APPLICABLE COMPONENTS						
ITEM	DESCRIPTION	MANDATORY (YES/NO)	TERMINAL CAVITY MIN/MAX OD	PLATING/MATERIAL	FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.
1	TRC B837/ 1.2mm (APPLICABLE CAVITIES 1-7)	NO	0/3.5X4.5	REFERENCE TRC	N/A	N/A
2	WIRE SEAL (APPLICABLE TO ITEM 1)	NO	SEE DRAWING	SILICONE	HU5T-10C930-JA	A-0611-H
3	WIRE SEAL (APPLICABLE TO ITEM 1)	NO	SEE DRAWING	SILICONE	HU5T-10C930-HA	A-0611-G
4	WIRE SEAL (APPLICABLE TO ITEM 1)	NO	SEE DRAWING	SILICONE	HU5T-10C930-GA	A-0611-F
5	CAVITY PLUG	NO	SEE DRAWING	SILICONE	AU5T-10C930-CA	A0412

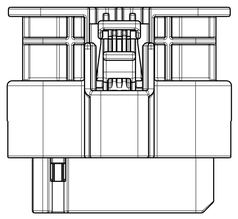
(A1) "FORD PART NUMBER" PIN OUT CHART

TERMINAL HOLE POSITION 1	2	3	4	5	6	7	TOTAL OPEN	TOTAL BLOCKED	FORD PART NUMBER	SUPPLIER PART NUMBER	SUPPLIER HOUSING PART NUMBER	DESCRIPTION
							7	-	MU5T-14A464-AGB-000	6189-8546	(A3) 6185-5908	KEY A w/ CPA, ALL-OPEN
(A2) 1	2	3					4	3	MU5T-14A464-AGB-001	6189-8624	(A4) 6185-5931	KEY A w/ CPA, #1-3 BLOCKED
							7	-	MU5T-14A464-AHB-000	6189-8547	(A3) 6185-5908	KEY A w/o CPA, ALL-OPEN
							7	-	MU5T-14A464-AJB-000	6189-8548	(A5) 6185-5909	KEY B w/ CPA, ALL-OPEN
							7	-	MU5T-14A464-AKB-000	6189-8549	(A5) 6185-5909	KEY B w/o CPA, ALL-OPEN
							7	-	MU5T-14A464-ALB-000	6189-8550	(A6) 6185-5910	KEY C w/ CPA, ALL-OPEN
							7	-	MU5T-14A464-AMB-000	6189-8551	(A6) 6185-5910	KEY C w/o CPA, ALL-OPEN

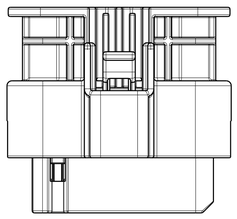
CHARTED BLOCKED CAVITY CONFIGURATIONS WITH A CAVITY NUMBER LISTED INDICATE BLOCKED TERMINAL POSITIONS

CHARTED BLOCKED CAVITY CONFIGURATIONS WITHOUT A CAVITY NUMBER LISTED INDICATE OPEN TERMINAL POSITIONS

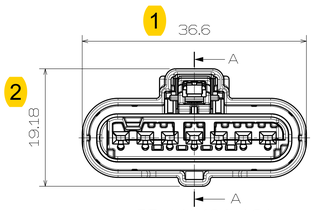
ITEM	DESCRIPTION	COLOR	FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.	MATERIAL / SPEC. NO.	RECYCLING CODE	WEIGHT	NO OF ITEMS REQUIRED					
1	FEMALE HOUSING KEY A	BLACK	N/A (A3)	SEE CHART	POLYESTER COMPOUND	PBT-GF15	6.3g	1	1				
	FEMALE HOUSING KEY B	BLACK	N/A (A5)	SEE CHART	POLYESTER COMPOUND	PBT-GF15	6.3g			1	1		
	FEMALE HOUSING KEY C	BLACK	N/A (A6)	SEE CHART	POLYESTER COMPOUND	PBT-GF15	6.3g					1	1
2	FEMALE TPA KEY A	NATURAL	N/A (A7)	6910-8690	POLYESTER COMPOUND	PBT-GF15	1.0g	1	1				
	FEMALE TPA KEY B	LT. GRAY	N/A (A8)	6910-8691	POLYESTER COMPOUND	PBT-GF15	1.0g			1	1		
	FEMALE TPA KEY C	DK. GRAY	N/A (A9)	6910-8692	POLYESTER COMPOUND	PBT-GF15	1.0g					1	1
3	RING SEAL (A10)	REDDISH BROWN	N/A (A11)	7135-1010	SILICONE METHYL/VINYL	VMQ	0.2g	1	1	1	1	1	1
4	CPA	RED	N/A (A12)	6910-8559	POLYESTER COMPOUND	PBT-GF15	0.3g	1		1		1	



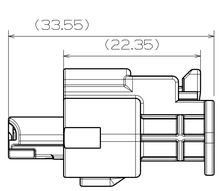
OPTION WITH CPA



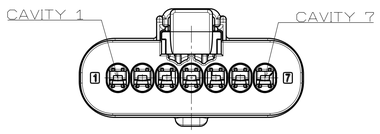
OPTION WITHOUT CPA



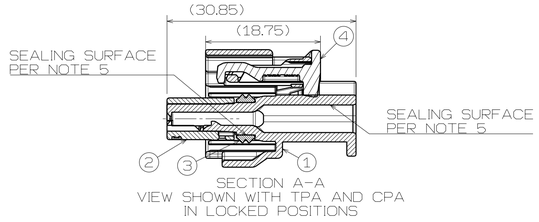
MU5T-14A464-AGA SHOWN



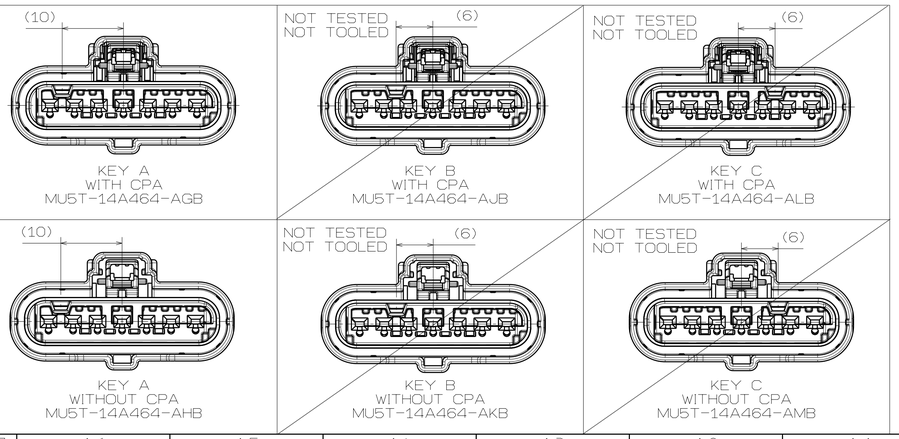
VIEW SHOWN WITH TPA AND CPA IN PRE-SET POSITIONS

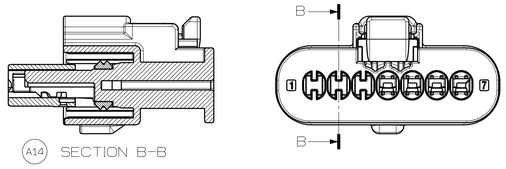


CAVITY IDENTIFICATION REAR VIEW



SECTION A-A
VIEW SHOWN WITH TPA AND CPA IN LOCKED POSITIONS





(A14) SECTION B-B

FLASHED OVER CAVITY CONFIGURATION:
MU5T-14A464-AGB-001 SHOWN
(MU5T-14A464-AGB-001 HAS CAVITIES #1-3 FLASHED OVER)

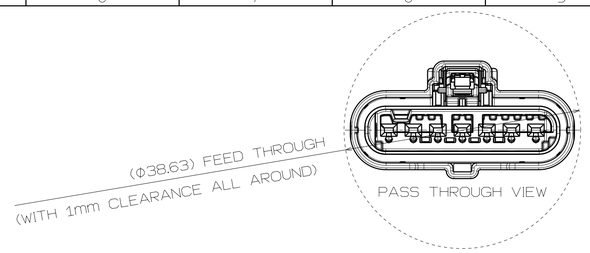
GENERAL TOLERANCES		
OVER	LESS THAN	
	10	±0.2
10	50	±0.3

CONNECTOR ASSEMBLY CHART						
ASSEMBLY PART NO.'S					MATING COMPONENT	
FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.	TEMPERATURE CLASS	VIBRATION CLASS	SEALING CLASS	FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.
MU5T-14A464-AGB	6189-8546	T3	V3	S3	TBD	TBD
MU5T-14A464-AHB	6189-8547	T3	V3	S3	TBD	TBD
MU5T-14A464-AJB	6189-8548	T3	V3	S3	TBD	TBD
MU5T-14A464-AKB	6189-8549	T3	V3	S3	TBD	TBD
MU5T-14A464-ALB	6189-8550	T3	V3	S3	TBD	TBD
MU5T-14A464-AMB	6189-8551	T3	V3	S3	TBD	TBD

(31)

NOTE:

1. PARTS CONFORM TO THE ELECTRICAL CONNECTION SYSTEM DESIGN SPECIFICATION (SDS) VER. 28.
2. PARTS CONFORM TO USCAR-2 REV 7. FOR PERFORMANCE CRITERIA AND EXCEPTIONS, SEE SUMITOMO DVP&R.
3. MAXIMUM MATING FORCE FULLY POPULATED WITH TIN TERMINALS IS = <75 N
   MAXIMUM MATING FORCE FULLY POPULATED WITH SILVER TERMINALS IS = <75 N
4. (A13) TERMINAL EXTRACTION TOOL WITH TPA IN PRE-SET POSITION: MOLEX PART NUMBER 63813-1500
   TERMINAL EXTRACTION TOOL WITH TPA REMOVED: SUMITOMO PART NUMBER 23730003
5. SEALING SURFACES AS IDENTIFIED ON THIS DRAWING ARE SMOOTH AND FREE OF PARTING LINES.
6. CONNECTOR IS RATED AS ERGONOMIC CLASS 3 BASED ON USCAR-25 REV 1.
   CONNECTOR PUSH AREA IS APPROXIMATELY 225 mm^2
7. N/A
8. PART RECEIVED AT THE FORD PLANT OR SERVICE PART PACKAGER/WAREHOUSE MUST BE FREE OF ANY CORROSION ALIGNED WITH THE FORD CUSTOMER SERVICE DIVISION (FCSD) PACKAGING AND SHIPPING GUIDE. PACKAGING AND PROTECTIVE MATERIALS MUST PRESERVE THE INTENDED FUNCTION AND APPEARANCE OF THE PART.
9. CHANGES TO DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION REQUIRE PRIOR APPROVAL FROM FORD MOTOR COMPANY PRODUCT ENGINEERING. REFER TO ISO/TS 16949.
10. FOR CURRENT RELEASE STATUS, SEE THE WERS ENGINEERING NOTICE
11.
12. FOR THE PURPOSES OF GEOMETRIC TOLERANCING, ALL DIMENSIONAL INFORMATION CONTAINED IN THE CAD MODEL IS BASIC (THEORETICAL)
13. FOR MATING INTERFACE, REFER TO EWCAP DRAWING: 120-S-007-1-Z04 (MEDIUM SHROUD)



PASS THROUGH VIEW

ISOMETRIC VIEW
SCALE: 1:1

NO	A	UNIQUE	SLV ASY WIR CONN FEM	MU5T-14A464-AHB
YES	B	UNIQUE	SLV ASY WIR CONN FEM	MU5T-14A464-AJB
NO	B	UNIQUE	SLV ASY WIR CONN FEM	MU5T-14A464-AKB
YES	C	UNIQUE	SLV ASY WIR CONN FEM	MU5T-14A464-ALB
NO	C	UNIQUE	SLV ASY WIR CONN FEM	MU5T-14A464-AMB
CPA INCLUDED	KEY CODE	DESCRIPTION	PART NAME	PART NUMBER

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	

RELEASED
AELE-E-11783930-514 20200603

J.SANDBURG	F.MAGDA	J.CHAPPELLE	SUMITOMO

REMOVED MU5T-14A464-AGA, -AHA, -AJA, -AKA, -ALA, -AMA

A1 ADDED PIN OUT CHART
A2 ADDED CONFIGURATION MU5T-14A464-AGB-001
A3 MOVED TO CHART, WAS 9936-1268
A4 ADDED FEMALE HOUSING KEY A F/O CAVITIES #1-3
A5 MOVED TO CHART, WAS 9936-1269
A6 MOVED TO CHART, WAS 9936-1270
A7 WAS 9936-1271
A8 WAS 9936-1272
A9 WAS 9936-1273
A10 WAS TAN
A11 WAS 9937-1157
A12 WAS 9936-0227
A13 REVISED NOTE 4
A14 ADDED FLASH OVER VIEWS AND CONFIGURATION LIST

RELEASED MU5T-14A464-AGB, -AGB-001, -AHB, -AJB, -AKB, -ALB, -AMB
AELE-E-11783930-552 20210527

J.SANDBURG	F.MAGDA	J.CHAPPELLE	SUMITOMO

B1 WAS T4

AELE-E-11783930-570 20220113

M.WILLINGHAM	F.MAGDA	J.CHAPPELLE	SUMITOMO

SUBMITTED TO FORD 14JAN20.
NOT RELEASED

SEWS

SUMITOMO ELECTRIC WIRING SYSTEMS, LTD
248-482-1300
27360 DRAKE RD, FARMINGTON HILLS, MI 48331

ENG APP	APP DATE
GSDB CODE	SUPPLIER PART NUMBER: SEE CHART

REFERENCE 7-WAY SEALED FEMALE CONN FOR SEWS 1.2 TERMINALS
MUST CONFORM TO: RESTRICTED SUBSTANCE MANAGEMENT STANDARD WSS-M99P9999-A1 TO SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT
DRAFTED IN ACCORDANCE WITH FORD MOTOR COMPANY ENGINEERING CAD AND DRAFTING STANDARDS VERSION 30
3RD ANGLE PROJ - DIMENSIONS ARE IN MILLIMETERS

CAD TYPE	CAD LOC.	CAD FILE			DTMC IS MASTER
K-CATIA5	TC	MU5T-14A464-AG			
PLANT CODE	LINE CODE	OPER. NO.	BT. NO.	STATION	SIZE
N/A	N/A	N/A	N/A	N/A	N/A
PLANT NAME		DEPT. NO.	DESIGN	SCALE	SHT 1 OF 1
N/A		N/A	JS	2:1	

TITLE/PART NAME
SLV ASY WIR CONN FEM

DRAWING/PART NO. MU5T-14A464-AGB N/A

FORD MOTOR COMPANY

DaimlerChrysler Ford GM

Production Part Approval
Dimensional Test Results

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS
SUPPLIER/VENDOR COI

NAME OF INSPECTION FACILITY:
Sumitomo Electric Wiring Systems Plt. 5

PART NUMBER: 6189-8624
PART NAME: FOW120A07FA-2
DESIGN RECORD CHANGE LEVEL: MU5T-14A464-AGB B1 01/13/22
ENGINEERING CHANGE DOCUMENTS: NA

ITEM	DIMENSION / SPECIFICATION	SPECIFICATION / LIMITS		TEST DATE	QTY. TESTED	ORGANIZATION MEASUREMENT RESULTS (DATA)								OK	NOT OK
						M1	M1	M2	M2	M3	M3	M4	M4		
1	36.60	-0.30	0.30	12/13/21	8	36.50	36.48	36.50	36.50	36.50	36.48	36.48	36.48	O	
2	19.18	-0.30	0.30			19.34	19.35	19.32	19.32	19.32	19.33	19.32	19.33	O	

Blanket statements of conformance are unacceptable for any test results.

