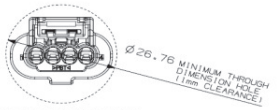
APPLICABLE COMPONENTS

ITEM	DESCRIPTION	MANDATORY (YES/NO)	TERMINAL CAVITY MIN/MAX OD	PLATING/ MATERIAL	FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.
1	TRCB837 / 1.2mm (APPLICABLE CAVITIES 1-4)	NO	0/ 3.5x4.5	REFERENCE TRC	N/A	N/A
2	WIRE SEAL	NO	N/A	SILICONE	HU5T-10C930-JA	A-0611-H
3	WIRE SEAL	NO	N/A	SILICONE	HU5T-10C930-HA	A-0611-G
4	WIRE SEAL	NO	N/A	SILICONE	HU5T-10C930-GA	A-0611-F
5	SEAL PLUG	NO	N/A	SILICONE	AU5T-10C930-CA	A0412

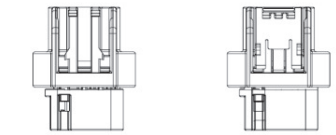


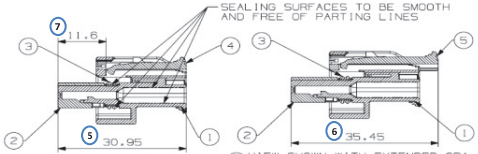

ISOMETRIC VIEW
SCALE 1:1

CONNECTOR ASSEMBLY CHART

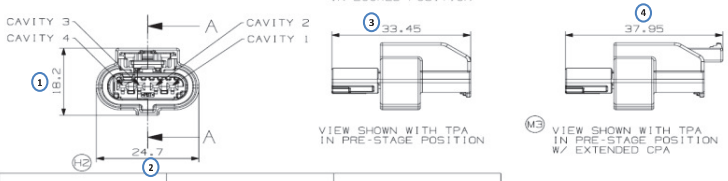
ASSEMBLY PART NO.'S				MATING COMPONENT		
FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.	MAX. TEMP.	VIBRATION CLASS	FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.	
EU5T-14A464-XB	6189-7460	150° C	V3	TBD	TBD	
EU5T-14A464-AKA	6189-7679	150° C	V3	TBD	TBD	H1
JU5T-14A464-EA	6189-7833	150° C	V3	TBD	TBD	K1
JU5T-14A464-DAA	6189-7832	150° C	V3	TBD	TBD	M2
LU5T-14A464-AXA	6189-8292	150° C	V3	TBD	TBD	

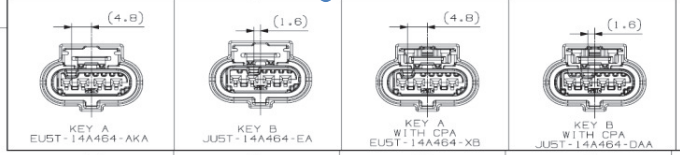
ITEM	DESCRIPTION	COLOR	FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.	MATERIAL /SPEC. NO.	RECYCLING CODE	WEIGHT	NO OF ITEMS REQUIRED				
1	FEMALE HOUSING KEY A	BLACK	N/A	6185-5162	PBT/WSS-M99P23-B	PBT	3.18g	1	1			1
	FEMALE HOUSING KEY B	BLACK	N/A	6185-5460	PBT/WSS-M99P23-B	PBT	3.18g			1	1	
2	FEMALE TPA KEY A	NATURAL	N/A	6910-7261	PBT/WSS-M99P23-B	PBT	0.48g	1	1			1
	FEMALE TPA KEY B	LT GREY	N/A	6910-7742	PBT/WSS-M99P23-B	PBT	0.48g			1	1	
G1 3	PERIMETER SEAL	TAN	N/A	7135-0700	HS = 30	VMQ	0.11g	1	1	1	1	1
4	CPA	NATURAL	N/A	6910-7263	PBT/WSS-M99P23-B	PBT	0.52g	1			1	
M1 5	EXTENDED CPA	RED	N/A	6910-8399	PBT/WSS-M99P23-B	PBT	0.71g					1


OPTION WITHOUT CPA



VIEW SHOWN WITH TPA IN LOCKED POSITION





NOTES:
1. PARTS CONFORM TO THE ELECTRICAL CONNECTION SYSTEM DESIGN SPECIFICATION (SDS) REV. 21, DATED JUN 2011.
2. PARTS CONFORM TO THE LATEST LEVEL OF USCAR 2, REV5 DATED NOV 2007, FOR COMPONENT TEMPERATURE CLASS 4, FOR PERFORMANCE CRITERIA AND EXCEPTIONS SEE SUMITOMO DVP&R.
3. MAXIMUM MATING FORCE FULLY POPULATED WITH Sn TERMINALS IS 32.9 [N]. Ag TERMINALS IS 26.7 [N].
4. TERMINAL EXTRACTION TOOLS: 23730003
5. SEALING SURFACES AS INDENTIFIED ON THIS DRAWING ARE SMOOTH AND FREE OF PARTING LINES.
6. CONNECTOR IS RATED AS ERGONOMIC CLASS 2 (HAND GRASP) BASED ON USCAR-25 REV1 CONNECTOR PUSH SURFACE AREA IS 192.5mm²
7. N/A
8. FOR INTERFACE VIEWS PLEASE SEE EWCAP
   I20-S-004-1-Z01
   I20-S-004-1-Z02
   FOR HEADER BLADE INFORMATION SEE EWCAP DRAWING EWCAP-001.
9. ---REMOVED---
L4 H3 10.---REMOVED---
11.---REMOVED---

