

PART SUBMISSION WARRANT

Part Name <u>SLV ASY WIR CONN FEM</u>		Customer Part Number <u>DU5T-14A464-LA</u>	
Shown on Drawing No. <u>DU5T-14A464-LA</u>		Supplier Part Number <u>4115A-01-001A(000)</u>	
Engineering Change Level <u>E2 AELE-E-12035198-409</u>		Dated <u>11-Sep-2019</u>	
Additional Engineering Changes <u>N/A</u>		Dated <u>N/A</u>	
Safety and/or Government Regulation ☐ Yes ☒ No	Purchase Order No. <u>N/A</u>	Weight (kg) <u>0.0061</u>	
Checking Aid No. <u>N/A</u>	Checking Aid Engineering Change Level <u>N/A</u>	Dated <u>N/A</u>	

SUPPLIER MANUFACTURING INFORMATION <u>Western Diversified Plastics / 609123190</u> Supplier Name & Supplier/Vendor Code <u>53150 North Main Street</u> Street Address <u>Mattawan MI 49071 USA</u> City State Postal Code Country	CUSTOMER SUBMITTAL INFORMATION <u>Nursan Kablo Donanimlari San. Ve Tic. A.S.</u> Customer Name/Division <u>FORD</u> Buyer/Buyer Code <u>FORD</u> Application
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MATERIALS REPORTING
 Has customer-required Substances of Concern information been reported? ☒ Yes ☐ No ☐ Not Applicable
 IMDS - 158088466 / 11

 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

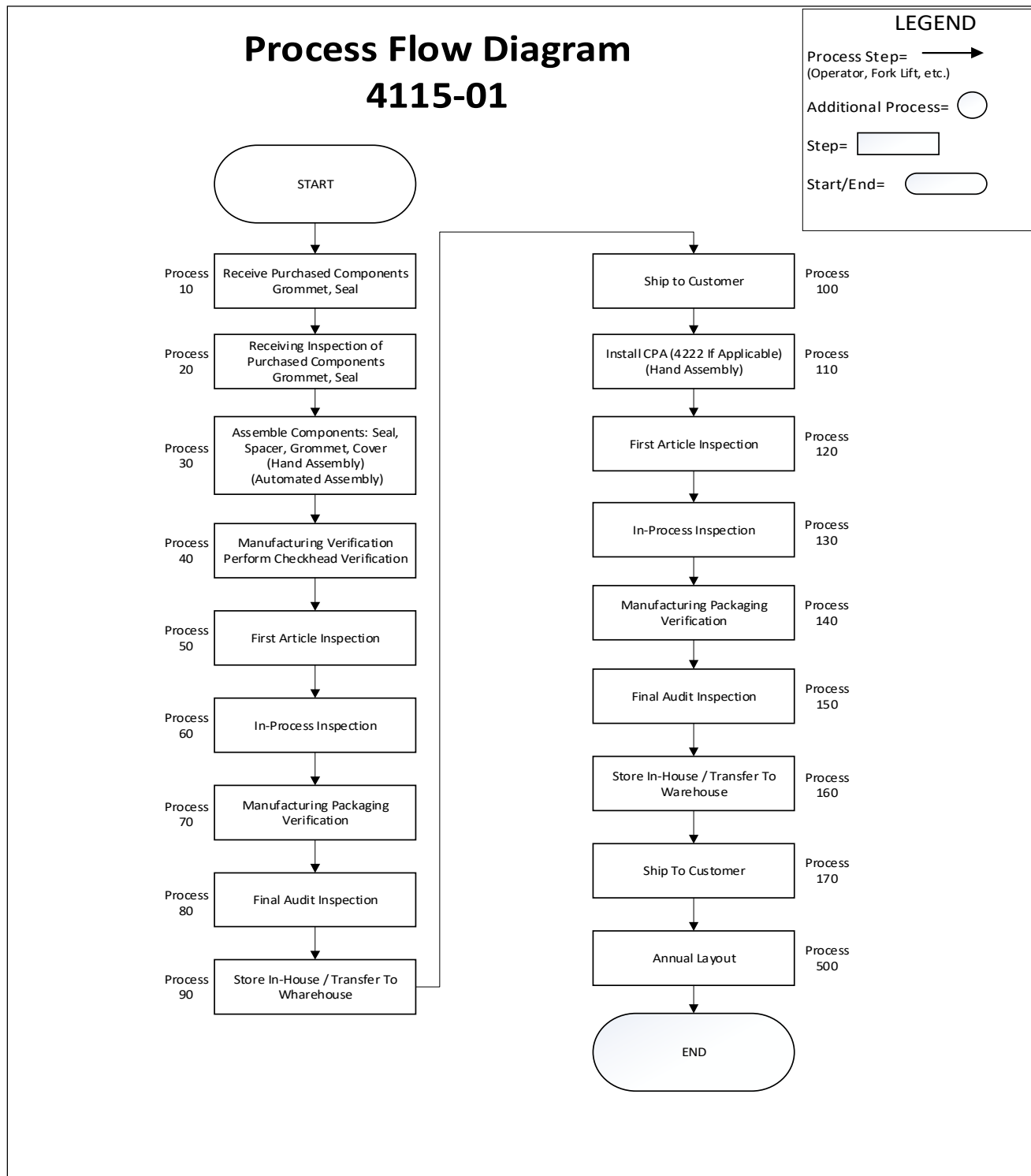
REQUESTED SUBMISSION LEVEL (Check one)
☐ Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
☐ Level 2 - Warrant with product samples and limited supporting data submitted to customer.
☒ Level 3 - Warrant with product samples and complete 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-4115 / 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 11380 / 8 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 Angela Henson Date 27-Oct-2023
 Print Name Angela Henson Phone No. 269-668-3393 Fax No. 269-668-7143
 Title Quality Engineer E-mail angela.henson@westerndp.com
 Part Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other
 Customer Signature _____ Date _____
 Print Name _____ Customer Tracking Number (optional) _____

Process Flow #: 4115x-01 (Revision E2 / A7) Date (Orig.) 03/28/2011 Date Rev. 07/18/2023
Item / Part #: 4115x-01-00xA(00x) / 800x4115x01A(00x) Prepared By Angela Henson / Merle Burger
Program(s) / Part Name: 4 Way Female .64mm Assembly



