

From: **Quality Assurance HellermannTyton GmbH**

Subject: PPAP Approval signature deadline

Dear customer:

As you are aware the PPAP process is an integral part of our business. With that in mind, we are informing our customers who are requesting a PPAP that there is a 30 day (calendar) deadline to which we are expecting your reply back with a signed copy of the PSW with a disposition regarding it's validity. It is important that we maintain compliance to the current AIAG PPAP manual.

As a part of compliance a signed and approved PSW is essential for our records.

We reserve the right to consider that PPAP valid and complete, if we do not receive a signed copy of the PSW within 30 days (calendar).

Once you have received our PPAP information please e-mail us a copy of your disposition with the appropriate signatures as soon as possible to the following person:

nescha.lohse@HellermannTyton.de

Quality Assistant

phone: +49 (0) 4122 701 5726

Your cooperation is greatly appreciated!

Respecting the procedure as described above, the documentation with HellermannTyton PB-No.:			
92467	with submission date	12.07.2021	will be considered as complete and valid auto-
atically on	11.08.2021	unless otherwise disposed!	



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

HELLERMANN TYTON GMBH
GROSSER MOORWEG 45
Tornesch, 25436
Attention: AXEL LANG
Container ID: 0000000000002010854

Certificate Date: 21-JAN-21
Delivery No: 0382549220
Shipped Qty: 12,075.000 Lbs
(5,477.220 Kgs)
Customer P.O. No: 4500129185 / 40

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 9001:2015 and IATF 16949:2016 criteria.

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 D4066 PA0161, FMVSS 302, MS-DB-41 CPN 1826, 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, Ford WQ 100C.

Material Type: VYDYNE 47H BK0644 Material No: 10397364 Batch No IK02FY03 Date of Mfg 02-NOV-2020

Ascend Performance Materials Operations LLC Specification

<u>Lot Data</u> <u>Property</u>	<u>Test Method</u>	<u>Min</u>	<u>Max</u>	<u>Result</u>	<u>Units</u>
Moisture	STM 00835	0.10	0.20	0.15	%
Copper	STM 00667	125	250	169	PPM
Strength @ Yld	STM 01253	50	70	59	MPa

Note: This certificate is generated and controlled by electronic means. No signature is required. This document may not be reproduced, except in full, without written consent of the Nylon Plastics and Polymers Department, Ascend Performance Materials Operations LLC.

All information contained in this letter is provided for informational purposes only and is not meant to alter or waive the appropriate contractual product specifications. Moisture values are representative of the product at the time it was sampled. If numerical flame spread ratings appear herein, they are not intended to reflect the hazards presented by this or any other material under actual fire conditions. Each end user should determine whether potential fire hazards are associated with the finished product, and whether this resin is suitable for the particular end use.

This Certificate of Analysis is provided by Ascend Performance Materials (or its authorized distributor) to its direct purchaser only and is intended for internal use. It is not valid if resold, conveyed or otherwise transferred to another party without Ascend's prior written consent. Ascend makes no warranties and assumes no liability for any product or certification obtained from an unauthorized source. Contact Ascend at +1 713-315-5700 to confirm the validity of any third party supplier.

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**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(PFMEA)**

PFMEA Number: **MFMEA-43**

Part Number / Name: Customary Mounts ess 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	R P N	Recommended Action(s)	Responsibility & Target Completion Date	Action Results				
													Actions Taken	Severity	Occurrence	Detection	R P N
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 lot received with moisture to high/low	2	D - Incoming Inspection P - Material Certs	8	80	None						0
		Improperly labeled	Delay in Manufacturing	4		Material lot received does not match cert	2	D - Incoming Inspection P - Material Certs	8	64	None						0
5-8 Material Movement Central Material	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 for stickers on Material	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
10-11 First Piece Acceptance	Product conforms per specifications before production.	First Piece Not Hung	Delay in Manufacturing	8		First Piece Not Submitted	1	D- Visual/No First Piece at press. P-Training of Production Personnel	5	40	None						0
12 Validation Testing	Validation and documentation of new tooling	Validation is Not Completed	Part Non- Compliance	8		Validation Testing Forgotten	1	D/P-PPAP Matrix	2	16	None						0
13-14 Setup / In process checks Injection Molding Process	Manufacturing a conforming part per specifications	Sinks	Part Non- Compliance	3		Insufficient Hold Pressure	2	D- Visual Inspections P - First Piece Approvals	8	48	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemente d Quality tree	3	2	7	42
				3		Cycle Time Too Fast	2	D- Visual Inspections P - First Piece Approvals	8	48	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemente d Quality tree	3	2	7	42
		Incorrect Blending	Part Non- Compliance / and Color Match Failures	5		Material blended incorrectly at press	2	D/P - Visual to Work Order	8	80	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemente d Quality tree	5	2	7	70
		Burning	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	John Gleason/Dean Anderson - 7/14	Implemente d Quality tree	3	3	7	63
		Sticking in mold	Part Non- Compliance / Mold Damage	5			2	D- Visual Inspections P - First Piece Approvals	8	80	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemente d Quality tree	5	2	7	70
				5		Excessive Hold Pressure	2	D- Visual Inspections P - First Piece Approvals	8	80	Increase Visual inspection	John Gleason/Dean Anderson - 7/14	Implemente d Quality tree	5	2	7	70
				5		Water hooked up incorrectly	2	D-Visual Inspection	8	80	Implemented Water Maps - Ongoing implementation of pre plumbing molds	Rich Staszewski On going for water map and pre plumbing	T18L- completed 6/26/09 Ongoing for other molds	5	2	6	60

