HellermannTyton

HellermannTyton GmbH internal remarks: PB-No.: **111978**

Part Describtion: BCSFTOVAL2 GPN 160407

Part Submission Warrant

Part Name **BCSFTOVAL2** Cust. Part Number **151-04237**

Shown on Drawing No. **16-0407-011-CSU** Org. Part Number **13303939**

Engineering Change Level **01.2** Dated **25.01.2017**

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

Safety and/or Government Regulation ☐ Yes ☑ No Purchase Order No. **13303939** Weight (kg) **0,0326**

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 Kablo Donanimlari **(30471)**
Customer Name/Division

Nadiye BARUTÇU
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: **1361889127**

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 **i.A.** W. Lohse Date 21-Feb-25

Print Name **i.A. N. Lohse** Phone No. +49 (0) 4122 701 5726 Fax No. +49 4122 701 241

Title **Quality Assistant** E-mail nescha.lohse@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.: **111978**

Production Part Approval
Dimensional Test Results

ORGANIZATION:	**HellermannTyton GmbH**	PART NUMBER:	**151-04237**
SUPPLIER/VENDOR CODE:	**DUNS: 315430892**	PART NAME:	**BCSFTOVAL2**
INSPECTION FACILITY:	**QS-Laboratory**	DESIGN RECORD CHANGE LEVEL:	01.2 25.01.2017
		ENGINEERING CHANGE DOCUMENTS:	
		NAME of LABORATORY:	

ITEM	DIMENSION / SPECIFCATION	SPECIFICATION / LIMITS	TEST DATE	QTY. TESTED	SUPPLIER TEST RESULTS (DATA)			OK	NOT OK
					mean	min	max		
1	1,5	± 0,5			1,5	1,47	1,5	✓	
2	38,7	± 2,0			39,1	39,1	39,1	✓	
3	11,6	± 1,0			11,7	11,7	11,7	✓	
	(13,4)				only for information				
	(10,10)				only for information				
	(7,37)				only for information				

Blanket statements of conformance are unacceptable for any test results.

This letter is done automatically and is valid without signature.

CREATOR	TITLE	DATE
i.A. N. Lohse	Quality Assistant	21-Feb-25

Production Part Approval, Performance Test Results

HellermannTyton

Internal PB-No.: **111978**

Production Part Approval
Performance Test Results

ORGANIZATION:	**HellermannTyton GmbH**	PART NUMBER:	**151-04237**
SUPPLIER/VENDOR CODE:	**DUNS: 315430892**	PART NAME:	**BCSFTOVAL2**
MATERIAL SUPPLIER:		DESIGN RECORD CHANGE LEVEL:	01.2 25.01.2017
*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
								☐	☐
4	**Performance requirements at**							☑	☐
	dry as molded:							☐	☐
	1. Fir tree push in force: ref.							☐	☐
	10 lbs max in each applicable							☐	☐
	oval hole size and a plate							☐	☐
	thickness of 1,8 mm							☐	☐
	2. Fir tree pull out force: ref.							☐	☐
	25 lbs min in each applicable							☐	☐
	oval hole size and a plate							☐	☐
	thickness of 1,8 mm							☐	☐
	3. Sheet metal thickness range	**0,6 - 2,5 mm**						☑	☐
	4. Applicable oval hole sizes:							☐	☐
	A. 6,2 x 12,2 mm							☐	☐
		min. 44,48 N			**34,46 N**	**31,10 N**	**39,10 N**	☑	☐
		max. 111,20 N			**328,93 N**	**309,00 N**	**354,20 N**	☑	☐
	B. 6,5 x 12,5 mm							☐	☐
		min. 44,48 N			**25,47 N**	**24,10 N**	**27,10 N**	☑	☐
		max. 111,20 N			**308,61 N**	**299,70 N**	**2317,60 N**	☑	☐
	C. 6,5 x 13,0 mm							☐	☐
		min. 44,48 N			**24,53 N**	**21,10 N**	**27,50 N**	☑	☐
		max. 111,20 N			**307,52 N**	**299,20 N**	**317,50 N**	☑	☐
	D. 7,0 x 12,0 mm							☐	☐
		min. 44,48 N			**18,04 N**	**15,10 N**	**20,80 N**	☑	☐
		max. 111,20 N			**291,63 N**	**245,70 N**	**299,50 N**	☑	☐
								☐	☐
								☐	☐
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								☐	☐

Blanket statements of conformance are unacceptable for any test results.

