HellermannTyton | HellermannTyton GmbH internal remarks: | PB-No.: **52923** | Part Describtion: T50ROSEC4A | GPN 99-0760

Part Submission Warrant

Part Name **Nursan Otomotive EOOD** | Cust. Part Number **2M5T-14197-LA** / **2M5T-14197-LA**

Shown on Drawing No. **2M5T-14197-HA** | Org. Part Number **150-76099**

Engineering Change Level **EV60-E-11341136-000** | Dated **18.03.2002**

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

Safety and/or Government Regulation ☐ Yes ☑ No | Purchase Order No. **150-76099** | Weight (kg) **0,0028**

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

Hyusein Tahir
Buyer/Buyer Code

Ford
Application

MATERIALS REPORTING

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

Submitted by IMDS or other customer format: **ID: 1323109 / 35**

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.** Stefan Fölster Date 15-Aug-18

Print Name **i.A. S. Fölster** / +49 (0) 4122 701 5722 Fax No. +49 4122 701 241

Title **Quality Assistant** E-mail S.Foelster@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.: **52923**

Production Part Approval
Dimensional Test Results

ORGANIZATION:	**HellermannTyton GmbH**	PART NUMBER:	**2M5T-14197-LA**
SUPPLIER/VENDOR CODE:	**DUNS: 315430892**	PART NAME:	**Nursan Otomotive EOOD**
INSPECTION FACILITY:	**QS Laboratory**	DESIGN RECORD CHANGE LEVEL:	11341136-000 18.03.2002
		ENGINEERING CHANGE DOCUMENTS:	

ITEM	DIMENSION / SPECIFICATION	SPECIFICATION / LIMITS	TEST DATE	QTY. TESTED	ORGANIZATION MEASUREMENT RESULTS (DATA)			OK	NOT OK
					mean	**min**	**max**		
1	**10**	**± 0,3**			**9,8**	**9,8**	**9,8**	☑	☐
2	**14**	**± 0,3**			**13,9**	**13,8**	**14,0**	☑	☐
3	**5**	**± 0,5**			**5,2**	**5,2**	**5,2**	☑	☐
4	**16**	**± 0,5**			**15,8**	**15,8**	**15,8**	☑	☐
5	**200**	**± 10**			**197,1**	**196,5**	**197,5**	☑	☐
6	**4,6**	**± 0,2**			**4,7**	**4,7**	**4,8**	☑	☐
7	**1,3**	**± 0,2**			**1,3**	**1,3**	**1,4**	☑	☐
								☐	☐
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								☐	☐

Blanket statements of conformance are acceptable for any test results.

SIGNATURE	TITLE	DATE
i.A. S. Fölster	Quality Assistant	15-Aug-18

Production Part Approval, Performance Test Results

HellermannTyton

Internal PB-No.: **52923**

Production Part Approval
Performance Test Results

ORGANIZATION:	**HellermannTyton GmbH**	PART NUMBER:	**2M5T-14197-LA**
SUPPLIER/VENDOR CODE:	**DUNS: 315430892**	PART NAME:	**Nursan Otomotive EOOD**
MATERIAL SUPPLIER:		DESIGN RECORD CHANGE LEVEL:	11341136-000 18.03.2002
*CUSTOMER SPECIFIED SUPPLIER/VENDOR CODE		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
						☐	☐
8	**serrated side**				**serrated side as shown on drawing**	☐	☐
	below	**n/a**			**below**	☑	☐
						☐	☐
9	**bundle**				**is suitable for bundles from**	☐	☐
	4 - 45 mm	**n/a**			**4 till 45 mm**	☑	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐
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						☐	☐

Blanket statements of conformance are unacceptable for any test results.

SIGNATURE	TITLE	DATE
i.A. S. Fölster *Stefan Fölster*	Quality Assistant	15-Aug-18

Production Part Approval, Material Test Results

HellermannTyton

Internal PB-No.: **52923**

Production Part Approval
Material Test Results

ORGANIZATION:	**HellermannTyton GmbH**	PART NUMBER:	**2M5T-14197-LA**
SUPPLIER/VENDOR CODE:	**DUNS: 315430892**	PART NAME:	**Nursan Otomotive EOOD**
MATERIAL SUPPLIER:		DESIGN RECORD CHANGE LEVEL:	11341136-000 18.03.2002
*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
						☐	☐
10	**item 1 socket EC5B**					☐	☐
	PA 6.6				**PA 6.6**	☐	☐
	material grade defined				**heatstabilized impact mod.**	☐	☐
	by suplier	**n/a**			**see Certificate of Analysis**	☑	☐
						☐	☐
11	**item 2 fixing tie T50ROS**					☐	☐
	PA 6.6				**PA 6.6**	☐	☐
	material grade defined				**heatstabilized**	☐	☐
	by suplier	**n/a**			**see Certificate of Analysis**	☑	☐
						☐	☐
12	**item 3 clamp TE4-511-000-K**					☐	☐
	spring steel				**spring steel**	☐	☐
	DIN 17222	**n/a**			**EN 10132 (replaced the DIN 17222)**	☑	☐
						☐	☐
						☐	☐
13	**part must comply with**				**part does comply with**	☐	☐
	material specification				**material specification**	☐	☐
	WSS-M99P9999-A1 to help				**WSS-M99P9999-A1 to help**	☐	☐
	safeguard health, safety				**safeguard health, safety**	☐	☐
	and the enviroment	**n/a**			**and the enviroment, see IMDS**	☑	☐
						☐	☐
						☐	☐
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Blanket statements of conformance are unacceptable for any test results.

