WDP Western Diversified Plastics

PART SUBMISSION WARRANT

Part Name	SLV ASY WIR CONN FEM	Customer Part Number	LU5T-14A464-ALA
Shown on Drawing No.	LU5T-14A464-ALA	Supplier Part Number	6001537601A
Engineering Change Level	Released AELE E 12035198 485	Dated	6/25/19
Additional Engineering Changes	N/A	Dated	N/A
Safety and/or Government Regulation	☐ Yes ☑ No	Purchase Order No. N/A	Weight (kg) 0.0056
Checking Aid No.	N/A	Checking Aid Engineering Change Level N/A	Dated N/A

SUPPLIER MANUFACTURING INFORMATION

Western Diversified Plastics / 609123190
Supplier Name & Supplier/Vendor Code

53150 N. Main St.
Street Address

Mattawan | MI | 49071 | USA
City | State | Postal Code | Country

CUSTOMER SUBMITTAL INFORMATION

Nursan Otomotiv EOOD
Customer Name/Division

Buyer/Buyer Code

Ford
Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? ☑ Yes ☐ No ☐ Not Applicable
IMDS - 826339583 / 1

Are polymeric parts identified with appropriate ISO marking codes? ☐ Yes ☐ No ☑ Not Applicable

REASON FOR SUBMISSION (Check at least one)

- ☑ Initial Submission
- ☐ Engineering Change(s)
- ☐ Tooling: Transfer, Replacement, Refurbishment, or additional
- ☐ Correction of Discrepancy
- ☐ Tooling Inactive > than 1 year
- ☐ Change to Optional Construction or Material
- ☐ Supplier or Material Source Change
- ☐ Change in Part Processing
- ☐ Parts Produced at Additional Location
- ☐ Other - please specify below

REQUESTED SUBMISSION LEVEL (Check one)

- ☐ Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
- ☐ Level 2 - Warrant with product samples and limited supporting data submitted to customer.
- ☑ Level 3 - Warrant with product samples and complete supporting data submitted to customer.
- ☐ Level 4 - Warrant and other requirements as defined by customer.
- ☐ Level 5 - Warrant with product samples and complete supporting data reviewed at organization's manufacturing location.

SUBMISSION RESULTS

The results for ☑ dimensional measurements ☑ material and functional tests ☐ appearance criteria ☐ statistical process package
These results meet all drawing and specification requirements: ☑ Yes ☐ No (If "No" - Explanation Required)
Mold / Cavity / Production Process W-5376 / Assembly

DECLARATION

I hereby affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of 50,301 / 24 hours.
I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from the declaration below.

EXPLANATION / COMMENTS: Customer requested

Is each Customer Tool properly tagged and numbered? ☐ Yes ☐ No ☑ n/a

Supplier Authorized Signature	Alice Lossie	Date	8/31/20
Print Name	Alice Lossie	Phone No. 269-668-3393	Fax No. 269-668-7143
Title	Quality Engineer	E-mail	Alice.Lossie@westerndp.com

Part Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other

Customer Signature _____ Date _____

Print Name _____ Customer Tracking Number (optional) _____

Process Flow Diagram

Western Diversified Plastics
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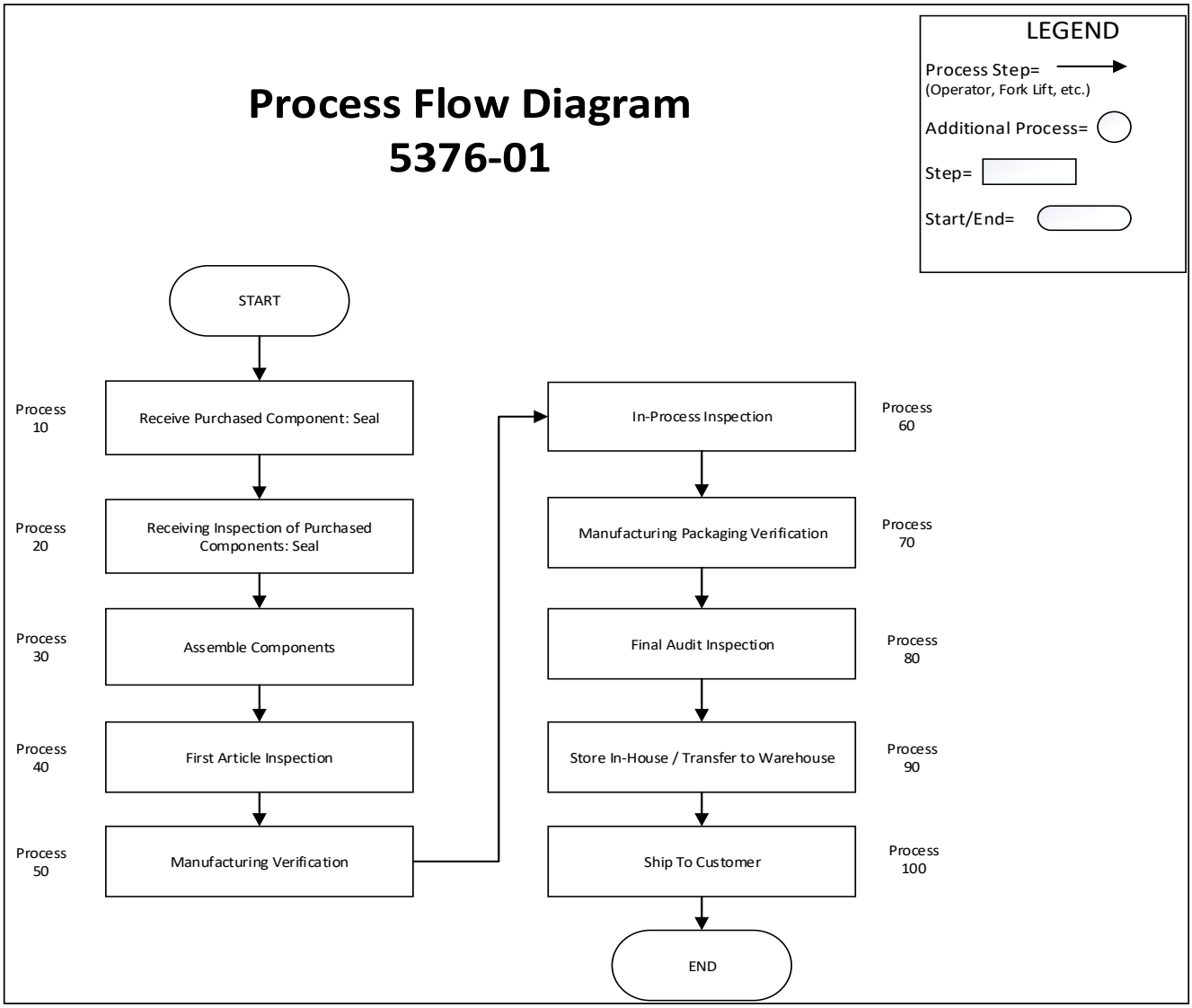
Process Flow #:	5376-01 (Revision Released)	Date (Orig.)	4/2/2019	Date Rev.	4/3/2020
Item / Part #:	6001537601A	Prepared By	Alice Lossie / Dan Switzer		
Program(s) / Part Name:	SLV ASY WIR CONN FEM				



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POTENTIAL
FALILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)

ITEM: **6001537601A**
Process Responsibility: **WDP Mfg. Engineering**
FMEA Number: **5376-01 (Revision Released)**
MODEL YEAR(s) / **SLV ASY WIR CONN FEM**
Key Date: **9/24/2019**
Prepared by: **Alice Lossie / Dan Switzer**
CORE TEAM: **PM - Mike Davidson , ME - Dan Switzer, QE - Alice Lossie , Plant Super. - Zach Durham, QC Super. - Patty Glynn**
FMEA Date (Orig.): **4/2/19**
FMEA Date (Rev): **4/3/20**