MARCH
2006

CFG-1003

SIGNATURE	TITLE	DATE
Christi Cornwell	Ppap Operator	12/13/2021

TO SUMITOMO ELECTRIC WIRING SYSTEMS

POLYPLASTICS CO., LTD.
JR SHINAGAWA EAST BLDG.13
2-18-1,KONAN
MINATO-KU,TOKYO, 108-8280 JAPAN

CERTIFICATE OF ANALYSIS

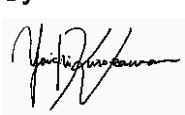
WE HEREBY CERTIFY THAT THE UNDERMENTIONED LOT WAS DULY INSPECTED AND PASSED BY OUR QUALITY CONTROL DEPARTMENT.

POLYBUTYLENE TEREPHTHALATE
DURANEX(R)

GRADE;COLOR NO. **CK7816 ED3003**
LOT NO. **B12572**
JUDGMENT PASS

ITEM	TESTING METHOD	UNIT	<<< SPEC >>>	VALUE
MFR	ISO 1133	g/10min	4.0 -- 14.0	9.1
Ash Content	ISO 3451	%	15.0 -- 19.0	17
Tensile strength	ISO 527-1,2	MPa	>= 75.0	101.2
Tensile strain	ISO 527-1,2	%	>= 2.0	3.8

2021/08/12
Approved By



QUALITY ASSURANCE DEPARTMENT
YOICHI KUROKAWA

※according to EN 10204-3.1

※This lot complies with RoHS requirements.

POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(PROCESS FMEA)

ISSUE	DETAIL	DATE	AUTH
5/6/21	New AIAG format	5/6/21	R. Gonzalez

DEPARMENT	SIGNATURE	DATE
Division Manager:	N. Hagiwara	5/10/21
Quality Manager:	L. Roth	5/6/21

SUPPLIER: Sumitomo Electric Wiring Systems
PART NAME: Various resin/Connector molded parts
PART NO: Various resin/Connector molded parts

SUPPLIER C NA
MANUF. LOCA Scottsville #5 / Franklin
MODEL NA
PREPARED BY R. Gonzalez

PFMEA NO: #1 5/6/20 Updated to new AIAG format and confirmation with Control Plan
CORE TEAM: R. Gonzalez, A. Davidson, D. Hall, L. Roth, J. Fraim

PROCESS NUMBER	PROCESS FUNCTION REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	SEV	CLASS	POTENTIAL CAUSES(S) MECHANISM(S) OF FAILURE	OCC	CURRENT PROCESS CONTROLS PREVENTION	CURRENT PROCESS CONTROLS DETECTION	DET	RPN	RECCOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS: ACTIONS TAKEN	SEV	OCC	DET	RPN
0010	Raw Material Receiving	1. Incorrect Raw Material	Raw Material shortage causing interruption to Inj. Molding scheduled production, leading to: *Parts shortage *Customer part delivery performance degraded.	4		Incorrect quantity shipped by Supplier	2	Supplier confirms material quantity or weight, and creates packing list.	Receiving Associate confirms BOL against Packing List (confirms each unit). Material is barcode scanned into system against open Purchase Order	6	48	NONE						
		2. Incorrect Raw Material Part Number Received	Raw Material shortage causing interruption to Inj. Molding scheduled production, leading to: *Parts shortage *Customer part delivery performance degraded.	4		Incorrect material part number shipped by Supplier	2	Supplier confirms material quantity or weight, and creates packing list.	Receiving Associate confirms BOL against Packing List (confirms each unit). Material is barcode scanned into system against open Purchase Order	6	48	NONE						
		3. Damaged Containers	Material rejected, insufficient material for production. Component produced from contaminated material. * Quality problem * Customer complaint	4		Improper Handling at point of origin and / or transportation. Improper Packaging	2	Packaging is designed to prevent damage.	Receiving associate visually confirms container for damage.	6	48	NONE						
0020	Quality Assurance Receiving Inspection	1. Raw Material Out of Specification	* Delay Scheduled Production * Brittle Parts * Customer part delivery performance degraded. * Customer compliant	7		Insufficient Supplier Process Controls	2	Supplier tests each lot of material for proper mechanical and chemical properties.	*SQA Receiving associate verifies Material cert to standard, and test Melt Flow each PBT lot. (IC) * Molding machine monitors detect process variation *QA Lab verifies product function each run.	5	70	Raw Material is confirmed to meet spec by material supplier and Melt Flow testing. QA Receiving Inspection. Molding Machine monitors will detect material variations, and QA tests the function of each part to confirm it meets the specification. No other correction action needed.						
		2. Incorrect Raw Material Color	* Delay Scheduled Production * Customer part delivery performance degraded. * Customer compliant	3		Mislabeled Raw Material Container.	2	Supplier confirms and matches color per their in process controls.	QA Receiving associate visually confirms per shipment / lot referencing master samples.	7	42	NONE						

PROCESS NUMBER	PROCESS FUNCTION REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	SEV	LASS	CAUSES(S) MECHANISM(S) OF FAILURE	OCC	PROCESS CONTROLS PREVENTION	PROCESS CONTROLS DETECTION	DET	RPN	RECCOMMENDED ACTION(S)	& TARGET COMPLETION DATE	ACTIONS TAKEN	SEV	OCC	DET	RPN
			Raw Material shortage causing interruption to			Incorrect quantity shipped by Supplier		Supplier confirms material quantity or weight, and creates	Receiving Associate confirms BOL against Packing List									
0030	Material Storage	1. Improper storage	*Difficulty in locating raw material *Raw material degradation.	2		*Incorrect storage location *Improper storage method.	2	Scanning system assign each part number to a specific warehouse location, controlling inventory and FIFO.	Scanning system assign each part number to a specific warehouse location, controlling inventory and FIFO.	5	20	NONE						
0040	Raw Material Loading	1. Incorrect Raw Material	* Discoloration of Parts * Brittle Parts * Impaired function of Part * Customer Complaint	7		Material handler selected incorrect raw material Mislabeled material Mixed material.	2	Shop order specifies required raw material. Barcode system confirms raw material part number when assigned to machine. Material received COA is confirmed to material spec.	* Barcode system * Visual confirmation of Raw Material ID against shop order each Set-up and Each shift.	2	28	Barcode system 100% confirms that the correct material is loaded at the machine and visual material ID checks are conducted each set-up and shift start. No other action is needed.						
	Material Drying (if required)	1. Material not dried correctly	* Burn mark, or weld line * Brittle Parts-Part breakage * Parts out of dimension.	3		Set-up operator failed to set correct process parameters : Oven Temp. Moisture Content Drying time.	2	1. Machine is interlocked not to operate if dryer is off. 2. Central Feed Dryer will alarm if power goes off. 3. Set-up operator verifies and visually confirms correct process parameters.	1. Parameters are reconfirmed by coordinator/leader and operator.	4	24	NONE						
		1. Incorrect Raw Material	* Parts out-of-specification * Discoloration of Parts * Brittle Parts * Impaired function of Part * Customer Complaint	5		Set-up Associate used incorrect raw material.	2	1. Barcode system confirms raw material matches shop order. Any mismatch prevents printing of labels.	1. Barcode system will detect wrong material . 2. Verify against Mold Book Condition Sheet & record on Condition Sheet Form and P chart. Confirmed with Material color codes & barrel colors.	5	50	NONE						
				5		Setup Operator selected incorrect central feed system raw material.	2	1: Central Feed System interlocks prevent incorrect material feed.	1: Barcode scan	5	50	NONE						
		2. Incorrect Mold placed in Machine	Incorrect Part Manufactured	2		Set-up Associate failed to use correct Mold	2	1. Barcode scan mold book to machine, any mismatch prevents printing of labels. 2.Set-up Associate instructions (shop order) & visual confirmation.	Verify against Mold Book Condition Sheet & record on Condition Sheet Form, Mold set up book and Critical check sheet	5	20	NONE						
		3. Improper Machine Process Parameters	Parts out-of-specification (Dim. & appearance) Short Shot, Discoloration of Parts, Brittle Parts, Impaired function of Part, Customer Complaint.	4		Set-up Associate failed to set correct process Parameters	3	1. Engineering established parameters selected by setup and automatically uploaded to machine. 2. Set-up Associate instructions (shop order) & visual confirmation.	1. Setup verify against Mold Book Condition Sheet & record on Condition Sheet Form 2. Leader/coordinator reverifies machine screen conditions match set up conditions.	5	60	NONE						

PROCESS NUMBER	PROCESS FUNCTION REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	S E V	L A S S	CAUSES(S) MECHANISM(S) OF FAILURE	O C C	PROCESS CONTROLS PREVENTION	PROCESS CONTROLS DETECTION	D E T	R P N	RECCOMMENDED ACTION(S)	& TARGET COMPLETION DATE	ACTIONS TAKEN	S E V	O C C	D E T	R P N
0050	Set-up Injection Molding Machine		Raw Material shortage causing interruption to			Incorrect quantity shipped by Supplier		Supplier confirms material quantity or weight, and creates	Receiving Associate confirms BOL against Packing List									
		4. Parts out-of-specification (Set-Up appearance checks): Broken pins, Damaged mold pins, Flash, Voids, Sinks, Short Shot, Holes, Weld Lines, Robot Damage and other visual defects. Confirmation of parts for contamination/grease/oil	Inj. Molding scheduled production interrupted. Impaired function of Part. Customer Compliant/Dissatisfaction.	3		Machine Parameters (Over adjustment & under adjustment, limited range) Material Instability Age of Mold Incorrect Mold Design Gate size, location, wear (affects material flow) or Combination of above. Flow variation due to change of injection function components (barrel,screw, nozzle type,etc)	3	1.Monthly PM by machine maintenance. 2.Confirmation system for molding set-up parameters. 3.Set-up Operator instructions (shop order) & visual confirmation per CPC. 4.Confirmation of correct gate size, location, wear	1.Verify against Mold Book Condition Sheet & record on Condition Sheet Form. 2.Engineering validation of injection function changes per internal robust test procedure. 3. Metal detector checks at SOP/EOP (as applicable)	5	45	NONE						
				3		Improper Robot settings	3	1. Setup confirms robot setting per condition sheet. 2.Utilize soft drop conveyors. 3.Confirmation of Set-up of auxiliary equipment. 4.PM for robot clamp. 5.Utilization of pick and place robots where applicable.	1. Set-up operator visual confirms first 10 shots. 2.Molding operator checks last shot each basket and QA check at each SOP per GA003 & Inspection Standard. 3.Leader/ coordinator reverification of robot settings.	5	45	NONE						
				3		Machine Wear Improper cleaning at changeover or machine PM.	2		Set-up operator verifies & visually confirms machine clean each Mold change/Set-up per work instructions. Maintenance PM Mold Schedule	6	36	NONE						
				5		Damaged or broken pins due to Age/condition of Mold	2	Maintenance PM Mold, QA Confirmation function SOP/EOP, Operator each lot visual check, Mold condition settings.		5	50	SEWS maintains molds and follows strict PM schedule. Parts are also confirmed functionally to detect for out of spec parts due to broken molds.						
		5. Parts out-of-specification (QA appearance checks) Broken pins, Flash, Voids, Sinks, Short Shot, Holes, Weld Lines and other visual defects.	Inj. Molding scheduled production interrupted. Impaired function of Part Customer Compliant/Dissatisfaction.	3	C, C# (IC / SW S / IM)	Machine Parameters (Over adjustment & under adjustment, limited range) Material Instability Age of Mold Incorrect Mold Design Gate size, location, wear (affects material flow) or Combination of above. Flow variation due to change of injection function components (barrel,screw, nozzle type,etc).	3	1.Monthly PM by machine maintenance. 2.Confirmation system for molding set-up parameters. 3.Set-up Operator instructions (shop order) & visual confirmation per CPC. 4.Confirmation of correct gate size, location, wear	1.Verify against Mold Book Condition Sheet & record on Condition Sheet Form. 2..QA Visual Inspection per CPC and QA IIS at SOP per GA003 & Inspection Standard. 3.Engineering validation of injection function changes per internal robust test procedure. 4. Metal detector checks at SOP/EOP (as applicable)	5	45	SEWS strictly controls processing parameters and tolerance levels and tool condition. QA also verifies part dimension and function at the start and end of production. No other action needed.						
		6. Parts out-of-specification (QA function checks) : terminal insertion, terminal retention, retainer insertion, retainer retention, engagement with mating parts (clip, etc.). Hinge, Clip/lock, or Lance damage-(where Applicable).	Inj. Molding scheduled production interrupted. Impaired function of Part Customer Compliant/Dissatisfaction.	3	C, C# (IC / SW S / IM)	Machine Parameters (Over adjustment & under adjustment, limited range) Material Instability Age of Mold Incorrect Mold Design Gate size, location, wear (affects material flow) or Combination of above. Flow variation due to change of injection function components (barrel, screw, nozzle type,etc).	2	1. Condition adjustment restricted to engineering. 2. Confirmation system for molding set-up parameters.	1.Verify against Mold Book Condition Sheet & record on Condition Sheet Form. 2.QA Functional testing each SOP per GA003 & Inspection Standard 3. Engineering validation of injection function changes per internal robust test procedure.	5	30	SEWS strictly controls processing parameters and tolerance levels. QA also verifies part dimension and function at the start and end of production. No other action needed.						

PROCESS NUMBER	PROCESS FUNCTION REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	SEV	LASS	CAUSES(S) MECHANISM(S) OF FAILURE	OCC	PROCESS CONTROLS PREVENTION	PROCESS CONTROLS DETECTION	DET	RPN	RECCOMMENDED ACTION(S)	& TARGET COMPLETION DATE	ACTIONS TAKEN	SEV	OCC	DET	RPN
			Raw Material shortage causing interruption to			Incorrect quantity shipped by Supplier		Supplier confirms material quantity or weight, and creates	Receiving Associate confirms BOL against Packing List									
		7. Parts out-of-specification (QA Dimension Checks).	Inj. Molding scheduled production interrupted. Impaired function of Part Customer Complaint / Dissatisfaction.	4		Machine Parameters (Over adjustment & under adjustment, limited range) Material Instability Age of Mold Incorrect Mold Design	2	Confirmation system for molding set-up parameters. Set-up Operator instructions (shop order) & visual confirmation per CPC.	1. Verify against Mold Book Condition Sheet & record on Condition Sheet Form. 2. QA Dimensional measurement each SOP per GA003 & Inspection Standard	6	48	SEWS strictly controls processing parameters and tolerance levels. QA also verifies part dimension and function at the start and end of production. No other action needed.						
		8. Mixed Parts.	Mixed Parts delivered to the customer Customer Complaint / Dissatisfaction.	5		Trapped or scattered parts / start-up shots remaining in molding machine.	3	1. Process Change System for evaluating chute/conveyor changes for potentially scattered parts.	1. Set up checks at each change over.	5	75	SEWS performs checks of each machine prior to each SOP to ensure start up shots/previous product is not scattered in machine.						
0060	Mass Production Injection Molding	1. Parts out-of-specification (Operator appearance checks): Broken pins, Damaged mold pins, Flash, Voids, Sinks, Short Shot, Holes, Weld Lines, Robot Damage and other visual defects. Confirmation of parts for contamination/grease/oil	Inj. Molding scheduled production interrupted. Impaired function of Part Customer Compliant/Dissatisfaction.	3		Machine Parameters (Over adjustment & under adjustment, limited range) Material Instability Age of Mold Incorrect Mold Design Gate size, location, wear (affects material flow) or Combination of above. Flow variation due to change of injection function components (barrel,screw, nozzle type,etc).	3	1. Monthly PM by machine maintenance. 2.Confirmation system for molding set-up parameters. 3.Set-up Operator instructions (shop order) & visual confirmation per CPC. 4.Confirmation of correct gate size, location, wear.	1. Verify parts against CPC. 2. Metal detector alarm (as applicable).	6	54	SEWS strictly controls processing parameters and tolerance levels and tool condition. QA also verifies part dimension and function at the start and end of production. No other action needed.						
	Inline Inspection	1. Parts out-of-specification (In-Line Roving Patrol) Broken pins, Damaged mold pins, Flash, Voids, Sinks, Short Shot, Holes, Weld Lines, Robot Damage and other visual defects. Confirmation of parts for contamination/grease/oil	Inj. Molding scheduled production interrupted. Impaired function of Part Customer Compliant/Dissatisfaction.	3		Machine Parameters (Over adjustment & under adjustment, limited range) Material Instability Age of Mold Incorrect Mold Design Gate size, location, wear (affects material flow) or Combination of above. Flow variation due to change of injection function components (barrel,screw, nozzle type,etc)	3	1. Monthly PM by machine maintenance. 2.Confirmation system for molding set-up parameters. 3.Set-up Operator instructions (shop order) & visual confirmation per CPC. 4.Confirmation of correct gate size, location, wear.	1. Verify parts against CPC.	5	45	SEWS strictly controls processing parameters and tolerance levels and tool condition. QA also verifies part dimension and function at the start and end of production. No other action needed.						
		1. Parts out-of-specification (QA appearance checks) Broken pins, Flash, Voids, Sinks, Short Shot, Holes, Weld Lines and other visual defects	Inj. Molding scheduled production interrupted. Impaired function of Part Customer Compliant/Dissatisfaction.	3	C, C# (IC / SWS / IM)	Machine Parameters (Over adjustment & under adjustment, limited range) Material Instability Age of Mold Incorrect Mold Design Gate size, location, wear (affects material flow) or Combination of above. Flow variation due to change of injection function components (barrel,screw, nozzle type,etc).	3	1. Monthly PM by machine maintenance. 2.Confirmation system for molding set-up parameters. 3.Set-up Operator instructions (shop order) & visual confirmation per CPC. 4.Confirmation of correct gate size, location, wear.	1. Verify against Mold Book Condition Sheet & record on Condition Sheet Form. 2..QA Visual Inspection per CPC and QA IIS at MOP/EOP per GA003, Inspection Standard & any applicable Work Instruction and/or Quality Alert. 3.Engineering validation of injection function changes per internal robust test procedure.	5	45	SEWS strictly controls processing parameters and tolerance levels and tool condition. QA also verifies part dimension and function at the start and end of production. No other action needed.						