SIGNATURE	TITLE	DATE
i.A. S. Fölster Stefan Fölster	Quality Assistant	15-Aug-18

AKRO-PLASTIC
Think Polyamide

Abnahmeprüfzeugnis

nach EN 10204-3.1

AKRO-PLASTIC GmbH
Ein Unternehmen der Feddersen-Gruppe

PROBENIDENTIFIKATION:

Nummer: 02179-TO

Bezeichnung: AKROMID A3 1 S3 black (1139)

PRODUKTIONSDATEN:

Charge: P11812121100089

KUNDENDATEN:

Bestellung:

PRÜFERGEBNISSE:

Prüfung:	Norm	Prüfbedingung	Sollwert	Istwert	Einheit
Restfeuchte	DIN EN ISO 15512 Verfahren B		<= 0,15	0,06	%
Zug-E-Modul	DIN EN ISO 527-2/1A	1mm/min	2550 ± 300	2365	MPa
Streckspannung	DIN EN ISO 527-2/1A	50mm/min	64,0 ± 5,0	61,4	MPa
Streckdehnung	DIN EN ISO 527-2/1A	50mm/min	>= 4,0	5,6	%
Bruchdehnung	DIN EN ISO 527-2/1A	50mm/min	35,0 ± 15,0	29,0	%
Charpy Kerbschlagzähigkeit	DIN EN ISO 179-1/1eA	23°C	15,0 ± 3,0	13,6	kJ/m^2
MVR	DIN EN ISO 1133	275/5	48,0 ± 15,0	51,8	$cm^3/10$ min

Freigabedatum: 27.03.2018 10:32

Zusatzvermerke :

Niederzissen, 11.05.2018

Gez. Abnahmebeauftragte: i.V. *Ute Bürger*

Dieses Dokument wurde elektronisch erstellt und ist ohne Unterschrift gültig.

Die in diesem Material eingesetzten Rohstoffe entsprechen der Empfehlung der EU-Richtlinie 2000/53 des europäischen Parlamentes vom 18.09.2000 über Altfahrzeuge. Hiermit wird bestätigt, daß die Lieferung den Vereinbarungen bei der Bestellannahme entspricht. Das Abnahmeprüfzeugnis entbindet den Käufer nicht von der ihm obliegenden gesetzlichen Eingangskontrolle und stellt keine Zusicherung bestimmter Eigenschaften dar.

AKRO-PLASTIC GmbH
Ein Unternehmen der Feddersen-Gruppe

Industriegebiet Brohltal Ost
Im Stiefelfeld 1
56651 Niederzissen

P.O.B. 67
56649 Niederzissen

Telefon: +49 2636 9742-0
Telefax: +49 2636 9742-31
info@akro-plastic.com
www.akro-plastic.com

Geschäftsführer:
Dirk Steinbrück, Andreas Stuber
Aufsichtsratsvorsitzender:
Dr. Matthias von Rönn

Amtsgericht Koblenz HRB 12227
USt-/VAT-IdNr. DE 811117257

ASCEND
PERFORMANCE MATERIALS

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

HELLERMANN TYTON
GROSSER MOORWEG 45
Tornesch, 25436
Attention: MR. SEKULIC

Container ID: BT0428EE-BT9640KK

Certificate Date: 11-JAN-18
Delivery No: 0382410992
Shipped Qty: 47,250.000 Lbs
(21,432.600 Kgs)
Customer P.O. No: 4500048988

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: ASTM D4066 PA0121, ASTM D6779 PA0121, WSK-M4D648A (ESF-M4D 82A), GMP.PA66.018, CMP NY057 AA, MSDB 41 CPN 1076, MSDB 41 CPN 1899, FMVSS 302*, CPN3490, D4000 PA012, SAE J1639 PA0121.

Material Type: VYDYNE 22HSP NT **Material No:** 10397766 **Batch No** FI21VY11 **Date of Mfg** 21-SEP-2017

Ascend Performance Materials Operations LLC Specification

Lot Data Property	Test Method	Min	Max	Result	Units
Relative Visc.	STM 00012	45.0	48.0	46.7	N/A
VISCOSITY NUM. SULFURIC	STM 00012	136.9	142.8	140.0	ml/g
Moisture	STM 00835	0.12	0.20	0.13	%

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 tha 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.

HFP Bandstahl

HFP Bandstahl GmbH · PF 1222 · 36422 Bad Salzungen

Ein Unternehmen der HUHOCO-Gruppe

Osterrath GmbH & Co. KG
Wahlbachsmühle 3
57334 Bad Laasphe / OT Sassmannshausen

Kunde: 17006031
Osterrath GmbH & Co.
Wahlbachsmühle 3
57334 Bad Laasphe / OT Sassmannshausen

Abnahmeprüfzeugnis WZ-51709823

DIN EN 10204 3.1 (1.05) Datum: 15.11.2017

Zu Lieferschein LA-51709823 vom: 16.11.2017 Seite: 2

Zu Auftrag Lieferplan AL-17000645 vom: 15.11.2016 (QF007)

Bestellnummer: E 16 01099 Bestelldatum: 08.11.2016 Lieferant: 1690000

Kundennummer: 10009 Fax-Nr.: +49 2754 375364 eMail: nadine.schuppert@osterrath.de

Abruf-Nr.: Abruf Hr. Heinzerling

Packstück	Dicke (mm)	PA-Nr.	Rp (N/mm²)	Rm (N/mm²)	A (%) A80
Soll min	0,370				15,0
Soll max	0,400		510	640	
UP153369	0,387	17003837-1	452	540	28,80
UP153370	0,387	17003837-1	452	540	28,80
UP153373	0,391	17003837-1	458	549	25,70
UP153374	0,394	17003837-1	446	545	28,00
UP153377	0,384 - 0,388	17002070-1	412	564	23,30
UP153378	0,384 - 0,388	17002070-1	412	564	23,30
UP153382	0,384 - 0,388	17002070-1	412-413	564-573	23,30-23,90
UP153391	0,391	17003837-1	458	549	25,70
UP153459	0,394	17003837-1	446	545	28,00

Es wird bestätigt, dass die Lieferungen den Anforderungen der Lieferbedingung entsprechen.

Abnahmebeauftragter
H.Gerlach

Diese durch ein geeignetes Datenverarbeitungssystem erstellte Bescheinigung ist gemäß EN 10204, Abschnitt 5, ohne Unterschrift gültig.

