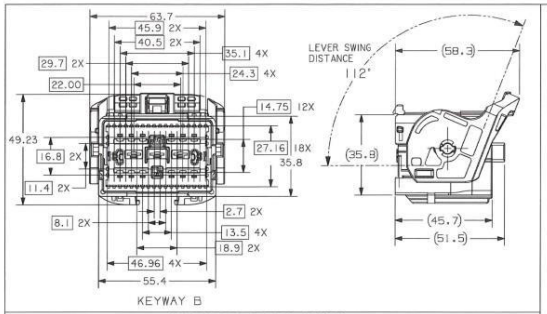
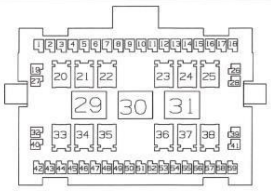
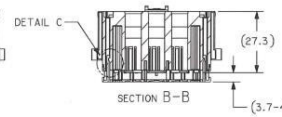
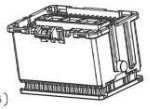


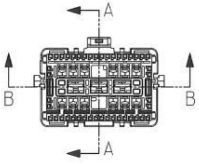
INTERFACE VIEW(S)



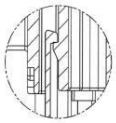
TERMINAL IDENTIFICATION
59 CAVITIES



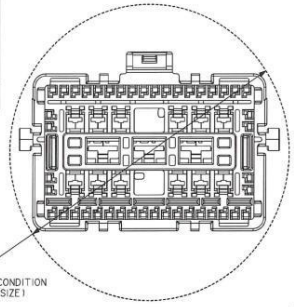




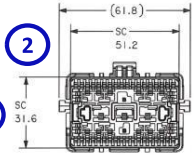
WIRE SIDE



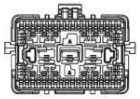
DETAIL C
SCALE 4:1
PRE-STAGE LOCK POSITION



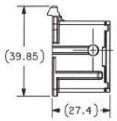
SCALE 2:1



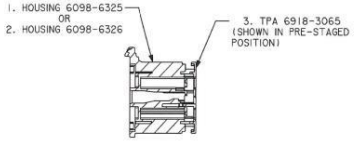
KEYWAY B
ENGAGEMENT SIDE
(WITH TPA REMOVED)



KEYWAY A
ENGAGEMENT SIDE
(WITH TPA REMOVED)



TPA IN
ASSEMBLED POSITION



SECTION A-A
(TPA IN PRE-STAGED / SHIPPED POSITION)

ACTIVE

ITEM	DESCRIPTION	COLOR	FORD COMPONENT PART NUMBER	SUMITOMO PART NUMBER	MATERIAL/ SPEC NO.	RECYCLING CODE	WEIGHT
1	FEMALE HOUSING KEYWAY A	BLACK	N/A	6098-6325	PBT	N/A	
2	FEMALE HOUSING KEYWAY B	NATURAL	N/A	6098-6326	PBT	N/A	
3	TPA	LT. GRAY	N/A	6918-3065	PBT	N/A	
4	FEMALE COVER	LT. GRAY	N/A	6911-4748	PBT	N/A	

(NI)

APPLICABLE TERMINALS

DESCRIPTION	MANDATORY (YES/NO)	TERMINAL CAVITY MIN/MAX OD	PLATING/ MATERIAL	DRAWING	SUPPLIER COMPONENT PART NO.
TERMINAL 0.64 FEMALE	YES	0/2.15x2.12	REFERENCE DRAWING	3F2T-14474-RA	REFERENCE DRAWING
TERMINAL 2.8 FEMALE	YES	0/4.4x4.5	REFERENCE DRAWING	97BG-14474-BAA	REFERENCE DRAWING
TERMINAL 2.8 FEMALE	YES	0/4.4x4.5	REFERENCE DRAWING	XF2T-14474-DA	REFERENCE DRAWING
TERMINAL 6.3 FEMALE	YES	0/7.55x5.45	REFERENCE DRAWING	97BG-14474-CAA	REFERENCE DRAWING
TERMINAL 6.3 FEMALE	YES	0/7.55x5.45	REFERENCE DRAWING	XW4T-14474-TA	REFERENCE DRAWING

(PI)

TERMINAL EXTRACTION TOOLS

TERMINAL	EXTRACTION TOOL
0.64	17180012
2.8	23730003
6.3	17330015

ASSEMBLY PART NUMBERS				MATING COMPONENT ASSEMBLY PART NUMBERS		MATING COMPONENT ASSEMBLY PART NUMBERS			
FORD COMPONENT PART NUMBER	SUMITOMO PART NUMBER	MAX TEMP	WEIGHT	FORD COMPONENT PART NUMBER	SUMITOMO PART NUMBER	FORD COMPONENT PART NUMBER	SUMITOMO PART NUMBER		OPTIONAL
9U5T-14489-AC	6098-6047	105° C	28g	9U5T-14A459-BC	6089-6044	9U5T-14N003-BC	6911-4748	1	1
9U5T-14489-VA	6098-6134	105° C		9U5T-14A459-VA	6089-6045	9U5T-14N003-BC	6911-4748	1	1

GENERAL TOLERANCES							
10 MAX	50 MAX	100 MAX	250 MAX	2500 VR	ANGLE	ECCENT	
±0.3	±0.5	±0.8	±1.4	±2.0	±0.3°	±0.15	9U5T-14489-VA

NOTES:
1. PARTS CONFORM TO THE ELECTRICAL CONNECTION SYSTEM DESIGN SPECIFICATION (SDS) REV.17
2. REFERENCE TO ANY OTHER SPECIFICATIONS AND REV LEVEL, E.G., VDA
3. MAXIMUM MATING FORCE FULLY POPULATED WITH TIN TERMINALS =75(N) WITH GOLD TERMINAL =
4. THE TERMINAL EXTRACTION TOOL MUST BE REFERENCED THE DRAWING
5. FOR SEALED INTERFACES ONLY SEALING SURFACES AS IDENTIFIED ON THIS DRAWING ARE SMOOTH AND FREE OF PARTING LINES.
6. CONNECTOR IS RATED AS ERGONOMIC CLASS (1,2, OR 3) BASED ON USCAR-25 REV 1. CONNECTOR PUSH SURFACE AREA IS 1761.0mm²