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CREATOR	TITLE	DATE
i.A. N. Lohse	Quality Assistant	21-Feb-25

Production Part Approval, Material Test Results

HellermannTyton

Internal PB-No.: **111978**

Production Part Approval
Material Test Results

ORGANIZATION:		**HellermannTyton GmbH**		PART NUMBER:	**151-04237**		
SUPPLIER/VENDOR CODE:		**DUNS: 315430892**		PART NAME:	**BCSFTOVAL2**		
MATERIAL SUPPLIER:				DESIGN RECORD CHANGE LEVEL:	01.2	25.01.2017	
*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
						☐	☐
5	**PA66HIRHS**				**Material is PA66HIRHS**	☑	☐
	Color: natural				**Color of material is natural**	☑	☐
						☐	☐
						☐	☐
						☐	☐
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Blanket statements of conformance are unacceptable for any test results.

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CREATOR	**TITLE**	**DATE**
i.A. N. Lohse	Quality Assistant	21-Feb-25

Abnahmeprüfzeugnis/CoA

nach EN 10204-3.1 / according to EN 10204-3.1

AKRO-PLASTIC GmbH
Member of the Feddersen Group

PROBENIDENTIFIKATION / DESCRIPTION OF PRODUCT:

Nummer / Item number: 06593-S

Bezeichnung / Material: AKROMID A3 1 S3 natur (2847)

PRODUKTIONSDATEN / PRODUCTION DATA:

Charge / LOT: FS02 161434

PRÜFERGEBNISSE / TESTRESULTS:

Prüfung Testing	Norm Norm	Prüfbedingung Testing condition	Spezifikation Target Value	Istwert Actual Value	Einheit Unit
Water content Restfeuchte	DIN EN ISO 15512 Verf. B2		<= 0,15	0,09	%
MVR MVR	DIN EN ISO 1133-1	275/5	>= 35,0	54,1	cm^3/10min
Tensile modulus Zug-E-Modul	DIN EN ISO 527-2/1A	1 mm/min / RT	2500 +/- 300	2670	MPa
Tensile stress at yield Streckspannung	DIN EN ISO 527-2/1A	50 mm/min / RT	68,0 +/- 6,0	65,8	MPa
Tensile strain at break Bruchdehnung	DIN EN ISO 527-2/1A	50 mm/min / RT	>= 15,0	48,7	%
Charpy notched impact strength	DIN EN ISO 179-1/1eA	23°C	>= 8,0	19,7	kJ/m^2

Freigabedatum / date of release: 13.11.2024

Zusatzvermerke / remarks:

Niederzissen, 15.11.2024 Gez. Abnahmebeauftragte / Inspection representative: i.V. *Ute Bürger*

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HellermannTyton

FEUILLE DE SYNTHÈSE
AMDEC

AMDEC Process ☑

Références : Toutes **Date :** 16/01/20224

Objectifs de l'étude

Analyse des risques pour les process de HellermannTyton Morocco selon le flow chart : Réception MP et composants, Déshumédification (Centrale Matière), Injection, assemblage, Vissage, Emballage et expédition

Causes de l'étude :

Nouveau Projet	☑	Modification process	☐	Réclamation Client	☐
Modification produit	☐			Suivi Périodique	☐

Limites de l'étude :

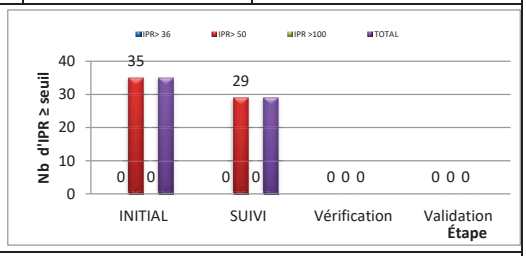
Site HT Manufacturing

PARTICIPANTS : Permanents	**Département :**	**Temporaire :**	**Département :**
Hasnaa KHALIDI	Qualité		
Mohamed ELJILALI	Production		
Mohamed ELJILALI	Logistique		
Bader BOUDHANE	Ingénierie		
Othmane Zekri	Maintenance		

ANIMATEUR : B. BOUDHANE **Département : Ingénierie**

P	**Semaine**	S3	S9	S18	S30	S36	S39	S42	S48	S51	S02	S06	S09	S12	S20	S22	S23	S34	S42	S47	S02	S06	S13	S18	S23	S30	S35	S43	S50	S03
L	**Prévisionnel**																													X
A	**Réalisé**	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
N	**Légende**	Réunion : R							Suivi : S							Vérification							Validation								
		étape 1 (IPR initial)							étapes 2 et 3 (IPR final)							étape 4 (Actions impl.)							étape 5 (Actions confirmées)								