THEIS
Steel Excellence. Passion

Friedr. Gustav Theis Kaltwalzwerke GmbH Postfach 5452 58093 Hagen

Kunde	OSTERRATH GMBH & CO. WAHLBACHSMÜHLE 3 57334 BAD LAASPHE

Abnahmeprüfzeugnis/Inspection certificat/Certificat de réception EN 10204 3.1
Zeugnis-Nr./Certificate No./No. du certificat: **Z70246**
Ihre Bestell-Nr./Order-No./No de commande: **E 17 00118** HS-Nr.: 72112900
Unsere Kom.-Nr./Our Order No./Notre commande: **22726759 / 1 / 2** **Alt-Kommissions-Nr.: 226759**
Datum/Date/Date: **15.11.17**

Liefervorschrift/Specification/Spécification: Kundenartikelnummer BC-04003530, Zeugniszusatzdaten 1 "ohne ausgeprägte Streckgrenze", Massnorm DIN-EN-10140

Werkstoff/Quality/Nuance: C75S (Ck75) DIN-EN-10132-4

17006133

Chargen-Nr./Cast No./Coulée No. 6665

Schmelzanalyse/Cast Analysis/Analyse de coulée(%)

		C	Si	Mn	P	S	Al	Nb	Ti	Cu	Cr	Ni	N	V	Mo	B
Soll	min															
	max															
Ist		0.7450	0.2210	0.7100	0.0110	0.0008					0.2300	0.0520			0.0230	

Abmessung Dimension Dimension (mm)
Solldicke 0.400
Sollbreite 35.00
Sollänge

Mechanische Werte/Mechanical Properties/Characteriques mécaniques

		Rp0,2(MPa)				Rm(MPa)				Dehnung A80 %				IE mm		Zmr %						Ra OS		Ra US		Zn OS		Zn US		
		längs		quer		längs		quer		längs		quer																		
		Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	
	min	410	473			530	589			20.0	21.8																			
	max	490				600				28.0																				

Metallografische Werte
metallographic values
valeurs métallographiques

Nettogewicht/net weight/poids net	1.070,000	Lieferschein-Nr./delivery note No./Bon de livraison No	388890
Bruttogewicht/gross weight/poids brut	1.096,000	Palettenanzahl/number of paletts/nombre de palettes	1
Coilanzahl/number of coils/nombre de rouleaux	1		

Sonstige Angaben:

22.11.17
Geprüft
Damm

THEIS Qualitätsmanagement

Abnahmebeauftragter
Inspection representative
Inspection responsabilite

Nina Korzuch

* Härterei Aribert Conrad GmbH

SPC / 112 / 001 P R Ü F Z E U G N I S 3.1 Seite: 01
Platz/Firma: 00/01 Datum: 28.11.17

Kunde : Osterrath
: GmbH & Co. KG
Anschrift/Ort : info@osterrath.de 57334 Bad Laasphe

Auftragsnummer : 00199664
Auftrag vom : 24.11.2017

Artikelnummer : 61-4296-15
Bezeichnung : Blechklammern C75
Zeichnungsnummer :
Abmessungen :

Arbeitsgang : 001 gehärtet u. angelassen
:

Prüfmerkmal : 001 Härte HV10 ( )

Prüfart : Variabel, Normalverteilt
Toleranzen : AOT : 500,0 NENM: 475,0 AUT : 450,0
Stichproben-Frequenz : 5 alle 60 min.
Meßmittelbezeichnung : Tastatur

Grenzen und Prozeßindex: a) Vorbesetzung b) Im Prozeß gültig c) Aktuell aus den letzten 10 Werten

	OEG-X/R	UEG-X/R	OEG-R	UEG-R	OEG-X/S	UEG-X/S	OEG-S	UEG-S	CP(Sges)	CPk(Sges)	Zkrt(Sges)
a)	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0			
b)	481,4944	467,8388	25,0156	0,0	481,6074	467,7258	10,1607	0,0	1,7277	1,7046	5,1140

Basiswerte		für b)	für c)
Stichproben: von - bis		1 - 6	27.11.2017 - 28.11.2017
Anzahl gesamt	A	6	
gültig	M	6	
=> Meßwerte	N	30	
Summe der Werte	Σx	14240,0	
Summe der Werte²	Σx²	6759928,0	
(Summe der Werte)²	(Σx)²	202777600,0	
Mittelwert	Xqq	474,666666	
Mittlere Spannweite	Rq	11,833333	
Mittlere Standard.	Sq	4,863918	
Standardabweichung	Sges	4,823315	
Sigmadach (R)	σR	5,087417	
Sigmadach (S)	σS	5,174381	

unsere Auftragsnr.: 177994
Ihre Bestellnummer: V17 1124 20211

(Unterschrift)

* Härterei Aribert Conrad GmbH

SPC / 110 / 001 E I N Z E L W E R T L I S T E Seite: 02
Platz/Firma: 00/01 Datum: 28.11.17

Nummer	Datum	Zeit	Prüfer-ID	Fehler	Meßwert	GSP?	AUT	AOT
0000001	27.11.17	18:05:56	BETRIEB	0	475,0	/	--.....*.....++	
0000002	27.11.17	18:05:58	BETRIEB	0	470,0	/	--....*.....++	
0000003	27.11.17	18:06:32	BETRIEB	0	480,0	/	--......*....++	
0000004	27.11.17	18:07:14	BETRIEB	0	474,0	/	--.....*.....++	
0000005	27.11.17	18:07:44	BETRIEB	0	480,0	/	--......*....++	
0000006	27.11.17	19:08:37	BETRIEB	0	475,0	/	--.....*.....++	
0000007	27.11.17	19:08:41	BETRIEB	0	472,0	/	--....*.....++	
0000008	27.11.17	19:09:38	BETRIEB	0	478,0	/	--......*....++	
0000009	27.11.17	19:10:35	BETRIEB	0	465,0	/	--...*.......++	
0000010	27.11.17	19:11:12	BETRIEB	0	469,0	/	--....*.....++	
0000011	27.11.17	21:06:03	BETRIEB	0	486,0	/	--.......*...++	
0000012	27.11.17	21:07:59	BETRIEB	0	470,0	/	--....*.....++	
0000013	27.11.17	21:08:47	BETRIEB	0	475,0	/	--.....*.....++	
0000014	27.11.17	21:09:39	BETRIEB	0	470,0	/	--....*.....++	
0000015	27.11.17	21:10:24	BETRIEB	0	470,0	/	--....*.....++	
0000016	27.11.17	22:32:19	BETRIEB	0	472,0	/	--....*.....++	
0000017	27.11.17	22:32:21	BETRIEB	0	477,0	/	--.....*.....++	
0000018	27.11.17	22:32:23	BETRIEB	0	475,0	/	--.....*.....++	
0000019	27.11.17	22:32:25	BETRIEB	0	482,0	/	--......*....++	
0000020	27.11.17	22:32:27	BETRIEB	0	473,0	/	--.....*.....++	
0000021	28.11.17	01:49:32	BETRIEB	0	474,0	/	--.....*.....++	
0000022	28.11.17	01:49:35	BETRIEB	0	472,0	/	--....*.....++	
0000023	28.11.17	01:49:37	BETRIEB	0	483,0	/	--.......*...++	
0000024	28.11.17	01:49:39	BETRIEB	0	480,0	/	--......*....++	
0000025	28.11.17	01:49:41	BETRIEB	0	475,0	/	--.....*.....++	
0000026	28.11.17	03:23:35	BETRIEB	0	468,0	/	--....*.....++	
0000027	28.11.17	03:23:40	BETRIEB	0	472,0	/	--....*.....++	
0000028	28.11.17	03:23:42	BETRIEB	0	479,0	/	--......*....++	
0000029	28.11.17	03:23:45	BETRIEB	0	477,0	/	--.....*.....++	
0000030	28.11.17	03:23:47	BETRIEB	0	472,0	/	--....*.....++	