		5		Heater band malfunctions	3	D- Visual Inspection D - Process Inspection P - PM	5	75	None						0
Excess Plastic	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	Implemente d Quality tree	5	2	7	70
Blocked thru holes/windows	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	Implemente d Quality tree	5	2	7	70
Missing Retainer tab insert (If Present)	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 detect temp. dev.	5	1	3	15
		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	Implemente d Quality tree	5	1	7	35
		5		Cycle Time Too Fast	1	D - Visual Inspections P - Final Inspections	8	40	None						0
		5		Worn inserts	2	D - Visual Inspections P - Final Inspections	8	80	None						0
		5		Washed out vents	2	D - Visual Inspections P - Final Inspections	8	80	None						0
Shorts	Part Non-Compliance / Cosmetic Low Extraction force	6		Insufficient Injection Pressure compatibility of Press / mold	3	D- Visual Inspections P - First Piece Approvals P - In process PM's	8	144	Gauges to Detect insertion force	Dean Anderson - 11/13	Developed and implemented Go/No Gauges	6	3	5	90
		6		Plugged/Worn Vents	3	D- Visual Inspections P - First Piece Approvals P - In process PM's	8	144	Gauges to Detect insertion force	Dean Anderson - 11/13	Developed and implemented Go/No Gauges	6	3	5	90
		6		Residue Build-Up	3	D- Visual Inspections P - First Piece Approvals P - In process PM's	8	144	- PM Schedule - Gauges	Mike Wendt - 9/12 Dean Anderson - 11/13	Ice Blasting to clean mold per shift Go/No Go Gauges	6	2	5	60
		6		Lot / Moisture Variations	3	D- Visual Inspections D - First Piece Approvals P - Material Certs P - Moisture Analysis	8	144	Develop moisture testing schedule	Mike Wendt - 8/13	Purchased Moisture Analyzers. Implemente d testing procedure	6	2	5	60

		6		Process Interruption	2	D- Visual Inspections D - First Piece Approvals P - Material Certs P - Moisture Analysis	4	48	None						0
Flash	Part Non-Compliance / High Insertion Force Failures / Cosmetic	6		Excessive Injection Pressure	3	D- Visual Inspections P - First Piece Approvals P - In Process PM's	8	144	Increase frequency of functional testing (insertion).	John Gleason/Dean Anderson - 7/14	Implemente d Quality tree - Go/No Go Gauge	6	3	5	90
		6		Incorrect Tonnage	3	D- Visual Inspections P - First Piece Approvals P - In Process PM's	8	144	- 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	6	2	5	60
Mold Mismatch	Parting Line Flash	6		Poor Mold Alignment	2	D - Visual Inspections D - Process Inspections P - First Piece Approvals P - In Process PM	8	96	- Increase Visual inspections - Gauge	-John Gleason/Dean Anderson - 7/14 - Dean Anderson - 11/13	- Quality tree - Go/No Go gauges	6	2	5	60
		6		Leader Pin/Sidelock Wear	2	D - Visual Inspections D - Process Inspections P - First Piece Approvals P - In Process PM	8	96	-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	7	42
Deep ejector pins	Part Non-Compliance	6		Excessive Hold Pressure	3	D - Visual Inspections D - Process Inspections P - First Piece Approvals P - In Process PM	8	144	- Increase Visual inspections	- John Gleason/Dean Anderson - 7/14	- Quality Tree	4	3	7	84

				6	Thermolator Malfunction	2	D - Visual Inspections D - Process Inspections P - First Piece Approvals P - In Process PM	8	96	Add audible warning	Manit. - 9/13	Audible alarms added to all Thermolator to detect temp. dev.	4	2	3	24
				3	Fast Cycle Time	2	D - Visual Inspections D - Process Inspections P - First Piece Approvals P - In Process PM	8	48	None						0
		Plugged Sprue Tips / Gates (Hot Manifold)	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
		Start up scrap packaged	Customer Dissatisfaction	3	Operator packages parts too soon	4	P - Visual Inspection P - Work Instructions D - Final Inspection D - Process Inspection	8	96	- Scrap Handling Procedure -Automate Program	- John Gleason - 1/1/13 - Randy Olhoff - 6/18/10	- Scrap handling procedure - Reversing Conveyors	3	3	7	63
15-16 Packaging	Package product per customers specifications	Incorrect or Missing Date Code on the Box	Traceability Loss	3	Wrong/no date code on package	3	D - Visual Inspections D - Final Inspections P - Date Code Calendar P - Work Instructions	7	63	None						0
		Greasy Parts Packaged	Part Non- Compliance	4	Ejector Pin / Machine Grease	1	D - Visual Inspection D - Process Inspection P - PM	8	32	None						0
		Incorrect / Missing Labels	Customer Dissatisfaction	3	Printer Ribbon not Inserted Properly	2	D - Visual Inspections D - Final Inspections P-Work order sign-off	8	48	- Improved Procedure	- John Gleason - 7/14 - Mike Wendt/Gary Schultz - 5-14	- Electronic shift log - Supervisor Check List	3	3	5	45
				3	Wrong Labels Placed on Product	4	D - Visual Inspections D - Final Inspections P - LPA P-Work order sign-off	8	96	- Improved Procedure	- John Gleason - 7/14 - Mike Wendt/Gary Schultz - 5-14	- Electronic shift log - Supervisor Check List	3	3	5	45