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

JU5T-14A464-EA	
EU5T-14A464-AKA	
JU5T-14A464-DAA	

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	
G1 WAS GREEN				
AELE E 11783930 345				20141007
J.SANKARI	M.SPENCER	J.PITTENGER	SUMITOMO	
RELEASED JU5T-14A464-EA				
H1 UPDATED CONNECTOR ASSEMBLY CHART H2 ADDED VIEW H3 REVISED NOTE 11				
AELE E 11783930 372				20150813
J.KIM	B. NATTER	J.PITTENGER	SUMITOMO	
J1 WAS AU5T-14603-EA				
AELE E 11783930 379				20151001
J.KIM	B. NATTER	J.PITTENGER	SUMITOMO	
RELEASED JU5T-14A464-DAA				
K1 UPDATED ASSEMBLY CHART K2 UPDATED KEY WAY VIEWS				
AELE E 11783930 399				20160208
J.KIM	N. TANIGAWA	J.PITTENGER	SUMITOMO	
L1 WAS DU5T-10C930-GAA L2 WAS DU5T-10C930-YA L3 WAS AU5T-10C930-BA L4 REMOVED NOTE 11				
AELE E 11783930-409				20161109
R.THOMAS	N. TANIGAWA	J.PITTENGER	SUMITOMO	
REMOVED REVISIONS A THRU F M1 ADDED EXTENDED CPA TO CHART M2 UPDATED ASSEMBLY CHART M3 ADDED VIEWS				
AELE E 11783930-486				20190517
E.FIELD	F. MAGDA	J.PITTENGER	SUMITOMO	
UPDATE DRAWING VIEW TO REFLECT PART				
AELE E 11783930-490				20190607
E.FIELD	F. MAGDA	J.PITTENGER	SUMITOMO	

SEWS

SEWS RELEASE LEVEL	PRODUCTION
APPLICATION	
SEWS DRAWING / PART NUMBER	SEE CHART
WEIGHT (g)	SEE CHART

REFERENCE: 4WAY SEALED FEMALE 1.20mm

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	CAD LOC.	CAD FILE PRT EU5T-14A464-XB DWG EU5T-14A464-XB	DTM IS MASTER
UG	TCE		
OPER. NO.	UNIT mm	DRAWING EU5T-14A464-XB	
DESIGN A	DETAIL A	TITLE SLV ASY WIR CONN FEM	SHT 1 OF 1
CHECKED MS	SAFETY		
SCALE 2:1	DATE 20121012	DIVISION PLANT	

Ford Motor Company

BRW SIZE A1/D

DaimlerChrysler Ford GM

Production Part Approval
Dimensional Test Results

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS	PART NUMBER: 1756-A
SUPPLIER/VENDOR CODE:	PART NAME: FOW120H04F-A
NAME OF INSPECTION FACILITY:	DESIGN RECORD CHANGE LEVEL: EU5T-14A464-XB M3 06/26/19
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
						M9	M10	M11	M12	M13	M14	M15	M16		
1	18.20	-0.30	0.30	2/22/21	8	18.24	18.21	18.18	18.21	18.20	18.17	18.18	18.21	O	
2	24.70	-0.30	0.30			24.78	24.78	24.79	24.73	24.73	24.72	24.72	24.75	O	
3	33.45	-0.30	0.30			33.34	33.45	33.58	33.49	33.46	33.50	33.41	33.45	O	
4	37.95	-0.30	0.30			37.70	37.78	37.91	37.87	37.96	37.86	37.89	37.93	O	
5	30.95	-0.30	0.30			30.92	30.91	30.97	30.95	30.94	30.95	30.96	30.97	O	
6	35.45	-0.30	0.30			35.36	35.40	35.55	35.46	35.51	35.38	35.44	35.39	O	
7	11.60	-0.30	0.30			11.53	11.66	11.59	11.69	11.65	11.68	11.67	11.66	O	

Blanket statements of conformance are unacceptable for any test results.

SIGNATURE	TITLE	DATE
Brandy Stout	PPAP Operator	2/22/2021

PN 6189-7460

'TORAY'
Innovation by Chemistry

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

Grade {PBT Toraycon}:	5108X01B
Lot:	R33406
Date:	09/14/2021

Certification of Properties

Test	Method	Unit	Specification	Result
Visual	-	-	Same as Std.	Good
Color	-	-	Same as Std.	Good
MFR	ISO 1133	g/10 min.	Min. 8 Max. 14.0	11.5
Tensile Strength	ISO 527	MPa	Min. 42	52.6
Tensile Elongation	ISO 527	%	Min. 14	23.7
Charpy, Notched	ISO 179	KJ/m2	Min. 5	7.0
Flexural Strength	ISO 178	MPa	Min. 70	72.2
Flexural Modulus	ISO 178	MPa	Min. 1700	2077

