WATERS Weekly FPY review (WW44 – 2018)

CONFIDENTIAL

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) <u>Scope of review</u> • 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.
<u>2) Alert Level</u> • If exceeds average failure plus one Standard Deviation. • New failures – 3 pieces and above in the same week or continuous for 3 weeks.

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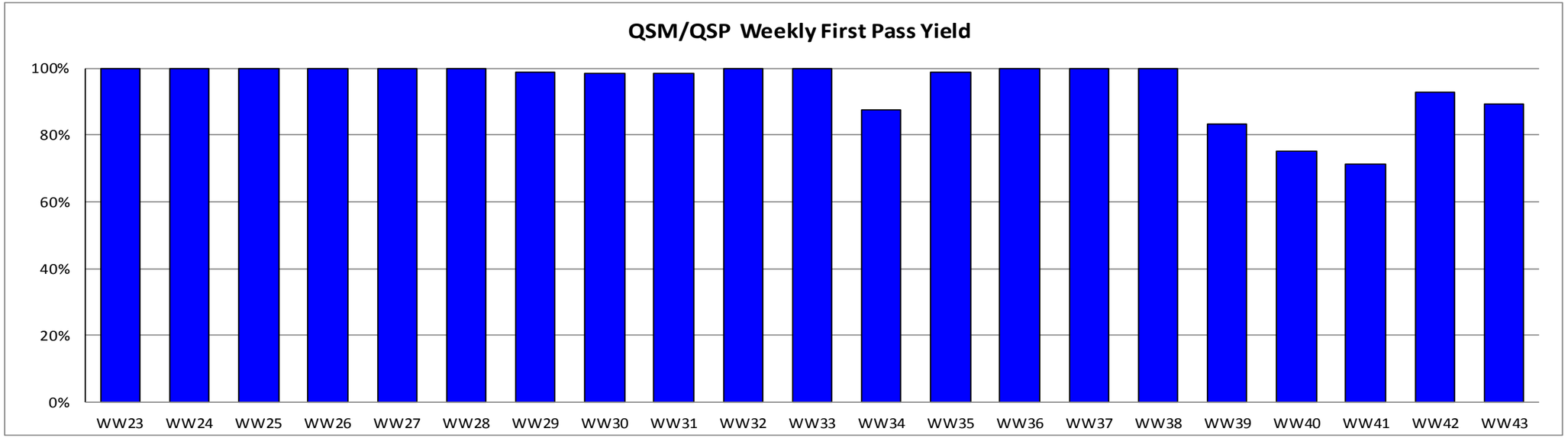
Open issues for discussion / follow up

Description	Owner	To complete by	Status
1) Failure Analysis for Alliance GPV (PN WAT270524) • 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 failures 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. • PPM: May 18 = 12,700 PPM. Jun 18 = 12,295 PPM. Jul'18 = 14337 PPM. Aug'18=7075 PPM • 28 Aug: TMD (Threadless Armature) implemented for Alliance for WAT270524 • 1st SN - 186269505 (H18SM7376A), and 186269506 **(**H18SM4478A) . • 11 Sep: TMD (Threadless Armature) implemented for QSM and QSM Plus for 279001810 • 1st SN - 186015080 (H18QSP885A) and 186015018 (H18QSM607A) • 25 Sep: To focus monitoring performance of Threadless armature GPV under TMD. • 25 Sep: see next slide for PPM till 27 Sep 2018 for Threadless armature GPV. • 02 Oct: Parker Oven Change S/N 146380 (WAT270524) and S/N 58188 (279001810) • 23 Oct: the FPY for QSM, with respect to GPV failures are PPM, see next few slides.	Flex - CFT	on going	Open

Open issues for discussion / follow up



	1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct
Problem Category	WW23	WW24	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35	WW36	WW37	WW38	WW39	WW40	WW41	WW42	WW43	WW44
First Pass Yield	100%	100%	100%	100%	100%	100%	99%	99%	99%	100%	100%	88%	99%	100%	100%	100%	83%	75%	71%	93%	89%	96%
Total Units Tested	41	59	46	54	50	21	95	69	70	48	40	16	79	35	52	22	18	24	21	71	46	48
Total Units Passed	41	59	46	54	50	21	94	68	69	48	40	14	78	35	52	22	15	18	15	66	41	46
Hard Failures							1	1	1			2	1				3	6	6	5	5	2

	1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct	
Row Labels	23'18	24'18	25'18	26'18	27'18	28'18	29'18	30'18	31'18	32'18	33'18	34'18	35'18	36'18	37'18	38'18	39'18	40'18	41'18	42'18	43'18	43'19	**Grand Total**
279001810 (GPV) (Threadless Armature)																	3	8	6	7	8	4	42
279001810 (GPV)							1	1	1			2	1										12

Note: green highlight indicates Threadless Armature

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Open issues for discussion / follow up

GPV failure (WAT270524) for Alliance (186269505 and 186269506) from Jan 2016 to Oct 2018 (WW43) Build

Trigger limt >15,000ppm

Month	186269505 and 186269506 Qty Build	Qty GPV Failure	% Failed	PPM (trigger if >15,000)	GPV SN	Instrument SN	Remarks
18-31 Aug -18	183	2	1.09%	10,929	(1) 145527 (2) 145530	(1) H18SM4527A (2) H18SM4532A	(1) Aug 2018 : Inlet D no solvent flow (2) Aug 2018 : Inlet C no solvent flow
Sep-18	484	5	1.03%	10,331	(1) 146402 (2) 146424 (3) 146426 (4) 146599 (5) 146568	(1) J18SM4723A (2) J18SM4728A (3) J18SM4810A (4) J18SM7565A (5) J18SM4847A	(1) Sep 2018 : Wire came off during assy (2) Sep 2018 : Inlet B no solvent flow (3) Sep 2018 : Inlet B no solvent flow (4) Sep 2018 : Inlet A no solvent flow (5) Sep 2018 : Inlet B no solvent flow
Oct-18 (WW40)	123	1	0.81%	8,130	(1) 146872	(1) K18SM7602A	(1) Oct 2018 : Inlet C no solvent flow
Oct-18 (WW41)	129	0	0.00%	-	-	-	-
Oct-18 (WW42)	90	0	0.00%	-	-	-	-
Oct-18 (WW43)	57	1	1.75%	17,544	(1) 147137	(1) K18SM4209A	(1) Inlet C no solvent flow
Oct-18 (WW44)	131	5	3.82%	38,168	(1) 147362 (2) 147359 (3) 147265 (4) 147286 (5) 147449	(1) K18SM4248A (2) K18SM4275A (3) K18SM4287A (4) K18SM4309A (5) K18SM4384A	(1) Inlet B no solvent flow (2) Inlet B no solvent flow (3) Inlet B no solvent flow (4) Inlet B no solvent flow (5) Inlet B no solvent flow

Open issues for discussion / follow up

GPV failure (279001810) for QSM and QSM Plus (186015018 and 186015080) from Jan 2017 to Oct 2018 (WW43) Build

Trigger limt >15,000ppm

Month	Qty Build (Instrument)	Qty used (GPV)	Qty Failure	% Failed	PPM	GPV SN	Instrument SN	Remarks
27-31 Aug-18	32	64	0	0.00%	-	-	-	-
Sep-18	127	254	3	1.18%	11,811	(1) 58329 (2) 58232 (3) 58336	(1) J18QSM632A (2) J18QSM633A (3) J18QSM638A	(1) Test compositional accuracy & high pressure test (2) Test input B prime with MeOH (3) Test input D prime with MeOH
Oct-18 (WW 40)	24	48	8	16.67%	**166,667**	(1) 58287 (2) 58203 (3) 58196 (4) 58282 (5) 58268 (6) 58192 (7) 58195 (8) 58200	(1) J18QSM640A (2) K18QSM667A (3) K18QSM667A (4) J18QSM657A (5) K18QSM670A (6) J18QSM662A (7) J18QSM663A (8) J18QSM663A	(1) Compositional Accuracy test failed - AC 90%, AC 10% (2) Failed Test Input D Prime with MeOH (3) Compositional Accuracy test failed - BD 90% (4) Compositional Accuracy test failed - BD 90%, BD 10% (5) Channel D Prime fail - No flow (6) Compositional Accuracy test failed - BD 90%, BD 10% (7) Compositional Accuracy test failed - BD 10% (8) Compositional Accuracy test failed - BD 90%, AC 10%
Oct-18 (WW 41)	21	42	6	14.29%	**142,857**	(1) 58191 (2) 58190 (3) 58421 (4) 58395 (5) 58198 (6) 58410	(1) J18QSM664A (2) K18QSM668A (3) K18QSP006A (4) K18QSP011A (5) K18QSP014A (6) K18QSP024A	(1) Test input B prime with MeOH (2) Test input B prime with MeOH (3) Test compositional accuracy & high pressure test (4) Test input B prime with MeOH (5) Test input B prime with MeOH (6) Test input B prime with MeOH
Oct-18 (WW 42)	71	142	7	4.93%	**49,296**	(1) 58393 (2) 58400 (3) 58409 (4) 58433 (5) 58703 (6) 58685 (7) 58751	(1) K18QSP054A (2) K18QSP028A (3) K18QSP028A (4) K18QSP028A (5) K18QSP057A (6) K18QSM679A (7) K18QSP070A	(1) Test Input B Prime with MeOH (2) Test Input D Prime with MeOH (3) Test Input B Prime with MeOH (4) Input C Prime with MeOH (5) Test Input B Prime with MeOH (6) Input Line A Prime with MeOH (7) Input Line B Prime with MeOH
Oct-18 (WW 43)	46	92	8	8.70%	**86,957**	(1) 58394 (2) 58419 (3) 58237 (4) 58740 (5) 58669 (6) 58355 (7) 58361 (8) 58715	(1) K18QSP054A (2) K18QSP037A (3) K18QSP037A (4) K18QSP081A (5) K18QSP090A (6) K18QSP051A (7) K18QSP102A (8) K18QSP102A	(1) Test Input D Prime with MeOH (2) Test Input B Prime with MeOH (3) Test Input D Prime with MeOH (4) Failed Compositional Accuracy and High Pressure Test (5) Test Input D Prime with MeOH (6) Test Input D Prime with MeOH (7) Test Input B Prime with MeOH (8) Failed Compositional Accuracy and High Pressure Test
Oct-18 (WW 44)	48	96	4	4.17%	**41,667**	(1) 58594 (2) 58430 (3) 58241 (4) 58549	(1) K18QSP039A (2) K18QSP039A (3) K18QSP039A (4) K18QSP120A	(1) Test Input B Prime with MeOH (2) Test input A Prime with MeOH (3) Test Input B Prime with MeOH (4) Test Input A Prime with MeOH

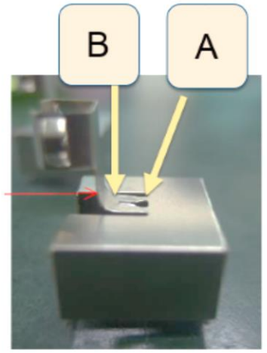
Open issues for discussion / follow up

Description	Owner	To complete by	Status
<u>2) Ethernet Cable (PN 441001280) – reopen this issue</u> • 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. • 04 Jul: 2 x samples received. To put up a PCN to WPPL for review. • 28 Aug: PCN submitted for WPPL review. • 08 Oct: PCN approved by WPPL. • 23 Oct: Flex working with CMTi on implementation	Flex / WPPL	TBA	Open

Quick Over view of proposal:

Failed part

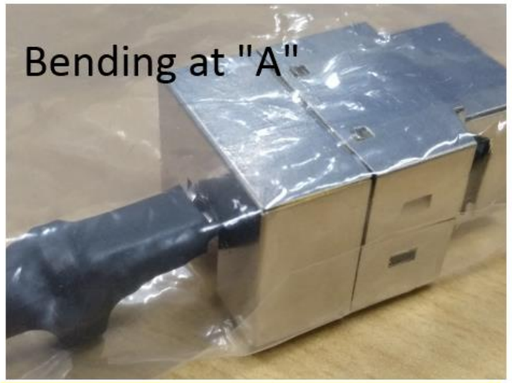
Raw part before bent



A – current bending point
B – proposed bending point

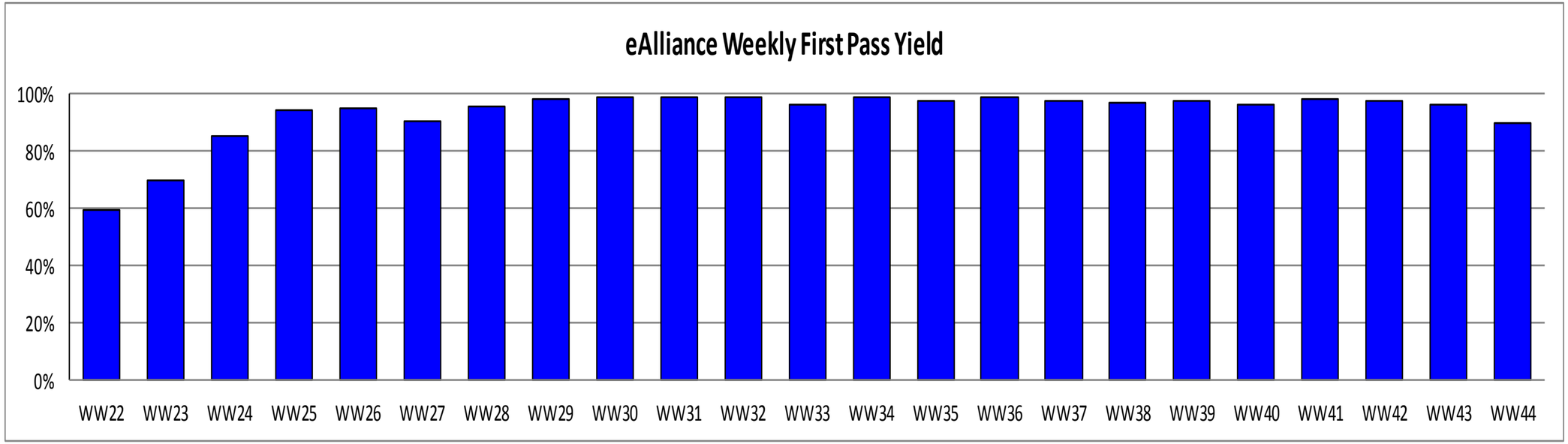
03 Jul: Sample received:

2 samples - proposed method



1 sample - current method

Weekly First Pass Yield



	25-May	1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct
Problem Category	WW22	WW23	WW24	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35	WW36	WW37	WW38	WW39	WW40	WW41	WW42	WW43	WW44
First Pass Yield	60%	70%	85%	95%	95%	91%	96%	98%	99%	99%	99%	96%	99%	98%	99%	98%	97%	98%	97%	98%	98%	96%	90%
Total Units Tested	87	126	128	94	140	119	115	114	105	105	77	103	107	137	122	125	127	128	123	129	90	57	131
Total Units Passed	52	88	109	89	133	108	110	112	104	104	76	99	106	134	121	122	123	125	119	127	88	55	118
Hard Failures	35	38	19	5	7	11	5	2	1	1	1	4	1	3	1	3	4	3	4	2	2	2	13

Weekly First Pass Yield

Alert Level crossed

		1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct	
	Row Labels	WW23	WW24	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35	WW36	WW37	WW38	WW39	WW40	WW41	WW42	WW43	WW44	AL
1	210000411 (CPU PCBA)		2			2						2				1	1			1	1	1	7	2
2	WAT270524 (GPV) (Non TMD)	4	2			4	2		1	1	1													3
3	WAT270524 (GPV) (Threadless armature)													2		2	1	2	1			1	5	3
4	210000425 (Pump tray PCBA)		2				1							1							1		1	5
5	210000416 (Fluidics PCBA)											2							2					2
6	279001055 (Vacuum pump)						1												1	1				2
7	WAT270471-00 (Power supply)																1	1						2
8	WAT073109 (Syringe)	2	4	2													1							2
9	289012691 (Chamber)												1											2
10	279003850 (V4)					1		1																2
11	210000444 (H/C PCBA)						1																	2
12	Replaced 279003915 (Injector subassembly)	19	2	1	1																			TBA
13	Carry over test fail. Replaced WAT033276 (Seal)																							TBA
14	Re-aligned 279003915 (Injector subassembly)																							TBA
15	430001194 (Tubing)	2	1	1	1	1		1																2
16	430001336 (Tubing)	2			1																			2
17	WAT078565(Tubing)	2	2		1																			2
18	WAT270409 (Tubing)	5	3		2										1									2
19	WAT270172 (Transducer)			1	1	3																		2
20	WAT271815 (Tubing)	1																						2
21	430000105 (tubing)	1																						2

Part Number	Supplier	Q1	Q2	Q3	Q4	Remarks
210000444 (H/C PCBA)	Flex Senai					Supplier change process to manual soldering. No failure reported. Closed
WAT270524 (GPV) (Non TMD)	Parker					Parker phased in Threadless armature on 18 Aug 2018 (TMD).. Fail parts - pending FA from Supplier.
Keypoint tubings	Keypoiint					Supplier using 108psi staking issue. No failure reported. Closed.
WAT073109 (Syringe)	MK Fluidic					WW26 to WW34 – no failure. Fail parts - pending FA from Supplier.
WAT270172 (Transducer)	DJ Instrument					WW28 to Ww38 – no failure. Fail parts - pending FA from Supplier.
279003915 (Injector sub assy)	-					WW27 onwards – stopped to replace Injector sub assy for carry over test

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Weekly First Pass Yield

Current : WW44'18

Problem Statement

Reported Date: 25 Oct 2018

Instrument Part Number & Instrument SN: see Containment Action
Affected Qty: see below
Problem:

WW	Failure	Qty
44	Error In VRTX task Main : DSP put Word TMO during Rear Panel Test	7

Date of Manufactured: Oct 2018

Reported site: Flex Kallang

Investigation/ Possible Root Cause

Off Line verification at Flex Kallang

WW	Instrument SN (Model: 186269506)	210000411 PCBA Serial Number	Kallang Failure	Off line verification
44	K18SM4247A	031018054M	Error In VRTX task Main : DSP put Word TMO during Rear Panel Test	failed
44	K18SM4288A	031018130M		failed
44	K18SM4247A	031018129M		failed
44	K18SM4236A	031018084M		failed
44	K18SM4342A	031018053M		failed
44	K18SM4343A	031018107M		failed
44	K18SM4329A	031018056M		failed

Root Cause

Senai: Below the prelim findings at Senai for the RTV bds

Serial	VMI	FCT	U66 offline programming verification
031018054M	Pass	failed (communication error)	failed
031018130M	Pass	failed (communication error)	failed
031018129M	Pass	failed (communication error)	failed
031018056M	Pass	failed (communication error)	failed
031018084M	Pass	failed (communication error)	failed
031018053M	Pass	failed (communication error)	failed
031018107M	Pass	failed (communication error)	failed

Prelim investigation - U66 corrupted. Pending reports from Senai

Corrective Action/ Improvement

Containment Action:

Supplier: Flex Senai send technician to Flex Kallang to screen thru all the Kallang on-hand PCBA.
Result of Screening: TBA

Corrective Action:

Flex Kallang: NA

Supplier:

- 7u of PCBA failed in WW44, already RTV to Senai.
- Pending reports from Senai

Weekly First Pass Yield

Current : WW44'18

Problem Statement

Reported Date: Aug 2018 to Oct 2018

Instrument Part Number: 186269505, 186269506

Affected Qty:

WW	Failure	GPV SH
44	5	(1) 147362 (2) 147359 (3) 147265 (4) 147286 (5) 147449

Problem: refer to table on right

Date of Manufactured: Oct 2018

Reported site: Flex Kallang

Investigation/ Possible Root Cause

Investigation:

Technician visual checked all Connections – no visual issue.