PROCESS STEP / FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	SEV	CLASS	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	OCC	Current Control: CURRENT DESIGN /PROCESS CONTROL PREVENTION	Current Control: CURRENT DESIGN /PROCESS CONTROL DETECTION	DET	RPN	RECOMMENDED ACTION(S)	RESPONSIBILITY &TARGET COMPLETION DATE	ACTION RESULTS: ACTION TAKEN	ACTION RESULTS: SEV	ACTION RESULTS: OCC	ACTION RESULTS: DET	ACTION RESULTS: RPN
Molded Components in Assembly: 1. Connector 2. Spacer	No molding defects, underfill, burn, warp, broken cores, etc	Inadequately molded part that will not comply with the print specifications	1. Dimensional inconsistency 2. Physical properties inadequate for design requirements 3. Part incomplete or deformed 4. Broken / chipped core	8		1. Machine parameters set up incorrectly on the molding machine 2. Tooling Failures 3. Machine Failures	2	1. Molding Setup Book Master work instruction 2. Material Mixing work instruction 3. Moisture Analysis work instruction 4. Material Collection for Moisture Analysis work instruction 5. Training to all relevant work instructions 6. System FMEA - Molding 7. Molding Cycle Interruption process work instruction	1. See Individual pFMEA for the component 2. See Systems pFMEA for molding	5	80	None						0
Purchased Components in Assembly: 1. Interfacial Seal	Purchased component complies with print specifications	Purchased component doesn't comply with print specifications	1. Dimensional inconsistency 2. Physical properties inadequate for design requirements 3. Purchased component incomplete or deformed	8		1. See supplier PFMEA	2	1. Receiving / receiving inspection work instructions 2. Training to all relevant work instructions	1. Training matrix 2. See Purchased Component PFMEA for each component 3. Receiving / receiving inspection	5	80	None						0
Process 10 Receive Purchased Component Seal	Seal is scanned in correctly	Seal is not scanned in correctly	1. Inaccurate inventory 2. Potential line shut down	8		1. Scanning instructions not effective 2. Scanning equipment malfunction 3. Supplier bar code not scannable	3	1. Warehouse receiving work instructions 2. Training to all relevant work instructions 3. Spare scanners available	1.Training matrix 2. Warehouse receiving process using scanners 3. Verify DTR with packing list 4. Checking scanning results process	3	72	None						0
	Label has correct quantity	Label has incorrect quantity	1. Inaccurate inventory 2. Potential line shut down	8		1. Supplier error 2. Labels not properly barcoded	3	1. Warehouse receiving work instructions 2. Training to all relevant work instructions	1.Training matrix 2. Warehouse receiving process using scanners 3. Verify DTR with packing list 4. Checking scanning results process 5. Packing slip	3	72	None						0
Process 20 Receiving Inspection of Purchased Component Seal	Correct Seal	Incorrect Seal	1 . Incomplete part 2. Part does not meet dimensional requirements 3. Part does not meet functional requirements 4. Customer reject	6		1. Supplier error 2. Inadequate work instructions 3. Incorrect label	2	1. Receiving Inspection work instructions 2. Training to all relevant work instructions 3. Supplier PFMEA	1. Training Matrix 2. Visual inspection 3. Component certification received for each lot delivered	7	84	None						0
	Seal Not Damaged	Seal Damaged	1. Customer rejection 2. Validation sorting	6		1. Damaged component received from supplier 2. Damaged during transit	2	1. Receiving Inspection work instructions 2. Training to all relevant work instructions 3. Supplier PFMEA	1. Training Matrix 2. Visual inspection	7	84	None						0

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Process 30 Assemble Seal To Connector Manual Assembly	Correct seal	Incorrect seal	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	4		1. Operator instructions inadequate 2. Insufficient training 3. Equipment failure 4. Wrong product brought to the assembly station	2	1. Fixtures are poka-yoke to assemble to the correct position and proper orientation 2. Operator work instructions 3. Training to all relevant work instructions 4. Label verification cards showing which components are needed	1. Training Matrix 2. First & last article inspection 3. In-process inspection 4. Final Audit inspection 5. Assembly operator verification 6. All hand assembled product is 100% sorted	7	56	None						0
	Seal is present	Seal is not present	1. FG assembly incomplete 2. FG assembly non-functional 3. Disrupts customer production flow 4. Product verification sorting required	6		1. Operator instructions inadequate 2. Insufficient training 3. Equipment failure	2	1. Fixtures are poka-yoke to assemble to the correct position and proper orientation 2. Operator work instructions 3. Training to all relevant work instructions 4. Label verification cards showing which components are needed	1. Training Matrix 2. First & last article inspection 3. In-process inspection 4. Final Audit inspection 5. Assembly operator verification 6. All hand assembled product is 100% sorted	7	84	None						0
	Part contains 1 seal	Part contains more than 1 seal	1. FG assembly incomplete 2. FG assembly non-functional 3. Disrupts customer production flow 4. Product verification sorting required	6		1. Operator instructions inadequate 2. Insufficient training 3. Equipment failure	2	1. Fixtures are poka-yoke to assemble to the correct position and proper orientation 2. Operator work instructions 3. Training to all relevant work instructions	1. Training Matrix 2. First & last article inspection 3. In-process inspection 4. Final Audit inspection 5. Assembly operator verification 6. All hand assembled product is 100% sorted	7	84	None						0
	Seal not damaged or underfilled	Seal is damaged or has underfill	1. FG assembly incomplete 2. FG assembly non-functional 3. Disrupts customer production flow 4. Product verification sorting required	4		1. Underfilled / Damaged Seal received from supplier 2. Seal damaged during assembly 3. Supplier controls are not robost	2	1. Operator work instructions 2. Training to all relevant work instructions 3. Supplier process controls	1. Training Matrix 2. First & last article inspection 3. In-process inspection 4. Final Audit inspection 5. Assembly operator verification 6. All hand assembled product is 100% sorted	7	56	None						0
	Seal not twisted / rolled	Seal is twisted or rolled	1. FG assembly incomplete 2. FG assembly non-functional 3. Disrupts customer production flow 4. Product verification sorting required	6		1. Operator instructions inadequate 2. Insufficient training 3. Equipment failure	2	1. Fixtures are poka-yoke to assemble to the correct position and proper orientation 2. Operator work instructions 3. Training to all relevant work instructions	1. Training Matrix 2. First & last article inspection 3. In-process inspection 4. Final Audit inspection 5. Assembly operator verification 6. All hand assembled product is 100% sorted	7	84	None						0

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Process 30 Assemble Spacer To Connector Manual Assembly	Correct Spacer	Incorrect Spacer	1. Wrong fit to terminals 2. Customer rejection 3. Product verification sorting	4		1. Operator instructions inadequate 2. Insufficient training 3. Equipment failure 4. Wrong product brought to the assembly station	2	1. Fixtures are poka-yoke to assemble to the correct position and proper orientation 2. Operator work instructions 3. Training to all relevant work instructions 4. Label verification cards showing which components are needed	1. Training Matrix 2. First & last article inspection 3. In-process inspection 4. Final Audit inspection 5. Assembly operator verification 6. All hand assembled product is 100% sorted	7	56	None						0
	Spacer present	Spacer is not present	1. FG assembly incomplete 2. FG assembly non-functional 3. Disrupts customer production flow 4. Product verification sorting required	6		1. Equipment Failure 2. Lock features in spacer/connector inadequate 3. Operator instructions inadequate 4. Insufficient training	2	1. Fixtures are poka-yoke to assemble to the correct position and proper orientation 2. Operator work instructions 3. Training to all relevant work instructions 4. Label verification cards showing which components are needed	1. Training Matrix 2. First & last article inspection 3. In-process inspection 4. Final Audit inspection 5. Assembly operator verification 6. All hand assembled product is 100% sorted	7	84	None						0
	Spacer with correct orientation	Spacer with incorrect orientation	1. FG assembly non-functional 2. Disrupts customer production flow 3. Product verification sorting required	5		1. Operator instructions inadequate 2. Insufficient training 3. Equipment failure	2	1. Part design prevents spacer assembly symmetrical 180° 2. Fixtures are poka-yoke to assemble to the corect position and proper orientation 3. Training to all relevant work instructions	1. Training Matrix 2. First & last article inspection 3. In-process inspection 4. Final Audit inspection 5. Assembly operator verification 6. All hand assembled product is 100% sorted	7	70	None						0
	Spacer is pre-staged	Spacer is fully seated	1. FG assembly non-functional 2. Disrupts customer production flow 3. Product verification sorting required 4. Customer rejection	3		1. Operator instructions inadequate 2. Insufficient training 3. Equipment failure 4. Lock features in spacer/connector inadequate	4	1. Fixtures are poka-yoke to assemble to the correct position and proper orientation 2. Operator work instructions 3. Training to all relevant work instructions 4. Label verification cards showing which components are needed	1. Training Matrix 2. First & last article inspection 3. In-process inspection 4. Final Audit inspection 5. Assembly operator verification 6. All hand assembled product is 100% sorted	7	84	None						0
Process 30 Assemble Seal To Connector (Automated Assembly)	No defects, one seal present & seated properly	Seal missing	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	6		1. Machine miss feed 2. Part detection sensor failure	2	1. Master sample error proof verification 2. Machine logic does not cycle without part presence detection 3. Inspector and operator training to the procedures 4. In-line vision system 100% inspection 5. Test verification parts beginning of each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. In-line vision system 100% inspection 6. Test verification parts beginning of each shift	3	36	None						0

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								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
		Interfacial Seal Underfilled / Torn	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	6		1. Underfilled / Damaged Seal received from supplier 2. Seal damaged during assembly	2	1. Supplier process controls 2. Inspector and operator training to the procedures 3. In-line vision system 100% inspection 4. Test verification parts beginning of each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. In-line vision system 100% inspection 6. Test verification parts beginning of each shift 7. Receiving inspection using AQL sampling plan 8. Supplier controls	3	36	None						0
		Double Interfacial Seal	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting 4. Unable to mate to mating part	6		1. Machine miss feed 2. Part detection sensor failure	2	1. Inspector and operator training to the procedures 2. In-line vision system 100% inspection 3. Test verification parts beginning of each shift 4. Sensors on seal mandrel head stop machine & give error message that 2 seals are present.	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. In-line vision system 100% inspection 6. Test verification parts beginning of each shift	3	48	None						0
		Seal Rolled	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting 4. Unable to mate to mating part	6		1. Machine miss feed 2. Part detection sensor failure	2	1. Inspector and operator training to the procedures 2. In-line vision system 100% inspection 3. Test verification parts beginning of each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. In-line vision system 100% inspection 6. Test verification parts beginning of each shift	3	36	None						0
		Mis-placed seal	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting 4. Unable to mate to mating part	6		1. Machine miss feed 2. Part detection sensor failure	2	1. Inspector and operator training to the procedures 2. In-line vision system 100% inspection 3. Test verification parts beginning of each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. In-line vision system 100% inspection 6. Test verification parts beginning of each shift	3	36	None						0