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

See the BOL for ship date and quantity

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

4/18/2018	Update Operation sequence #'s. Remove Automatic bulk / Non bulk packaging and labeling operation (moved to FRK).	R. Gonzalez, L. Roth, P. Keith, A. Davidson
4/3/2014	Update process - Packing	L. Roth
3/30/2011	Update process - Packing	L. Roth
1/25/2008	Update process 101	J Fraim
9/27/2005	Update Information	D Karleskint
8/25/2005	Update Information	J Fraim , J Saylors
1/25/2005	Update Information	J Fraim L Roth, J Renfrow, D Gillenwater
4/7/2004	Update information	D Gillenwater, G Smith, J Renfrow
3/13/2001	Update Information	T. Gravil, R. Ramsey, D.Lyons
2/06/2001	Update Information	T.Gravil
1/8/2000	ISSUED WITH FORMAT CHANGES	T.Day
6/04/1999	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 AS ASSYD | PART AS RECD | OPERATION | INSPECTION | OPERATION/ INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

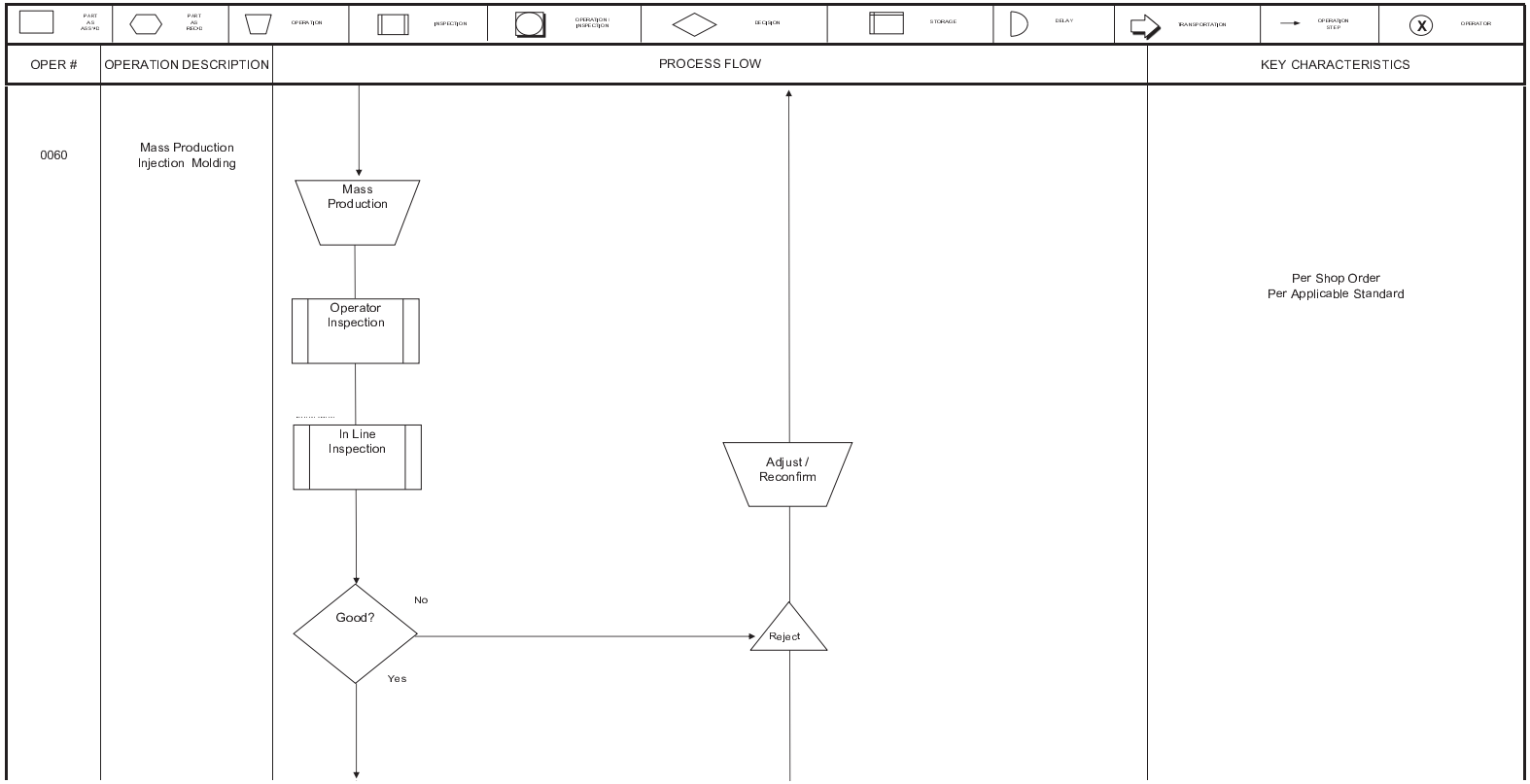
OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
010	Receive Raw Material	Purchased Raw Material	Visual Comparison Against Packing List Shipping-Receiving
	Reject for non-conformance	Good? No → Reject; Yes	Notify Quality Assurance Red Tag Procedure & Return to Vendor
0020	Quality Assurance 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	

PART AS ASSYD | PART AS RECD | OPERATION | INSPECTION | OPERATION/ INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