LTRS	REVISIONS			
	ORIGINATOR	CHECKER	ENGR APP	MATL APP
A	RELEASE 9U5T-14489-AA ARCHIVE DATE: 102606 AELE-E-11783930-031 CAD:Y			
	B.SKOLNIK	K.DAVIS	M.SALANTA	SUMITOMO
	REDRAWN AFTER REVISION J TO THE FORD DRAWING STANDARDS AELE E 11783930 222 20110811			
	D.MALONE	M. SPENCER	M.SALANTA	SUMITOMO
	L1 ADDED INTERFACE DRAWING (PAGE 2) AELE E 11783930 257 20120613			
	B. NAGY	M. SPENCER	J. PITTENGER	SUMITOMO
	M1 ADDED KEYWAY B DETAIL VIEW TO TEST FIXTURE INTERFACE AELE E 11783930 270 20120918			
	J. KIM	M. SPENCER	M.SALANTA	SUMITOMO
	N1 MODIFIED COLOR AND SUMIOTOMO PART NUMBER IN CHART AELE E 11783930 273 20121107			
	D.MALONE II	M. SPENCER	M.SALANTA	SUMITOMO
	P1 WAS 2.80(MAX) WAS 4.20(MAX) WAS 3.40(MAX) ADDED 0/4.4X4.5 ADDED 0/7.55X5.45 AELE E 11783930 292 20130626			
	B. NAGY	M. SPENCER	M.SALANTA	SUMITOMO

Received
DEC 16 2013
SV5 QA
RECEIVED
DEC 16 2013
CONTROLLED COPY

SEWS
SEWS RELEASE LEVEL: PRODUCTION
APPLICATION: INLINE / DOOR
SEWS DRAWING/PART NUMBER: 9U5T-14489-AC
WEIGHT (g)

REFERENCE 6098-6047 59 WAY
PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT
DRAFTED IN ACCORDANCE WITH FORD MOTOR COMPANY ENGINEERING CAD AND DRAFTING STANDARDS CURRENT AT INITIAL RELEASE
3RD ANGLE PROJ. DIMENSIONS ARE IN MILLIMETERS

CAD TYPE Z-NX	CAD LDC. N/A	CAD FILE 9U5T-14489-AC_DWG_K	DTMC IS MASTER
OPER. NO. N/A	UNIT MM	DRAWING 9U5T-14489-AC	
DESIGN B.SKOLNIK	DETAIL D.MALONE	TITLE SLV WIR CONN FEM	SHT 1 OF 2
CHECKED K.DAVIS	SAFETY N/A		
SCALE 1:1	DATE 08/11/2011	DIVISION PLANT	

Ford Motor Company

DRW SIZE A1/3

PROCESS FLOW DIAGRAM

KEY CONTACT/DEPT. LOC. Debbie Gillenwater /-QA Dept.

PRODUCT : Molded Component Parts

PROCESS: Injection Molding Group 1
Supplier/Loc. SEWS-Scottsville#5
Mfg. Sup.: Alan Bomar
Prepared By: John Fraim

4/3/14	Update process - Packing	L. Roth
3/30/2011	Update process - Packing	L. Roth
1.25.08	Updated process 101	J Fraim
9/27/05	Update Information	D Karleskint
8/25/05	Update Information	J Fraim , J Saylors
1/25/05	Update Information	J Fraim L Roth, J Renfrow, D Gillenwater
4-7-04	Update Information	D Gillenwater, G Smith, J Renfrow
3/13/01	Update Information	T. Gravil, R. Ramsey, D.Lyons
2/06/01	Update Information	T.Gravil
1/8/00	ISSUED WITH FORMAT CHANGES	T.Day
6/04/99	ISSUED WITH FORMAT CHANGES/UPDATED INFRO	T.Gravil, D. Lyons, T. Nall, K. Cantrell
DATE	CHANGE POINTS	CORE / DEVELOPMENT TEAM
ISSUE/REVISION HISTORY		

SUPPLIER APPROVALS;

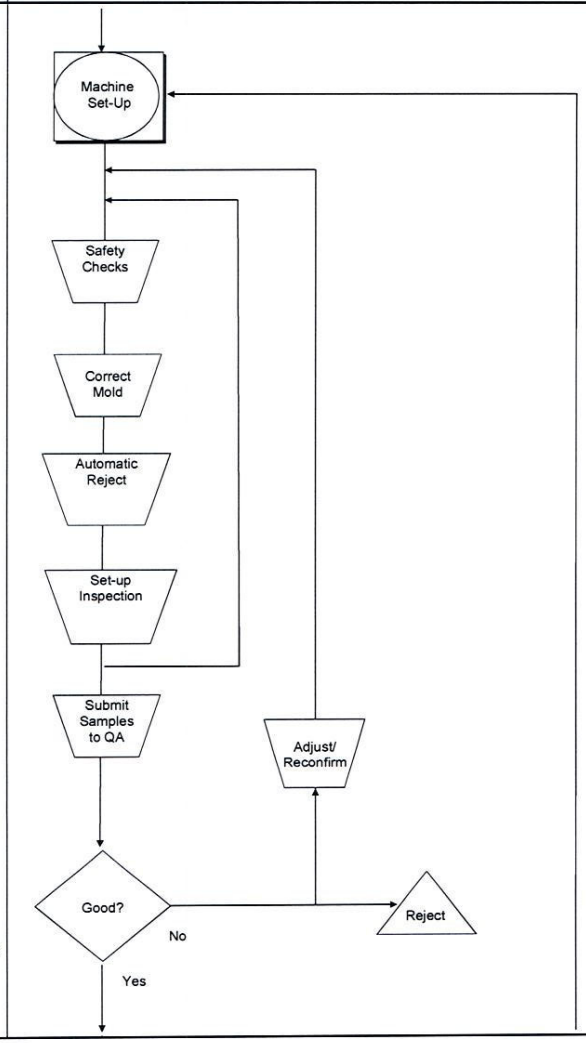
General Plant Manager
Quality Manager
Other Approvals
CUSTOMER APPROVALS:(IF REQUIRED)