AU17-22053

Abnahmeprüfzeugnis DIN EN 10204/3.1

Kunde:	Osterrath GmbH & Co.KG
Artikel:	Stahl- Klammer 61-4296-15/6049 10009570F
Menge:	1.506kg
Auftragsnummer:	AU17-22053
Beschichtungsdatum:	11.12.17
Beschichtung:	microcor 500 silber GZ TL245 t647
Beschichtungsdicke (Mittelwert) :	18µm (ZnPHS,Protekt KL 100, VH301GZ)
Korrosionsbeständigkeit : DIN EN ISO 9227 NSS : Rostgrad nach DIN EN ISO 4628-3: Ri0	840h (VW TL 245 t647)

Chargen: 05201

Datum: 11.12.17 QM: QMB Herr Schäfer

Eibach Oberflächentechnik GmbH
Golsberger Straße 3
58513 Lüdenscheid
Deutschland

Telefon: 02351/9546-0
Telefax: 02351/9546-99
Internet: www.eot-gmbh.de
E-Mail: info@eot-gmbh.de

Sparkasse Finnentrop, Finnentrop · (BLZ: 46251590) 6050212
IBAN-Nr.: DE26462515900006050212 · SWIFT-Nr.: WELADED1FTR
Volksbank im Märkischen Kreis, Werdohl · (BLZ: 44761534) 5002607200
IBAN-Nr.: DE57447615345002607200 · SWIFT-Nr.: GENODEM1NRD

USt.-IdNr.: DE126174991
Gerichtsstand: Lüdenscheid
Handelsregister: AG Iserlohn HRB 4610
Geschäftsführer: Wolfgang Roll

THEIS
Steel. Excellence. Passion.

Friedr. Gustav Theis Kaltwalzwerke GmbH Postfach 5452 58093 Hagen

Kunde	Kleiner GmbH Postfach 900163 75090 Pforzheim	**Abnahmeprüfzeugnis/Inspection certificat/Certificat de réception EN 10204 3.1** Zeugnis-Nr./Certificate No./No. du certificat: **Z63067** Ihre Bestell-Nr./Order-No./No de commande: **4500023889** Unsere Kom.-Nr./Our Order No./Notre commande: **22623994 / 1 / 1** Datum/Date/Date: **20.12.16**	HS-Nr.: 72112900 **Alt-Kommissions-Nr.: 223994**

Liefervorschrift/Specification/Spécification: Kundenartikelnummer 10003714, Zeugniszusatzdaten 1 "ohne ausgeprägte Streckgrenze", Massnorm DIN-EN-10140

Werkstoff/Quality/Nuance: C75S (Ck75) DIN-EN-10132-4

Chargen-Nr./Cast No./Coulée No. 8531

Schmelzanalyse/Cast Analysis/Analyse de coulée(%)

		C	Si	Mn	P	S	Al	Nb	Ti	Cu	Cr	Ni	N	V	Mo	B
Soll	min	0.7000	0.1500	0.6000												
	max	0.8000	0.3500	0.9000	0.0250	0.0250					0.4000	0.4000			0.1000	
Ist		0.7300	0.2160	0.6800	0.0130	0.0033					0.2140	0.0850			0.0290	

Abmessung
Dimension
Dimension (mm)

Solldicke 0.400
Sollbreite 40.00
Solllänge

Mechanische Werte/Mechanical Properties/Characteriques mécaniques

		Rp0.2(MPa)				Rm(MPa)				Dehnung A80 %				IE mm		Zmr %						Ra OS µm		Ra US µm		Zn OS		Zn US		
		längs		quer		längs		quer		längs		quer																		
		Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	Soll	ist	
	min		489			480	595			17.0	19.1												0.17		0.16					
	max	510				640																								

Metallografische Werte
metallographic values
valeurs métallographiques

THEIS Qualitätsmanagement

Abnahmebeauftragter

Nettogewicht/net weight/poids net	Lieferschein-Nr./delivery note No./Bon de livraison No
Bruttogewicht/gross weight/poids brut	Palettenanzahl/number of paletts/nombre de palettes 0
Coilanzahl/number of coils/nombre de rouleaux	

Sonstige Angaben:
Geradheit= max 1,00mm/1m, Ebenheit quer= 0,010-0,038 mm/40 mm
Schneidgrat= max. 0,004-0,019 mm
Istdicke: 0,380-0,387 mm, Istbreite: 40,06-40,11 mm,

Art. Nr.	10003714
Wkz. Nr.	30321/001
Charge	11814
Auftr. Nr.	4500023889/10
Datum	Donnerstag, 12 Januar, 2017
Prüfer	Britsche / i.O.
Material	C 75S

WAELZHOLZ

Abnahmeprüfzeugnis EN 10204 - 3.1

HAGEN 24.11.2016 Telefon +49 2331 964-2879
Verkäufer Lechtenfeld, Sara
Vertreter
Kommission **5008340100 / 110000**

C. D. Wälzholz KG Postfach 60 02 52 58138 HAGEN

KLEINER GmbH
Postfach 900163
Göppinger Str. 2-4

75179 Pforzheim

Artikel	10033813
Kunde	04008052
Betriebsauftrag	**7777524334**
Schmelznummer	327476
Abnahmeprüfzeugnis	WA00464953
Kundenidentnummer	4
Herkunft	WKD
Lieferant	87375

Original

Ihre Bestellung	**4500023893**				
Abmessungen	**0,400 mm**	x	**40,00 mm**	Werkstoff nach	EN 10132-4
Toleranz +	0,000 mm		0,20 mm	Toleranz nach	EN 10140
Toleranz -	0,030 mm		0,00 mm		
Werkstoff	C75S				
Ausführung	LC				
Oberflache	MA-RL (glatt)				
Kante	GK				
Streckgrenze	Max		510 MPa	Ihre Warengruppe 1	10000254
Festigkeit	480 -		640 MPa	Bestellmenge	11000 kg
Dehnung	A 80 minimum		17,0 %	Netto	10308 kg
				Lieferschein	10695698
					06.12.2016
				Liefervorschr. 01	TLB 19 4
				Liefervorschr. 02	4
				Liefervorschr. 03	4
				Liefervorschr. 04	4