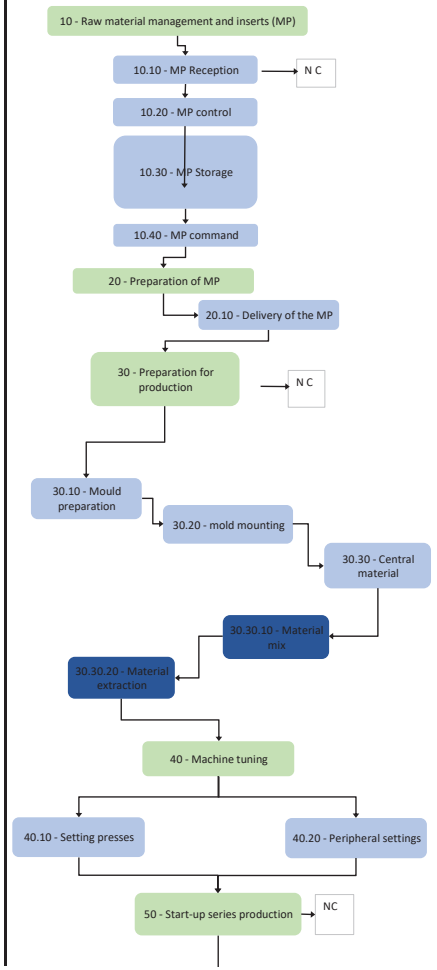
			INITIAL	**SUIVI**	**Vérification**	**Validation**
B		**DATE :**	17-janv	06-févr	16-juin	22-déc
I		**TOTAL**	35	29	0	0
L	Nb d'IPR	G=9 et 10 IPR> 36	0	0	0	0
A		5 ≤ G ≤ 8 IPR> 50	35	29	0	0
N		1 ≤ G ≤ 4 IPR >100	0	0	0	0



HellermannTyton

Control plan

DESIGNATION OF THE PART		BCSFTOVAL 2	Date of issue
REFERENCE		151-04237/ 70521520	10/01/2024
Done by : F. LBAKKALI	Control plan N° :	Phase: Prototype / Pré-Series / Series	Indice: 1 — Drawing N°: 16-0407-011-CSU — Customer — Revision date: 10/01/2024