PART A/S ASSY'D | PART A/S REC'D | OPERATION | INSPECTION | OPERATION / INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
010	Receive Raw Material	Purchased Raw Material	Visual Comparison Against Packing List Shipping-Receiving
	Reject for non-conformance	Good? No → Reject; Yes	Notify Quality Assurance Red Tag Procedure & Return to Vendor
0020	Quality Assurance Receiving Inspection	QA Receiving Inspection	
	Packaging, Identification, Visual Inspection, # Characteristics		Per QA Inspection Instruction Sheet-Receiving
	Reject for non-conformance	Good? No → Reject; Yes	Red Tag Procedure/Return to Vendor
0030	Raw Material Storage	Material Storage	
	Raw Material Inventory Assessment	Raw Material Inventory Assessment	

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
	Material Staging	Deliver to Raw Material Staging Area	
0050	Raw Material Loading	MATERIAL LOADING	Injection Molding Machine

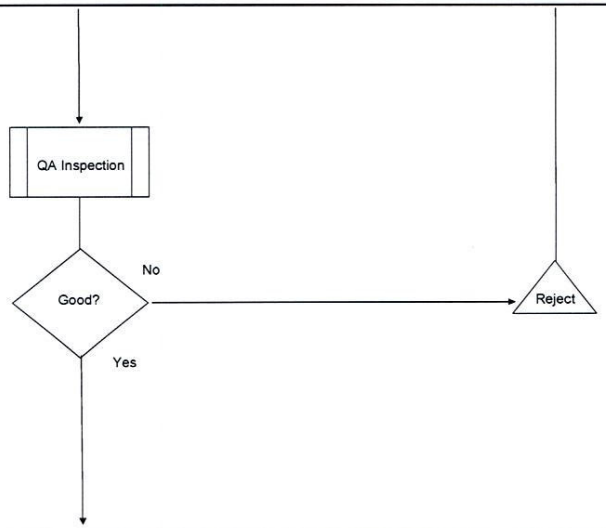
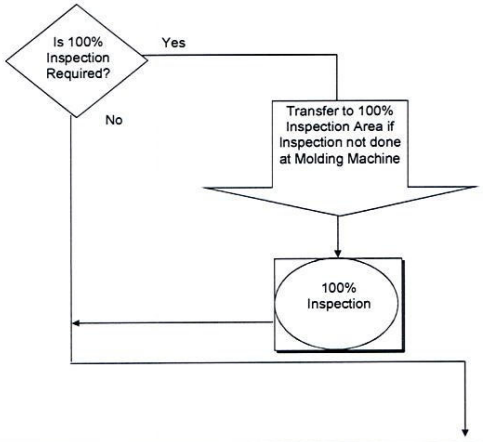
PART AS ASSY'D | PART AS REC'D | OPERATION | INSPECTION | OPERATION / INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
0060	Set-up Injection Molding Machine		
	Raw Material Mold Numbers Process Parameters Regrind Ratio Raw Material Dryers		Per Shop Order Per Applicable Standard
			# Part Dimension / Function
	Reject for non-conformance		Make Adjustments, Reverify Parts, Mold Sent to Maintenance or Stop Production if applicable

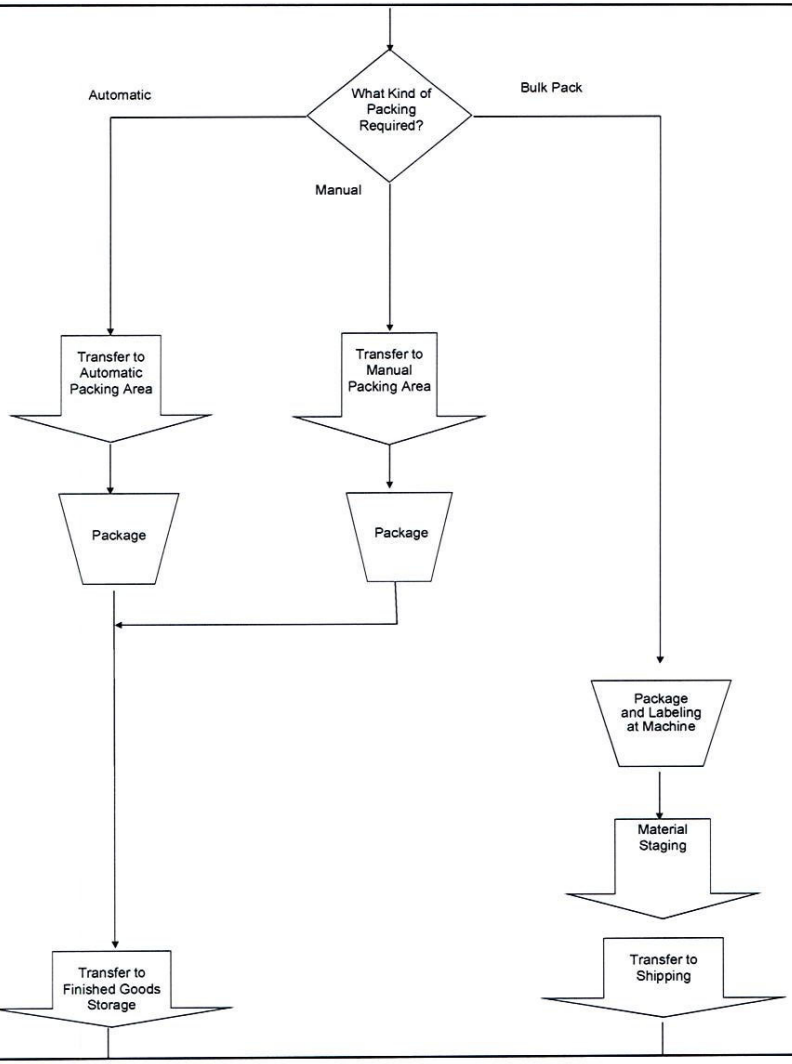
PART AS ASS'D | PART AS REC'D | OPERATION | INSPECTION | OPERATION / INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
0070	Mass Production Injection Molding	Mass Production Operator Inspection In Line Inspection Good? No Reject Yes Adjust / Reconfirm	Per Shop Order Per Applicable Standard

