HellermannTyton | HellermannTyton GmbH internal remarks: | PB-No.: **36613** | Part Describtion: T50ROSFT625SO | GPN

Part Submission Warrant

Part Name **T50ROSFT625SO** | Cust. Part Number **GU5T-14E047-FA** / **GU5T-14E047-FA**

Shown on Drawing No. **GU5T-14E047-FA** | Org. Part Number **157-00195**

Engineering Change Level **AELE-E-12982958-107** | Dated **23.12.2015**

Additional Engineering Changes **n/a** | Dated **n/a**

Safety and/or Government Regulation ☐ Yes ☑ No | Purchase Order No. **157-00195** | Weight (kg) **0,0026**

Checking Aid No. **n/a** | Checking Aid Engineering Change Level **n/a** | Dated **n/a**

ORGANIZATION MANUFACTURING INFORMATION

HellermannTyton GmbH **DUNS: 315430892**
Organization Name & Supplier/Vendor Code

Großer Moorweg 45
Street Address

Tornesch | Region | **25436** | **Germany**
City | Postal Code | Country

CUSTOMER SUBMITTAL INFORMATION

Nursan Otomotive EOOD (**30712**)
Customer Name/Division

Mehmed Nejdet Mehmed
Buyer/Buyer Code

various
Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? ☑ Yes ☐ No ☐ n/a

Submitted by IMDS or other customer format: **ID: 644236125**

Are polymeric parts identified with appropriate ISO marking codes? ☐ Yes ☐ No ☑ n/a

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 design record requirements: ☑ Yes ☐ No (If "No" - Explanation Required)

Mold / Cavity / Production Process **injection moulding / serial mold**

DECLARATION

I 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 confidential pcs / 24 hours.

I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from this declaration below.

EXPLANATION/COMMENTS:

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

Organization Authorized Signature A. Kalkowski | Date 27-Mar-18

Print Name **i.A. A. Kalkowski** | Assistant Doc. QD | +49 (0) 4122 701 330 | Fax No. +49 4122 701 241

Title | E-mail O.Pracht@HellermannTyton.de

FOR CUSTOMER USE ONLY (IF APPLICABLE)

PPAP Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other

Customer Signature | Date

Print Name | Customer Tracking Number (optional)

Production Part Approval, Dimensional Results

HellermannTyton

Internal PB-No.: **36613**

Production Part Approval
Dimensional Test Results

ORGANIZATION:	**HellermannTyton GmbH**	PART NUMBER:	**GU5T-14E047-FA**
SUPPLIER/VENDOR CODE:	**DUNS: 315430892**	PART NAME:	**T50ROSFT625SO**
INSPECTION FACILITY:	**QS Laboratory**	DESIGN RECORD CHANGE LEVEL:	12982958-107 23.12.2015
		ENGINEERING CHANGE DOCUMENTS:	

ITEM	DIMENSION / SPECIFICATION	SPECIFICATION / LIMITS	TEST DATE	QTY. TESTED	ORGANIZATION MEASUREMENT RESULTS (DATA)			OK	NOT OK
					mean	**min**	**max**		
								☐	☐
1	**247,2**	**± 6**			**248,7**	**248,2**	**249,1**	☑	☐
2	**Ø 19,0**	**± 1**			**19,2**	**19,1**	**19,9**	☑	☐
								☐	☐
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Blanket statements of conformance are unacceptable for any test results.

SIGNATURE	TITLE	DATE
i.A. A. Kalkowski A. Kalkowski	Assistant Doc. QD	27-Mar-18

Production Part Approval, Material Test Results

HellermannTyton

Internal PB-No.: **36613**

Production Part Approval
Material Test Results

ORGANIZATION:	**HellermannTyton GmbH**	PART NUMBER:	**GU5T-14E047-FA**
SUPPLIER/VENDOR CODE:	**DUNS: 315430892**	PART NAME:	**T50ROSFT625SO**
MATERIAL SUPPLIER:		DESIGN RECORD CHANGE LEVEL:	12982958-107 23.12.2015
*CUSTOMER SPECIFIED SUPPLIER/VENDOR		ENGINEERING CHANGE DOCUMENTS:	
*If source approval is req`d, include the Supplier (Source) Customer assigned code.		NAME of LABORATORY:	

	MATERIAL SPEC. NO. / REV / DATE	SPECIFICATION / LIMITS	TEST DATE	QTY. TESTED	SUPPLIER TEST RESULTS (DATA)	OK	NOT OK
						☐	☐
3	**Material**					☐	☐
	Nylon 6/6 (WSS-M4D706-B1)				**Material is 6/6 acc. WSS-M4D706-B1**	☐	☐
	Colour: Black				**Colour: Black**	☑	☐
						☐	☐
4	**Part must comply with restricted**					☐	☐
	substance managament					☐	☐
	standard WSS-M99P9999-A1				**Part compliey with restricted substance**	☐	☐
	to safeguard health, safety				**management standard**	☐	☐
	and the environment				**WSS-M99P9999-A1**	☑	☐
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Blanket statements of conformance are unacceptable for any test results.

SIGNATURE	TITLE	DATE
i.A. A. Kalkowski A. Kalkowski	Assistant Doc. QD	27-Mar-18

Production Part Approval, Performance Test Results

HellermannTyton

Internal PB-No.: **36613**

Production Part Approval
Performance Test Results

ORGANIZATION:	**HellermannTyton GmbH**	PART NUMBER:	**GU5T-14E047-FA**
SUPPLIER/VENDOR CODE:	**DUNS: 315430892**	PART NAME:	**T50ROSFT625SO**
MATERIAL SUPPLIER:		DESIGN RECORD CHANGE LEVEL:	12982958-107 23.12.2015
*CUSTOMER SPECIFIED SUPPLIER/VENDOR		ENGINEERING CHANGE DOCUMENTS:	
*If source approval is req`d, include the Supplier (Source) Customer assigned code.			

	MATERIAL SPEC. NO. / REV / DATE	SPECIFICATION / LIMITS	TEST DATE	QTY. TESTED	SUPPLIER TEST RESULTS (DATA) / TEST CONDITIONS	OK	NOT OK
						☐	☐
5	**Fir tree push in force in the**					☐	☐
	applicable nominal hole size and	**45N max**				☐	☐
	a plate thickness of 1,8 mm	**10 (lbs)**			**mean 8,8 lbs / min. 8,3 lbs / max. 9,1 lbs**	☑	☐
						☐	☐
6	**Fir tree pull out force in the**					☐	☐
	applicable nominal hole size	**110 N min**				☐	☐
	and a plate thickness of 1,8 mm	**(25 lbs)**			**mean 79 lbs / min. 74 lbs / max. 84 lbs**	☑	☐
						☐	☐
7	**Sheet metal thickness range**	**0,6 - 8,25 mm**			**suitable for sheet metal thickness**	☐	☐
					between 0,6 - 8,25 mm	☑	☐
						☐	☐
8	**applicable hole size**	**6,5 ±0,4 mm**			**suitable for hole site 6,5 ±0,4 mm**	☑	☐
						☐	☐
9	**cable tie tensil strenght**	**220 N**				☐	☐
		(50 lbs)			**mean 115 lbs / min. 101 lbs / max. 126 lbs**	☑	☐
						☐	☐
10	**Bundle range**	**2,0 - 50,0 mm**			**Bundle range 2,0 - 50,0 mm**	☑	☐
						☐	☐
11	**serrated side**				**is serrated side**	☑	☐
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Blanket statements of conformance are unacceptable for any test results.