Synoptic	N° Flux	Step	Operations	Process parameters or product characteristics	Means of production or control	Special Feature	Specifications/ Tolerances	Evidence of control	Reference document	process tracking	Sample: Size and frequency of control — 1 - operateurs	2 - team leaders / Quality controllers	3 - Quality	POKA YOKE	Maintenance	Rules of recation	Archiving
	10	10.10	Raw material reception (MP)	Visual identification of the product + pallet number	Visual	/	/	Referred BL	BL	Acceptance procedure HTM-SUP-INT-010	1 by reception				N/A	Non-Compliant Processing HTM-SUP-INT-049	HTM-DOC-FOR-002
		10.20	MP control	Presence of the CC	Document control (CC)	Viscosity (R) Regulation on combustibility next products Resistivity according to material	Viscosity (R) Regulation on combustibility next products Resistivity according to material	Validation du CC accepted label	CC	MP Tracking Table HTM QUA-FOR-090			1 per batch		N/A	Non-Compliant Processing HTM-SUP-INT-049	HTM-DOC-FOR-002
		10.30	MP Storage	Location no.	Visual	/	/	SAP	SAP	Storage procedure HTM-SUP-INT-012 HTM-SUP-INT-013	whole stock 1 time per week				N/A	Non-Compliant Processing HTM-SUP-INT-049	HTM-DOC-FOR-002
		10.40	MP command	Quantity need MP	SAP	/	/	SAP	SAP		Visual				N/A	Non-Compliant Processing HTM-SUP-INT-049	HTM-DOC-FOR-002
	20	20.10	Preparation and delivery of PD	presence label accepted SAP	Visual	/	/	MP delivered in accordance with BP	Bon of Preparation	Feed flow HTM-SUP-PRO-007		MP used 1 time per shift			N/A	Non-Compliant Processing HTM-SUP-INT-049	HTM-DOC-FOR-002
	30	30.10	Mould preparation	Mold without version Version mold	Manual	/	/	Historical	Tracking mold iterventions	Mold preparation procedure HTM-ENG-PRO-005		Audit of green cards: 1 per month			Preventive maintenance on mussels	Non-Compliant Processing HTM-SUP-INT-049	HTM-DOC-FOR-002
		30.20	Mold mounting	Mount settings	Visual + Manufacturing Control Range HTM-QUA-INT-005	/	/	Check-list of Starting HTM-PRD-FOR-052 validée	Mold folder (mold configuration sheet) + start-up checklist	Mold preparation procedure HTM-ENG-PRO-006	Every production start					Non-Compliant Processing HTM-PRD-INT-007	HTM-DOC-FOR-002
		30.30	Central material preparation	Product References and/or UNS Code	Visual	/	/	Check-list of Starting HTM-PRD-FOR-052 validée	Check-list of start-up	Mold preparation procedure HTM-ENG-PRO-007	Every production start	Job Audit HTM-PRD-FOR-044: : frequencies according to the grid	Job audit HTM-PRD-FOR-044: 1 per week		Curative maintenance	Non-Compliant Processing HTM-PRD-INT-007	HTM-DOC-FOR-002
		30.30.10	Material mix	Product References and/or UNS Code	Gamme de contrôle fabrication HTM-QUA-INT-005	/	/	Check-list of Starting HTM-PRD-FOR-052 validée	Control range HTM-QUA-INT-005	Mold preparation procedure HTM-ENG-PRO-008	Every production start			HTM-ENG-FOR 183 List of Poka Yoke	Maintenance curative	Non-Compliant Processing HTM-PRD-INT-007	HTM-DOC-FOR-002
		30.30.20	Material extraction	Product References and/or UNS Code	Display of T°C	T° mini and T° maxi	T° mini 75 and T° maxi 85	Check-list of Starting HTM-PRD-FOR-052 validée HTM-PRD-FOR-275	List of PMs to work or not with T° --> see doc displayed --> codified?	Mold preparation procedure HTM-ENG-PRO-009	Every production start				Maintenance 1st level	Non-Compliant Processing HTM-PRD-INT-007	HTM-DOC-FOR-002
	40	40.10	Setting presses	Setting parameters --> tps hold, tps cooling, cycle tps, vit injection, pressure maintaining	Adjustment plug HTM-PRD-FOR-016	RJG	/	Check-list of Starting HTM-PRD-FOR-052 validée	Adjustment sheet HTM-PRD-FOR-016	HTM-PRD-INT-003 Start-up series production		Job Audit HTM-PRD-FOR-044: : frequencies according to the grid	HTM-PRD-FOR-044 job audit: 1 per week	HTM-ENG-FOR 183 List of Poka Yoke	Maintenance 1st level	Non-Compliant Processing Managing degraded modes	HTM-DOC-FOR-002
		40.20	Peripheral settings	Preheater, hot channel: T°C the rest: N/A	Adjustment plug HTM-PRD-FOR-016	Maximum tolerances of T°C	Maximum tolerances of T°C	Check-list of Starting HTM-PRD-FOR-052 validée	Adjustment sheet HTM-PRD-FOR-016	HTM-PRD-INT-003 Start-up series production				HTM-ENG-FOR 183 List of Poka Yoke	Maintenance 1st level	Non-Compliant Processing Managing degraded modes	HTM-DOC-FOR-002
	50	-	Start-up series production	1st feed	Visual	Lack of material Burr	no Lack of Material no burrs on functional parts	1st feed	HTM-QUA-INT-006 Défauthèque HTM-QUA-INT-005 Control range	HTM-PRD-INT-003 Start-up series production		Sampling and validation 1st molded	Counter-validation 1st mold	HTM-ENG-FOR 183 List of Poka Yoke	Maintenance 1st level	Traitement de Non conforme HTM-PRD-INT-007	HTM-DOC-FOR-002
	60	-	Production	Adjustment plug settings RJG	Visual Machine monitoring settings	/	/	Validated palette (Signature Team Leader)	Control card by attribute filled according to the part	HTM-PRD-INT-003 Start-up series production		According to rated control frequencies + each end of pallet	According to rated control frequencies	HTM-ENG-FOR 183 List of Poka Yoke	Maintenance 1st level	Non-Compliant Processing HTM-PRD-INT-007	HTM-DOC-FOR-002