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Process 30 Assemble Spacer To Connector (Automated Assembly)	No molding defects, spacer present & seated properly	Spacer missing	1. Open circuit in the finished application 2. Customer rejection 3. Product verification sorting	6		1. Machine misfed 2. Part detection sensor failure	2	1. Master sample error proof verification 2. Machine logic does not cycle without part presence detection 3. Inspector and operator training to the procedures 4. In-line vision system 100% inspection 5. Test verification parts beginning of each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. In-line vision system 100% inspection 6. Test verification parts beginning of each shift	3	36	None						0
		Spacer mis-oriented	1. Open circuit in the finished application 2. Customer rejection 3. Product verification sorting	6		1. Machine misfed 2. Part detection sensor failure	2	1. Part design allows spacer assembly symmetrical 180° 2. Inspector and operator training to the procedures 3. In-line vision system 100% inspection 4. Test verification parts beginning ofe each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. In-line vision system 100% inspection 6. Test verification parts beginning of each shift	3	36	None						0
		Spacer damaged / broken	1. Not capture the terminals 2. Customer rejection 3. Product verification sorting	6		1. Machine misfed 2. Molding issues	2	1. Camera is in line to verify that spacers are not broken 2. Fixtures and cylinder stroke have been designed to assemble to locked position - positive stop in equipment 3. Inspector and operator training to the procedures 4. Individual PFMEA/Control Plan to verify the molding process to make sure components are not broken or damaged in the molding process	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. In-line vision system 100% inspection 6. Test verification parts beginning of each shift	3	36	None						0
		Spacer fully engaged from prestaged position (seated)	1. Requires wire harness assembler to pull spacer out to prestage position prior to assembling terminals 2. Customer rejection 3. Product verification sorting	3		1. Machine cylinder over stroke	2	1. Cylinder stroke position sensor 2. Fixtures and cylinder stroke have been designed to assemble to locked position - positive stop in equipment 3. Inspector and Operator Training to the procedures 4. In-line vision system 100% inspection 5. Verification test parts the beginning of each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. In-line vision system 100% inspection 6. Test verification parts beginning of each shift	3	18	None						0

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Process 40 First Article Inspection	All In-process steps completed, no molding defects, no missing or mis-seated components proper carton identification	Inspection process does not detect defects	1. Customer reject 2. Excessive flash 3. Underfill 4. Broken core 5. Warpage 6. Validation sorting 7. Missing components 8. Components mis-seated	8		1. Inspection instructions not adequate 2. Inspection instructions not followed 3. Inspector error u	2	1. Training for all work instructions 2. Gaging guides 3. Internal audits 4. Cross functional team creates inspection instructions	1. Internal audits 2. Final Audit Inspection 3. In-process inspection 4. First Last Article inspection 5. Training Matrix 6. All hand assembled product is 100% sorted	5	80	None						0
		Inspection process not completed	1. Potential nonconforming part will be produced 2. Possible customer reject & line shut down	8		1. Inspection instructions not followed 2. Operator error	2	1. Cross functional team creates inspection instructions 2. Training to all relevant work instructions 3. Gaging guides	1. Inspection entry into the WDP Database 2. Evidence of parts on First Article board 3. Work instruction Operator Hourly Review 4. Final Audit Inspection 5. All hand assembled product is 100% sorted	5	80	None						0
		Inspection process not effective	1. Potential nonconforming part will be produced 2. Possible customer reject & line shut down	8		1. Inspection Instructions not adequate 2. Inspection instructions not completed correctly 3. Operator error	2	1. Cross functional team creates inspection instructions 2. Training to all relevant work instructions 3. Gaging guides	1. Non-conforming pictures in WDP Database 2. Alerts in WDP Database 3. Cross functional team creates inspection instructions 4. Final Audit inspection 5. Operator Houly Review 6. In-process inspection 7. Training Matrix 8. All hand assembled product is 100% sorted	5	80	None						0
		Label printing not completed per procedure (Wrong labels)	1. Internal customer reject 2. Possibly wrong product shipped 3. Potential customer manufacturing shut down	8		1. Operator not following label printing instructions 2. Error with label maker 3. Inspector failure to verify correct labels	2	1. Printing Production Labels work instruction 2. First Last Article Inspection work instruction 3. In-process inspection work instruction 4. Label ID & Use work instruction 5. Final Audit inspection work instruction 6. Training to all work instructions	1. Label Verification Master 2. First Last Article inspection 3. In-process inspection 4. Final Audit inspection 5. Label ID & Use 6. All hand assembled product is 100% sorted	5	80	None						0
Process 50 Manufacturing Verification	Visual inspection of parts, no molding defects, no missing or mis-seated components	1. Visual Inspection not 100% effective 2. Error in using gage	1. Customer rejection 2. Potential customer manufacturing shut down 3. Visual Defects go undetected	8		1. Operator not following proper instructions 2. Operator error 3. Visual inspection not 100% affective	2	1. Gaging guides 2. Training to all relevant work instructions	1. Label Verification Master 2. First Last Article inspection 3. In-process inspection 4. Final Audit inspection 5. Training Matrix 6. All hand assembled product is 100% sorted	5	80	None						0

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Key Date: **9/24/2019**
Prepared by: **Alice Lossie / Dan Switzer**
CORE TEAM: **PM - Mike Davidson , ME - Dan Switzer, QE - Alice Lossie , Plant Super. - Zach Durham, QC Super. - Patty Glynn**
FMEA Date (Orig.): **4/2/19**
FMEA Date (Rev): **4/3/20**

PROCESS STEP / FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	SEV	CLASS	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	OCC	Current Control: CURRENT DESIGN /PROCESS CONTROL PREVENTION	Current Control: CURRENT DESIGN /PROCESS CONTROL DETECTION	DET	RPN	RECOMMENDED ACTION(S)	RESPONSIBILITY &TARGET COMPLETION DATE	ACTION RESULTS: ACTION TAKEN	SEV	OCC	DET	RPN
Process 60 In-process Inspection	All In-process steps completed, no molding defects, no missing or mis-seated components proper carton identification	See First Article See Control plan	See First Article See Control plan	8		See First Article See Control plan	2	See First Article See Control plan	See First Article See Control plan	5	80	None						0
Process 70 Manufacturing Packaging Verification	Correct quantity must be packaged	Incorrect quantity packaged	1. Customer rejection 2. Potential customer line shut down 3. Component damaged during shipment	6		1. Packaging instructions not clear 2. Packaging instructions not available 3. Packaging instructions not followed 4. Audit scale APW number not calculated correctly	2	1. Detailed packaging instructions developed for each product 2. Training of operators on packaging instructions 3. Using the scale at final audit work instruction	1. First piece inspection 2. In-process inspection 3. Final audit 4. Weigh count using final audit scale	6	72	None						0
	Correct label affixed to packaging	Incorrect label affixed to packaging	1. Customer rejection 2. Potential customer line shut down	6		1. Label verification not available 2. Label verification not used 3. Labels made and affixed to container ahead of time 4. Wrong labels printed at first article 5. Mutiple part numbers running at same work station & labels not separated	2	1. Molding label verification work instructions 2. Training to all work instructions 3. Each part number assigned a label job number to print labels	1. Training matrix 2. First and Last Article inspection 3. In-process inspection 4. Operator inspection 5. Final audit inspection 6. Molding Label Verification Card	6	72	None						0
	Correct parts in the package	Wrong or mixed parts in the package	1. Customer rejection 2. Potential customer manufacturer shut down	6		1. Packages sitting open and unsealed 2. Operators not cleaning out job setups from run to run 3. Filling a partial carton with wrong product	2	1. Packaging plan 2. Housekeeping and Line clearance from previous run. 3. Inspector and Operator Training to the inspection and scanning procedures.	1. First article inspection QWI010 2. In Process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection MWI004 Label ID & Use / Label verification card	7	84	None						0
Process 80 Final Audit Inspection	Visual inspection of parts, no molding defects, correct carton label	Inspection process does not detect defects	1. Customer reject 2. Excessive flash 3. Underfill 4. Broken core 5. Warpage 6. Validation sorting 7. Missing components 8. Components mis-seated	6		1. Inspection Instructions not adequate 2. Inspection instructions not followed 3. Operator error	2	1. Training to all work instructions 2. Internal audits 3. Cross functional team creates inspection instructions	1. Internal audits 2. Final Audit Inspection 3. In-process inspection 4. First Last Article inspection 5. Training Matrix	7	84	None						0
		Visual Inspection not 100% effective	1. Visual Defects go undetected	6		1. Inspection Instructions not adequate 2. Inspection instructions not followed 3. Operator error	2	1. Training to all work instructions 2. Past defective boundary sample pictures in the database	1. Internal audits 2. Final Audit Inspection 3. In-process inspection 4. First Last Article inspection 5. Training Matrix	7	84	None						0

WDP
Western Diversified Plastics

53150 N. Main Street
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POTENTIAL
FALILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)