Containment Actions:

Technician replaced GPV (PN:WAT270524, threadless armature under TMD) with new one.

Retest Instrument – passed.

Defective part transferred to Non Conformance Area

Date Detected/ Instrument SN	Fail Code	GPV SN	Verification
24 Oct 2018 (K18SM4248A)	Inlet B no solvent flow	SN 147362	On 26 Oct, Offline verification using result failed. Findings: Same failure encountered. Verified by TE David
25 Oct 2018 (K18SM4275A)	Inlet B no solvent flow	SN 147359	On 26 Oct, Offline verification using result failed. Findings: Same failure encountered. Verified by TE David
29 Oct 2018 (K18SM4287A)	Inlet B no solvent flow	SN 147265	On 29 Oct, Offline verification using result failed. Findings: Same failure encountered. Verified by TE David
29 Oct 2018 (K18SM4309A)	Inlet B no solvent flow	SN 147286	On 29 Oct, Offline verification using result failed. Findings: Same failure encountered. Verified by TE David
31 Oct 2018 (K18SM4384A)	Inlet B no solvent flow	SN 147449	On 02 Nov, Offline verification using result failed. Findings: Same failure encountered. Verified by TE David

GPV Supplier : Parker

Root Cause

Pend FA from supplier

Corrective Action/ Improvement

Corrective Action:

Flex Kallang: NA

Supplier: see below

Weekly First Pass Yield

WW43'18 to previous

Problem Statement

Reported Date: Aug 2018 to Oct 2018

Instrument Part Number: 186269505, 186269506

Affected Qty:

WW	Failure	GPV SH
35	2	SN 145527, SN 145530
36	0	-
37	2	SN 146402, SN 146424
38	1	SN 146426
39	2	SN 146568, SN 146599
40	1	SN 146872
41	0	NA
42	0	NA
43	1	SN147137

Problem: refer to table on right

Date of Manufactured: Aug, Sep, Oct 2018

Reported site: Flex Kallang

Investigation/ Possible Root Cause

Investigation:

Technician visual checked all Connections – no visual issue.

Containment Actions:

Technician replaced GPV (PN:WAT270524, threadless armature under TMD) with new one.

Retest Instrument – passed.

Date Detected/ Instrument SN	Fail Code	GPV SN	Verification
27 Aug 2018 (H18SM4527A)	Inlet D no solvent flow during Solvent inlet Plumbing Verification.	SN 145527	On 05 Sept, Offline verification using KGU J18SM7496A, result failed. Findings: Same failure encountered. Verified by TE David
27 Aug 2018 (H18SM4532A)	Inlet C no solvent flow during Solvent inlet Plumbing Verification	SN 145530	On 05 Sept, Offline verification using KGU J18SM7496A, result failed. Findings: Same failure encountered. Verified by TE David
11 Sep 2018 (J18SM4723A)	Wire came off during assy	SN 146402	NA
11 Sep 2018 (J18SM4728A)	Inlet B failed during Solvent Inlet Plumbing	SN 146424	On 18 Sep, Offline verified using KGU S/N : J18SM7515A, result failed. Findings : No Solvent flow on channel "B" Verified by TE David
14 Sep 2018 (J18SM4810A)	Inlet B no solvent flow during Solvent Inlet Plumbing	SN 146426	On 20 Sep, Offline verified using KGU S/N : J18SM7569A, result failed. Findings : Same failure encountered. Verified by TE David
20 Sep 2018 (J18SM7565A)	Inlet A no solvent flow during Solvent Inlet Plumbing	SN 146599	On 24 Sep, Offline verified using KGU S/N : J18SM4880A, result failed. Findings : Same failure encountered. Verified by TE David
21 Sep 2018 (J18SM4847)	Inlet B no solvent flow during Solvent Inlet Plumbing	SN 146568	On 24 Sep, Offline verified using KGU S/N : J18SM4880A, result failed. Findings : Same failure encountered. Verified by TE David
03 Oct 2018 (K18SM7602A)	Solvent C no water flow during Solvent Inlet Plumbing Verification	SN 146872	On 04 Oct, Offline verified using KGU S/N : K18SM4019A. result failed. Findings: Same failure encountered. Verified by TE David
23 Oct 2018 (K18SM4209A)	Inlet C no solvent flow during Solvent Inlet Plumbing Verification	SN 147137	On 23 Oct, Offline verified failed, Findings : No air blowing out of Inlet C during Nitrogen purge.. Verified by TE Shamsul

GPV Supplier : Parker

Root Cause

Pend FA from supplier

Corrective Action/ Improvement

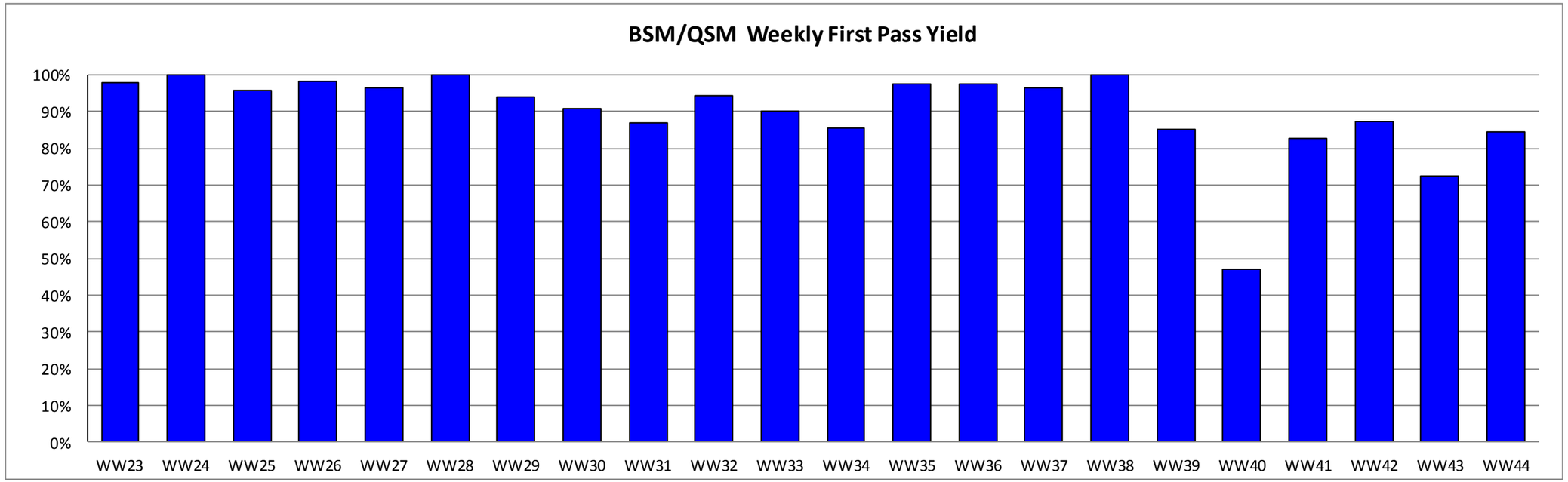
Corrective Action:

Flex Kallang: NA

Supplier: see below

GPV SN	Verification
SN 145527	RMA **ATR # 05375** dated 25 Sep 2018
SN 145530	RMA **ATR # 05375** dated 25 Sep 2018
SN 146402	RMA ATR# 05407 dated 02 Oct 2018
SN 146424	RMA ATR# 05407 dated 02 Oct 2018
SN 146426	RMA ATR # 05437 dated 05 Oct 2018
SN 146599	RMA ATR # 05437dated 05 Oct 2018
SN 146568	RMA ATR # 05437 dated 05 Oct 2018
SN 146872	Pending RMA#

Weekly First Pass Yield



	1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct
Problem Category	WW23	WW24	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35	WW36	WW37	WW38	WW39	WW40	WW41	WW42	WW43	WW44
First Pass Yield	98%	100%	96%	98%	96%	100%	94%	91%	87%	94%	90%	86%	98%	98%	96%	100%	85%	47%	83%	87%	72%	85%
Total Units Tested	49	63	46	54	57	28	101	75	76	54	50	21	82	41	56	22	27	17	58	71	58	52
Total Units Passed	48	63	44	53	55	28	95	68	66	51	45	18	80	40	54	22	23	8	48	62	42	44
Hard Failures	1		2	1	2		6	7	10	3	5	3	2	1	2		4	9	10	9	16	8

Weekly First Pass Yield (BSM / QSM family)

Alert Level crossed

		1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct	
	Row Labels	WW23	WW24	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35	WW36	WW37	WW38	WW39	WW40	WW41	WW42	WW43	WW44	AL
1	279001810 (GPV) (Non TMD)	1						1	1	1			2	1										2
2	279001810 (GPV) (Threadless armature)																	3	8	6	7	8	4	2
3	210000345 (PCBA Analytical)			1		1			1		1	1								1	1		1	2
4	279001817 (ASSY, QSM, I2V)					1		1		1		1								1			1	2
5	430002388 (ASSY, TUBE, GPV-C TO MIXER)									1												1	1	2
6	WAT270594 (SOLENOID)								1														1	2
7	289001940 (Check Valve)							1		2										1		2		2
8	279000495 (Power Supply)																	1				1		2
9	289003207 (Assy Cartridge)			1	1				1		1	1										2		2
10	430002389 (TUBE Assy, GPV TO MIXER)									1												1		2
11	430002390 (Tubing)								1													2		2
12	210000520 (PCBA CPU)									1				1										2
13	210000396 (PCB Degasser Transducer)																				1			2
14	430002316 (ASSY, TUBE, XDUCER - VENT VALV)																			1				2
15	279001056 (PUMP Degasser)									1									1					2
16	210000422 (PCBA PUMP)								1				1		1									2
17	441000973 (Cable on/off)											1												2
18	430002316 (XDUCER - VENT VALVE)											1												2
19	441000974 (Cable)									1	1					1								2
20	279001864 (Vent Valve)							2		2						1								2

Part Number	Supplier	Q1	Q2	Q3	Q4	Remarks
210000520 (PCBA, CPU)	CEI					Common PCBA and crossed trigger limit in Detector models, Under monitoring
279001810 (GPV non TMD)	Parker					Parker phased in Threadless armature on 27 Aug 2018 (TMD). Fail parts - pending FA from Supplier.

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Weekly First Pass Yield

Current : WW44'18

Problem Statement

Reported Date:
Oct 2018

Instrument Part Number: 186015080
Affected Qty:
See below

WW	No of GPV Failed	Confirmed Failed GPV SN
44	4	(1) 58594 (2) 58430 (3) 58241 (4) 58549

Reported site: Flex Kallang

Investigation/ Possible Root Cause

Investigation:
Technician visual checked all Connections – no visual issue.
Action Taken:
Technician replaced GPV (PN:279001810, threadless armature under TMD) with new one and retested the Instrument passed. Defective part transferred to Non Conformance Area for further verification

Date Detected/ Instrument SN	Fail Code	GPV SN	Verification
Week 44 (1) K18QSP039A (2) K18QSP039A (3) K18QSP039A (4) K18QSP120A	(1) Test Input B Prime with MeOH (2) Test input A Prime with MeOH (3) Test Input B Prime with MeOH (4) Test Input A Prime with MeOH	(1) 58594 (2) 58430 (3) 58241 (4) 58549	(1) Test Input B Prime with MeOH. Verify by TE David Kee (2) Test Input A Prime with MeOH. Verify by TE David Kee (3) Test Input B Prime with MeOH. Verify by TE David Kee (4) Test Input A Prime with MeOH. Verify by TE David Kee

Root Cause: Pending FA from supplier(Parker)

Corrective Action/ Improvement

Corrective Action:

Flex Kallang: NA

Supplier:

Weekly First Pass Yield

W42'18 to WW43'18

Problem Statement

Reported Date:
19, 24 Sep 2018 & 01 Oct 2018

Instrument Part Number: 186015018
Affected Qty:
See below

WW	No of GPV failed	Confirmed Failed GPV SN
42	7	58393 58400 58409 58433 58703 58685 58751
43	8	(1) 58394 (2) 58419 (3) 58237 (4) 58740 (5) 58669 (6) 58355 (7) 58361 (8) 58715

Reported site: Flex Kallang

Investigation/ Possible Root Cause

Investigation:
Technician visual checked all Connections – no visual issue.
Action Taken:
Technician replaced GPV (PN:279001810, threadless armature under TMD) with new one and retested the Instrument passed. Defective part transferred to Non Conformance Area for further verification

Date Detected/ Instrument SN	Fail Code	GPV SN	Verification
Week 42 K18QSP054A K18QSP028A K18QSP028A K18QSP028A K18QSP057A K18QSM679A K18QSP070A	Test Input B Prime with MeOH Test Input D Prime with MeOH Test Input B Prime with MeOH Input C Prime with MeOH Test Input B Prime with MeOH Input Line A Prime with MeOH Input Line B Prime with MeOH	58393 58400 58409 58433 58703 58685 58751	Test Input B Prime with MeOH. Verify by TE David Kee Failed Test Input D Prime with MeOH. Verify by TE David Kee Fail Test Input B Prime with MeOH. Verify by TE David Kee Failed Compositional and High Pressure Test BD 90. Verify by TE David Kee Fail Test Input B Prime with MeOH. Verify by TE David Kee Failed Test Input A Prime with MeOH. Verify by TE David Kee Failed Test Input B Prime with MeOH. Verify by TE David Kee
Week 43 (1) K18QSP054A (2) K18QSP037A (3) K18QSP037A (4) K18QSP081A (5) K18QSP090A (6) K18QSP051A (7) K18QSP102A (8) K18QSP102A	(1) Test Input D Prime with MeOH (2) Test Input B Prime with MeOH (3) Test Input D Prime with MeOH (4) Failed Compositional Accuracy and High Pressure Test (5) Test Input D Prime with MeOH (6) Test Input D Prime with MeOH (7) Test Input B Prime with MeOH (8) Failed Compositional Accuracy and High Pressure Test	(1) 58394 (2) 58419 (3) 58237 (4) 58740 (5) 58669 (6) 58355 (7) 58361 (8) 58715	(1) Failed test Input D Prime with MeOH, Verify by TE David Kee (2) Failed test Input B Prime with MeOH, Verify by TE David Kee (3) Failed test Input D Prime with MeOH, Verify by TE David Kee (4) Fail Test Input D Prime with MeOH. Verify by TE David (5) Failed Test Input B Prime with MeOH. Verify by TE David (6) Fail Test Input B Prime with MeOH. Verify by TE David (7) Test Input B Prime with MeOH failed. Verify by TE David (8) Compositional Accuracy Test failed - BD 90%. Verify by TE David

Root Cause: Pending FA from supplier(Parker)

Corrective Action/ Improvement

Corrective Action:

Flex Kallang: NA

Supplier: RTV is in progress

Weekly First Pass Yield

WW39'18 to WW41'18

Problem Statement

Reported Date:
19, 24 Sep 2018 & 01 Oct 2018

Instrument Part Number: 186015018
Affected Qty:
See below

WW	No of GPV failed	Confirmed Failed GPV SN
39	3	SN 58329 SN 58232 SN 58336
40	8	SN 58287, SN 58203 SN 58196, SN 58282 SN 58268, SN 58192 SN 58195, SN 58200
41	6	(1) 58191, (2) 58190 (3) 58421, (4) 58395 (5) 58198. (6) 58410

Reported site: Flex Kallang

Investigation/ Possible Root Cause

Investigation:
Technician visual checked all Connections – no visual issue.
Action Taken:
Technician replaced GPV (PN:279001810, threadless armature under TMD) with new one and retested the Instrument passed. Defective part transferred to Non Conformance Area for further verification

Date Detected/ Instrument SN	Fail Code	GPV SN	Verification
Week 39 (J18QSM632A)	Failed Compositional Accuracy and High Pressure Test	SN 58329	Offline verification, result failed. Findings: Same failure encountered. Verified by TE David On 03 Oct, GPV (SN 58329, re- verified in known good units (J18QSM668A) and confirmed fail. Witnessed by WPPL
Week 39 (J18QSM633A)	Failed Test Input B prime with MeOH. 1) Reading out of range is 60 2) Reading out of range is 58	SN 58232	Offline verification, result failed. Findings: Same failure encountered. Verified by TE David On 03 Oct, GPV (SN 58232) re- verified in known good units (J18QSM663A) and confirmed fail. Witnessed by WPPL
Week 39 (J18QSM638A)	Failed Test Input D Prime with MeOH. Good Spec 10PSI(Low) to 85PSI(High). Actual reading 0.4PSI	SN 58336	Offline verification, result failed. Findings: Same failure encountered. Verified by TE David On 03 Oct, GPV (SN 58336) re- verified in known good units (J18QSM669A) and confirmed fail. Witnessed by WPPL
Week 40 J18QSM640A K18QSM667A K18QSM667A J18QSM657A K18QSM670A J18QSM662A J18QSM663A J18QSM663A	1. Input line D prime with MEOH fail 2.Test composition accuracy BD 90% fail. 3. Test composition accuracy BD 10% fail	SN 58287 SN 58203 SN 58196 SN 58282 SN 58268 SN 58192 SN 58195 SN 58200	On 02 Oct, 3x GPV SN 58287, SN 58282 and SN 58268 verified by David and confirmed fail. On 03 Oct, 5x GPV (SN 58203,SN 58196,SN 58195,SN 58192 and SN 58200) re- verified in known good units (J18QSM663A, 662A,663A,004A and 663A) and confirmed fail. Witnessed by WPPL
Week 41 J18QSM664A K18QSM668A K18QSP006A K18QSP011A K18QSP014A K18QSP024A	(1) Test input B prime with MeOH (2) Test input B prime with MeOH (3) Test compositional accuracy & high pressure test (4) Test input B prime with MeOH (5) Test input B prime with MeOH (6) Test input B prime with MeOH	(1) 58191 (2) 58190 (3) 58421 (4) 58395 (5) 58198 (6) 58410	All offline verified and confirmed failed as per the fail code stated.