HellermannTyton	Control plan					DESIGNATION OF THE PART			BCSFTOVAL 2				Date of issue			
						REFERENCE			151-04237/ 70521520				10/01/2024			
Done by : F. LBAKKALI	Control plan N° :		Phase				Indice	1	Drawing N°	16-0407-011-CSU			Revision date			
			Prototype	Pré-Series	Series		Customer						10/01/2024			

Synoptic	N° Flux	Step	Operations	Process parameters or product characteristics	Means of production or control	Special Feature	Specifications/ Tolerances	Evidence of control	Reference document	process tracking	Sample: Size and frequency of control			POKA YOKE	Maintenance	Rules of recation	Archiving
											1 - operateurs	2 - team leaders / Quality controllers	3 - Quality				
60 - Production → NC	80	-	Product control	1-Note the Number of the plastic 2-Record the temperature oven 3-Raise the parameters injection 4- no lack of material 5- no Burr 6-No frost, bubble or flow trace, surface homogeneous, deformation of the room, no task on the surface of the room 7- weight of a feed: min 33,29g, max 31,01g	Packaged lot of matter Temperature indicated on the oven Adjustment sheet Visual Balance	CC	No lack of material See defect Min weight: 0,969g Max weight: 1,040 g	Check-list of Starting HTM-PRD-FOR-052 validée	Product Folder	Product Audit Management HTM-QUA-INT-005 Rapport de Capabilité annuel du processus	Every 8h	Each team DMS & DMF Each production batch	Each team Annual product audit	HTM-ENG-FOR 183 List of Poka Yoke	According to frequency of calibrations defined	Non-Compliant Processing HTM-PRD-INT-007	HTM-DOC-FOR-002
80 - Product control → NC	90	-	End of production	Last feed	Visual	Lack of material	no Lack of Material	Last feed + Validated palette (Signature Team Leader)	HTM-PRD-INT-003 OK Startup	HTM-PRD-INT-003		Sampling and validation last molded + last pallet	Last molded counter-validation	HTM-ENG-FOR 183 List of Poka Yoke	Maintenance 1st level	Non-Compliant Processing HTM-PRD-INT-007	HTM-DOC-FOR-002
90 - End of production → NC	100	100.10	Transfer	Pallets	Visual	/	/	Palette validée (Signature Team Leader)	Fiche de suivi	Procédure de stockage	100% des palettes				/	Non-Compliant Processing HTM-PRD-INT-007	/
140 - Manual internal packaging → NC	140	-	Manual internal packaging	Product References and/or UNS Code + scale	Packaging range	/	/	Visual	/	Assemble and Package					According to frequency of calibrations defined	Non-Compliant Processing HTM-PRD-INT-007	HTM-DOC-FOR-002
100 - Production transfer	180	-	Storage finished products (PF)	Empty slot	Visual	/	/	glued label	SAP	Receive and Put in Stock	100% of products				/	Non-Compliant Processing HTM-PRD-INT-007	HTM-DOC-FOR-002
180 - Storage of finished products (PF) → NC	190	-	EDI order preparation	Picking list	SAP	/	/	SAP	Expedition HTM-SUP-INT-008	Prepare an order	100% of UM and UC100% of UM and UC				Preventive maintenance on trolleys	Non-Compliant Processing HTM-PRD-INT-007 Gestion des modes dégradés	HTM-DOC-FOR-002
190 - Order preparation EDI → NC	210	-	EDI Shipping	Shipping Notice (AVIEXP)	SAP	/	/	verification quantity of loaded Ums	Expedition HTM-SUP-INT-009	EDI Shipment Processing					/	Non-Compliant Processing HTM-PRD-INT-007 Managing degraded modes	HTM-DOC-FOR-002
210.10 - Flow shipping EDI → NC																	

Legend:

NC: Treatment of non-compliant

HellermannTyton	CAPABILITE /CAPABILITY		N° RC

OBJET / OBJECT : CAPABILITE REP / CAPABILITY REP :		PPAP	
Moyen utilisé / Means used :	Balance	Produit/Product :	151-04237
Date de contrôle/Control date :	27/11/2023	Désign./Part name :	BCSFTOVAL 2