Chemische Zusammensetzung

Schmelznummer	% C	% Si	% Mn	% P	% S	% Al
327476	0,7490	0,2000	0,6540	0,0240	0,0020	0,0200

Art. Nr.	10000254
Wkz. Nr.	30321/001
Charge	11757
Auftr. Nr.	4500023893/10
Datum	Freitag, 9 Dezember, 2016
Prüfer	Britsche / i.O.
Material	C 75S

-bitte wenden-

C. D. Wälzholz KG
Feldmühlenstr. 55
58093 Hagen

Telefon +49 (0) 2331 964-0
Telefax +49 (0) 2331 964-21 00
Internet www.waelzholz.com
E-Mail info@waelzholz.com

Handelsregister: Hagen HRA 1920
USt.IdNr.: DE 125144075
Steuernummer: 321/5866/0019
Komplementärin: C.D Wälzholz Verwaltungs-GmbH
Handelsregister: Handelsregister Hagen HRB 3721
Geschäftsführer Dr.-Ing. Hans-Toni Junius
Dr.-Ing. Heino Buddenberg
Dr. Matthias Gierse

Abnahmeprüfzeugnis EN 10204 - 3.1

Abnahmeprüfzeugnis WA00464953

Original

Technologische Prüfwerte

Pos.	Dicke Bandmitte [mm]	Breite [mm]	Streckgrenze längs RP0.2 [MPa]	Zugfestigkeit längs Rm [MPa]	Dehnung laengs A80 [%]
1	0,376/0,389	40,040/40,100	439/448	559/575	24,0/27,0

Pos.	Rauheit Ra Kundenvorgabe [µm]	Hohlheit [mm]	Geradheit [mm]	Schneidgrat [mm]
1	0,10/0,13	0,04/0,09	0,60/0,80	0,01/0,02

Es wird bestätigt, dass die Ergebnisse der Prüfung den vereinbarten Lieferbedinungen entsprechen. Dieses Zeugnis wurde elektronisch erstellt und benötigt keine Unterschrift.

C.D. Wälzholz GmbH
T.Köhler
Leiter Qualitätssicherung
Abnahmebeauftragter

HellermannTyton

P-FMEA	D-02	Project- No GPN / NT Nr.	variable	Revision date Überarbeitungsdatum	02.05.2018
Group Assignment Produkt Gruppe	assembling edge clips (Montage Edge Clips)	Installation location Verbauort des Bauteils		Revision by Überarbeitet durch:	M. Michel
Part No Artikel Nr.	variable	Drawing number Zeichnung Nr.	variable	Review Date Überprüfungsdatum	02.05.2019
Part Description Artikel Bezeichnung	variable	Ind. Of Drwg. /date Zg. Index / Datum	variable	Reviewed by Überprüft durch	M. Michel
Core Team FMEA Team	M.Michel Prod., O.Pracht QS, H.Spieß PE, S.Behrend NT-PM				
Process Responsibility Prozessverantwortung bei	HT-Tornesch	Version of FMEA Version der FMEA	9	FMEA is electronic generatet and administradet. No Signature required. Diese FMEA ist elektronisch erstellt und verwaltet. Gültig ohne Unterschrift.	
Prepared by Erstellt von	Marco Michel	Original Issue Date Erstausgabe Datum	01.07.2010		

						Current status Derzeitiger Zustand							improved stage Verbesserter Zustand				
Feature / System / Process Merkmal / System / Prozess	location	Potential failure Potentieller Fehler	Potential consequences of failure Potentielle Folgen des Fehlers	D	Potential cause Potentielle Fehlerursache	Preventive and test measures Verhütungs- und Prüfmaßnahmen	A	B	E	RPZ	Recommended rectifying measures Empfohlene Abstellmaßnahmen	Responsible Verantwortlich Date / Datum	Implemented measures Getroffene Maßnahmen	A	B	E	RPZ
Resin	HT	no stocks	unable to start manufacture	N	poor stock control	P: bag stock on consignment	2	8	1	16							0
Goods Inwards	HT	incorrect goods	use wrong material	N	Supplier error	T: Goods in check	2	8	3	48							0
	HT	incorrect moisture content	cant't process	N	Supplier error	P: Cerificate of analysis	3	5	4	60							0
	HT	incorrect quantity	half production	N		P: Advised in advance	2	6	1	12							0
Cable tie/ clips goods in	HT	defect Clamps	no function of the part	N	deformation	Check parts at goods in	4	3	6	72							0
Clamp	HT	incorrect hardness	no function of the part	N	bad delivery resupply	P: certification report from supplier T: function check	2	6	6	72							0
	HT	mix parts	no function of the part	N	no function of the part	P: vision check	5	1	2	10							0

FMEA No.: D-02						Current status Derzeitiger Zustand							improved stage Verbesserter Zustand				
Feature / System / Process Merkmal / System / Prozess	**location**	**Potential failure** Potentieller Fehler	**Potential consequences of failure** Potentielle Folgen des Fehlers	**D**	**Potential cause** Potentielle Fehlerursache	**Preventive and test measures** Verhütungs- und Prüfmaßnahmen	A	B	E	RPZ	**Recommended rectifying measures** Empfohlene Abstellmaßnahmen	**Responsible** Verantwortlich **Date /** Datum	**Implemented measures** Getroffene Maßnahmen	A	B	E	RPZ
	H T	incorrect coating	no function of the part	N	bad delivery resupply	P: certification report from supplier	2	6	7	84							0
Cable tie goods in	H T	no stocks	unable to start manufacture	N	poor stock control	Goods receipt identity check	2	8	2	32							0
	H T	incorrect goods	use wrong material	N	Supplier error	T: Goods in check	2	8	3	48							0
	H T	incorrect quantity	half production	N		P: Advised in advance	2	6	1	12							0
Resin Stores	H T	incorrect material issued	delayed production	N	Stores error	P: Production verify delivery	5	3	3	45							0
Injection moulding	H T	part not fully moulded or flash on part	functional degradation	N	improper moulding parameters	P: visual check FSK-pos.1,2,3 Individual testing according FSK	3	3	7	63							0
	H T	mould misalignment	heavy handling/ processing	N	improper sliding bolt	Visual check FSK-pos.4 Individual testing according FSK	2	3	7	42							0
	H T	flowing lines	optical degradation	N	improper mould parameters improper mould temperature	P: Visual inspection FSK-pos.5	3	1	7	21							0
	H T	burnings	optical degradation	N	improper mould venting	P: visual check FSK-pos.6	4	5	7	140	24 hours test, to put ejectors, ventilation improved	Technical Center , Mr.Bösel , 01.04.2015	Expansion check list =continuous	2	5	7	70
	H T		optical degradation	N	improper moulding parameters	P: Rules I manufacturing instructions T: visual check by manufacturing control	4	5	7	140	To re-use saved last injection parameter	Production Mr.Rust 15.04.2015	continuous	2	5	7	70