Root Cause: Pending FA from supplier(Parker)

Corrective Action/ Improvement

Corrective Action:

Flex Kallang: NA

Supplier:

GPV SN	Verification
SN 58329	RMA ATR # 05437 dated 05 Oct 2018
SN 58232	RMA ATR # 05437 dated 05 Oct 2018
SN 58336	RMA ATR # 05437 dated 05 Oct 2018
SN 58287	RMA ATR # 05437 dated 05 Oct 2018
SN 58203	RMA ATR # 05437 dated 05 Oct 2018
SN 58196	RMA ATR # 05437 dated 05 Oct 2018
SN 58282	RMA ATR # 05437 dated 05 Oct 2018
SN 58268	RMA ATR # 05437 dated 05 Oct 2018
SN 58192	RMA ATR # 05437 dated 05 Oct 2018
SN 58195	RMA ATR # 05437 dated 05 Oct 2018
SN 58200	RMA ATR # 05437 dated 05 Oct 2018

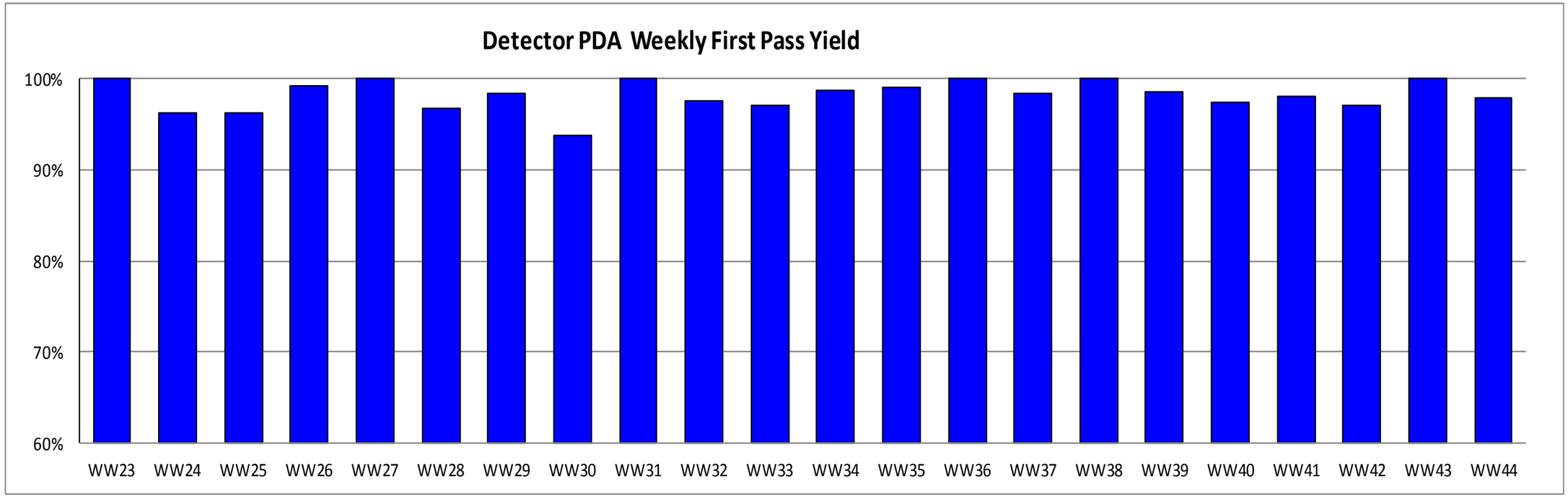
Weekly First Pass Yield

Current : WW44’18

PCBA 210000520 – Tracker (PCBA failing in BSM/QSM family)

WW	Model PN	Instrument SN	210000520 PCBA SN	Fail Code	Off line verification	Failure Analysis / Actions
31	186015080 QSM Plus	G18QSP768A	230618369C	Failed on power when test loader download continue with beep sound.	Failed. - Continue beep when power on, thus unable to download firmware (by David Kee)	RMA# 26493 provided.

Weekly First Pass Yield



	1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct
Problem Category	WW23	WW24	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35	WW36	WW37	WW38	WW39	WW40	WW41	WW42	WW43	WW44
First Pass Yield	100%	96%	96%	99%	100%	97%	98%	94%	100%	98%	97%	99%	99%	100%	98%	100%	99%	97%	98%	97%	100%	98%
Total Units Tested	116	109	107	129	126	94	132	97	101	81	101	84	117	95	122	92	72	116	109	106	98	94
Total Units Passed	116	105	103	128	126	91	130	91	101	79	98	83	116	95	120	92	71	113	107	103	98	92
Total Units Failures (hard)		4	4	1		3	2	6		2	3	1	1		2		1	3	2	3		2

Weekly First Pass Yield

Alert Level crossed

Detector PDA

		1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct	
	Row Labels	WW23	WW24	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35	WW36	WW37	WW38	WW39	WW40	WW41	WW42	WW43	WW44	AL
1	210000520 (PCBA CPU)			1	1		1				1	1	1	1									1	2
2	210000404 (PCBA Pers)			1					1			1				1				1	1		1	2
3	210000415 (PCBA Pers)			1			1		1			1							1					2
4	402000353 (lamp)															1		1			2			2
5	441000579 (cable pow er status led)																			1				2
6	402000351 (Lamp)		1																2					2
7	279001846 (cable)								4															2
8	279001105 (lamp power supply)		1					1			1													2
9	210001164 (PCBA Charge Amp)		1					1																2
10	279000852 (Power supply)			1			1																	2

Part Number	Supplier	Q1	Q2	Q3	Q4	Remarks
402000198 (Grating)	Horiba					Part issue. Grating RTV after supplier reported workmanship issue. Closed
210000520 (PCBA, CPU)	CEI					Common PCBA. Q1 and Q3 - consecutive weeks seeing failures. Under monitoring
279001846 (cable)	CMTI					4M reviewed by CMTI and Flex. No failure from WW31 to WW38. Closed

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Weekly First Pass Yield

Current : WW44’18

PCBA 210000520 – Tracker (PCBA failing in PDA family)

WW	Model PN	Instrument SN	210000520 PCBA SN	Fail Code	Off line verification	Failure Analysis / Actions
44	186015033 PDA	K18UPL311A	180918685C	Fail to download firmware	in progress	NA
35	186299800 PDA	H18998073A	200718290C	Communication failure	Passed. Able to download firmware. On 186248900 model only. (By David Kee)	NA
34	186015033 PDA	H18UPL148A	090318079C	Communication Failure	Failed. (1) Able to detect instrument at Loader (2) Unable to download firmware due to continue beep (by David Kee)	RMA# 26597 provided.
32	186002998 PDA	H18998930A	100718928C	Communication Failure	Failed - Unable to detect instrument at loader (by David Kee)	RMA# 26568 provided.

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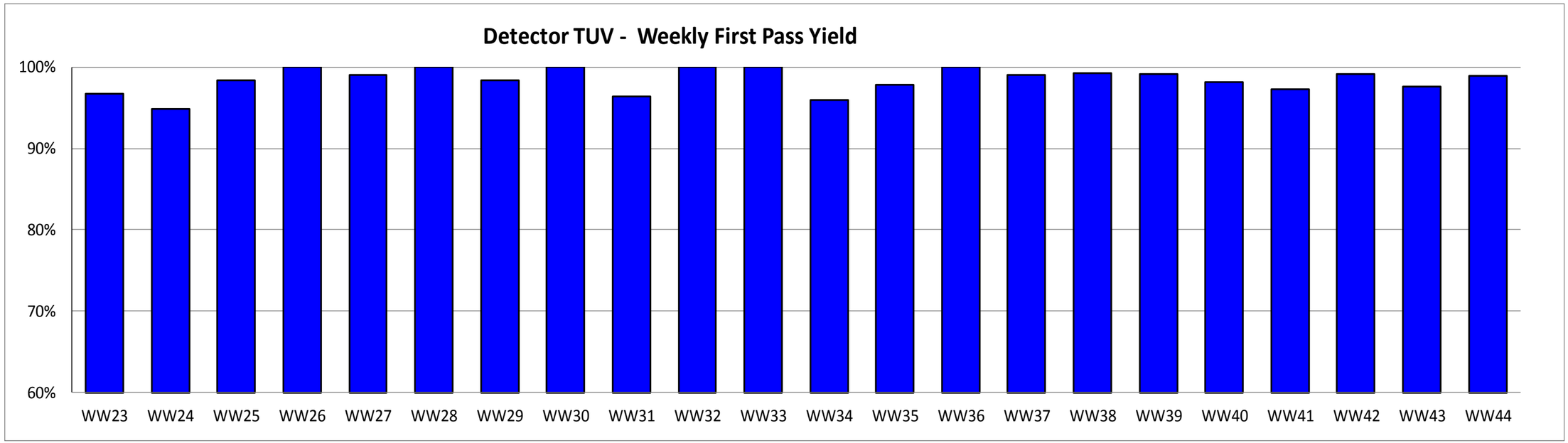
Weekly First Pass Yield



	1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct
Problem Category	WW23	WW24	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35	WW36	WW37	WW38	WW39	WW40	WW41	WW42	WW43	WW44
First Pass Yield	97%	95%	98%	100%	99%	100%	98%	100%	96%	100%	100%	96%	98%	100%	99%	99%	99%	98%	97%	99%	98%	99%
Total Units Tested	61	116	60	104	105	99	127	89	110	96	94	98	140	108	104	138	123	109	108	116	124	95
Total Units Passed	59	110	59	104	104	99	125	89	106	96	94	94	137	108	103	137	122	107	105	115	121	94
Total Units Failed (Hard)	2	6	1		1		2		4			4	3		1	1	1	2	3	1	3	1

Weekly First Pass Yield (Detector – TUV)

Alert Level crossed

	Row Labels	1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct	AL
		WW23	WW24	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35	WW36	WW37	WW38	WW39	WW40	WW41	WW42	WW43	WW44	
2	279001105 (Lamp Power Supply)	1	1			1														1			1	2
1	279002660 (PCBA PRE-AMP 2489)	1																						2
3	210000355 (PCBA, PERSO, 2489 TUV)		2					1		1			1			1			2			2		2
4	210000520 (PCBA, CPU)		1							1			1	1						1		1		2
5	210000414 (PCBA, PERSO, TUV)												1								1			2
6	279000852 (pwr supply)		1	1													1			1				2
7	441001280 (Cable)																	1						2
8	279002842 (DISPLAY, LCD)													1										2
9	441000617 (FAN)													1										2
10	420000129 (KEYPAD)		1										1											2
11	279001846 (cable)							1		2														2
12	279001098 (PCBA, PRE-AMP, TUV)																							2
13	402000351 (LAMP)																							2
14	279003224 (optic bench)																							2
15	WAT081268 (grating motor)																							2
16	279001150 (Optics bench Assy)																							2
17	WAT081254 (ASSY,CABLE,REV.,GRN)																							2
18	279001839 (ASSY,Motor Filter wh dr)																							2
19	WAT081251 (ASSY, CABLE, RED)																							2
20	279001845 (FAN, 49CFM)																							2

Part Number	Supplier	Q1	Q2	Q3	Q4	Remarks
210000520 (PCBA, CPU)	CEI					Common PCBA. For PDA Detectors - Q1 and Q3 - consecutive weeks seeing failures. Under monitoring

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Weekly First Pass Yield

Current : WW44’18

PCBA 210000520 – Tracker (PCBA failing in TUV family)

WW	Model PN / Family	Instrument SN	210000520 PCBA SN	Fail Code	Off line verification	Failure Analysis / Actions
43	186015031 TUV	K18TUV136A	230818137C	Fail to download Firmware	Failed. Unable to download firmware, continues beep when power ON. (by David Kee)	RMA# request is in progress
41	186248900 TUV	K1887E055A	130818944C	Unable to communicate	Failed. (1) Unable to detect instrument at Loader. (2) Unable to detect instrument LAN. (by David Kee).	RMA# request is in progress
35	186248900 TUV	H1887E613A	200718212C	Communication failure.	Failed. Fail Initialization (by David Kee)	RMA# 26595 provided.
34	186248900 TUV	H1887E524A	200718211C	Firmware loading failed.	Failed. Unable to detect instrument at loader (by David Kee)	RMA# 26596 provided.
31	186248900 TUV	G1887E301A	230618454C	Firmware loading failed.	Failed. Unable to download firmware due to fatal error. (by David Kee)	RMA# 26569 provided 18 Sept. Collection done on 24 Sept.
24	186017002 TUV	F18VTU253A	040518329C	Communication failure	Failed, Unable to detect instrument loader. (by David Kee)	Supplier responded FA with NTF result. Pending to return to Flex.
20	186248900 TUV	E1887E523A	221217506C	Fail to initialize.	Failed UUT fail to initialize. (by David Kee)	Supplier responded FA with NTF result. Pending to return to Flex.
16	186002487 TUV	D1887E243A	090318079C	Instrument fail to initialize	Failed. Continuous beep when powered ON, unable to download firmware manually. (by David Kee)	RMA 25919 received on 4 May 18. 30 May 18 board collected by supplier. FA sent on 04 July, board tested NTF. Pending to ship back to Flex. 25 Aug 2018: Flex Re verified using KGU s/n:D1387E763A - result Failed (Able to detect instrument t@ Loader but UUT continuous beep with error message "WinHttpReceiveResponse Failed:12029" when trying to download firmware.

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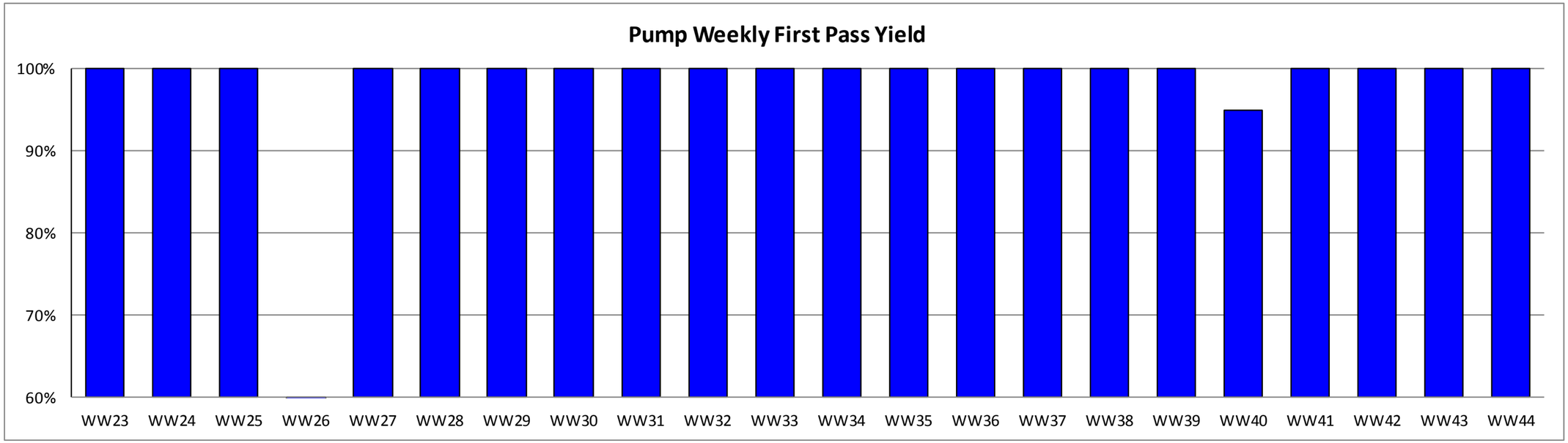
Weekly First Pass Yield

Previous : WW39'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 25 Sep 2018 Instrument Part Number: 186002487 Instrument SN: J1887E970A Affected Qty: 1u Problem: Communication failure. Date of Manufactured: Sep 2018 Reported site: Flex Kallang	**Investigation:** On 25 Sep, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 25 Sep, Technician replaced Cable (PN 441001280) Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) On 05 Oct, Offline verified using KGU SN K1887E069A. Result passed. Verified by TE David. On 11 Oct, Offline verified using KGU, Result passed. Verified by Joel and David Kee. Cable Supplier: CMTI **Root Cause** NTF. Part will be returned back to the line for use .	**Corrective Action:** Flex Kallang: NA Supplier: NA

Weekly First Pass Yield



	1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct
Problem Category	WW23	WW24	WW25	WW26	WW27	WW28	WW29	WW30	WW31	WW32	WW33	WW34	WW35	WW36	WW37	WW38	WW39	WW40	WW41	WW42	WW43	WW44
First Pass Yield	100%	100%	100%	#DIV/0!	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	95%	100%	100%	100%	100%
Total Units Tested	12	6	4		16	16	10	14	12	14	12	10	16	8	7	8	6	20	12	18	12	12
Total Units Passed	12	6	4		16	16	10	14	12	14	12	10	16	8	7	8	6	19	12	18	12	12
Total Units Failures (Hard)																		1				

Weekly First Pass Yield

Alert Level crossed

		1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep	28-Sep	5-Oct	12-Oct	19-Oct	26-Oct	
	Row Labels	23'18	24'18	25'18	26'18	27'18	28'18	29'18	30'18	31'18	32'18	33'18	34'18	35'18	36'18	37'18	38'18	39'18	WW40	WW41	WW42	WW43	WW44	AL
1	21000057520 (PCB)																		1					2
2	210000562 (PCBA pump controller)																							2
3	210000548 (PCBA pump rear panel)																							2
4	210000520 (PCBA CPU)																							2
5	279000138 (power supply)																							2
6	WAT207053 (PCBA pump controller)																							2

- Part in Focus: 21000520 (CPU PCBA) if there is failure

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Weekly First Pass Yield (In process)

#	Part Number / Description	23'18 1-Jun	24'18 8-Jun	25'18 15-Jun	26'18 22-Jun	27'18 29-Jun	28'18 6-Jul	29'18 13-Jul	30'18 20-Jul	31'18 27-Jul	32'18 3-Aug	33'18 10-Aug	34'18 17-Aug	35'18 24-Aug	36'18 31-Aug	37'18 7-Sep	38'18 14-Sep	39'18 21-Sep	40'18 28-Sep	41'18 5-Oct	42'18 12-Oct	43'18 19-Oct	44'18 26-Oct	AL
1	405001338 (Needle injector)	2	4	3	3	4	7	11	10	15	13	5	5	4	19	8	6	3	2	3	2		3	7
2	WAT270148 (ENCODER,HEDL-560)																		1			2		2
3	WAT270678 (ASSY, HEAD)																					1		2
4	210000429 (ASSY,PCB,DUAL,OPTICAL,SENSOR)																	1	1					2
5	WAT270563 (ASSY,OPTICAL SENSOR)																			1				2
6	210000384 (PCB,ALLIANCE_FRONT_PANEL)								1				1						1					2
7	210000425 (ASSY, PCB, PUMP DRIVER, ROHS)																	1			1			2
8	289012691 (CHAMBER, DEGASSER, STENTED)													2										2
9	WAT270621 (ASSY CABLE CAROUSEL SENSORS)							1	1					1										2
10	326000104 (DISPLAY LIQUID CRISTAL GRAPHIC)													1	1									2
11	420002695 (KEYPAD, ALLIANCE X)												2			1								2
12	402000353 (DEUTERIUM LAMP)												1											2
13	405003375 (PUMP HEAD)												1											2
14	WAT-402000198-M (GRATING, PDA)																							2
15	430000101-01 (ASSY,TUBING, VALVE TO FILTER)	25	2	2	1	1																		2
16	289000144(check Valve)		1			3	3	4																4
17	WAT270404 (TUBE ASSY., ACC PUMB TO BOT. X)	17	6	2	2	3																		3
18	WAT270403 (TUBE ASSY., ACC PUMP TO TOP XD)	14	2	1	1	1																		2
19	WAT270405-01 (TUBE ASSY, XDUCER TO VENT VALV)	11	2	1		1																		2
20	WAT270406-02 (TUBING ASSY., PRIMARY PUMP TO)	4		3		1																		3
21	WAT270279 (ASSY,MOTOR CARRIAGE DRIVE)		1																					2
22	279001055 (Vacuum pump assy)																							2
23	WAT271289 (MOTOR LINEAR ACTUAT)																							2
24	279002755 (GEAR MOTOR, FILTER FLAG, BRASS)											2			4									2
25	405002598 (FILTER FLAG)																							3
26	210000565 (CHARGE AMP PCBA)																							3
27	WAT045264(Stepper Motor)																							3
28	210001164 (ASSY, PCB HAMAMATSU 518 PIX PD)											1				1								2
29	289012264 (ASSY, FLOW CELL, 2489 W/BULKHE)								1															2

Part Number	Supplier	Q1	Q2	Q3	Q4	Remarks
402000198 (Grating)	Horiba					Part issue. Grating RTV after supplier reported workmanship issue. Closed
Keypoint tubings	Keypoint					Supplier using 108psi staking issue. No failure reported. Closed.
289000144 (Check Valve)	Idex					Supplier provided CA. Now pending closure. WW30 to WW38 -- no failure reported. Closed.
405001338 (Needle Injector)	Waters					Fail parts RTV to supplier. Pending FA.

