallang: Evaluation and data collection is still on-going Supplier: using lower staking pressure. Evaluation and data collection is still on-going
	WAT2704 03	WAT270 404	WAT270 405	WAT270 406	430000 101																											
WW21-23	38	51	26	19	103																											
WW24	2	6	2	0	2																											
WW25	1	2	1	3	2																											
WW26	1	2	0	0	1																											

Weekly First Pass Yield

Current : WW26'18 and previous data

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Part Number : WAT-405001338-B Description: NEEDLE,INJECTOR Problem: Fail decay test spec of < 270PSI. Failure: WW22 – 7 WW23 – 2 WW24 – 4 WW25 – 3 WW26 - 3 Date of Manufactured: May to June 2018 Reported site: Flex Kallang	<u>Investigation:</u> Technician visual checked all Connections –no visual issue. <u>Containment Actions:</u> Technician replaced Needle (PN:405001338) – Injector Sub Assy Retest passed. Offline verification on 07 Jun 2018, failed decay test. Verified : TE Shamsul Defective part transferred to Non Conformance Area Needle Supplier: Waters Tech <u>Root Cause:</u> It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA

Weekly First Pass Yield

Previous : WW21'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Date Reported: 22 May 2018 Part Number : WATH-WAT270279-05 Description : ASSY,MOTOR CARRIAGE DRIVE Qty: 01 Problem: Unable aligned within the 5/64 inch range during carrier motor alignment. Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 22 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 22 May Technician replaced ASSY,MOTOR CARRIAGE DRIVE (PN: WAT270279) Retest – passed. Defective part transferred to Non Conformance Area On 22 May: Offline verification result failed. Findings : Failed carrier motor alignment ass unable to align within 5/64 inch range within 3 times. (Performed by: EA David) ASSY,MOTOR CARRIAGE DRIVE Supplier: NIDEC MOTOR <u>Root Cause:</u> It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA requested on 14 May 18. RMA 5408 received on 16 May 18. Parts returned on 06 June 18. Supplier received 08 June 18. Note: Team requested to take a closer look at Assy Motor Carousel Drive as having consistence failures for past weeks

Weekly First Pass Yield

Previous : WW19'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Date Reported: 10 May 2018 Part Number : WATH-WAT270279-05 Description : ASSY,MOTOR CARRIAGE DRIVE Qty: 01 Problem: Unable to home carrier motor alignment. Date of Manufactured: May 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 10 May: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 10 May Technician replaced ASSY,MOTOR CARRIAGE DRIVE (PN: WAT270279) Retest – passed. Defective part transferred to Non Conformance Area On 22 May: Offline verification result failed. Findings : Unable to align carrier motor alignment within 5/64 range. (Performed by: EA David) ASSY,MOTOR CARRIAGE DRIVE Supplier: NIDEC MOTOR <u>Root Cause:</u> It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA requested on 14 May 18. RMA 5408 received on 16 May 18. Parts returned on 06 June 18. Supplier received 08 June 18. Note: Team requested to take a closer look at Assy Motor Carousel Drive as having consistence failures for past weeks

Weekly First Pass Yield

Previous : WW18'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Date Reported: 26 Apr 2018 Part Number : WATH-WAT270279-05 Description : ASSY,MOTOR CARRIAGE DRIVE Qty: 01 Problem: Unable to align carrier home within 5/64 range during 3 times homing carrier motor alignment Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 26 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 26 Apr Technician replaced ASSY,MOTOR CARRIAGE DRIVE (PN: WAT27027) Retest – passed. Defective part transferred to Non Conformance Area On 27 Apr: Offline verification result failed. Findings : Failed carrier motor alignment ass unable to align within 5/64 inch range within 3 times. (Performed by: EA David) ASSY,MOTOR CARRIAGE DRIVE Supplier: NIDEC MOTOR <u>Root Cause:</u> It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA requested on 14 May 18. RMA 5408 received on 16 May 18. Parts returned on 06 June 18. Supplier received 08 June 18. Note: Team requested to take a closer look at Assy Motor Carousel Drive as having consistence failures for past weeks