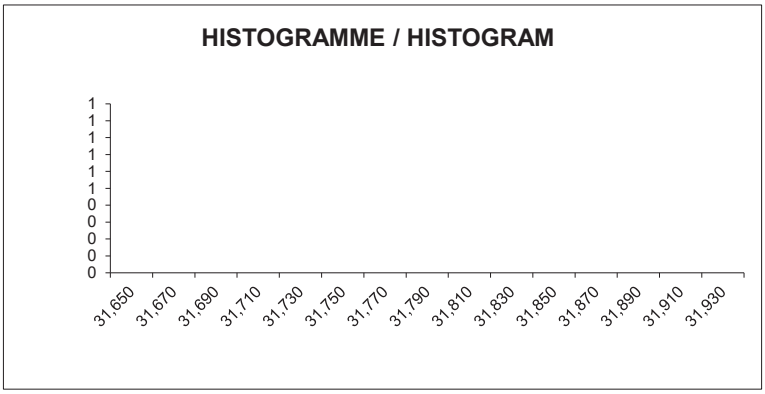
N° Empreinte/N° of Cavity :
Client/Customer : Divers (pièce standard)

Nominale / Nom. :	32,640		
Tol.Sup / USL :	0,653	33,29	
Tol.Inf / LSL :	-1,632	31,01	IT : 2,2848

n°	Values	n°	Values
1	31,81	61	31,8
2	31,82	62	31,81
3	31,79	63	31,88
4	31,8	64	31,81
5	31,81	65	31,82
6	31,88	66	31,79
7	31,81	67	31,8
8	31,82	68	31,81
9	31,79	69	31,88
10	31,8	70	31,81
11	31,81	71	31,82
12	31,88	72	31,79
13	31,81	73	31,8
14	31,82	74	31,81
15	31,79	75	31,88
16	31,8	76	31,81
17	31,81	77	31,82
18	31,88	78	31,79
19	31,81	79	31,8
20	31,82	80	31,81
21	31,79	81	31,88
22	31,8	82	31,81
23	31,81	83	31,82
24	31,88	84	31,79
25	31,81	85	31,8
26	31,82	86	31,81
27	31,79	87	31,88
28	31,8	88	31,81
29	31,81	89	31,82
30	31,88	90	31,79
31	31,81	91	31,8
32	31,82	92	31,81
33	31,79	93	31,88
34	31,8	94	31,81
35	31,81	95	31,82
36	31,88	96	31,79
37	31,81	97	31,8
38	31,82	98	31,81
39	31,79	99	31,82
40	31,8	100	31,79
41	31,81	101	31,8
42	31,88	102	31,81
43	31,81	103	31,88
44	31,82	104	31,81
45	31,79	105	31,82
46	31,8	106	31,79
47	31,81	107	31,8
48	31,88	108	31,81
49	31,88	109	31,82
50	31,81	110	31,79
51	31,82	111	31,8
52	31,79	112	31,81
53	31,8	113	31,8
54	31,81	114	31,81
55	31,82	115	31,88
56	31,79	116	31,81
57	31,81	117	31,80
58	31,82	118	31,81
59	31,88	119	31,85
60	31,85	120	31,71

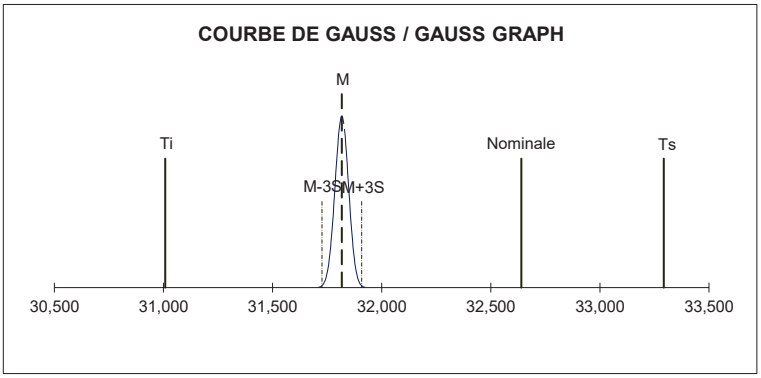
Nombre de chiffres après la virgule pour l'intervalle de classe / Number of numbers after the point for class interval : 2

HISTOGRAMME / HISTOGRAM



Intervalle de classe / Class interval :

COURBE DE GAUSS / GAUSS GRAPH



Moyenne/Average	31,817
Max	31,880
Min	31,710
Etendue/Spread	0,170
Ecart type	0,0303
Cm / Cp	12,56
Cmk / Cpk	8,89
% of samples out of tolerance	0,00%

Cp : Renseigne sur la dispersion / Dispersion informations Cp = IT / (6 x Ec.type)

Cpk : Renseigne sur le centrage / Centrage informations

Cpk = Minimum de [(Ts - Moyenne) / (3 x Ec.type) ; (Moyenne - Ti) / (3 x Ec.type)]