Weekly First Pass Yield (in process failure)

For Reference (Part number and it's supplier)

#	Part Number / Description	Supplier
1	405001338 (Needle injector)	WATERS
2	WAT270148 (ENCODER,HEDL-560)	AVAGO TECHNOLOGIES
3	WAT270678 (ASSY, HEAD)	WATERS
4	210000429 (ASSY,PCB,DUAL,OPTICAL,SENSOR)	Flex Senai
5	WAT270563 (ASSY,OPTICAL SENSOR)	ATRONIX
6	210000384 (PCB,ALLIANCE_FRONT_PANEL)	Flex Senai
7	210000425 (ASSY, PCB, PUMP DRIVER, ROHS)	Flex Senai
8	289012691 (CHAMBER, DEGASSER, STENTED)	RHEODYNE
9	WAT270621 (ASSY CABLE CAROUSEL SENSORS)	CMTI
10	326000104 (DISPLAY LIQUID CRISTAL GRAPHIC)	HANTRONIX
11	420002695 (KEYPAD, ALLIANCE X)	EASTPRINT INCORPORATED
12	402000353 (DEUTERIUM LAMP)	HAMAMATSU
13	405003375 (PUMP HEAD)	YANGBUM ENGINEERING
14	WAT-402000198-M (GRATING, PDA)	HORIBA INSTRUMENTS INC
15	430000101-01 (ASSY,TUBING, VALVE TO FILTER)	KEY POINT
16	289000144(check Valve)	IDEX
17	WAT270404 (TUBE ASSY., ACC PUMB TO BOT. X)	KEY POINT
18	WAT270403 (TUBE ASSY., ACC PUMP TO TOP XD)	KEY POINT
19	WAT270405-01 (TUBE ASSY, XDUCER TO VENT VALV)	KEY POINT
20	WAT270406-02 (TUBING ASSY., PRIMARY PUMP TO)	KEY POINT
21	WAT270279 (ASSY,MOTOR CARRIAGE DRIVE)	NIDEC MOTOR
22	279001055 (Vacuum pump assy)	IDEX
23	WAT271289 (MOTOR LINEAR ACTUAT)	HAYDON KERK MOTION SOLUTIONS INC
24	279002755 (GEAR MOTOR, FILTER FLAG, BRASS)	HAYDON KERK MOTION SOLUTIONS INC
25	405002598 (FILTER FLAG)	B & E
26	210000565 (CHARGE AMP PCBA)	Flex Senai
27	WAT045264(Stepper Motor)	LIN ENGINEERING
28	210001164 (ASSY, PCB HAMAMATSU 518 PIX PD)	Flex Senai
29	289012264 (ASSY, FLOW CELL, 2489 W/BULKHE)	WATERS
30	WAT081268 (ASSY, MOTOR, GRATING DRIVE)	ORIENTAL MOTOR ASIA PACIFIC PTE LTD

Weekly First Pass Yield (In process)

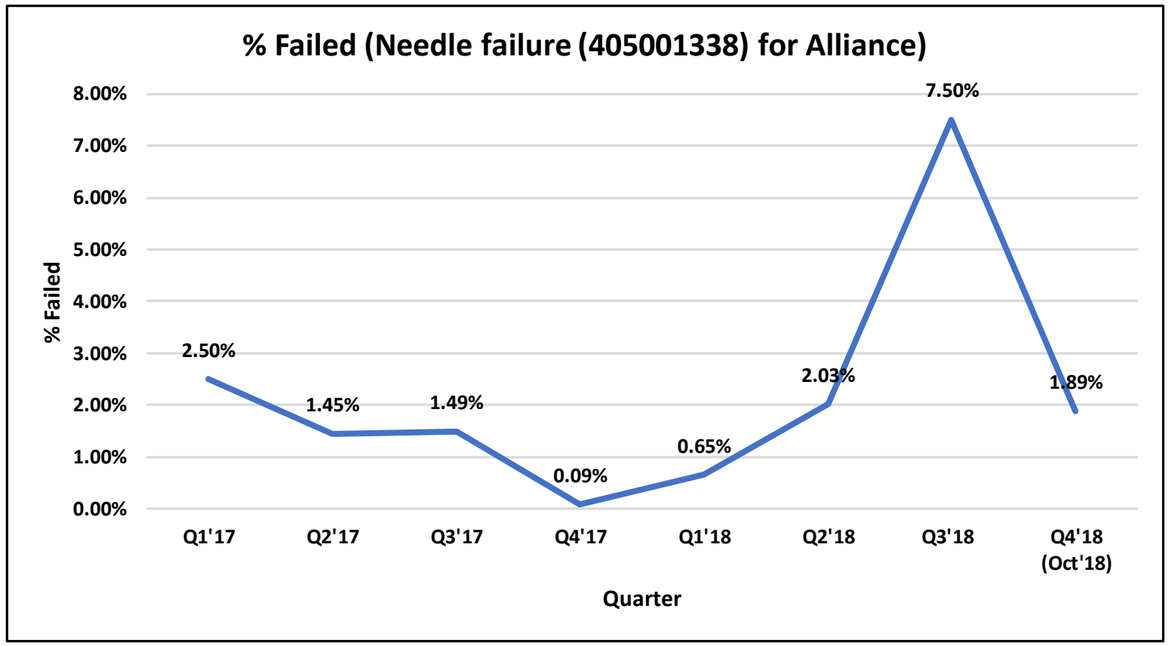
Current : WW44'18 and previous data

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 WW27 - 4 WW28 - 7 WW29 - 11 WW30 - 10 WW31 – 15 WW32 – 13 WW33 – 5 WW34 – 5 WW35 – 4 WW36 – 19 WW37 – 8 WW38 - 6 WW39 – 3 WW40 – 2 WW41 – 3 WW42 – 2 WW43 – 0 WW44 - 3 Date of Manufactured: May to Jul 2018 Reported site: Flex Kallang	**Investigation:** Technician visual checked all Connections –no visual issue. **Containment Actions:** Technician replaced Needle (PN:405001338) – Injector Sub Assy Retest passed. Offline verification were verified to be failed. From WW44 onwards, additional info (leak at which area and visual inspection for scratches and pit will be done) Defective part transferred to Non Conformance Area Needle Supplier: Waters Tech **Root Cause:** It is confirmed that the Defective part has caused the Sub Assy Test as per stated in the Problem Statement.	**Corrective Action:** Flex Kallang: NA Supplier: Pending for monthly RMA request to Waters Note: see next slide for failure rate compare Year 2017 and 2018 Reported site: Flex Kallang

Weekly First Pass Yield (In process)

Needle (PN 405001338) – failure by Month and Quarter (2017 and 2018)

Month	186269505 and 186269506 Qty Build	Qty Failure	% Failed	Quarter	Qty Build	Qty Failure	% Failed
Jan-17	394	10	2.54%	Q1'17	1118	28	2.50%
Feb-17	326	7	2.15%				
Mar-17	398	11	2.76%				
Apr-17	425	5	1.18%	Q2'17	1169	17	1.45%
May-17	342	9	2.63%				
Jun-17	402	3	0.75%				
Jul-17	482	1	0.21%	Q3'17	1206	18	1.49%
Aug-17	406	10	2.46%				
Sep-17	318	7	2.20%				
Oct-17	416	0	0.00%	Q4'17	1132	1	0.09%
Nov-17	340	0	0.00%				
Dec-17	376	1	0.27%				
Jan-18	462	2	0.43%	Q1'18	1223	8	0.65%
Feb-18	361	2	0.55%				
Mar-18	400	4	1.00%				
Apr-18	352	3	0.85%	Q2'18	1234	25	2.03%
May-18	394	10	2.54%				
Jun-18	488	12	2.46%				
Jul-18	558	47	8.42%	Q3'18	1466	110	7.50%
Aug-18	424	46	10.85%				
Sep-18	484	17	3.51%				
Oct-18	530	10	1.89%	Q4'18 (Oct'18)	530	10	1.89%
Total Qty	**9078**	**217**		**Total**	**9078**	**217**	



Thank You

Issues under Monitoring

Appendix A
Presentation slides from CMTi

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.

flex

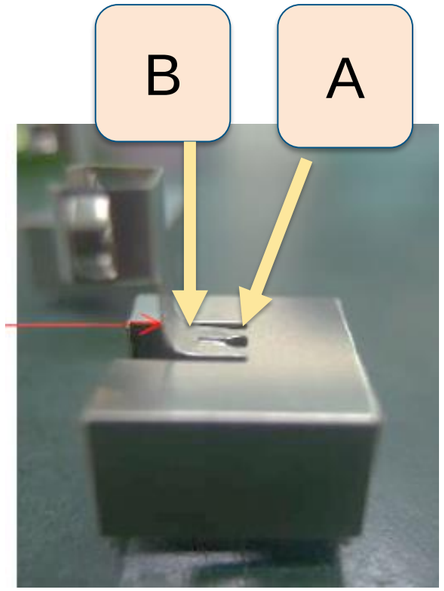
WAT-441001280 (Ethernet Cable, supplier CMTi)

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.

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IMPROVEMENT PROPOSAL

CUSTOMER : FLEXTRONICS
PRODUCT NO. : 441001289 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.

flex
LIVE SMARTER

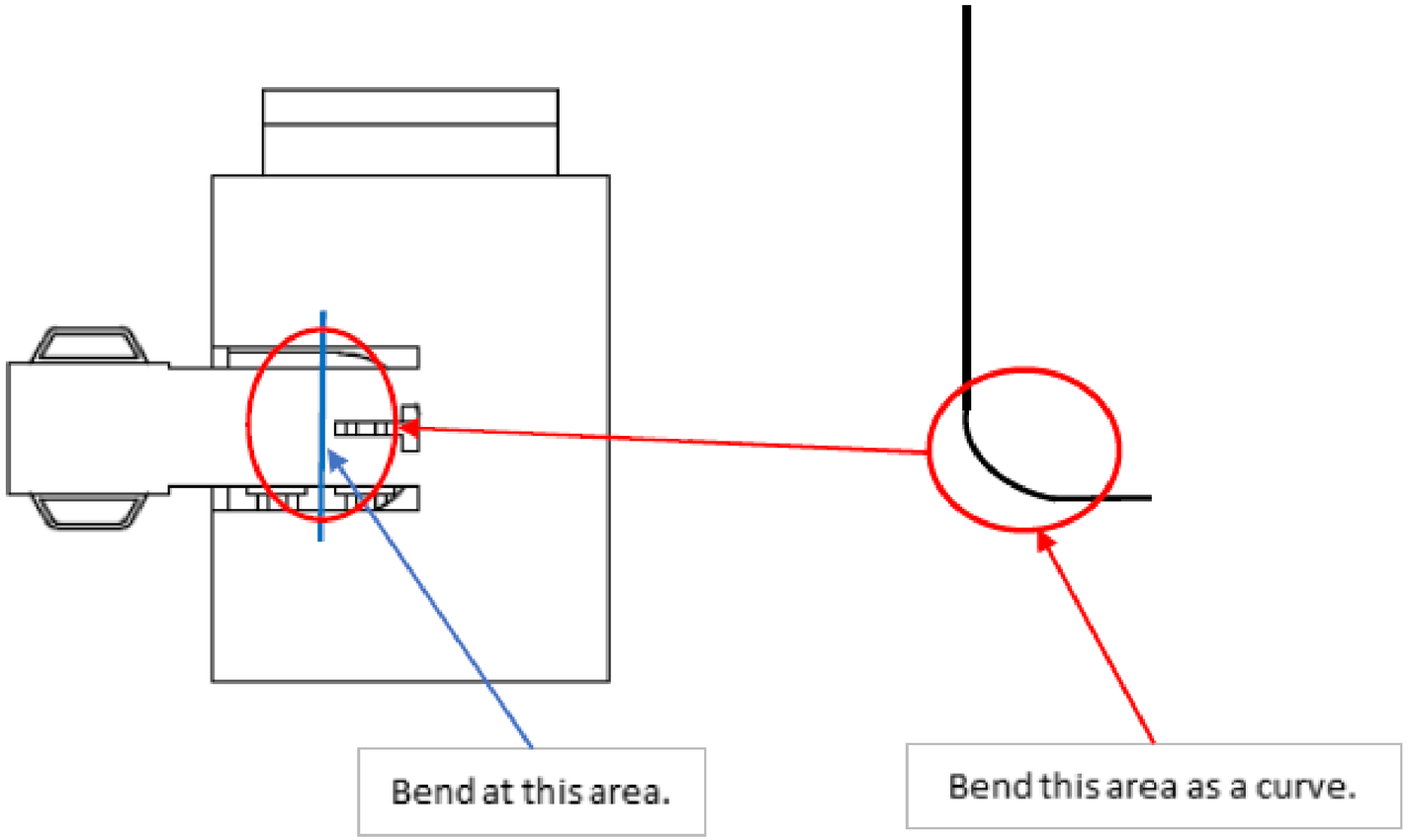
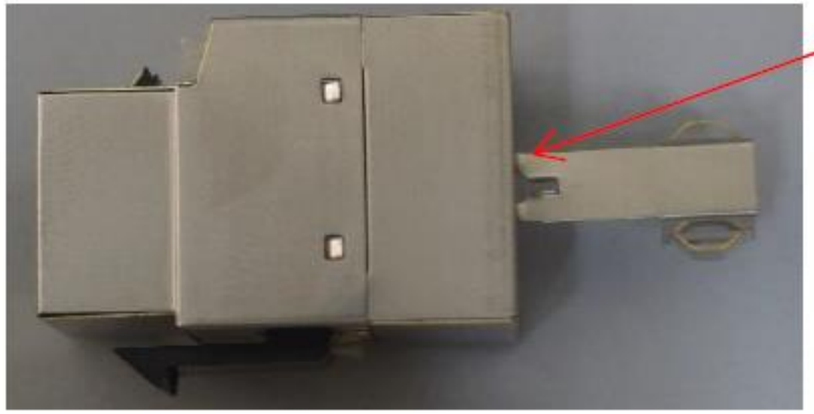


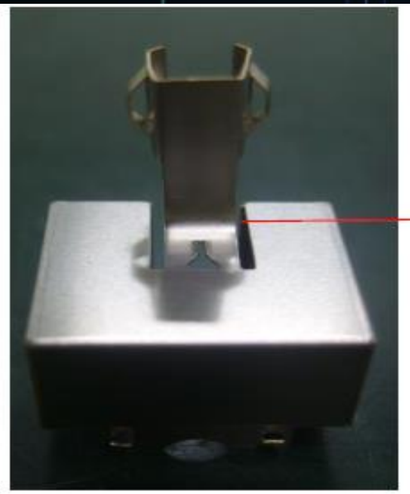
Illustration 1

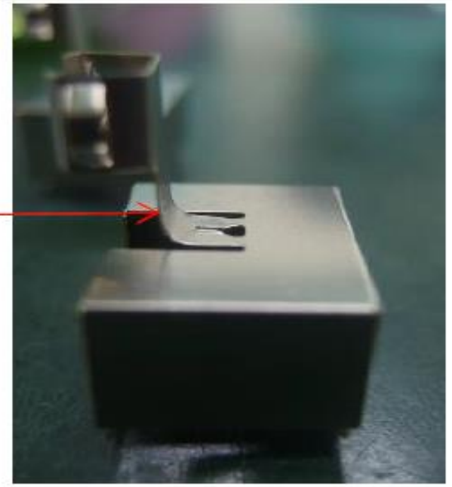
1. Assy & Simulation Result :

Current bending area :