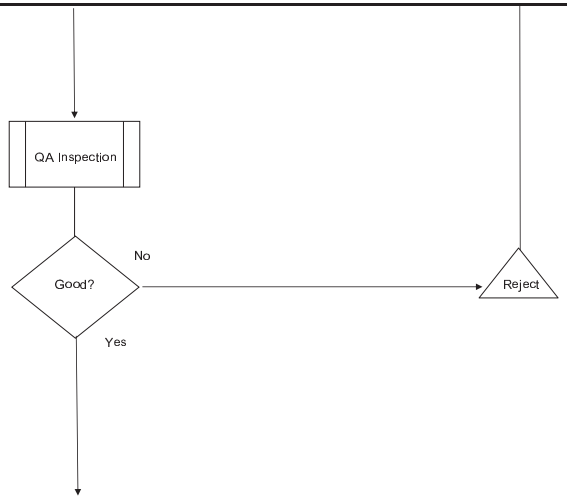
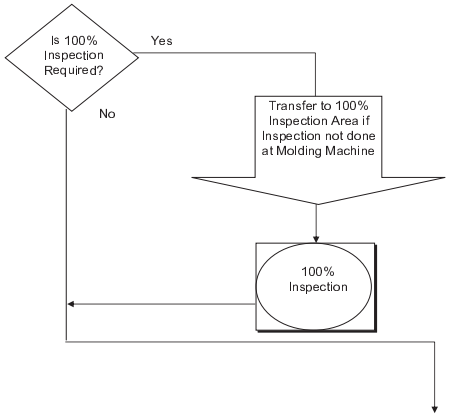
OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
	Material Staging	Deliver to Raw Material Staging Area	
0040	Raw Material Loading	MATERIAL LOADING	Injection Molding Machine

PART AS ASSYD | PART AS RECD | OPERATION | INSPECTION | OPERATION/ INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
0050	Set-up Injection Molding Machine	Machine Set-Up	
	Raw Material Mold Numbers Process Parameters Regrind Ratio Raw Material Dryers	Safety Checks	Per Shop Order Per Applicable Standard
		Correct Mold	
		Automatic Reject	
		Set-up Inspection	
		Submit Samples to QA	# Part Dimension / Function
		Adjust/ Reconfirm	
		Good?	
	Reject for non-conformance	No → Reject	Make Adjustments, Reverify Parts, Mold Sent to Maintenance or Stop Production if applicable
		Yes	


PART AS ASSYD
PART AS RECD
OPERATION
INSPECTION
OPERATION/ INSPECTION
DECISION
STORAGE
DELAY
TRANSPORTATION
OPERATION STEP
OPERATOR
OPER #
OPERATION DESCRIPTION
PROCESS FLOW
KEY CHARACTERISTICS
0060
Mass Production
Injection Molding
Mass Production
Operator Inspection
In Line Inspection
Good?
No
Yes
Reject
Adjust / Reconfirm
Per Shop Order
Per Applicable Standard

PART AS ASSYD | PART AS RECD | OPERATION | INSPECTION | OPERATION/ INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
0070	Quality Assurance Inspection Reject for non-conformance		# Part Dimension / Function / Visual Notify Manufacturing Leader /QA Eng. Reject Tag Procedure
	Material Staging for Inspection 100% Inspection (when applicable)		Visual Inspection

PART AS ASSYD | PART AS RECD | OPERATION | INSPECTION | OPERATION/ INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
0080	Material Staging for Bulk Packaging / Labeling	Package and Labeling at Machine	Per Packaging Style and Shop Order
	Packaging and Labeling at Machine	Material Staging	
0090	Transfer Packaged Parts to Storage	Transfer to Finished Goods Storage Transfer to Shipping	
0100	Finished Goods Storage	Finished Goods/ Storage.	
0110	Finish Goods Inventory Assessment	Finished Goods Inventory Assessment	
		Finished goods may be in-house or an off site warehouse.	
0120	Finished Goods Dock Audit (weekly) Random	Shipping Dock Audit	Quantity Identification
0130	Finished Goods Shipping	Finished Goods/ Shipping	Shipping Label
		Shipped to Customer	

PROCESS FLOW DIAGRAM

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DATE	CHANGE POINTS	CORE / DEVELOPMENT TEAM
ISSUE/REVISION HISTORY		

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

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	Raw Material Inventory Assessment	Raw Material Inventory Assessment	

PART AS ASSYD | PART AS RECD | OPERATION | INSPECTION | OPERATION/ INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