Weekly First Pass Yield

Previous : WW18'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Date Reported: 28 Apr 2018 Part Number : WATH-WAT270279-05 Description : ASSY,MOTOR CARRIAGE DRIVE Qty: 01 Problem: Unable to home carrier motor alignment. Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 28 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 28 Apr Technician replaced ASSY,MOTOR CARRIAGE DRIVE (PN: WAT27027) Retest – passed. Defective part transferred to Non Conformance Area On 28 Apr: Offline verification result failed. Findings : Motor unable to full turn to complete motor alignment, stop intermittently (Performed by: EA David) ASSY,MOTOR CARRIAGE DRIVE Supplier: NIDEC MOTOR <u>Root Cause:</u> It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA requested on 14 May 18. RMA 5408 received on 16 May 18. Parts returned on 06 June 18. Supplier received 08 June 18. Note: Team requested to take a closer look at Assy Motor Carousel Drive as having consistence failures for past weeks

Weekly First Pass Yield

Previous : WW18'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Date Reported: 30 Apr 2018 Part Number : WATH-WAT270279-05 Description : ASSY,MOTOR CARRIAGE DRIVE Qty: 01 Problem: Unable to home carrier motor alignment. Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 30 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 30 Apr Technician replaced ASSY,MOTOR CARRIAGE DRIVE (PN: WAT27027) Retest – passed. Defective part transferred to Non Conformance Area On 30 Apr: Offline verification result failed. Findings : Motor unable to fully turn one round during carrier motor alignment. (Performed by: EA David) ASSY,MOTOR CARRIAGE DRIVE Supplier: NIDEC MOTOR <u>Root Cause:</u> It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA requested on 14 May 18. RMA 5408 received on 16 May 18. Parts returned on 06 June 18. Supplier received 08 June 18. Note: Team requested to take a closer look at Assy Motor Carousel Drive as having consistence failures for past weeks

Weekly First Pass Yield

Previous : WW17'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Date Reported: 26 Apr 2018 Part Number : WATH-WAT270279-05 Description : ASSY,MOTOR CARRIAGE DRIVE Qty: 01 Problem: Unable to home carrier motor alignment. Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 26 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 26 Apr Technician replaced ASSY,MOTOR CARRIAGE DRIVE (PN: WAT27027) Retest – passed. Defective part transferred to Non Conformance Area On 26 Apr: Offline verification result failed. Findings : Motor unable to complete one full turn hence unable to home carrier motor alignment. (Performed by: EA David) ASSY,MOTOR CARRIAGE DRIVE Supplier: NIDEC MOTOR <u>Root Cause:</u> It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA requested on 14 May 18. RMA 5408 received on 16 May 18. Parts returned on 06 June 18. Supplier received 08 June 18. Note: Team requested to take a closer look at Assy Motor Carousel Drive as having consistence failures for past weeks