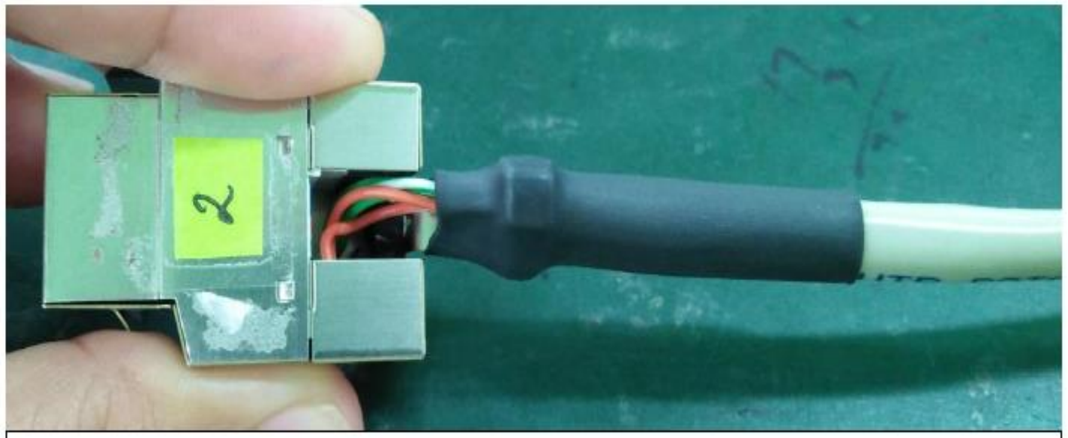


1. Simulation for bending condition as illustration 1 as below :



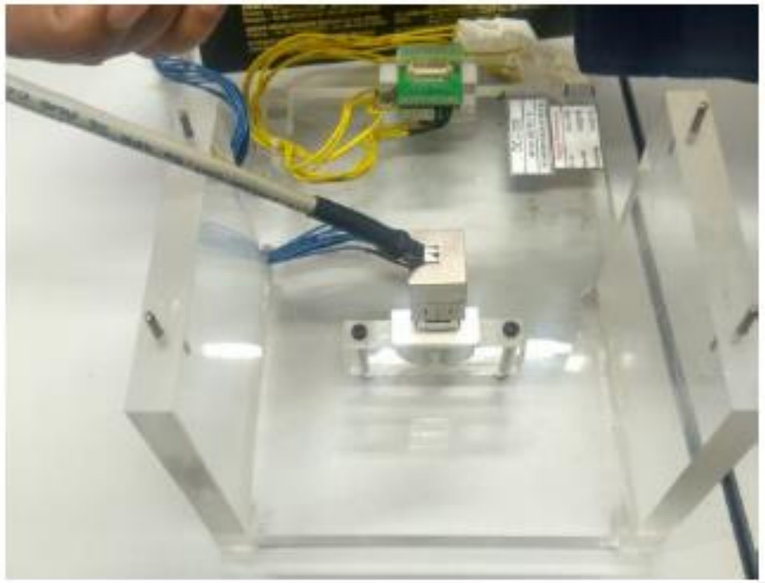


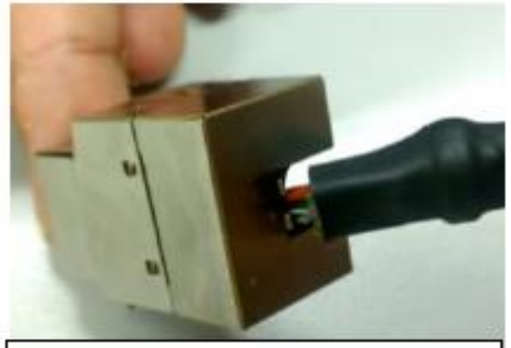
After assy in connector



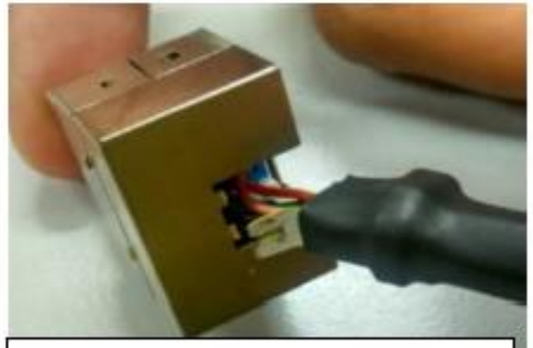
Overall condition of simulation part

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





Current bend method



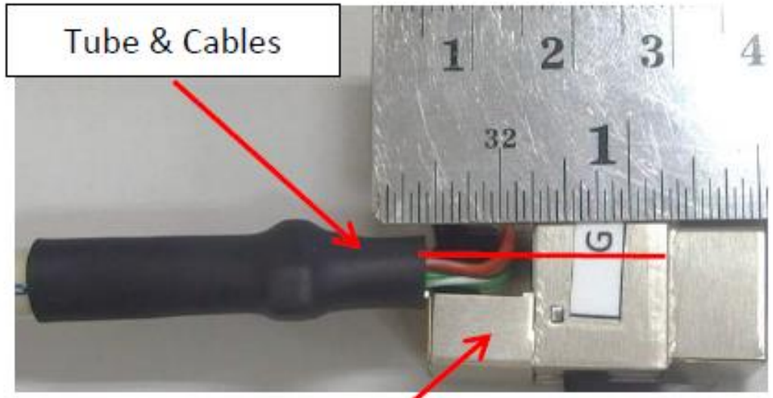
Propose bend method

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

LIVE SMARTER

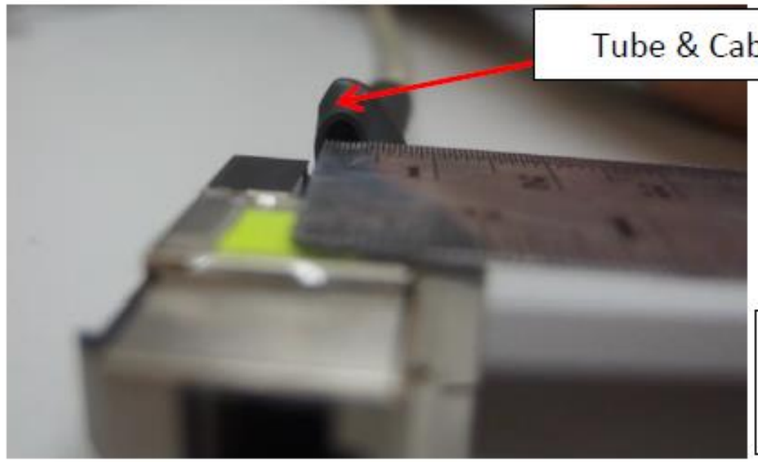
1. Propose bending method strength result is better than current bending method
2. Cable position of propose bending method is out of connector surface (refer to below picture for comparison)

Current bending method



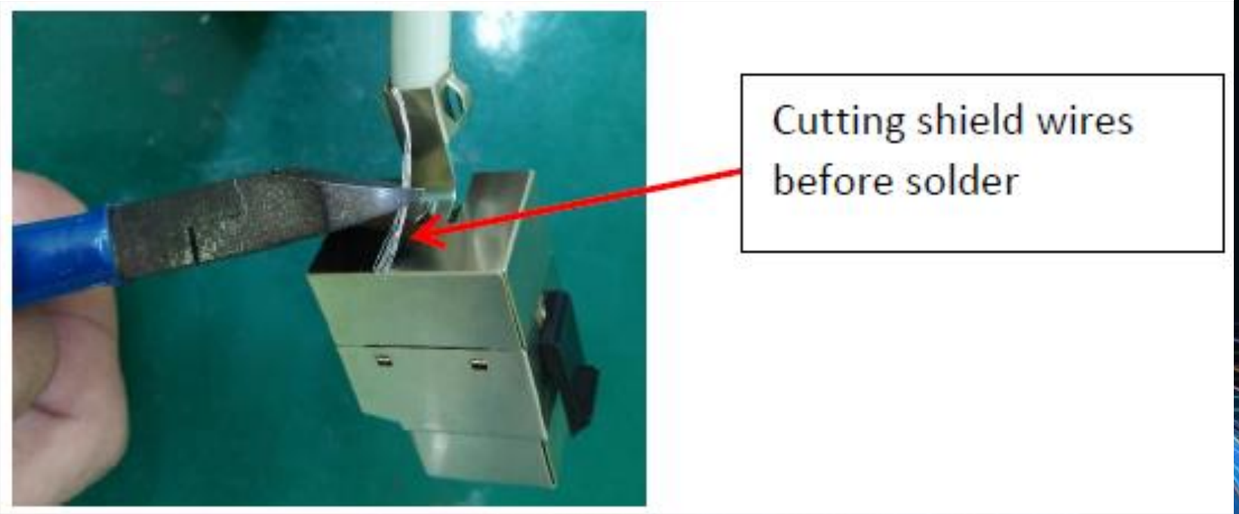
Tube & Cables are not extend beyond connector surface

Propose bending method



Tube & Cables are extend beyond connector surface

- 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

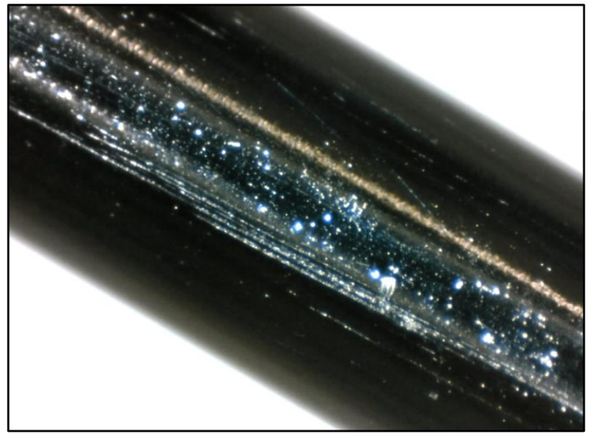
Delivery DATE	PO No.	Delivery Qty
5/1/2017	J1BJ07795	200
6/1/2017	J1BJ07795	200
6/1/2017	J1BJ08026	400
20/1/2017	J1BJ08026	200
23/1/2017	J1BJ08269	30
17/2/2017	J1BJ08269	570
7/3/2017	J12G04881	600
28/3/2017	J12G05038	600
25/4/2017	J12G04920	400
9/5/2017	J12G04920	200
9/5/2017	J1BJ09055	200
9/6/2017	J1BJ09055	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

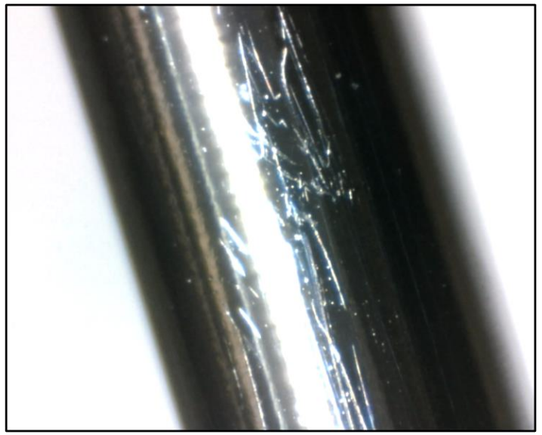
- Total delivery qty: 9200 pcs
- No RMA return during this period
- No NG found at final electrical test process for above delivery lots

Weekly First Pass Yield (in process failure)

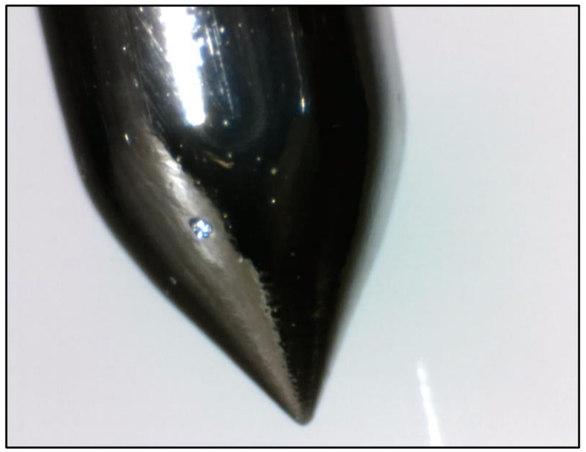
01 Oct 2018 : response from Machine Shop, for info and discussion

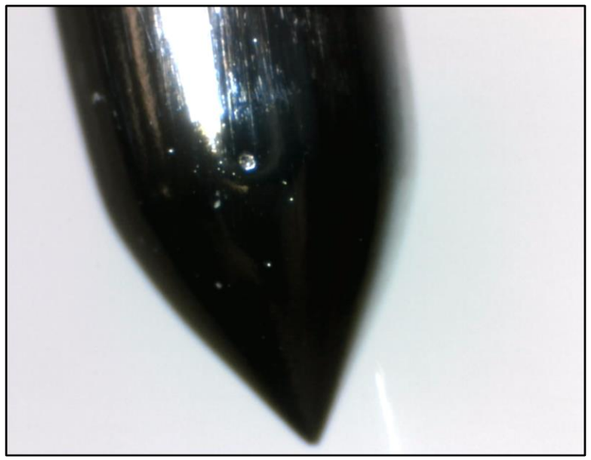
Scratches





Pits



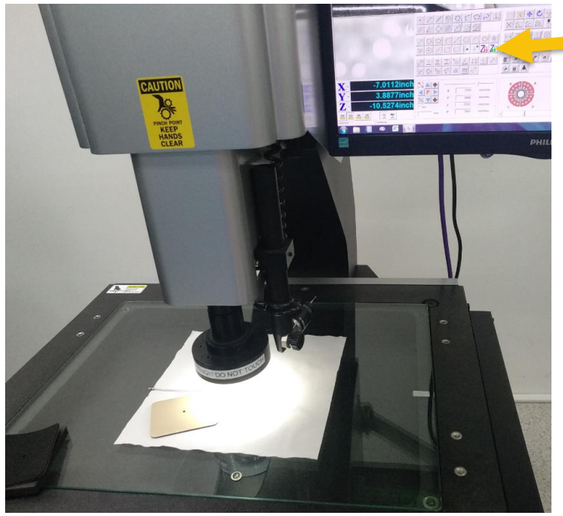


405001338 Injector Needle
- 3 x Needle samples removed from passed Injector Assy -

08 Oct 2018

Smart scope Set-up, Magnification selection and Auto-Focus

Set-up:



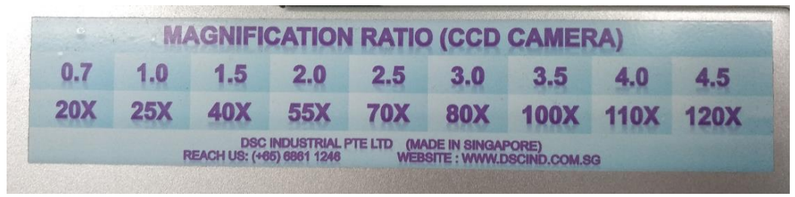
Monitor display

Set-up – Overall view

Needle (Sample)

Close up view

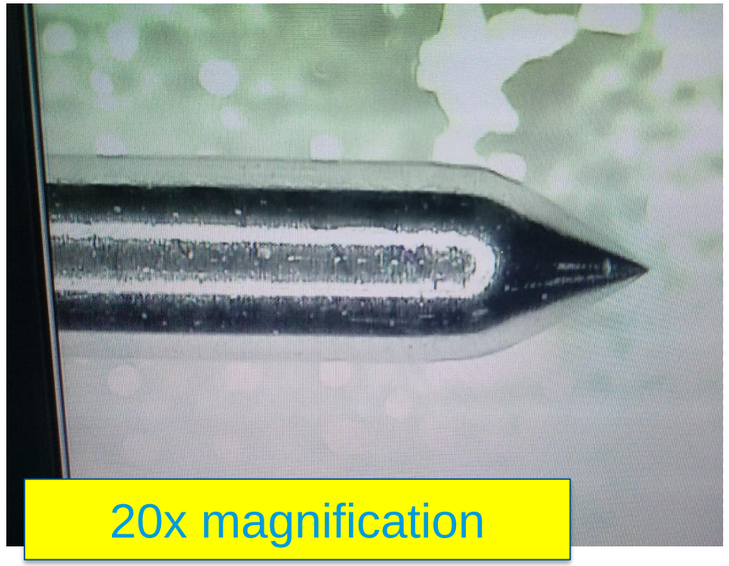
Magnification:

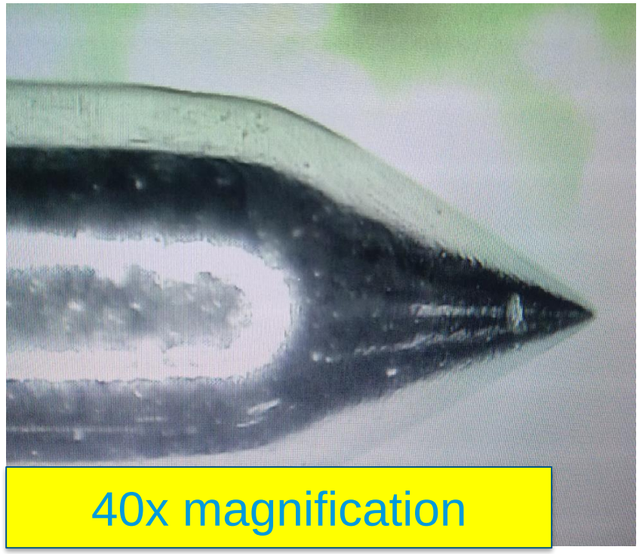


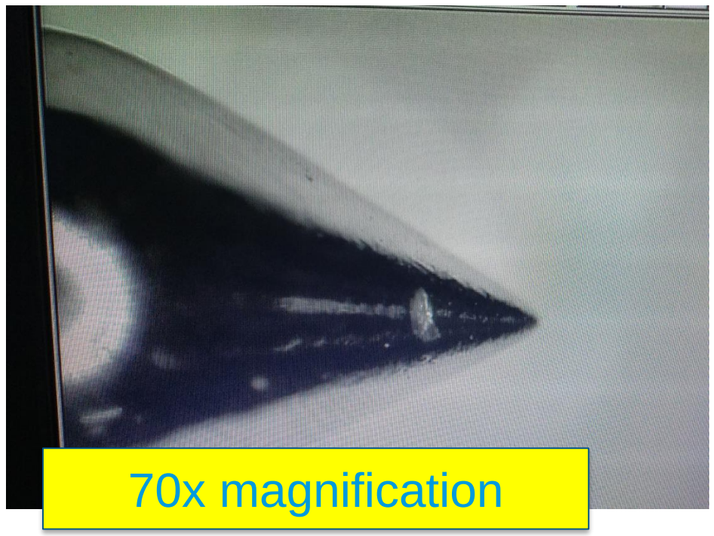
Able to choose a few magnifications, such as 20x, 40x, 100x, etc,

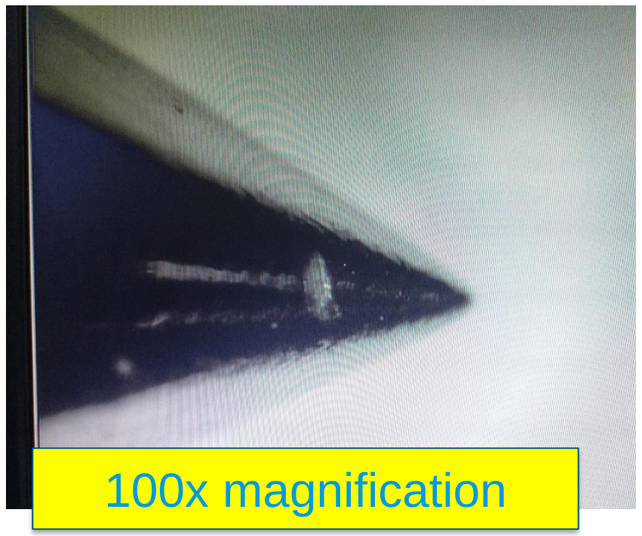
Auto-focus: Auto-focus function is used.