PROCESS NUMBER	PROCESS FUNCTION REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	SEV	LASS	CAUSES(S) MECHANISM(S) OF FAILURE	OCC	PROCESS CONTROLS PREVENTION	PROCESS CONTROLS DETECTION	DET	RPN	RECCOMMENDED ACTION(S)	& TARGET COMPLETION DATE	ACTIONS TAKEN	SEV	OCC	DET	RPN
0070			Raw Material shortage causing interruption to			Incorrect quantity shipped by Supplier		Supplier confirms material quantity or weight, and creates	Receiving Associate confirms BOL against Packing List									
	Quality Assurance Inspection Injection Molding	2. Parts out-of-specification (QA function checks) : terminal insertion, terminal retention, retainer insertion, retainer retention, engagement with mating parts (clip, etc.). Hinge, Clip/lock, or Lance damage- (where Applicable).	Inj. Molding scheduled production interrupted. Impaired function of Part Customer Compliant/Dissatisfaction.	3	C, C# (IC / SWS / IM)	Machine Parameters (Over adjustment & under adjustment, limited range) Material Instability Age of Mold Incorrect Mold Design Gate size, location, wear (affects material flow) or Combination of above. Flow variation due to change of injection function components (barrel, screw, nozzle type,etc).	2	1. Condition adjustment restricted to engineering. 2. Confirmation system for molding set-up parameters.	1. Verify against Mold Book Condition Sheet & record on Condition Sheet Form. 2..QA Visual Inspection per CPC and QA IIS at MOP/EOP per GA003, Inspection Standard & any applicable Work Instruction and/or Quality Alert. 3.Engineering validation of injection function changes per internal robust test procedure.	5	30	SEWS strictly controls processing parameters and tolerance levels. QA also verifies part dimension and function at the start and end of production. No other action needed.						
		3. Parts out-of-specification (QA Dimension Checks).	Inj. Molding scheduled production interrupted. Impaired function of Part Customer Complaint / Dissatisfaction.	4	C, C# (IC / SWS / IM)	Machine Parameters (Over adjustment & under adjustment, limited range) Material Instability Age of Mold Incorrect Mold Design.	2	Confirmation system for molding set-up parameters. Set-up Operator instructions (shop order) & visual confirmation per CPC.	1. Verify against Mold Book Condition Sheet & record on Condition Sheet Form. 2..QA Visual Inspection per CPC and QA IIS at MOP/EOP per GA003, Inspection Standard & any applicable Work Instruction and/or Quality Alert.	6	48	SEWS strictly controls processing parameters and tolerance levels. QA also verifies part dimension and function at the start and end of production. No other action needed.						
	Material Staging for 100% Inspection (where applicable)	1. Incorrect Storage Location	Wrong Part/Mixed Parts delivered to customer Compliant/Dissatisfaction	3		Material Handler failed to place product in correct location.	2	P- Material Handler verifies correct location per electronically scanning Part number into system (BPCS)		5	30	NONE						
	100% Inspection (where applicable)	1. Parts out-of-specification (Inspector) Broken pins, Damaged mold pins, Flash, Voids, Sinks, Short Shot, Holes, Weld Lines, Robot Damage and other visual defects. Confirmation of parts for contamination/grease/oil.	Inj. Molding scheduled production interrupted. Impaired function of Part Customer Compliant/Dissatisfaction.	3		Machine Parameters (Over adjustment & under adjustment, limited range) Material Instability Age of Mold Incorrect Mold Design Gate size, location, wear (affects material flow) or Combination of above. Flow variation due to change of injection function components (barrel,screw, nozzle type,etc).	3	1. Monthly PM by machine maintenance. 2.Confirmation system for molding set-up parameters. 3.Set-up Operator instructions (shop order) & visual confirmation per CPC. 4.Confirmation of correct gate size, location, wear.	1. Verify parts against CPC / TWI.	5	45	SEWS strictly controls processing parameters and tolerance levels and tool condition. QA also verifies part dimension and function at the start and end of production. No other action needed.						
0080	Packaging and labeling at Machine	1. Incorrect Box Label	Wrong Part delivered to internal customer Customer Complaint / Dissatisfaction.	5		Molding operator failed to place correct label on bag / box	3	To generate label requires to scan shop order against mold book and machine.	1. Set up confirms mold number and part number are correct. 2. QA confirmation against CPC	5	75	NONE						
		2. Incorrect Quantity	Impact assembly/packing process Cause inventory variation.	5		Set up failed to correctly set lot quantity	3	Lot quantity set in machine memory.	1. Lot quantity confirmed each SOP by set up. Details are recorded on the set up condition check sheet. 2. Bags are 100% counted by machine.	5	75	NONE						
	Material Staging for Non-Bulk Packing / Labeling	1. Incorrect Storage Location	Delay in locating material, possible delay of shipment.	3		Material Handler failed to place product in correct location.	2	P- Each part is assigned to a specific location though barcode scan system.		5	30	NONE						

PROCESS NUMBER	PROCESS FUNCTION REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	SEV	LASS	CAUSES(S) MECHANISM(S) OF FAILURE	OCC	PROCESS CONTROLS PREVENTION	PROCESS CONTROLS DETECTION	DET	RPN	RECCOMMENDED ACTION(S)	& TARGET COMPLETION DATE	ACTIONS TAKEN	SEV	OCC	DET	RPN
			Raw Material shortage causing interruption to			Incorrect quantity shipped by Supplier		Supplier confirms material quantity or weight, and creates	Receiving Associate confirms BOL against Packing List									
0090	Transfer packaged parts to storage	1. Incorrect Storage Location	Delay in locating material, possible delay of shipment.	3		Material Handler failed to place product in correct location.	2		Material Handler verifies correct location per electronically scanning Part number into system (BPCS).	5	30	NONE						
0100	Finished Goods Storage	1. Incorrect Storage Location	Wrong Part delivered to customer Customer Complaint / Dissatisfaction.	3		Material Handler failed to place product in correct location.	2		Material Handler verifies correct location per electronically scanning Part number into system (BPCS)	5	30	NONE						
		2. Deterioration of packaging.	Damaged to box, potential delay of shipment.	3		Environmental conditions, handling errors.	2	Climate controlled warehouse, FIFO barcode controlled, monthly shelf life assessment.	Weekly audit and inventory assessment.	5	30	NONE						
0110	Finished Goods Inventory (Shipping)	1. Finished Goods Shortage	Inj. Molding scheduled production interrupted & intermittent leading to: *Parts shortage *Customer part shortage & assembly line shutdown *Customer part delivery performance degraded. * Customer complaint	3		BPCS SYSTEM not 100% dependable	2	Inventory Control System.	Manual inventory taken, Operator manual / visual inventory.	5	30	NONE						
0120	Finished Goods Dock Audit- (Weekly) Random box per skid)	1. Incorrect Part in box.	Customer Complaint / Dissatisfaction.	3		Operator failed to verify shipping label present, clear, correct and legible.	2	Packing Barcode Scanning operation, confirming inventory label to shipping label.	Operator visually confirms per instructions.	5	30	NONE						
		2. Incorrect Quantity in box and / or Damaged Box.	Customer Complaint / Dissatisfaction.	3		Shipping Operator failed to verify no damaged boxes & correct quantity shipped.	2		Operator electronically scans Box Label number to Print AIAG part number, includes cross verification system.	5	30	NONE						
		3. Incorrect AIAG Label (where Applicable).	Customer Complaint / Dissatisfaction.	3		Operator failed to verify AIAG label present, clear, correct and legible.	4		Operator electronically scans Box Label number to Print AIAG part number, includes cross verification system.	5	60	NONE						
0130	Shipping Finished Goods	1. Missing Box Label	Possible delayed shipment or shortage or parts.	3		Operator failed to verify shipping label is present, clear, correct and legible	2		Operator visually checks for damage & scans label / verifies correct quantity acceptance.	5	30	NONE						
		2. Damaged Boxes	Customer Complaint / Dissatisfaction.	3		Shipping Operator failed to verify no damaged boxes shipped.	2		Operator visually checks for damage & scans label / verifies correct quantity acceptance.	5	30	NONE						
		3. Incorrect AIAG Label (where Applicable)	Customer Complaint / Dissatisfaction.	3		Operator failed to verify AIAG label present, clear, correct and legible.	3	Operator electronically scans Box Label number to Print AIAG part number.		5	45	NONE						

POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(PROCESS FMEA)

ISSUE	DETAIL	DATE	AUTH

DEPARMENT	SIGNATURE	DATE
QA	Leroy Roth	2/25/21

SUPPLIER:
PART NAME: Various Assembled Connectors
PART NO: Various Assembled Connectors

SUPPLIER C NA
MANUF. LOCA CBU SV5 & FRK
MODEL NA
PREPARED BY Lindsey Stuart

PFMEA NO: Revised to new AIAG format
CORE TEAM: L. Stuart, P. Keith, J. Fraim, L. Roth, N. Walker

PROCESS NUMBER	PROCESS FUNCTION REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	SEV	CLASS	POTENTIAL CAUSES(S) MECHANISM(S) OF FAILURE	OCC	CURRENT PROCESS CONTROLS PREVENTION	CURRENT PROCESS CONTROLS DETECTION	DET	RPN	RECCOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS: ACTIONS TAKEN	SEV	OCC	DET	RPN
0010	RECEIVE MATERIAL FROM VENDOR (SEALS, TERMINALS, ETC.)	1. WRONG MATERIAL / UNIDENTIFIED PARTS	1a. MIXED PARTS 2b. SHORTAGE OF CORRECT PARTS	2		1. SUPPLIER ERROR	2	1a. VERIFY PURCHASE ORDER LIST WITH PACKING LIST 1b. BARCODE SCANNING (EACH UNIT)	1a. VERIFY PURCHASE ORDER LIST WITH PACKING LIST 1b. BARCODE SCANNING (EACH UNIT)	6	24	None						
		2. WRONG QUANTITY	2. SHORTAGE AND / OR OVERAGE OF PARTS	2		2. SUPPLIER ERROR	2	2a. VERIFY PURCHASE ORDER LIST WITH PACKING LIST 2b. BARCODE SCANNING (EACH UNIT)	2a. VERIFY PURCHASE ORDER LIST WITH PACKING LIST 2b. BARCODE SCANNING (EACH UNIT)	6	24	None						
		3. DAMAGE TO CONTAINERS	3. DAMAGE TO CONTAINERS	2		3. IMPROPER HANDLING AT POINT OF SHIPMENT AND / OR TRANSPORTATION	2	3. VISUAL CHECK OF PACKAGING (EACH UNIT)	3. VISUAL CHECK OF PACKAGING (EACH UNIT)	6	24	None						
0020	QA RECEIVING INSPECTION (WHERE APPLICABLE)	1. POOR PACKAGING CONDITIONS (DAMAGE, WET, CONTAMINATION)	1. DAMAGED PARTS AND / OR RAW MATERIALS CONTAMINATION	2		1. IMPROPER HANDLING AT POINT OF SHIPMENT AND / OR TRANSPORTATION	2	1. VISUAL CHECK OF PACKAGING (EACH UNIT)	1. VISUAL CHECK OF PACKAGING (EACH UNIT)	6	24	None						
		2. DEFECTIVE APPEARANCE OF COMPONENTS	2. SHORTAGE OF USABLE PARTS / PRODUCT REJECTION	4		2. DEFECTIVE PARTS SHIPPED FROM SUPPLIER	3	2a. VISUAL CONFIRMATION EACH SHIPMENT LOT COMPARED TO INSPECTION SHEET 2b. MASTER PRODUCT PHOTO	2a. VISUAL CONFIRMATION EACH SHIPMENT LOT COMPARED TO INSPECTION SHEET 2b. MASTER PRODUCT PHOTO	6	72	None						
		3. DIMENSIONAL NONCONFORMANCE	3a. SHORTAGE OF USABLE PARTS / PRODUCT REJECTION 3b. POTENTIAL FINISHED GOODS NON COMPLIANCE	4		3. DEFECTIVE PARTS SHIPPED FROM SUPPLIER	2	3. DIMENSIONAL AND FUNCTIONAL TESTING PER RECEIVING INSPECTION SHEET	3. DIMENSIONAL AND FUNCTIONAL TESTING PER RECEIVING INSPECTION SHEET	5	40	None						
0030	COMPONENTS STORAGE / STAGING (PURCHASED AND IN-HOUSE MANUFACTURED)	1a. INCORRECT COMPONENT LOCATION 1b. INCORRECT COMPONENT STAGED AT MACHINE	1a. INACCURATE INVENTORY, POTENTIAL SHORTAGE OF PARTS 2a. WRONG COMPONENT ASSEMBLED	3		1. HUMAN ERROR / WRONG COMPONENT STAGED AT MACHINE	2	1a. PER APPLICABLE STANDARD 1b. BARCODE SCANNING	1a. PER APPLICABLE STANDARD 1b. BARCODE SCANNING	5	30	None						