Weekly First Pass Yield

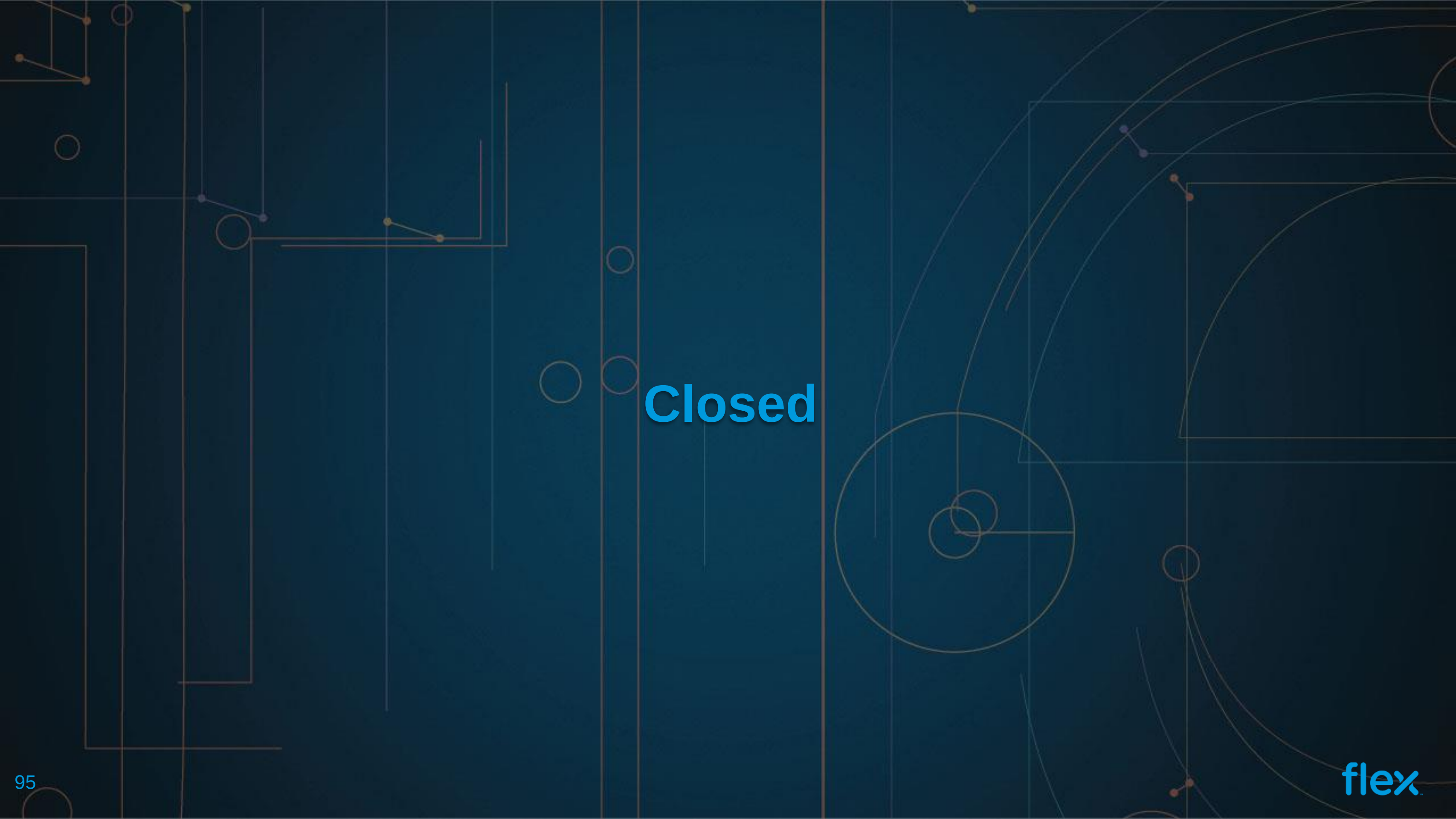
Previous : WW16'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Date Reported: 18 Apr 2018 Part Number : WATH-WAT270279-05 Description : ASSY,MOTOR CARRIAGE DRIVE Qty: 01 Problem: Unable to home carrier motor alignment. Date of Manufactured: Apr 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 18 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 18 Apr Technician replaced ASSY,MOTOR CARRIAGE DRIVE (PN: WAT27027) Retest – passed. Defective part transferred to Non Conformance Area On 18 Apr: Offline verification result failed. Findings : Unable to complete one full turn hence unable to home carrier motor alignment (Performed by: EA David) ASSY,MOTOR CARRIAGE DRIVE Supplier: NIDEC MOTOR <u>Root Cause:</u> It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA requested on 26 Apr 18. Credit memo given on 26 Apr to scrap in house. Cancelled as high fallout, requested supplier to conduct FA. RMA requested on 14 May 18. RMA 5408 received on 16 May 18. Parts returned on 06 June 18. Supplier received 08 June 18. Note: Team requested to take a closer look at Assy Motor Carousel Drive as having consistence failures for past weeks