FMEA No.: D-02						Current status Derzeitiger Zustand							improved stage Verbesserter Zustand				
Feature / System / Process Merkmal / System / Prozess	**location**	**Potential failure** Potentieller Fehler	**Potential consequences of failure** Potentielle Folgen des Fehlers	**D**	**Potential cause** Potentielle Fehlerursache	**Preventive and test measures** Verhütungs- und Prüfmaßnahmen	A	B	E	RPZ	**Recommended rectifying measures** Empfohlene Abstellmaßnahmen	**Responsible** Verantwortlich **Date /** Datum	**Implemented measures** Getroffene Maßnahmen	A	B	E	RPZ
	H T	mould misalignment	functional degradation	N	wear of mould	P: maintance of mould T: functional check by manufacturing control	2	7	7	98							0
	H T		optical degradation	N	wear of mould	P: maintance of mould T: visualll check by manufacturing control	2	4	7	56							0
	H T	contamination	optical degradation	N	machine and accessories not clean enough	P: visual check FSK-pos.7	4	2	7	56							0
	H T	contamination	increased sensitiveness to break	N	material contamination	P: visual check FSK-pos.7 Individual testing according FSK	3	6	5	90							0
	H T			N	optical degradation	P: visual check FSK-pos.7	4	2	7	56							0
	H T			N	thermical damage	P: visual check FSK-pos.7 Individual testing according FSK	3	7	7	147	Working instruction after start/stop, to observe parameter on the machine	Production Mr.Rust 30.03.2015	training for employees	2	7	7	98
											In arrangement with mould management about avoidance of "bleak corners" in the hot channel system. 02.05.2018	Mould Management Mr. Florian Peters 02.05.2018	Admission to the tool specification 02.05.2018				
	H T			N	Insufficient running reserve at material change	P: visual check FSK-pos.7 Individual testing according FSK	3	6	5	90							0
	H T	deformation	optical and functional degradation	N	defective production equipment	P: visual check FSK-pos.9	3	3	6	54							0

FMEA No.: D-02						Current status Derzeitiger Zustand							improved stage Verbesserter Zustand				
Feature / System / Process Merkmal / System / Prozess	**location**	**Potential failure** Potentieller Fehler	**Potential consequences of failure** Potentielle Folgen des Fehlers	**D**	**Potential cause** Potentielle Fehlerursache	**Preventive and test measures** Verhütungs- und Prüfmaßnahmen	A	B	E	RPZ	**Recommended rectifying measures** Empfohlene Abstellmaßnahmen	**Responsible** Verantwortlich **Date /** Datum	**Implemented measures** Getroffene Maßnahmen	A	B	E	RPZ
allocation	H T	improper quantity of water	insufficient mechanical features	N	improper dosing equipment	P: measuring test of the dosing quantity FSK-pos.14,15	2	3	8	48							0
	H T	improper welding seam	open bags, improper moisture content	N	incorrect adjustment of the equipment, heating device defective	P: visual and mechanical check FSK-pos.16	3	3	6	54							0
	H T	improper printing/ bag stamp	goods wrongly identified	N	defective or incorrectly adjusted stamps, wrong bags or labels	T: visual check FSK-pos.17	3	5	4	60							0
	H T	incorrect number of pcs.	delivery of short or excess quantities	N	improper counting device	T: quantity check FSK-pos.18	3	3	5	45							0
	H T	mixed parts	missing /wrong parts at customer side	N	human error	T : visual checks, training,rotating articles,production card, FSK-pos.45	2	5	8	80							0
Assembly	L	incorrect assembly	customer receives wrong product	N	wrong assembling	T: check of assembling	2	3	6	36							0
Assembling Clamp	L	incorrect assembly	coating damaged	N	wrong assembling tool	T: check of assembling	2	6	6	72							0
	L		case damaged	N	broken assembling tool	T: check of assembling	2	6	7	84							0
	L	deformation	no function	N	machine defect	Checked by assembling machine	3	6	5	90							0
	L		incorrect gasified	N	bent bracket	Spot check	3	6	3	54							0
Assembling cable tie	L	wrong assembled	rework at customer	N	wrong assembled by worker	Spot check	3	3	2	18							0

FMEA No.: D-02						Current status Derzeitiger Zustand							improved stage Verbesserter Zustand				
Feature / System / Process Merkmal / System / Prozess	**location**	**Potential failure** Potentieller Fehler	**Potential consequences of failure** Potentielle Folgen des Fehlers	**D**	**Potential cause** Potentielle Fehlerursache	**Preventive and test measures** Verhütungs- und Prüfmaßnahmen	A	B	E	RPZ	**Recommended rectifying measures** Empfohlene Abstellmaßnahmen	**Responsible** Verantwortlich **Date /** Datum	**Implemented measures** Getroffene Maßnahmen	A	B	E	RPZ
Storing goods	H T	no storage	no delivery to customer	N	incorrect master-data	T : crosscheck data	6	8	2	96							0
commissioning	H T	incorrect charge carrier	wrong parts to customer	N	insufficient charge carrier	L : Logistic verify charge carrier	3	2	1	6							0
	H T	ncorrect charge carrier	wrong parts to customer	N	human error	L : Logistic verify charge carrier	3	2	1	6							0
	H T	no storage	no delivery	N	damaged packing	L : visual check / repacking	2	4	1	8							0
Shipping goods	H T	wrong VDA label	missing /wrong parts at customer side	N	human error	L : crosscheck shipment / daily shipping audits	2	6	8	96							0