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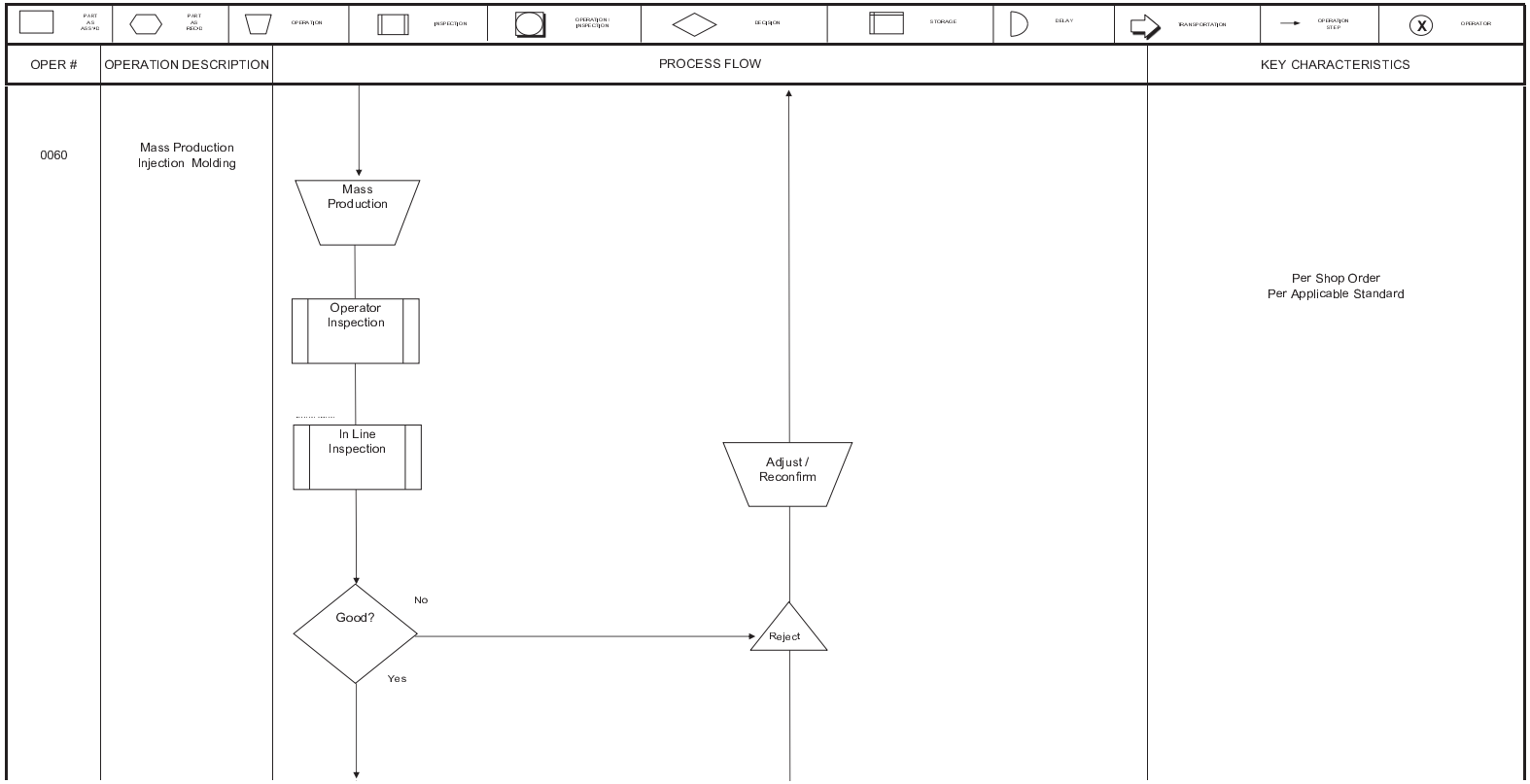
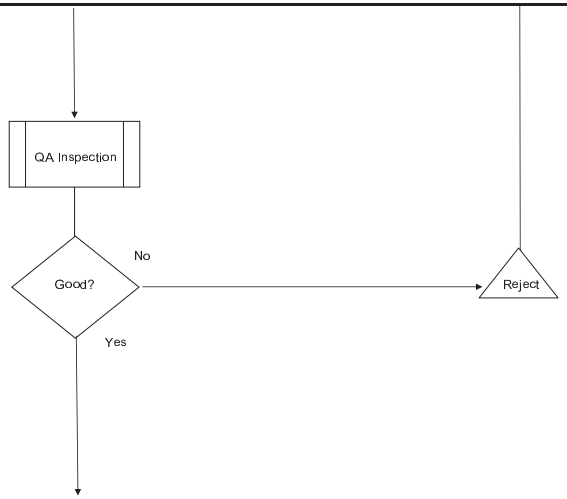
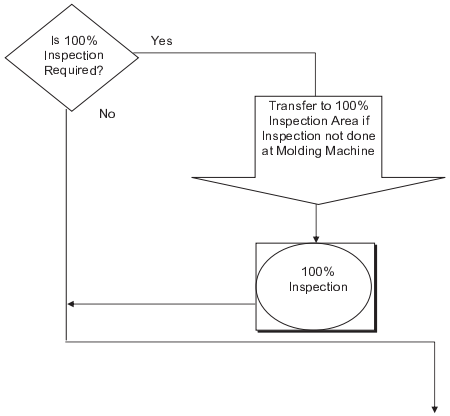
		Correct Mold	
		Automatic Reject	
		Set-up Inspection	
		Submit Samples to QA	# Part Dimension / Function
		Adjust/ Reconfirm	
		Good?	
	Reject for non-conformance	No → Reject	Make Adjustments, Reverify Parts, Mold Sent to Maintenance or Stop Production if applicable
		Yes	


PART AS ASSYD
PART AS RECD
OPERATION
INSPECTION
OPERATION/ INSPECTION
DECISION
STORAGE
DELAY
TRANSPORTATION
OPERATION STEP
OPERATOR
OPER #
OPERATION DESCRIPTION
PROCESS FLOW
KEY CHARACTERISTICS
0060
Mass Production
Injection Molding
Mass Production
Operator Inspection
In Line Inspection
Good?
No
Yes
Reject
Adjust / Reconfirm
Per Shop Order
Per Applicable Standard

PART AS ASSYD | PART AS RECD | OPERATION | INSPECTION | OPERATION/ INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

OPER #	OPERATION DESCRIPTION	PROCESS FLOW	KEY CHARACTERISTICS
0070	Quality Assurance Inspection Reject for non-conformance		# Part Dimension / Function / Visual Notify Manufacturing Leader /QA Eng. Reject Tag Procedure
	Material Staging for Inspection 100% Inspection (when applicable)		Visual Inspection