ITEM: **6001537601A**
Process Responsibility: **WDP Mfg. Engineering**
FMEA Number: **5376-01 (Revision Released)**
MODEL YEAR(s) / **SLV ASY WIR CONN FEM**
Key Date: **9/24/2019**
Prepared by: **Alice Lossie / Dan Switzer**
CORE TEAM: **PM - Mike Davidson , ME - Dan Switzer, QE - Alice Lossie , Plant Super. - Zach Durham, QC Super. - Patty Glynn**
FMEA Date (Orig.): **4/2/19**
FMEA Date (Rev): **4/3/20**

PROCESS STEP / FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	SEV	CLASS	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	OCC	Current Control: CURRENT DESIGN /PROCESS CONTROL PREVENTION	Current Control: CURRENT DESIGN /PROCESS CONTROL DETECTION	DET	RPN	RECOMMENDED ACTION(S)	RESPONSIBILITY &TARGET COMPLETION DATE	ACTION RESULTS: ACTION TAKEN	ACTION RESULTS: SEV	ACTION RESULTS: OCC	ACTION RESULTS: DET	ACTION RESULTS: RPN
Process 90 Store In-house / Transfer to Warehouse	Correct product stored in correct location	Incorrect product stored in right location	1. Unable to locate product 2. May need to remake product	8		1. Mis-labeled cartons 2. Scanning instructions not followed 3. Scanning instructions not available	2	1. Scanning from Plant to Warehouse work instructions 2. Scanning from Warehouse to Plant work instructions 3. Training to all relevant work instructions	1. Training matrix 2. Barcode ERP system 3. Month end inventory audit	3	48	None						0
		Correct product stored in wrong location	1. Unable to locate product 2. May need to remake product	8		1. Mis-labeled cartons 2. Scanning instructions not followed 3. Scanning instructions not available	2	1. Scanning from Plant to Warehouse work instructions 2. Scanning from Warehouse to Plant work instructions 3. Training to all relevant work instructions	1. Training matrix 2. Barcode ERP system 3. Month end inventory audit	3	48	None						0
Process 100 Ship To Customer	Correct product shipped to customer	Incorrect product shipped to customer	1. Customer rejection 2. Potential customer manufacturing shut down 3. Product non-functional for the application	8		1. Mis-labeled cartons 2. Scanning instructions not followed 3. Scanning instructions not available	2	1. Scanning Product for Shipment work instructions 2. Printing Production Labels work instruction 3. Customer specific label work instruction 4. Training to all relevant work instructions	1. Training matrix 2. Barcode ERP system 3. Label ID & Use 4. Inventory audits-monthly/quarterly 5. Pick process by WHS utility 6. Shipping clerk matches packing list with order and applies BOL & Packing List if they agree 7. WHS utility verifies load to paper work, physically loads it and stamps/initials paper work for accountability	3	48	None						0
		Correct product shipped to incorrect customer	1. Customer rejection 2. Potential customer manufacturing shut down 3. Product non-functional for the application	8		1. Mis-labeled cartons 2. Scanning instructions not followed 3. Scanning instructions not available	2	1. Scanning Product for Shipment work instructions 2. Printing Production Labels work instruction 3. Customer specific label work instruction 4. Training to all relevant work instructions	1. Training matrix 2. Barcode ERP system 3. Label ID & Use 4. Inventory audits-monthly/quarterly 5. Pick process by WHS utility 6. Shipping clerk matches packing list with order and applies BOL & Packing List if they agree 7. WHS utility verifies load to paper work, physically loads it and stamps/initials paper work for accountability	3	48	None						0

Control Plan

Western Diversified Plastics

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[ ] Pre-Launch [X] Production [ ] Assembly [ ] Safe Launch	Key Contact / Phone	Date (Orig.)	Date (Rev.)
Job Number 5376 Part	Alice Lossie 269.668.3393	04/02/2019	04/03/2020

Part Number	Rev.	Engineering Number	Rev.	Core Team	Customer Engineering Approval / Date (If Req'd)
6001537601A	Released	5376-01	Released	A. Lossie, D. Switzer, Z. Durham, M. Davidson, P. Glynn	

Part Name / Description	Quality Engineering	Customer Quality Approval / Date (If Req'd)
2 W F Sealed Speaker Conn		

Supplier / Plant	Supplier Code	Quality Control	Other Approval / Date (If Req'd)
WDP	609123190		

Step No.	Process No.	Process Name Operation / Description	Machine, Device, Jig, or Tool for Manufacturing	Characteristics		Special Char. Class.	Methods					Reaction Plan
				Product	Process		Product/Process Specification/ Tolerance	Evaluation Measurement Technique	Sample Size	Sample Freq.	Control Method	
1	10	Receiving	Supplier	Purchased Product Received			3570-50-001A	Visually Verify Correct Quantity Received		Each Lot / Shipment	WHI007 Warehouse Receiving Instructions	Reject Per QWI001 / Notify Supervisor / Adjust Process
2	20	Receiving Inspection	Supplier	Purchased Seal 3570-50-001A			Verify PPAP is on file and not more than 1 year old	Supplier Database - Purchased Components		Each Lot / Each Shipment	QWI022 / Receiving Inspection	Reject Per QWI001 / Notify Supervisor / Request PPAP From Supplier
3	20	Receiving Inspection	Supplier	Purchased Seal 3570-50-001A			Inspect for any defects, underfill, flash, tears, etc.	Visual	Sampling Plan AQL 1	Each Lot / Shipment	QWI022 / Receiving Inspection	Reject Per QWI001 / Request RMA & 8D From Supplier / Reduce Sampling Plan T
4	20	Receiving Inspection	Supplier	Purchased Seal 3570-50-001A			Verify parts have sufficient silicone	Visual / Verify Not Dry	Sampling Plan AQL 1	Each Lot / Shipment	QWI022 / Receiving Inspection	Reject Per QWI001 / Request RMA & 8D From Supplier / Reduce Sampling Plan T
5	20	Receiving Inspection	Supplier	Purchased Seal 3570-50-001A			Place OK TO USE on acceptable cartons	Use OK TO USE stamp	Each Acceptable Carton	Each carton per shipment	QWI022 / Receiving Inspection	Re-inspect cartons with no label
6	30	Hand Assembly	Hand Assembly Step #1	Assembly (Hand Assembly)			Place Seal & Spacer Into Fixture FW0477	Manual Placement	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin
7	30	Hand Assembly	Hand Assembly Step #2	Assembly (Hand Assembly)			Place Seal Onto Shell	Manual Placement / FW0477	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin
8	30	Hand Assembly	Hand Assembly Step #3	Assembly (Hand Assembly)			Place Spacer Into Shell	Manual Placement / FW0477	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin
9	30	Hand Assembly	Hand Assembly Step #4	Assembly (Hand Assembly)			Verify Components Presence & Placement	Visual	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin
10	30	Automated Assembly	Assembly Machine Station # 1	Assembly (1-43)			Shell Placement	Fiber Optic Eye	Each Part	Each Assembly	Camera Vision System Operartor Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
11	30	Automated Assembly	Assembly Machine Station #2	Assembly (1-43)			Seal Placement	Camera Vision System Station #3	Each Part	Each Assembly	Camera Vision System Operartor Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
12	30	Automated Assembly	Assembly Machine Station #4	Assembly (1-43)			Spacer Placement	Camera Vision System Station #6	Each Part	Each Assembly	Camera Vision System Operartor Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
13	30	Automated Assembly	Assembly Machine Station #5	Assembly (1-43)			Placement Of Identification Mark	Automated Placement / Visual Inspection	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Adjust Process
14	30	Automated Assembly	Assembly Machine Station #7	Assembly (1-43)			Eject Good Assembly	Camera Vision Systems Stations #3 & 6	Each Part	Each Assembly	Camera Vision System Operartor Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
15	30	Automated Assembly	Assembly Machine Station #8	Assembly (1-43)			Eject Bad Assembly Into Reject Bin	Camera Vision Systems Stations #3 & 6	Each Part	Each Assembly	Camera Vision System Operartor Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
16	40	First / Last Piece Inspection	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			All Control Plan In-Process Inspection steps listed	See steps listed	2 Assemblies	When Required	QWI010 First / Last Article	Reject Per QWI001 / Notify Supervisor / Adjust Process

Control Plan

Western Diversified Plastics

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[ ] Pre-Launch [X] Production [ ] Assembly [ ] Safe Launch Job Number 5376 Part				Key Contact / Phone Alice Lossie 269.668.3393	Date (Orig.) 04/02/2019 / Date (Rev.) 04/03/2020
Part Number 6001537601A	Rev. Released	Engineering Number 5376-01	Rev. Released	Core Team A. Lossie, D. Switzer, Z. Durham, M. Davidson, P. Glynn	Customer Engineering Approval / Date (If Req'd)
Part Name / Description 2 W F Sealed Speaker Conn				Quality Engineering	Customer Quality Approval / Date (If Req'd)
Supplier / Plant WDP		Supplier Code 609123190		Quality Control	Other Approval / Date (If Req'd)