**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O x S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
Molded Components in the Assembly Shell Cover Spacer CPA (if applicable)	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	6		1. Machine parameters set up incorrectly on the molding machine 2. Tooling Failures 3. Machine Failures 4. Operational failures	2	1. See Individual pFMEA for the component. 2. See Systems pFMEA for molding 3. See control plan for molding	1. See Individual pFMEA for the component. 2. See Systems pFMEA for molding 3. See control plan for molding	5	60	12	BD WDP6215, short shot on spacer. Review molding process for spacer, review tooling for spacer, review issue with operators.	JH, KK 07/2023	BD WDP6215, short shot on spacer. Sent tool for PM (TMRW 4/9419), reviewed issue with operators, added non-conformign pictures to the database. No changes to S/O/D/RPN. AH	6	2	5	60
Process 10 Receive material & purchased components	Material is labeled correctly with the correct quantity	Incorrectly labeled material or components from supplier Incorrect quantity of material or components	1. Inaccurate inventory 2. Possible line shut down	6		1. Supplier system failure 2. Labels not properly bar coded	3	1. Warehouse scanning system 2. Supplier is minimum ISO 9001 certified 3. Receiving inspection	1. Warehouse scanning system 2. Receiving inspection	2	36	18	None						0
Process 20 Receiving Inspection Of Material	Material certification on file Material correctly labeled	No material certification on file Material labeled wrong	1. Inaccurate inventory 2. Possible line shut down	6		1. Error in raw material handling or processing at supplier. 2. Error in labeling product in house	2	1. Suppliers are ISO 9001 certified at minimum. 2. External Audits of the Suppliers by WDP.. 3. Receiving Inspection Instructions QWI022 4. Training of the Receiving Inspector to the work Instructions.	1. Receiving inspection 2. Material certification with each shipment	3	36	12	None						0
Process 20 Receiving Inspection Of Purchased Components Seal Grommet	PPAP on file, no defects, all parts meet drawing specifications	No PPAP on file Components not made to print specifications Components damaged, tears, plugged holes, etc.	1. Possible line shut down 2. Unable to build assemblies 3. Customer reject 4. Product on hold until PPAP is completed	6		1. Error in suppliers manufacturing process 2. Inadequate receiving inspection 3. Receiving inspection does not detect defects	2	1. Suppliers process controls 2. Suppliers submit PPAP package to WDP 3. Suppliers are ISO 9001 certified at minimum 4. Receiving inspection instructions.QWI022	1. Receiving inspection QWI022 2. AQL sampling plan	6	72	12	None						0
Process 30 Assemble Interfacial seal to connector Hand Assembly	No defects, one seal present & seated properly	Interfacial Seal missing	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunctions	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Fixtures reviewed daily for operational use 4. Operator inspection 5. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0
		Double Interfacial seal	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection 4. Fixture will not allow 2 seals 5. Fixtures reviewed daily for operational use 6. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O X S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
		Twisted Interfacial Seal	1. Connector leak causing open circuit 2. Customer rejection 3. Validation sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Fixtures reviewed daily for operational use 4. Operator inspection 5. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0
		Interfacial Seal Underfilled / Damaged	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Underfilled / Damaged Seal received from supplier 2. Seal damaged during assembly	2	1. Supplier process controls 2. Operator Training to the procedures 3. Operator Inspection 4. Fixtures reviewed daily for operational use	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0
Process 30 Assembly Of Spacer To Connector Hand Assembly	No molding defects, spacer present & seated properly	Spacer missing	1. Open circuit in the finished application 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection 4. Fixtures reviewed daily for operational use 5. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0
		Spacer misoriented	1. Open circuit in the finished application 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Fixtures have been Pokey-Yoke to assemble to the pre- locked position and proper orientation 2. Operator training on work instruction 3. Floor operator training on assembly set up 4. Operator inspection 5. Fixtures reviewed daily for operational use 6. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0
		Spacer damaged / broken	1. Not capture the terminals 2. Customer Rejection 3. Product Verification Sorting	8		1. Part broken from molding process 2. Operator error during assembly 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection 4. Fixtures reviewed daily for operational use 5. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O X S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
		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. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Fixtures have been Pokey-Yoke to assemble to the pre- locked position and proper orientation 2. Operator training on work instruction 3. Floor operator training on assembly set up 4. Operator inspection 5. Fixtures reviewed daily for operational use 6. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	24	6	None						0
Process 30 Assembly of Grommet to Connector Hand Assembly	Grommet present & seated properly	Grommet missing	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunctions pulling grommet back out	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Fixtures reviewed daily for operational use 4. Operator inspection 5. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0
		Grommet miss orientated	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	1	1. Part design allows grommet assembly symmetrical 180° 2. Fixtures have been Pokey-Yoke to assemble to the proper orientation 3. Operator training on work instruction 4. Fixture reviewed daily for operational use 5. Operator inspection 6. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	32	8	None						0
Process 30 Assemble Cover To Connector Hand Assembly	No molding defects, correct cover present & seated properly	Cover missing	1. Open circuit in the finished application 2. Customer rejection 3. Product verification sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection 4. Fixtures reviewed daily for operational use 5. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0
		Cover mis-oriented	1. Open circuit in the finished application 2. Customer rejection 3. Product verification sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection 4. Fixture has been poke yoke to assemble in one direction 5. Fixtures reviewed daily for operational use 6. Red rabbit parts ran through machine each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O X S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
		Cover damaged / broken	1. Not capture the terminals 2. Customer rejection 3. Product verification sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection 4. Fixtures reviewed daily for operational use	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection with collaborative robot	4	64	16	None						0
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	12	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 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	12	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	12	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O X S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
		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	6	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 6. Enable/Disable Camera button program allows only technicians access	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	12	None						0
		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 / Keyence measuring 8. Supplier controls	3	36	12	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	36	12	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O X S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
		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	12	None						0
Process 30 Assemble Grommet To Connector Automated Assembly	No defects, grommet present & seated properly	Grommet 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. Machine logic does not cycle without part presence detection 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	3	36	12	None						0
		Grommet miss orientated	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. Part design allows grommet assembly symmetrical 180° 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	2	24	12	None						0
		Grommet Underfilled / Torn	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	6		1. Underfilled / Damaged Grommet received from supplier 2. Grommet 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 / Keyence measuring 8. Supplier controls	3	36	12	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O X S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
Process 30 Assemble Grommet Cover To Connector Automated Assembly	Correct cover orientation, cover present & seated properly, no molding defects	Grommet Cover missing	1. Wireharness Customer Rejection 2. Potential loss of grommet 3.Connector leak causing open circuit 4. Validationiion sorting	6		1. Machine miss feed 2. Part detection sensor failure	2	1. Machine logic does not cycle without part presence detection 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	3	36	12	None						0
		Grommet Cover misoriented	1. Wireharness Customer Rejection 2. Potential loss of grommet 3.Connector leak causing open circuit 4. Validationiion sorting	6		1. Machine miss feed 2. Part detection sensor failure	2	1. Part design allows Grommet Cover One way 2. In-line sensors detect backward cover, causes machine stoppage fault failure 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	12	None						0
		Grommet Cover not fully engaged	1. Wireharness Customer Rejection 2. Potential loss of grommet 3.Connector leak causing open circuit 4. Validationiion sorting	6		1. Machine cylinder under stroke	2	1. Cylinder stroke position sensor 2. Fixtures and cylinder stroke have been designed to assemble to locked position - positive stop in equipment.	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	12	None						0
		Wrong Cover Pin Configuration (Orientation)	1. Wire harness customer rejection 2. Connector leak causing open circuit 3. Product Verification Sorting	6		1. Operator error loading machine with components 2. Operator error setting machine up 3. Vision system failure	2	1. Operator set up instructions 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	3	36	12	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O X S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
		Cover pegs broken and / or bent	1. Wire harness Potential cutting of wires - Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	6		1. Machine cylinder malfunction. 2. Molding ejection process not stable 3. Grommet not dimensionally stable	2	1. Cylinder stroke position sensor 2. Cylinder stroke has 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	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. Machine PM schedule to maintain optimal performance	3	36	12	None						0
		Cover pegs do not seal	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Machine cylinder malfunction. 2. Molding ejection process not stable 3. Grommet not dimensionally stable 4. Molding defects, flash, pitting, etc.	2	1. Cylinder stroke position sensor 2. Cylinder stroke has been designed to assemble to locked position - positive stop in equipment. 3. Inspector and Operator Training to the procedures. 4. 100% Vision system inspection at dedicated stations	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% Vision system inspection at dedicated stations 6. Machine PM schedule to maintain optimal performance	3	48	16	None						0
Process 40 Manufacturing Verification 100% Visual Inspection of Assembly Hand Assembly	All components one of each, spacer, seal, grommet, cover, present & seated properly	Parts mis-assembled (wrong or missing components)	1. Cause loss of designed functionality	8		1. Vision system not detecting mis-assembled parts 2. Parts not going into reject chute	2	1. Training on setup of equipment. 2. Computer controlled system. 3. 100% vision system inspection	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% vision system inspection 6. Test verification parts beginning of each shift	7	112	16	None						0
Process 40 Manufacturing Verification 100% Inspection of Assembly Automated Assembly	All components one of each, spacer, seal, grommet, cover, present & seated properly	Parts mis-assembled (wrong or missing components)	1. Cause loss of designed functionality	6		1. Vision system not detecting mis-assembled parts 2. Parts not going into reject chute	2	1. Training on setup of equipment. 2. Computer controlled system. 3. Vision system inspection at 3 stations that 100% each part	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. Vision system at 3 stations that 100% inspection each part 6. Test verification parts beginning of each shift	3	36	12	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O x S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
Process 40 Checkhead Verification Hand Or Automated Assembly	All components present & seated properly	Parts mis-assembled (wrong or missing components)	1. Assembly machine passes non-conforming parts 2. Customer rejection 3. Validation sorting	8		1. Sensor failure on equipment 2. Opeator doesn't understand instructions	2	1. Operator training on assembly 2. First Article Inspection on Work Instructions 3. Inprocess Inspection Work Instructions 4. Final Audit Inspection Work Instructions 5. Operator Inspection Work Instruction 6. PM on machine	1. First Article Inspection 2. Inprocess Inspection 3. Final Audit Inspection 4. Operator Inspection 5. Verification test parts the beginning of each shift	3	48	16	None						0
Process 50 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. Dimensional inconsistency 2. Poor fit to mating part causing an open or incomplete circuit 3. Missing or incomplete features 4. Validation sorting 5. Customer reject	6		1. Inspection Instructions not adequate 2. Inspection instructions not followed 3. Operator error	2	1. Training for all inspectors to the work instructions 2. Cross functional team creates inspection instructions	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection	5	60	12	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. Work instruction QWI010 First Last Article Inspection 2. Work Instruction QWI026 In-process inspection 3. Supervisor review of In process inspections being performed 4. Work instruction QWI016 Final Audit inspection 5. Cross functional team creates inspection instructions 6. Training to all work instructions 7. Gaging guides	1. Inspection entry into the WDP Database 2. Evidence of parts on First Article board & molding machine 3. Work instruction QWI016 Final Audit Inspection	5	80	16	None						0
		Inspection process not effective	1. Potential nonconforming part will be produced 2. Possible customer reject & line shut down	6		1. Inspection Instructions not adequate 2. Inspection instructions not completed correctly 3. Operator error	2	1. Work instruction QWI010 First Last Article Inspection 2. Work Instruction QWI026 In-process inspection 3. Supervisor review of In process inspections being performed 4. Work instruction QWI016 Final Audit inspection 5. Cross functional team creates inspection instructions 6. Training to all work instructions 7. Gaging guides	1. Non-conforming pictures in WDP Database 2. Alerts in WDP Database 3. Cross functional team creates inspection instructions 4. Work instruction QWI016 Final Audit inspection 5. Work instruction QWI026 In-process inspection	5	60	12	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O X S	RECOMMENDED ACTION(S)	RESPONSIBILITY &TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
		Label printing not completed per procedure (Wrong labels)	1. Internal customer reject 2. Possibly wrong product shipped 3. Potential customer manufacturing shut down	6		1. Operator not following label printing instructions 2. Error with label maker 3. Inspector failure to verify correct labels	2	1. Work instruction MWI025 Printing Production Labels 2. Work instruction QWI010 First Last Article Inspection 3. Work instruction QWI026 In-process inspection 4. Work instruction MWI004 Label ID & Use 5. Work instruction QWI016 Final Audit inspection 6. Training to all work instructions	1. Label Verification Master 2. Work instruction QWI010 First Last Article inspection 3. Work instruction QWI026 In-process inspection 4. Work instruction QWI016 Final Audit inspection 5. Work instruction MWI004 Label ID & Use	5	60	12	None						0
Process 60 In-Process Inspection	Visual inspection of parts, no molding defects, no missing, mis-seated components, proper carton identification	See First Article Inspection See control plan in database	See First Article Inspection See control plan in database	6		See First Article Inspection See control plan in database	2	See First Article Inspection See control plan in database	See First Article Inspection See control plan in database	5	60	12	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	12	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. Multiple 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	12	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 and unsealed 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	12	None						0

POTENTIAL FAILURE MODE AND EFFECTS ANALYSIS (Process FMEA)

ITEM: 4115x-01-00xA(00x) / 800x4115x01A(00x)

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) 4 Way Female .64mm Assembly