PART AS ASSY'D | PART AS REC'D | OPERATION | INSPECTION | OPERATION / INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
0080	Quality Assurance Inspection		# Part Dimension / Function / Visual
	Reject for non-conformance		Notify Manufacturing Leader /QA Eng. Reject Tag Procedure
	Material Staging for Inspection		
	100% Inspection (when applicable)		Visual Inspection

PART AS ASSY'D | PART AS REC'D | OPERATION | INSPECTION | OPERATION / INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
0090	Automatic Bulk / Non Bulk Packaging and Labeling		Per Packaging Style and Shop Order
			Per Packaging Style and Shop Order
0100	Packaging and Labeling at Machine		Per Packaging Style and Shop Order
	Material Staging for Bulk Packaging / Labeling		
0110	Transfer Packaged Parts to Storage		

PART AS ASS'D/TD | PART AS REC'D | OPERATION | INSPECTION | OPERATION / INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
0120	Finished Goods Storage	Finished Goods/ Storage.	
0130	Finish Goods Inventory Assessment	Finished Goods Inventory Assessment	
		Finished goods may be in-house or an off site warehouse.	
0140	Finished Goods Dock Audit (weekly) Random	Shipping Dock Audit	Quantity Identification
0150	Finished Goods Shipping	Finished Goods/ Shipping	Shipping Label
		Shipped to Customer	

Sumitomo Electric Wiring Systems, Inc

Gage R&R Study

Study Date: 1/16/2020 12:00:00 AM
Gage ID: 05476117
Gage Desc: 0 - 150 Caliper
Appraisers: 3 **Trials:** 3 **Parts:** 10
Study Type:
MSA Version: 4

Company Part No.: Mold 268
Part No.:
Part Desc: HW09-RET-064
Characteristic: Length
Specification Limits: **Min** 19.7 **Max** 20.1

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

	Appr A: M Haddix			Appr B: T Holland			Appr C: E Skaggs		
1	20.09	20.1	20.1	20.09	20.09	20.09	20.09	20.1	20.09
2	20.04	20.05	20.04	20.04	20.04	20.05	20.04	20.05	20.05
3	19.68	19.67	19.68	19.68	19.67	19.68	19.67	19.67	19.68
4	20.09	20.08	20.09	20.09	20.08	20.08	20.08	20.08	20.09
5	19.8	19.79	19.8	19.8	19.8	19.79	19.79	19.8	19.8
6	20.05	20.06	20.07	20.05	20.06	20.06	20.06	20.05	20.05
7	20.09	20.09	20.09	20.08	20.09	20.09	20.09	20.08	20.08
8	19.65	19.64	19.64	19.65	19.64	19.64	19.65	19.65	19.65
9	20.06	20.06	20.07	20.06	20.07	20.07	20.06	20.06	20.06
10	19.66	19.67	19.67	19.67	19.67	19.66	19.66	19.67	19.67

	Std. Dev.	% Contribution	% TV	% Tol		
Repeatability (EV):	0.005317	0.1%	3.8%	8.0%	**R bar:**	0.009000
Reproducibility (AV):	0.000000	0.0%	0.0%	0.0%	**UCL-R:**	0.023220
Appraiser x Part (INT):					**Study Variation:**	0.140971
GRR:	**0.005317**	**0.1%**	**3.8%**	**8.0%**	**Total Variation (TV):**	0.140971
Part-to-Part (PV):	0.140871	99.9%	99.9%	99.7%	**Tolerance/6 (Tol):**	0.066667
	number of distinct categories:		37.4	17.6		

* 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 Skaggs Date: 3/17/2020

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GRR Analysis Sheet

Study Date:	1/16/2020 12:00:00 AM	**Company Part No.:**	Mold 268
Gage ID:	05476117	**Part No.:**	
Gage Desc:	0 - 150 Caliper	**Part Desc:**	HW09-RET-064
Appraisers:	3 **Trials:** 3	**Characteristic:**	Length
Study Type:	Long-AIAG 4	**Specification Limits:**	19.7 20.1
R bar A =	0.010000 X bar A = 19.922333	**6 Sigma Process Variation:**	
R bar B =	0.009000 X bar B = 19.921000	**Pp (or Ppk) Target:**	
R bar C =	0.008000 X bar C = 19.920667		
R bar =	**0.0090000** X bar Diff = **0.001667**	Rp = **0.447777**	Tol/6 = **0.066667**

Measurement Unit Analysis	**% Total Variation (TV)**	**% Tolerance**
Repeatability - Equipment Variation (EV) EV = R bar x K1 = **0.005317** Trials K1: 2 0.8862; 3 0.5908	% EV = 100 [EV / TV] = **3.8%**	% EV = 100 [EV / (Tol / 6)] = **8.0%**
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 = $\sqrt{(EV^2 + AV^2)}$ = **0.005317**	%GRR = 100 [GRR / TV] = **3.8%**	% GRR = 100 [GRR / (Tol / 6)] = **8.0%**
Part Variation (PV) PV = Rp x K3 = **0.140871** 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)] = **99.7%**
	In MSA4, for % Tolerance, PV = SQRT [(Tol / 6)^2 - (GRR)^2]	
	ndc = 1.41(PV/GRR) = **37.4**	ndc = 1.41(PV/GRR) = **17.6**
Total Variation (TV) TV = $\sqrt{(GRR^2 + PV^2)}$ = 0.140971	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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DaimlerChrysler Ford GM

Production Part Approval
Dimensional Test Results

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS	PART NUMBER: 6098-6047
SUPPLIER/VENDOR CODE:	PART NAME: FODR-59F-A-ASSY
NAME OF INSPECTION FACILITY:	DESIGN RECORD CHANGE LEVEL: 9U5T-14489-AC P1 06/26/13
Sumitomo Electric Wiring Systems Plt. 5	ENGINEERING CHANGE DOCUMENTS NA

ITEM	DIMENSION / SPECIFICATION	SPECIFICATION / LIMITS		TEST DATE	QTY. TESTED	ORGANIZATION MEASUREMENT RESULTS (DATA)						OK	NOT OK
1	31.60	-0.50	0.50	6/11/19	6	31.61	31.60	31.60	31.61	31.61	31.61	O	
2	51.20	-0.80	0.80			51.19	51.18	51.15	51.20	51.17	51.17	O	

Blanket statements of conformance are unacceptable for any test results.