Commentaires :

Excellent

HellermannTyton	Production part approval MSA (R&R method)	HTM-LAB-FOR-163 Ind00

UNS	151-04237	Gage Name:	Appraiser A / Opérateur A
GPN	16-0407-011	Balance	OBD
Désignation :		Gage Number:	Appraiser B / Opérateur B
TAPE CLIP WITH SHORT OVAL FIR TREE		WF20007715	YBD
Standard part used for this R&R metho	Units	Temperature	Appraiser C / Opérateur C
98,40	g	21 ± 2°C	IJA

Characteristic Classification	Defination	Trials	Parts quantity	Appraisers	Date Performed
Dimension	0,01	3	10	3	21/03/23

ENTER LOWER TOLERANCE IN D9

APPRAISER TRIAL n°		PART 1	2	3	4	5	6	7	8	9	10	AVERAGE	
APPRAISER A	1	96,35	96,37	96,36	96,37	96,33	96,37	96,36	96,35	96,36	96,37		96,3590
	2	96,35	96,36	96,36	96,37	96,33	96,37	96,36	96,35	96,36	96,37		96,3580
	3	96,35	96,36	96,36	96,37	96,33	96,37	96,36	96,35	96,36	96,37		96,3580
	AVE	96,350	96,363	96,360	96,370	96,330	96,370	96,360	96,350	96,360	96,370	x_a=	96,3583
	R	0,000	0,010	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	r_a=	0,0010
APPRAISER B	1	96,35	96,36	96,36	96,37	96,33	96,37	96,36	96,35	96,36	96,37		96,3580
	2	96,35	96,36	96,36	96,37	96,33	96,37	96,36	96,35	96,36	96,37		96,3580
	3	96,35	96,36	96,36	96,37	96,33	96,37	96,36	96,35	96,36	96,37		96,3580
	AVE	96,350	96,360	96,360	96,370	96,330	96,370	96,360	96,350	96,360	96,370	x_b=	96,3580
	R	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	r_b=	0,0000
APPRAISER C	1	96,35	96,36	96,36	96,37	96,33	96,37	96,36	96,35	96,36	96,37		96,3580
	2	96,35	96,36	96,36	96,37	96,33	96,37	96,36	96,35	96,36	96,37		96,3580
	3	96,35	96,36	96,36	96,37	96,33	96,37	96,36	96,35	96,36	96,37		96,3580
	AVE	96,350	96,360	96,360	96,370	96,330	96,370	96,360	96,350	96,360	96,370	x_c=	96,3580
	R	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	r_c=	0,0000
PART AVERAGE												X=	96,3581
		96,3500	96,3611	96,3600	96,3700	96,3300	96,3700	96,3600	96,3500	96,3600	96,3700	R_p=	0,0400

2	$(r_a + r_b + r_c)$ / (# OF APPRAISERS) =	R=	0,0003
3	x_{DIFF} = (Max x - Min x) =	x_{DIFF}=	0,0003
4	* $UCL_R = R \times D_4$ = APPRAISER A OUT OF CONTROL	UCL_R=	0,0009

Measurement Unit Analysis

Repeatability - Equipment Variation (EV) / Répétabilité

EV = $R \times K_1$

Trials	K1
2	0,8862
3	0,5908

= 0,000 x 0,5908
= 0,000196933

Reproducibility - Appraiser Variation (AV) / Reproductibilité

AV = $\{(x_{DIFF} \times K_2)^2 - (EV^2/nr)\}^{1/2}$

= {(0,000 x 0,5231)^2 - (0,000 ^2/(10 x 3))}^1/2
= 0,000170619

n = parts r = trials

Appraisers	2	3
K_2	0,7071	0,5231

Repeatability & Reproducibility (GRR)

GRR = $\{(EV^2 + AV^2)\}^{1/2}$

= {(0,000^2 + 0,000^2)}^1/2
= 0,000260564

Parts	K_3
2	0,7071
3	0,5231
4	0,4467
5	0,403
6	0,3742
7	0,3534
8	0,3375
9	0,3249
10	0,3146

Part Variation (PV)

PV = $R_P \times K_3$

= 0,040 x 0,3146
= 0,012584

Total Variation (TV)

TV = sqrt(GRR²+PV²)

= sqrt(0,000260564222977294² + 0,012584000000002²)
= 0,012586697

% Tolerance (Tol)