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

CORE TEAM: PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): 7/18/23

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O X S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
Process 80 Final Audit Inspection	Visual inspection of parts, no molding defects, no missing or mis-seated components, correct carton label	Inspection process does not detect defects	1. Dimensional inconsistency 2. Poor fit to mating part causing an open or incomplete circuit 3. Missing or incomplete features 4. Validation sorting 5. Customer reject	6		1. Inspection Instructions not adequate 2. Inspection instructions not followed 3. Operator error	2	1. Training for all inspectors to the work instructions 2. Cross functional team creates inspection instructions	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection	7	84	12	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. Work instruction QWI016 Final Audit Inspection 3. Work instruction QWI026 In-process inspection 4. Work instruction QWI010 First Last Article inspection 5. Operator inspection	7	84	12	None						0
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	16	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	16	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	16	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **4115x-01-00xA(00x) / 800x4115x01A(00x)**

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

4115x-01 (Revision E2 / A7)

MODEL YEAR(s) / PROGRAM(s) **4 Way Female .64mm Assembly**

Key Date:

10/03/2011

Prepared by:

Angela Henson / Merle Burger

CORE TEAM: **PM - Kirk Boeskool, ME - Merle Burger, QE - Angela Henson, Plant Super. - Karen Nickrent, QC Super. - Bev Roberts**

FMEA Date (Orig.):

3/28/11

FMEA Date (Rev): **7/18/23**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	O X S	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION						ACTION TAKEN	S E V	O C C	D E T	R P N
		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	16	None					0	
Process 110 Assemble CPA To Connector (If applicable) Hand Assembly	No molding defects, CPA present & seated properly	CPA missing	1. Customer rejection 2. Product verification sorting	6		1. Operator not understanding the installation instructions 2. Instructions not available during build 3. Fixture malfunction	2	1. Operator instructions 2. Operator training to the instructions 3. Assembly set up instructions 4. Fixture which verifies the CPA is present 5. Fixtures are checked daily during use	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. Verification fixture	6	72	12	None					0	

Control Plan

Western Diversified Plastics

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☐ Pre-Launch	☒ Production	☐ Assembly	☐ Safe Launch	Key Contact / Phone					Date (Orig.)		Date (Rev.)	
Job Number 4115 Part				Angela Henson 269.668.3393					04/21/2008		07/18/2023	
Part Number 4115A-01-00xA(00X)/800		Rev. E2 / A7	Engineering Number 4115A-01		Rev. E2 / A7	Core Team A.Henson, M. Burger, K. Nickrent, K. Boeskool, B. Roberts				Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 4 WF 0.64MM Conn Shell						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		Control Method	
									Size	Freq.		
1	10	Receiving	Supplier	Purchased Components			Components Purchased	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 4115-50-001A			Verify PPAP on File	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 4115-50-001A			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 4115-50-001A			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 4115-50-001A			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	20	Receiving Inspection	Supplier	Purchased Grommet 4115-51-001A			Verify PPAP on File	Supplier Database - Purchased Components		Each Lot / Each Shipment	QWI022 / Receiving Inspection	Reject Per QWI001 / Notify Supervisor / Request PPAP From Supplier
7	20	Receiving Inspection	Supplier	Purchased Grommet 4115-51-001A			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
8	20	Receiving Inspection	Supplier	Purchased Grommet 4115-51-001A			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
9	20	Receiving Inspection	Supplier	Purchased Grommet 4115-51-001A			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
10	30	Hand Assembly	Hand Assembly Step #1	4 Way Female			Install Seal, Spacer, Grommet & Cover Into Fixture FW0050-A	Manual Placement	Each Part	Each Assembly	Operator Instructions	Place Defective Parts In Reject Bin
11	30	Hand Assembly	Hand Assembly Step # 2	4 Way Female			Install Seal, Spacer, Grommet & Cover Into Shell	Manual Placement / FW0050-A	Each Part	Each Assembly	Operator Instructions	Place Defective Parts In Reject Bin
12	30	Hand Assembly	Hand Assembly Step # 3	4 Way Female			Verify Presence Of Seal, Spacer, Grommet, Cover	Visual	Each Part	Each Assembly	Operator Instructions	Place Defective Parts In Reject Bin
13	30	Hand Assembly	Hand Assembly Step # 4	4 Way Female			Place Assembly Into Co-bot Holding Fixture	Manual Placement	Each Part	Each Assembly	Operator Instructions	Place Defective Parts In Reject Bin
14	30	Automated Assembly	Assembly Machine Station #1	Assembly Step #1 (1-33)			Shell Placement	Fiber Optic Eye Station #1	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
15	30	Automated Assembly	Assembly Machine Station #2	Assembly Step #2 (1-33)			Grommet Placement	Vision System Station #4	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst

Control Plan

Western Diversified Plastics

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☐ Pre-Launch	☒ Production	☐ Assembly	☐ Safe Launch	Key Contact / Phone					Date (Orig.)		Date (Rev.)	
Job Number 4115 Part				Angela Henson 269.668.3393					04/21/2008		07/18/2023	
Part Number 4115A-01-00xA(00X)/800		Rev. E2 / A7	Engineering Number 4115A-01		Rev. E2 / A7	Core Team A.Henson, M. Burger, K. Nickrent, K. Boeskool, B. Roberts				Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 4 WF 0.64MM Conn Shell						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			Control Method
									Size	Freq.		
16	30	Automated Assembly	Assembly Machine Station #3	Assembly Step #3 (1-33)			Cover Placement	Vision System Station #4 & #8	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
17	30	Automated Assembly	Assembly Machine Station # 5	Assembly Step #4 (1-33)			Seal Placement	Vision System Station #6	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
18	30	Automated Assembly	Assembly Machine Station #7	Assembly Step #5 (1-33)			Spacer Placement	Vision System Station #8	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
19	30	Automated Assembly	Assembly Machine Station #9	Assembly Step #6 (1-33)			Eject Good Assembly In Production Carton	Vision System Stations #4,6 & 8	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
20	30	Automated Assembly	Assembly Machine Station # 11	Assembly Step #7 (1-33)			Eject Bad Assembly Into Reject Bin	Vision System Stations #4, 6 & 8	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
21	40	Manufacturing Verification	Hand Assembly (Co-bot)	4 Way Female			Verify Presence Of Components	Visual	Each Part	Each Assembly	Operator Instructions	Place Defective Parts In Reject Bin
22	40	Manufacturing Verification	Automated Assembly	Assembly (1-33)			Verify Presence & Proper Placement Of Components	Camera Vision System Stations #4, 6, 8 & Mandrel Sensor Check	Each Assembly	Each Cycle	Verification Test Parts Beginning Of Each Shift	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
23	40	Checkhead Verification	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)	Perform Checkhead Verification		Verify Machine Is Functioning Properly	Test Verification Parts On Machine	See Verification Log	Beginning of each shift equipment is used	Operator Instructions / Checkhead Verification Log	Reject Per QWI001 / Notify Supervisor / Adjust Process
24	50	First / Last Piece Inspection	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			All Control Plan In-Process Inspection steps listed	See steps listed	2 Parts	At start up	QWI010 First / Last Article	Reject Per QWI001 / Notify Supervisor / Adjust Process
25	60	In-Process Inspection	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Verify Part Matches Picture In Upper Right Hand Corner	Visual Part To Picture	5 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
26	60	In-Process Inspection	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Proper Assembly	Visual Parts From Production Carton	5 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
27	60	In-Process Inspection	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Fully Seat Spacer / Verify No Breakage Or Issues	Manually Seat / Visually Verify No Breakage Or Issues	5 Parts from Production Carton / Dispose Of After Review	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
28	60	In-Process Inspection	Automated Assembly	Assembly (1-33)			Review Machine Table For Any Plastic Chips	Visually Review Machine Table		Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process

Control Plan

Western Diversified Plastics

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☐ Pre-Launch	☒ Production	☐ Assembly	☐ Safe Launch	Key Contact / Phone					Date (Orig.)		Date (Rev.)	
Job Number 4115 Part				Angela Henson 269.668.3393					04/21/2008		07/18/2023	
Part Number 4115A-01-00xA(00X)/800		Rev. E2 / A7	Engineering Number 4115A-01		Rev. E2 / A7	Core Team A.Henson, M. Burger, K. Nickrent, K. Boeskool, B. Roberts				Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 4 WF 0.64MM Conn Shell						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		Control Method	
									Size	Freq.		
29	60	In-Process Inspection	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Verify No Molding Defects, Underfill, Flash, Burn, Warp, etc.	Visual Parts From Assembly Hoppers	5 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
30	60	In-Process Inspection	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Verify Cover Sealing Pins Are Defect Free / No Flash, Pits, Gouges, Etc	Visual Parts From Assembly Hopper / See Non-Conforming Pictures	10 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
31	60	In-Process Inspection	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Verify No Purchased Component Defects, Flash, Underfill, Plugged Holes,etc.	Visual Parts From Assembly Hoppers	5 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
32	60	In-Process Inspection	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Verify Operator Is Following Instructions & Aware Of Any Alerts	Verbally Verify With The Operator	Each Operator	At start up / Once A Shift	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
33	60	In-Process Inspection	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Verify Check Head Verification Checks Are 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
34	60	In-Process Inspection	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Carton Identification / Proper Label	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
35	70	Manufacturing Packaging Verification	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Carton Identification / Proper Label	Visual	Each Label	Each Carton	MWI004 Label ID & Use / Label Verification Card	Reject Per QWI001 / Notify Supervisor / Re-Print Labels
36	80	Final Audit	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Proper Assembly	Visual Part To Picture, From Top, Middle & Bottom Of Carton	10 Parts	Each carton	QWI016 Final Audt Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
37	80	Final Audit	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Verify No Molding Defects, Underfill, Flash, Burn, Warp, etc.	Visual Parts From The Top, Middle & Bottom Of The Carton	10 Parts	Each carton	QWI016 Final Audt Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
38	80	Final Audit	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Verify No Purchased Component Defects, Flash, Underfill, Plugged Holes,etc.	Visual Parts From The Top, Middle & Bottom Of The Carton	10 Parts	Each carton	QWI016 Final Audt Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
39	80	Final Audit	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)			Carton Identification / Proper Label	Visual	Each Label	Each carton	QWI016 Final Audt Inspection	Reject Per QWI001 / Notify Supervisor / Re-Print Labels