PROCESS NUMBER	PROCESS FUNCTION REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	S E V	L A S S	CAUSES(S) MECHANISM(S) OF FAILURE	O C C	PROCESS CONTROLS PREVENTION	PROCESS CONTROLS DETECTION	D E T	R P N	RECCOMMENDED ACTION(S)	& TARGET COMPLETION DATE	ACTIONS TAKEN	S E V	O C C	D E T	R P N
								1a. VERIFY PURCHASE	1a. VERIFY PURCHASE ORDER									
0040	SET-UP FOR AUTOMATIC ASSEMBLY MACHINES.	1. INCORRECT MACHINE SETTINGS	1. DAMAGED OR INCORRECTLY ASSEMBLED PART, CANNOT MATE TO HARNESS.	8		1. HUMAN ERROR AND / OR INCORRECT SETUP	2	1a. PER APPLICABLE WORK INSTRUCTION / CHECKSHEET. 1b. CONTROLLED GO/NO GO SAMPLES AT START OF PRODUCTION TO VERIFY ALL AUTOMATED SENSORS 1c. 100% AUTOMATIC INSPECTION OF CRITICAL ASSEMBLY FEATURES WITH MACHINE INTERLOCK.	1a. PER APPLICABLE WORK INSTRUCTION / CHECKSHEET. 1b. CONTROLLED GO/NO GO SAMPLES AT START OF PRODUCTION TO VERIFY ALL AUTOMATED SENSORS 1c. 100% AUTOMATIC INSPECTION OF CRITICAL ASSEMBLY FEATURES WITH MACHINE INTERLOCK.	2	32	None						
		2. MIXED PARTS AT CHANGEOVER (FOR M/C'S WITH MULTIPLE PARTS NUMBERS)	2. INCORRECT COLOR OR KEYWAY PARTS SHIPPED TO CUSTOMER	4		2. INCOMPLETE CHANGEOVER BETWEEN PART NUMBERS	2	2a. OPERATOR CHANGES OVER USING CHANGEOVER CHECKSHEET; LEADER TO CONFIRM KEY ITEMS (AUTOBAGGER) 2b. CONTROLLED GO/NO GO SAMPLES AT START OF PRODUCTION TO VERIFY ALL AUTOMATED SENSORS 2c. 100% AUTOMATIC INSPECTION OF CRITICAL ASSEMBLY FEATURES WITH MACHINE INTERLOCK.	2a. OPERATOR CHANGES OVER USING CHANGEOVER CHECKSHEET; LEADER TO CONFIRM KEY ITEMS (AUTOBAGGER) 2b. CONTROLLED GO/NO GO SAMPLES AT START OF PRODUCTION TO VERIFY ALL AUTOMATED SENSORS 2c. 100% AUTOMATIC INSPECTION OF CRITICAL ASSEMBLY FEATURES WITH MACHINE INTERLOCK.	4	32	None						
				4		3. PARTIAL BAG REMAINS IN AUTOBAGGER DURING CHANGEOVER	2	3. AUT0BAGGER PROGRAMMING AUTOMATICALLY CYCLES EACH TIME PART NUMBER IS CHANGED, ENSURING THAT PARTIAL BAG DOES NOT REMAIN INSIDE BAGGER.	3. AUT0BAGGER PROGRAMMING AUTOMATICALLY CYCLES EACH TIME PART NUMBER IS CHANGED, ENSURING THAT PARTIAL BAG DOES NOT REMAIN INSIDE BAGGER.	3	24	None						
		4. SETUP INCORRECT PART NUMBER	4. INCORRECT PART NUMBER SHIPPED TO THE CUSTOMER	4		4. HUMAN ERROR AND/OR INCORRECT SETUP	4	4a. OPERATOR CHANGES OVER USING CHANGEOVER CHECKSHEET; LEADER TO CONFIRM KEY ITEMS 4b. CONTROLLED GO/NO GO SAMPLES AT START OF PRODUCTION TO VERIFY ALL AUTOMATED SENSORS 4c. BARCODE SCANNING CONFIRMS PART NUMBER	4a. OPERATOR CHANGES OVER USING CHANGEOVER CHECKSHEET; LEADER TO CONFIRM KEY ITEMS 4b. CONTROLLED GO/NO GO SAMPLES AT START OF PRODUCTION TO VERIFY ALL AUTOMATED SENSORS 4c. BARCODE SCANNING CONFIRMS PART NUMBER	3	48	None						
	MACHINE VERIFICATION (SAMPLE CHECKS)	1. PASS DEFECTIVE PARTS	1. DAMAGED PART / INCORRECT ASSEMBLY	8		1a. MACHINE MALFUNCTION 1b. NON-CERTIFIED SAMPLES	2	1a. 100% AUTOMATED INSPECTION USING SENSORS, SENSORS CHECKED EACH SHIFT WITH CONTROLLED GO / NO-GO SAMPLES. 1b. CONTROLLED CALIBRATED GO / NO-GO SAMPLES AND VERIFICATION PER SHIFT TO CONFIRM ALL AUTOMATED SENSORS	1a. 100% AUTOMATED INSPECTION USING SENSORS, SENSORS CHECKED EACH SHIFT WITH CONTROLLED GO / NO-GO SAMPLES. 1b. CONTROLLED CALIBRATED GO / NO-GO SAMPLES AND VERIFICATION PER SHIFT TO CONFIRM ALL AUTOMATED SENSORS	3	48	None						

PROCESS NUMBER	PROCESS FUNCTION REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	S E V	L A S S	CAUSES(S) MECHANISM(S) OF FAILURE	O C C	PROCESS CONTROLS PREVENTION	PROCESS CONTROLS DETECTION	D E T	R P N	RECCOMMENDED ACTION(S)	& TARGET COMPLETION DATE	ACTIONS TAKEN	S E V	O C C	D E T	R P N
								1a. VERIFY PURCHASE	1a. VERIFY PURCHASE ORDER									
0050	Assembly PRODUCTION	1. WRONG COMPONENT PARTS	1. NON-COMPLIANT PARTS PRODUCED	8		1a. HUMAN ERROR AND / OR INCORRECT WORK ORDER INFORMATION 1b. INCORRECT LABELS AT MACHINE	3	1a. BARCODE SCANNING 1b. 100% AUTOMATED INSPECTION USING SENSORS & CAMERA SYSTEMS (as appropriate), SENSORS & CAMERA SYSTEMS CHECKED EACH SHIFT WITH CONTROLLED GO / NO-GO SAMPLES	1a. BARCODE SCANNING 1b. 100% AUTOMATED INSPECTION USING SENSORS & CAMERA SYSTEMS (as appropriate), SENSORS & CAMERA SYSTEMS CHECKED EACH SHIFT WITH CONTROLLED GO / NO-GO SAMPLES	3	72	None						
		2. MISSING PART OF THE COMPONENT	2. NON-COMPLIANT PARTS PRODUCED	8		2. MECHANICAL MISINSERTION OF COMPONENT	2	2a. 100% AUTOMATED INSPECTION USING SENSORS & CAMERA SYSTEMS (as appropriate), SENSORS & CAMERA SYSTEMS CHECKED EACH SHIFT WITH CONTROLLED GO / NO-GO SAMPLES 2b. MACHINE PM SYSTEM	2a. 100% AUTOMATED INSPECTION USING SENSORS & CAMERA SYSTEMS (as appropriate), SENSORS & CAMERA SYSTEMS CHECKED EACH SHIFT WITH CONTROLLED GO / NO-GO SAMPLES 2b. MACHINE PM SYSTEM	3	48	None						
		3. INCORRECT PUNCH OR TERMINAL PATTERN (AS APPLICABLE)	3. NON-COMPLIANT PARTS PRODUCED	8		3. WRONG PROGRAM	2	3a. QA INSPECTIONS 3b. MICS SYSTEM VERIFIES THE LABELS SCANNED TO THE MACHINE VERSES WHAT THE MACHINE IS SET UP ON.	3a. QA INSPECTIONS 3b. MICS SYSTEM VERIFIES THE LABELS SCANNED TO THE MACHINE VERSES WHAT THE MACHINE IS SET UP ON.	3	48	None						
		4. ASSEMBLY DEFECTS	4. NON-COMPLIANT PARTS PRODUCED	8		4. MACHINE FAILURE	2	4a. 100% AUTOMATED INSPECTION USING SENSORS & CAMERA SYSTEMS (as appropriate), SENSORS & CAMERA SYSTEMS CHECKED EACH SHIFT WITH CONTROLLED GO / NO-GO SAMPLES 4b. QA VISUAL INSPECTION PER QAW - GA003 4c. INLINE INSPECTOR PATROL	4a. 100% AUTOMATED INSPECTION USING SENSORS & CAMERA SYSTEMS (as appropriate), SENSORS & CAMERA SYSTEMS CHECKED EACH SHIFT WITH CONTROLLED GO / NO-GO SAMPLES 4b. QA VISUAL INSPECTION PER QAW - GA003 4c. INLINE INSPECTOR PATROL	3	48	None						
				8		5. DEFECT PARTS FROM MOLDING PROCESS	2	5a. FUNCTIONAL TESTING PER QAW GA-003 5b. BACKTRACKING PROCEDURE	5a. FUNCTIONAL TESTING PER QAW GA-003 5b. BACKTRACKING PROCEDURE	3	48	None						
0060	QA ASSEMBLY INSPECTION	1. DEFECTIVE APPEARANCE	1. NON-COMPLIANT PARTS PRODUCED	3		1. INCORRECT SETUP, MACHINE FAILURE, OR WRONG COMPONENT.	2	1. QA CHECKS PER INSPECTION STANDARD	1. QA CHECKS PER INSPECTION STANDARD	6	36	None						
		2. NO INSPECTION CERTIFICATION MARK	2. CANNOT CONFIRM PARTS WERE CERTIFIED	3		2. MACHINE FAILURE OR INCORRECT ADJUSTMENT OF PUNCH	2	2a. QA CHECK PER INSPECTION STANDARD 2b. OPERATOR CHECKS AT START OF SHIFT AND EACH BOX	2a. QA CHECK PER INSPECTION STANDARD 2b. OPERATOR CHECKS AT START OF SHIFT AND EACH BOX	2	12	None						
		3. ASSEMBLY DOES NOT MEET SEALING REQUIREMENTS (IF APPLICABLE)	3. DEBRIS IN SEAL AREA.	8		3. INCORRECT ASSEMBLY OR SEAL FAILURE	2	3a AUTOMATIC SEAL CHECKS INCLUDE DEBRIS DETECTION. 3b. QA WATERPROOF CHECK PER QA INSPECTION INSTRUCTION SHEET	3a AUTOMATIC SEAL CHECKS INCLUDE DEBRIS DETECTION. 3b. QA WATERPROOF CHECK PER QA INSPECTION INSTRUCTION SHEET	2	32	None						

PROCESS NUMBER	PROCESS FUNCTION REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECT(S) OF FAILURE	SEV	LASS	CAUSES(S) MECHANISM(S) OF FAILURE	OCC	PROCESS CONTROLS PREVENTION	PROCESS CONTROLS DETECTION	DET	RPN	RECCOMMENDED ACTION(S)	& TARGET COMPLETION DATE	ACTIONS TAKEN	SEV	OCC	DET	RPN
								1a. VERIFY PURCHASE	1a. VERIFY PURCHASE ORDER									
0070	FINAL ASSEMBLY PACKING / LABELING	1. MISSING AND / OR WRONG PRODUCT LABEL	1. SHIPMENT TO CUSTOMER OF UNIDENTIFIED AND / OR WRONG PARTS	8		1. OPERATOR ERROR	2	1. BARCODE SCANNING, INCLUDES SYSTEM CROSS-CHECK TO CONFIRM PART NUMBER AGAINST WORK CENTER (PREVENT MISLABEL)	1. BARCODE SCANNING, INCLUDES SYSTEM CROSS-CHECK TO CONFIRM PART NUMBER AGAINST WORK CENTER (PREVENT MISLABEL)	3	48	None						
		2. WRONG PACKED QUANTITY (BAG)	2. SHORTAGE AND / OR OVERAGE OF PARTS SHIPPED	4		2. OPERATOR ERROR / ALIGNMENT OF AUTOBAGGER / COUNTING MECHANISM WITH 2 UP MACHINES	2	2. WEIGH BAGS AT MACHINE SIDE / COUNT PART QUANTITY IN BAG AT START OF SHIFT AND CHANGEOVER TO VERIFY BAG COUNT IS CORRECT	2. WEIGH BAGS AT MACHINE SIDE / COUNT PART QUANTITY IN BAG AT START OF SHIFT AND CHANGEOVER TO VERIFY BAG COUNT IS CORRECT	2	16	None						
		3. WRONG PACKED QUANTITY (BOX)	3. SHORTAGE AND / OR OVERAGE OF PARTS SHIPPED	4		3. OPERATOR ERROR	2	3a. BAG TO BOX SCAN TO ENSURE CORRECT BOX QUANTITY 3b. WEIGH BOXES OFFLINE WHEN APPLICABLE	3a. BAG TO BOX SCAN TO ENSURE CORRECT BOX QUANTITY 3b. WEIGH BOXES OFFLINE WHEN APPLICABLE	2	16	None						
		4. PRODUCT BAG LABELED WITH INCORRECT LABEL (CORRECT LABEL / INCORRECT PARTS)	4. SHIPMENT TO CUSTOMER OF WRONG PARTS.	4		4. OPERATOR ERROR	2	4. BAG LIFTERS CONNECT AUTOBAGGER TO PACKING TABLE, ELIMINATE EXCESS HANDLING OF PRODUCT BAGS (AS APPLICABLE)	4. BAG LIFTERS CONNECT AUTOBAGGER TO PACKING TABLE, ELIMINATE EXCESS HANDLING OF PRODUCT BAGS (AS APPLICABLE)	5	40	None						
		5. MIXED PARTS FROM RESIDUAL PARTS AT CHANGEOVER	5. SHIPMENT TO CUSTOMER OF WRONG PARTS	4		5. OPERATOR FAILED TO CLEAR BAGGER OF RESIDUAL PRODUCT	4	5a. ASSEMBLY MACHINE TO AUTO CYCLE AT CHANGEOVER TO DROP PARTIAL BAG 5b. EJECT PARTIAL BOX (AS APPROPRIATE)	5a. ASSEMBLY MACHINE TO AUTO CYCLE AT CHANGEOVER TO DROP PARTIAL BAG 5b. EJECT PARTIAL BOX (AS APPROPRIATE)	5	40	None						
0080	FINAL PRODUCT STAGING	1. INCORRECT LOCATION	1. DELAY OF SHIPMENT	4		1. OPERATOR ERROR	2	1a. VISUAL CHECK 1b. BARCODE SCAN	1a. VISUAL CHECK 1b. BARCODE SCAN	5	40	None						
0090	FINISHED GOODS STORAGE	1. WRONG STORAGE LOCATIO	1. DELAY OF SHIPMENT	4		1. INCORRECT AND / OR MISSING LABEL	2	1a. VISUAL CHECK 1b. BARCODE SCAN ASSIGNS WAREHOUSE LOCATION	1a. VISUAL CHECK 1b. BARCODE SCAN ASSIGNS WAREHOUSE LOCATION	5	40	None						
0100	Finished Goods Dock Audit-(Weekly)(Random box per skid)	1. Incorrect Part in box.	1. Customer Complaint / Dissatisfaction	3		1. Operator failed to verify shipping label present, clear, correct and legible	2	1a. P- Packing Barcode Scanning operation, confirming inventory label to shipping label. 1b. D - Operator visually confirms per instructions	1a. P- Packing Barcode Scanning operation, confirming inventory label to shipping label. 1b. D - Operator visually confirms per instructions	5	30	None						
		2. Incorrect Quantity in box and / or Damaged Box	2. Customer Complaint / Dissatisfaction	3		2. Shipping Operator failed to verify no damaged boxes & correct quantity shipped.	2	2a. D - Operator visually checks for damage & scans label to verify correct quantity acceptance.	2a. D - Operator visually checks for damage & scans label to verify correct quantity acceptance.	5	30	None						
		3. Incorrect AIAG Label (where Applicable)	3. Customer Complaint / Dissatisfaction	3		3. Operator failed to verify AIAG label present, clear, correct and legible	4	3. D - Operator electronically scans Box Label number to Print AIAG part number, includes cross verification system	3. D - Operator electronically scans Box Label number to Print AIAG part number, includes cross verification system	5	30	None						
0110	SHIPPING FINISHED GOODS	1. Missing Box Label	1. Possible delayed shipment or shortage or parts.	3		1. Operator failed to verify shipping label is present, clear, correct and legible	2	1. D - Operator visually checks for damage & scans label / verifies correct quantity acceptance.	1. D - Operator visually checks for damage & scans label / verifies correct quantity acceptance.	5	30	None						
		2. Damaged Boxes	2. Customer Complaint / Dissatisfaction	3		2. Shipping Operator failed to verify no damaged boxes shipped.	2	2. D - Operator visually checks for damage & scans label / verifies correct quantity acceptance.	2. D - Operator visually checks for damage & scans label / verifies correct quantity acceptance.	5	30	None						
		3. Incorrect AIAG Label or Mismatch AIAG Labels (where Applicable)	3. Customer Complaint / Dissatisfaction	3		3. Operator failed to verify AIAG label is present and attached to the correct box; AIAG label(s) match the box serial number and part number	3	3. P - Operator electronically scans Box Label number to Print AIAG part number; system requires scan of both box label and AIAG label(s) to confirm they match.	3. P - Operator electronically scans Box Label number to Print AIAG part number; system requires scan of both box label and AIAG label(s) to confirm they match.	4	37	IMPLEMENT NEW AUTOMATIC AIAG LABEL CROSS CHECK FEATURE IN BARCODE SCAN PROGRAM	6/1/2021					