				3		Excess Labels not Removed From Production Area	4	D - Visual Inspections D - Final Inspections P - LPA P-Work order sign-off	8	96	- Improved Procedure	- John Gleason - 7/14 - Mike Wendt/Gary Schultz - 5-14	- Electronic shift log - Supervisor Check List	3	3	5	45
				3		Wrong label provided	4	D - Visual Inspections D - Final Inspections P - LPA P-Work order sign-off	8	96	- Improved Procedure	- John Gleason - 7/14 - Mike Wendt/Gary Schultz - 5-14	- Electronic shift log - Supervisor Check List	3	3	5	45
		Insufficient Packaging	Customer Dissatisfaction	3		Insufficient Packaging Supplies	3	D - Visual Inspection D - Final Inspection	8	72	None						0
		Incorrect Quantity in Box	Customer Dissatisfaction	4		Improper Scale Set Up	3	D - Visual Inspection D - Final Inspection	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	7		Inspection Not Performed by QA	1	D/P - Final and Live Inspection	1	7	None						0
				7		Bad Product not Found in Random Sampling	2	D /P- Final and Live Inspection	7	98	None						0
18 QA Testing	Validation and documentation of product per specifications	QA Testing Incomplete	Part Non-Compliance	6		Testing Not Performed by QA	1	D/P - Weekly Matrix, First Piece Acceptance. P- Daily Production Meeting./Training Quality Personnel.	3	18	None						0
19-20 Material Movement Shipping	Ship product per specifications to warehouse	Shipped Incorrectly	Customer Dissatisfaction	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
21 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

PROCESS FLOW DIAGRAM

Part Description: Customary Mounts
 HT Dwg.# and Rev: Various
 Customer P/N and Rev: Various
 Customer Name: Various

Program Name: NA
 Created By: Gwendolyn Benz
 Creation Date: 10/22/07

	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 Storage	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 per TS-WI-MAX4000XL.	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
10				☒	QA Completes First Piece Approval (Injection Molding)	Short Shots, Any Flash, Warpage, or Burning.	First Piece Acceptance F-QA-10.3-5
11	■				Quality Approval of First Piece	Hang First Piece	Visual At Press
12				☒	Validation Testing	Validate Parts	Measurements - Refer to Control Plan
13	■				Work Order Set up LPA	Validate materials, labels, etc. to Work Order LPA Random Audit	Visual, Signed Set-Up Stamp on Work Order F-PRD-9
14				☒	In Process Checks (Injection Molding)	Short Shots, Any Flash, Warpage, or Burning.	Per Control Plan

15				☒	Final Product and Packaging is Verified	Check Parts for Visual Defects Seals, Quantity, Bags, Boxes, Date Code Verified.	Label (Initialed and Dated) on Box / Share Point / F-PRD-1.1
16	■				Full Skid / Order Complete	Verify Product is Skidded Properly and Mark Ready for Inspection	Label Placed on Skid
17				☒	Final Inspection	Quality Approval of Final Product	F-QA-10.4-21/ Share Point
18				☒	QA Testing	Verify Part Testing Has Been Completed	Per Control Plan
19		◆			Material Movement	Move Skid To Shipping Dock	Ready for Movement cone / ERP System
20	■				Material Movement	Ship Product to Warehouse	Shipping Manifest/ ERP System
21				☒	Annual Validation (If Required)	PPAP Parts on Yearly Basis if Required	PPAP Matrix

☐ Prototype ☐ Pre-Launch ☒ Production

Control Plan

Control Plan Number: MCP 43			Key Contact/Phone: 414.355.1130			Date (Orig.) 08/21/07		Date (Rev.) See Footer					
Part Number/Latest Change Level: Customary Mounts - Various			Core Team: Quality Assurance, Manufacturing, Automation, Receiving-Shipping			Customer Engineering Approval/Date (If Req'd) NA							
Part Name/Description Customary Mounts - Various			Supplier/Plant Approval/Date NA			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		Team Supervisor		Material Handler		Processing 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	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 meets 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 moisture in Silo Materials		Perform Moistures per TS-WI-MAX4000XL	Computrac Max 4000XL Tester	1 Sample/ Material	Daily	Moisture 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 / Set Up Per Work Order	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	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	
10-11	First Piece Approval Visual	Injection Molding Machine	1	Part Quality			Check for Burns, Shorts, Flash and Warp that will effect Fit, Form or Function of the Mount	Visual Inspection	1 Shot	Each Set Up	First Piece Acceptance F-QA-10.3-5	Adjust Process Retest / Control of Non-Conforming Product PR-QA-13.1-2	
			2	Stud Verification (If Required)			Check M6 and M5 Studs on Fixture for size	WI-QA-10.4-8	1 Shot	Each Set Up	First Piece Acceptance F-QA-10.3-5	Notify Supervisor and Tool Room Retest / Control of Non-Conforming Product PR-QA-13.1-2	
12	Initial Validation Testing	Injection Molding Machine	1	Dimensional			Perform Dimensional on the Part to Print	Calibrated Gages per Dimensional Study	1 Shot	At Initial Validation	Dimensional Study F-QA-10.4-2	Control of Non-Conforming Product PR-QA-13.1-2	