SIGNATURE	TITLE	DATE
i.A. A. Kalkowski	Assistant Doc. QD	27-Mar-18

POTENTIAL

FAILURE MODE AND EFFECTS ANALYSIS

(PFMEA)

PFMEA Number: **MFMEA-1**

Part Number / Name: Cable Ties - Various Materials | Process Responsibility: HellermannTyton | Prepared by: Quality Assurance

Model Year(s) / Vehicle(s): NA | Key Date: 3/11/1994 | PFMEA Date Org: 3/11/1994 | Rev. Date: See Footer

Core Team: Quality Assurance, Manufacturing, Automation, Receiving-Shipping | Rev. Level: See Footer

Item & Function	Requirement	Potential Failure Mode	Potential Effect(s) of Failure	Severity	Class	Potential Cause(s)/ Mechanism(s) of Failure	Occurrence	Current Design Controls -Prevention -Detection	Detection	RPN	Recommended Action(s)	Responsibility & Target Completion Date	Action Results				
													Actions Taken	Severity	Occurre	Detectio	RPN
1-4 Incoming Receiving	Cert matches material and P.O. request	Unacceptable Moisture Levels	Cannot Manufacture	5	PTC	Shipping Damage	2	D - Incoming Inspection P - Material Certs	8	80	None						0
				5	PTC	Material received with moisture too high/low	2	D - Incoming Inspection P - Material Certs	8	80	None						0
		Improperly labeled	Delay in Manufacturing	4		Material received with wrong/missing label	2	D - Incoming Inspection P - Material Certs	8	64	None						0
5-8 Material Ratio Central Material Handling System Operation	Acceptable material for production	Unacceptable Moisture Levels	Part Non-Compliance	5		Dryer malfunction	2	D - Dryer Alarms D - Moisture Testing P - Filter Cleaning P - Moisture Testing	5	50	Upgrade to Novatech system. Increase Moisture test freq.	Maintenance - 3/4/13 Mike Wendt - 830/13	New Dryer system New moisture analyzers	5	2	2	20
		Contamination	Part Non-Compliance	5		Foreign Matter in Material	2	D - Visual Inspections P - Material Handling Work Instruction	8	80	Develop new material handling procedure	Mike Wendt - 8/30/13	Added color-coded container	5	2	6	60
			Part Non-Compliance	5		Unlike Materials Mixed Together	2	D - Visual Inspections P - Material Handling Work Instruction	8	80	New material ID system	John Gleason - 1/1/13	Material ID added to WO, New process	5	2	5	50
		Incorrect Material	Part Non-Compliance	6		Wrong material hook-up at press	2	D/P - Visual to Work Order	8	96	Upgrade to Novatech system.	Maintenance - 3/4/13	ID proofing in new system upgrade	6	2	5	60
9 Molding Machine Set-up	Instructions for production	Work Order Set Up Incorrectly	Delay in Manufacturing	4		Work Order read incorrectly	2	D/P - Work Order D - Set-up Verification	8	64	Electronic Shift Log	John Gleason/Ross H. - 6/13	Computers added to work station. Sharepoint logs implemented	4	2	5	40

		Incorrect Blending	Part Non-Compliance / Breakage and Color Match Failures	5		Material blender set incorrectly	2	D/P - Visual to Work Order	8	80	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	2	7	70
		Excess Plastic on Ties	Part Non-Compliance	5		Hot Excess Runner	2	D - Visual Inspections P - Process Inspections	8	80	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	2	7	70
				5		Improper start-up	1	D - Visual Inspection D - LPA at startup P - Final Inspections	8	40	Increase frequency of functional testing (insertion).	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	1	5	25
		Soft Insertions	Part Non-Compliance	5		Thermolator Malfunction	1	D - Visual Inspections D - Process Inspections P - First Piece Approvals D - Hand Insertion	6	30	Add audile warning	Manit. - 9/13	Audible alarms added to all Thermolator to detect temp. dev.	5	1	3	15
				5		Incorrect Tonnage	2	D- Visual Inspections D- Hand Insertions P - First Piece Approvals P - In Process PM's	5	50	None						0
				5		Start-up/Cycle Interruptions	4	D- Visual Inspections D - Process Inspections D- Hand Insertions	4	80	None						0
				5		Fast Cycle Time	2	D - Visual Inspection D - Process Inspections D - Hand Insertions P - First Piece Approvals	6	60	Increase frequency of functional testing (insertion).	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	2	5	50
				6		Leader Pin/Sidelock Wear	2	D - Visual Inspections D - Process Inspections D - Hand Insertions P - First Piece Approvals P - In Process PM	6	72	Increase frequency of functional testing (insertion).	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	6	2	5	60
		Plugged Sprue Tips / Gates (Hot Manifold/Valve-Gated Molds)	Part Non-Compliance / Unbalanced Fill	3		Material Contamination	2	D- Visual Inspections D - Process Inspections P - Magnets in Hopper and Melt Filters on Nozzle	8	48	Increase frequency of functional testing (insertion).	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	3	2	5	30
		Start up scrap packaged	Customer Dissatisfaction	3		Automation equipment started too early after start up of process re-start.	4	P - Visual Inspection P - Work Instructions P - Automation disable	5	60	None						0

10 First Piece Approval Injection Molding Process	Manufacturing a conforming part per specifications	Sinks in heads and straps	Part Non-Compliance Tensile and Wire Bundle Failures	3		Insufficient Hold Pressure	2	D- Visual Inspections P - First Piece Approvals	8	48	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	3	2	6	36
				3		Cycle Time Too Fast	2	D- Visual Inspections P - First Piece Approvals	8	48	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	3	2	6	36
		Incorrect Blending	Part Non-Compliance / Breakage and Color Match Failures	5		Material Handling Error	2	D/P - Visual to Work Order	8	80	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	2	6	60
		Burnt tips	Part Non-Compliance / Cosmetic Issues / Short	3		Plugged/Worn Vents	3	D- Visual Inspections P - First Piece Approvals P - In process PM's	8	72	- Increase Visual inspection - PM	John Gleason/Dean Anderson - 7/14 - Mike Wendt - 9/12	- Implemented Quality tree -Ice Blasting to clean mold per shift	3	2	6	36
		Sticking in mold	Part Non-Compliance / Mold Damage	5		Excessive Mold Temperatures	2	D- Visual Inspections P - First Piece Approvals	8	80	Add audible warning	Manit. - 9/13	Audible alarms added to all Thermolator to detect temp. dev.	5	2	5	50
				5		Excessive Hold Pressure	2	D- Visual Inspections P - First Piece Approvals	8	80	Increase frequency of functional testing.	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	2	6	60
				5		Residue Build-Up	2	D- Visual Inspections P - First Piece Approvals	8	80	- PM Schedule - Increased Visual inspection	Mike Wendt - 9/12	- Ice Blasting to clean mold per shift - Implemented Quality Tree	5	2	5	50
				5		Water hooked up incorrectly	2	D-Visual Inspection	6	60	None						0
				3		Packaging interruptions Degator Jams	3	D- Visual Inspections P - First Piece Approvals	8	72	None						0
				5		Heater band malfunctions	2	D- Visual Inspection D - Process Inspection P - PM	5	50	None						0
		Excess Plastic on Ties	Part Non-Compliance	5		Hot Excess Runner	2	D - Visual Inspections P - Process Inspections	8	80	Increase Visual inspection Replace side locks M2530	John Gleason/Dean Anderson - 7/14 Kevin Paske 4/30/15 02/9/16	Implemented Quality tree Side locks replaced.	5	2	7	70
		Blocked/Misformed Head	Part Non-Compliance	5		Broken Insert/Ejector Blade	2	D - Visual Inspection P - Final Inspection	8	80	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	2	7	70
		Cut Head	Part Non-Compliance	5		Automation Malfunction	2	D - Visual Inspection P - Final Inspection	8	80	Add audiblle warning cup will be flagged-operator to clear alarm and empty cups then scrap parts.	Curt Rice 07/15	Implemented alarm allowing the operator to scrap parts after cups are emptied.	5	2	7	70
		Missing or Extended Pawl	Part Non-Compliance	5		Thermolator Malfunction	1	D - Visual Inspections D - Process Inspections P - First Piece Approvals D - Hand Insertion	6	30	Add audible warning	Manit. - 9/13	Audible alarms added to all Thermolator to detect temp. dev.	5	1	3	15