% EV = 100 (EV/TV)
= 100(0,000/0,013)
= 1,56

% AV = 100 (AV/TV)
= 100(0,000/0,013)
= 1,36

% GRR = 100 (GRR/TV)
= 100(0,000/0,013)
= **2,07%**

Gage system O.K, moyen de mesure satisfaisant

% PV = 100 (PV/TV)
= 100(0,013/0,013)
= 99,98

ndc = 1.41(PV/GRR)
= 1.41(0,013/0,000)
= **68**

Gage discrimination acceptable

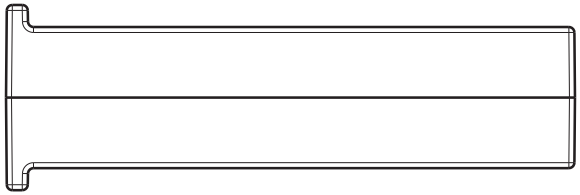
Notes:

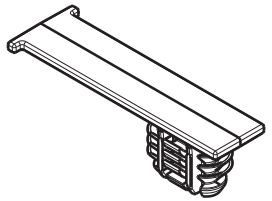
* D4 =3.27 for 2 trials and 2.58 for 3 trials. UCLR represents the limit of individual R's. Circle those that are beyond this limit. Identify the cause and correct. Repeat these readings using the same appraiser and unit as originally used or discard

For information on the theory and constants used in the form see MSA Reference Manual, Fourth edition.

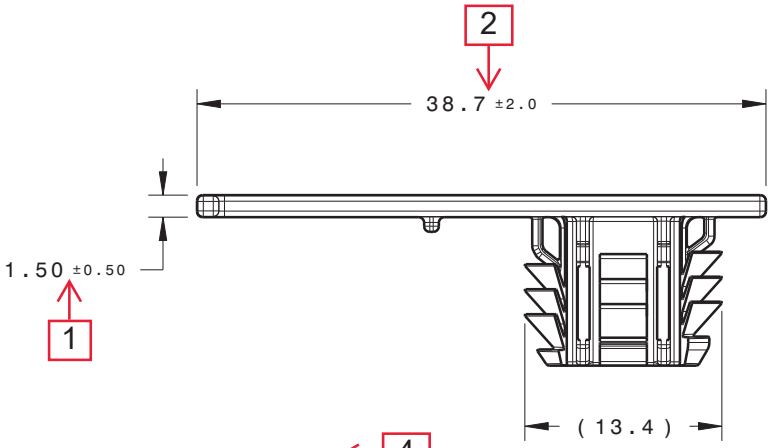
CATIA V5

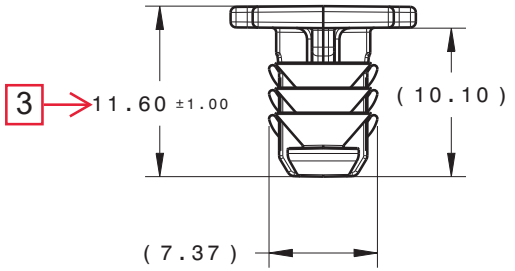
Revision Level			Revision Record	Changed	Date	Approved	Date
Drawing	State	Part					
01.2	Design Release	C	SEE ECN# 013690	CJR	1/25/17	EJH	1/25/17





ISOMETRIC VIEW
(SCALE 1:1)





REFERENCE:
PERFORMANCE REQUIREMENTS AT DRY AS MOLDED: 4

1. FIR TREE PUSH IN FORCE: REF. 10 LBS MAX IN EACH APPLICABLE OVAL HOLE SIZE AND A PLATE THICKNESS OF 1.8mm
2. FIR TREE PULL OUT FORCE: REF. 25 LBS MIN IN EACH APPLICABLE OVAL HOLE SIZE AND A PLATE THICKNESS OF 1.8mm
3. SHEET METAL THICKNESS RANGE: 0.60mm - 2.5mm
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

01.2

Material: PA66HIRHS COLOR: NATURAL (5) 01.2	Units: **millimeters** Tolerance defined on each dimension		Drawn: CJR 6/14/16 Approved: SJA 6/14/16 **HellermannTyton** **North America** **Email: corp@htamericas.com** **Web: www.hellermann.tyton.com**	Article/Type-No: BCSFTOVAL2/ 151-01884 Title: TAPE CLIP WITH SHORT OVAL FIR TREE Drawing-No: **16-0407-011-CSU** PRODUCTION : Phase	Scale: 2:1 Project Number: 16-0407 Format: AH Sheet: 1/1