Quality Assurance		Team Supervisor	Material Handler		Processing 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		
			2	Push In / Push On Force (If Needed)			Per Drawing / SQC Pack	Force Tester or Tensometer	1 Shot	At Initial Validation	SPC Software	Control of Non-Conforming Product PR-QA-13.1-2
			3	Pull Out/Pull Off Force (If Needed)			Per Drawing / SQC Pack	Force Tester or Tensometer	1 Shot	At Initial Validation	SPC Software	Control of Non-Conforming Product PR-QA-13.1-2
			4	Dimensional Capability			Per Drawing / SQC Pack	Calibrated Gages	100pcs	At Initial Validation	SPC Software	Control of Non-Conforming Product PR-QA-13.1-2
			5	Connector Clip Push On/Pull Off Forces (If required)			Per Drawing / SQC Pack	Calibrated Gages	1 Shot	At Initial Validation	SPC Software	Control of Non-Conforming Product PR-QA-13.1-2
13	Work Order Set-Up TEAM SUPERVISOR or PROCESSING TECH	Packaging Equipment	1	Packaging Requirements			Set-Up 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 Processing Tech Completed Visual Process Inspection	Injection Molding Machine	1	Part Quality			No Burns, Shorts, Flash, Warp or Part Damage Allowed.	Visual Inspection	1 Shot	4 x 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
		Injection Molding Machine	2	Process Set-Up			Work Order Matches MRO / 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
15-16	Packaging Packaging Operator Process Inspections	Injection Molding Machine	1	Visual Appearance			Check Parts for Visual Defects	Visual	1 Shot	Per Hour	Inspection Label (Initialed and Dated)	Adjust Process/ Notify Supervisor and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Waters in Bag (If Needed)	2	Amount of Water Added Per Bag			Per Work Order	Scale WI-PRD-10.3-1	1 measurement	2 Times Per Shift	Inspection Label (Initialed and Dated) / 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
		Sealer (If needed)	3	Proper Bag Seal			Bag Must Have a Complete and Un-Wrinkled Seal	Visual and Pull at Seams	1 bag	Twice per Shift	Inspection Label (Initialed and Dated) / Share Point or F-PRD-1.1	Adjust Process/ Notify Supervisor or QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Stamper	4	Date Code Stamp			Bag and Box Must Have Correct Date Code S-PRD-8.1-6	Visual	Once	Per Shift	Inspection Label (Initialed and Dated)	Adjust Process/ Notify Supervisor and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2

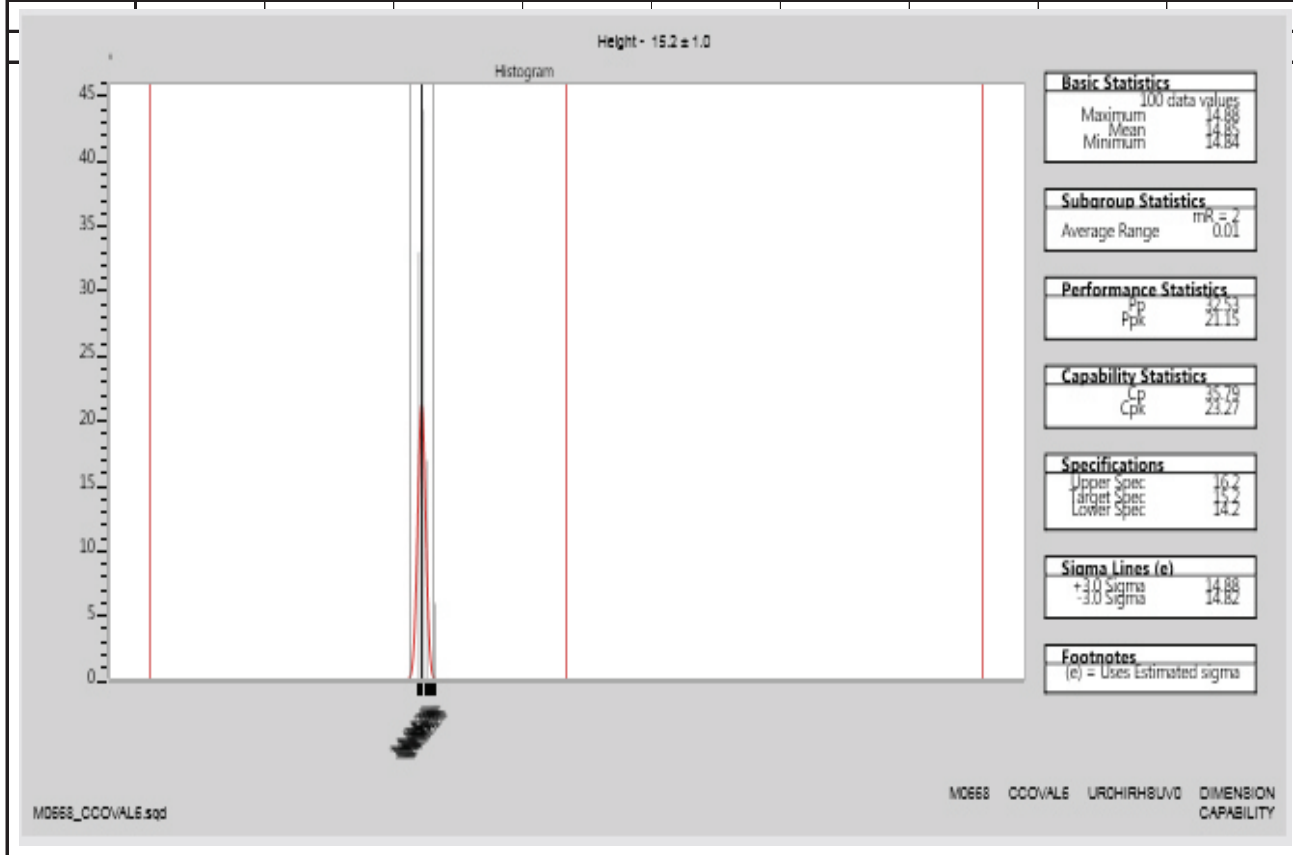
Quality Assurance		Team Supervisor	Material Handler		Processing Technician		Operator		QA and/or Team Supervisor		Shipping and/or Receiving	
Part / Process Number	Process Name / Operation Description	Machine, Device, Jig, Tools for MFG.	CHARACTERISTICS			Special Char. Class	METHODS					Reaction Plan
			NO.	PRODUCT	PROCESS		Product/Process Specification/ Tolerance	Evaluation/ Measurement Technique	SIZE		Control Method	
									Size	Freq		
		Labels	5	Bag and Box Labels			Bag and Box Labels Must Match Work Order	Visual	Twice	Per Shift	Inspection Label (Initialed and Dated)	Adjust Process/ Notify Supervisor and QA Recheck / Control of Non-Conforming Product PR-QA-13.1-2
		Scale/Conveyor Check	6	Scale/Conveyor Verification for Count			Verify Scale is Counting Correctly/ Conveyor has correct number of parts	Using Scales to Package Product WI-PRD-16 or Hand Count	Twice	Per Shift	Inspection Label (Initialed and Dated) / 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 Cell	Injection Molding Machine	1	Part Quality			Check for Burns, Shorts, Flash and Warp	Work Order	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
		Labels	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
		Labels	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 (If Needed)	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 Where Required	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	Part Quality			Check for Burns, Shorts, Flash and Warp that will effect Fit, Form or Function of the Mount	Visual Inspection	1 Shot	Daily	Weekly Matrix F-QA-10.3-8	Adjust Process Retest / Control of Non-Conforming Product PR-QA-13.1-2
		Injection Molding Machine	2	Push In / Push On Force (If Needed)			Per Drawing / SQC Pack	Force Tester or Tensometer	1 part	Weekly	SPC Software	Adjust Process Retest / Control of Non-Conforming Product PR-QA-13.1-2