				5		Restart(Mold Cleaning)	1	D/P- Visual Inspections D/P - Hand Insertion	5	25	None							0
				5		Improper start-up	1	D - Visual Inspection D - LPA at startup P - Final Inspections	8	40	Increase frequency of functional testing (insertion).	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	1	5	25
				5		Cycle Time Too Fast	1	D - Visual Inspections P - Final Inspections	8	40	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	1	6	30
				5		Worn inserts	2	D - Visual Inspections P - Final Inspections	6	60	Replace fir tree inserts M0340 Replace fir tree insert #14 and mark each insert M0327	Replace inserts M0340 Kevin Paske 6/14 Kevin Paske 01/15	All Inserts replaced and insert check on mold checklist Insert #14 replaced.	5	1	6	30
			Soft Insertions	Part Non-Compliance	5		Thermolator Malfunction	1	D - Visual Inspections D - Process Inspections P - First Piece Approvals	6	30	Add audible warning	Manit. - 9/13	Audible alarms added to all Thermolator to	5	1	3	15
					5		Cycle Time Too Fast	1	D - First Piece P - Process Inspections	6	30	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	1	6	30
			Shorts	Part Non-Compliance / Cosmetic	3		Insufficient Injection Pressure compatibility of Press / mold	4	D- Visual Inspections P - First Piece Approvals P - In process PM's	8	96	Gauges to Detect insertion force	Dean Anderson - 11/13	Developed and implemented Go/No Gauges	3	3	5	45
					3		Plugged/Worn Vents	4	D- Visual Inspections P - First Piece Approvals P - In process PM's	8	96	Gauges to Detect insertion force	Dean Anderson - 11/13	Developed and implemented Go/No Gauges	3	3	5	45
					3		Residue Build-Up	4	D- Visual Inspections P - First Piece Approvals P - In process PM's	8	96	- PM Schedule - Gauges	Mike Wendt - 9/12 Dean Anderson - 11/13	Ice Blasting to clean mold per shift Go/No Go Gauges	3	2	5	30
					3		Lot / Moisture Variations	3	D- Visual Inspections D - First Piece Approvals P - Material Certs P - Moisture Analysis	8	72	Develop moisture testing schedule	Mike Wendt - 8/13	Purchased Moisture Analyzers. Implemented testing procedure	3	2	5	30
					3		Process Interruption	3	D- Visual Inspections D - First Piece Approvals P - Material Certs P - Moisture Analysis	3	27	Gauges to Detect insertion force	Dean Anderson - 11/13	Developed and implemented Go/No Gauges	3	2	5	30

		Flash	Part Non-Compliance / Insertion Failures / Cosmetic	5		Excessive Injection Pressure	4	D- Visual Inspections D- Hand Insertions P - First Piece Approvals P - In Process PM's	6	120	Increase frequency of functional testing (insertion).	John Gleason/Dean Anderson - 7/14	Implemented Quality tree Go/No Gauges	5	3	5	75
				5		Incorrect Tonnage	4	D- Visual Inspections D- Hand Insertions P - First Piece Approvals P - In Process PM's	6	120	- Upgrade Presses (Replace Van Dorn) - Capacity Plan/Controls on Routing Changes - Increase visual inspection	Rick R - Ongoing - John Gleason - John Gleason/Dean Anderson - 7/14	Replaced Toggle with hydraulic/electric clamp style. Introduce MIE Group to manage proper routing Go/No Gauge	5	2	5	50
				5		Water hook up incorrect on sub gated tools	4	D- Visual Inspections D - Process Inspections D- Hand Insertions	4	80	None						0
				5		Start-up/Cycle Interruptions	3	D- Visual Inspections D - Process Inspections D- Hand Insertions	4	60	Increase the number of drops to 15 for startup/restart on A07 for T30R0HS- M2235	Curt Rice -12/14	Number of drops verfied to 15.	5	2	4	40
				5		Clamp pressure on press	3	D- Visual Inspections D - Process Inspections D- Hand Insertions	4	60							0
				5		Worn inserts	2	D- Visual Inspections D - Process Inspections D- Hand Insertions	4	40	T18RA and T30RA add a tool test to see if the product performs in the tool	Gwen B & Taleala W. 9/25/14	Tool test implemented 1 time per day.	5	4	3	60
				5		Broken Insert/Ejector Blade	4	D- Visual Inspections D - Process Inspections D- Hand Insertions	6	120	Increase frequency of functional testing.	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	3	5	75
		Breakage	Part Non-Compliance	5		Thermolator Malfunction	4	D - Visual Inspections D - Process Inspections P - First Piece Approvals D - Hand Insertion	6	120	Add audible warning	Manit. - 9/13	Audible alarms added to all Thermolator to detect temp. dev.	5	1	3	15
				6		Barrel Heat Malfunction	4	D - Visual Inspections D - Process Inspections D - Parameter/Heat Checks D - Hand Insertions P - First Piece Approvals	7	168	Add automated controls	Danny Shereran - 12/8	SPC setup to trigger faults	6	4	3	72
		Slippage	Part Non-Compliance / Strap Engagement Failure	5		Worn inserts	2	D - Visual Inspection D - Process Inspections D - Hand Insertions P - First Piece Approvals	6	60	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	1	6	30
				5		Fast Cycle Time	2	D - Visual Inspection D - Process Inspections D - Hand Insertions P - First Piece Approvals	6	60	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	1	6	30

				5		Dirty Inserts	2	D - Visual Inspections D - Process Inspections D - Hand Insertions D - Parameter/Heat Checks P - First Piece Approvals P - In Process PM	6	60	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	1	6	30
				5		High oil temperature on press due to insufficient water to cool	3	D - Visual Inspections D - Process Inspections D - Hand Insertions P - First Piece Approvals P - In Process PM	6	90	Increase frequency of functional testing.	John Gleason/Dean Anderson - 7/14	Implemented Quality tree	5	3	5	75
		Mold Mismatch	Part Non-Compliance/High Insertion Force	6		Poor Mold Alignment	2	D - Visual Inspections D - Process Inspections D - Hand Insertions P - First Piece Approvals P - In Process PM	6	72	- Increase Visual inspections	-John Gleason/Dean Anderson - 7/14	- Quality tree	6	2	5	60
				6		Leader Pin/Sidelock Wear	2	D - Visual Inspections D - Process Inspections D - Hand Insertions P - First Piece Approvals P - In Process PM	6	72	-PM - Increase Visual Inspection	Dan Sheeran - 11/12 - John Gleason/Dean Anderson - 7/14	- Tech now conduct inspections doing cleaning schedule - Quality Tree	6	1	6	36
		Deep ejector pins	Part Non-Compliance/High Insertion Force	3		Excessive Hold Pressure	3	D - Visual Inspections D - Process Inspections	6	54	None						0
				3		Thermolator Malfunction	2	D - Visual Inspections D - Process Inspections D - Hand Insertions P - First Piece Approvals P - In Process PM	3	18							0
				3		Fast Cycle Time	2	D - Visual Inspections D - Process Inspections D - Hand Insertions P - First Piece Approvals P - In Process PM	6	36	- Increase Visual inspections	-John Gleason/Dean Anderson - 7/14	- Quality tree	3	2	5	30
		Plugged Sprue Tips / Gates (Hot Manifold/Valve-Gated Molds)	Part Non-Compliance / Unbalanced Fill	3		Material Contamination	2	D- Visual Inspections D - Process Inspections P - Magnets in Hopper and Melt Filters on Nozzle	8	48	None						0
				3		Mold Heater Malfunction	2	D- Visual Inspections D - Process Inspections	8	48	None						0
				3		Valve Gate Malfunction	2	D- Visual Inspections D - Process Inspections	8	48	None						0
		Elongated Sprues	Part Non-Compliance / Cut Heads and Missing Pawls	6		Inadequate Cooling	2	D- Visual Inspections D - Process Inspections	7	84	None						0
		Start up scrap packaged	Customer Dissatisfaction	3		Automation equipment started too early after start up of process re-start.	4	P - Visual Inspection P - Work Instructions P - Automation disable switch during changeover D - Final Inspection D - Process Inspection	5	60	- Increase Visual inspections	-John Gleason/Dean Anderson - 7/14	- Quality tree	3	3	5	45