SIGNATURE	TITLE	DATE
Tammy Lonas	PPAP Operator	6/11/2019

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FODR-59F-ASSY**
PART NO (s): **6098-6047, 6098-6134**
Mold #: **1624**

Tested by/Date: Christi Cornwell 5/22/18
Design Rec. Change level/date:
9U5T-14489-AC P1 6/26/2013
Eng. Change Documents: NA

CAVITY #:↓

M25	51.20 +.8 -.8	31.60 +.5 -.5	M26	51.20 +.8 -.8	31.60 +.5 -.5	M27	51.20 +.8 -.8	31.60 +.5 -.5	
1	51.05	31.33		51.02	31.32		51.02	31.32	
2	51.03	31.34		51.01	31.31		51.03	31.32	
3	51.02	31.34		51.02	31.33		51.03	31.32	
4	51.03	31.34		51.02	31.32		51.03	31.32	
5	51.04	31.34		51.02	31.32		51.01	31.31	
6	51.03	31.34		51.01	31.31		51.03	31.32	
7	51.02	31.33		51.02	31.32		51.02	31.32	
8	51.01	31.33		51.03	31.32		51.03	31.31	
9	51.02	31.34		51.02	31.31		51.02	31.31	
10	51.04	31.34		51.02	31.32		51.03	31.32	
11	51.04	31.35		51.00	31.30		51.03	31.31	
12	51.04	31.34		51.00	31.30		51.01	31.30	
13	51.05	31.35		51.01	31.31		51.04	31.31	
14	51.02	31.34		51.02	31.31		51.03	31.31	
15	51.02	31.34		51.02	31.31		51.02	31.30	
16	51.02	31.33		51.02	31.30		51.02	31.30	
17	51.03	31.35		51.02	31.32		51.03	31.30	
18	51.04	31.35		51.02	31.30		51.00	31.30	
19	51.03	31.34		51.01	31.31		51.01	31.31	
20	51.05	31.35		51.03	31.31		51.02	31.30	
21	51.03	31.35		51.01	31.30		51.04	31.31	
22	51.02	31.33		51.00	31.29		51.01	31.31	
23	51.03	31.35		51.01	31.31		51.02	31.31	
24	51.04	31.35		51.02	31.30		51.03	31.30	
25	51.04	31.35		51.02	31.31		51.02	31.31	
26	51.02	31.33		51.02	31.31		51.03	31.31	
27	51.04	31.34		51.03	31.31		51.01	31.31	
28	51.04	31.35		51.01	31.31		51.02	31.31	
29	51.03	31.34		51.02	31.31		51.05	31.31	
30	51.02	31.33		51.02	31.31		51.00	30.30	

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FODR-59F-ASSY**
PART NO (s): **6098-6047, 6098-6134**
Mold #: **1624**

Tested by/Date: Christi Cornwell 5/22/18
Design Rec. Change level/date:
9U5T-14489-AC P1 6/26/2013
Eng. Change Documents: NA

CAVITY #:↓

M25	51.20 +.8 -.8	31.60 +.5 -.5	M26	51.20 +.8 -.8	31.60 +.5 -.5	M27	51.20 +.8 -.8	31.60 +.5 -.5	
31	51.03	31.32		51.00	31.30		51.01	31.30	
32	51.02	31.33		51.02	31.30		51.01	31.30	
33	51.02	31.33		51.01	31.31		51.00	31.30	
34	51.03	31.33		51.01	31.29		51.01	31.30	
35	51.03	31.35		51.03	31.31		51.01	31.30	
36	51.03	31.34		51.01	31.30		51.01	31.30	
37	51.02	31.33		51.02	31.30		51.01	31.31	
38	51.02	31.34		51.00	31.29		51.01	31.30	
39	51.03	31.34		51.03	31.31		51.02	31.30	
40	51.04	31.34		51.01	31.30		51.02	31.30	
41	51.02	31.34		51.01	31.30		51.02	31.30	
42	51.02	31.33		51.02	31.31		51.03	31.30	
43	51.03	31.35		51.01	31.30		51.02	31.30	
44	51.02	31.33		51.01	31.30		51.00	31.30	
45	51.02	31.33		51.02	31.31		51.01	31.31	
46	51.03	31.34		51.01	31.30		51.02	31.30	
47	51.02	31.34		51.00	31.30		51.01	31.32	
48	51.03	31.32		51.00	31.29		51.00	31.30	
49	51.03	31.32		51.00	31.29		51.00	31.31	
50	51.03	31.34		51.00	31.29		51.03	31.30	
51	51.03	31.34		51.01	31.29		51.01	31.30	
52	51.02	31.34		51.02	31.30		51.02	31.30	
53	51.02	31.34		51.01	31.30		51.02	31.31	
54	51.02	31.34		51.02	31.30		51.02	31.30	
55	51.03	31.34		51.00	31.30		51.02	31.30	
56	51.04	31.35		51.02	31.30		51.02	31.30	
57	51.03	31.32		51.02	31.30		51.01	31.31	
58	51.03	31.34		51.03	31.31		51.01	31.30	
59	51.02	31.34		51.02	31.30		51.01	31.31	
60	51.03	31.34		51.03	31.31		51.03	31.30	

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FODR-59F-ASSY**
PART NO (s): **6098-6047, 6098-6134**
Mold #: **1624**

Tested by/Date: Christi Cornwell 5/22/18
Design Rec. Change level/date:
9U5T-14489-AC P1 6/26/2013
Eng. Change Documents: NA