PROCESS QUALITY CONTROL TABLE

SUMITOMO ELECTRIC WIRING SYSTEMS, INC. - COMPONENTS DIVISION

PROTO TYPE ☐ PRE-LAUNCH ☐ PRODUCTION ☒

PRODUCT: ASSEMBLED MOLDED COMPONENTS

PROCESS: ASSEMBLY

SUPPLIER / LOCATION: SEWS PLANT 5 / PLANT FR1 — 2687 Old Gallatin Road, Scottsville, KY 42164

PQCT # : PC3 — 265 Garvin Lane, Franklin, KY 42134

KEY CONTACT / DEPART. LOC.: D. Gillenwater / L. Roth (Quality Assurance)

PHONE: (270) 237-5419 X8563 or X8555

SUPPLIER APPROVALS:

General Plant Manager

Quality Manager — Leroy Roth

Other Approvals

Customer Approval (if Required)

ISSUE / REVISION HISTORY

DATE	CHANGE POINTS	CORE/DEVELOPMENT TEAM
4/27/2021	Reviewed document per Open Operations Audit. Added child parts supply and master samples checks to section 0050, Corrected responsible persons section 0040, Added FIFO label to release product in section 0020. Added box weight check to 0070 for Franklin	L. Roth, L. Stuart
2/25/2021	Updated: QA Receiving Inspection: Subcontractor assembled parts product section. Setup Assembly machines (automatic) Good / No-Good master check samples to clarify missing component (seal). Shipping and finished goods to add correct and matching AIAG labels	L. Roth, L. Stuart
6/4/2020	Added roving In-Line patrol, reference to clip crack confirmation, etc.	L. Roth
4/27/2020	Updated process machine checksheets to match actual process, added box weigh process, combined	L. Stuart, P. Keith, B. Melton, N. Walker, M. Ryan
9/24/2019	Updated 30 - 80, 100 to match actual process	L. Stuart, P. Keith, B. Thompson, J. Riffe
4/26/2018	Annual review	R. Gonzalez, P. Keith, L. Higdon
1/30/2015	Update process 70 to include changeover using autobagger to cycle at changeover	L. Roth, L. Higdon
6/6/2014	Update process 50 to match actual process.	L. Roth , J. Fraim, M. Ryan
5/12/2014	Updated for threaded insert assembly process	L. Roth , J. Fraim, M. Ryan
4/8/2014	Added reference to Hopper Lock system (0040), Bag Lifter (0070)	L. Roth, B. Thompson
8/17/2012	Improved description of child part warehousing / staging process	L. Roth, P. Keith
5/18/2011	Clarify control method 0010,	L. Roth, A. Bomar, P. Keith, D. Hall
6/18/2010	Removed reference to Life Skills, added detail for bag to box scan, updated as applicable	L. Roth, A. Bomar, P. Keith, D. Hall
8/28/2008	Revised 0050 with correct visual inspection. Revised 0070 with correct bag count instructions.	D. Gillenwater, P. Keith, D. Hall, K. Keen
9/14/2007	Revised the frequency of QA Inspection #60 from end of lot to GA-003. GA003 is the detailed procedure for QA Lab. Added function where applicable.	D. Gillenwater, P. Keith, D. Hall, K. Keen
3/15/2001	MODIFIED TO INCLUDE 6188-0572	T. GRAVIL/ R.RAMSEY/ T. STEGER/ D. LYONS/ N. YAMAMOTO/ T. WIX
3/5/2001	UPDATED INFORMATION/ ADDED SUB-CONTRACTORS	T. GRAVIL/T. STEGER/D. LYONS/N. YAMAMOTO,T. WIX
2/6/2001	Created a separate PQCT for Assembly Process	T. GRAVIL/T. STEGER/D. LYONS/N. YAMAMOTO,T. WIX
9/4/1997	Issued with format changes	H. HATTORI, D. LYONS, Y. NIWA, A. DAVIDSON, R. BRENNINGTON, T. HALL, J. WYNAN, S. GREGORY, P. ZAMBORSKY

PART/ PROCESS NUMBER	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE, JIG,TOOLS FOR ASSEMBLY	CHARACTERISTICS No.	CHARACTERISTICS PRODUCT	CHARACTERISTICS PROCESS	CHARACTERISTICS CI	RESPONSIBILITY	METHODS PRODUCT/ PROCESS SPECIFICATIONS	METHODS EVALUATION MEASUREMENT TECHNIQUE	SAMPLE SIZE	SAMPLE FREQUENCY	SAMPLE RESULTS FORMAT CONTROL METHOD	REACTION PLAN
0010	MATERIAL: RECEIVING PURCHASED MATERIAL (COMPONENTS, SEALS, TERMINALS, METAL CLIPS)	N/A	0010	COMPONENTS, SEALS, TERMINALS, METAL CLIPS FOR ASSEMBLY PROCESS	RECEIVING COMPONENT PARTS		SHIPPING / RECEIVING OPERATOR	1. CORRECT TYPE 2. DAMAGE FREE CONTAINER 3. CORRECT PART NUMBER & ALL APPROPRIATE DOCUMENTATION TO BE CORRECT.	VISUAL INSPECTION AGAINST PACKING LIST	100% VISUAL EACH CONTAINER	EACH RECEIPT	W/I: SRW-RECFLOW, BPCS	NOTIFY LEADER / COORDINATOR / SQA AS NEEDED- 1. RETURN TO SUPPLIER
0020	QUALITY ASSURANCE : MATERIAL RECEIVING INSPECTION WHERE APPLICABLE	SCANNER	0020	1. NO PACKAGING / SHIPPING DAMAGE 2. NO DEFECTS PER QA RECEIVING IIS 3. NO CONTAMINATION 4. CORRECT PART NUMBER 5. CORRECT COLOR (WHERE APPLICABLE)	QA RECEIVING INSPECTION QA RELEASE MATERIAL		RECEIVING QUALITY ASSURANCE OPERATOR	1. CORRECT TYPE 2. NO DEFECTS PER QA RECEIVING IIS 3. DAMAGE FREE CONTAINER 4. CONTAMINATION FREE MATERIAL 5. CORRECT PART NUMBER & CORRECT DOCUMENTATION. 5. CERTIFICATION RECORDS (WHERE APPLICABLE) RELEASE INSPECTED MATERIAL	VISUAL INSPECTION PER INSTRUCTION SHEET - QA RECEIVING WHERE APPLICABLE. QRW- CHEKINSEALS QRW - CHECKINRM QRW - CHEKKINRP	PER QRW-RAINBOW SQA SAMPLE PLAN EACH UNIT	EACH INCOMING SHIPMENT EACH INCOMING SHIPMENT	1. APPLICABLE INSPECTION INSTRUCTION SHEET- QA RECEIVING WHERE APPLICABLE. 2. BARCODE SCAN, FIFO LABELS	NOTIFY LEADER / COORDINATOR / QA ENGINEER AS NEEDED- 1. RETURN TO SUPPLIER 2. REJECT / HOLD TAG PROCEDURE 3. INITIATE PIR AS NEEDED

PROCESS QUALITY CONTROL TABLE

PART/ PROCESS NUMBER	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE, JIG,TOOLS FOR ASSEMBLY	CHARACTERISTICS			CI		METHODS		SAMPLE		SAMPLE RESULTS FORMAT	REACTION PLAN
			No.	PRODUCT	PROCESS		RESPONSIBILITY	PRODUCT/ PROCESS SPECIFICATIONS	EVALUATION MEASUREMENT TECHNIQUE	SIZE	FREQUENCY	CONTROL METHOD	
	QA RECEIVING INSPECTION: SUB-CONTRACTOR ASSEMBLED PARTS	N/A		1. CORRECT PART NUMBER 2. NO DEFECTS PER QA RECEIVING IIS EXAMPLES INCLUDE:: * CORRECT APPEARANCE (PART /SEAL /RETAINER COLOR / COSMETIC) * RETAINER / SEALS / MBS CORRECT POSITION. * SEAL PRESENCE * INSPECTION MARK PRESENT	QA RECEIVING INSPECTION		RECEIVING QUALITY ASSURANCE OPERATOR	PER APPLICABLE QA RECEIVING INSPECTION SHEET	VISUAL OR AS SPECIFIED ON APPLICABLE QA RECEIVING INSPECTION SHEET	PER QRW-RAINBOW SQA SAMPLE PLAN	EACH INCOMING SHIPMENT	APPLICABLE INSPECTION INSTRUCTION SHEET-QA RECEIVING	NOTIFY LEADER / COORDINATOR / QA ENGINEER AS NEEDED- 1. RETURN TO SUPPLIER 2. REJECT / HOLD TAG PROCEDURE 3. INITIATE PIR AS NEEDED
								RELEASE INSPECTED MATERIAL	QRW - CHECKINPT	EACH UNIT	EACH INCOMING SHIPMENT	2. BARCODE SCAN, FIFO LABELS	
0025	MATERIAL TRANSFER (FOR FRANKLIN ASSEMBLY PRODUCT AS APPLICBLE)	SCANNER	0025	COMPONENTS, SEALS FOR ASSEMBLY PROCESS	TRANSFER OF COMPONENTS TO FRANKLIN		SHIPPING / RECEIVING OPERATOR AT COMPONENTS WAREHOUSE	TRANSFER ITEMS TO FRANKLIN ON TRUCK FOR STOCKING AT FRANKLIN WAREHOUSE LOCATION	SRFSEALS-(X)DOCUMENT IS USED TO IDENTIFY PARTS FOR TRANSFER TO FRANKLIN	NA	NA	W/I: SRW-RECFLOW, BPCS	NOTIFY LEADER / COORDINATOR / QA ENGINEER AS NEEDED
0030	COMPONENTS MATERIAL STORAGE (BOTH IN-HOUSE & PURCHASED)	SCANNER	0030	1. CORRECT PARTS / IDENTIFIED LOCATION	STORAGE OF CHILD PARTS (HOUSINGS / RETAINERS / SEALS, ETC)		SHIPPING / KANBAN OPERATOR	CORRECT STORAGE WAREHOUSE LOCATION	VISUAL JUDGEMENT BY TRAVELLER / BOX LABEL. SCAN TO LOCATION	PER CONTAINER	EACH RECEIPT	BARCODE SCANNING,	NOTIFY : SHIPPING / RECEIVING LEADER, SUPERVISOR & QA IF NEEDED
				1. CORRECT PARTS / IDENTIFIED LOCATION	PULLING OF CHILD PARTS (HOUSINGS / RETAINERS / SEALS, ETC)		SHIPPING / KANBAN OPERATOR	CORRECT PARTS, AYW - ASSYKANBAN	GENERATE PICKLIST FROM BARECODE SCANNING, PICK PARTS	PER CONTAINER	EACH REQUEST	BARCODE SCANNING,	NOTIFY : SHIPPING / RECEIVING LEADER, SUPERVISOR & QA IF NEEDED
				1. CORRECT PARTS / IDENTIFIED LOCATION	STAGING OF CHILD PARTS IN ASSEMBLY		KANBAN / JIT OPERATOR	CORRECT STAGING LOCATION	VISUAL VERIFICATION PER PICKLIST	PER CONTAINER	EACH RECEIPT	BARCODE SCAN TO ACP LOCATION	NOTIFY : ASSEMBLY LEADER / SUPERVISOR IF NEEDED
0040	SET-UP ASSEMBLY MACHINES (AUTOMATIC)	AUTOMATIC ASSEMBLY MACHINE	0040		SET-UP ASSEMBLY MACHINES (AUTOMATIC / SEMI AUTOMATIC PROCESS PARAMETERS)		ASSEMBLY LEADER / SETUP	PER APPLICABLE WORK INSTRUCTION	VISUAL COMPARISON PER APPLICABLE WORK INSTRUCTION	EACH MACHINE	PER SHOP ORDER	a) DAILY REPORT b) CHANGEOVER CHECKSHEET c) DAILY MACHINE CHECK SHEET d) SET-UP CHECK SHEET	NOTIFY LEADER / COORDINATOR / QA / MAINTENANCE OF ANY ABNORMALITY
		SCANNER, HOPPER LOCKS (IF APPLICABLE)		CHILD PARTS	SUPPLY CHILD PARTS TO ASSEMBLY MACHINE		LEADER / SETUP / ASSEMBLY OPERATOR	PER SHOP ORDER	SCAN CHILD COMPONENTS TO ASSEMBLY MACHINE. WHEN HOPPER LOCK OPENS, LOAD CHILD PARTS INTO MACHINE.	EACH UNIT	EACH UNIT	DAILY REPORT, BARCODE SCAN	NOTIFY LEADER / COORDINATOR / QA / MAINTENANCE OF ANY ABNORMALITY
		GOOD / NO-GOOD MASTER CHECK SAMPLES			ASSEMBLY MACHINE VERIFICATION		ASSEMBLY LEADER	PER MACHINE SPECIFIC SAMPLE CHECK WORK INSTRUCTION. CONFIRM MACHINE INSPECTION EQUIPMENT IS OPERATING CORRECTLY AND WILL DETECT: 1. MISSING COMPONENT (SEAL / RETAINER / CPA / MBS / LEVER / CLIP) 2. CORRECT KEYWAY (HOUSING / RETAINER / ETC) 3. COMPONENT POSITION (RETAINER / CPA / MBS / SEAL / LEVER / CLIP) 4. DOUBLE COMPONENT (SEAL / MBS / RETAINER) 5. COLOR (HOUSING / SEAL / RETAINER / OTHER COMPONENTS AS APPLICABLE) 6. DAMAGE (AS APPLICABLE) 7. OTHER FAILURE MODES AS IDENTIFIED BY ENGINEERING ON MACHINE SPECIFIC SAMPLE CHECK SHEET	RUN EACH MASTER CHECK SAMPLE THROUGH ASSEMBLY/INSPECTION MACHINE TO CONFIRM DETECTION	PER EACH AUTOMATIC MACHINE	EACH SOP EACH SHIFT (END OF SHIFT & CHANGEOVER), SOME SPECIFIED MACHINES ARE DAILY	SAMPLE CHECKSHEET	NOTIFY QA (SEWS) OR MAINTENANCE AS NEEDED 1. .REJECT / HOLD TAG PROCEDURE
0050	ASSEMBLY PRODUCTION	AUTOMATIC/SEMI AUTOMATIC ASSEMBLY MACHINES	0050	ASSEMBLED PARTS	AUTOMATIC ASSEMBLY		ASSEMBLY OPERATOR	PER APPLICABLE WORK INSTRUCTION	AUTOMATED ASSEMBLY EQUIPMENT.	100%	CONTINUOUS	100% AUTOMATED INSPECTION	NOTIFY LEADER / COORDINATOR / QA AS NEEDED- 1. REJECT / HOLD TAG PROCEDURE