Quality Assurance		Team Supervisor	Material Handler			Processing 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		
		Injection Molding Machine	3	Pull Out/Pull Off Force (If Needed)			Per Drawing / SQC Pack	Force Tester or Tensometer	1 part	Weekly	SPC Software	Adjust Process
												Retest / Control of Non-Conforming Product PR-QA-13.1-2
19-20	Shipping		1		Shipping		Per Shipping Requirements	Visual	Each Skid	Each Shipment	Shipping Manifest and ERP System	Notify Supervisor
21	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

Initial Process Study

Part No. 151-01033	Part Description Short Oval Fir Tree With EWCAP-	Supplier HellermannTyton	
Drawing No. 14-0402-001-CSU	Drawing Date 12/7/2015	Drawing Revision 03.1	Inspection Facility HT-Milwaukee
Production Date 8/3/2017	Material UR0HIRHSUV0	Tool No. M0668	Inspector J.D.

DATA	Height 15.2 +/- 1.0 mm								
1-9	14.84	14.85	14.84	14.84	14.85	14.84	14.86	14.85	14.86
10-18	14.85	14.84	14.85	14.86	14.85	14.86	14.85	14.84	14.88
19-27	14.84	14.84	14.84	14.84	14.88	14.84	14.85	14.86	14.84
28-36	14.84	14.84	14.84	14.85	14.85	14.85	14.85	14.85	14.84
37-45	14.85	14.86	14.85	14.85	14.84	14.85	14.84	14.85	14.86
46-54	14.85	14.84	14.86	14.84	14.84	14.84	14.84	14.84	14.84
55-63	14.86	14.85	14.84	14.85	14.85	14.85	14.84	14.85	14.85
64-72	14.85	14.85	14.84	14.88	14.85	14.86	14.88	14.85	14.85
73-81	14.84	14.85	14.84	14.86	14.85	14.88	14.85	14.85	14.86
82-90	14.85	14.85	14.84	14.86	14.86	14.85	14.86	14.88	14.85
91-99	14.84	14.85	14.84	14.85	14.86	14.85	14.85	14.85	14.85
100-108	14.86								



Gage R&R

R&R Study Results Using Specifications

2/1/2018

Gage number:	TGM-628	Done by:	Donna Szczepanski
Gage description:	Scale	Part name:	151-01314
Gage type:	Scale	Characteristics:	weight
Study name:	Anova Gage R & R	Specifications:	LSL=2.4 Nominal=2.5 USL=2.6
Study date:	01/26/2018	Number of Distinct Categories:	116.6139

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 = 0.0003189476

%EV = 0.9568438

Reproducibility - Appraiser Variation (AV)

AV = 0.0002463516

%AV = 0.7390556

Repeatability & Reproducibility (R&R)

R&R = 0.0004030096

%R&R = 1.20903

Part Variation (PV)