CAVITY #:↓

M25	51.20 +.8 -.8	31.60 +.5 -.5	M26	51.20 +.8 -.8	31.60 +.5 -.5	M27	51.20 +.8 -.8	31.60 +.5 -.5	
61	51.02	31.32		51.02	31.31		51.04	31.32	
62	51.03	31.34		51.01	31.30		51.03	31.30	
63	51.03	31.34		51.01	31.30		51.02	31.32	
64	51.02	31.33		51.02	31.30		51.02	31.30	
65	51.05	31.35		51.02	31.31		51.01	31.31	
66	51.04	31.35		51.01	31.30		51.02	31.31	
67	51.03	31.33		51.00	31.30		51.00	31.30	
68	51.04	31.35		51.00	31.30		51.02	31.31	
69	51.04	31.34		51.02	31.30		51.02	31.30	
70	51.04	31.34		51.02	31.31		51.01	31.32	
71	51.05	31.35		51.02	31.31		51.01	31.30	
72	51.03	31.33		51.01	31.31		51.03	31.31	
73	51.05	31.33		51.00	31.30		51.02	31.30	
74	51.04	31.34		51.03	31.32		51.02	31.30	
75	51.03	31.34		51.02	31.30		51.03	31.30	
76	51.03	31.33		51.02	31.31		51.01	31.31	
77	51.04	31.35		51.03	31.32		51.01	31.30	
78	51.04	31.35		51.01	31.30		51.00	31.30	
79	51.02	31.34		51.01	31.31		51.04	31.30	
80	51.02	31.34		51.01	31.30		51.03	31.31	
81	51.03	31.34		51.00	31.30		51.02	31.30	
82	51.05	31.35		51.01	31.30		51.03	31.31	
83	51.05	31.35		51.00	31.30		51.02	31.30	
84	51.04	31.35		51.01	31.30		51.02	31.31	
85	51.02	31.33		51.01	31.30		51.03	31.30	
86	51.03	31.34		51.01	31.30		51.00	31.31	
87	51.03	31.34		51.00	31.30		51.02	31.30	
88	51.01	31.34		51.01	31.30		51.01	31.29	
89	51.03	31.34		51.03	31.31		51.01	31.30	
90	51.03	31.34		51.01	31.30		51.01	31.29	

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FODR-59F-ASSY**
PART NO (s): **6098-6047, 6098-6134**
Mold #: **1624**

Tested by/Date: Christi Cornwell 5/22/18
Design Rec. Change level/date:
9U5T-14489-AC P1 6/26/2013
Eng. Change Documents: NA

CAVITY #:

M25	51.20 +.8 -.8	31.60 +.5 -.5	M26	51.20 +.8 -.8	31.60 +.5 -.5	M27	51.20 +.8 -.8	31.60 +.5 -.5	
91	51.04	31.35		51.01	31.30		51.00	31.30	
92	51.02	31.33		51.02	31.30		51.02	31.30	
93	51.03	31.33		51.03	31.31		51.01	31.29	
94	51.05	31.35		51.03	31.30		51.02	31.29	
95	51.02	31.33		51.02	31.30		51.02	31.29	
96	51.02	31.34		51.02	31.31		51.03	31.29	
97	51.02	31.33		51.02	31.31		51.03	31.30	
98	51.03	31.34		51.03	31.31		51.01	31.29	
99	51.03	31.34		51.01	31.30		51.03	31.29	
100	51.03	31.33		51.02	31.31		51.01	31.30	

average	51.03	31.34	51.01	31.30	51.02	31.30
minimum	51.01	31.32	51.00	31.29	51.00	31.29
maximum	51.05	31.35	51.03	31.33	51.05	31.32
range	0.04	0.03	0.03	0.04	0.05	0.03
std dev	0.01	0.01	0.01	0.01	0.01	0.01
LSL	**50.40**	**31.10**	**50.40**	**31.10**	**50.40**	**31.10**
NOM	**51.20**	**31.60**	**51.20**	**31.60**	**51.20**	**31.60**
USL	**52.00**	**32.10**	**52.00**	**32.10**	**52.00**	**32.10**
CPK	21.45792204	9.623425208	22.28318058	8.562537703	19.14959968	8.565473179

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FODR-59F-ASSY**
PART NO (s): **6098-6047, 6098-6134**
Mold #: **1624**

Tested by/Date: Christi Cornwell 5/22/18
Design Rec. Change level/date:
9U5T-14489-AC P1 6/26/2013
Eng. Change Documents: NA

CAVITY #:↓

M28	51.20 +.8 -.8	31.60 +.5 -.5	M29	51.20 +.8 -.8	31.60 +.5 -.5	M30	51.20 +.8 -.8	31.60 +.5 -.5	
1	51.03	31.32		51.03	31.35		51.00	31.30	
2	51.04	31.32		51.04	31.35		51.03	31.32	
3	51.04	31.32		51.04	31.36		51.01	31.31	
4	51.05	31.33		51.05	31.36		51.01	31.31	
5	51.06	31.34		51.02	31.34		51.02	31.31	
6	51.05	31.32		51.03	31.35		51.03	31.32	
7	51.04	31.33		51.03	31.35		51.03	31.32	
8	51.04	31.32		51.04	31.35		51.01	31.31	
9	51.04	31.33		51.05	31.36		51.01	31.31	
10	51.05	31.33		51.03	31.34		51.01	31.31	
11	51.02	31.30		51.04	31.33		51.01	31.30	
12	51.01	31.30		51.04	31.33		51.02	31.30	
13	51.01	31.30		51.03	31.34		51.00	31.30	
14	51.01	31.30		51.01	31.34		51.02	31.30	
15	51.01	31.30		51.02	31.32		51.00	31.30	
16	51.01	31.30		51.02	31.34		51.00	31.30	
17	51.04	31.31		51.03	31.33		51.03	31.30	
18	51.04	31.32		51.01	31.33		51.03	31.30	
19	51.04	31.31		51.05	31.33		51.02	31.30	
20	51.03	31.31		51.03	31.34		51.01	31.30	
21	51.03	31.31		51.04	31.34		51.00	31.30	
22	51.02	31.31		51.02	31.32		51.01	31.30	
23	51.02	31.30		51.02	31.33		51.02	31.30	
24	51.02	31.31		51.03	31.33		51.03	31.30	
25	51.02	31.31		51.01	31.33		51.01	31.30	
26	51.01	31.31		51.01	31.33		51.00	31.30	
27	51.03	31.31		51.02	31.34		51.02	31.30	
28	51.01	31.30		51.00	31.32		51.01	31.30	
29	51.04	31.32		51.02	31.32		51.02	31.30	
30	51.02	31.30		51.04	31.33		51.00	31.30	

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FODR-59F-ASSY**
PART NO (s): **6098-6047, 6098-6134**
Mold #: **1624**