				3		Automation equipment started too early after start up of process re-start.	3	P - Visual Inspection P - Work Instructions P - Automation disable switch during changeover D - Final Inspection D - Process Inspection	5	45	- Increase Visual inspections	-John Gleason/Dean Anderson - 7/14	- Quality tree	3	3	5	45
11 First Piece Approval	Product Conforms per specifications before production	First Piece Not Hung	Delay in Manufacturing	6		Failure to hang First Piece	1	D/P - Tool Evaluation Sheet	8	48	None						0
12 Validation Testing	Validation and Documentation of New Tooling	Validation is Not Completed	Part Non-Compliance	6		Validation Testing Forgotten	1	D/P - New Tool Evaluation Sheet	8	48	None						0
13-16 Packaging and Automation	Package product per customers specifications	Incorrect or Missing Date Code on the Bag/Box	Traceability Loss	3		Printer Malfunction	3	D - Visual Inspections D - Final Inspections P - Date Code Calendar	5	45	None						0
				3		Wrong/no date code on packaging	3	D - Visual Inspections D - Final Inspections P - Date Code Calendar P - Work Instructions	7	63	None						0
		Degator Jams	Part Non-Compliance	5		Parts Not Aligned	4	D - Visual Inspection P - Machine Alarms	5	100	None	Curt Rice 6/9/2014 Dan Gildner 4/3/2015	Addition of Degator Guides and warped sprue detection. Add checklist for degator jam clearance verification for those presses with guide bars	5	4	4	80
			Loss Production	5		Dull Cutter Blades	4	D - Visual Inspection D - Process Inspection P - PM	7	140	None	Curt Rice 6/9/2014	Addition of Degator Guides and warped sprue detection.	5	2	6	60
				5		Cylinder Failure	4	D - Visual Inspection D - Process Inspection P - PM	3	60	None	Curt Rice 9/1/2014	Replaced all Pneumatic Pusher Cylinders with Servo drive	5	2	3	30
		Incorrect Degator alignment	Cut Heads	5		Improper Set-up	2	D- Visual Inspection D - Process Inspection P - PM	7	70	None	Curt Rice 5/5/2014	Manufactured Guide	5	2	5	50
						Manual Degator Jams	4	D- Visual Inspection D - Process Inspection P - PM	4	80	None						
						Automated Degator Jams	3	D- Visual Inspection D - Process Inspection P - PM P- Degater Alarm	4	60	None						

						Improper part feed	2	D- Visual Inspection D - Process Inspection P - PM P- Degater Alarm	5	50	Add guidance bars. Add detection for T18R Press- A17	Curt Rice 10/30/13 Curt Rice 10/28/14	Guidance bars verified. Detection verified- machine will shut down if cut heads are detected	5	2	3	30
						Part missing from lead in edge of runner	2	D- Visual Inspection D - Process Inspection P - PM P- Degater Alarm	5	50	None						
		Greasy Parts Packaged	Part Non-Compliance	4		Robot Drags the Parts Across the Leader Pins	1	D - Visual Inspection D - Process Inspection P - PM	7	28	None	Curt Rice	Removed all side entry robots.	4	1	7	28
		Incorrect Moisture in Bags	Part Non-Compliance / Parts Conditioned Incorrectly	3		Water Dosing system failure	2	D - Monitoring Water D - Final Inspection	5	30	None	Curt Rice	Removed all key switches	3	2	5	30
				3		Water Supply Not On	2	D - Monitoring Water D - Final Inspection	2	12	None	Curt Rice	Removed all key switches	3	2	5	30
				3		Dirty or Clogged Filter	2	D - Monitoring Water D - Final Inspection P - Preventative Maintenance P - dosing system monitors flow	2	12	None	Curt Rice	Removed all key switches	3	2	5	30
				3		Improper Timer Setting	3	D - Monitoring Water P-dosing system monitors flow	5	45	None	Curt Rice	Removed all key switches.	3	2	5	30
				3		Bad Bag Seals leak water	2	D - Visual Inspection D - Monitoring Water D - Final Inspection	6	36	None						
		Mis-labeling	Customer Dissatisfaction	3		Printer Ribbon not Inserted Properly	2	D - Visual Inspections D - Final Inspections P-Work order sign-off	7	42	None						0
				3		Wrong Labels Placed on Product	4	D - Visual Inspections D - Final Inspections P - LPA P-Work order sign-off	7	84	None						0
				3		Wrong Pre-labeled Bag for Product	4	D - Visual Inspections D - Final Inspections P - LPA P-Work order sign-off	7	84	None						0
				3		Excess Labels not Removed From Production Area	4	D - Visual Inspections D - Final Inspections P - LPA P-Work order sign-off	7	84	None						0
				3		Wrong label provided	3	D - Visual Inspections D - Final Inspections P - LPA P-Work order sign-off	7	63	None						0
		Insufficient Bag Seals	Part Non-Compliance	3		Sealer Tape Worn	4	D - Visual Inspection D - Final Inspection	7	84	Checking bag seal integrity twice per shift	John Gleason/Dean Anderson - 7/14	Integrated into the electronic shift	3	4	6	72

				3		Bag Wrinkled/Bag Mil Thickness Inconsistencies	4	D - Visual Inspection D - Final Inspection	7	84	None						0
				3		Sealer Malfunctions	2	D - Visual Inspection D - Final Inspection	7	42	None						0
				3		Material stuck on sealer	4	D - Visual Inspection D - Final Inspection P - Incoming Inspection	7	84	None						0
				3		Improperly Adjusted Timer	4	P - Work Instruction D - Visual Inspection	7	84	None						0
				3		Teflon coating worn Rennco baggers	3	P - Work Instruction D - Visual Inspection P-In-process PM's	7	63	New packaging system	Curt Rice - 1/2015	integrating new packaging system	3	2	6	36
		Insufficient Packaging	Customer Dissatisfaction	3		Issues with the Bag Stock (Not Quantity)	3	D - Visual Inspection D - Final Inspection	7	63	None						0
				3		Insufficient Packaging Supplies	4	D - Visual Inspection D - Final Inspection	7	84	None						0
		Incorrect Quantity in Bag	Customer Dissatisfaction	4		Robot grippers failed to place parts	3	D - Visual Inspection P - Final Inspection	7	84							0
				4		Pick and Place Grippers Drop Parts	3	D - Visual Inspection P - Final Inspection	7	84	None						0
				4		Degator Jams	3	D - Visual Inspection P - Final Inspection	5	60	None						0
				4		Inconsistent Bag Width	3	P/D - Visual Inspection	7	84	None						0
		Missing or Incorrect Hang Hole	Customer Dissatisfaction	4		Bag register mark Inconsistencies	2	P/D - Visual Inspection	8	64	None						0
				4		Bags not Webbed Correctly	2	P/D - Visual Inspection	8	64	None						0
				4		Too Much Air in Bag	2	P/D - Visual Inspection	8	64	None						0
				4		Cylinder Failure	2	D - Visual Inspection P - PM	8	64	None						0
		Incorrect Quantity in Box	Customer Dissatisfaction	4		Improper Scale Set Up	3	D - Visual Inspection D - Final Inspection P - Bag Counter (T18R-C)	5	60	None						0
				4		Scale Out of Calibration	1	D - Visual Inspection D - Final Inspection P - Calibration Schedule	5	20	None						0
		Parts mixed	Customer Dissatisfaction	4		Operator mixed product from previous work order	2	D - Visual Inspection D - Final Inspection	6	48	None						0
17 Final and Live Inspection	Product conforms per specifications after production run.	Bad Product Shipped	Customer Dissatisfaction	8		Inspection Not Performed by QA	1	D/P - Final and Live Inspection	1	8	None						0
				7		Bad Product not Found in Random Sampling	2	D /P- Final and Live Inspection	7	98	None						0
		Water Verification Incomplete	Part Non-Compliance	6		Water not Verified During Process Inspection	1	D/P - Shift Log or Share Point. P- Final and Live Inspection	1	42	None						

18-19 QA Testing	Validation and documentation of product per specifications	Daily Testing Incomplete	Part Non-Compliance	6		Testing Not Performed by QA	1	D/P - Weekly Matrix, First Piece Acceptance. P- Daily Production Meeting	3	18	None						0
		Weekly Testing Incomplete	Part Non-Compliance	6		Testing Not Performed by QA	1	D/P - Weekly Matrix P- Daily Production Meeting	3	18	None						0
				5		Damaged Shipment	2	D - Visual Inspection D - Final Inspection	8	80	None						0
				5		Customer Specific Requirements Not Met	2	D - Visual Inspection P - Final Inspection	8	80	None						0
20-21 Material Movement Shipping	Ship Product per Specifications to Warehoues	Shipped Incorrectly	Customer Dissatifaction	5		Late Shipment	2	D - Visual Inspection D - Final Inspection	8	80	None						0
				5		Damaged Shipment	2	D - Visual Inspection D - Final Inspection	8	80	None						0
				5		Customer Specific Requirements Not Met	2	D - Visual Inspection P - Final Inspection	8	80	None						0
22 Annual Validation (if required)	Meet customer requirements	Annual Validation not Completed	Customer Dissatisfaction	5		Customer Specific Requirements Not Met	2	D/P - PPAP Matrix P-Training Quality Personnel	2	20	None						0