PFC-No: **15076099**	**Process Flow Chart**	HellermannTyton
REV: 05.09.2013		
reviewed: 09.11.2011 GPN: 076099	**T50ROSEC4A-MC5-BK-D1**	part-no: 15076099 drw-no: 141457

PROCESS	CONTROLS	PROCEDURE
100 goods receipt		VA10.1
	20 incoming inspection 01900522 KLAMMER 01120130 PA66-I-HS-BK 01110033 PA66-HS-NA O K / N O K	VA13.1
200 injection moulding		production plan
	50 process inspection +first / final shot + 1 per shift visuel attributes 1-9 by production 01076099 SOCKEL EC4 A O K / N O K	VA13.1
400 assembling SCON		assembling procedure
101 goods in SCON		
	81 final inspection (3 times) 15076099 T50ROSEC4A-MC5-BK-D1 O K / N O K	VA13.1
600 storage		VA15-1
700 shipping		VA15-1
1000 ARTICLE-AUDIT		
	100 annual layout 15076099 T50ROSEC4A-MC5-BK-D1 O K / N O K	VA13.1
Customer		

☐ Prototyp ☐ Pre-launch ☑ Production

CONTROL PLAN

HellermannTyton

Control Plan No 15076099	Key Contact / Phone +49 4122 701 272	Date reviewed 09.11.2011	Date rev. 25.11.2016
Part No / latest changelev 15076099 project:: 076099	Core Team PE / NTPM / QS / F	Customer Engineering Approval / date	
Part name/Description T50ROSEC4A-MC5-BK-D1 PGroup: 200	Supplier / Plant approval date	Customer Quality Approval / Date	
Supplier Plant Tornesch	other approval date / Drawing 141457	other Approval / Date	

Part / Prozess No	Prozess name / Operation description	Machine /	No / Product / Prozess Characteristics	SC	Part / Prozess Specification / Tolerance	Sample Size	Frequenz	Evaluation / Measurement Technique Control Method	Reaction Plan
20	incoming inspection								VA13.1
01110033	PA66-HS-NA		302-0 COC residual moisture			1 bag	1 delivery	410000 manual / visual	
01120130	PA66-I-HS-BK		302-0 COC residual moisture			1 bag	1 delivery	410000 manual / visual	
			304-0 COC notch impact strength			1 bag	1 delivery	410000 manual / visual	
			305-0 COC yield stress			1 bag	1 delivery	410000 manual / visual	
01900522	KLAMMER		40-1 dimension		4,05 ± 0,15 mm	5 pcs	1 delivery	40000 calliper	
			40-2 dimension		0,4 +0,2 / -0,4 mm	5 pcs	1 delivery	140000 profile projector	
			40-3 dimension		6,2 ± 0,25 mm	5 pcs	1 delivery	40000 calliper	
			40-4 dimension		7,95 ± 0,2 mm	5 pcs	1 delivery	40000 calliper	
			54-0 expanding test			50 pcs	1 delivery	80243 check gauge	
			116-0 compare with master sample			5 pcs	1 delivery	500353 Master Samples, visual	
			307-0 COC hardness		410 - 520 HV10	1	1 delivery	410000 manual / visual	
			1007-0 pull out force		min 70 N / HTQS-Blech	25 pcs	1 delivery	10000 Tensile tester	
50	process inspection +first / final shot + 1 per shift visuel attributes 1-9 by production								VA13.1
01076099	SOCKEL EC4 A		1-0 sink marks			1 shot	1 day	500283	
			2-0 shortage			1 shot	1 day	500283	
			3-0 Flashes			1 shot	1 day	500283	
			4-0 mould mis alignment			1 shot	1 day	500283	
			5-0 moulding lines			1 shot	1 day	500283	
			6-0 burnings			1 shot	1 day	500283	
			7-0 dirt			1 shot	1 day	500283	
			8-0 deformation			1 shot	1 day	500283	
			9-0 inclusions			1 shot	1 day	500283	
			54-0 expanding test			1 shot	1 day	80066 check gauge	
			54-0 expanding test			1 shot	1 day	80136 check gauge	
			65-0 shot weight			1 shot	1 day	20000 balance	
81	final inspection (3 times)								VA13.1
15076099	T50ROSEC4A-MC5-BK-D		18-0 quantity			1 bag	1 delivery	430000 scale counter / manual	
			45-0 mixed parts in pack unit			1 bag	1 delivery	410000 manual / visual	
			59-0 assembling			1 bag	1 delivery	500943 Master Samples, visual	
			118-0 identification single parts			1 bag	1 delivery	500943 Master Samples, visual	

☐ Prototyp ☐ Pre-launch ☑ Production

CONTROL PLAN

HellermannTyton

Control Plan No	15076099	Key Contact / Phone	+49 4122 701 272	Date reviewed 09.11.2011	Date rev. 25.11.2016
Part No / latest changelev	15076099 project:: 076099	Core Team	PE / NTPM / QS / F	Customer Engineering Approval / date	
Part name/Description	T50ROSEC4A-MC5-BK-D1 PGroup: 200	Supplier / Plant approval date		Customer Quality Approval / Date	
Supplier Plant	Tornesch	other approval date / Drawing	141457	other Approval / Date	