Weekly First Pass Yield (In process)

Current : WW26'18
Previous weeks

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: WW11 (09 Mar to 15 Mar 2018) WW12 (16 Mar to 22 Mar 2018) Part Number: Part SN: 289000144 (Check Valve) Affected Qty: WW11- 40pcs (off line sorting) WW12 - 35pcs(off line sorting) WW14 – 17pcs(off line sorting) WW16 – 4pcs(off line sorting) WW22 – 4pcs (unable to ramp up to 5000psi) WW24 – 1pc (unable to ramp up to 5000psi) WW26 – 5pcs (unable to ramp up to 5000psi) Part used: Alliance (Pump Tray) Date of Manufactured: May and Jun 2018 Note: Flex initiated the Off-Line sorting as impacted Production out put. Off line sorting stopped around WW20, after supplier reported better in-house yield.	<u>Investigation:</u> WW21 – the Pump Tray passed after the Check valve replaced. The technician subjected the check valve thru ultra-sonic cleaning, retest off-line, confirm Check Valve faulty and they were moved to Mon-conformance area. <u>Containment Actions:</u> WW22 - The Defective part is to be RTV to Supplier. Check Valve Supplier: IDEX <u>Root Cause</u> WW21 - It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement.	<u>Corrective Action:</u> Flex Kallang: NA Supplier: Supplier responded on 17 Apr 18 The root cause : The contamination found at ball-seat interface. The component not sufficiently cleaned or cleared of contamination sources. Contamination can move as the ball moves in the valve, causing inconsistent test results. Supplier has establish immediate maintenance plan for changing of O-rings to prevent degradation and also to rework cartridge assemblies from supplier to eliminate risk of metal chips or poor surface conditions. – Completed 26 Mar 18 To develop Standard work and Eliminate contamination sources: burrs from components, cleaning trays, O-ring degradation, metal chips from cartridge body through internal CAPA 1220- To be complete by 29 Jun 18

The background is a dark blue gradient with a complex pattern of thin, light blue lines and circles. Some lines are straight and vertical, while others are curved or form geometric shapes like rectangles. Small circles of varying sizes are scattered throughout, some appearing to be part of larger circular paths or arcs. The overall aesthetic is technical and architectural.

Closed

Weekly First Pass Yield

Previous - WW09'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 23 Feb 2018 Instrument Part Number: 186248900 Instrument SN: B1887E890A Affected Qty: 1u Problem: Fail to initialize. Date of Manufactured: Feb 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 23 Feb: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 23 Feb, Technician replaced PCB, CPU (PN: 210000520) from SN 080118825C to SN 150118545C. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) On 27 Feb: To reverify using UPD model due to wrong model (2489), being used for production sort and use to 5032 model. After Note: off line verification – pass. Board has returned back to production. Performed by: EA (David Kee) <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA To close

Weekly First Pass Yield

Previous – WW07'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 10 Feb 2018 Instrument Part Number: 186015032 Instrument SN: B18UPD098A Affected Qty: 1u Problem: Communication failure. Date of Manufactured: Feb 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 10 Feb: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 10 Feb, Technician replaced PCB, CPU (PN: 210000520) from SN 080118825C to SN 231217644C. Reload firmware and retest carried out. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) On 21 Feb: Off Line verification using KGU SN BE7UPD008N, result Passed. Able to auto download firmware and able to perform CPU 2K. (Performed by: EA (David Kee) The Defective part is to be returned to the Production. PCB, CPU Supplier: CEI Limited <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: NA Closed