PTC = Pass Through Characteristic

☐Prototype ☐Pre-Launch ☑Production

Control Plan

Control Plan Number:	Key Contact/Phone:	Date (Orig.)	Date & Revision
MCP-1	**414.355.1130**	**03/11/94**	**See Footer**
Part Number/Latest Change Level: **Cable Ties - Various Materials**	Core Team: **Quality Assurance, Manufacturing, Automation, Receiving-Shipping**	Customer Engineering Approval/Date (If Req'd) **NA**	
Part Name/Description **Cable Ties - Various Materials**	Supplier/Plant Approval/Date **07/28/05**	Customer Quality Approval/Date (If Req'd) **NA**	
Supplier/Plant: **HellermannTyton MKE** / Supplier Code: **NA**	Other Approval/Date (If Req'd) **NA**	Other Approval/Date (If Req'd) **NA**	

Quality Assurance	Material Handler	Process Tech / Auto Technician	Operator	QA and/or Team Supervisor	Shipping and/or Receiving

Part / Process Number	Process Name / Operation Description	Machine, Device, Jig, Tools for MFG.	CHARACTERISTICS			Special Char. Class	METHODS						Reaction Plan
			NO.	PRODUCT	PROCESS		Product/Process Specification/ Tolerance	Evaluation/ Measurement Technique	SIZE		Control Method		
									Size	Freq			
1-4	Incoming Receiving		1	Material Characteristics			Per Certificate of Analysis DTL/D of FMVSS302	Visual Material Cert	Each Lot	Each Lot	ERP System		Isolate lot PR-QA-13.1-2
			2	Quantity			Per Packing List	Gaylord Count	Each Lot	Each Lot	ERP System		Notify Purchasing
			3	Packaging Requirements			Packaging meet Requirements	Gaylord Visual	Each Lot	Each Lot	WI-SR-10.2-1		Notify Purchasing and QA
			4	Lot Number			Per Packing List	Gaylord Visual	Each Lot	Each Lot	ERP System		Notify QA
			5	Material Color			Per Color Chip	Material Visual	Each Lot	Each Lot	ERP System		Isolate lot PR-QA-13.1-2
5-7	Material Movement	Material Handling System	1		Move Material to Material Handling System		Correct Material is set up in the Material Handling System per Work Order	Visual	Each Material Change	Each Material Change	Material Process Log F-PRD-8.1-4		Isolate Lot PR-QA-13.1-2
			2		Check moisutres in Silo Materials		Perform Moistures per TS-WI-MAX400XL	Computrac Max 4000XL	1 Sample/Material	Daily	Moisure Log F-QA-10.3-9		Check and Adjust Dryers / Control of Non-Conforming Product PR-QA-13.1-2
8	Material Ratio	Material Handling System	1		Material Ratio		Set up Per Work Order	Visual	Each material Change	Each Material Change	Material Process Log F-PRD-8.1-4		Isolation PR-QA-13.1-2 Adjust Ratio
			2		Colorant (When Needed)		Mix Ratio Setting According to S-PRD 9.1-19 / Set Up Per Work	Ratio Setting	Each Lot	Each Colorant	Material Process Log F-PRD-8.1-4		Isolation PR-QA-13.1-2 Adjust Ratio
9	Molding Machine Set-up	Injection Molding Machine	1		Machine Set-Up		Per Mattec, Set-Up Sheet, and Acceptable Visual Part and Hand Insertion	Review of Set-Up Specs	Each Set Up	Each Set Up	Machine Set-Up Sheet F-PRD-9.6-1		Adjust Process/Recheck Isolation PR-QA-13.1-2
		Thermal Transfer Machine (If Needed)	2		Machine Set-Up		Set up Foil Applicator for Stripes (If Necessary)	Review of Set-Up Specs	Each Set Up	Each Set Up	Work Order		Adjust Process/Recheck Isolation PR-QA-13.1-2
10-11	First Piece Approval Visual	Injection Molding Machine	1	Part Quality			Check For Flash, Shorts, Blocked Heads, Mismatch, Color(If Needed)	Visual	1 Shot	Each Set Up	First Piece Acceptance F-QA-10.3-5 and Hung at Press		Adjust Process / Retest / Control of Non-Conforming Product PR-QA-13.1-2

	First Piece Approval Hand Insertion	Injection Molding Machine	2	Insertion Properties of Cable Tie			No Hard Insertions, Slippage or Cracked Inserts Allowed. Breakage Testing According to WI-QA-10.3-2	Hand Insertion Process Inspection Check Per WI-QA-10.3-2	1 Shot	Each Set Up	First Piece Acceptance F-QA-10.3-5 and Hung at Press	Adjust Process Retest / Control of Non-Conforming Product PR-QA-13.1-2
12	Validation Testing	Injection Molding Machine	1	Push In / Push On Force (If Needed)			Per Drawing / SQC Pack	Force Tester or Tensometer	1 Shot	At Initial Validation Testing	SPC Software	Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	2	Pull Out/Pull Off Force (If Needed)			Per Drawing / SQC Pack	Force Tester or Tensometer	1 Shot	At Initial Validation Testing	SPC Software	Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	3	Dimensional			Perform Dimensional on the Part	Calibrated Gages per Dimensional Study	1 shot	At Initial Validation Testing	Dimensional Study F-QA-10.4-2	Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	4	Test for Minimum Wire Bundle			Minimum Wire Bundle Requirements Per Print	Wire Bundle Test	1 Shot	At Initial Validation Testing	SPC Software	Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	5	Tensile Strength			Tensile Strength of Tie Must Meet Minimum Requirements Per Print	Tensile Tester WI-QA-10.3-14	1 Shot or 100pcs Minimum	At Initial Validation Testing	SPC Software	Control of Non-Conforming Product PR-QA-13.1-2
13	Work Order Set-Up TEAM SUPERVISOR or MOLD TECH	Packaging Equipment	1	Packaging Requirements			Validate Material and Packaging Requirements per Work Order	Visual	1	Each Work Order	Signed Set-Up Stamp on Work Order	Adjust Process Control of Non-Conforming Product PR-QA-13.1-2
	Layered Process Audit	Production Process	2		Production process		Per questions on LPA form F-PRD-9	Visual	1	Shift	Layered Process Audit Form F-PRD-9	Adjust Process Control of Non-Conforming Product PR-QA-13.1-2 (if applicable)
14	In Process Checks Completed Hand Insertion/Visual Process Inspection	Injection Molding Machine	1	Hand Insertions			No Hard Insertions, Slippage or Cracked Inserts Allowed. Breakage Testing According to WI-QA-10.3-2	Hand Insertion Process Inspection Check Per WI-QA-10.3-2	1 Shot	Twice per Shift	Share Point or Shift Log F-PRD-1.1	WI-PRD-13.1-3 Adjust Process/ Notify Supervisor and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	2	Process Set-Up			Work Order Matches MIU / Cavity Count Matches Actual / Cycle Time is to Standard or Adjusted Notes	Visual	Once	Per Shift	Share Point or Shift Log F-PRD-1.1	WI-PRD-13.1-3 Adjust Process/ Notify Supervisor and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	3	Part Quality			Check For Flash, Shorts, Blocked Heads, Mismatch, Color(If Needed)	Visual	1 Shot	4x per Shift and 1 x per each start-up	Share Point or Shift Log F-PRD-1.1	WI-PRD-13.1-3 Adjust Process/ Notify Supervisor and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
15-16	Packaging Packaging Operator Process Inspections	Injection Molding Machine	1	Visual Appearance			Check Ties for Visual Defects	Visual	1 Shot	Per Hour	Inspection Stamp/Label (Initialed and Dated) on Box and Share Point or F-PRD-1.1	Notify Supervisor, Processing Tech and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2