Control Plan

Western Diversified Plastics

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☐ Pre-Launch	☒ Production	☐ Assembly	☐ Safe Launch	Key Contact / Phone				Date (Orig.)		Date (Rev.)	
Job Number 4115 Part				Angela Henson 269.668.3393				04/21/2008		07/18/2023	
Part Number 4115A-01-00xA(00X)/800		Rev. E2 / A7	Engineering Number 4115A-01	Rev. E2 / A7	Core Team A.Henson, M. Burger, K. Nickrent, K. Boeskool, B. Roberts				Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 4 WF 0.64MM Conn Shell					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		Control Method	
									Size	Freq.		
40	90	Store In-House	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)	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
41	100	Shipping	Automated Assembly / Manual Assembly	Assembly (1-33) / Hand Assembly (Co-bot)	Load matches shipper		Scanning System	WHI001	100%	Each Shipment	WHI001 Scanning Product For Shipment	Notify Supervisor / Adjust Process
42	110	Hand Assembly	Manual Assembly	4 Way Female With CPA (If Applicable)			Install CPA Lock To Connector	Manual Placement / FW0299	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
43	110	Hand Assembly	Manual Assembly	4 Way Female With CPA (If Applicable)			Verify CPA Installation	Manual Placement / FW0507	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
44	110	Hand Assembly	Manual Assembly	4 Way Female With CPA (If Applicable)			Verify Proper CPA Installation	Visual	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
45	120	First / Last Piece Inspection	Manual Assembly	4 Way Female With CPA (If Applicable)			All Control Plan In-Process Inspection steps listed	See steps listed	2 Parts	At start up	QWI010 First / Last Article	Reject Per QWI001 / Notify Supervisor / Adjust Process
46	130	In-Process Inspection	Manual Assembly	4 Way Female With CPA (If Applicable)			Verify Part Matches Picture In Upper Right Hand Corner	Visual Part To Picture	2 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
47	130	In-Process Inspection	Manual Assembly	4 Way Female With CPA (If Applicable)			Verify No Molding Defects, Underfill, Flash, Burn, Warp, etc.	Visual Parts From Holding Bins	10 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
48	130	In-Process Inspection	Manual Assembly	4 Way Female With CPA (If Applicable)			Verify Proper Assembly (No Damage To Components)	Visual Parts From Production Carton	10 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
49	130	In-Process Inspection	Manual Assembly	4 Way Female With CPA (If Applicable)			Proper label	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
50	140	Manufacturing Packaging Verification	Manual Assembly	4 Way Female With CPA (If Applicable)			Proper label	Visual	Each Label	Each Carton	MWI004 Label ID & Use / Label Verification Card	Reject Per QWI001 / Notify Supervisor / Re-Print Labels
51	150	Final Audit	Manual Assembly	4 Way Female With CPA (If Applicable)			Proper assembly	Visual Part To Picture, From Top, Middle & Bottom Of Carton	10 Parts	Each Carton	QWI016 Final Audt Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
52	150	Final Audit	Manual Assembly	4 Way Female With CPA (If Applicable)			Verify No Defects, Molding Or Assembly	Visual Parts From Top, Middle & Bottom Of Carton	10 Parts	Each Carton	QWI016 Final Audt Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process

Control Plan

Western Diversified Plastics

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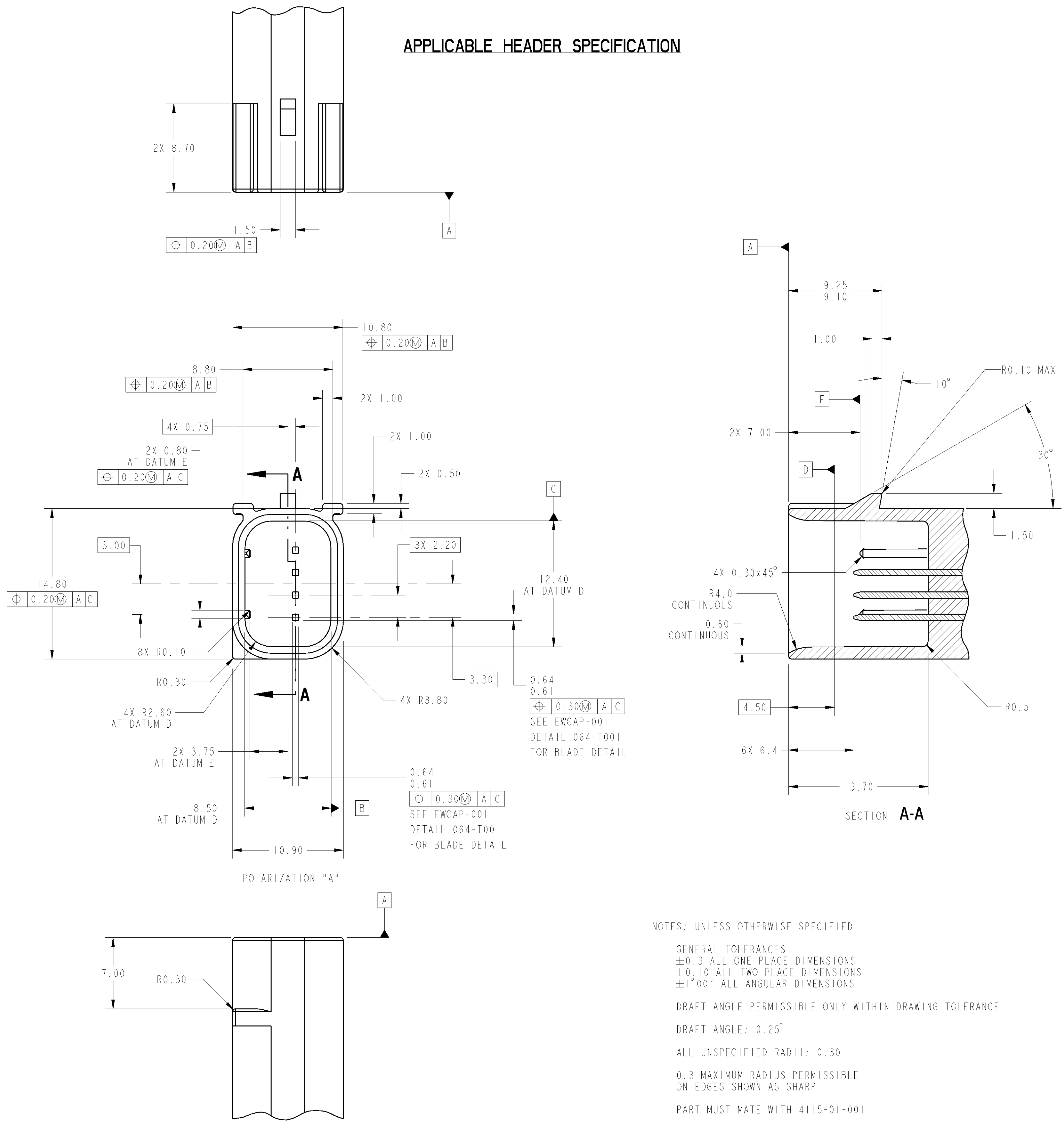
Page 5 of 5

☐ Pre-Launch	☒ Production	☐ Assembly	☐ Safe Launch	Key Contact / Phone				Date (Orig.)		Date (Rev.)	
Job Number 4115 Part				Angela Henson 269.668.3393				04/21/2008		07/18/2023	
Part Number 4115A-01-00xA(00X)/800		Rev. E2 / A7	Engineering Number 4115A-01		Rev. E2 / A7	Core Team A.Henson, M. Burger, K. Nickrent, K. Boeskool, B. Roberts			Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 4 WF 0.64MM Conn Shell						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			Control Method
									Size	Freq.		
53	150	Final Audit	Manual Assembly	4 Way Female With CPA (If Applicable)			Proper label	Visual	Each Label	Each Carton	QWI016 Final Audt Inspection	Reject Per QWI001 / Notify Supervisor / Re-Print Labels
54	150	Final Audit	Manual Assembly	4 Way Female With CPA (If Applicable)			Correct Carton Quantity / Must Match Label	Audit Scale	Each Carton	Every Carton	QWI012 Using The Scale At Final Audit	Adjust Quantity To Match Label
55	160	Store In-House	Manual Assembly	4 Way Female W/CPA	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
56	170	Shipping	Manual Assembly	4 Way Female With CPA (If Applicable)	Load Matches Shipper		Scanning System	WHI001	100%	Each Shipment	WHI001 Scanning Product For Shipment	Notify Supervisor / Adjust Process
57	500	Annual Requirement	Layout Equipment	Dimensional			Print Dimensions	Layout	5 Parts	Annual	PDP 21 Annual Layout	Reject Per QWI001 / Notify Supervisor / Adjust Process

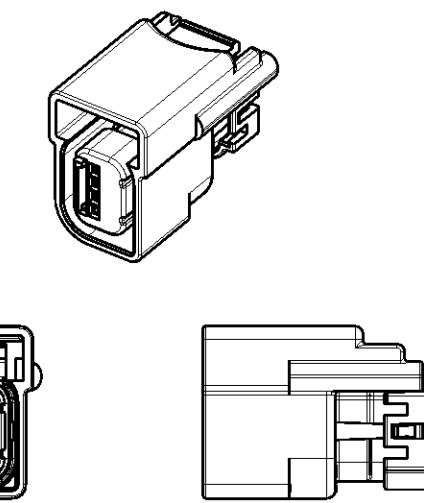
This assembly is processed on automated assembly equipment. The process includes the use of machine vision which verifies each step of the assembly process. The equipment is verified each shift to ensure it's continues to detect any defects. Because of the nature of the process we do not have a CPK or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