PROCESS QUALITY CONTROL TABLE

PART/ PROCESS NUMBER	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE, JIG,TOOLS FOR ASSEMBLY	CHARACTERISTICS				METHODS		SAMPLE		SAMPLE RESULTS FORMAT	REACTION PLAN
			No.	PRODUCT	PROCESS	CI	RESPONSIBILITY	PRODUCT/ PROCESS SPECIFICATIONS	EVALUATION MEASUREMENT TECHNIQUE	SIZE	FREQUENCY	CONTROL METHOD	
				ASSEMBLED PARTS	SUPPLY CHILD PARTS		ASSEMBLY OPERATOR	LOAD CHILD PARTS INTO HOPPER	SCAN CHILD COMPONENTS TO ASSEMBLY MACHINE. WHEN HOPPER LOCK OPENS, LOAD CHILD PARTS INTO MACHINE.	EACH UNIT	EACH UNIT	DAILY REPORT, BARCODE SCAN	NOTIFY LEADER / COORDINATOR / QA AS NEEDED.
				ASSEMBLED PARTS	MACHINE CHECKS		ASSEMBLY OPERATOR	PER APPLICABLE WORK INSTRUCTION	CONFIRM EACH ITEM PER THE CHECKSHEET, AYF - DAILYMACHINECHECK CONFIRM NUMBER OF BAGS IN BOX, CONFIRM SCRAP BIN IS CLEAN, CONFIRM ALL NEST ARE CLEAR OF DEBRIS, CONFIRM AIR PRESSURE, ETC.	PER EACH AUTOMATIC MACHINE	EACH SHIFT	MACHINE CHECK SHEET	NOTIFY QA OR MAINTENANCE AS NEEDED 1. .REJECT / HOLD TAG PROCEDURE
				ASSEMBLED PARTS	VISUAL INSPECTION		ASSEMBLY OPERATOR	1. CORRECT COMPONENTS (RETAINER / SPACER / MBS / SEAL, ETC) 2) CORRECT COMPONENT POSITION (RETAINER / SPACER / MBS / SEAL / LEVER, ETC) 3) INSPECTION MARK PRESENT 4) CORRECT PART NUMBER 5) CORRECT BAG / TRAY QUANTITY	VISUAL INSPECTION AGAINST CRITICAL POSITION CHECK SHEET	1 PC (1 UP MACHINE) 2 PC (2 UP MACHINE)	SOS and Start of Every Box	DAILY REPORT	NOTIFY LEADER / COORDINATOR / QA AS NEEDED- 1. REJECT / HOLD TAG PROCEDURE
				ASSEMBLED PARTS	AUTOMATED INSPECTION		AUTOMATIC	ASSEMBLY FIT & FUNCTION 1. MISSING COMPONENT (SEAL / RETAINER / CPA / MBS / LEVER / CLIP) 2. CORRECT KEYWAY (HOUSING / RETAINER / ETC) 3. COMPONENT POSITION (RETAINER / CPA / MBS / SEAL / LEVER / CLIP) 4. DOUBLE COMPONENT (SEAL / MBS / RETAINER) 5. COLOR (HOUSING / SEAL / RETAINER / OTHER COMPONENTS AS APPLICABLE) 6. DAMAGE (AS APPLICABLE) 7. OTHER FAILURE MODES AS IDENTIFIED BY ENGINEERING ON MACHINE SPECIFIC SAMPLE CHECK SHEET Note: Inspection mark etched on each part if passed automatic testing. **L-20 uses blue/black dot	AUTOMATED INSPECTION (INPECTION SENSORS, CAMERA INSPECTION SYSTEMS)	100%	CONTINUOUS	* 100% AUTOMATED INSPECTION / REJECTION * DAILY REPORT	NOTIFY LEADER / COORDINATOR / QA AS NEEDED- 1. REJECT / HOLD TAG PROCEDURE
				ASSEMBLED PARTS	ASSEMBLY MACHINE VERIIFICATION		ASSEMBLY OPERATOR	PER MACHINE SPECIFIC SAMPLE CHECK WORK INSTRUCTION. CONFIRM MACHINE INSPECTION EQUIPMENT IS OPERATING CORRECTLY AND WILL DETECT: 1. MISSING COMPONENT (SEAL / RETAINER / CPA / MBS / LEVER / CLIP) 2. CORRECT KEYWAY (HOUSING / RETAINER / ETC) 3. COMPONENT POSITION (RETAINER / CPA / MBS / SEAL / LEVER / CLIP) 4. DOUBLE COMPONENT (SEAL / MBS / RETAINER) 5. COLOR (HOUSING / SEAL / RETAINER / OTHER COMPONENTS AS APPLICABLE) 6. DAMAGE (AS APPLICABLE) 7. OTHER FAILURE MODES AS IDENTIFIED BY ENGINEERING ON MACHINE SPECIFIC SAMPLE CHECK SHEET	RUN EACH MASTER CHECK SAMPLE THROUGH ASSEMBLY/INSPECTION MACHINE TO CONFIRM DETECTION	PER EACH AUTOMATIC MACHINE	EACH SHIFT (END OF SHIFT & CHANGEOVER), SOME SPECIFIED MACHINES ARE DAILY	SAMPLE CHECKSHEET	NOTIFY QA OR MAINTENANCE AS NEEDED 1. .REJECT / HOLD TAG PROCEDURE
				ASSEMBLED PARTS	INLINE INSPECTION (ROVING PATROL)		INLINE INSPECTOR	1. NO DAMAGE (FROM GRIPPERS / INSERTION JIGS, ETC) 2. COMPONENT PRESENCE (SEAL / RETAINER / MBS / LEVER / CLIP, ETC) 3. COMPONENT POSITION (RETAINER / CPA / MBS / SEAL / LEVER / CLIP, ETC) 4. COMPONENT COLOR (HOUSING / SEAL / RETAINER, ETC) 5. CORRECT KEYWAY (HOUSING / RETAINER, ETC) 6. INSPECTION MARK LEGIBLE	VISUAL INSPECTION PER MACHINE SPECIFIC CRITICAL POSITION CHECKSHEET (CPC) AND/OR APPLICABLE WORK INSTRUCTION	1 PC (1UP MACHINE) 2 PC (2UP MACHINE) EACH INSPECTION ROUND	ROVING PATROL	DAILY REPORT	NOTIFY LEADER / COORDINATOR / QA LEADER AS NEEDED.

PROCESS QUALITY CONTROL TABLE

PART/ PROCESS NUMBER	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE, JIG,TOOLS FOR ASSEMBLY	CHARACTERISTICS			CI	RESPONSIBILITY	METHODS		SAMPLE		SAMPLE RESULTS FORMAT	REACTION PLAN
			No.	PRODUCT	PROCESS			PRODUCT/ PROCESS SPECIFICATIONS	EVALUATION MEASUREMENT TECHNIQUE	SIZE	FREQUENCY	CONTROL METHOD	
0060	QA ASSEMBLY INSPECTION	N/A	0060	ASSEMBLED PRODUCT	PER QA INSPECTION INSTRUCTION SHEET ASSEMBLY		QA OPERATOR	ASSEMBLY APPEARANCE, FUNCTION AND MOLDING DEFECTS (TEST PER QAW-GA-003) VISUAL INSPECTION INCLUDES: 1. NO DAMAGE (FROM GRIPPERS / INSERTION JIGS, ETC) 2. COMPONENT PRESENCE (SEAL / RETAINER / MBS / LEVER / CLIP, ETC) 3. COMPONENT POSITION (RETAINER / CPA / MBS / SEAL / LEVER / CLIP, ETC) 4. COMPONENT COLOR (HOUSING / SEAL / RETAINER, ETC) 5. CORRECT KEYWAY (HOUSING / RETAINER, ETC) 6. INSPECTION MARK LEGIBLE	VISUAL: VERIFY RETAINER / SEAL INSERTED / MACHINE INSPECTION MARK. FUNCTION: WATERPROOF OTHER: AS APPLICABLE PER INSPECTION STANDARD.	ONE PIECE	Per QAW-GA-003	QA ASSEMBLY DATA ENTRY PROGRAM	NOTIFY SET-UP / LEADER / COORDINATOR 1. REJECT / HOLD TAG PROCEDURE
0070	ASSEMBLY PACKING / LABELING,	MACHINE BAGGER (IF APPLICABLE) , MACHINE COUNTER, LABELS & SCANNER, BAG LIFTER (IF APPLICABLE)	0070	1. CORRECT QUANTITY 2. CORRECT IDENTIFICATION 3. NO MIXED BAGS/PRODUCT	PACKING FINISHED PARTS		MACHINE OPERATOR	1. CORRECT LABEL (PART NUMBER.	1. CONFIRM LABELS MATCH SHOP ORDER AT MACHINE, SCAN SYSTEM	EACH BAG / CARTON	EACH BAG/BOX	BARCODE SCANNING PER AYW-SCANBAGTOBOX	NOTIFY SET-UP / LEADER / COORDINATOR, 1. REJECT TAG PROCEDURE
								2. NO MIXED BAGS IN BOX	2. SCAN EACH BAG LABEL TO BOX (SYSTEM DETECTION)				
								3A. BAG QUANTITY MATCHES LABEL QUANTITY	3A. MANUALLY COUNT FIRST BAG OF SHOP ORDER / COMPARE CORRECT QUANTITY PER BAG LABEL.	1 BAG	EACH STARTUP / SHIFT /	* MACHINE SPECIFIC OPERATION INSTRUCTION * ASSEMBLY DAILY REPORT * BARCODE SCANNING PER AYW-SCANBAGTOBOX	NOTIFY SET-UP / LEADER / COORDINATOR, 1. REJECT TAG PROCEDURE
								3B. CORRECT BOX QTY (CORRECT NUMBER OF BAGS IN BOX)	3B. SCAN EACH BAG LABEL TO BOX	EACH BAG			
								4. CORRECT PARTS IN BAG / BOX	4. CYCLE BAGGER / BOX FILL AT CHANGEOVER TO DROP PARTIAL BAG OF RESIDUAL PARTS / EJECT PARTIAL BOX (AS REQUIRED)	EACH CHANGE OVER	EACH CHANGEOVER	* MACHINE SPECIFIC CHANGE OVER CHECK SHEET	NOTIFY SET-UP / LEADER / COORDINATOR, 1. REJECT TAG PROCEDURE
	BOX WEIGHT (MACHINES WITH PRINT ON LABELS) @ FRANKLIN	SCALE		ASSEMBLED PRODUCT	WEIGH FINISHED GOODS BOX		MACHINE OPERATOR	5. CORRECT BAG/BOX QUANTITY	5. CONFIRM BOX WEIGHT (FRANKLIN)	EACH UNIT	EACH UNIT	ASSEMBLY DAILY REPORT	NOTIFY LEADER / CORDINATOR
0080	FINISHED PRODUCT STAGING	N/A	0080	ASSEMBLED PRODUCT	FINISHED PRODUCT STAGING		JIT OPERATOR	REPORT PRODUCTION, STAGE FINISHED GOODS	ELECTRONIC BPCS SYSTEM (SCANNING SYSTEM)	EACH CONTAINER / BOX	CONTINUOUS	ELECTRONIC BPCS SYSTEM (SCANNING SYSTEM)	NOTIFY LEADER / COORDINATOR REJECT TAG PROCEDURE
0085	BOX WEIGH	MACHINES & BAGGERS WITH PRINT ON BAG LABELS	0085	ASSEMBLED PRODUCT	WEIGH FINISHED GOOD BOX		TRAINED ASSOCIATE	PER WORK INSTRUCTION	CONFIRMATION OF BOX WEIGHT PER WORK INSTRUCTION	EACH BOX	CONTINUOUS	AYF - DAILYINSPLOG, CALIBRATED SCALE	NOTIFY LEADER / COORDINATOR 1. REJECT TAG PROCEDURE
0090	FINISHED GOODS STORAGE	N/A	0090	ASSEMBLED PRODUCT	WAREHOUSE / SHIPPING		WAREHOUSE / SHIPPING OPERATOR	1. TRANSFER TO MILK RUN TRUCK 2. CORRECT STORAGE LOCATION	ELECTRONIC BPCS SYSTEM (SCANNING SYSTEM)	EACH BOX	CONTINUOUS	ELECTRONIC BPCS SYSTEM (SCANNING SYSTEM)	NOTIFY : SHIPPING / RECEIVING LEADER, SUPERVISOR & QA IF NEEDED
0100	SHIPPING DOCK AUDIT	N/A	0100	1. LABEL 2. CARRIER 3. BOL / DELIVERY 4. PART# 5. PACKAGING 6. SKID 7. REQ. / PO# 8. CORRECT AIAG LABEL / BOX LABEL	SHIPPING DOCK AUDIT		RECEIVING / SHIPPING CLERK OR HIGHER	1. CORRECT LABEL 2. CORRECT CARRIER 3. CORRECT BOL/DELIVERY 4. CORRECT PART# 5. NO PACKAGING DAMAGE 6. SKID OF MATERIAL CORRECTLY STACKED 7. CORRECT REQ. / PO#	VISUAL COMPARISON	RANDOM BOX / PART / SHIPMENT	WEEKLY	SV5 SHIPPING DOCK AUDIT SHEET	NOTIFY : SHIPPING / RECEIVING DEPARTMENT, SUPERVISOR & QA IF NEEDED
0110	SHIPPING FINISHED ASSEMBLED GOODS	N/A	0110	1. PROPER LABEL 2. PROPER PART NUMBER	LABELING AND SHIPPING FINISHED GOODS		SHIPPING / RECEIVING OPERATORS	1. PRESENT, CORRECT, CLEAR AND LEGIBLE LABELS 2. CORRECT PART NUMBER 3. CORRECT AND MATCHING AIAG SHIPPING LABELS (for customers requiring 2 AIAG labels)	BAR-CODE SCANNER-BPCS SYSTEM	EACH BOX / CONTAINER	EACH BOX / CONTAINER	ELECTRONIC BPCS SYSTEM-OPERATOR SCANNING	NOTIFY SHIPPING LEADER
	ANNUAL LAYOUT			PER CUSTOMER DRAWING			PPAP GROUP	PER CUSTOMER DRAWING	PER CUSTOMER REQUIREMENTS	PER CUSTOMER REQUEST	PER CUSTOMER REQUEST	CUSTOMER PPAP	NOTIFY QA ENGINEER / MANAGER

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A07FA-2**
PART NO (s): **6189-8624**
Mold #: **1874-A2**

Tested by/Date: Christi Cornwell 12/13/21
Design Rec. Change level/date:
MU5T-14A464-AGB B1 1/13/2022
Eng. Change Documents: NA

CAVITY #:	M1		M2		M3		M4	
	36.60 +.3 -.30	19.18 +.3 -.3	36.60 +.3 -.30	19.18 +.3 -.3	36.60 +.3 -.30	19.18 +.3 -.3	36.60 +.3 -.30	19.18 +.3 -.3
1	36.566	19.351	36.53	19.353	36.512	19.343	36.548	19.339
2	36.551	19.362	36.52	19.373	36.518	19.348	36.553	19.343
3	36.550	19.355	36.52	19.315	36.523	19.313	36.558	19.364
4	36.562	19.328	36.52	19.342	36.523	19.307	36.558	19.322
5	36.546	19.347	36.51	19.338	36.518	19.348	36.568	19.337
6	36.549	19.330	36.51	19.342	36.527	19.341	36.561	19.342
7	36.552	19.357	36.53	19.343	36.512	19.320	36.538	19.312
8	36.567	19.341	36.52	19.335	36.520	19.328	36.549	19.354
9	36.551	19.341	36.51	19.351	36.520	19.341	36.557	19.321
10	36.552	19.360	36.52	19.337	36.528	19.343	36.565	19.338
11	36.559	19.349	36.53	19.339	36.525	19.331	36.554	19.339
12	36.562	19.356	36.52	19.350	36.517	19.330	36.540	19.339
13	36.553	19.365	36.52	19.345	36.528	19.339	36.558	19.345
14	36.566	19.339	36.53	19.335	36.521	19.373	36.556	19.345
15	36.556	19.369	36.55	19.342	36.520	19.318	36.552	19.340
16	36.563	19.358	36.51	19.340	36.507	19.342	36.541	19.333
17	36.551	19.341	36.52	19.334	36.517	19.347	36.554	19.344
18	36.558	19.351	36.47	19.342	36.518	19.348	36.548	19.352
19	36.558	19.375	36.51	19.360	36.517	19.336	36.558	19.361
20	36.551	19.351	36.53	19.335	36.518	19.317	36.551	19.364
21	36.557	19.359	36.51	19.327	36.511	19.339	36.560	19.356
22	36.553	19.352	36.53	19.343	36.504	19.343	36.547	19.337
23	36.557	19.371	36.53	19.337	36.524	19.329	36.559	19.333
24	36.560	19.351	36.53	19.335	36.508	19.337	36.559	19.326
25	36.554	19.371	36.52	19.336	36.518	19.327	36.559	19.340
26	36.554	19.362	36.52	19.356	36.511	19.353	36.552	19.340
27	36.548	19.357	36.52	19.328	36.518	19.334	36.555	19.329
28	36.552	19.364	36.52	19.335	36.514	19.335	36.561	19.344
29	36.559	19.367	36.52	19.346	36.504	19.355	36.568	19.351
30	36.544	19.354	36.52	19.333	36.522	19.358	36.566	19.333

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A07FA-2**
PART NO (s): **6189-8624**
Mold #: **1874-A2**