Comparing Images of different magnifications – sample 1



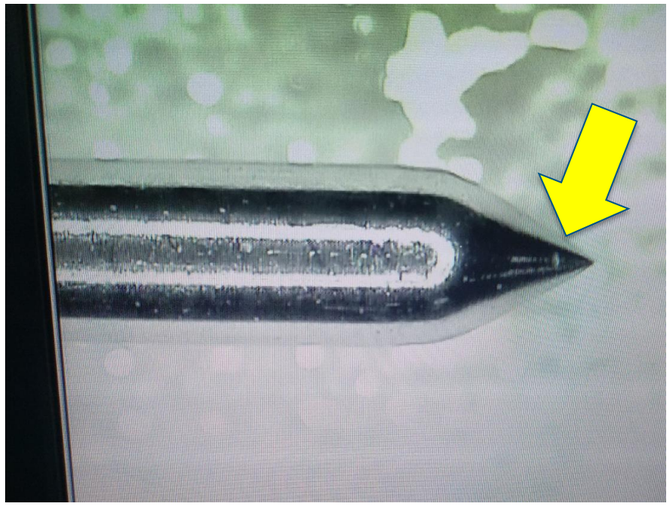




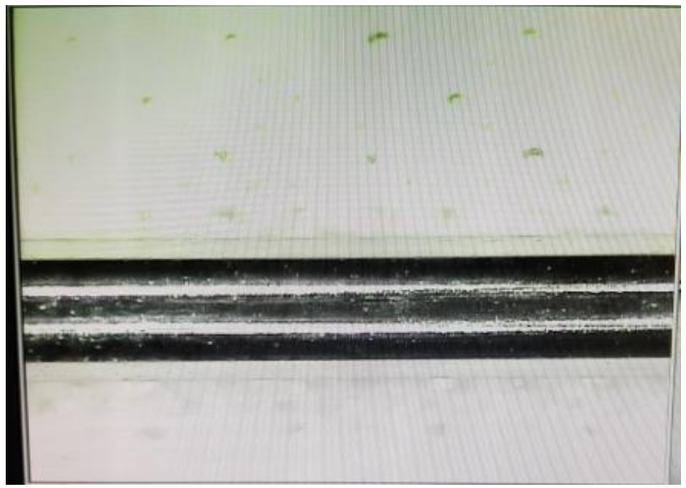


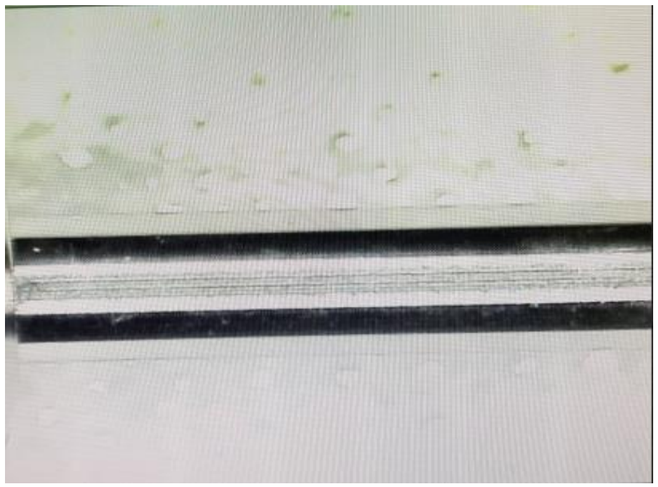
- For the 3 x passed needles samples, to use 20x magnification for inspection (to check for pit and scratches)

Sample 1 (20x magnification)



- Needle tip is checked for pit mark. A small pit mark was observed.

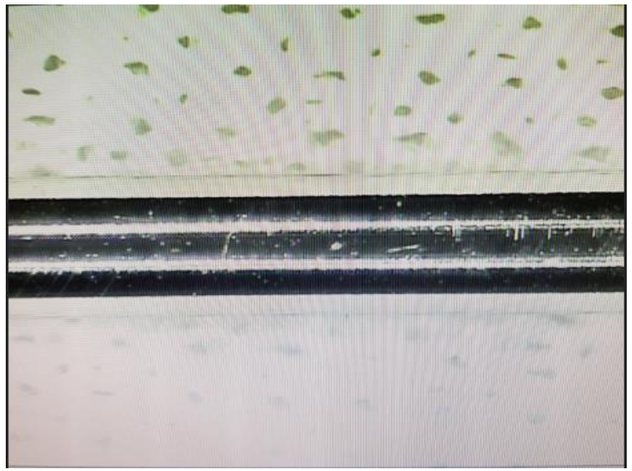




- Needle body is also checked for longitudinal scratches. No scratches found.

Sample 2 (20x magnification)

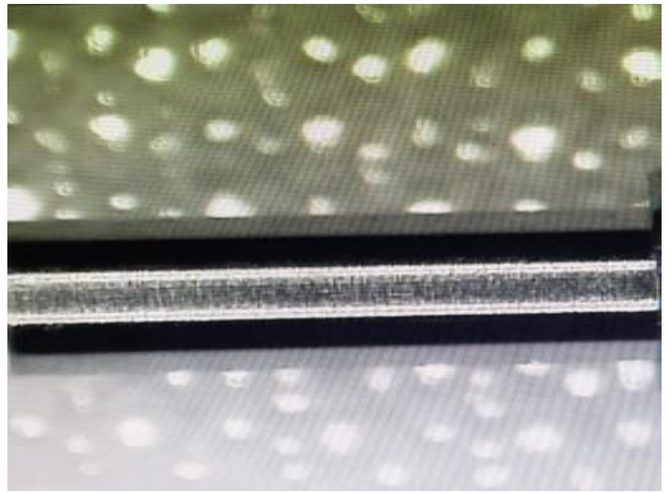
- Needle tip is checked for pit mark Unable to detect pit.



- Needle body is also checked for longitudinal scratches. No scratches found.

Sample 3 (20x magnification)

- Needle tip is checked for pit mark Unable to detect pit.



- Needle body is also checked for longitudinal scratches. No scratches found.

Weekly First Pass Yield

Previous : WW27'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 29 Jun 2018 Instrument Part Number: 186269505 Instrument SN: F18SM7238A Affected Qty: 1u Problem: Sample transducer failed (0.28V) during Rear Panel test. Date of Manufactured: Jun 2018 Reported site: Flex Kallang	**Investigation:** On 29 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 29 Jun, Technician replaced Transducer (PN: WAT270172). Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 13 JUL, Verified on a known good unit s/n : G18SM4027A result fail. Findings : Sample transducer failed 0.28v during rear panel test. Verified by: TE Shamsul Transducer Supplier: DJ INSTRUMENTS The Defective part is to be RTV to Supplier. **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 requested and received on 30th July (RMA# 51493). Parts delivered to supplier on 06 Aug. WW28 to WW31 no failure – move to monitoring

Weekly First Pass Yield

Previous : WW27'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 03 Jul 2018 Instrument Part Number: 186269506 Instrument SN: F18SM4891A Affected Qty: 1u Problem: Sample transducer failed (1.16V) during Rear Panel test. Date of Manufactured: Jun 2018 Reported site: Flex Kallang	**Investigation:** On 03 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 03 Jul, Technician replaced Transducer (PN: WAT270172). Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 13 JUL, Verified on a known good unit s/n : G18SM4027A result fail. Findings : Failed sample transducer 1.16v during rear panel test. Verified by: TE Shamsul Transducer Supplier: DJ INSTRUMENTS The Defective part is to be RTV to Supplier. **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 requested and received on 30th July (RMA# 51493) WW28 to WW31 no failure – move to monitoring

Weekly First Pass Yield

Previous : WW24'18

Problem Statement

Reported Date: 07, 12 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

Investigation/ Possible Root Cause

Investigation:
Technician visual checked all Connections – no visual issue.

Containment Actions:
Technician replaced Syringe (PN: WAT073109).
Retest Instrument – passed.
Defective part transferred to Non Conformance Area
Performed by: Technician (24606, 836410)

Offline verification:

Date Detected	Findings	Date Verified	Verified by
07 Jun 2018 Qty: 01	Verified on KGU SN F18SM4869A. Result failed. Same issue, no reading. Reverified using good seal, result failed	10 Jul 2018	Shamsul (TE)
12 Jun 2018 Qty: 01	Verified on KGU SN F18SM4869A. Result failed. Compression check failed. Findings: Leakage between barrel and shaft. Reverified using good seal, result failed	10 Jul 2018	Shamsul (TE)
13 Jun 2018 Qty: 02	Verified on KGU SN F18SM4869A. Result failed. No reading during Compression test. Findings: No leakage found during compression test. Reverified using good seal, result failed	10 Jul 2018	Shamsul (TE)

Syringe Supplier: MK Fluidic Systems LLC

The Defective part is to be RTV to Supplier.

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/ Improvement

Corrective Action:
Flex Kallang: NA

Supplier: RMA requested on 27 July. RMA# 10199 received on 06 Aug. Return in progress.

WW26 to WW29 - no failure – move to monitoring

Closed issues

Weekly First Pass Yield

Current : WW34'18 and Previous

Problem Statement

Reported Date: 19 May 208 onwards
Instrument Part Number: 186269505, 186269506

Problem: Leak Detection Procedure.
Tubings were replaced during the troubleshooting as shown below:

WW	430001194	WAT078565	WAT270409	430001336
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
WW27	1	0	0	0
WW28	0	0	0	0
WW29	1	0	0	0
WW30 – 34	0	0	0	0

Investigation/ Possible Root Cause

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.
Scope: 4 tubings for Main Line and 5 tubings for Pump Tray Assy.

Corrective Action/ Improvement

Corrective Action:
Flex Kallang: Evaluation and data collection is still on-going

Supplier: Using lower staking pressure around 108psi.
Supplier reported Ferrule drop out rate as below:
After staking process
- about 20% Ferrule drop out
- Stake a new Ferrule.

After tube bending process
- about 30% Ferrule drop out
- did not stake a new Ferrule
- placed the drop out Ferrule inside Zip Lock Bag together with the Tubing.

Flex Incoming and Production also found around 30% of drop out Ferrule inside Zip Lock Bag.

WW30 to WW33 - no failure – move to monitoring

WW27 to WW30 – no failure – move to closure

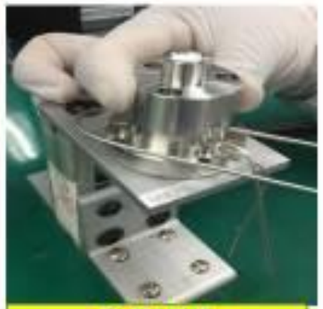
4M review for New Seal Pack (289012412)

Seal Pack Assembly 4M Review

WW27 to WW30 – no failure – move to closure

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 in-consistent	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.  CURRENT Top Screw Fixture PROPOSED
Material	Part dimensions not meeting specs.	Parts dimensions were meeting specs as per respective IPC	N	NA

Weekly First Pass Yield

Previous : WW32'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 03 Jul 2018 Instrument Part Number: 186269506 Instrument SN: G18SM4251A Affected Qty: 1u Problem: Inlet B no solvent Flow during Solvent Inlet Plumbing Verification Date of Manufactured: Aug 2018 Reported site: Flex Kallang	**Investigation:** On 01 Aug, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 01 Aug, Technician replaced GPV (PN: WAT270524), SN 144872 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) Offline verification: Inlet B no flow during Nitrogen Purge (verified by TE Shamsul) The Defective part is to be RTV to Supplier. **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: NA Old GPV – moved to closure. RTV and FA is in progress

Weekly First Pass Yield

Previous : WW31'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 30 Jul 2018 Instrument Part Number: 186269506 Instrument SN: G18SM4226A Affected Qty: 1u Problem: Inlet A no flow during solvent Inlet Plumbing Verification Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 31 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 31 Jul, Technician replaced GPV (PN: WAT270524). SN 144791 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) Offline verification: Verified using KGU SN H18SM7334A, Result – failed (same as observed by Technician. Verified by TE David Kee) The Defective part is to be RTV to Supplier. **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: NA Old GPV – moved to closure. RTV and FA is in progress

Weekly First Pass Yield

Previous : WW30'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 24 Jul 2018 Instrument Part Number: 186269505 Instrument SN: G18SM7297A Affected Qty: 1u Problem: Precision BD test failed Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 24 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 24 Jul, Technician replaced GPV (PN: WAT270524), S/N 144685 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (1037617) Offline verification: GPV failed during BD Chemistry Test. Verified on a KGU S/N L16SM4368A, Result – failed. Verified by TE Shamsul The Defective part is to be RTV to Supplier. **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: NA Old GPV – moved to closure. RTV and FA is in progress

Weekly First Pass Yield

Previous : WW28'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 07 Jul 2018 Instrument Part Number: 186269506 Instrument SN: G18SM4965A Affected Qty: 1u Problem: Failed due to GPV inlet "D" no flow during Solvent inlet Plumbing Verification Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 07 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 07 Jul, Technician replaced GPV (PN: WAT270524) SN 141457. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (1037617) On 16 Jul, Offline verified on a known good unit s/n : L16SM4368A result failed. Findings : Inlet D has no flow during nitrogen purge. Verified : TE Shamsul GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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: ATR # 05070 received on 07 Aug 2018. Old GPV – moved to closure. RTV and FA is in progress

Weekly First Pass Yield

Previous : WW28'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 09 Jul 2018 Instrument Part Number: 186269506 Instrument SN: G18SM4975A Affected Qty: 1u Problem: AC Precision test failed during complete test. Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 09 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 09 Jul, Technician replaced GPV (PN: WAT270524) SN 142062. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 17 Jul, Offline verified using KGU s/n : G18SM4056A result failed. Findings : Prime nitrogen through channel A to D, channel A nitrogen no flow. Verified by: TE David GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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 requested and received on 30th July (ATR # 05028). Return in progress. Old GPV – moved to closure. RTV and FA is in progress

Weekly First Pass Yield

Previous : WW27'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 28 Jun 2018 Instrument Part Number: 186269505 Instrument SN: F18SM7194A Affected Qty: 1u Problem: BD Test failed during Chemistry test Date of Manufactured: Jun 2018 Reported site: Flex Kallang	**Investigation:** On 28 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 28 Jun, Technician replaced GPV (PN: WAT270524) SN 144272. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 17 JUL, Verified using KGU s/n : G18SM4056A result failed. Findings: Prime nitrogen through channel A to D, Channel B very little nitrogen blow thru. Verified by: TE David Kee GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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 requested and received on 30th July (ATR # 05028) Old GPV – moved to closure. RTV and FA is in progress

Weekly First Pass Yield

Previous : WW27'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 28 Jun 2018 Instrument Part Number: 186269505 Instrument SN: F18SM7204A Affected Qty: 1u Problem: Inlet D no flow during Solvent Inlet Plumbing Verification Date of Manufactured: Jun 2018 Reported site: Flex Kallang	**Investigation:** On 28 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 28 Jun, Technician replaced GPV (PN: WAT270524) SN 143865. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 17 JUL, Verified using KGU s/n : G18SM4056A result failed. Findings : Prime nitrogen through channel A to D, D channel no nitrogen blow through. Verified by: TE David Kee GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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 requested and received on 30th July (ATR # 05028) Old GPV – moved to closure. RTV and FA is in progress

Weekly First Pass Yield

Previous : WW27'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 03 Jul 2018 Instrument Part Number: 186269506 Instrument SN: G18SM4889A Affected Qty: 1u Problem: BD Precision test failed during complete test Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 03 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 03 Jul, Technician replaced GPV (PN: WAT270524) SN 141795 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 17 JUL, Verified using KGU s/n : G18SM44056A result failed. Findings : Prime nitrogen through channel A to D. Channel D very little nitrogen blow thru. Verified by: TE David Kee GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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 requested and received on 30th July (ATR # 05028) Old GPV – moved to closure. RTV and FA is in progress

Weekly First Pass Yield

Previous : WW27'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 29 Jun 2018 Instrument Part Number: 186269505 Instrument SN: F18SM7241A Affected Qty: 1u Problem: No flow for all four channels, from "D" to "C" to "B" to "A" during Solvent Inlet Plumbing Verification Date of Manufactured: Jun 2018 Reported site: Flex Kallang	**Investigation:** On 29 Jun,Technician visual checked all Connections – no visual issue. **Containment Actions:** On 29 Jun, Technician replaced GPV (PN: WAT270524) SN 144079. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (928460) On 17 JUL, Verified using KGU s/n : G18SM4056A result failed. Findings : Prime nitrogen through channel A to D all four no nitrogen blow through. Verified by: TE David Kee GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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 requested and received on 30th July (ATR # 05028) Old GPV – moved to closure. RTV and FA is in progress

Weekly First Pass Yield

Previous : WW27'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 28 Jun 2018 Instrument Part Number: 186269505 Instrument SN: F18SM7202A Affected Qty: 1u Problem: Failed sample transducer range (4.00) during Rear Panel test. Date of Manufactured: Jun 2018 Reported site: Flex Kallang	**Investigation:** On 28 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 28 Jun, Technician replaced Transducer (PN: WAT270172). Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (927989) On 13 JUL, Verified on a known good unit s/n : G18SM4027A result failed. Findings : Failed sample transducer range (4.00) during rear panel test. Verified by: TE Shamsul Transducer Supplier: DJ INSTRUMENTS The Defective part is to be RTV to Supplier. **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 requested and received on 30th July (RMA# 51493). Parts delivered to supplier on 06 Aug. Old GPV – moved to closure. RTV and FA is in progress

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 6nstrument SN: F18SM4689A Affected Qty: 1u Problem: Solvent leakage during solvent inlet Plumbing verification Date of Manufactured: June 2018 Reported site: Flex Kallang	**Investigation:** On 12 June: Technician visual checked all Connections – no visual issue. **Containment Actions:** On 12 June, Technician replaced GPV (PN: WAT270524) SN: 143501 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 13 Jul, Verified on a known good unit S/N : G18SM4021A. Findings : Solvent leakage during solvent Inlet Plumbing Verifications Verified by TE Shamsul GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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# ATR# 05028 received on 31 Jul. Old GPV – move to closure.

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	**Investigation:** On 04 Jun: Technician visual checked all Connections – no visual issue. **Containment Actions:** On 04 Jun Technician replaced GPV (PN: WAT270524) SN: 143393 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 11 Jul, Verified on a known good unit S/N: D18SM7270A, result failed. Findings : Failed BD Precision Test during complete test Verified by, TE Shamsul GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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 requested and received on 30th July (ATR # 05028) Old GPV – move to closure.

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 6nstrument 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	**Investigation:** On 30 May: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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. **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 requested on 29 Jun, RMA# ATR # 04903 received on 10 Jul. Part shipped out 27 Jul. Delivered to supplier on 03 Aug 18.

Old GPV – move to closure.

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 6nstrument 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	**Investigation:** On 30 May: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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. **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 requested on 07 June 18. RMA# 14925 received on 07 June 18. RTV in progress. Supplier received on 10 Jul. Old GPV – move to closure.