PV = 0.03333067

%PV = 99.99269

Specification Spread (USL-LSL)/

(USL - LSL) / = 0.03333333

Appraiser	Replication	Part 1	Part 2	Part 3	Part 4	Part 5	Part 6	Part 7	Part 8	Part 9	Part 10
Donna	1	2.5679	2.568	2.5509	2.5709	2.5694	2.5403	2.5431	2.5705	2.5696	2.5382
Donna	2	2.568	2.5682	2.5511	2.5709	2.5683	2.5409	2.5431	2.5703	2.5696	2.5384
Donna	3	2.5671	2.5688	2.5511	2.5708	2.5691	2.5406	2.5436	2.5705	2.5696	2.5388
Taliesia	1	2.5671	2.5677	2.551	2.5708	2.569	2.5406	2.5434	2.5696	2.57	2.5385
Taliesia	2	2.5678	2.5682	2.5512	2.5711	2.569	2.5409	2.543	2.5705	2.5696	2.5385
Taliesia	3	2.5676	2.5685	2.5513	2.5712	2.5695	2.5403	2.5433	2.5707	2.57	2.5387
Rob	1	2.568	2.5687	2.5516	2.5703	2.5691	2.5408	2.5438	2.5709	2.5696	2.5387
Rob	2	2.5685	2.5689	2.5519	2.5716	2.5696	2.5416	2.5436	2.5708	2.5701	2.539
Rob	3	2.5681	2.5691	2.5514	2.5715	2.5695	2.5415	2.5439	2.5705	2.5703	2.539

Gage R&R

R&R Study Results Using Specifications

2/6/2018

Gage number:	TGM-537	Done by:	QA_Admin
Gage description:	Digital Indicator	Part name:	T50R0
Gage type:	Indicator	Characteristics:	Head Height
Study name:	ANOVA Scale R&R	Specifications:	LSL=5.3 Nominal=5.9 USL=6.5
Study date:	01/15/2018	Number of Distinct Categories:	80.32957

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 = 0.003347164 %EV = 1.673582

Reproducibility - Appraiser Variation (AV)
 AV = 0.001056678 %AV = 0.528339

Repeatability & Reproducibility (R&R)
 R&R = 0.003509997 %R&R = 1.754999

Part Variation (PV)
 PV = 0.1999992 %PV = 99.9846

Specification Spread (USL-LSL)/
 (USL - LSL) = 0.2

Appraiser	Replication	Part 1	Part 2	Part 3	Part 4	Part 5	Part 6	Part 7	Part 8	Part 9	Part 10
Talecia	1	5.74	5.74	5.72	5.75	5.72	5.77	5.74	5.75	5.74	5.72
Talecia	2	5.73	5.74	5.73	5.75	5.72	5.78	5.75	5.75	5.74	5.72
Talecia	3	5.74	5.74	5.73	5.75	5.72	5.77	5.75	5.76	5.75	5.72
Felicia	1	5.73	5.74	5.72	5.74	5.72	5.77	5.74	5.75	5.74	5.72
Felicia	2	5.74	5.74	5.73	5.74	5.73	5.78	5.74	5.75	5.74	5.73
Felicia	3	5.73	5.74	5.72	5.74	5.72	5.77	5.74	5.75	5.74	5.72
Joyce	1	5.74	5.74	5.72	5.74	5.72	5.77	5.74	5.76	5.74	5.73
Joyce	2	5.73	5.74	5.73	5.74	5.72	5.78	5.74	5.75	5.74	5.72
Joyce	3	5.73	5.74	5.72	5.74	5.72	5.77	5.74	5.75	5.75	5.72

Gage R&R

R&R Study Results Using Specifications

2/6/2018

Gage number:	TGM-760	Done by:	QA_Admin
Gage description:	Micro-Vu	Part name:	T50R0
Gage type:	Micro-Vu	Characteristics:	Length
Study name:	Anova Gage R&R	Specifications:	LSL=196 Nominal=202 USL=208
Study date:	01/12/2018	Number of Distinct Categories:	1633.901

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 = 0.000959223 %EV = 0.04979611

Reproducibility - Appraiser Variation (AV)
 AV = 0.0014096 %AV = 0.07048

Repeatability & Reproducibility (R&R)
 R&R = 0.00172593 %R&R = 0.08629649

Part Variation (PV)
 PV = 1.999999 %PV = 99.99999

Specification Spread (USL-LSL)/
 (USL - LSL) = 2

Appraiser	Replication	Part 1	Part 2	Part 3	Part 4	Part 5	Part 6	Part 7	Part 8	Part 9	Part 10
Barry	1	197.9655	197.9134	197.8126	197.826	197.7084	197.8157	198.0724	197.6714	197.9272	198.0251
Barry	2	197.9657	197.911	197.8131	197.8262	197.7127	197.8153	198.0736	197.6719	197.9272	198.0253
Barry	3	197.9667	197.9111	197.813	197.8269	197.7125	197.8127	198.0763	197.6731	197.9272	198.0271
Donna	1	197.967	197.9108	197.814	197.8282	197.7128	197.812	198.0751	197.6749	197.9277	198.027
Donna	2	197.9677	197.9099	197.8139	197.8273	197.7106	197.812	198.075	197.6779	197.9287	198.0277
Donna	3	197.9681	197.9096	197.8153	197.8279	197.7139	197.8135	198.0746	197.6779	197.9293	198.0279
Taleala	1	197.968	197.9102	197.8166	197.8304	197.7147	197.815	198.0754	197.6768	197.9296	198.028
Taleala	2	197.9682	197.9109	197.8174	197.8319	197.7153	197.8154	198.0754	197.6809	197.9286	198.0289
Taleala	3	197.9692	197.9101	197.818	197.8307	197.7154	197.8145	198.076	197.6801	197.9315	198.0289