Step No.	Process No.	Process Name Operation / Description	Machine, Device, Jig, or Tool for Manufacturing	Characteristics		Special Char. Class.	Methods					Reaction Plan
				Product	Process		Product/Process Specification/ Tolerance	Evaluation Measurement Technique	Sample Size	Sample Freq.	Control Method	
17	50	Manufacturing Verification	Hand Assembly	Assembly (Hand Assembly)			Verify No Missing, Mis-seated Components	Visual	Each Part	Each Assembly	Reject / Rework Disposition	Place In Reject Bin
18	50	Manufacturing Verification	Automated Assembly	Assembly (1-43)			Verify No Missing / Mis-seated Components	Vision System Inspections Stations 3 & 6	Each Part	Each Assembly	Operator Instructions / Verification Test Parts Beginning Of Each Shift	Place In Reject Bin
19	60	In-Process Inspection	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Verify Part Matches Picture In Upper Right Hand Corner	Visual Part To Picture	2 Assemblies	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
20	60	In-Process Inspection	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Verify No Molding Defects, Underfill, Flash, Burn, Warp, etc.	Visual Parts In Holding Bins	10 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
21	60	In-Process Inspection	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Verify No Purchased Component Defects, Underfill, Flash, Tears,etc.	Visual Parts In Holding Bins	10 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
22	60	In-Process Inspection	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Manually Flex Locking Beam	Verify No Breakage Or Issues	5 Parts from Production Carton	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
23	60	In-Process Inspection	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Fully Seat Spacer / Verify No Breakage Or Issues	Manually Seat Spacer / Visually Verify No Issues	5 Parts From Production Carton / Dispose Of After Review	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
24	60	In-Process Inspection	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Verify Operators Are Following Instructions & Aware Of Any Alerts	Verbally Verify With The Operator		Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
25	60	In-Process Inspection	Automated Assembly	Assembly (1-43)			Verify Acceptable Bee Sting Is Present On Parts	Visual Parts / See Conforming Picture In Database	10 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
26	60	In-Process Inspection	Automated Assembly	Assembly (1-43)			Verify Checkhead Verification Was Completed & Documented	Visual Verification Log / Look For No Failures		Beginning of each shift equipment is used	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
27	60	In-Process Inspection	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Verify Proper Labels / Cartons	Visual	All Labels At Point Of Use	At start up / Once A Shift	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Re-Print Labels
28	70	Manufacturing Packaging Verification	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Verify Proper Labels / Cartons	Visual	Each Label	Each Carton	MWI004 Label ID & Use / Label Verification Card	Reject Per QWI001 / Notify Supervisor / Adjust Process

Control Plan

Western Diversified Plastics

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[ ] Pre-Launch [X] Production [ ] Assembly [ ] Safe Launch	Key Contact / Phone	Date (Orig.)	Date (Rev.)
Job Number 5376 Part	Alice Lossie 269.668.3393	04/02/2019	04/03/2020

Part Number	Rev.	Engineering Number	Rev.	Core Team	Customer Engineering Approval / Date (If Req'd)
6001537601A	Released	5376-01	Released	A. Lossie, D. Switzer, Z. Durham, M. Davidson, P. Glynn	

Part Name / Description	Quality Engineering	Customer Quality Approval / Date (If Req'd)
2 W F Sealed Speaker Conn		

Supplier / Plant	Supplier Code	Quality Control	Other Approval / Date (If Req'd)
WDP	609123190		

Step No.	Process No.	Process Name Operation / Description	Machine, Device, Jig, or Tool for Manufacturing	Characteristics		Special Char. Class.	Methods					Reaction Plan
				Product	Process		Product/Process Specification/ Tolerance	Evaluation Measurement Technique	Sample Size	Sample Freq.	Control Method	
29	80	Final Audit	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Proper Assembly	Visual Part To Picture, From Top, Middle & Bottom Of Carton	10 Parts	Each Carton	QWI016 Final Audit Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
30	80	Final Audit	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Verify No Molding Defects, underfill, flash, burn, warp, etc.	Visual Parts From Top, Middle & Bottom Of Carton	10 Parts	Each Carton	QWI016 Final Audit Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
31	80	Final Audit	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Verify No Purchased Component Defects, Flash, Underfill, Tears, etc.	Visual Parts From Top, Middle & Bottom Of Carton	10 Parts	Each Carton	QWI016 Final Audit Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
32	80	Final Audit	Automated Assembly	Assembly (1-43)			Verify Acceptable Bee Sting On Parts	Visual Parts / See Conforming Picture In Database	10 Parts	Every 4 hours	QWI016 Final Audt Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
33	80	Final Audit	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)			Verify Proper Label / Carton	Visual	Each Label	Each Carton	QWI016 Final Audit Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
34	90	Store In-House	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)	Transfer To Warehouse		Forklift Truck / Scanning System	WHI008	Each Carton	Each Skid	WHI008 Scanning From Plant To Warehouse	Notify Final Audit To Scan Product Into System
35	100	Shipping	Hand Assembly / Automated Assembly	Assembly / HA - Automated (1-43)	Load matches shipper		Scanning System	WHI001	100%	Each Shipment	WHI001 Scanning Product For Shipment	Reject Per QWI001 / Notify Supervisor / Adjust Process
36	500	Annual Requirement	Layout Equipment	Dimensional			Print Dimensions	Layout	5 Parts	Annual	PDP 21 Annual Layout	Reject Per QWI001 / Notify Supervisor / Adjust Process

This assembly is processed on automated assembly equipment. The process includes the use of machine vision which verifies each step of the assembly process. The equipment is verified each shift to ensure it's continues to detect any defects. Because of the nature of the process we do not have a CPK or Gage study for this assembly.

WDP Western Diversified Plastics

Dimensional Layout Inspection Report

W-No. **W-5376** Run Date **08/20/2020** Material **See list of parts**

Part No. **LU5T-14A464-ALA, 6001537601A** Print No. **LU5T-14A464-ALA** Insp. Date **08/31/2020**

Part Name **SLV ASY WIR CONN FEM** Revision / Date **Rel. (AELE-E-12035198-485) 6/25/19** Insp. By **B Roberts**

					Sample Number									
Dim.	**Specification**	**Tol. ±**	**Lo Lim**	**Hi Lim**	**1**	**2**	**3**	**4**	**5**					
1MN	24.05	0.30	23.75	24.35	23.89	23.88	23.89	23.90	23.88					
1MX	24.05	0.30	23.75	24.35	23.90	23.92	23.91	23.91	23.90					
2MN	17.10	0.30	16.80	17.40	16.81	16.80	16.81	16.80	16.81					
2MX	17.10	0.30	16.80	17.40	16.82	16.84	16.84	16.82	16.82					
3MN	31.00	0.30	30.70	31.30	31.01	31.02	30.94	31.00	31.02					
3MX	31.00	0.30	30.70	31.30	31.03	31.04	30.98	31.02	31.04					
4-1	Sealing surfaces smooth	Note	-	-	Conforms	Conforms	Conforms	Conforms	Conforms					
4-2	No part lines	Note	-	-	Conforms	Conforms	Conforms	Conforms	Conforms					

CONNECTOR ASSEMBLY CHART

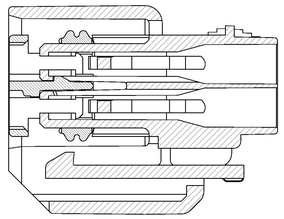
ASSEMBLY PART NO.'S						MATING COMPONENT	
FORD PART NO.	SUPPLIER PART NO.	TEMPURATURE CLASS	VIBRATION CLASS	SEALING CLASS	BRANDING & CODING	FORD PART NO.	SUPPLIER PART NO.
LU5T-14A464-ALA	6001537601A	T3	V2	S3	BLK BOX EXCEPTION	XR3T-14A624-CA	E-3385
						XR2T-14A624-BAA	E-3385-1
						XR2T-14A624-BBA	E-3385-2

ITEM	PART NAME	COLOR	FORD PART NO.	SUPPLIER PART NO.	MATERIAL	MATERIAL CODE	WEIGHT	QTY
1	HOUSING	BLACK	N/A	5376-00-001A	ASTM D5927-03 TPES011G30	>PBT-GF30<	5.14	1
2	TPA	NATURAL	N/A	3571-00-001A	ASTM D5927-03 TPES011G33	>PBT-GF33<	0.32	1
3	INTERFACIAL SEAL	RED/BROWN	N/A	3570-50-001A	SAE J200 M2GE 303 G11	>VMQ<	0.16	1

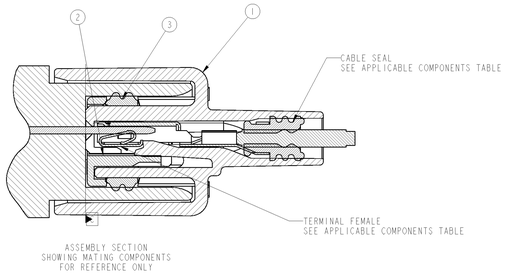
APPLICABLE COMPONENTS

ITEM	DESCRIPTION	MANDATORY (YES/NO)	TERMINAL CAVITY MIN/MAX OD	PLATING / MATERIAL	FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.
1	G120 1.5 YAZAKI FEMALE	NO	0/4.6	COPPER ALLOY/TIN PLATE	N/A	N/A
2	WIRE SEAL (APPLICABLE TO ITEM 1)	NO	N/A	SILICONE RUBBER	9TBG-10C930-SB*	E-1644-01
3	WIRE SEAL (APPLICABLE TO ITEM 1)	NO	N/A	SILICONE RUBBER	XW43-14603-A*	E-1644-00
4	WIRE SEAL (APPLICABLE TO ITEM 1)	NO	N/A	SILICONE RUBBER	XW4T-14603-F*	E-1644-02