Alliance PCBA 210000425 Failure

Previous – WW48'17

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 27 Nov 2017 Instrument Part Number: 186269506 Instrument SN: L17SM4642A Affected Qty: 1u Problem: Failed Bio-Chem valve unable to work during Seal wash Test. Date of Manufactured: Nov2017 On 27 Nov, Flex Kallang Technician replaced a new PCBA. Retest Instrument – passed. On 27 Nov – Off line verification at Kallang with KGU- PCBA (SN 161117066M).still failure. Fuse not burnt. Not related to C111. Performed by: EA (Shamsul) PCBA was RTV to Flex Senai.	<u>Flex Senai Investigation:</u> 1. ICT verification failed at location U8 and U5. 2. Both U8 & U5 are same component-Logic CMOS Schmitt Trg Hex Inverter. 3. Board history – PCBA initially Pass ICT and FCT with no failure detected before shipped to Flex Kallang. <u>Flex Senai Containment Action:</u> 1. After replaced U8 and U5, PCBA passed ICT and FCT. 2. Failed component sent for component level FA to Supplier On-Semi. <u>On-Semi Investigation</u> 1. Component found electrically damaged, as per attached FA. <u>Root Cause</u> Unknown what has caused 2 x IC to be electrically damaged. Propose to continue monitoring. 	<u>Corrective Action:</u> Flex Kallang: NA Flex Senai: NA On-Semi: NA Follow up: On 13 Feb – pending verification On 01 Mar – assembled to Instrument SN B18SM4515A. Result – passed.

CLOSED

Weekly First Pass Yield

Previous - WW14'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 27 Mar 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4902A Affected Qty: 1u Problem: Failed sample temp H/W (2) during heater cooler test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 27 Mar: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 27 Mar, Technician replaced one Heater Cooler PCB (PN: 210000444), from SN 160318316M to SN 160318333M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (847838) On 04 Apr: Offline verification of Heater Cooler PCB (PN: 210000444), using KGU SN C18SM4897A, result failed Findings: same issue failed sample temp h/w fault (2). (Performed by: EA David) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA-SEN-00000109 received 9 Apr 18. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA approved 7 May 18 444 issue is closed

Weekly First Pass Yield

Previous - WW14'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 27 Mar 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4913A Affected Qty: 1u Problem: Failed sample temp H/W (2) during heater cooler test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 27 Mar: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 27 Mar, Technician replaced one Heater Cooler PCB (PN: 210000444), from SN 160318314M to SN 160318257M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (847838) On 04 Apr: Offline verification of Heater Cooler PCB (PN: 210000444) using KGU SN C18SM4897A, result failed. Findings: Same issue failed sample temp h/w fault (2). (Performed by: EA David) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA-SEN-00000109 received 9 Apr 18. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA approved 7 May 18 444 issue is closed

Weekly First Pass Yield

Previous - WW14'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 29 Mar 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4852A Affected Qty: 1u Problem: Failed sample temp H/W (4) during heater cooler test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 29 Mar: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 29 Mar, Technician replaced one Heater Cooler PCB (PN: 210000444), from SN 010218007M to SN 160318250M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (847838) On 29 Mar: Offline verification of Heater Cooler PCB (PN: 210000444), result failed. Findings: Same issue failed sample temp h/w fault (4). (Performed by: EA David) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA-SEN-00000109 received 9 Apr 18. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA approved 7 May 18. 444 issue is closed

Weekly First Pass Yield

Previous - WW14'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 02 Apr 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4946A Affected Qty: 1u Problem: Failed sample temp H/W (2) during heater cooler test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 02 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 02 Apr, Technician replaced one Heater Cooler PCB (PN: 210000444), from SN 160318282M to SN 160318201M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 03 Apr: Offline verification of Heater Cooler PCB (PN: 210000444), result failed. Findings: Same issue failed sample temp h/w fault (2). (Performed by: EA David) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA-SEN-00000109 received 9 Apr 18. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA approved 7 May 18 444 issue is closed