PART AS ASSYD | PART AS RECD | OPERATION | INSPECTION | OPERATION/ INSPECTION | DECISION | STORAGE | DELAY | TRANSPORTATION | OPERATION STEP | OPERATOR

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		Finished goods may be in-house or an off site warehouse.	
0120	Finished Goods Dock Audit (weekly) Random	Shipping Dock Audit	Quantity Identification
0130	Finished Goods Shipping	Finished Goods/ Shipping	Shipping Label
		Shipped to Customer	

Sumitomo Electric Wiring Systems, Inc

Gage R&R Study

Study Date: 1/8/2019 12:00:00 AM
Company Part No.: Mold 268
Gage ID: 05476117
Part No.:
Gage Desc: 0 - 150 Caliper
Part Desc: HW09-RET-06F
Appraisers: 3 **Trials:** 3 **Parts:** 10
Characteristic: Length
Study Type:
Specification Limits: **Min** 19.7 **Max** 20.1
MSA Version: 4
☑ **Approved** **Pp (or Ppk) Target** **6-Sigma Proc Variation**

	Appr A: T. Holland			Appr B: E Skaggs			Appr C: M Haddix		
1	20.1	20.09	20.09	20.09	20.09	20.1	20.09	20.09	20.09
2	20.03	20.02	20.02	20.02	20	20.01	20.03	20.03	20.03
3	19.68	19.67	19.67	19.67	19.68	19.67	19.68	19.68	19.67
4	20.08	20.07	20.07	20.07	20.07	20.07	20.08	20.07	20.07
5	19.81	19.81	19.8	19.8	19.81	19.8	19.81	19.8	19.8
6	20.04	20.03	20.03	20.03	20.04	20.04	20.05	20.05	20.04
7	20.09	20.09	20.09	20.09	20.1	20.09	20.08	20.09	20.1
8	19.64	19.64	19.65	19.63	19.63	19.64	19.64	19.63	19.64
9	20.08	20.08	20.08	20.07	20.08	20.08	20.07	20.08	20.08
10	19.67	19.67	19.68	19.68	19.68	19.67	19.68	19.67	19.68

	Std. Dev.	% Contribution	% TV	% Tol		
Repeatability (EV):	0.005317	0.1%	3.7%	8.0%	**R bar:**	0.009000
Reproducibility (AV):	0.001448	0.0%	1.0%	2.2%	**UCL-R:**	0.023220
Appraiser x Part (INT):					**Study Variation:**	0.143074
GRR:	**0.005511**	**0.1%**	**3.9%**	**8.3%**	**Total Variation (TV):**	0.143074
Part-to-Part (PV):	0.142968	99.9%	99.9%	99.7%	**Tolerance/6 (Tol):**	0.066667
	number of distinct categories:		36.6	17.0		

* 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: 4/3/19

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GRR Analysis Sheet

Study Date: 1/8/2019 12:00:00 AM
Gage ID: 05476117
Gage Desc: 0 - 150 Caliper
Appraisers: 3 **Trials:** 3
Study Type: Long-AIAG 4

R bar A = 0.008000 X bar A = 19.919000
R bar B = 0.010000 X bar B = 19.916667
R bar C = 0.009000 X bar C = 19.920000
R bar = **0.0090000** X bar Diff = **0.003333**

Company Part No.: Mold 268
Part No.:
Part Desc: HW09-RET-06F
Characteristic: Length
Specification Limits: 19.7 20.1
6 Sigma Process Variation:
Pp (or Ppk) Target:

Rp = **0.454443** 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] = **3.7%**	% EV = 100 [EV / (Tol / 6)] = **8.0%**
Reproducibility - Appraiser Variation (AV) AV = $\sqrt{[(\text{X bar Diff} \times K2)^2 - (EV^2 / n \times r)]}$ = **0.001448** Appraisers K2: 2 0.7071; 3 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] = **1.0%**	% AV = 100 [AV / (Tol / 6)] = **2.2%**
Repeatability and Reproducibility (GRR) GRR = $\sqrt{(EV^2 + AV^2)}$ = **0.005511**	%GRR = 100 [GRR / TV] = **3.9%**	% GRR = 100 [GRR / (Tol / 6)] = **8.3%**
Part Variation (PV) PV = Rp x K3 = **0.142968** 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) = **36.6**	ndc = 1.41(PV/GRR) = **17.0**
Total Variation (TV) TV = $\sqrt{(GRR^2 + PV^2)}$ = 0.143074	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: 1756-A
SUPPLIER/VENDOR CODE:	PART NAME: FOW120H04F-A
NAME OF INSPECTION FACILITY:	DESIGN RECORD CHANGE LEVEL: EU5T-14A464-XB M3 06/26/19
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
						M9	M10	M11	M12	M13	M14	M15	M16		
1	18.20	-0.30	0.30	2/22/21	8	18.24	18.21	18.18	18.21	18.20	18.17	18.18	18.21	O	
2	24.70	-0.30	0.30			24.78	24.78	24.79	24.73	24.73	24.72	24.72	24.75	O	
3	33.45	-0.30	0.30			33.34	33.45	33.58	33.49	33.46	33.50	33.41	33.45	O	
4	37.95	-0.30	0.30			37.70	37.78	37.91	37.87	37.96	37.86	37.89	37.93	O	
5	30.95	-0.30	0.30			30.92	30.91	30.97	30.95	30.94	30.95	30.96	30.97	O	
6	35.45	-0.30	0.30			35.36	35.40	35.55	35.46	35.51	35.38	35.44	35.39	O	
7	11.60	-0.30	0.30			11.53	11.66	11.59	11.69	11.65	11.68	11.67	11.66	O	

Blanket statements of conformance are unacceptable for any test results.