		Injection Molding Machine	2	Hand Insertions			No Hard Insertions	Hand Insertion Process Inspection Check per WI-QA-10..3-2	1 Shot	Per Hour for molds under 38 cavities, Every Other Hour for cavitation over 38	Inspection Stamp/Label (Initialed and Dated) on Box and Share Point or F-PRD-1.1	Notify Supervisor, Processing Tech and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Sealer	3	Proper Bag Seal			Bag Must Have a Complete and Un-Wrinkled Seal	Visual and Pull at Seams	1 bag	Twice per Shift	Inspection Stamp/Label (Initialed and Dated) on Box and Share Point or F-PRD-1.1	Adjust Process/ Notify Supervisor or QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Waters in Bag	4	Amount of Water Added Per Bag			Per Work Order	Scale WI-PRD-10.3-1	1 measurement	2 Times Per Shift	Inspection Stamp/Label (Initialed and Dated) on Box and Share Point or F-PRD-1.1	Notify Supervisor and Quality Assurance / Adjust Process Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Date Code	5	Date Code Stamp			Bag and Box Must Have Correct Data Code S-PRD-8.1-6	Visual	Once	Per Shift	Inspection Stamp/Label (Initialed and Dated) on Box and Share Point or F-PRD-1.1	Adjust Process/ Notify Supervisor and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Labels	6	Bag and Box Labels			Bag and Box Labels Must Match Work Order	Visual	2 Checks	Per Shift	Inspection Stamp/Label (Initialed and Dated) on Box and Share Point or F-PRD-1.1	Adjust Process/ Notify Supervisor and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Packaging Equipment	7	Hole Punch (Where Applicable)			Hole Punch Must Be Within Header Boundaries and Complete	Visual	Once	Per Shift	Inspection Stamp/Label (Initialed and Dated) on Box and Share Point or F-PRD-1.1	Adjust Process/ Notify Supervisor and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Scale / Conveyor Check	8	Scale / Conveyor Verification for Count			Verify Scale is Couting Correctly / Conveyor has correct number of parts	Using Scales to Package Product WI-PRD-16 or Hand Count	Twice	Per Shift	Inspection Stamp/Label (Initialed and Dated) on Box and Share Point or F-PRD-1.1	Adjust Process/ Notify Supervisor and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
17	Final Inspection at the Cell	Injection Molding Machine	1	Part Quality			Check For Flash, Shorts, Blocked Heads, Mismatch, Color(If Needed)	Visual	1 Shot	Twice per 24 hours	Share Point or Final Inspection F-QA-10.4-21	Control of Non-Conforming Product PR-QA-13.1-2
		Labeles	2	Box Label			Per Work Order Check for Correct Label Placement; if Required	Visual match	1 label	Twice per 24 hours	Share Point or Final Inspection F-QA-10.4-21	Control of Non-Conforming Product PR-QA-13.1-2
		Labeles	3	Bag Label			Per Work Order Check for Correct Label Placement; if Required	Visual match	1 label	Twice per 24 hours	Share Point or Final Inspection F-QA-10.4-21	Control of Non-Conforming Product PR-QA-13.1-2
		Waters in Bag	4	Water Verification			Verify Water is in Bag where required	Visual	1 Bag	Twice per 24 hours	Share Point or Final Inspection F-QA-10.4-21	Control of Non-Conforming Product PR-QA-13.1-2
		Sealer	5	Proper Bag Seal			Bag Must Have a Complete Seal	Visual and Pull at Seams	1 bag	Twice per 24 hours	Share Point or Final Inspection F-QA-10.4-21	Control of Non-Conforming Product PR-QA-13.1-2

		Correct Amount of Parts in Box	6	Quantity in Box			Boxes Must Have Specified Amount of Bags per Box	Hand Count	1 Sample	Twice per 24 hours	Share Point or Final Inspection F-QA-10.4-21	Control of Non-Conforming Product PR-QA-13.1-2
		Packaging	7	Packaging Requirements			Verify per Work Order correct Box	Visual	1 check	Twice per 24 hours	Share Point or Final Inspection F-QA-10.4-21	Control of Non-Conforming Product PR-QA-13.1-2
		Stamp	8	Date Code Stamp / Printer			S-PRD-8.1-6	Visual match	1 check	Twice per 24 hours	Share Point or Final Inspection F-QA-10.4-21	Control of Non-Conforming Product PR-QA-13.1-2
18	QA Daily Testing	Injection Molding Machine	1	QA Lab Tech Hand Insertion			No Hard Insertions, Slippage or Cracked Inserts Allowed. Breakage Testing According to WI-QA-10.3-2	Hand Insertion Process Inspection Check Per WI-QA-10.3-2	1 Shot	Daily	Weekly Matrix	Adjust Process Retest / Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	2	Part Quality			Check For Flash, Shorts, Blocked Heads, Mismatch, Color(If Needed)	Visual	1 Shot	Daily	Weekly Matrix	Adjust Process Retest / Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	3	Part Quality			T18RA and T30RA ran through a tool	Tool	4 pcs welded together	Daily	Weekly Matrix/SPC Software	Adjust Process Retest / Control of Non-Conforming Product PR-QA-13.1-2
19	Weekly Testing	Injection Molding Machine	1	Test for Minimum Wire Bundle			Minimum Wire Bundle Requirements Per Print	Wire Bundle Test	1 Shot	Weekly	SPC Software	Adjust Process Retest / Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	2	Monitor Tensile Strength			Tensile Strength of Tie Must Meet Minimum Requirements Per Print	Tensile Tester	1 Shot	Weekly	SPC Software	Adjust Process Retest / Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	3	Force Testing Push On, Push In, Pull Off, Pull Out (If Required)			Per Print	Tensile Tester / Force Gauge	1pc	Weekly	SPC Software	Adjust Process Retest / Control of Non-Conforming Product PR-QA-13.1-2
20	Material Movement		1		Move Parts to Shipping Dock		Per ERP System	Visual	Each Skid	Each Skid	ERP System	Notify Supervisor
21	Material Movement		1		Ship Product to Warehouse		Per Shipping Requirements	Visual	Each Skid	Each Shipment	Shipping Manifest and ERP System	Notify Supervisor
22	Annual Validation (If Required)		1		Validation of Product		Re-Validation of Product to Customer Requirements	PPAP	Per Customer Requirements	Per Customer Requirements	PPAP Matrix	Control of Non-Conforming Product PR-QA-13.1-2

PROCESS FLOW DIAGRAM

Part Description:	Cable Tie	Program Name:	Cable Ties
HT Dwg.# and Rev:	Various	Created By:	Gwendolyn Benz
Customer P/N and Rev:	Various	Creation Date:	03/11/94
Customer Name:	Various		

	Process ■ "n"	Move ◆ "u"	Store ● "l"	Inspect ☒ "x"	Operational Description:	Special Characteristics / Descriptions	Control Methods
1	■				Incoming Receiving QA Receives C of A from Raw Material Supplier	C of A	ERP system
2	■				Incoming Receiving Receive in Raw Materials From Suppliers	Quality Approval of Material	ERP system
3				☒	Incoming Receiving Shipping and Receiving Inspects Raw Material	Review Container, Packaging, Lot Numbers and Quantity of Material	ERP system
4				☒	Incoming Receiving QA Inspects Color of Material (If Needed)	Review Color of Material	ERP system
5		◆			Material Movement	Move Raw Materials into Storage	ERP system
6			●		Material Movement	Store Raw Materials until needed	FIFO By Lot
7		◆			Material Movement	Move Materials to material handling system and Verify Correct Material Moisture Check on Silo Materials	Material Process Log F-PRD-8.1-4 and Moisture Log F-QA-10.3-9
8	■				Material Ratio	Verify Correct Material	Material Process Log F-PRD-8.1-4
9	■				Molding Machine Set Up	Verify Mold Machine is Set Up	Per Set-Up Instructions F-PRD-8.1-4
10				☒	First Piece Approval QA Completes (Injection Molding)	Short Shots, Any Flash, Color, and Hand Insertions	First Piece Acceptance F-QA-10.3-5
11	■				First Piece Approval	Hang First Piece	Visual At Press