Gage R&R

R&R Study Results Using Specifications

1/31/2018

Gage number:	TGM-966	Done by:	Donna Szczepanski
Gage description:	Global Performance 7-10-7	Part name:	133-01339
Gage type:	Coordinate Measuring Machine	Characteristics:	
Study name:	Anova Gage R & R	Specifications:	LSL=193.77 Nominal=194.47 USL=195.17
Study date:	01/26/2018	Number of Distinct Categories:	15.66439

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 = 0.01851334 %EV = 7.934321

Reproducibility - Appraiser Variation (AV)
 AV = 0.009738355 %AV = 4.173599

Repeatability & Reproducibility (R&R)
 R&R = 0.02091839 %R&R = 8.965065

Part Variation (PV)
 PV = 0.2323928 %PV = 99.59733

Specification Spread (USL-LSL)/
 (USL - LSL) = 0.2333323

Appraiser	Replication	Part 1	Part 2	Part 3	Part 4	Part 5	Part 6	Part 7	Part 8	Part 9	Part 10
Tom	1	184.2618	184.3054	184.2134	184.3446	184.2817	184.4099	184.1092	184.3943	184.5566	184.5174
Tom	2	184.311	184.2812	184.2398	184.3407	184.2711	184.4173	184.092	184.3912	184.5438	184.5198
Tom	3	184.2663	184.2774	184.2218	184.3436	184.2964	184.4163	184.1053	184.4084	184.5551	184.5127
Dave	1	184.2344	184.305	184.1868	184.3155	184.2766	184.3772	184.0993	184.4225	184.5465	184.5188
Dave	2	184.2632	184.2456	184.2533	184.3096	184.2957	184.4001	184.0926	184.3564	184.5102	184.4883
Dave	3	184.2346	184.2579	184.2209	184.2919	184.2628	184.3929	184.1042	184.3468	184.5107	184.5146
Rob	1	184.2706	184.2944	184.2427	184.3427	184.2989	184.3777	184.1079	184.3828	184.5559	184.506
Rob	2	184.3106	184.3253	184.188	184.3414	184.2729	184.3944	184.0905	184.392	184.5135	184.5014
Rob	3	184.2378	184.3008	184.2495	184.3303	184.273	184.3649	184.0979	184.351	184.5271	184.4758

Gage R&R

R&R Study Results Using Specifications

2/1/2018

Gage number:	TGM-850	Done by:	Donna Szczepanski
Gage description:	Tensile Tester	Part name:	T120R
Gage type:	Tensile Tester	Characteristics:	Tensile Strength
Study name:	Anova Gage R & R	Specifications:	LSL=120 Nominal=158 USL=196
Study date:	10/17/2017	Number of Distinct Categories:	35.33951

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 = 0.1754119	%EV = 1.392725
Reproducibility - Appraiser Variation (AV) AV = 0.4731552	%AV = 3.735514
Repeatability & Reproducibility (R&R) R&R = 0.5049815	%R&R = 3.966597
Part Variation (PV) PV = 12.6556	%PV = 99.9205

Specification Spread (USL-LSL)/
(USL - LSL) = 12.66667

Appraiser	Replication	Part 1	Part 2	Part 3	Part 4	Part 5	Part 6	Part 7	Part 8	Part 9	Part 10
Joyce	1	150.45	155.85	154.74	153.07	157.55	155.25	162.5	159.98	159.25	162.5
Joyce	2	150.65	157	154.87	153.07	157.62	155.32	162.52	160.1	159.31	162.52
Joyce	3	151.2	157.07	155.11	153.28	157.59	155.33	162.53	160.31	159.38	162.53
Taleala	1	151.51	157.11	155.55	153.49	157.7	155.43	162.56	160.5	159.49	162.56
Taleala	2	151.85	157.13	155.96	153.8	157.75	155.55	162.84	160.55	159.77	162.84
Taleala	3	151.91	157.25	156.13	154.17	157.85	155.84	162.92	160.73	159.77	162.92
Robin	1	152.44	157.34	156.23	154.21	157.99	158.91	163.06	160.74	159.8	163.06
Robin	2	152.65	157.4	156.73	154.51	158.08	159.16	163.66	160.79	159.84	162.66
Robin	3	152.67	157.45	156.78	154.64	158.14	159.25	163.67	161.2	159.95	162.67

Gage R&R

R&R Study Results Using Specifications

2/6/2018

Gage number:	TGM-918	Done by:	Donna Szczepanski
Gage description:	Calliper	Part name:	151-01314
Gage type:	Calliper	Characteristics:	Width
Study name:	Anova Gage R & R	Specifications:	LSL=22.15 Noninal=23.15 USL=24.15
Study date:	01/25/2018	Number of Distinct Categories:	76.27592

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 = 0.006103516 %EV = 1.831055

Reproducibility - Appraiser Variation (AV)
 AV = 0.0008380896 %AV = 0.2514269

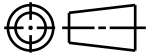
Repeatability & Reproducibility (R&R)
 R&R = 0.006160787 %R&R = 1.848236