APPLICABLE HEADER SPECIFICATION



LIST OF PARTS

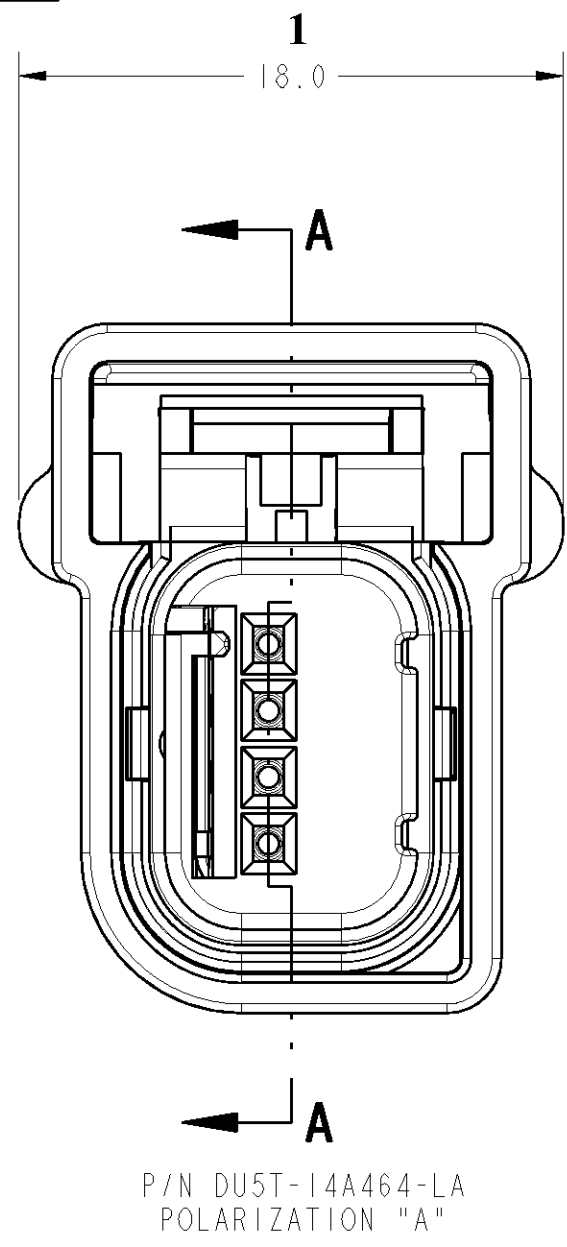
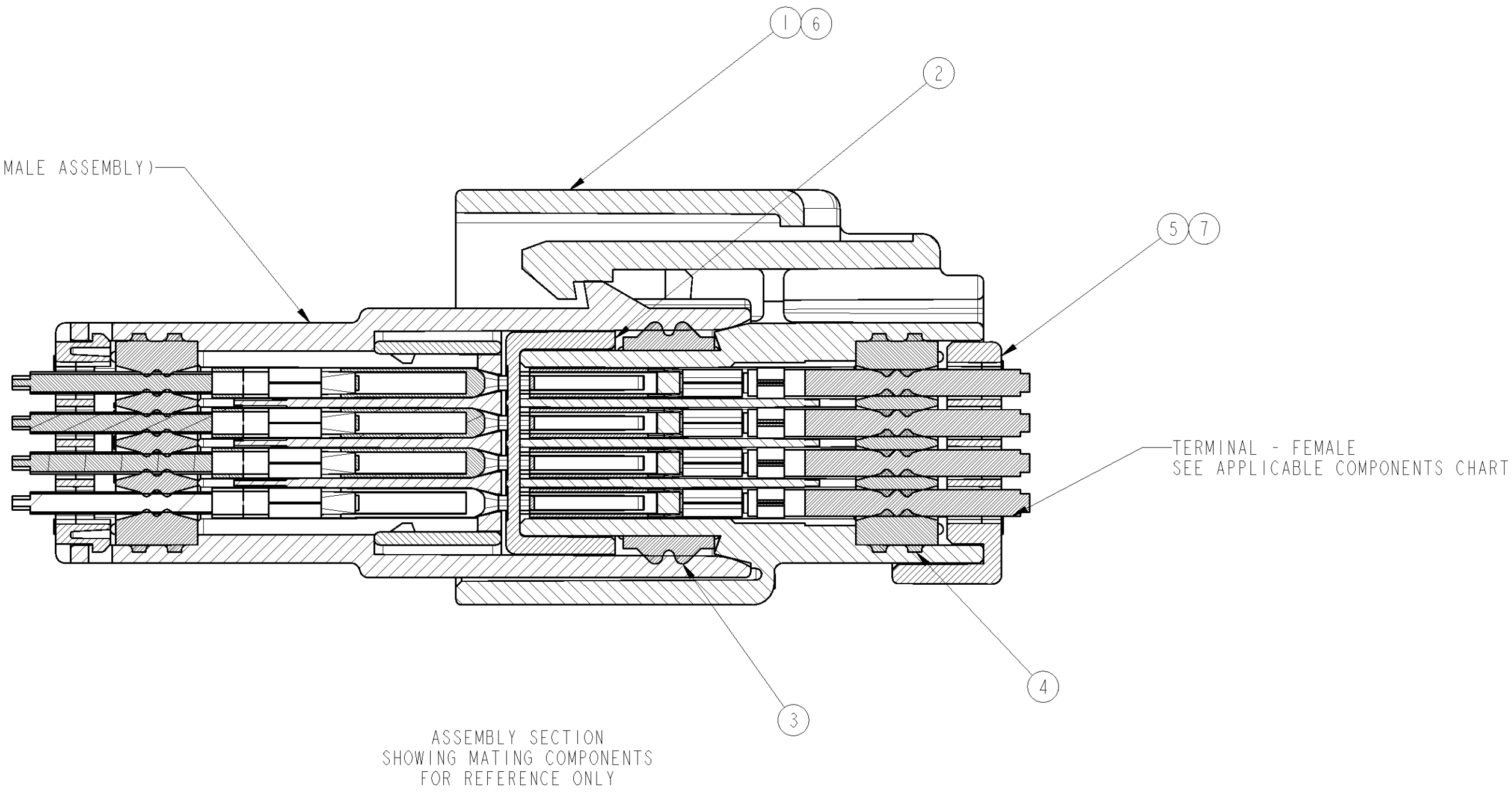
						FORD ASSEMBLY NUMBER	WDP ASSEMBLY NUMBER
						DUST-14A464-LA(000)	4115A-01-001A(000)
						DUST-14A464-DA(000)	4115A-01-002A(000)
ITEM	DESCRIPTION	COLOR	PART NUMBER	MATERIAL (I.D. SYMBOL)	NUMBER OF ITEMS REQUIRED		
1	HOUSING (A POL)	BLACK	4115A-00-001A	>PBT-GF30<	1		
2	SPACER	NATURAL	4116-00-001A	>PBT-GF33<	1		
3	INTERFACIAL SEAL	BLUE	4115-50-001A	>VMQ<	1		
4	GROMMET	ORANGE	4115-51-001A	>VMQ<	1		
5	GROMMET COVER	SEE PIN CHART	>PBT-GF33<		1		
6	HOUSING (A POL)	GRAY	4115A-00-002A	>PBT-GF30<	1		