Tested by/Date: Christi Cornwell 12/13/21
Design Rec. Change level/date:
MU5T-14A464-AGB B1 1/13/2022
Eng. Change Documents: NA

CAVITY #:	M1		M2		M3		M4	
	36.60 +.3 -.30	19.18 +.3 -.3	36.60 +.3 -.30	19.18 +.3 -.3	36.60 +.3 -.30	19.18 +.3 -.3	36.60 +.3 -.30	19.18 +.3 -.3
31	36.547	19.372	36.53	19.337	36.524	19.342	36.555	19.358
32	36.548	19.375	36.53	19.333	36.518	19.356	36.549	19.345
33	36.551	19.362	36.53	19.329	36.526	19.346	36.560	19.351
34	36.540	19.364	36.52	19.331	36.525	19.341	36.545	19.366
35	36.551	19.335	36.52	19.327	36.519	19.331	36.554	19.352
36	36.562	19.352	36.52	19.343	36.516	19.310	36.561	19.366
37	36.548	19.348	36.52	19.351	36.519	19.348	36.561	19.354
38	36.567	19.361	36.52	19.342	36.520	19.341	36.546	19.330
39	36.543	19.356	36.52	19.358	36.508	19.349	36.563	19.355
40	36.542	19.355	36.52	19.362	36.514	19.319	36.555	19.335
41	36.549	19.362	36.52	19.347	36.534	19.341	36.547	19.327
42	36.555	19.360	36.52	19.347	36.516	19.329	36.553	19.320
43	36.557	19.366	36.53	19.340	36.523	19.353	36.546	19.349
44	36.554	19.357	36.51	19.331	36.512	19.350	36.550	19.342
45	36.547	19.367	36.53	19.337	36.527	19.362	36.550	19.335
46	36.548	19.354	36.52	19.329	36.515	19.348	36.548	19.344
47	36.553	19.362	36.52	19.337	36.521	19.354	36.555	19.336
48	36.557	19.373	36.52	19.345	36.510	19.332	36.549	19.342
49	36.546	19.357	36.53	19.336	36.524	19.343	36.561	19.350
50	36.558	19.362	36.54	19.329	36.508	19.345	36.557	19.331
51	36.550	19.353	36.53	19.337	36.525	19.347	36.560	19.341
52	36.553	19.365	36.54	19.319	36.510	19.366	36.557	19.338
53	36.553	19.358	36.53	19.327	36.518	19.319	36.551	19.346
54	36.550	19.364	36.52	19.338	36.517	19.351	36.557	19.352
55	36.550	19.347	36.53	19.327	36.516	19.339	36.548	19.328
56	36.563	19.351	36.51	19.333	36.524	19.361	36.562	19.359
57	36.546	19.368	36.53	19.339	36.511	19.340	36.564	19.359
58	36.548	19.369	36.53	19.324	36.522	19.336	36.558	19.342
59	36.552	19.356	36.53	19.357	36.519	19.362	36.555	19.345
60	36.555	19.343	36.53	19.317	36.521	19.351	36.553	19.346

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A07FA-2**
PART NO (s): **6189-8624**
Mold #: **1874-A2**

Tested by/Date: Christi Cornwell 12/13/21
Design Rec. Change level/date:
MU5T-14A464-AGB B1 1/13/2022
Eng. Change Documents: NA

CAVITY #:	M1		M2		M3		M4	
	36.60 +.3 -.30	19.18 +.3 -.3	36.60 +.3 -.30	19.18 +.3 -.3	36.60 +.3 -.30	19.18 +.3 -.3	36.60 +.3 -.30	19.18 +.3 -.3
61	36.567	19.363	36.53	19.336	36.522	19.361	36.550	19.343
62	36.550	19.371	36.52	19.327	36.522	19.366	36.564	19.351
63	36.545	19.368	36.53	19.328	36.514	19.366	36.552	19.344
64	36.547	19.331	36.52	19.340	36.511	19.339	36.555	19.340
65	36.568	19.330	36.52	19.350	36.524	19.363	36.558	19.362
66	36.549	19.340	36.52	19.336	36.527	19.343	36.561	19.340
67	36.551	19.326	36.53	19.336	36.520	19.340	36.554	19.317
68	36.550	19.334	36.53	19.332	36.522	19.342	36.552	19.342
69	36.549	19.320	36.51	19.333	36.517	19.351	36.545	19.340
70	36.552	19.347	36.53	19.333	36.522	19.354	36.550	19.338
71	36.557	19.337	36.53	19.339	36.513	19.350	36.546	19.352
72	36.566	19.352	36.52	19.342	36.522	19.351	36.552	19.350
73	36.572	19.354	36.51	19.334	36.516	19.339	36.553	19.356
74	36.547	19.358	36.53	19.326	36.517	19.299	36.550	19.354
75	36.541	19.353	36.53	19.332	36.521	19.354	36.564	19.343
76	36.551	19.375	36.52	19.339	36.514	19.350	36.550	19.356
77	36.557	19.367	36.57	19.328	36.529	19.356	36.538	19.352
78	36.551	19.359	36.52	19.320	36.529	19.326	36.560	19.366
79	36.557	19.350	36.55	19.322	36.525	19.351	36.555	19.344
80	36.543	19.332	36.54	19.337	36.520	19.354	36.539	19.366
81	36.550	19.339	36.52	19.331	36.503	19.368	36.565	19.342
82	36.548	19.331	36.52	19.345	36.518	19.340	36.555	19.341
83	36.560	19.351	36.53	19.322	36.520	19.354	36.551	19.348
84	36.554	19.353	36.52	19.358	36.521	19.364	36.559	19.340
85	36.561	19.324	36.54	19.339	36.528	19.339	36.555	19.338
86	36.554	19.319	36.51	19.360	36.520	19.339	36.544	19.369
87	36.541	19.348	36.53	19.356	36.535	19.347	36.560	19.349
88	36.543	19.357	36.52	19.350	36.513	19.350	36.552	19.361
89	36.562	19.360	36.53	19.337	36.512	19.321	36.546	19.333
90	36.561	19.356	36.53	19.357	36.516	19.339	36.544	19.346

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A07FA-2**
PART NO (s): **6189-8624**
Mold #: **1874-A2**

Tested by/Date: Christi Cornwell 12/13/21
Design Rec. Change level/date:
MU5T-14A464-AGB B1 1/13/2022
Eng. Change Documents: NA

CAVITY #:	M1		M2		M3		M4	
	36.60 +.3 -.30	**19.18** +.3 -.3	**36.60** +.3 -.30	**19.18** +.3 -.3	**36.60** +.3 -.30	**19.18** +.3 -.3	**36.60** +.3 -.30	**19.18** +.3 -.3
91	36.555	19.365	36.51	19.357	36.514	19.341	36.552	19.366
92	36.544	19.371	36.52	19.339	36.513	19.294	36.565	19.360
93	36.544	19.371	36.53	19.331	36.520	19.332	36.544	19.349
94	36.548	19.347	36.53	19.349	36.528	19.348	36.557	19.364
95	36.562	19.359	36.53	19.344	36.531	19.335	36.554	19.360
96	36.553	19.368	36.53	19.354	36.524	19.357	36.554	19.353
97	36.549	19.367	36.54	19.343	36.526	19.323	36.547	19.357
98	36.544	19.355	36.52	19.363	36.524	19.331	36.562	19.333
99	36.543	19.358	36.53	19.346	36.515	19.335	36.557	19.342
100	36.549	19.372	36.51	19.363	36.537	19.332	36.555	19.347
average	36.55	19.35	36.52	19.340	36.52	19.34	36.55	19.35
minimum	36.54	19.32	36.47	19.315	36.50	19.29	36.54	19.31
maximum	36.57	19.38	36.57	19.373	36.54	19.37	36.57	19.37
range	0.03	0.06	0.10	0.06	0.03	0.08	0.03	0.06
std dev	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
LSL	**36.30**	**18.88**	**36.30**	**18.88**	**36.30**	**18.88**	**36.30**	**18.88**
NOM	**36.60**	**19.18**	**36.60**	**19.18**	**36.60**	**19.18**	**36.60**	**19.18**
USL	**36.90**	**19.48**	**36.90**	**19.48**	**36.90**	**19.48**	**36.90**	**19.48**
CPK	12.07456641	3.171205949	7.013854686	4.161748713	10.96622119	3.10101756	12.58186683	3.774661092

TERMINAL TO HOUSING INSERTION FORCE DATA

Specification: **15 N MAX**

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A07FA-2**
PART NO (s): **6189-8624**
Mold #: **1874-A2**

Tested by/Date: Christi Cornwell 12/16/21
Design Rec. Change level/date:
MU5T-14A464-AGB △B1 1/13/22
Eng. Change Documents: NA

CAVITY # →	M1							M2							M3							M4						
1	B	B	B	9.6	9.9	10.8	9.8	B	B	B	9.7	9.5	10.8	10.9	B	B	B	7.9	8.0	10.3	9.5	B	B	B	8.0	9.2	8.7	9.2
2	B	B	B	8.8	8.6	10.1	10.2	B	B	B	8.7	9.6	9.4	8.8	B	B	B	9.4	9.1	8.7	9.3	B	B	B	8.7	9.0	8.6	8.3
3	B	B	B	10.7	9.0	9.2	9.6	B	B	B	9.5	8.9	10.1	8.9	B	B	B	9.0	8.7	8.3	10.1	B	B	B	9.7	7.2	10.5	10.9
4	B	B	B	9.3	8.7	9.2	10.4	B	B	B	10.1	10.1	10.3	8.8	B	B	B	9.3	9.1	8.1	10.4	B	B	B	9.2	8.4	9.6	8.9
5	B	B	B	9.3	8.9	8.6	10.0	B	B	B	8.0	9.1	10.0	8.8	B	B	B	6.7	7.2	10.2	10.3	B	B	B	8.1	7.6	10.2	9.2

AVERAGE	9.2
MIN	6.7
MAX	10.9

TERMINAL TO HOUSING RETENTION FORCE DATA

Specification: **see below**

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A07FA-2**
PART NO (s): **6189-8624**
Mold #: **1874-A2**

Tested by/Date: Christi Cornwell 12/16/21
Design Rec. Change level/date:
MU5T-14A464-AGB △B1 1/13/2022
Eng. Change Documents: NA

TERMINAL RETENTION WIth TPA 70 N MIN

CAVITY # →	M1							M2							M3							M4						
1	B	B	B	85.6	86.9	81.6	86.6	B	B	B	90.5	87.0	90.8	86.8	B	B	B	91.6	89.9	89.4	84.7	B	B	B	90.9	89.5	87.2	88.5
2	B	B	B	86.9	85.2	90.0	85.7	B	B	B	89.0	85.7	88.4	85.8	B	B	B	87.3	89.4	86.9	83.2	B	B	B	90.2	81.6	88.6	79.9
3	B	B	B	84.6	83.6	87.3	86.7	B	B	B	87.1	89.1	87.6	84.3	B	B	B	86.5	89.8	86.9	85.6	B	B	B	87.4	88.4	91.3	86.2
4	B	B	B	87.0	87.8	89.1	85.8	B	B	B	87.6	88.3	85.1	85.2	B	B	B	87.9	87.8	89.8	85.8	B	B	B	86.5	84.4	88.8	85.5
5	B	B	B	87.3	90.9	88.9	87.7	B	B	B	89.4	87.6	87.4	83.7	B	B	B	88.5	86.9	87.1	86.3	B	B	B	87.3	88.3	88.4	83.3

AVERAGE 87.18
MIN 79.89
MAX 91.57

TERMINAL RETENTION WITHOUT TPA 40 N MIN

CAVITY # →	M1							M2							M3							M4						
1	B	B	B	81.69	92.22	92.93	89.40	B	B	B	89.62	92.28	90.43	91.16	B	B	B	90.72	87.87	90.24	88.58	B	B	B	90.63	89.14	94.85	90.37
2	B	B	B	85.19	89.73	93.52	90.60	B	B	B	91.35	89.96	88.68	88.32	B	B	B	86.48	84.80	91.83	87.41	B	B	B	89.18	93.49	93.78	96.28
3	B	B	B	88.55	89.99	93.50	91.08	B	B	B	90.71	89.10	88.54	87.67	B	B	B	90.28	87.81	87.23	87.34	B	B	B	89.16	90.63	93.00	91.56
4	B	B	B	89.80	91.65	93.15	91.59	B	B	B	89.76	89.75	87.59	87.50	B	B	B	87.73	88.13	88.57	89.63	B	B	B	90.11	88.14	88.99	90.13
5	B	B	B	88.37	89.92	92.27	90.02	B	B	B	87.27	86.10	90.33	86.84	B	B	B	88.01	89.14	88.58	89.04	B	B	B	88.55	89.96	94.09	91.46

AVERAGE 89.76
MIN 81.69
MAX 96.28

CONNECTOR OPERATION FORCE DATA

Specification: **See below**

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A07FA-2**
PART NO (s): **6189-8624**
Mold #: **1874-A2**

Tested by/Date: Carlie Moore 1/12/22
Design Rec. Change level/date:
MU5T-14A464-AGB B1 1/13/22
Eng. Change Documents: NA

CONNECTOR INSERTION WITH LOCK & TERMINAL 75 N MAX

CAVITY # →	M1	M2	M3	M4		
1	47.9	45.7	42.8	46.6		
2	43.4	46.5	41.0	46.4		
3	41.2	42.4	43.0	44.6		
4	47.8	43.3	44.8	53.7		
5	42.2	41.9	48.4	43.7		

AVERAGE 44.9
MIN 41.0
MAX 53.7

CONNECTOR EXTRACTION W/O LOCK 75 N MAX

CAVITY # →	M1	M2	M3	M4		
1	31.8	35.2	37.9	31.2		
2	38.1	32.6	37.4	32.0		
3	32.9	32.6	32.1	36.2		
4	40.4	29.1	33.3	34.7		
5	31.9	35.0	40.9	34.5		

AVERAGE 34.5
MIN 29.1
MAX 40.9

HOUSING RETENTION FORCE DATA

Specification: **110 N MIN**

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A07FA-2**
PART NO (s): **6189-8624**
Mold #: **1874-A2**

Tested by/Date: Carlie Moore 1/10/22
Design Rec. Change level/date:
MU5T-14A464-AGB △B1 1/13/22
Eng. Change Documents: NA

CAVITY # →	M1	M2	M3	M4										
1	142.3	118.6	136.6	137.7										
2	140.7	113.7	134.6	140.2										
3	136.8	142.3	130.4	136.7										
4	127.5	134.1	130.0	138.3										
5	125.1	140.2	133.8	143.4										

AVERAGE 134.1
MIN 113.7
MAX 143.4

TPA TO HOUSING DATA

Specification: **SEE BELOW**

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A07FA-2**
PART NO (s): **6189-8624**
Mold #: **1874-A2**

Tested by/Date: Carlie Moore 1-10-22
Design Rec. Change level/date:
MU5T-14A464-AGB B1 1/13/22
Eng. Change Documents: NA

	PRE-ASSEMBLED TO ASSEMBLED 15 N MIN (without terns)			
CAVITY # →	**M1**	**M2**	**M3**	**M4**
1	43.0	52.1	45.2	48.7
2	47.4	46.3	43.2	45.6
3	53.2	57.4	50.5	55.6
4	57.2	51.5	54.9	58.8
5	54.0	56.3	49.9	47.6
AVERAGE	50.9			
MIN	43.0			
MAX	58.8			

	PRE-ASSEMBLED TO ASSEMBLED 60 N MAX (with terms)			
	M1	**M2**	**M3**	**M4**
1	41.0	49.4	53.7	48.9
2	52.3	48.0	59.3	56.6
3	49.5	49.8	56.6	45.6
4	45.0	52.4	51.8	54.7
5	46.2	54.7	51.2	57.2
AVERAGE	51.2			
MIN	41.0			
MAX	59.3			

	ASSEMBLED TO PRE-ASSEMBLED INTIAL WITH TERMS 60 N MAX			
CAVITY # →	**M1**	**M2**	**M3**	**M4**
1	25.1	31.0	29.4	25.3
2	29.1	33.1	26.8	33.7
3	32.8	33.9	27.3	27.2
4	26.2	27.6	27.9	33.4
5	28.4	35.8	30.6	27.8
AVERAGE	29.6			
MIN	25.1			
MAX	35.8			