Part Variation (PV)
 PV = 0.3332764 %PV = 99.98293

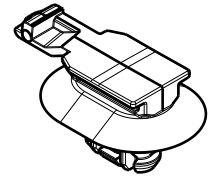
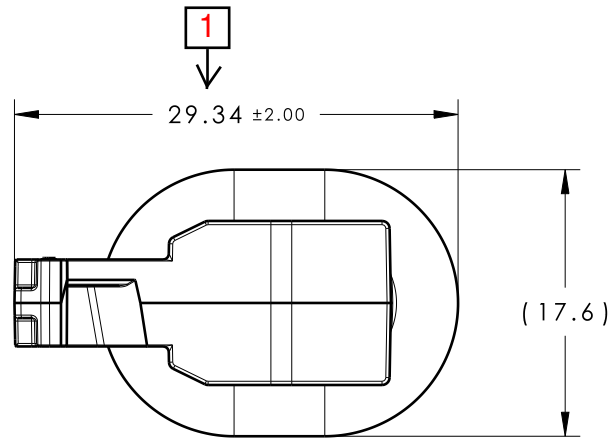
Specification Spread (USL-LSL)/
 (USL - LSL) = 0.3333333

Appraiser	Replication	Part 1	Part 2	Part 3	Part 4	Part 5	Part 6	Part 7	Part 8	Part 9	Part 10
Donna	1	23.15	23.16	23.23	23.22	23.21	23.22	23.19	23.21	23.19	23.19
Donna	2	23.14	23.17	23.22	23.21	23.19	23.23	23.18	23.22	23.18	23.18
Donna	3	23.15	23.17	23.22	23.22	23.2	23.23	23.18	23.22	23.18	23.18
Taleala	1	23.15	23.17	23.21	23.21	23.21	23.22	23.17	23.22	23.18	23.18
Taleala	2	23.15	23.18	23.2	23.22	23.2	23.23	23.19	23.21	23.18	23.18
Taleala	3	23.14	23.17	23.21	23.21	23.2	23.22	23.19	23.21	23.19	23.18
Rob	1	23.15	23.17	23.22	23.22	23.21	23.23	23.19	23.21	23.19	23.18
Rob	2	23.16	23.18	23.21	23.22	23.2	23.23	23.19	23.2	23.18	23.18
Rob	3	23.16	23.17	23.22	23.22	23.2	23.21	23.17	23.21	23.19	23.18

CATIA V5



Revision Level			Revision Record	Changed	Date	Approved	Date
Drawing	State	Part					
03.1	Design Release	B	SEE ECN# 013314	CJR	12/7/15	KVH	12/7/15



ISOMETRIC VIEW
SCALE 1:1

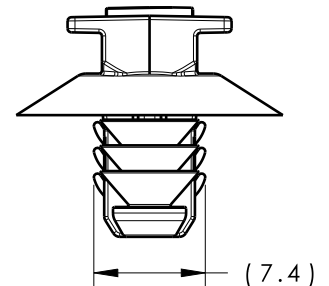
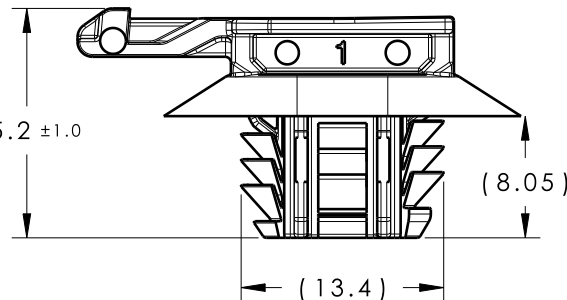
REFERENCE:

PERFORMANCE REQUIREMENTS AT DRY AS MOLDED:

1. FIR TREE PUSH IN FORCE: 45 NEWTONS (10 LBS) MAX IN EACH APPLICABLE OVAL HOLE SIZE AND A PLATE THICKNESS OF 1.8mm.
2. FIR TREE PULL OUT FORCE: 110 NEWTONS (25 LBS) MIN IN EACH APPLICABLE OVAL HOLE SIZE AND A PLATE THICKNESS OF 1.8mm.
3. SHEET METAL THICKNESS RANGE: 0.60mm - 3.00mm
4. APPLICABLE OVAL HOLE SIZES:
 - A. 6.2 X 12.2mm
 - B. 6.5 X 12.5mm
 - C. 6.5 X 13.0mm
 - D. 7.0 X 12.0mm
5. DESIGNED TO MEET PUSH ON/PULL OFF FORCES OF SAE/USCAR-2
6. FITS INTO USCAR CLIP SLOT SPECIFICATION EWCAP-005-11 (NOT A TEST SPEC.)
7. MAXIMUM PERCENT REGRIND PERMISSIBLE: 25%

2

15.2 ±1.0



Material PA66HIRHS COLOR: BLACK 	Units millimeters Tolerance defined on each dimension	The copyright of this drawing is reserved by HellermannTyton. It is issued on condition that it is not reproduced, copied or disclosed to a third party, either wholly or in part, without the consent of HellermannTyton.	Drawn	SJA	1/7/14	Article/Type-No	CCOVAL6	Scale	2:1
			Approved	KVH	1/7/14	Title	SHORT OVAL FIR TREE WITH EWCAP-005-11	Project Number	14-0402
			HellermannTyton North America Email: corp@htamericas.com Web: www.hellermann.tyton.com			Drawing-No	PRODUCTION : Phase	Format	AH
						14-0402-001-CSU		Sheet	1/1