Weekly First Pass Yield

Previous - WW14'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 02 Apr 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4943A Affected Qty: 1u Problem: Failed sample temp H/W (1) during heater cooler test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 02 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 02 Apr, Technician replaced one Heater Cooler PCB (PN: 210000444) from SN 160318243M to SN 160318245M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 03 Apr : Offline verification of Heater Cooler PCB (PN: 210000444), result failed. Findings: Same issue, failed sample temp h/w fault (1). (Performed by: EA David) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA-SEN-00000109 received 9 Apr 18. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA approved 7 May 18 444 issue is closed

Weekly First Pass Yield

Previous - WW14'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 03 Apr 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4944A Affected Qty: 1u Problem: Unable to detect Heater Cooler during Heater Cooler test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 03 Apr: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 03 Apr, Technician replaced one Heater Cooler PCB (PN: 210000444) from SN 160318312M to SN 160318198M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (847838) On 04 Apr : Offline verification of Heater Cooler PCB (PN: 210000444), using KGU SN C18SM4897A, result failed. Findings: Unable to detect instrument under installed option. (Performed by: EA David) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: RMA-SEN-00000109 received 9 Apr 18. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA approved 7 May 18 444 issue is closed

Weekly First Pass Yield

Previous – WW13'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 09 Mar 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4712A Affected Qty: 1u Problem: Failed sample temp H/W (2) during heater cooler test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 09 Mar: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 09 Mar, Technician replaced one Heater Cooler PCB (PN: 210000444), from SN 250218158M to SN 250218116M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 12 Mar: Offline verification findings, U2 fail (no output at pin 6) (Performed by: Joel) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> Based on FA from IC supplier (Avago), it is because of the Flux used containing Halite. .	<u>Corrective Action:</u> Flex Kallang: continue to perform additional Heater Cooler Test Supplier: RMA-SEN-00000109 received 9 Apr 18. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA is progress for approval. FA approved 7 May 18 444 issue is closed

Weekly First Pass Yield

Previous – WW13'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 27 Mar 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4785A Affected Qty: 1u Problem: Failed sample temp H/W (2) during heater cooler test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 27 Mar: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 27 Mar, Technician replaced one Heater Cooler PCB (PN: 210000444), from SN 250218043M to SN 160318238M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 31 Mar: Offline verification findings, same failure sample temp H/W fault (2) (Performed by: EA David) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> Based on FA from IC supplier (Avago), it is because of the Flux used containing Halite. .	<u>Corrective Action:</u> Flex Kallang: continue to perform additional Heater Cooler Test Supplier: RMA-SEN-00000109 received 9 Apr 18. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA is progress for approval. FA approved 7 May 18 444 issue is closed

Weekly First Pass Yield

Previous – WW13'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 27 Mar 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4774A Affected Qty: 1u Problem: Failed sample temp H/W (4) during heater cooler test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 27 Mar: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 27 Mar, Technician replaced one Heater Cooler PCB (PN: 210000444), from SN 010218015M to SN 160318313M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (836410) On 31 Mar: Offline verification findings, same failure sample temp H/W fault (4) (Performed by: EA David) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> Based on FA from IC supplier (Avago), it is because of the Flux used containing Halite. .	<u>Corrective Action:</u> Flex Kallang: continue to perform additional Heater Cooler Test Supplier: RMA-SEN-00000109 received 9 Apr 18. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA is progress for approval. FA approved 7 May 18 444 issue is closed