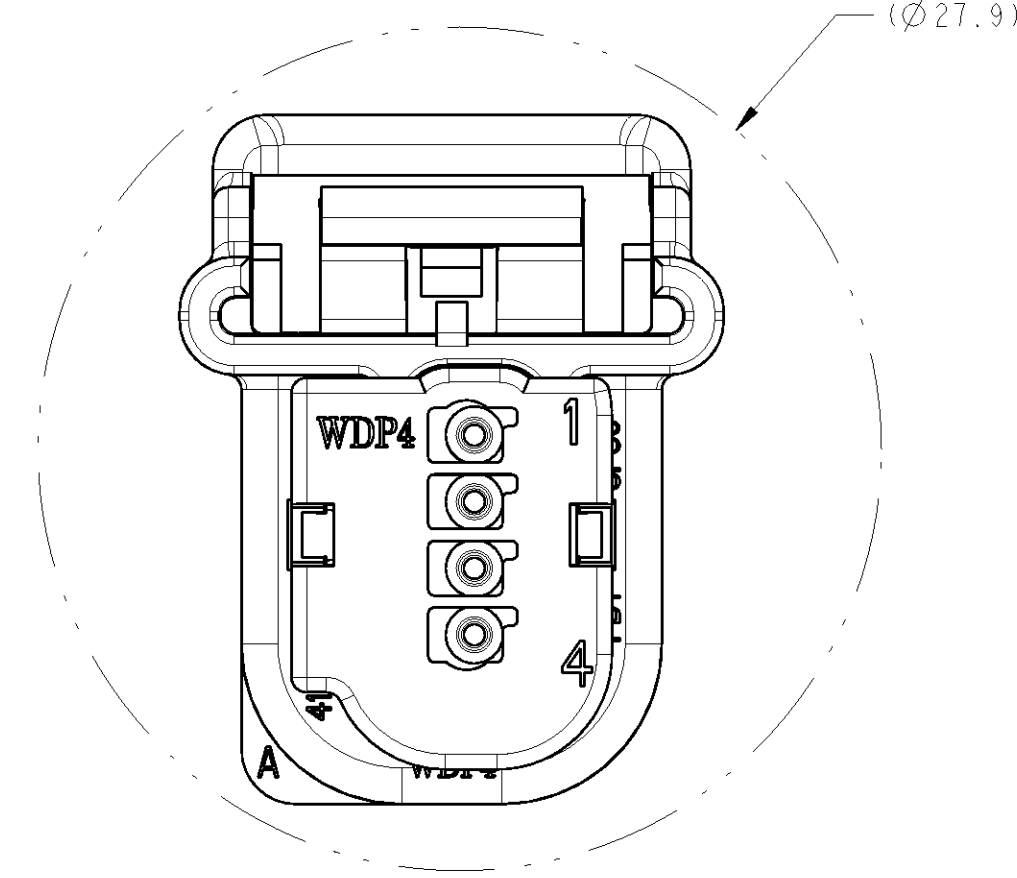
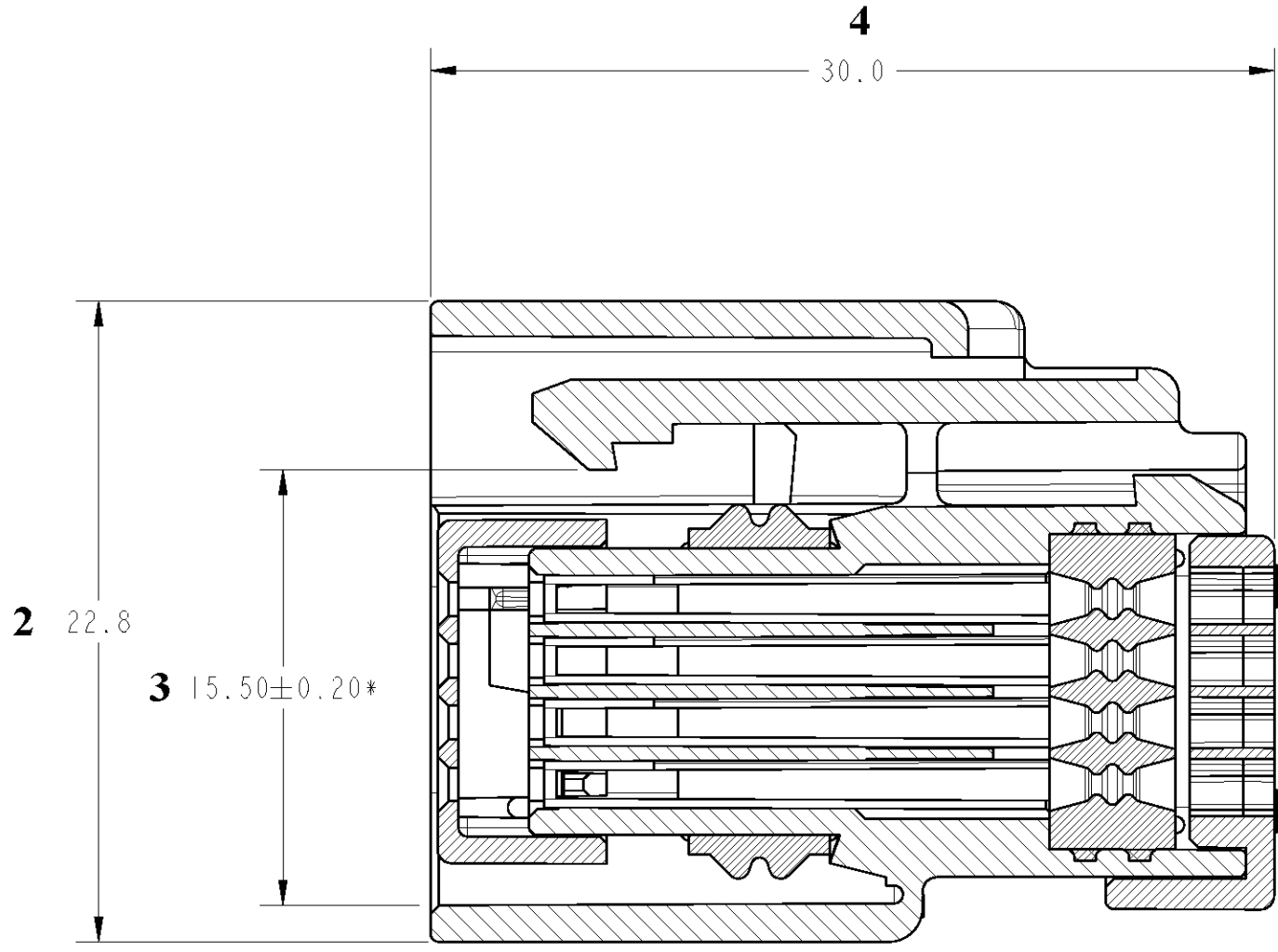
FULL SIZE VIEWS

REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MAT'L APP
RELEASED			
AEL E 12035198 150	20110105		
SHINABARGAR	OSTERHOUSE	GLEECE	WDP
A RELEASED DUST-14A464-DA(000)			
AEL E 12035198 162	20110526		
SHINABARGAR	OSTERHOUSE	GLEECE	WDP
B1 ORANGE GROMMET WAS GREEN			
B2 MODIFIED NOTES			
AEL E 12035198 179	20110912		
SUTTON	FINSTROM	GLEECE	WDP
C1 RELEASED DUST-14A464-DA(002), DUST-14A464-DA(000)			
AEL E 12035198 213	20121018		
SHINABARGAR	FINSTROM	KLAZARI	WDP
D1 RELEASED DUST-14A464-LA(003)			
AEL E 12035198 292	20141110		
SUTTON	FINSTROM	JPITTENI	WDP
E1 UPDATED APPLICABLE COMPONENTS TABLE			
E2 RELEASED DUST-14A464-LA(004)			
AEL E 12035198 409	20170206		
LEMMER	FINSTROM	JPITTENI	FREW

(REF. MALE ASSEMBLY)



P/N DUST-14A464-LA
POLARIZATION "A"



NOTES: UNLESS OTHERWISE SPECIFIED

PART MUST CONFORM TO THE ELECTRICAL CONNECTION DESIGN SPECIFICATION (SDS). (REV. 17/17-FEB-10).

PART MUST CONFORM TO THE LATEST LEVEL OF USCAR REFERENCED IN THE SDS.

EXCEPTION: TPA LOCK TO PRESET RETENTION 16N MINIMUM

EXPOSURE CLASSIFICATIONS PER USCAR:
A) TEMPERATURE CLASSIFICATION: CLASS 4 -40 TO 150°C
B) SEALING CLASSIFICATION: S2 - SEALED
C) VIBRATION CLASSIFICATION: V2 - COUPLED TO ENGINE
D) ERGONOMICS CLASSIFICATION: CLASS 2

MAXIMUM INSERTION FORCE FULLY POPULATED WITH TIN TERMINALS <= 45 N.

ALL PLASTIC PARTS MUST HAVE MATERIAL IDENTIFICATION SYMBOLS CLEARLY MARKED, WHEREVER PACKAGE SIZE PERMITS.

FOR ENGINEERING APPROVED SOURCE. SEE ENGINEERING RELEASE.

NOTES: UNLESS OTHERWISE SPECIFIED (CONTINUED)

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

FEED THROUGH CONDITION (I.E. MIN HOLE SIZE) TO GIVE 2MM TOTAL CLEARANCE ACROSS THE MAXIMUM DIAMETER.

0.3mm MAXIMUM RADIUS PERMISSIBLE ON EDGES SHOWN AS SHARP FOR PLASTIC PARTS.

ALL RADIUS R0.5.

PARTS ARE TO BE FREE OF SCRATCHES, DISCOLORATION, SALT RESIDUE OR OTHER IMPERFECTIONS THAT MAY AFFECT FUNCTION OR FIT OF PART.

DRAWING CONFORMS TO AVP-IT404/T4063-001 REVISION C DATED 8-8-03.

DIMENSIONS DENOTED WITH AN * TO BE MONITORED IN PROCESS

APPLICABLE COMPONENTS

ITEM	DESCRIPTION	MANDATORY (YES/NO)	TERMINAL CAVITY MIN/MAX OD	PLATING / MATERIAL	FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.
1	TRC B798 (TERMINAL POSITION 1-4)	NO	1.197/1.90	COPPER ALLOY/TIN PLATE	N/A	N/A
2	TRC B798 (TERMINAL POSITION 1,4 ONLY)	NO	1.197/2.06	COPPER ALLOY/TIN PLATE	N/A	N/A

DUST-14A624-FA(004)	4118A-01-012A(004)	4117-00-001A(004)	BLACK	4	3	2	1	0	4115A-01-001A(004)	DUST-14A464-LA(004)	A	
DUST-14A624-FA(002)	4118A-01-007A(002)	4117-00-001A(002)	BLACK					3	4115A-01-002A(002)	DUST-14A464-DA(002)	A	
DUST-14A624-FA(001)	4118A-01-002A(001)	4117-00-002A(001)	GREY				3	2	4115A-01-002A(001)	DUST-14A464-DA(001)	A	
DUST-14A624-FA(000)	4118A-01-006A(000)	4117-00-001A(000)	BLACK					4	4115A-01-002A(000)	DUST-14A464-DA(000)	A	
DUST-14A624-DA(003)	4118A-01-009A(003)	4117-00-001A(003)	BLACK	4				1	2	4115A-01-001A(003)	DUST-14A464-LA(003)	A
DUST-14A624-DA(000)	4118A-01-001A(000)	4117-00-001A(000)	BLACK					4	4115A-01-001A(000)	DUST-14A464-LA(000)	A	
FORD MATING ASSEMBLY NUMBER	WDP MATING ASSEMBLY NUMBER	GROMMET COVER NUMBER	GROMMET COVER COLOR	TERMINAL CAVITY NUMBER DENOTES SEALING PIN POSITION				TOTAL OPEN HOLES	WDP ASSEMBLY NUMBER	FORD ASSEMBLY NUMBER	POLARIZATION	

DUST-14A464-DA	SCALE	DATE	DIVISION
DUST-14A464-LA	4:1	20110105	PLANT
FORD ASSEMBLY NO.			

DESIGN	DETAIL	TITLE	SHT 1 OF 1
SHINABARGAR	SHINABARGAR	SLV ASY WIR CONN FEM	
CHECKED	SAFETY		
OSTERHOUSE			
SCALE	DATE	DIVISION	
4:1	20110105	PLANT	
FORD ASSEMBLY NO.			