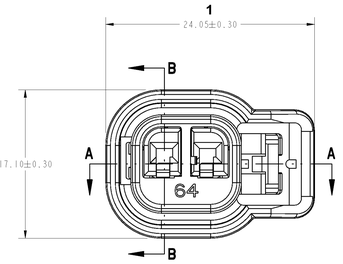
FULL SIZE VIEWS

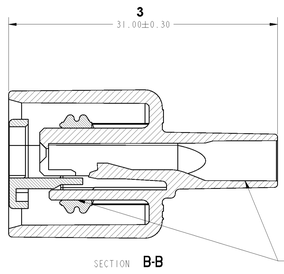


SECTION **A-A**

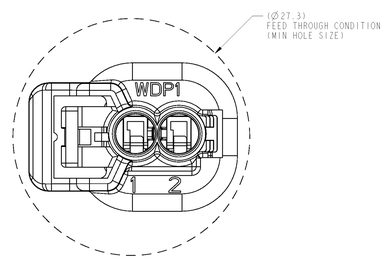


ASSEMBLY SECTION
SHOWING MATING COMPONENTS
FOR REFERENCE ONLY





SECTION **B-B**



DRAWING NOTE TEXT:

1. PARTS CONFORM TO THE ELECTRICAL CONNECTION SYSTEM DESIGN SPECIFICATION (SDS) DATED 09-AUG-2018 EXCEPT ROT-180107-008641 REQUIREMENTS FOR NEW ELECTRICAL CONNECTORS 5A THRU 5A-3 CONNECTOR LOCK PROTECTION 5B-1 THRU 5B-2 CONNECTOR LOCK AUDIBLE AND TACTILE FEEDBACK
2. PARTS CONFORM TO THE LATEST LEVEL OF USCAR REFERENCED IN THE SDS EXCEPT PARA 5.4.5.2.4 TPA LOCK TO PRE-SET IS ION MIN AFTER TWO CYCLES
3. MAXIMUM MATING FORCE FULLY POPULATED WITH TIN TERMINALS <= 45 N
4. TERMINAL EXTRACTION TOOL **N/A**
4 5. SEALING SURFACES AS IDENTIFIED ON THIS DRAWING ARE SMOOTH AND FREE OF PARTING LINES
6. CONNECTOR IS RATED AS ERGONOMIC CLASS 2 BASED ON USCAR-25 REV1 CONNECTOR PUSH SURFACE AREA IS 180 MM2
7. MEETS THE CLIP SLOT SIZE ES-BUST-144485-AA PER USCAR EWCAP-005-11 **N/A**
8. PART AS 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. THIS DRAWING HAS BEEN PREPARED BY OR ON BEHALF OF FORD MOTOR COMPANY. FORD MOTOR COMPANY RETAINS ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS. THIS DRAWING MUST NOT BE USED FOR ANY PURPOSE OTHER THAN PERFORMING SERVICES DIRECTLY OR INDIRECTLY TO FORD MOTOR COMPANY, WITHOUT THE EXPRESSED WRITTEN PERMISSION OF FORD MOTOR COMPANY. UNAUTHORIZED USE, COPYING OR MODIFICATION, INCLUDING THE REMOVAL OF THIS NOTE, MAY CONSTITUTE A VIOLATION OF CIVIL OR CRIMINAL LAWS ENFORCEABLE BY FORD OR GOVERNMENTAL AGENCIES COPYRIGHT 20190625 FORD MOTOR COMPANY
12. FOR THE PURPOSES OF GEOMETRIC TOLERANCING, ALL DIMENSIONAL INFORMATION CONTAINED IN THE CAD MODEL IS BASIC (THEORETICAL)
13. REFER TO DVP&R 6001537601 FOR TESTING REQUIREMENTS
14. SUPPLIER CODE: F618C

LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MAT'L APP	
RELEASED AELE E 12035198 485		20190625		
J.DEBOER	S.FINSTROM	JPITTENI	M.DAVIDSON	

WDP RECEIVED
By Mike Davidson at 11:31 am, Jul 29, 2019

WDP
Western Diversified Plastics
Phone: (269) 668 3393

REFERENCE

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
X-PROE	TC				
PLANT CODE	LINE CODE	OPER NO.	BT NO.	STATION	SIZE
N/A	N/A	N/A	N/A	N/A	A0
PLANT NAME	DEPT NO.	DESIGN	SCALE	SHT 1 OF 2	
N/A	N/A	J.DEBOER	4:1		

TITLE/PART NAME
SLV ASY WIR CONN FEM

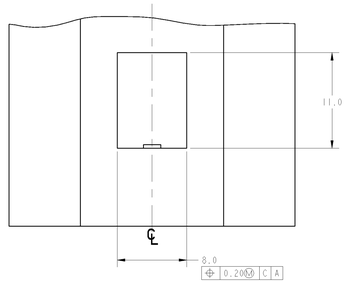
DRAWING/PART NO.
LU5T-14A464-ALA

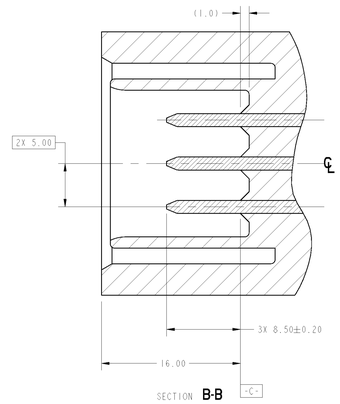
N/A

FORD MOTOR COMPANY

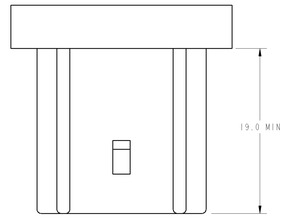
APPLICABLE HEADER SPECIFICATION

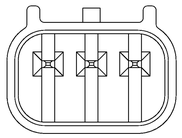
SCALE = 4:1



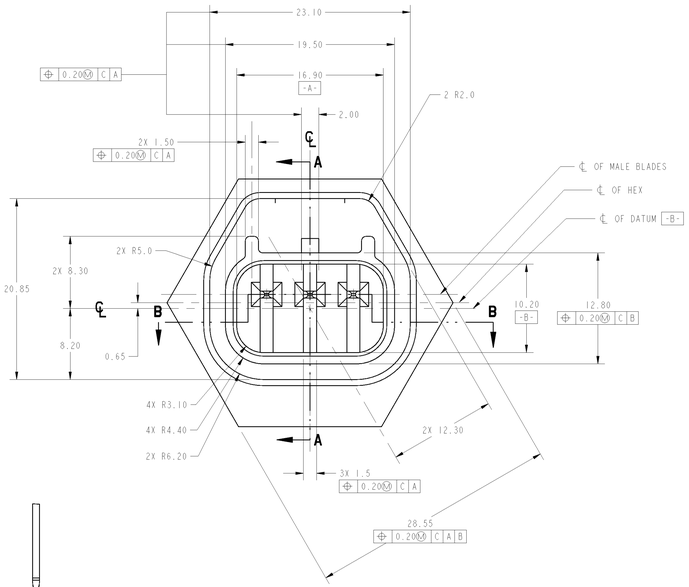


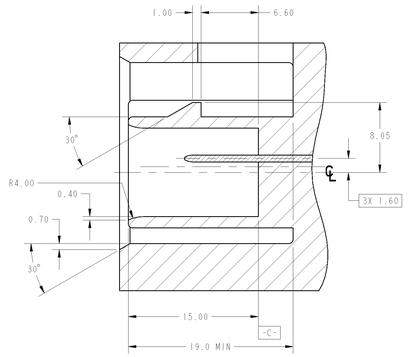
SECTION **B-B**



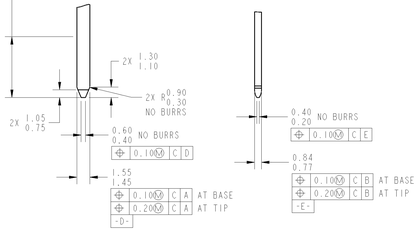


OPTIONAL CONSTRUCTION



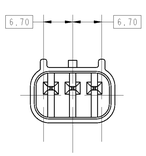


SECTION **A-A**

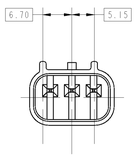


TERMINAL CONFIGURATION

SCALE = 4:1



"A" POLARIZATION
SCALE = 2:1



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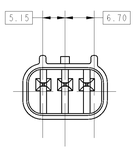
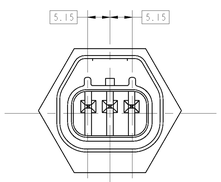


"C" POLARIZATION
SCALE = 2:1



"D" POLARIZATION
SCALE = 2:1

MALE TERMINAL AND ELECTRICAL REQUIREMENTS
(EXCEPTIONS MUST BE APPROVED BY THE RESPONSIBLE ENGINEER)

BASE MATERIAL - COPPER ALLOY

ELECTRICAL CONDUCTIVITY - >=28% IACS AT 20°C (AS ANNEALED).
USE OF MATERIALS WITH CONDUCTIVITY <28% IACS OR NON-COPPER ALLOYS ARE ACCEPTABLE WHEN APPROVED BY THE RESPONSIBLE ENGINEER.