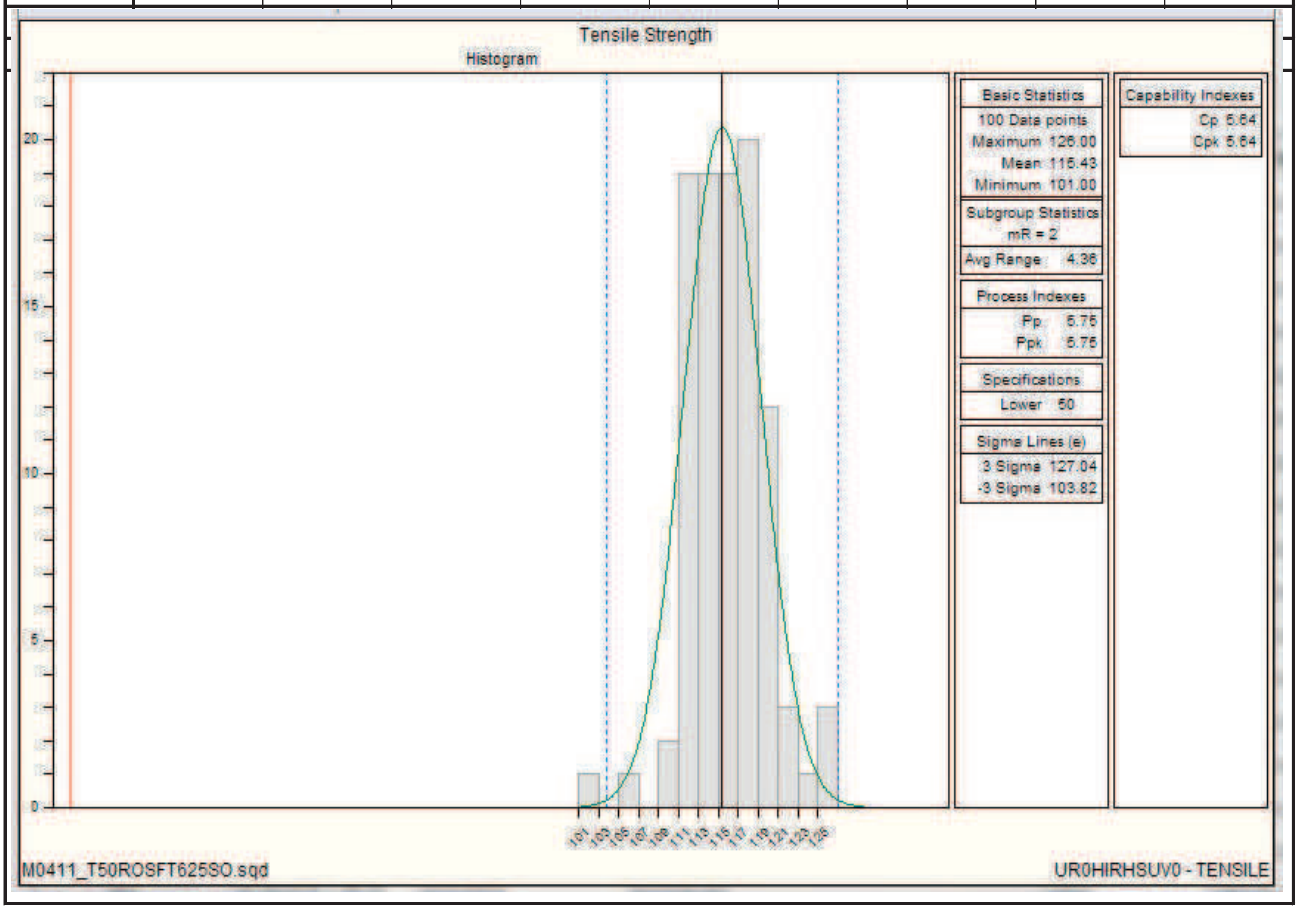
12				☒	Validation Testing	Validate Parts	Measurements - Refer to Control Plan
13	■				Work order set-up LPA	Validate work order to materials, labels, etc LPA-Random Audit	Visual, Signed Set-up Stamp on Work Order F-PRD-9
14				☒	In Process Checks (Injection Molding)	Short Shots, Any Flash, Color, and Hand Insertions	Per Control Plan
15				☒	Packaging	Verify Seals, Water, Date Code, Labels, Hole Punch, Box Quanity	Inspection Stamp/Label (Initialed and Dated) on Box / Share Point / Shift Log F-PRD-1.1 / Placard
16				☒	Visual Appearance	Check Ties for Visual Defects	
17				☒	Final and Live Inspection Inspection	Quality Approval of Final Product	F-QA-10.4-21/ Share Point
18				☒	QA Testing	Verify Daily Testing Has Been Completed	Per Control Plan
19				☒	QA Testing	Verify Weekly Testing Has Been Completed	Per Control Plan
20		◆			Material Movement	Move Skid To Shipping Dock	ERP System
21		◆			Material Movement	Ship Product to Warehouse	Shipping Manifest ERP System
22				☒	Annual Validation (If Required)	PPAP Parts on Yearly Basis if Required	PPAP Matrix

HellermannTyton

Initial Process Study

Part No.	Part Description	Supplier	
157-00195	25mm STAND OFF CABLE TIE	HellermannTyton	
Drawing No.	**Drawing Date**	**Drawing Revision**	**Inspection Facility**
13-0277-001-CSU	12/7/2015	04.1	HT-Milwaukee
Production Date	**Material**	**Tool No.**	**Inspector**
9/16/2016	UR0HIRHSUV0	M0411	T.M.

DATA	Tensile Strength (lbs)								
1-9	114.00	110.00	116.00	116.00	112.00	112.00	117.00	115.00	118.00
10-18	120.00	111.00	112.00	125.00	118.00	121.00	115.00	121.00	106.00
19-27	113.00	119.00	115.00	115.00	112.00	118.00	126.00	113.00	117.00
28-36	112.00	116.00	119.00	114.00	125.00	116.00	117.00	114.00	120.00
37-45	118.00	123.00	113.00	115.00	116.00	111.00	117.00	114.00	115.00
46-54	113.00	119.00	114.00	115.00	118.00	118.00	112.00	120.00	120.00
55-63	112.00	112.00	114.00	117.00	118.00	116.00	119.00	112.00	113.00
64-72	101.00	115.00	120.00	111.00	120.00	117.00	112.00	116.00	117.00
73-81	118.00	117.00	117.00	111.00	112.00	117.00	117.00	113.00	115.00
82-90	115.00	113.00	113.00	113.00	115.00	112.00	121.00	110.00	114.00
91-99	114.00	119.00	113.00	113.00	116.00	112.00	119.00	112.00	117.00
100-108	112.00								



Gage R&R

R&R Study Results
Using Specifications

Gage number:	TGM-850	Done by:	Donna Szczepanski
Gage description:	Tensile Tester	Part name:	T150M0X2
Gage type:	Tensile Tester	Characteristics:	TENSILE
Study name:	Annual Gage R & R	Specifications:	LSL=350 Nominal=400 USL=450
Study date:	09/05/2016	Number of Distinct Cate	33.77499

Objective:

Comment:

	Interpretation guidelines
< 10%	generally considered to be an acceptable measurement system
10%-30%	may be acceptable based upon importance of application, cost of measurement device, cost of repair etc.
> 30%	considered to be not acceptable - every effort should be made to improve the measurement system

Results based on specifications

Measurement Unit Analysis

Specification Spread (USL-LSL)/

Repeatability - Equipment Variation (EV)
EV = 0.5977558

%EV = 3.586535

Reproducibility - Appraiser Variation (AV)
AV = 0.3549044

%AV = 2.129426

Repeatability & Reproducibility (R&R)
R&R = 0.6951756

%R&R = 4.171054

Part Variation (PV)
PV = 16.65216

%PV = 99.91298

Specification Spread (USL-LSL)/
(USL - LSL)/ = 16.66667

Appraiser	Replicati	Part 1	Part 2	Part 3	Part 4	Part 5	Part 6	Part 7	Part 8	Part 9	Part 10
Donna	1	412.72	397.78	404.6	408.78	396.05	402.22	405.73	410.82	389.22	407.63
Donna	2	412.57	399.11	403.87	409.73	396.68	402.27	405.44	410.15	390.27	408.1
Donna	3	414.47	397.85	403.65	408.79	396.13	403.21	406.39	410	390.24	407.69
Taleala	1	414.82	397.63	404.83	408.97	395.15	400.96	405.76	410.05	391.3	407.32
Taleala	2	414.04	398.32	404.53	408.52	395.75	399.79	405.35	411.83	390.51	407.42
Taleala	3	416.31	396.93	404.84	408.78	395.51	400.03	405.39	410.34	391.35	406.07
Marreall	1	412.83	397.2	403.15	408.01	393.95	399.72	405.5	410.07	392.4	406.62
Marreall	2	414.54	396.58	403.48	407.64	395.16	400.1	405.05	410.25	391.75	406.23
Marreall	3	413.5	397.36	403.25	408.07	395.29	401.18	405.65	408.24	391.7	406.4

Ascend Performance Materials Operations LLC
Nylon Plastics and Polymers
3000 Chemstrand Road
Cantonment, FL 32533
Telephone: (850) 968-7000

HELLERMANN TYTON
6701 W GOOD HOPE
Milwaukee, WI 53224
Attention: QUALITY DEPARTMENT

Customer Part No: UR0HIRHSUV0
Container ID: SLAY 5301

Certificate Date: 12-FEB-18
Delivery No: 0382417248
Shipped Qty: 46,660.000 Lbs
(21,164.976 Kgs)
Customer P.O. No: 110653-9

Certificate of Analysis

This certifies that the Nylon Resin shipped to you from Ascend Performance Materials Operations, LLC has been tested and found to meet the required specifications.