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 6nstrument 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	**Investigation:** On 30 May: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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. **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 requested on 07 June 18. RMA# 14925 received on 07 June 18. RTV in progress. Supplier received on 10 Jul. Old GPV – move to closure.

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	**Investigation:** On 22 May: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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. **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 #14925 received 07 June 18. RTV in progress. Supplier received on 10 Jul. Old GPV – move to closure.

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	**Investigation:** On 26 May: Technician visual checked all Connections – no visual issue. **Containment Actions:** On 26 May Technician replaced GPV (PN: WAT270524) SN: Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 31 MAY, Findings, no solvent purging out from inlet C during nitrogen purge. Verified by : TE Shamsul GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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 #14925 received 07 June 18. RTV in progress.. Supplier received on 10 Jul. Old GPV – move to closure.

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	**Investigation:** On 18 May: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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. **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 #14913 received on 25 May 2018. Shipped out 06 June 18. Pending update from supplier Old GPV – move to closure.

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	**Investigation:** On 18 May: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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. **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 #14913 received on 25 May 2018. Shipped out 06 June 18. Pending update from supplier Old GPV – move to closure.

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	**Investigation:** On 13 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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 #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“

Old GPV – move to closure.

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	**Investigation:** On 06 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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# 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

Old GPV – move to closure.

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	**Investigation:** On 06 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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# 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 Old GPV – move to closure.

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	**Investigation:** On 06 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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# 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 Old GPV – move to closure.

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	**Investigation:** On 11 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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# 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“ Old GPV – move to closure.

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	**Investigation:** On 03 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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 #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“

Old GPV – move to closure.

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	**Investigation:** On 02 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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 #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“

Old GPV – move to closure.

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	**Investigation:** On 06 Mar: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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# 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“ Old GPV – move to closure.

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	**Investigation:** On 24 Mar: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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# 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“ Old GPV – move to closure.

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	**Investigation:** On 11 Jun: Technician visual checked all Connections – no visual issue. **Containment Actions:** On 11 Jun Technician replaced GPV (PN: WAT270524) SN: 143569 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 13 Jul, Verified on a known good unit S/N : G18SM4021A. Result failed. Verified by TE Shamsul GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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 requested and received on 30th July (ATR # 05028) Old GPV – to move to closure

Weekly First Pass Yield

Current: WW34'18 and previous data

Problem Statement

Reported Date: May to Aug 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)

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
27 - 34	00	00	00

Date of Manufactured: Apr to Aug 2018
Reported site: Flex Kallang

Investigation/ Possible Root Cause

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 sent 2 x Injector Assy (removed from Alliance failing carry over test (high blank), to help identify root cause.
There is a discussion going on to send one Alliance unit that is consistently failing, to Milford (for info)

Corrective Action/ Improvement

Corrective Action:
Flex Kallang: NA

Supplier: NA

WW27 to WW30 – no failure – move to closure

Weekly First Pass Yield

Previous : WW35'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 28 Aug2018 Instrument Part Number: 186015080 Instrument SN: H18QSP880A Affected Qty: 1u Problem: Test compositional accuracy and high pressure test failure Date of Manufactured: Aug 2018 Reported site: Flex Kallang	**Investigation:** On 28 Aug, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 28 Aug, Technician replaced Dual Channel GPV (PN:279001810) SN 56058 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (847838) On 28 Aug, Offline verified, result failed. Same failure encountered. Verified by TE David. Dual Channel GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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: NA Old GPV – to move to closure

Weekly First Pass Yield

Current : WW34'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 16 Aug 2018 Instrument Part Number: 186015018 Instrument SN: H18QSM584A Affected Qty: 1u Problem: Failed Test Compositional and High Pressure Test AC90% Spite Failed. Date of Manufactured: Aug 2018 Reported site: Flex Kallang	**Investigation:** On 16 Aug, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 16 Aug, Technician replaced Dual Channel GPV (PN: 279001810, S/N: 57036. Retest Instrument – still same failure. Defective part transferred to Non Conformance Area Performed by: Technician (847838) Offline verification: Result – failed (same as reported by Technician). Verified by TE Shamsul (246394) Dual Channel GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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: NA Old GPV – to move to closure

Weekly First Pass Yield

Current : WW34'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 16 Aug 2018 Instrument Part Number: 186015018 Instrument SN: H18QSM584A Affected Qty: 1u Problem: Failed Test Compositional and High Pressure Test AC90% Spite Failed. Date of Manufactured: Aug 2018 Reported site: Flex Kallang	**Investigation:** On 16 Aug, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 16 Aug, Technician replaced Dual Channel GPV (PN: 279001810, S/N: 57279. Retest Instrument – still same failure. Defective part transferred to Non Conformance Area Performed by: Technician (847838) Offline verification: Result – failed (same as reported by Technician). Verified by TE Shamsul (246394) Dual Channel GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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: NA Old GPV – to move to closure

Weekly First Pass Yield

Previous : WW31'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 25 Jul 2018 Instrument Part Number: 186015080 Instrument SN: G18QSP747A Affected Qty: 1u Problem: Failed input line Prime C with MeOH Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 19 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 19 Jul, Technician replaced Dual Channel GPV (PN: 279001810. S/N: 56982. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (927989) Offline verification: No solvent on C channel. Verified : David Kee Dual Channel GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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# ATR # 05070 received on 07 Aug Old GPV – to move to closure

Weekly First Pass Yield

Previous : WW30'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 19 Jul 2018 Instrument Part Number: 186015080 Instrument SN: G18QSP740A Affected Qty: 1u Problem: Failed input line D/MeOH during (D) dual channel GPV cannot flow through. Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 19 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 19 Jul, Technician replaced Dual Channel GPV (PN: 279001810. S/N: 57014. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (927989) Offline verification: Verified using KGU S/N : H18QSM547A. Result Failed (same as reported by Technician). Verify by TE David Kee Dual Channel GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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: NA Old GPV – to move to closure

Weekly First Pass Yield

Previous : WW29'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 18 Jul 2018 Instrument Part Number: 186015080 Instrument SN: G18QSP735A Affected Qty: 1u Problem: Failed test input A Prime with MeOH. Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 18 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 18 Jul, Technician replaced Dual Channel GPV (PN: 279001810). S/N: 56795 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (927989) Offline verification: Verified result failed, Findings : No solvent flow on A channel. Verified : David Kee Dual Channel GPV Supplier: Parker The Defective part is to be RTV to Supplier. **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: NA Old GPV – to move to closure

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	**Investigation:** On 05 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** 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. **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 requested on 29 Jun. RMA# ATR # 04903 received on 10 Jul, parts returned to supplier on 11 Jul. Old GPV – to move to closure

GPV Failure in QSM

Previous – WW09'18

Problem Statement

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/ Possible Root Cause

Investigation:

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

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

Corrective Action/ Improvement

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"

Old GPV – to move to closure

Weekly First Pass Yield

Previous : WW32'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 03 Aug 2018 Instrument Part Number: 186299800 Instrument SN: G18998915A Affected Qty: 1u Problem: Lamp lighting failure Date of Manufactured: Aug 2018 Reported site: Flex Kallang	**Investigation:** On 03 Aug, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 03 Aug, Technician replaced Lamp Power Supply (PN: 279001105) from SN 109490 to SN 109707. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) Offline verification: Verified on a known good unit S/N : D1387E763A. Result Failed. Findings : Lamp lighting failure. Verified by TE Shamsul 246394. Lamp Power Supply Supplier: HAMAMATSU CORPORATION The Defective part is to be RTV to Supplier. **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 request in progress. WW33 to 36 – no failure. To move to Monitoring.

Weekly First Pass Yield

Previous : WW30'18

Problem Statement

Reported Date: 20, 23, 24 Jul 2018

Problem: Fail to power up

Instrument PN	Instrument SN	Qty failed
186299800	G18998864A	1
186015032	G18UPD547A, G18UPD557A	2
186017003	G18VPD416A	1

Total affected Qty: 4u
Date of Manufactured: Jul 2018

WW31 to 34 – No similar failure

Reported site: Flex Kallang

Investigation/ Possible Root Cause

Investigation:
On 20 Jul, Technician visual checked all Connections – no visual issue.

Containment Actions:
On 20 Jul, Technician replaced Cable (PN: 279001846).
Retest Instrument – passed.
Defective part transferred to Non Conformance Area
Performed by: Technician (842185)

Defective part subject for further investigation.
On 31 Jul, 2 out of 4 cable offline verified, preliminary investigation result: connectivity OK. (refer to attached video)
Verified by: TE Joel

Further verification:
Observed the deformed pins.

Cable Supplier: CMTI

Root Cause
Did not identify the root cause, Refer to CMI and Flex 4M
WW31 to 34 – No similar failure

Corrective Action/ Improvement

Corrective Action:
Flex Kallang: NA

Supplier: NA

Note:
CMTI came to Flex to sort on-hand inventory. 181pcs.
No similar defect found.

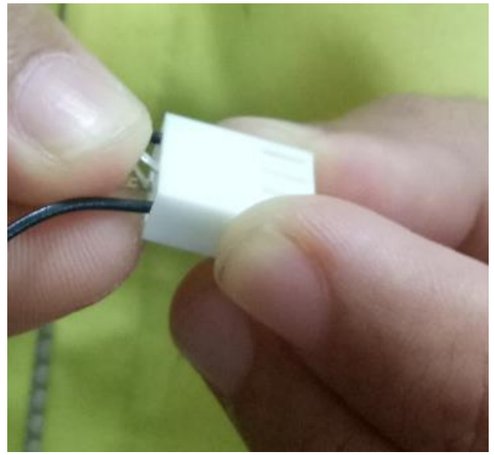
WW31 to 34 – no failure.
To move to Monitoring.

CMTI Pte. Ltd.
Part Number: WATH-279001846-B
Issue: Pin deformed

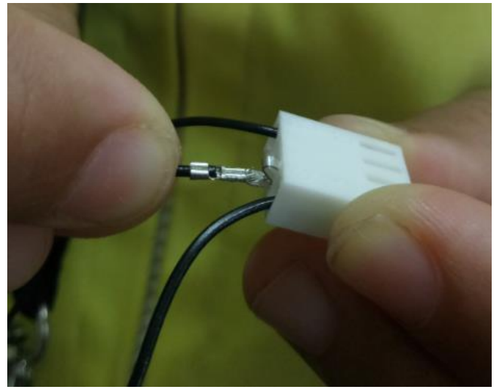
WW31 to 34 – no failure. To move to Monitoring.

	Possible Causes	Verification	Possible Cause (Y / N)	Proposed Actions
Man	It might cause by operator finger touching the terminal lock	Operator holding the wires during start process till end process.	NO	N/A
Method	It might cause by Improper insertion method	Wires unable to insert when terminal hold at incorrect position	NO	N/A
Machine	1. Improper crimping / terminal position in crimping machine 2. It might cause connector / terminal plug into mating jig more than 1 time	1. Terminal is in reel type which is the terminal position will not be able to moving 2. Simulated to plug connector into mating jig 5X. Result : NO deformation was happen **(100% continuity test conducted by factory)**	NO	N/A
Material	It might cause Original Material been deformed before process	NO deformed terminal been found **(there is carton pad to protect)**	YES	Conduct 100% visual inspection for 3 lots after terminal insertion.

Man & Method



Terminal unable to insert at the holding position and operator difficult to hold this area



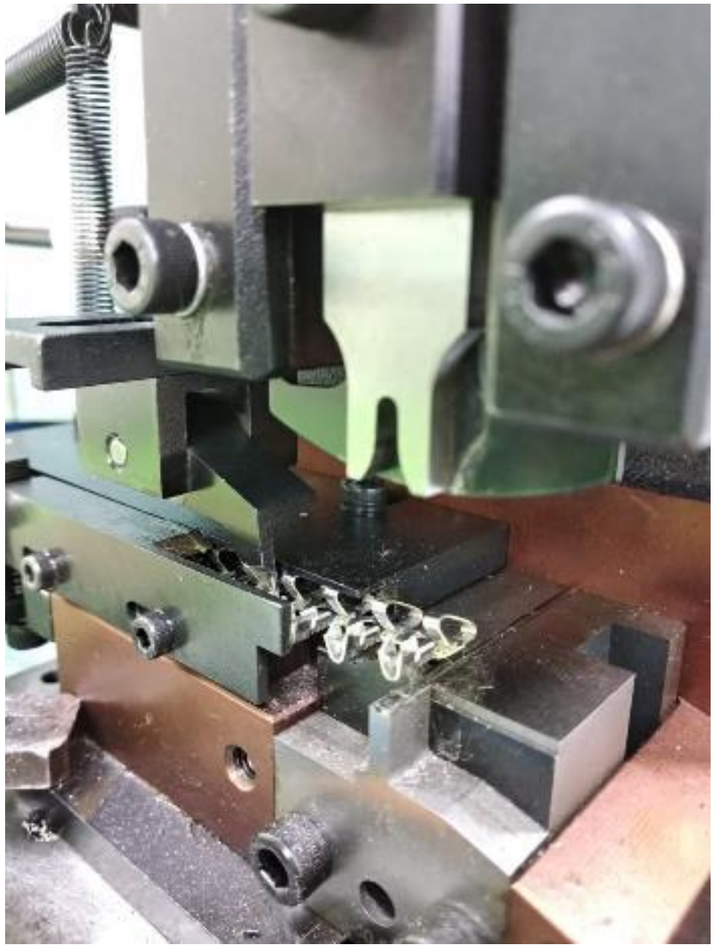
Correct holding position

Machine & Material

Original Material Condition in reel type and there is carton pad to protect

WW31 to 34 – no failure. To move to Monitoring.

Machine



Insulation crimping area

Conductor crimping area

Terminal position is fix (unable to move). Crimping portion only at conductor and insulation crimping area

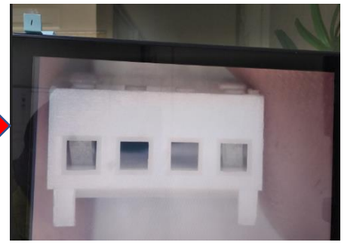
WW31 to 34 – no failure. To move to Monitoring.

Machine

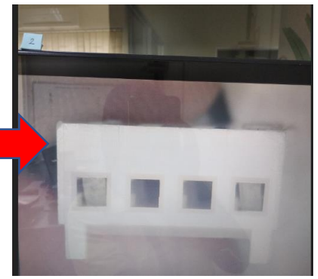
before insert into mating jig

Simulation result for 5X plug into Mating jig. Result : NO Deformation terminal cause by mating jig (100% continuity test conducted by factory)

1st simulation result

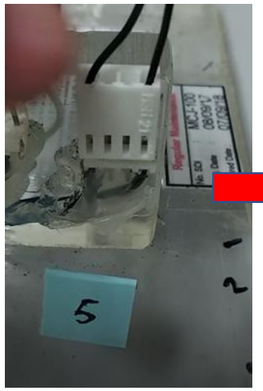


2nd simulation result



3rd simulation result

4th simulation result



5th simulation result

WW31 to 34 – no failure. To move to Monitoring.

Weekly First Pass Yield

WW31 to 34 – no failure.
To move to Monitoring.

4M Analysis (Flex)

Category	Material	Machine	Man	Method	Environment
Observation	Terminal in the connector is deformed.	No abnormalities observed on the testers. PM and Calibration is up-to-date.	Operators were trained and certified to follow the work instruction created and taught by Engineer. No variation in human factor observed.	Connector not able to insert onto PCBA with incorrect orientation.	NA
Actions Taken	1. Vendor did a sorting at Flex on the existing stock: 181pcs. No defect found 2. Continue to monitor from the Line fallout.	No action require.	1.Continue monitor the training and ensure operator follow Work instructions.	No action require.	NA
Proposals	NA	NA	NA	NA	NA

flex

Weekly First Pass Yield

Previous : WW29'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 17 Jul 2018 Instrument Part Number: 186299800 Instrument SN: G18998813A Affected Qty: 1u Problem: Communication with DSP failed Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 17 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 17 Jul, Technician replaced Lamp Power Supply (PN: 279001105) from SN 109014 to SN 109232. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) Offline verification: Verity using KGU S/N: D1387E763A. Result Failed. Finding: Lamp lighting failure. Verified by TE - David Kee Lamp Power Supply Supplier: HAMAMATSU CORPORATION The Defective part is to be RTV to Supplier. **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: NA WW33 to 36 – no failure. To move to Monitoring.

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	**Investigation:** On 06 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** 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) On 10 Jul, Verified on a known good unit S/N: D1387E763A. Findings : Display flickering when power on.(Fail to power on) PCB Lamp power supply Verified by, TE Shamsul PCB Lamp power supply Supplier: HAMAMATSU CORPORATION The Defective part is to be RTV to Supplier. **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 in progress. WW33 to 36 – no failure. To move to Monitoring.

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	**Investigation:** On 19 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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: 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. Target respond by 27 Jul. No update, chaser sent 31 July.. 1 Q3 Transistor FA received 31 Jul: it is presumed that chip was damaged by the operation exceeding SOA, There is also possibility that secondary excessive current flowed after the chip was damaged due to excessive voltage and caused this damage. Another 2 pcs of Q3 pending analysis.

WW31 to 34 – no failure.
To move to Monitoring.

Weekly First Pass Yield

Lamp Power Supply (PN: 279001105) - Prelim FA from component supplier for one of the Faulty Components:

貴社、益々ご清栄の段お慶び申し上げます。
過日、ご依頼の有りました不具合品調査につきまして下記にご報告申し上げます。

1．ご返品内容・発生状況

品名	2SK3148-E
ロット番号	7C2
不具合発生場所	貴社市場
不具合症状	その他の電気的特性
返却数	1個　　（入手日：7月18日）

2．返品調査結果

2.1 外観調査

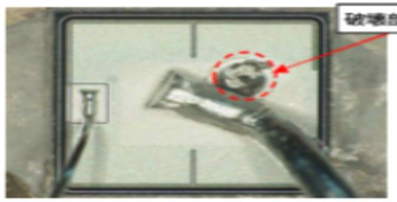
返却品のパッケージ外観を調査した結果、パッケージ表面に異常は確認されませんでした。

2.2 電気的特性

返却品の電気的特性調査の結果、VDSS及びVGSSショートを確認致しました。

2.3 分解調査

返却品の分解後の外観観察の結果、チップ表面に破壊部位を確認致しました。



Damaged portion

写真1．返却品(7C2) 破壊部位

Photo. 1 Damaged portion of retuned goods

3．見解

返却品は分解後のチップの破壊様相より、SOA(Safe Operation Area)を超えたため素子破壊したものと推定されます。尚、過電圧による素子破壊後に二次的な過電流が流れたため、現状のような破壊様相になったことも考えられます。

以上の通りですが、宜しくお願い致します。

-以上-

1. Details of return / Occurrence situation

Product Name	2SK3148-E
Lot Number	7C2
Where the problem occurred	Your customer
Failure phenomenon	Other electric characteristics
Number of return	1 pc (receipt date: July 18)

2. Inspection result

2.1 Visual inspection

Any defect was not observed on the package surface.