Weekly First Pass Yield

Previous – WW13'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 26 Mar 2018 Instrument Part Number: 186269506 Instrument SN: C18SM4788A Affected Qty: 1u Problem: Failed sample temp H/W (4) during heater cooler test Date of Manufactured: Mar 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 26 Mar: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 26 Mar, Technician replaced one Heater Cooler PCB (PN: 210000444), from SN 250218117M to SN 160318331M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 31 Mar: Offline verification findings, same failure sample temp H/W fault (4) (Performed by: EA David) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> Based on FA from IC supplier (Avago), it is because of the Flux used containing Halite. .	<u>Corrective Action:</u> Flex Kallang: continue to perform additional Heater Cooler Test Supplier: RMA-SEN-00000109 received 9 Apr 18. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA is progress for approval. FA approved 7 May 18 444 issue is closed

Weekly First Pass Yield

Previous - WW09'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 26 Feb 2018 Instrument Part Number: 186269506 Instrument SN: B18SM4552A Affected Qty: 1u Problem: Sample temp h/w fault (2) during heater cooler test. Date of Manufactured: Feb 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 26 Feb: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 26 Feb, Technician replaced one Heater Cooler Board (PN: 210000444) from SN 120218940M to SN 120218815M. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 2 Mar: Off Line verification of Heater Cooler Board (PN: 210000444) using KGU SN B18SHC757A, result failed. Findings: Failed sample temp h/w fault (2) during heater cooler test. Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. Heater Cooler Board Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: On 7 Mar, RMA# RMA-RF007238 provided. Supplier findings : Component Failure- (U2) fail. Part has been send out for FA. Component was delivered to supplier on 16 Mar. Target 3 weeks upon receipt for the failure analysis report. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA is progress for approval. Target to complete by 25 May 18. 444 issue is closed

Weekly First Pass Yield

Previous - WW09'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 26 Feb 2018 Instrument Part Number: 186269506 Instrument SN: B18SM4566A Affected Qty: 1u Problem: Sample temp h/w fault (2) during heater cooler test. Date of Manufactured: Feb 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 26 Feb: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 26 Feb, Technician replaced one Heater Cooler Board (PN: 210000444) from SN 010218056M to SN 100218127M . Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 2 Mar: Off Line verification of Heater Cooler Board (PN: 210000444) using KGU SN B18SHC757A, result failed. Findings: Failed sample temp h/w fault (2) during heater cooler test. Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. Heater Cooler Board Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: On 7 Mar, RMA# RMA-RF007238 provided Supplier findings : Component Failure- (U2) fail. Part has been send out for FA. Component was delivered to supplier on 16 Mar. Target 3 weeks upon receipt for the failure analysis report. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA is progress for approval. Target to complete by 25 May 18. FA approved 7 May 18 v 444 issue is closed

Weekly First Pass Yield

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Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 27 Feb 2018 Instrument Part Number: 186269506 Instrument SN: B18SM4591A Affected Qty: 1u Problem: Unable to detect Heater Cooler during Heater Cooler test. Date of Manufactured: Feb 2018 Reported site: Flex Kallang	<u>Investigation:</u> On 27 Feb: Technician visual checked all Connections – no visual issue. <u>Containment Actions:</u> On 27 Feb, Technician replaced one Heater Cooler PCB (PN: 210000444) from SN 120218943M to SN 010218145M. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (1037617) On 2 Mar: Off Line verification of Heater Cooler PCB (PN: 210000444) using KGU SN B18SHC757A, result failed. Findings: Unable to detect sample Heater Cooler under installed option. Performed by: EA (David Kee) The Defective part is to be RTV to Supplier. Heater Cooler PCB Supplier: Flex Senai <u>Root Cause</u> It is confirmed that the Defective part has caused the Instrument to fail Final Test as per stated in the Problem Statement. .	<u>Corrective Action:</u> Flex Kallang: NA Supplier: On 7 Mar, RMA# RMA-RF007238 provided Supplier findings : Component Failure- (U5) fail. Part has been send out for FA. Component was delivered to supplier on 16 Mar. Target 3 weeks upon receipt for the failure analysis report. Supplier raised CRF to change process from Wave soldering to Manual soldering. FA is progress for approval. Target to complete by 25 May 18. FA approved 7 May 18 444 issue is closed