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 PF312G6BK401-T4
Polyram Desc: PBT I GF30 HR BLACK
Customer PN#: MAT-110-BLK
Customer Desc: RAMSTER 930 BLK
LOT Number: 23040040
LOT Date: 05/21/23
Color: BLACK 401
Customer: WESTERN DIVERSIFIED PLASTICS

Properties	Test Method	Units	Designated Min	Designated Max	AVG RESULTS
Determination of ASH	ISO 3451-1	%	28.0000	32.0000	30.4000
Physical					
SPIRAL FLOW	Internal	in	32.0000	38.0000	37.5000
MFI (250/2.16kg)	ISO 1133	g/10min	12.0000	35.0000	14.3755
Mechanical					
TENSILE STRENGTH	ISO 527-2/1A	MPa	115.0000	---	129.5000
TENSILE MODULUS	ISO 527-2/1A	MPa	7,500.0000	---	10,200.0000
Impact					
NOTCHED CHARPY IMPACT	ISO179-1/1eA	kJ/m ²	7.0000	---	10.1500
Thermal					
HDT 1.8MPa	ISO-75	°C	200.0000	---	205.0000

Grade RemarksLayout inspection data:HDT @1.8 MPa ISO-75 200C

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

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 PF316G33NT
Polyram Desc: PBT I GF33 HR NATURAL
Customer PN#: MAT-090-NAT
Customer Desc: RAMSTER 316 NATURAL
LOT Number: 23050121
LOT Date: 06/18/23
Color: NATURAL
Customer: WESTERN DIVERSIFIED PLASTICS

Properties	Test Method	Units	Designated Min	Designated Max	AVG RESULTS
Determination of ASH	ISO 3451-1	%	31.0000	35.0000	32.1500
Physical					
MFI (250/2.15kg)	ISO 1133	g/10min	9.0000	16.0000	13.0635
Mechanical					
TENSILE STRENGTH	ISO 527-2/1A	MPa	103.0000	---	141.0000
STRAIN AT BREAK	ISO 527-2/1A	%	2.0000	---	2.9000
TENSILE MODULUS	ISO 527-2/1A	MPa	9.000.0000	---	10.650.0000
Impact					
NOTCHED CHARPY IMPACT	ISO179-1/1eA	kJ/m ²	7.0000	---	12.8750
Thermal					
HDT 1.8MPa	ISO-75	°C	194.0000	---	204.0000

Grade Remarks

Layout inspection data:

HDT @1.8 MPa ISO-75 200C

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

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

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URL: <https://www.polyram-group.com>E-mail: mail@polyram-group.com**Certificate of Analysis**

acc. to ASTM D5927-03 TPES011G33

Grade Name: RAMSTER PF316G33BK10
Polyram Desc: PBT I GF33 HR BLACK
Customer PN#: MAT-090-BLK
Customer Desc: RAMSTER 316 BLACK
LOT Number: 23040652
LOT Date: 06/20/23
Color: BLACK 10
Customer: WESTERN DIVERSIFIED PLASTICS

Properties	Test Method	Units	Designated Min	Designated Max	AVG RESULTS
Determination of ASH	ISO 3451-1	%	31.0000	35.0000	32.8000
Physical					
MFI (250/2.16kg)	ISO 1133	g/10min	9.0000	16.0000	13.9000
Mechanical					
TENSILE STRENGTH	ISO 527-2/1A	MPa	103.0000	---	135.3333
STRAIN AT BREAK	ISO 527-2/1A	%	2.0000	---	2.4000
TENSILE MODULUS	ISO 527-2/1A	MPa	6,000.0000	---	10,666.6667
Impact					
NOTCHED IZOD IMPACT	ISO 180	kJ/m ²	7.0000	---	12.1167
Thermal					
HDT 1.8MPa	ISO-75	°C	194.0000	---	205.5000

Grade RemarksLayout 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
- [USI TR4RXE]**

Certificate Number **61487/BB/0001/SM/En**

A certificate number of 0001, confirms the Client has a single site Certified & the site is their Head Office or Main site in relation to the Certified scope with URS. A certificate number of 0002, or greater (e.g.: xxxx/8/0002/UK/En) refers to a client that has more than one site certified with URS, as such, the following statement shall apply - 'The validity of this certificate depends on the validity of the main certificate'.

Date of Issue of Certification Cycle	Issue Number	Certificate Expiry Date	Certification Cycle
22 May 2023	5	21 May 2026	3
Revision Date	Revision Number	Original Certificate Issue Date	Scheme Number
22 May 2023	0	04 July 2017	

For detailed explanation for the data fields above, refer to <http://www.urs-holdings.com/logos-and-regulations>

Issued by

Mukesh Singhal - On behalf of the Schemes Manager





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
- [USI TR4RXE]**

Certificate Number **61487/B/0001/SM/En**

A certificate number of 0001, confirms the Client has a single site Certified & the site is their Head Office or Main site in relation to the Certified scope with URS. A certificate number of 0002, or greater (e.g.: xxxx/B/0002/UK/En) refers to a client that has more than one site certified with URS, as such, the following statement shall apply - 'The validity of this certificate depends on the validity of the main certificate'.

Date of Issue of Certification Cycle	Issue Number	Certificate Expiry Date	Certification Cycle
22 May 2023	5	21 May 2026	3
Revision Date	Revision Number	Original Certificate Issue Date	Scheme Number
22 May 2023	0	04 July 2017	0474914

For detailed explanation for the data fields above, refer to <http://www.urs-holdings.com/logos-and-regulations>

Issued by

Mukesh Singhal - On behalf of the Schemes Manager





Appendix to Certificate

Extended Manufacturing Location

Afula Site
1 Rabin Road
Tadiran Site
Afula
Israel

Scope: Manufacture of Thermoplastic Raw Material Compounds

Certificate Number **61487/B/0001/SM/En**

A certificate number of 0001, confirms the Client has a single site Certified & the site is their Head Office or Main site in relation to the Certified scope with URS. A certificate number of 0002, or greater (e.g.: xxxx/0/0002/UK/En) refers to a client that has more than one site certified with URS, as such, the following statement shall apply - "The validity of this certificate depends on the validity of the main certificate".

Date of Issue of Certification Cycle	Issue Number	Certificate Expiry Date	Certification Cycle
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22 May 2023	5	21 May 2026	3
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Revision Date	Revision Number	Original Certificate Issue Date	Scheme Number
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22 May 2023	0	04 July 2017	0474914
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For detailed explanation for the data fields above, refer to <http://www.urs-holdings.com/logos-and-regulations>

Issued by

Mukesh Singhal - On behalf of the Schemes Manager





The standards Institution of Israel
42 Chaim Levanon St,
Tel-Aviv 6997701

CERTIFICATE

This is to certify that the Environmental Management System of
POLYRAM PLASTIC INDUSTRIES LTD.

Ram On Ram- On Israel

Has been assessed and complies with the requirements of :

ISO 14001:2015

This Certificate is Applicable to

Design and manufacture of thermoplastic raw material compounds.

Initial Approval:

12/03/2020

Valid From:

12/03/2023

Valid Until:

12/03/2026

Revised:

18/08/2020

Certificate No.:

103045

SII-QCD assumes no liability to any party other than the client, and then only in accordance with the agreed upon Certification Agreement. This certificate's validity is subject to the organization maintaining their system in accordance with SII-QCD requirements for system certification. The continued validity may be verified via scanning the code with a smartphone, or via website www.sii.org.il. This certificate remains the property of SII-QCD.


Dr. Gilad Golub
CEO



R.N 515251593


Avital Weinberg
Director, Quality & Certification Division



THE STANDARDS INSTITUTION OF ISRAEL



The standards Institution of Israel
42 Chaim Levanon St,
Tel-Aviv 6997701

Annex to Certificate of Registration no. 103045 POLYRAM PLASTIC INDUSTRIES LTD.

Ram On Ram- On Israel

With Additional Sites At:

ISRAEL - Ran On -

Moshav Ram On 1920500

ISRAEL - Afula -

1, Haim Laskov, Afula

CHINA -

No. 5 Cuiliu Road, Yixian Scientific Industrial Pa rk ,
wuqing District, Tianjin. China

U.S.A -

15000 Foudation Ave. Evansville, IN 47725 USA

Initial Approval:

Valid From:

Valid Until:

12/03/2020

12/03/2023

12/03/2026

Revised:

Certificate No.:

18/08/2020

103045


Dr. Gilad Golub
CEO




Avital Weinberg
Director, Quality & Certification Division

LABORATORY, MATERIAL TEST REPORT

serial no.: 07182220

CUSTOMER :	WDP	COMPOUND :	A5003
PART NO. :	4115-50-001A	LOT NO. :	14283929
PART NAME :	INTERFACIAL SEAL - 4	MATR'L. :	SILICONE
	WAY 0.64		
TEST DATE :	03-31-22	SPEC. NO. :	SAE J200
			M5FE508A19B37EA14Z1
COLOR :	ALL THAT APPLY	POST CURE :	3 HRS AT 400 F

TYPE OF TEST / SPECIFICATION / TEST RESULTS

ORIGINAL PROPERTIES, ASTM D2240, D412, D624, D297

HARDNESS, SHORE A,	50 +- 5	50
TENSILE STRENGTH, DIE-C, PSI	1160 MIN.	1447
ELONGATION, %	500MIN.	638
MATERIAL BLEED AFTER 24 HRS.	MUST PASS	PASS

HEAT AGING, ASTM D865, 70h @ 225 C

HARDNESS CHANGE, pts.	+ -10 MAX.	-2
TENSILE STRENGTH, DIE-C, PSI	-50 MIN.	-13
ELONGATION, %	-50 MIN.	-8

FLUID RESISTANCE, ASTM D-471, IRM 903 OIL, 70h @ 150 C

VOLUME CHANGE, %	+ 80 MAX.	+41
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WATER, 70h @ 100 C

HARDNESS, SHORE A,	+ -5 MAX.	0
VOLUME CHANGE, %	+ -5 MAX.	0

COMPRESSION SET, ASTM D-395, METHOD B, 22h @ 175 C

COMPRESSION SET, %	35 MAX.	23
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Approved by Richard Rybka
Richard Rybka, Technical Manager

Date: July 18, 2022

QUALITY SYNTHETIC RUBBER, INC. CERTIFIES THAT THIS MATERIAL HAS BEEN TESTED IN ACCORDANCE WITH ALL NOTED TEST METHODS AND THAT THE RESULTS OBTAINED MEET SPECIFICATION REQUIREMENTS UNLESS OTHERWISE NOTED ON THIS REPORT. THE INFORMATION CONTAINED HEREIN APPLIES TO THE SPECIFIC LOT OF MATERIAL NOTED ABOVE. NO WARRANTY OF ANY KIND IS HEREIN CONSTRUED OR IMPLIED. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF QUALITY SYNTHETIC RUBBER, INC.