2.2 Electric characteristics

Short circuits were confirmed at V_{DSS} and V_{GSS} .

2.3 Destructive inspection

Damaged portion was observed on the chip surface.

3. Opinion

Judging from the state of the damage on the chip, it is presumed that chip was damaged by the operation exceeding SOA (Safe Operation Area).

There is also a possibility that secondary excessive current flowed after the chip was damaged due to excessive voltage, and it caused this damage.

WW31 to 34 – no failure.
To move to Monitoring.

flex

Hamamatsu Lamp Power Supply P/N 279001105 - Flex 4M Analysis

	Possible Causes	Verification	Possible cause (Y/ N)	Proposed Actions
Man	1) Untrained/ Uncertified Technician (Testing)	Verified, trained/ certified Tech/Operators performing Detector Testing as per document provide by WPPL. No abnormality found.	N	NA
	2) Technician not following the MPI defined steps.(Assy Operation)	Verified that Tech/Operators performing Detector Main Line Assembly as per document provide by WPPL. No abnormality found	N	NA
Method	Assembly method not repeatable	All Assembly as per ASP provide by WPPL to mount Hamamatsu lamp supply 279001105 to Chassis with 4 screws. No change to Assembly method.	N	NA
Machine	Test Stations: 1. Hipot Test is not calibrated 2. Prog'g Station does not have PM schedule 3. Final Test Station does not have PM schedule	Test Stations: 1.Hipot Station is calibrated yearly 2. Prog'g Station computer is PM yearly 3. Final Test Station is PM yearly	N	NA
Material	Lamp Power Supply is Faulty	Off line verification - Display with blinking or no power at Final test .After replace new Lamp Power Supply instrument retest - Pass	Y	RTV / FA

WW31 to 34 – no failure.
To move to Monitoring.

flex

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	**Investigation:** On 13 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** 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) On 17 JUL, Verify using KGU s/n : D1387E763A result failed, lamp lighting failure. Verified by: TE David Kee Lamp Power Supply Supplier: HAMAMATSU CORPORATION The Defective part is to be RTV to Supplier. **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# 35586 received on 06 Aug. WW33 to 36 – no failure. Move issue to Monitoring

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	**Investigation:** On 02 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 02 Jun, Technician replaced Lamp Power Supply (PN: 279001105). Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) On 10 Jul, Verified on a known good unit S/N: D1387E763A. Findings : Display flickering during power on. (Fail to power on) Verified by, TE Shamsul Lamp Power Supply Supplier: HAMAMATSU CORPORATION The Defective part is to be RTV to Supplier. **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# 35564 received on 31 Jul. WW33 to 36 – no failure. Move issue to Monitoring

Weekly First Pass Yield

Previous : WW27'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 28 Jun 2018 Instrument Part Number: 186002487 Instrument SN: F1887E024AA Affected Qty: 1u Problem: Display malfuncton Date of Manufactured: Jun 2018 Reported site: Flex Kallang	**Investigation:** On 28 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 28 Jun, Technician replaced Lamp Power Supply (PN: 279001105) from SN 108470 to SN108410. Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) On 13 Jul, Verified on a known good unit S/N : D1387E763A. Findings : Display Flickering (unable to power up) Verified by TE Shamsul Lamp Power Supply Supplier: HAMAMATSU CORPORATION The Defective part is to be RTV to Supplier. **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: RA# 35564 received on 31 Jul. Return in progress WW33 to 36 – no failure. Move issue to Monitoring

Weekly First Pass Yield (In process)

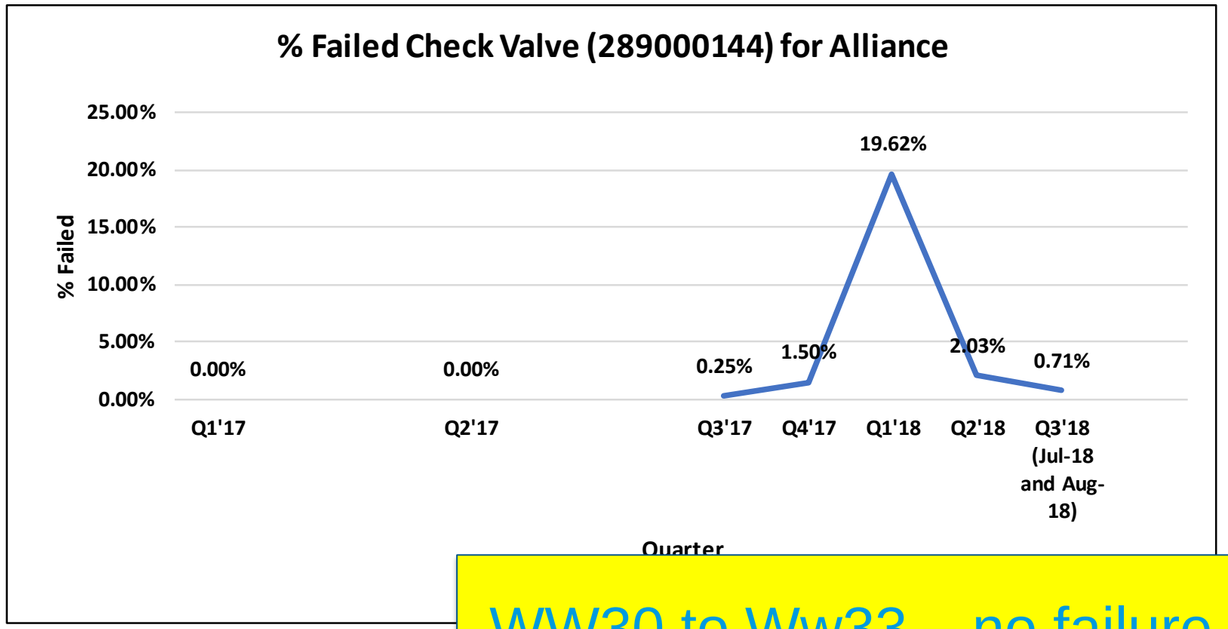
Current : WW36'18 and previous data

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: WW22 (25 May to 31 May 2018) onwards Part Number: 289000144 (Check Valve) Affected Qty: WW22 – 4pcs (unable to ramp up to 5000psi) WW24 – 1pc (unable to ramp up to 5000psi) WW27 – 3pcs (unable to ramp up to 5000psi) WW28 – 3pcs (unable to ramp up to 5000psi) WW29 – 4pcs (unable to ramp up to 5000psi) WW30 to 36 – 0pcs Part used: Alliance (Pump Tray) Date of Manufactured: May and Jun 2018 Note: The above lots onwards, supplier reported better in-house yield.	**Investigation:** 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. **Containment Actions:** The Defective part is to be RTV to Supplier. Check Valve Supplier: IDEX **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: NA WW30 to Ww33 – no failure. Move issue to Monitoring

Weekly First Pass Yield (In process)

Check Valve (PN 289000144) – failure by Month and Quarter (2017 and 2018)

Month	186269505 and 186269506 Qty Build	Qty Failure	% Failed	Quarter	Qty Build	Qty Failure	% Failed
Jan-17	394	0	0.00%	Q1'17	1118	0	0.00%
Feb-17	326	0	0.00%				
Mar-17	398	0	0.00%				
Apr-17	425	0	0.00%	Q2'17	1169	0	0.00%
May-17	342	0	0.00%				
Jun-17	402	0	0.00%				
Jul-17	482	0	0.00%	Q3'17	1206	3	0.25%
Aug-17	406	3	0.74%				
Sep-17	318	0	0.00%				
Oct-17	416	0	0.00%	Q4'17	1132	17	1.50%
Nov-17	340	0	0.00%				
Dec-17	376	17	4.52%				
Jan-18	462	115	24.89%	Q1'18	1223	240	19.62%
Feb-18	361	50	13.85%				
Mar-18	400	75	18.75%				
Apr-18	352	17	4.83%	Q2'18	1234	25	2.03%
May-18	394	0	0.00%				
Jun-18	488	8	1.64%				
Jul-18	558	7	1.25%	Q3'18 (Jul-18 and Aug-	982	7	0.71%
Aug-18	424	0	0.00%				
Total Qty	**8064**	**292**		**Total**	**8064**	**292**	



WW30 to Ww33 – no failure.
Move issue to Monitoring

flex

Weekly First Pass Yield (In process)

Current : WW36'18 and previous data

Problem Statement

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:

	WAT270403	WAT270404	WAT270405	WAT270406	430000101
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
WW27	1	3	1	1	1
WW28	0	0	0	0	0
WW29	0	0	0	0	0
WW30 to WW36	0	0	0	0	0

Investigation/ Possible Root Cause

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.
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/ Improvement

Corrective Action:
Flex Kallang: NA

Supplier: Using lower staking pressure around 108psi.
Supplier reported Ferrule drop out rate as below:
After staking process
- about 20% Ferrule drop out
- Stake a new Ferrule.

After tube bending process
- about 30% Ferrule drop out
- did not stake a new Ferrule
- placed the drop out Ferrule inside Zip Lock Bag together with the Tubing.

Flex Incoming and Production also found around 30% of drop out Ferrule inside Zip Lock Bag.

WW30 to Ww33 – no failure. Move issue to Monitoring

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	**Investigation:** On 23 Feb: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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) **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: 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	**Investigation:** On 10 Feb: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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: NA Closed

Alliance PCBA 210000425 Failure

Previous – WW48'17

Problem Statement

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.

Investigation/ Possible Root Cause

Flex Senai Investigation:

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.

Flex Senai Containment Action:

1. After replaced U8 and U5, PCBA passed ICT and FCT.
2. Failed component sent for component level FA to Supplier On-Semi.

On-Semi Investigation

1. Component found electrically damaged, as per attached FA.

Adobe Acrobat Document

Root Cause

Unknown what has caused 2 x IC to be electrically damaged.
Propose to continue monitoring.

Corrective Action/ Improvement

Corrective Action:

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	**Investigation:** On 27 Mar: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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-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	**Investigation:** On 27 Mar: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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-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	**Investigation:** On 29 Mar: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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-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	**Investigation:** On 02 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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-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	**Investigation:** On 02 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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-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	**Investigation:** On 03 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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-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	**Investigation:** On 09 Mar: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause** Based on FA from IC supplier (Avago), it is because of the Flux used containing Halite. .	**Corrective Action:** 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	**Investigation:** On 27 Mar: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause** Based on FA from IC supplier (Avago), it is because of the Flux used containing Halite. .	**Corrective Action:** 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	**Investigation:** On 27 Mar: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause** Based on FA from IC supplier (Avago), it is because of the Flux used containing Halite. .	**Corrective Action:** 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	**Investigation:** On 26 Mar: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause** Based on FA from IC supplier (Avago), it is because of the Flux used containing Halite. .	**Corrective Action:** 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	**Investigation:** On 26 Feb: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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: 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	**Investigation:** On 26 Feb: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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: 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

Previous - WW09'18

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	**Investigation:** On 27 Feb: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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: 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

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	**Investigation:** On 11 May: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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. **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# 14886 received on 11 May 2018. FedEx no.: 772265343274. Part delivered to Parker on 21 May 2018. Reinspection / retesting /disassembly for analysis completed. No FA required. To move to closed

Weekly First Pass Yield (In process)

Current : WW30'18 and previous data

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: WW11 (09 Mar to 15 Mar 2018) till WW16 (13 Apr to 19 Apr 2018) Part Number: Part Number: 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) 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. Note: see next slide for failure rate compare Year 2017 and 2018 Reported site: Flex Kallang	**Investigation:** 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. **Containment Actions:** The Defective part is to be RTV to Supplier. Check Valve Supplier: IDEX **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: 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 supplier's internal CAPA 1220- STATUS: Closed

Weekly First Pass Yield

Previous : WW28'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 06 Jul 2018 Instrument Part Number: 186269506 Instrument SN: G18SM4906A Affected Qty: 1u Problem: Sample temperature H/W fault (4) during heater cooler test Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 06 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 06 Jul, Technician replaced Heater Cooler PCB (PN: 210000444). From SN 110618305M to SN 110618260M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (847838) On 13 Jul, Offline verified on a known good unit S/N : G18SM4021A. Failed on sample temperature h/w fault Findings : F1 fuse blow. But 4x IC were OK Verified by TE Joel Heater Cooler PCB Supplier: Flex Senai The Defective part is to be RTV to Supplier. **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 request in progress. For monitoring

Weekly First Pass Yield

Previous : WW28'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 10 Jul 2018 Instrument Part Number: 186269506 Instrument SN: G18SM4968A Affected Qty: 1u Problem: GPV no function during Solvent Inlet Plumbing Verification Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 10 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 10 Jul, Technician replaced Pump PCB (PN: 210000425). From SN 050618478M to SN 210618055M Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (246026) On 10 Jul, Offline verified failed. Findings: C111 - OK Verified by TE Joel Pump PCB Supplier: Flex Senai The Defective part is to be RTV to Supplier. **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: RTV in progress. For monitoring

Weekly First Pass Yield

Previous : WW28'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 10 Jul 2018 Instrument Part Number: 186269506 Instrument SN: G18SM4001A Affected Qty: 1u Problem: Degasser failed 1.5 PsiA after 30mins from Boot up during Degasser test Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 10 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 10 Jul, Technician replaced Vacuum Pump (PN: 279001055). From SN 81168505 to SN 81168505 Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (836410) On 20 Jul, Offline verified on a known good unit S/N : G18SM4145A, result failed Findings : Degasser failed 1.5 PSiA after boot up Verified by TE Shamsul Vacuum Pump Supplier: Idex The Defective part is to be RTV to Supplier. **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: To request RMA For back up

Weekly First Pass Yield

Previous : WW25'18

Problem Statement

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

Investigation/ Possible Root Cause

Investigation:
Technician visual checked all Connections – no visual issue.

Containment Actions:
Technician replaced Syringe (PN: WAT073109).
Retest Instrument – passed.
Defective part transferred to Non Conformance Area
Performed by: Technician (246026)

Offline verification:

Date Detected	Findings	Date Verified	Verified by
19 Jun 2018	Verified on KGU Sn F18SM4869A. Result passed.	10 Jul 2018	Shamsul (TE)

Syringe Supplier: MK Fluidic Systems LLC

The Defective part is to be RTV to Supplier.

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/ Improvement

Corrective Action:
Flex Kallang: NA

Supplier: NA

Move to close

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	**Investigation:** On 07 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** 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. **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-SEN-00000359 received on 06 July. RTV on 09 July For monitoring

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	**Investigation:** On 02 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** 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) On 11 Jun 2018, Offline verification, retest Pump tray failed. Findings: No visible component defect, F1 fuse good., C111 measurement passed. 5V, 12V, 15V, 24V all Ok. Verified : TE Joel and Shamsul Pump PCB Supplier: Flex Senai The Defective part is to be RTV to Supplier. **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: To request for RMA For monitoring

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	**Investigation:** On 14 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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-SEN-00000187 received on 7 May 18. Return to supplier on 15 May 2018. The unit has passed ICT but failed FCT, Suspected Q9 & Q6 MOSFET leak or defective. Need to change component Q9 & Q6 for further analysis. To move to closed

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	**Investigation:** On 19 Mar: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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 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	**Investigation:** On 23 Feb: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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 #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	**Investigation:** On 14 Feb: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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 #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	**Investigation:** On 27 Feb: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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 #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	**Investigation:** On 18 Jan: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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 #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	**Investigation:** On 06 Dec: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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:** 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	**Investigation:** On 29 Dec: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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: 22 Jan 2018, RMA-RF007121 provided by Senai. Supplier findings : U8 & U5-Component Failure

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: 186015018 Instrument SN: A18QSM659A Affected Qty: 1u Problem: 18 Jan: Test loader download failed Date of Manufactured: Jan 2018 Reported site: Flex Kallang	**Investigation:** On 18 Jan: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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: 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

Previous : WW28'18

Problem Statement	Investigation/ Possible Root Cause	Corrective Action/ Improvement
Reported Date: 09 Jul 2018 Instrument Part Number: 186299800 Instrument SN: G18998778A Affected Qty: 1u Problem: Communication failure Date of Manufactured: Jul 2018 Reported site: Flex Kallang	**Investigation:** On 09 Jul, Technician visual checked all Connections – no visual issue. **Containment Actions:** On 09 Jul, Technician replaced PCB CPU (PN: 210000520) from SN 080618042C to SN 110618071C Retest Instrument – passed. Defective part transferred to Non Conformance Area Performed by: Technician (842185) Offline verification: Verified using Golden Unit SN D1387E763A,able to download 2489 firmware manually using jumper PCB CPU Supplier: CEI LIMITED The Defective part is to be RTV to Supplier. **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: NA To move to closure

Weekly First Pass Yield

Previous : 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	**Investigation:** On 26 Jun, Technician visual checked all Connections – no visual issue. **Containment Actions:** 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) On 03 JUL, Verified using KGU s/n : B13998443N result passed. Verified : David Kee (TE) The PCBA is to be released back to Production. **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: NA To move to closure

flex

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	**Investigation:** Technician visual checked all Connections – no visual issue. **Containment Actions:** • 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 **Root Cause** Horiba reported workmanship issue and requested old Grating to the returned.	**Corrective Action:** 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	**Investigation:** On 02 Feb: Technician visual checked all Connections – no visual issue. **Containment Actions:** (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 **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# 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	**Investigation:** On 18 Jan: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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: 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	**Investigation:** On 23 Jan: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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# 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	**Investigation:** On 22 Jan: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **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: 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 – WW15'18

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. FA sent 04 July, board repaired and pending to send back to Flex. Move to close

Weekly First Pass Yield

Previous : WW21'18

Problem Statement	Investigation/ Pssible 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	**Investigation:** On 22 May: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause:** It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	**Corrective Action:** 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. FA still in progress. 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/ Pssible 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	**Investigation:** On 10 May: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause:** It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	**Corrective Action:** 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. FA still in progress. 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/ Pssible 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	**Investigation:** On 26 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause:** It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	**Corrective Action:** 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. FA still in progress. 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/ Pssible 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	**Investigation:** On 28 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause:** It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	**Corrective Action:** 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. FA still in progress.

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/ Pssible 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	**Investigation:** On 30 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause:** It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	**Corrective Action:** 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. FA still in progress. 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/ Pssible 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	**Investigation:** On 26 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause:** It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	**Corrective Action:** 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. FA still in progress. 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/ Pssible 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	**Investigation:** On 18 Apr: Technician visual checked all Connections – no visual issue. **Containment Actions:** 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 **Root Cause:** It is confirmed that the Defective part has caused the Sub AssyTest as per stated in the Problem Statement.	**Corrective Action:** 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. FA still in progress. Note: Team requested to take a closer look at Assy Motor Carousel Drive as having consistence failures for past weeks