	ASSEMBLED TO PRE-ASSEMBLED W/O TERMS SECOND 60 N MAX			
	M1	**M2**	**M3**	**M4**
1	23.1	26.4	34.0	26.7
2	21.7	28.2	32.2	26.2
3	27.8	27.3	26.6	34.4
4	34.8	31.6	22.4	33.8
5	37.2	25.0	35.1	31.2
AVERAGE	29.3			
MIN	21.7			
MAX	37.2			

	PRE-ASSEMBLED TO EXTRACTION (AFTER 2ND DISENGAGEMENT CYCLE W/O 25 N MIN			
	M1	**M2**	**M3**	**M4**
1	67.1	63.6	63.7	53.4
2	46.6	54.2	60.4	61.4
3	48.4	60.5	62.3	58.2
4	43.6	62.8	55.6	61.0
5	43.7	59.0	70.3	58.5
AVERAGE	57.7			
MIN	43.6			
MAX	70.3			

CPA DATA

Specification: **SEE BELOW**

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A07FA-2**
PART NO (s): **6189-8624**
Mold #: **1874-A2**

Tested by/Date: Carlie Moore 1-13-22
Design Rec. Change level/date:
MU5T-14A464-AGB B1 1/13/22
Eng. Change Documents: NA

CPA PRE-ASSEMBLED TO ASSEMBLED W/ CONNECTORS MATED 5 - 30 N

CAVITY # →	M1	M2	M3	M4
1	24.7	24.4	23.4	24.0
2	25.6	25.5	26.3	24.3
3	24.9	28.0	26.0	26.5
4	25.6	27.7	25.0	26.9
5	25.0	24.8	23.7	27.8

AVERAGE 25.5
MIN 23.4
MAX 28.0

CPA ASSEMBLED TO PRE-ASSEMBLED W/ CONNECTORS MATED 20 - 40 N

M1	M2	M3	M4
36.9	32.5	35.1	35.4
35.9	32.9	33.6	32.8
35.6	35.2	36.8	32.4
36.3	38.9	31.1	37.0
35.9	32.4	31.0	35.3

AVERAGE 34.7
MIN 31.0
MAX 38.9

CPA PRE-ASSEMBLED TO ASSEMBLED W/O CONNECTORS MATED 60 N MIN

CAVITY # →	M1	M2	M3	M4
1	97.0	91.2	88.4	80.0
2	98.1	96.7	91.4	102.0
3	100.4	98.6	91.3	87.5
4	92.0	97.1	101.0	98.7
5	100.2	101.7	85.1	101.4

AVERAGE 95.0
MIN 80.0
MAX 102.0

CPA PRE-ASSEMBLED TO EXTRACTION W/O CONNECTORS MATED 30 N MIN

M1	M2	M3	M4
73.7	74.1	72.5	73.8
76.1	73.1	75.2	78.1
71.0	72.6	75.0	71.0
71.0	75.3	75.2	73.3
70.4	74.0	76.6	78.0

AVERAGE 74.0
MIN 70.4
MAX 78.1

Sumitomo Electric Wiring Systems, Inc

Gage R&R Study

05/19/2021

Study Date: 5/18/2021 12:00:00 AM
Gage ID: SN1000104
Gage Desc: Profile Projector
Appraisers: 3 **Trials:** 3 **Parts:** 10
Study Type:
MSA Version: 4

Company Part No.: Mold 268
Part No.:
Part Desc: HW09-RET-06
Characteristic: Length
Specification Limits: **Min** 19.6 **Max** 20.02

☑ Approved **Pp (or Ppk) Target** **6-Sigma Proc Variation**

	Appr A: S. Disman			Appr B: M. Haddix			Appr C: T. Holland		
1	20.01	20.02	20.02	20.02	20.01	20.02	20.02	20.01	20.01
2	20.05	20.06	20.05	20.05	20.05	20.04	20.06	20.04	20.05
3	19.72	19.73	19.71	19.71	19.72	19.71	19.72	19.72	19.73
4	20.09	20.08	20.08	20.09	20.08	20.09	20.09	20.08	20.08
5	19.85	19.84	19.86	19.86	19.84	19.85	19.86	19.85	19.85
6	20.08	20.06	20.07	20.06	20.07	20.07	20.08	20.07	20.07
7	20.02	20.02	20.01	20.03	20.02	20.03	20.02	20.02	20.01
8	19.72	19.72	19.7	19.72	19.7	19.71	19.72	19.72	19.71
9	20.01	20.01	20	20.01	20	20.01	20	20.01	20
10	19.67	19.67	19.67	19.67	19.67	19.67	19.67	19.68	19.67

	Std. Dev.	% Contribution	% TV	% Tol		
Repeatability (EV):	0.006893	0.3%	5.3%	9.8%	**R bar:**	0.011667
Reproducibility (AV):	0.000000	0.0%	0.0%	0.0%	**UCL-R:**	0.030100
Appraiser x Part (INT):					**Study Variation:**	0.130217
GRR:	**0.006893**	**0.3%**	**5.3%**	**9.8%**	**Total Variation (TV):**	0.130217
Part-to-Part (PV):	0.130035	99.7%	99.9%	99.5%	**Tolerance/6 (Tol):**	0.070000
	number of distinct categories:		26.6	14.2		

* Limit of individual R's (range values). An (*) is used to identify those sets of measurements that have a Range value that exceeds the UCL-R limit value. Correct by repeating those readings using the same appraiser and part or discard the values and recalculate the study results and the value UCL-R.

Comments:

Approved By: E Sapp Date: 5/19/21

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GRR Analysis Sheet

Study Date: 5/18/2021 12:00:00 AM
Gage ID: SN1000104
Gage Desc: Profile Projector
Appraisers: 3 **Trials:** 3
Study Type: Long-AIAG 4

R bar A = 0.013000 X bar A = 19.920000
R bar B = 0.011000 X bar B = 19.919333
R bar C = 0.011000 X bar C = 19.920667
R bar = **0.0116670** X bar Diff = **0.001333**

Company Part No.: Mold 268
Part No.:
Part Desc: HW09-RET-06
Characteristic: Length
Specification Limits: 19.6 20.02
6 Sigma Process Variation:
Pp (or Ppk) Target:

Rp = **0.413334** Tol/6 = **0.070000**

Measurement Unit Analysis	% Total Variation (TV)	% Tolerance
Repeatability - Equipment Variation (EV) EV = R bar x K1 = **0.006893** Trials K1: 2 0.8862; 3 0.5908	% EV = 100 [EV / TV] = **5.3%**	% EV = 100 [EV / (Tol / 6)] = **9.8%**
Reproducibility - Appraiser Variation (AV) AV = $\sqrt{[(\text{X bar Diff} \times K2)^2 - (EV^2 / n \times r)]}$ = **0.000000** Appraisers 2 3; K2 0.7071 0.5231 Note: If a negative value is calculated under the square root sign, AV defaults to zero. n = number of parts; r = number of trials	% AV = 100 [AV / TV] = **0.0%**	% AV = 100 [AV / (Tol / 6)] = **0.0%**
Repeatability and Reproducibility (GRR) GRR = $\sqrt{(EV^2 + AV^2)}$ = **0.006893**	%GRR = 100 [GRR / TV] = **5.3%**	% GRR = 100 [GRR / (Tol / 6)] = **9.8%**
Part Variation (PV) PV = Rp x K3 = **0.130035** Parts K3: 2 0.7071; 3 0.5231; 4 0.4467; 5 0.4030; 6 0.3742; 7 0.3534; 8 0.3375; 9 0.3249; 10 0.3146	% PV = 100 [PV / TV] = **99.9%**	% PV = 100 [PV / (Tol / 6)] = **99.5%**
	In MSA4, for % Tolerance, PV = SQRT [(Tol / 6)^2 - (GRR)^2]	
	ndc = 1.41(PV/GRR) = **26.6**	ndc = 1.41(PV/GRR) = **14.2**
Total Variation (TV) TV = $\sqrt{(GRR^2 + PV^2)}$ = 0.130217	If the 6 sigma process variation is known, then TV = [6 sigma process variation] / 6.00 and PV = SQRT[(TV^2) - (GRR)^2].	

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WORK INSTRUCTION

AREA:	QUALITY ASSURANCE LAB
TITLE	LABORATORY SCOPE - SCOTTSVILLE (SV5, SV5-2, SV5-Franklin)

PURPOSE:	APPLICATION:
To summarize the testing capabilities available at Scottsville Plant (SV5, SV5-2, SV5-Franklin), and to clarify the equipment, tests performed, standards, recording method and reaction plan.	Scottsville (SV5, SV5-2, SV5-Franklin)
	RULE ENFORCER: QA Coordinator / Above

SV5 Tests Performed

TESTS PERFORMED	EQUIPMENT USED	TEST METHODS / STANDARD	RECORDING METHOD	REACTION METHOD
Melt Flow Rate	Tinius Olsen Extrusion Plastometer	QRW - MELTFLOW	Melt Index Record	QAW-ABNORMALPROC
Waterproof Test	Waterproof Tester	QAW - WATERPROOFTEST	Inspection Data Sheet	QAW-ABNORMALPROC
Moisture Analysis (Reference Only)	Moisture Tester	QAW - LABSCOPE	Moisture Test Data Sheet	QAW-ABNORMALPROC
Insertion / Retention Test	Force Gage Instron Tester	QAW - INSERTRETPROC QAW - InstronOperation	Inspection Data Sheet Data storage	QAW-ABNORMALPROC
Dimensional Measurement	Profile / Caliper / Micrometer / Depth Gage / Keyence Measurement System	Inspection Instruction Sheet	Inspection Data Sheet	QAW-ABNORMALPROC
Part Weight	Scale	Inspection Instruction Sheet	Inspection Data Sheet	QAW-ABNORMALPROC
Freeze Test	Freezer	SWS Inspection Standard	Inspection Data Sheet	QAW-ABNORMALPROC

SV5 - Franklin Tests Performed

TESTS PERFORMED	EQUIPMENT USED	TEST METHODS / STANDARD	RECORDING METHOD	REACTION METHOD
Melt Flow Rate	Tinius Olsen Extrusion Plastometer	QRW - MELTFLOW	Melt Index Record	QAW-ABNORMALPROC
Waterproof Test	Waterproof Tester	QAW - WATERPROOFTEST	Inspection Data Sheet	QAW-ABNORMALPROC
Insertion / Retention Test	Force Gage Instron Tester	QAW - INSERTRETPROC QAW - InstronOperation	Inspection Data Sheet Data storage	QAW-ABNORMALPROC

WORK INSTRUCTION

AREA:	QUALITY ASSURANCE LAB
TITLE	LABORATORY SCOPE - SCOTTSVILLE (SV5, SV5-2, SV5-Franklin)

Dimensional Measurement	Caliper / Micrometer / Depth Gage / Keyence Measurement System	Inspection Instruction Sheet	Inspection Data Sheet	QAW-ABNORMALPROC
Part Weight	Scale	Inspection Instruction Sheet	Inspection Data Sheet	QAW-ABNORMALPROC
Freeze Test	Freezer	SWS Inspection Standard	Inspection Data Sheet	QAW-ABNORMALPROC

SV5 (Building 2) Tests Performed

TESTS PERFORMED	EQUIPMENT USED	TEST METHODS / STANDARD	RECORDING METHOD	REACTION METHOD
Hardness Test	Hardness Tester	QRF-IDSRM	Hardness Test Data Sheet	QAW-ABNORMALPROC
Dimensional Measurement	Profile / Caliper / Micrometer / Depth Gage / Measurement Microscope/ Keyence System/ OGP	SWS Inspection Standard / Inspection Instruction Sheet	Inspection Data Sheet / Excel Data Files	QAW-ABNORMALPROC
Contact Force	Contact Force Gage	MSW-Force Gage	Inspection Data Sheet	QAW-ABNORMALPROC
Insertion / Retention Test	Push / Pull Gage	MSW-InsertRetention	Inspection Data Sheet	QAW-ABNORMALPROC

Equipment Calibrations

	EQUIPMENT USED	TEST METHODS / STANDARD	RECORDING METHOD	REACTION METHOD
Micrometers, Depth Gages, Weigh Scales, other process tools/jigs.	Certified Gages (Gage Blocks & Weights)	Per Calibration Procedure	Calibration Record and Gagetrak	QAW-ABNORMALPROC
Assembly Master Samples	Calipers, Profile			
Caliper	Gage Block, Profile, Measuring Microscope			
Slip Gages	Micrometer			
Keyence Microscope	Certified Gages			
Force Gages	Certified Weights			
Freezer	Certified Meter			
Melt Indexer	Outside Vendor			
Moisture Analyzer	Outside Vendor			
Water Pressure Gage	Outside Vendor			
Hardness Tester	Outside Vendor			
Optical Comparator (Profile)	Outside Vendor			
Keyence Measurement Scope	Gage Pins			
OGP	Outside Vendor			
NIKON Measurment Microscope	Outside Vendor			
INSTRON Tensile Tester	Outside Vendor			

CERTIFICATE

This is to certify that

Sumitomo Electric Wiring Systems

Components Business Unit
2687 Old Gallatin Road
Scottsville, KY 42164
United States of America

has implemented and maintains a **Quality Management System**.

Scope:
The design and manufacture of connectors, connector components, and terminals.

An audit, conducted and documented in a report, has verified that this quality management system fulfills the requirements of the following International Automotive Standard:

IATF 16949:2016
(with product design)

Certificate registration no.	10001349 IATF16
Main certificate registration no.	10003837 IATF16
Issuing date	2021-06-23
This certificate is valid until	2024-06-22
IATF No.	0406733

2-IAO-QMC-01001

For and on behalf of DQS

Brad McGuire
Managing Director, DQS Inc.

Michael Drechsel
Managing Director, DQS Holding GmbH

IATF Contract Office: DQS Holding GmbH, Konrad-Adenauer-Allee 8-10, 61118 Bad Vilbel, Germany
Issuing Office: DQS Inc., 1500 McConnor Parkway, Suite 400, Schaumburg, IL 60173 USA

2017-03-09

Annex to certificate registration no.: 10001349 IATF16
IATF-No.: 0406733

Sumitomo Electric Wiring Systems

Components Business Unit
2687 Old Gallatin Road
Scottsville, KY 42164
United States of America

2-IAO-QMC-01001

Remote Location	Scope
10003837 **Sumitomo Electric Wiring Systems** **1018 Ashley Street** **Bowling Green, KY 42102** **United States of America**	Information Technology, Internal Audit Management, Management Review, Policy Making, Purchasing, Quality System Management, Strategic Planning and Training.
10004404 **Sumitomo Electric Wiring Systems** **27360 Drake Road** **Farmington Hills, MI 48331** **United States of America**	Product Design, Purchasing, and Warranty Management.
10004405 **Sumitomo Wiring Systems (USA), Inc.** **7500 Viscount Drive, Suite 192** **El Paso, TX 79925** **United States of America**	Customer Service.
10004406 **Sumitomo Wiring Systems (USA), Inc.** **39555 Orchard Hill Place** **Suite L60** **Novi, MI 48375** **United States of America**	Contract Review.
10013991 **Sumitomo Electric Wiring Systems** **120 Industrial Drive** **Scottsville, KY 42164** **United States of America**	Warehousing.
10017459 **Sumitomo Wiring Systems, Ltd.** **Components Group** **1820 Nakanoike, Mikkaichi-cho** **Suzuka-City** **Mie Pref 513-8631** **Japan**	Product Design.

Annex to certificate registration no.: 10001349 IATF16
IATF-No.: 0406733

Sumitomo Electric Wiring Systems

Components Business Unit
2687 Old Gallatin Road
Scottsville, KY 42164
United States of America

2-IAO-QMC-01001

Extended manufacturing site

10012558
Sumitomo Electric Wiring Systems
796 Smith Grove Rd.
Scottsville, KY 42164
United States of America

10015246
Sumitomo Electric Wiring Systems
265 Garvin Lane
Franklin, KY 42134
United States of America