Tested by/Date: Christi Cornwell 5/22/18
Design Rec. Change level/date:
9U5T-14489-AC P1 6/26/2013
Eng. Change Documents: NA

CAVITY #:↓

M28	51.20 +.8 -.8	31.60 +.5 -.5	M29	51.20 +.8 -.8	31.60 +.5 -.5	M30	51.20 +.8 -.8	31.60 +.5 -.5	
31	51.02	31.31		51.02	31.34		51.01	31.30	
32	51.02	31.30		51.03	31.32		51.01	31.30	
33	51.00	31.30		51.02	31.33		51.03	31.30	
34	51.02	31.31		51.03	31.33		51.00	31.29	
35	51.01	31.29		51.02	31.33		51.00	31.29	
36	51.03	31.31		51.02	31.32		51.03	31.31	
37	51.04	31.32		51.04	31.32		51.00	31.29	
38	51.03	31.31		51.01	31.33		51.02	31.31	
39	51.02	31.31		51.02	31.32		51.00	31.29	
40	51.01	31.30		51.01	31.33		51.00	31.29	
41	51.03	31.32		51.02	31.32		51.01	31.30	
42	51.01	31.30		51.02	31.33		51.01	31.29	
43	51.03	31.31		51.01	31.33		51.01	31.30	
44	51.05	31.33		51.04	31.32		51.00	31.29	
45	51.03	31.31		51.01	31.33		51.02	31.30	
46	51.03	31.31		51.01	31.32		51.00	31.29	
47	51.02	31.31		51.02	31.33		51.00	31.29	
48	51.03	31.31		51.03	31.34		51.01	31.30	
49	51.00	31.30		51.02	31.32		51.00	31.30	
50	51.03	31.31		51.02	31.34		51.00	31.29	
51	51.02	31.30		51.03	31.34		51.00	31.29	
52	51.02	31.31		51.03	31.32		51.00	31.29	
53	51.02	31.31		51.03	31.32		51.00	31.30	
54	51.03	31.31		51.02	31.32		51.00	31.29	
55	51.00	31.29		51.01	31.33		51.00	31.30	
56	51.00	31.29		51.01	31.33		51.02	31.30	
57	51.03	31.31		51.01	31.33		51.03	31.30	
58	51.00	31.30		51.02	31.33		51.01	31.29	
59	51.00	31.29		51.02	31.33		51.00	31.30	
60	51.02	31.30		51.04	31.33		51.00	31.29	

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FODR-59F-ASSY**
PART NO (s): **6098-6047, 6098-6134**
Mold #: **1624**

Tested by/Date: Christi Cornwell 5/22/18
Design Rec. Change level/date:
9U5T-14489-AC P1 6/26/2013
Eng. Change Documents: NA

CAVITY #:↓

M28	51.20 +.8 -.8	31.60 +.5 -.5	M29	51.20 +.8 -.8	31.60 +.5 -.5	M30	51.20 +.8 -.8	31.60 +.5 -.5	
61	51.01	31.30		51.01	31.32		51.00	31.30	
62	51.02	31.31		51.02	31.34		51.00	31.30	
63	51.03	31.32		51.04	31.32		51.00	31.29	
64	51.00	31.30		51.04	31.32		51.00	31.30	
65	51.01	31.30		51.02	31.31		51.01	31.29	
66	51.04	31.33		51.04	31.33		51.01	31.30	
67	51.03	31.31		51.04	31.32		51.00	31.29	
68	51.03	31.32		51.01	31.31		51.00	31.29	
69	51.01	31.30		51.04	31.33		51.03	31.31	
70	51.04	31.32		51.04	31.33		51.00	31.30	
71	51.03	31.31		51.03	31.34		51.00	31.30	
72	51.01	31.30		51.01	31.33		51.00	31.29	
73	51.01	31.30		51.01	31.34		51.02	31.30	
74	51.00	31.30		51.03	31.34		51.02	31.30	
75	51.03	31.31		51.03	31.33		51.00	31.29	
76	51.03	31.30		51.03	31.31		51.00	31.30	
77	51.00	31.29		51.03	31.34		51.03	31.31	
78	51.04	31.31		51.04	31.32		51.00	31.29	
79	51.00	31.29		51.02	31.30		51.01	31.30	
80	51.03	31.31		51.02	31.34		51.00	31.29	
81	51.02	31.31		51.00	31.32		51.01	31.29	
82	51.03	31.31		51.00	31.33		51.01	31.29	
83	51.03	31.31		51.03	31.33		51.03	31.30	
84	51.01	31.30		51.04	31.32		51.02	31.30	
85	51.03	31.31		51.03	31.34		51.01	31.30	
86	51.02	31.30		51.01	31.34		51.03	31.29	
87	51.02	31.30		51.03	31.34		51.02	31.29	
88	51.03	31.30		51.03	31.32		51.00	31.29	
89	51.02	31.30		51.03	31.33		51.03	31.30	
90	51.01	31.30		51.01	31.31		51.03	31.30	

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FODR-59F-ASSY**
PART NO (s): **6098-6047, 6098-6134**
Mold #: **1624**

Tested by/Date: Christi Cornwell 5/22/18
Design Rec. Change level/date:
9U5T-14489-AC P1 6/26/2013
Eng. Change Documents: NA

CAVITY #:

M28	51.20 +.8 -.8	31.60 +.5 -.5	M29	51.20 +.8 -.8	31.60 +.5 -.5	M30	51.20 +.8 -.8	31.60 +.5 -.5	
91	51.05	31.31		51.02	31.33		51.00	31.29	
92	51.01	31.30		51.02	31.32		51.00	31.29	
93	51.03	31.32		51.00	31.31		51.01	31.30	
94	51.01	31.30		51.03	31.33		51.03	31.30	
95	51.02	31.30		51.02	31.34		51.02	31.30	
96	51.01	31.30		51.03	31.34		51.00	31.30	
97	51.02	31.30		51.01	31.31		51.01	31.30	
98	51.03	31.31		51.02	31.33		51.02	31.30	
99	51.01	31.30		51.03	31.34		51.02	31.30	
100	51.04	31.31		51.02	31.32		51.02	31.29	

average	51.02	31.31	51.02	31.33	51.01	31.30
minimum	51.00	31.29	51.00	31.30	51.00	31.29
maximum	51.06	31.34	51.05	31.36	51.03	31.32
range	0.06	0.05	0.05	0.06	0.03	0.03
std dev	0.01	0.01	0.01	0.01	0.01	0.01
LSL	**50.40**	**31.10**	**50.40**	**31.10**	**50.40**	**31.10**
NOM	**51.20**	**31.60**	**51.20**	**31.60**	**51.20**	**31.60**
USL	**52.00**	**32.10**	**52.00**	**32.10**	**52.00**	**32.10**
CPK	14.83780006	6.807667206	17.45840578	6.727395747	18.32941631	9.241422598