CONTACT AREA PLATING - (ES-F8DB-14A229-AA, BA, CA, DA)
TIN - FOR UP TO 125°C MAX. CONTINUOUS TEMPERATURE
BARRIER PLATE - (OPTIONAL FOR SOLDERABILITY) UNDERPLATE WITH COPPER 0.0025MM (100 MICRO-INCHES) MIN. THICKNESS.
TOP LAYER - 0.0050±0.0025MM (200 MICRO-INCHES) TIN

PRECIOUS METAL - (WHEN SPECIFIED)
BARRIER PLATE - (OPTIONAL FOR SOLDERABILITY) UNDERPLATE WITH COPPER 0.0025MM (100 MICRO-INCHES) MIN. THICKNESS.
INTERMEDIATE LAYER #1 - NICKEL - 0.0012MM (50 MICRO-INCHES) MIN. NICKEL ELECTROPLATE
INTERMEDIATE LAYER #2 - (OPTIONAL) - 0.001MM (40 MICRO-INCHES) MIN. PALLADIUM ELECTROPLATE
TOP PLATING - 0.0001MM (4 MICRO-INCHES) MIN. HARD-GOLD ELECTROPLATE IF INTERMEDIATE LAYER #2 IS APPLIED.
- 0.0005MM (20 MICRO-INCHES) MIN. HARD-GOLD ELECTROPLATE IF INTERMEDIATE LAYER #2 IS NOT APPLIED.

PROCESS LUBRICANT:
ANY PROCESS LUBRICANT REMAINING ON THE TERMINAL MUST NOT VARNISH OR DEGRADE ITS ELECTRICAL PERFORMANCE UP TO A MAXIMUM CLASS AMBIENT TEMPERATURE PER SAE/USCAR-2 FOR 1008 HOURS. PROCESS LUBRICANTS SHOULD BE APPROVED BY THE RESPONSIBLE ENGINEER.

NOTES: UNLESS OTHERWISE SPECIFIED

GENERAL TOLERANCES
±0.3 ALL ONE PLACE DIMENSIONS
±0.10 ALL TWO PLACE DIMENSIONS
±1°00' ALL ANGULAR DIMENSIONS

DRAFT ANGLE PERMISSIBLE ONLY WITHIN DRAWING TOLERANCE

0°30' MAXIMUM DRAFT ANGLE

ALL UNSPECIFIED RADII: 0.50

0.3 MAXIMUM RADIUS PERMISSIBLE ON EDGES SHOWN AS SHARP

WDP W
Western Diversified Plastics
Phone: (269) 668-3393

DRAWING	REV	SHT 2 OF 2
LU5T-14A464-XA	A	
CAD FILE	FORD MOTOR COMPANY	

Polyram Plastic Industries LTD
Moshav Ram On
M.P Gilboa 1920500
Israel
Tel.: 972-4-6599900, Fax: 972-4-6499763
Company Number: 515251593
VAT Number: 515251593
Withheld Tax File: 902248582

URL: https://www.polyram-group.com
E-mail: mail@polyram-group.com

Certificate of Analysis

acc. to ASTM D5927-03 TPES011G30

Grade Name: **RAMSTER 620 BLK**
Customer PN#: MAT-089-BLK
Description: PBT I GF30 HR BLACK
LOT Number: 20010593
LOT Date: 16/02/20
Color: BLACK 401
Customer: WESTERN DIVERSIFIED PLASTICS
Polyram Name: RAMSTER PF312G6BK401

Properties	Test Method	Units	Designated Min	Designated Max	AVG RESULTS
HDT 1.8MPa	ISO-75	°C	200.0000	---	206.2000
Determination of ASH	ISO 3451-1	%	28.0000	32.0000	29.5833
SPIRAL FLOW	INTERNAL	in	35.0000	42.0000	38.1000
MFI (250/2.16kg)	ISO 1133	g/10min	12.0000	35.0000	16.9500
TENSILE STRENGTH	ISO 527-2/1A	MPa	115.0000	---	132.1667
TENSILE MODULUS	ISO 527-2/1A	MPa	7,500.0000	---	9,810.0000
NOTCHED CHARPY IMPACT	ISO179-1/1eA	kJ/m²	7.0000	---	10.9960

Grade Remarks

Layout inspection data:

HDT @1.8 MPa ISO-75 200C

This lot meets the mechanical requirements of FCA MS50103 CPN 4615 and Ford WSK-M4D725-B1 specification

No. 86 Version A

The test values reported are means of individual test values
determined on samples taken in accordance with the testing plan
of the day of production.
Thank you for deciding on Polyram product.

Yaara Avrahami
Quality Manager
Polyram Plastic Industries LTD

Polyram Plastic Industries LTD
Moshav Ram On
M.P Gilboa 1920500
Israel
Tel.: 972-4-6599900, Fax: 972-4-6499763
Company Number: 515251593
VAT Number: 515251593
Withheld Tax File: 902248582

URL: https://www.polyram-group.com
E-mail: mail@polyram-group.com

Certificate of Analysis

acc. to ASTM D5927-03 TPES011G33

Grade Name:	**RAMSTER 316 NATURAL**
Customer PN#:	MAT-090-NAT
Description:	PBT I GF33 HR NATURAL
LOT Number:	20020016
LOT Date:	09/03/20
Color:	NATURAL
Customer:	WESTERN DIVERSIFIED PLASTICS
Polyram Name:	RAMSTER PF316G33NT

Properties	Test Method	Units	Designated Min	Designated Max	AVG RESULTS
MFI (250/2.16kg)	ISO 1133	g/10min	9.0000	16.0000	12.0000
HDT 1.8MPa	ISO-75	°C	194.0000	---	205.7000
Determination of ASH	ISO 3451-1	%	31.0000	35.0000	32.8500
TENSILE STRENGTH	ISO 527-2/1A	MPa	103.0000	---	138.5000
STRAIN AT BREAK	ISO 527-2/1A	%	2.0000	---	2.9000
TENSILE MODULUS	ISO 527-2/1A	MPa	9,000.0000	---	10,350.0000
NOTCHED CHARPY IMPACT	ISO179-1/1eA	kJ/m²	7.0000	---	12.7550

Grade Remarks

Layout inspection data:

HDT @1.8 MPa ISO-75 200C

This lot meets the mechanical requirements of Ford SPEC WSK-M4D608-A

The test values reported are means of individual test values determined on samples taken in accordance with the testing plan of the day of production.
Thank you for deciding on Polyram product.

No. 86 Version A

Yaara Avrahami
Quality Manager
Polyram Plastic Industries LTD

Certificate of Registration

This certificate has been awarded to

Polyram Plastic Industries Ltd

Ram-On, 1920500, Israel

in recognition of the organization's Quality Management System which complies with

ISO 9001:2015

The scope of activities covered by this certificate is defined below

Design and Manufacture of Thermoplastic Raw Material Compounds

Certificate Number:	Date of Issue: (Original)	Date of Issue:
61487/BB/0001/SM/En	04 July 2017	22 June 2020
Issue No:	**Expiry Date:**	
4	21 June 2023	

Issued by: *On behalf of the Schemes Manager*

0043

Appendix to Certificate

Design and Manufacture of Thermoplastic Raw Material Compounds

Extended Manufacturing Location
Afula Site
1 Rabin Road
Tadiran Site
Afula
Israel

Scope: Manufacture of Thermoplastic Raw Material Compounds

Certificate Number:	Date of Issue of Certification Cycle:	
61487/B/0001/SM/En	22 June 2020	
Issue No:	**Expiry Date:**	**IATF No:**
4	21 June 2023	0368787

Certificate of Registration

This certificate has been awarded to

Polyram Plastic Industries Ltd

Ram-On, 1920500, Israel

in recognition of the organization's Quality Management System which complies with

IATF 16949:2016

The scope of activities covered by this certificate is defined below

Design and Manufacture of Thermoplastic Raw Material Compounds

Certificate Number:	**Date of Issue of Certification Cycle:**	
61487/B/0001/SM/En	22 June 2020	
Issue No:	**Expiry Date:**	**IATF No:**
4	21 June 2023	0368787

Issued by: *On behalf of the Schemes Manager*

FOREST CITY TECHNOLOGIES, INC.
INNOVATION BY DESIGN

Print Rev.: A14

MATERIAL: SAE J200 M2GE 303 G11 Z1-Z4
Z1 - SHORE A DUROMETER: 22-32
Z2 - ELONGATION: 450% MIN.
Z3 - COMPRESSION SET: 25% MAX.
Z4 - LUBRICANT BLEED MUST BE EVIDENT WITHIN 24 HOURS OF MOLDING
POST CURE - 3 HOURS AT 400° F
COLOR: RED/BROWN

DaimlerChrysler Ford General Motors

SUPPLIER	PART NUMBER
FOREST CITY TECHNOLOGIES	3570-50-001A
NAME OF LABORATORY	PART NAME
FOREST CITY TECHNOLOGIES	INTERFACIAL SEAL 2-WAY

JS#: 16-0262

	Test	MATERIAL SPECIFICATION SAE J200 M2GE 303 G11 Z1 - Z4	FCMS# 769 SPEC MIN.	SPEC MAX.	TEST RESULTS	UOM	OK	NOT OK
Z1 (GE30)	DUROMETER	ASTM-D2240, SHORE A	22	32	29	points		
(GE3)	TENSILE	ASTM-D412	3		6.3	Mpa		
Z2	ELONGATION @ BREAK	ASTM-D412, DIE C	450		563	%		
G11 (Grade2)	TEAR STRENGTH	ASTM-D624, DIE B	5		21	kN/m		
Z3	COMPRESSION SET	ASTM-D395, 70 hrs @ 150°C	0	25	25	%		
Z4	LUBRICANT BLEED		Evident Within 24 Hours		PASS			

IMDS # 88228312

Signature  Date 9/17/2019

Reported by/Tilte: Tyler Vegh, Quality Engineer

SMITHERS
QUALITY ASSESSMENTS

CERTIFICATE OF APPROVAL

This is to Certify that the Environmental Management System of:

Forest City Technologies, Inc.