This material was produced under a Quality System that meets ISO/TS16949:2009 criteria.

This Nylon Resin meets the relevant requirements of Directive 2011/65/EU ("RoHS 2 Directive") including all amendments through Directive 2015/863 on the restriction of the use of certain hazardous substances in electrical and electronic equipment and Directive 2012/19/EU on waste electrical and electronic equipment ("WEEE Directive").

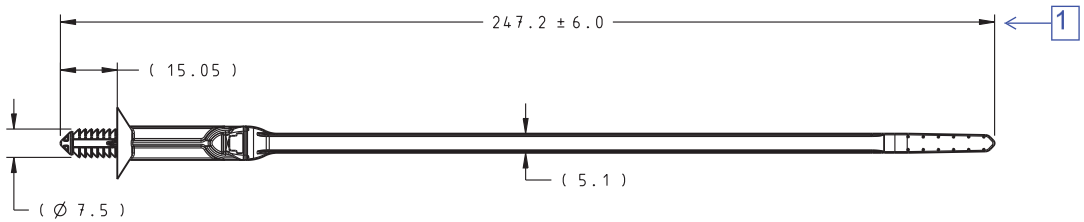
If you have questions or concerns about this Certificate of Analysis, please contact Ascend Performance Materials Customer Operations at 1-888-927-2363.

This product meets the requirements of the following specifications: SAE J1639, SAE J1639 PA0171, ASTM D6779-PA0161-Z1Z2, ASTM 4066 PA0161, FMVSS 302, Chrysler MS-DB-41 CPN1826, ESB-M4D178-A2, WSS-M99P23-C1/C2, WSS-M99P9999-A1, WSSM4D706B1, WSS-M99P1111-A, WSS-M4D706-A4, WSK-M4D706-A, GMW16447P-PA66-T2, GMW16558P-PA66-T1 and GMP.PA66.015.

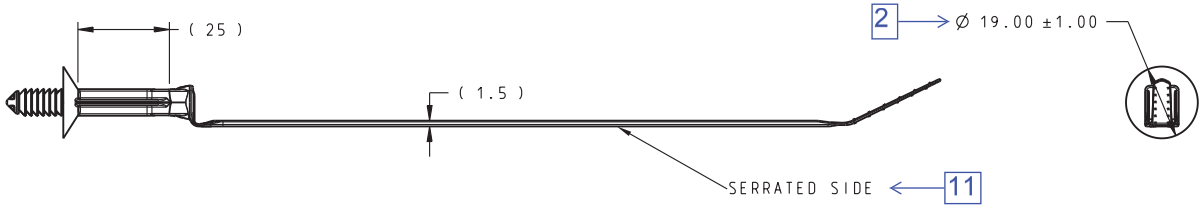
Material Type: VYDYNE 47H BK0644 **Material No:** 10404298 **Batch No** GB09FY03 **Date of Mfg** 09-FEB-2018

Ascend Performance Materials Operations LLC Specification

Lot Data **Property**	**Test Method**	**Min**	**Max**	**Result**	**Units**
Moisture	ASTM D6869	0.10	0.20	0.15	%
Copper	STM 00667	125	250	202	PPM
Strength @ Yld	ISO 527-1,2 / 1A	50	70	56	MPa
Flammability @ 0.8mm	UL 94HB	P	P	P	N/A



ISOMETRIC VIEW
SCALE 1:2



LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	
RELEASED: GU5T-14E047-FA				
AELE-E-12982958-107			20151223	
CROHDE	EHAFTAR	RVITALI	RVITALI	

UNLESS OTHERWISE SPECIFIED:

PART MUST BE FREE OF BURRS, FLASH AND SHARP EDGES THAT MAY AFFECT THE FUNCTION, SAFE HANDLING, INSTALLATION OR REMOVAL OF THE PART.

PART AS RECEIVED AT THE FORD PLANT OR SERVICE PART PACKAGER/WAREHOUSE SHALL BE FREE OF ANY CORROSION ALIGNED WITH THE FORD CUSTOMER SERVICE DIVISION (FCSD) PACKAGING AND SHIPPING GUIDE. CORROSION INHIBITORS OR FOREIGN MATERIALS DETRIMENTAL TO THE INSTALLATION OR FUNCTION OF THE PART MUST BE REMOVABLE BY INTENDED CLEANING METHOD.

ENGINEERING APPROVAL OF SAMPLES FROM EACH SUPPLIER IS REQUIRED PRIOR TO AUTHORIZATION OF PART PRODUCTION

CHANGES TO DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION REQUIRE PRIOR APPROVAL FROM FORD MOTOR COMPANY PRODUCT ENGINEERING REFER TO ISO/TS 16949.

FOR CURRENT RELEASE STATUS SEE THE WERS ENGINEERING NOTICE

SOURCES FOR MATERIALS DEFINED BY FORD MATERIAL SPECIFICATIONS SHALL BE SELECTED FROM THE FORD MOTOR COMPANY ENGINEERING MATERIAL APPROVED SOURCE LIST

MATERIAL: NYLON 6/6 (WSS-M4D706-B1), COLOR:BLACK 3

REFERENCE:
PERFORMANCE REQUIREMENTS AT DRY AS MOLDED:
1. FIR TREE PUSH IN FORCE: 45 NEWTONS (10 LBS) MAX 5
   IN THE APPLICABLE NOMINAL HOLE SIZE AND A
   PLATE THICKNESS OF 1.8mm.
2. FIR TREE PULL OUT FORCE: 110 NEWTONS (25 LBS) MIN 6
   IN THE APPLICABLE NOMINAL HOLE SIZE AND A
   PLATE THICKNESS OF 1.8mm.
3. SHEET METAL THICKNESS RANGE: 0.60MM - 8.25MM 7 8
4. APPLICABLE HOLE SIZE:
   A. 6.5MM +/- 0.4 9
5. CABLE TIE TENSILE STRENGTH: 220 NEWTONS (50LBS)
6. BUNDLE RANGE: 2.0mm TO 50mm 10
7. MAXIMUM PERCENT REGRIND PERMISSIBLE: 25%

4

HellermannTyton

REFERENCE	T50ROSFT625SO		
PART MUST COMPLY WITH RESTRICTED SUBSTANCE MANAGEMENT STANDARD WSS-M99P9999-A1 TO SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT			
DRAFTED IN ACCORDANCE WITH FORD MOTOR COMPANY ENGINEERING CAD AND DRAFTING STANDARDS VERSION 28.1		3RD ANGLE PROJ DIMENSIONS ARE IN MILLIMETERS	
CAD TYPE K-CATIA5	CAD LOC. TCe	CAD FILE GU5T-14E047-F-DWG-01	DTMC IS MASTER
OPER. NO. N/A	UNIT N/A	DRAWING GU5T-14E047-FA	
DESIGN CROHDE	DETAIL TPUSILO	TITLE RET WIR HRNS TIE STRAP	SHT 1 OF 1 N/A
CHECKED EHAFTAR	SAFETY ---		
SCALE 1:1	DATE 20151223	DIVISION N/A PLANT N/A	

FORD MOTOR COMPANY