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FODR-59F-ASSY**
PART NO (s): **6098-6047, 6098-6134**
Mold #: **1624**

Tested by/Date: Christi Cornwell 5/22/18
Design Rec. Change level/date:
9U5T-14489-AC P1 6/26/2013
Eng. Change Documents: NA

CAVITY #:↓

M31	51.20 +.8 -.8	31.60 +.5 -.5	M32	51.20 +.8 -.8	31.60 +.5 -.5				
1	51.03	31.34		51.03	31.34				
2	51.01	31.32		51.04	31.35				
3	51.02	31.33		51.04	31.34				
4	51.01	31.33		51.04	31.34				
5	51.02	31.34		51.04	31.35				
6	51.01	31.33		51.04	31.34				
7	51.00	31.33		51.04	31.35				
8	51.01	31.33		51.05	31.34				
9	51.02	31.33		51.05	31.34				
10	51.02	31.32		51.02	31.33				
11	51.03	31.30		51.00	31.30				
12	51.01	31.30		51.00	31.31				
13	51.01	31.29		51.00	31.31				
14	51.00	31.30		51.02	31.33				
15	51.04	31.30		51.01	31.32				
16	51.00	31.30		51.04	31.33				
17	51.00	31.30		51.00	31.30				
18	51.03	31.30		51.02	31.32				
19	51.01	31.30		51.01	31.31				
20	51.02	31.30		51.02	31.32				
21	51.02	31.30		51.00	31.32				
22	51.00	31.29		51.03	31.32				
23	51.01	31.32		51.01	31.32				
24	51.02	31.30		51.01	31.32				
25	51.02	31.30		51.03	31.32				
26	51.03	31.30		51.03	31.33				
27	51.01	31.30		51.02	31.32				
28	51.01	31.30		51.01	31.31				
29	51.00	31.30		51.00	31.31				
30	51.02	31.31		51.00	31.31				

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	Reject Tag Procedure
Waterproof Test	Waterproof Tester	QAW - WATERPROOFTEST	Inspection Data Sheet	Reject Tag Procedure
Moisture Analysis (Reference Only)	Moisture Tester	F-A-SV5-010	Moisture Test Data Sheet	Reject Tag Procedure
Insertion / Retention Test	Force Gage Instron Tester	QAW - INSERTRETPROC QAW - InstronOperation	Inspection Data Sheet Data storage	Reject Tag Procedure
Dimensional Measurement	Profile / Caliper / Micrometer / Depth Gage / Keyence Measurement System	Inspection Instruction Sheet	Inspection Data Sheet	Reject Tag Procedure
Part Weight	Scale	Inspection Instruction Sheet	Inspection Data Sheet	Reject Tag Procedure
Freeze Test	Freezer	SWS Inspection Standard	Inspection Data Sheet	Reject Tag Procedure

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	Reject Tag Procedure
Waterproof Test	Waterproof Tester	QAW - WATERPROOFTEST	Inspection Data Sheet	Reject Tag Procedure
Insertion / Retention Test	Force Gage Instron Tester	QAW - INSERTRETPROC QAW - InstronOperation	Inspection Data Sheet Data storage	Reject Tag Procedure

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	Reject Tag Procedure
Part Weight	Scale	Inspection Instruction Sheet	Inspection Data Sheet	Reject Tag Procedure
Freeze Test	Freezer	SWS Inspection Standard	Inspection Data Sheet	Reject Tag Procedure

SV5 (Building 2) Tests Performed

TESTS PERFORMED	EQUIPMENT USED	TEST METHODS / STANDARD	RECORDING METHOD	REACTION METHOD
Hardness Test	Hardness Tester	H-A-001	Hardness Test Data Sheet	Reject Tag Procedure
Dimensional Measurement	Profile / Caliper / Micrometer / Depth Gage / Nikon MM-400	Inspection Instruction Sheet	Inspection Data Sheet	Reject Tag Procedure
Contact Force Test	Contact Force Gage	MSW-Force Gage	Inspection Data Sheet	Reject Tag Procedure
Dimensional Measurement	Profile / Keyence System / OGP / Caliper / Micrometer / Depth Gage / Slip Gages	SWS Inspection Standard	Inspection Data Sheet	Reject Tag Procedure

Equipment Calibrations

	EQUIPMENT USED	TEST METHODS / STANDARD	RECORDING METHOD	REACTION METHOD
Calipers, Micrometers, Depth Gages, Weigh Scales, other process tools/jigs.	Certified Gages (Gage Blocks & Weights)	**Per Calibration Procedure**	Calibration Record and Gagetrak	Reject Tag Procedure
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	Outside Vendor			
OGP	Outside Vendor			
NIKON MM-400	Outside Vendor			
INSTRON Tensile Tester	Outside Vendor			

PN 6098-6047

'TORAY'

Innovation by Chemistry

Toray Resin Company, 821 W. Mausoleum Road, Shelbyville, Indiana 46176

Grade:	5101S01B
Lot:	R30619
Date:	07/30/19

Certification of Properties				
Test	Method	Unit	Specification	Result
Visual	.	.	Same as Std.	Good
Color	.	.	Same as Std.	Good
MFR	ISO 1133	g/10 min.	6.7~9.2	7.4
Tensile strength	ISO 527	MPa	Min. 45	53.6
Tensile elongation	ISO 527	%	Min. 8	16.1
Charpy - notched	ISO 179	kJ/m2	Min. 4	5.5

For the ship date, please see the BOL. For the ship quantity, please see the BOL.

Toray Resin Company certifies the above results are in accordance with our Quality Management System

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