SIGNATURE	TITLE	DATE
Brandy Stout	PPAP Operator	2/22/2021

PN 6189-7460

'TORAY'
Innovation by Chemistry

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

Grade {PBT Toraycon}:	5108X01B
Lot:	R33406
Date:	09/14/2021

Certification of Properties

Test	Method	Unit	Specification	Result
Visual	-	-	Same as Std.	Good
Color	-	-	Same as Std.	Good
MFR	ISO 1133	g/10 min.	Min. 8 Max. 14.0	11.5
Tensile Strength	ISO 527	MPa	Min. 42	52.6
Tensile Elongation	ISO 527	%	Min. 14	23.7
Charpy, Notched	ISO 179	KJ/m2	Min. 5	7.0
Flexural Strength	ISO 178	MPa	Min. 70	72.2
Flexural Modulus	ISO 178	MPa	Min. 1700	2077

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

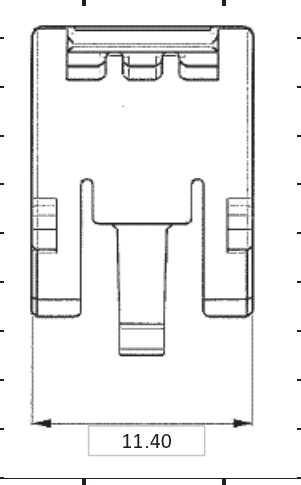
See the BOL for ship date and quantity

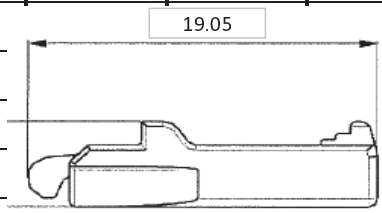
CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A04F**
PART NO (s): **6189-7460, 6189-7832**
Mold #: **1786**

Tested by/Date: CRYSTAL MACKIN 12/5/19
Design Rec. Change level/date:
EU5T-14A464-XB M3 6/26/2019
Eng. Change Documents: NA

CAVITY #:	SV5				FRANKLIN				
ALL	**11.40** +.3 -.3	**19.05** +.3 -.3			**11.40** +0.5 -0.5	**19.05** +0.5 -0.5			
1	11.36	19.05			11.35	19.06			
2	11.36	19.06			11.35	19.06			
3	11.34	19.05			11.36	19.07			
4	11.35	19.05			11.36	19.06			
5	11.35	19.04			11.37	19.06			
6	11.35	19.04			11.36	19.07			
7	11.36	19.05			11.35	19.06			
8	11.35	19.04			11.35	19.06			
9	11.36	19.04			11.36	19.07			
10	11.35	19.04			11.36	19.07			
11	11.36	19.04			11.36	19.06			
12	11.36	19.05			11.36	19.07			
13	11.33	19.04			11.35	19.06			
14	11.34	19.05			11.35	19.07			
15	11.33	19.04			11.35	19.07			
16	11.35	19.04			11.36	19.06			
17	11.35	19.04			11.35	19.06			
18	11.35	19.04			11.35	19.07			
19	11.36	19.05			11.35	19.06			
20	11.36	19.04			11.35	19.07			
21	11.36	19.04			11.35	19.07			
22	11.36	19.03			11.36	19.06			
23	11.36	19.05			11.36	19.06			
24	11.35	19.04			11.36	19.06			
25	11.36	19.03			11.35	19.06			
26	11.34	19.03			11.35	19.06			
27	11.36	19.06			11.35	19.05			
28	11.35	19.05			11.35	19.07			
29	11.34	19.05			11.35	19.07			
30	11.37	19.05			11.35	19.07			
31	11.36	19.06			11.35	19.06			
32	11.34	19.05			11.35	19.07			





CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A04F**
PART NO (s): **6189-7460, 6189-7832**
Mold #: **1786**

Tested by/Date: CRYSTAL MACKIN 12/5/19
Design Rec. Change level/date:
EU5T-14A464-XB M3 6/26/2019
Eng. Change Documents: NA