ANNUAL TESTING

LABORATORY, MATERIAL TEST REPORT

serial no.: 07152214

CUSTOMER : WDP	COMPOUND: A2361
PART NO. : 4115-51-001A	LOT NO. : 13440228
PART NAME: GROMMET SEAL - 4 WAY	MATR'L. : SILICONE
0.64	
TEST DATE: 01-20-22	SPEC.NO.: PRINT

TYPE OF TEST

/ SPECIFICATION / TEST RESULTS

ORIGINAL PROPERTIES, ASTM D2240, D412, D624

HARDNESS, SHORE A,	13 TO 22	19
TENSILE STRENGTH, DIE-C, MPa	2.0 MIN.	4.6
ELONGATION, %	500 MIN.	858
TEAR RESISTANCE, DIE-C, kN/m	3.0 MIN.	8.7

HEAT AGING, ASTM D573, 1000h @ 150°C

HARDNESS CHANGE, pts.	-5 TO +10	-1
TENSILE STRENGTH CHANGE, %	-30 MAX.	-29
ELONGATION CHANGE, %	-30 MAX.	-20
VISUAL - NO SURFACE TACKINESS OR CRACKS	MUST PASS	PASS

FLUID RESISTANCE, ASTM D-471, IRM901 OIL, 168h @ 150°C

HARDNESS CHANGE, pts.	0 TO -12	-3
TENSILE STRENGTH CHANGE, %	-30 MAX.	-15
ELONGATION CHANGE, %	-30 MAX.	+12
VOLUME CHANGE, %	0 TO +15	+3

COMPRESSION SET, ASTM D-395, METHOD B, 70h @ 150°C

COMPRESSION SET, %	25 MAX.	20
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Approved by Richard Rybka
Richard Rybka, Technical Manager

Date: July 15, 2022

QUALITY SYNTHETIC RUBBER, INC. CERTIFIES THAT THIS MATERIAL HAS BEEN TESTED IN ACCORDANCE WITH ALL NOTED TEST METHODS AND THAT THE RESULTS OBTAINED MEET SPECIFICATION REQUIREMENTS UNLESS OTHERWISE NOTED ON THIS REPORT. THE INFORMATION CONTAINED HEREIN APPLIES TO THE SPECIFIC LOT OF MATERIAL NOTED ABOVE. NO WARRANTY OF ANY KIND IS HEREIN CONSTRUED OR IMPLIED. THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF QUALITY SYNTHETIC RUBBER, INC.



PERRY JOHNSON REGISTRARS, INC.

Certificate of Registration

*Perry Johnson Registrars, Inc., has audited
the Environmental Management System of:*

***TAC Materials Inc. DBA Quality Synthetic Rubber, Inc. Medical
Elastomer Development, Inc. DBA Qure Medical-Twinsburg
1700 Highland Road, Twinsburg, OH 44087 United States***

*(Hereinafter called the Organization) and hereby declares that
Organization is in conformance with:*

ISO 14001:2015

This Registration is in respect to the following scope:

Manufacture of Custom Molded and Extruded Elastomeric Products

*This Registration is granted subject to the system rules governing the Registration referred to above, and the
Organization hereby covenants with the Assessment body duty to observe and comply with the said rules.*



Terry Boboige

Terry Boboige, President

Perry Johnson Registrars, Inc. (PJR)
755 West Big Beaver Road, Suite 1340
Troy, Michigan 48084
(248) 358-3388

The use of the UKAS accreditation symbol is in respect to the activities covered by the Accreditation Certificate Number 0105.

The validity of this certificate is dependent upon ongoing surveillance.

Effective Date:

April 9, 2021

Expiration Date:

January 19, 2024

Certificate No.:

C2021-01686

ABS Quality Evaluations

Certificate Of Conformance

This is to certify that the Quality Management System of:

Quality Synthetic Rubber, Inc.

**1700 Highland Road
Twinsburg, OH 44087
U.S.A.**

(WITH ADDITIONAL FACILITIES LISTED ON ATTACHED ANNEX)

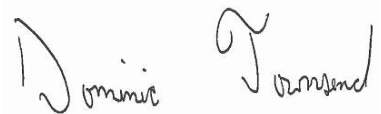
has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

IATF 16949:2016

The Quality Management System is applicable to:

**MANUFACTURE OF CUSTOM MOLDED ELASTOMERIC PRODUCTS,
EXCLUDING PRODUCT DESIGN - IATF 16949 CLAUSE 8.3**

Certificate No: 38137
Effective Date: 16 December 2021
Expiration Date: 15 December 2024
Revision Date: 16 December 2021
IATF No: 0438221



Dominic Townsend, President



Validity of this certificate is based on the successful completion of the periodic surveillance audits of the management system defined by the above scope and is contingent upon prompt, written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.

ABS Quality Evaluations, Inc. 1701 City Plaza Drive, Spring, TX 77389, U.S.A.

Validity of this certificate may be confirmed at www.abs-qe.com/cert_validation.

ABS Quality Evaluations

IATF 16949:2016

Certificate Of Conformance

ANNEX

Certificate No: 38137

IATF No: 0438221

Quality Synthetic Rubber, Inc.

At Below Facilities:

Facility: 3565 Highland Park Street NW
North Canton, OH 44720
U.S.A.

Facility: 1664 Highland Road, Unit 10
Twinsburg, OH 44087
U.S.A.

Activity: Sales, Contract Review, Process Design

Activity: Warehouse

Facility: 1670 Enterprise Parkway
Twinsburg, OH 44087
U.S.A.

Activity: Warehouse



Validity of this certificate may be confirmed at www.abs-qe.com/cert_validation.

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
0407520

Certificate Number:
2007-0124

Certificate Issue Date:
28 June 2021

Certificate Expiry Date:
27 June 2024



Calin Moldovean
President, Business Assurance

Intertek – 4700 Broadmoor, Suite 200
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:

Western Diversified Plastics -
53196 N. Main Street, Mattawan,
MI, 49071, USA

Calibration, Contract Review,
Laboratory, Process Design,
Product Design, Sales

Western Diversified Plastics -
53301 N. Main Street, Mattawan,
MI, 49071, USA

Warehousing

IATF Certificate Number
0407520

Certificate Number:
2007-0124

Certificate Issue Date:
28 June 2021

Certificate Expiry Date:
27 June 2024



Calin Moldovean
President, Business Assurance

Intertek – 4700 Broadmoor, Suite200
Kentwood MI 49512, USA



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 WDP PSA-002	Instron 3342 5 to 500N Instron 3366 5 to 10KN
Mechanical	Electrical and Mechanical Components	Torque	ES-GU5T-14A067-AB Ford Connector SDS WDP PS-001 WDP PSA-002	Jetco ED-2501 Stanley E231b-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 WDP PSA-002	Humboldt H30135E Thermotron SM32 & 4, S8 Thermotron SE-600 & 300 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 WDP PSA-002	Thermotron VCS DSX-2250 & 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 WDP PSA-002	Thermotron ATS-320 H/V/DD Fluke 54II 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 WDP PS-001 WDP PSA-002	Weiss DUGY2-015 ±15psi Fluke 700RG07 -14 - 500psi 29.9 in Hg to 350 psi ESPEC ETH-37 Water chmbr Up to 1500 psi - 4 gpm Hongqi0-.41Mpa IPX3/4 Spray Head Ashcroft 5000 psig gage 100, 2000, 4000ml Grad Cyl Control Co 1042 Stopwatch - 1/100 th sec

Distribution List:	Quality Director, Test Lab Manager, Test Lab Technicians, Quality Engineering, Program Managers, Manufacturing Engineer		
TLI002 Internal Test Lab Scope		Page 1 of 3	Revision Date 04/05/2023
Printed Copies are for Reference Only			

Field of Test	Products or Items Tested	Specified Tests or Properties Measured	Specification, Standard, or Method Used	Equipment / Range
Temperature	Electrical Components	Thermal Imaging	ES-GU5T-14A067-AB WDP PS-001 WDP PSA-002	FLIR T620 FLIR E50 Up to 500°C
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 WDP PSA-002	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 WDP PS-001 WDP PSA-002	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 WDP PSA-002	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 WDP PSA-002	Fluke 87, 287, 289 Keysight 34450A, HP 60504 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 WDP PSA-002	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 WDP PSA-002	Keithley 580 Keysight 34450A Analysis Tech 32-106 10micro to 200Kohm
Mechanical / DC Electrical	Electrical and Mechanical Components	Combined Environment Durability/Life Test	Various as Listed Above	Various as Listed Above

Distribution List:	Quality Director, Test Lab Manager, Test Lab Technicians, Quality Engineering, Program Managers, Manufacturing Engineer		
TLI002 Internal Test Lab Scope	Page 2 of 3	Revision Date 04/05/2023	
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- 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.

Distribution List:	Quality Director, Test Lab Manager, Test Lab Technicians, Quality Engineering, Program Managers, Manufacturing Engineer	
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