299 Clay Street
Wellington, OH 44090

(Page 1 of 2; see Appendix)

has been assessed and approved by Smithers Quality Assessments, Inc., to the following environmental management system standards and requirements:

ISO 14001:2015

The Environmental Management System is Applicable to:

The manufacture of sealing devices and molded products and the application of sealants, coatings tapes and related services to both such as sorting/packing, and delivery for the fastener, automotive, infant care and other industries.

Approval
Certificate Number: 10.328.2

Original Approval: November 24, 2010

Current Certificate: March 28, 2019

Certificate Expires: March 27, 2022

The use of the accreditation mark indicates accreditation in respect of those activities covered by the above certificate number.

on behalf of SQA - J. Michael Hochschwender, CEO

The approval is subject to the company maintaining its system to the required standards which will be monitored by Smithers Quality Assessments, Inc., 121 S. Main St. Suite 300, Akron, Ohio 44308, USA

ANAB ACCREDITED ISO/IEC 17021 MANAGEMENT SYSTEMS CERTIFICATION BODY

APPENDIX A
TO THE CERTIFICATE
OF REGISTRATION NO. 10.328.2

SMITHERS QUALITY ASSESSMENTS, INC.

Forest City Technologies, Inc.
299 Clay Street
Wellington, OH 44090, U.S.A.

is certified by Smithers Quality Assessments, Inc. with regard to ISO 14001:2015.

In addition, the following sites have been assessed and found to be in compliance with the applicable requirements of ISO 14001:2015.

Locations:

Forest City Technologies, Inc.
299 Clay Street
Wellington, OH 44090
Scope: Manufacturing

Forest City Technologies, Inc.
401 Magyar Street
Wellington, OH 44090
Scope: Manufacturing

Forest City Technologies, Inc.
232 Maple Street
Wellington OH 44090
Scope: Manufacturing

Forest City Technologies, Inc.
22069 Fairgrounds Road,
Wellington OH 44090
Scope: Manufacturing

This appendix applies only to those sites listed above. As other sites are assessed and approved, or as sites already approved are removed from active services, this appendix will be amended to show the current status. Sites not listed on this appendix shall not be viewed as approved.

ANAB ACCREDITED ISO/IEC 17021 MANAGEMENT SYSTEMS CERTIFICATION BODY

intertek
Total Quality. Assured.

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Western Diversified Plastics, LLC

53150 North Main Street, Mattawan, MI, 49071, USA

has been registered by Intertek as conforming to the requirements of:

IATF 16949:2016

The management system is applicable to:

Design and Manufacture of Plastic Components and Assemblies

Permissible exclusions include: None

IATF Certificate Number
0312892

Certificate Number:
2007-0124

Certificate Issue Date:
28 June 2018

Certificate Expiry Date:
27 June 2021

Calin Moldovean
President, Business Assurance

Intertek – 4700 Broadmoor, Suite200
Kentwood MI 49512, USA

APPENDIX TO CERTIFICATE OF REGISTRATION

This is to certify that the quality management system of:

Western Diversified Plastics, LLC

53150 North Main Street, Mattawan, MI, 49071, USA

has been registered by Intertek as conforming to the requirements of:

IATF 16949:2016

Including the Following Support Functions:

53196 N. Main Street, Mattawan, MI, 49071, USA	**After-Sales, Calibration, Contract Review, Laboratory, Process Design, Product Design, Sales**

IATF Certificate Number
0312892

Certificate Number:
2007-0124

Certificate Issue Date:
28 June 2018

Certificate Expiry Date:
27 June 2021

Calin Moldovean
President, Business Assurance

Intertek – 4700 Broadmoor, Suite200
Kentwood MI 49512, USA

intertek
Total Quality. Assured.

CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Western Diversified Plastics, LLC

53150 North Main Street, Mattawan, MI, 49071, USA

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

Design and Manufacture of Plastic Components and Assemblies

Certificate Number:
06-058e-01

Initial Certification Date:
02 June 2006

Date of Certification Decision:
28 June 2018

Issuing Date:
28 June 2018

Valid Until:
27 June 2021

ANAB ACCREDITED ISO/IEC 17021 MANAGEMENT SYSTEMS CERTIFICATION BODY

Calin Moldovean
President Business Assurance

Intertek Testing Services NA, Inc. dba Intertek
900 Chelmsford Street, Lowell, MA, USA

Western Diversified Plastics

53150 N. Main St. • Mattawan, MI 49071
Phone 269-668-3393 • Fax 269-668-4694

INTERNAL TEST LAB SCOPE

Field of Test	Products or Items Tested	Specified Tests or Properties Measured	Specification, Standard, or Method Used	Equipment / Range
Mechanical	Electrical and Mechanical Components	Force - Tension & Compression	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 25 FCA PF90012 WDP PS-001	Instron 3342 5 to 500N Instron 3366 5 to10KN
Mechanical	Electrical and Mechanical Components	Torque	ES-GU5T-14A067-AB Ford Connector SDS WDP PS-001	Jetco ED-2501 Stanley E23lb-16 Stanley E33LA18-46 .5 to 46 Nm
Mechanical	Electrical and Mechanical Components	Environmental Exposure – Temperature, Humidity Salt Fog Dust	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 20, 21 FCA PF90012 CETP 00.00L/E-412 WDP PS-001	Humboldt H30135E Thermotron SM-32& 4 Thermotron SE-600 Singleton SCCH 22 ESPEC EDC-27 Control Co 4040 Fluke 54 T/C Monitor -70C to 500C
Mechanical	Electrical and Mechanical Components	Environmental Exposure - Vibration – Sine, Random, Sine on Random, & Transient	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2 SAE/USCAR-20 FCA PF90012 WDP PS-001	Thermotron DSX-8000 Vib 5 to 3000 Hz, 8000 force lb 11ms 100g half sine shock 2.54 mps, 3” displacement Endevco 7251A Accel Dytran 3215 Accel ±500g max
Mechanical	Electrical and Mechanical Components	Environmental Exposure - Thermal Shock	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 20, 21 FCA PF90012 WDP PS-001	Thermotron ATS-320 H/V Fluke 54 T/C Meter -70C to 175C
Mechanical	Electrical and Mechanical Components	Sealing Integrity	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2 FCA PF90012 ISO 2653 IPX3,4	Weiss DUGY2-015 ±15psi Fluke 700RG07 -14 - 500psi 29.9 in Hg to 350 psi ESPEC ETH-37 Water chbr Up to 1500 psi - 4 gpm IPX3/4 Spray Head Ashcroft 5000 psig gage 100, 2000, 4000ml Grad Cyl Control Co 1042 Stopwatch - 1/100th sec
Temperature	Electrical Components	Thermal Imaging	ES-GU5T-14A067-AB WDP PS-001	FLIR T620 Up to 500°C

WDP W
Western Diversified Plastics

53150 N. Main St. • Mattawan, MI 49071
Phone 269-668-3393 • Fax 269-668-4694

Field of Test	Products or Items Tested	Specified Tests or Properties Measured	Specification, Standard, or Method Used	Equipment / Range
Sound	Mechanical Components	Sound Level Audible noise	Ford Connector SDS SAE/USCAR-2	Extech 407768 dB A&C scale to 140dB
AC Electrical	Electrical and Mechanical Components	Dielectric	ES-GU5T-14A067-AB WDP PS-001	Vitrek V63 100V to 5KV AC
Dimensional	Electrical and Mechanical Components	Distance / Length Height/Width	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2 SAE/USCAR-20	Mitutoyo 0- 6” Caliper GEI SS 1000mm ruler Wixey WR300 Angle Gage
DC Electrical	Electrical and Mechanical Components	Insulation Resistance Dielectric Resistance	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2 FCA PF90012 WDP PS-001	Vitrek V63 IR from 1 to 10Gohm Dielectric 100V to 6KV DC
DC Electrical	Electrical and Mechanical Components	Amperage	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 20, 21 FCA PF90012 WDP PS-001	Fluke 87, 287, 289 Keysight 34450A Extech 380941, 380947 .01 micro to 400A DC
DC Electrical	Electrical and Mechanical Components	Voltage	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 20, 21 FCA PF90012 WDP PS-001	Fluke 87, 287, 289 Keysight 34450A HP 44701A HP 44702B Rigol DS1104Z O-scope 1 micro to 1000 Volts DC
DC Electrical	Electrical and Mechanical Components	Resistance	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 20, 21 FCA PF90012 WDP PS-001	Keithley 580 Keysight 34450A 10micro to 200Kohm
Mechanical / DC Electrical	Electrical and Mechanical Components	Combined Environment Durability/Life Test	Various as Listed Above	Various as Listed Above

1.1 WDP test lab performs testing relative to the internal scope using the Test Request, DVP&R, and the Test Specification.

1.2 Capabilities may include tests related to the test technologies listed which utilize equipment and properties listed.

1.3 Any required conditions, or deviations, are communicated to the customer as identified in the DVP&R and/or Test data sheet.