CAVITY #:	SV5					FRANKLIN				
ALL	**11.40** +.3 -.3	**19.05** +.3 -.3				**11.40** +0.5 -0.5	**19.05** +0.5 -0.5			
33	11.36	19.06				11.35	19.06			
34	11.34	19.06				11.36	19.06			
35	11.34	19.04				11.36	19.06			
36	11.34	19.05				11.36	19.06			
37	11.35	19.04				11.36	19.06			
38	11.36	19.06				11.36	19.06			
39	11.36	19.06				11.36	19.06			
40	11.36	19.05				11.35	19.06			
41	11.33	19.05				11.36	19.07			
42	11.34	19.06				11.36	19.06			
43	11.35	19.06				11.36	19.06			
44	11.34	19.04				11.36	19.07			
45	11.35	19.04				11.36	19.07			
46	11.36	19.06				11.35	19.07			
47	11.36	19.06				11.36	19.07			
48	11.36	19.05				11.35	19.06			
49	11.36	19.04				11.35	19.06			
50	11.36	19.04				11.35	19.06			
51	11.36	19.05				11.36	19.07			
52	11.36	19.06				11.35	19.07			
53	11.36	19.04				11.35	19.06			
54	11.33	19.05				11.35	19.06			
55	11.35	19.04				11.35	19.06			
56	11.34	19.04				11.35	19.07			
57	11.35	19.05				11.36	19.07			
58	11.33	19.06				11.36	19.07			
59	11.35	19.05				11.36	19.06			
60	11.34	19.05				11.36	19.07			
61	11.35	19.04				11.35	19.05			
62	11.34	19.05				11.35	19.06			
63	11.35	19.05				11.35	19.06			
64	11.35	19.04				11.35	19.06			
65	11.34	19.04				11.35	19.05			
66	11.35	19.04				11.35	19.07			

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A04F**
PART NO (s): **6189-7460, 6189-7832**
Mold #: **1786**

Tested by/Date: CRYSTAL MACKIN 12/5/19
Design Rec. Change level/date:
EU5T-14A464-XB M3 6/26/2019
Eng. Change Documents: NA

CAVITY #:	SV5				FRANKLIN				
ALL	**11.40** +.3 -.3	**19.05** +.3 -.3			**11.40** +0.5 -0.5	**19.05** +0.5 -0.5			
67	11.36	19.05			11.36	19.06			
68	11.35	19.05			11.36	19.07			
69	11.36	19.04			11.35	19.06			
70	11.35	19.05			11.35	19.07			
71	11.36	19.05			11.37	19.06			
72	11.35	19.05			11.35	19.06			
73	11.35	19.04			11.35	19.07			
74	11.35	19.04			11.37	19.06			
75	11.34	19.04			11.36	19.07			
76	11.33	19.04			11.35	19.06			
77	11.34	19.04			11.36	19.06			
78	11.33	19.03			11.35	19.05			
79	11.35	19.06			11.35	19.05			
80	11.34	19.04			11.35	19.06			
81	11.35	19.03			11.35	19.05			
82	11.34	19.04			11.35	19.06			
83	11.35	19.06			11.35	19.06			
84	11.33	19.04			11.35	19.06			
85	11.34	19.05			11.35	19.06			
86	11.34	19.06			11.35	19.07			
87	11.35	19.04			11.35	19.08			
88	11.34	19.04			11.35	19.07			
89	11.36	19.05			11.35	19.07			
90	11.35	19.05			11.35	19.07			
91	11.35	19.05			11.35	19.06			
92	11.36	19.05			11.36	19.06			
93	11.35	19.05			11.35	19.06			
94	11.35	19.04			11.35	19.07			
95	11.36	19.06			11.36	19.06			

CPK DATA

ORGANIZATION: SUMITOMO ELECTRIC WIRING SYSTEMS (PLT.5)
PART Name/Desc: **FOW120A04F**
PART NO (s): **6189-7460, 6189-7832**
Mold #: **1786**

Tested by/Date: CRYSTAL MACKIN 12/5/19
Design Rec. Change level/date:
EU5T-14A464-XB M3 6/26/2019
Eng. Change Documents: NA

CAVITY #:	SV5				FRANKLIN			
ALL	**11.40** +.3 -.3	**19.05** +.3 -.3			**11.40** +0.5 -0.5	**19.05** +0.5 -0.5		
96	11.36	19.06			11.36	19.07		
97	11.35	19.04			11.36	19.07		
98	11.33	19.06			11.36	19.05		
99	11.35	19.06			11.35	19.07		
100	11.36	19.06			11.35	19.07		
average	11.35	19.05	#DIV/0!	#DIV/0!	11.35	19.06	#DIV/0!	#DIV/0!
minimum	11.33	19.03	0.00	0.00	11.35	19.05	0.00	0.00
maximum	11.37	19.06	0.00	0.00	11.37	19.08	0.00	0.00
range	0.04	0.03	0.00	0.00	0.02	0.03	0.00	0.00
std dev	0.01	0.01	#DIV/0!	#DIV/0!	0.01	0.01	#DIV/0!	#DIV/0!
LSL	**11.10**	**18.75**	**0.00**	**0.00**	**10.90**	**18.55**	**0.00**	**0.00**
NOM	**11.40**	**19.05**	**0.00**	**0.00**	**11.40**	**19.05**	**0.00**	**0.00**
USL	**11.70**	**19.35**	**0.00**	**0.00**	**11.90**	**19.55**	**0.00**	**0.00**
CPK	8.500782377	11.56539836	#DIV/0!	#DIV/0!	27.27834235	26.03015521	#DIV/0!	#DIV/0!

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			

Innovation by Chemistry

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

Grade: {PBT Toraycon}	1401X34-TNA NATURAL
Lot:	R31344
Date:	01/22/20

Certification of Properties

Test	Method	Unit	Specification	Result
Visual	.	.	Same as Std.	Good
Color	.	.	Same as Std.	Good
MFR	ISO 1133	g/10 min.	3.2~4.8	4.0
Tensile strength	ISO 527	MPa	Min. 49	57.9
Tensile elongation	ISO 527	%	Min. 24	55.6
Charpy - notched	ISO 179	kJ/m2	Min. 2.7	3.6

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

Original Lot R31398

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