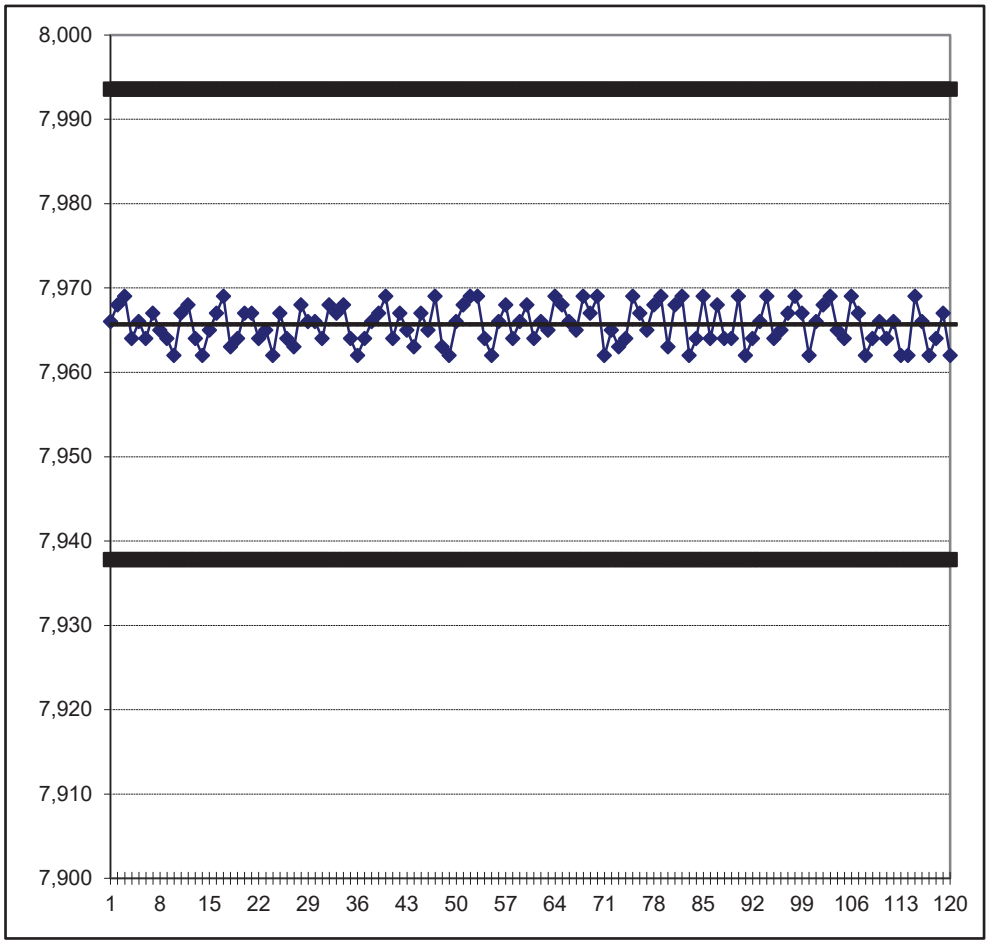
Part / Prozess No	Prozess name / Operation description	Machine /	No / Product / Prozess Characteristics	SC	Part / Prozess Specification / Tolerance	Sample Size	Frequenz	Evaluation / Measurement Technique Control Method	Reaction Plan
100	annual layout								VA13.1
15076099	T50ROSEC4A-MC5-BK-D		1200-0 requalification / product audit acc. DRW-spec incl. packageing (1 part-No for mentioned part group)			1 shot	acc. AUDIT		

HellermannTyton

Capability study

Partname: Edge Clip 4
NT-Nr.: 760-99

No.:	weight (g)
1	7,966
2	7,968
3	7,969
4	7,964
5	7,966
6	7,964
7	7,967
8	7,965
9	7,964
10	7,962
11	7,967
12	7,968
13	7,964
14	7,962
15	7,965
16	7,967
17	7,969
18	7,963
19	7,964
20	7,967
21	7,967
22	7,964
23	7,965
24	7,962
25	7,967
26	7,964
27	7,963
28	7,968
29	7,966
30	7,966
31	7,964
32	7,968
33	7,967
34	7,968
35	7,964
36	7,962
37	7,964
38	7,966
39	7,967
40	7,969
41	7,964
42	7,967
43	7,965
44	7,963
45	7,967
46	7,965
47	7,969
48	7,963
49	7,962
50	7,966
51	7,968
52	7,969
53	7,969
54	7,964
55	7,962
56	7,966
57	7,968



acceptable tolerance (+/-)	3,5	[‰]

max	**7,9690**
min	**7,9620**
R	**0,0070**
S	**0,0023**
X/	**7,9657**
LT	**7,9378**
UT	**7,9935**
valid +/-	**0,0279**

ppk	**4,04**

(demand: >= 1.67)

58	7,964
59	7,966
60	7,968
61	7,964
62	7,966
63	7,965
64	7,969
65	7,968
66	7,966
67	7,965
68	7,969
69	7,967
70	7,969
71	7,962
72	7,965
73	7,963
74	7,964
75	7,969
76	7,967
77	7,965
78	7,968
79	7,969
80	7,963
81	7,968
82	7,969
83	7,962
84	7,964
85	7,969
86	7,964
87	7,968
88	7,964
89	7,964
90	7,969
91	7,962
92	7,964
93	7,966
94	7,969
95	7,964
96	7,965
97	7,967
98	7,969
99	7,967
100	7,962
101	7,966
102	7,968
103	7,969
104	7,965
105	7,964
106	7,969
107	7,967
108	7,962
109	7,964
110	7,966
111	7,964
112	7,966
113	7,962
114	7,962
115	7,969
116	7,966
117	7,962
118	7,964
119	7,967
120	7,962

HellermannTyton

REPEATIBILITY AND REPRODUCIBILITY ANALYSIS REPORT

acc. to MSA 4th Edition

NON DESTRUCTIVE TEST

Specimen :	Plastic reference part (GPN 15-1084)	Gage type :	Weight scale	Plant :	Tornesch
Part. No. :	133-04158	Gage number :	PMN 02-0111	Date :	08.03.2018
Characteristic :	Shot weight (±5‰)	performed by:		approved by:	
Tolerance :	0,4542 Units gramm	Name:	Michael Klenner		Olaf Pracht
		Signature:			

# of operators:	3	# of trials:	3	# of parts:	10

OPERATOR	A:	Michael Klenner	B:	Wolf Schröder	C:	Volker Harms

		P		A		R		T				RESULTS	
	TRIAL #	1	2	3	4	5	6	7	8	9	10		AVG
A	1	21,564	21,638	21,568	21,496	21,568	21,640	21,530	21,481	21,629	21,478	A_1	
	2	21,563	21,639	21,567	21,496	21,568	21,641	21,529	21,480	21,628	21,479	A_2	
	3	21,563	21,637	21,567	21,494	21,567	21,641	21,529	21,480	21,627	21,479	A_3	
Average		21,563	21,638	21,567	21,495	21,568	21,641	21,529	21,480	21,628	21,479	X_A	**21,5589**
Range		0,001	0,002	0,001	0,002	0,001	0,001	0,001	0,001	0,002	0,001	R_A	**0,0013**
B	1	21,565	21,638	21,568	21,496	21,569	21,642	21,532	21,482	21,628	21,480	B_1	
	2	21,565	21,639	21,567	21,497	21,568	21,641	21,530	21,481	21,628	21,479	B_2	
	3	21,564	21,638	21,568	21,495	21,568	21,641	21,531	21,482	21,628	21,478	B_3	
Average		21,565	21,638	21,568	21,496	21,568	21,641	21,531	21,482	21,628	21,479	X_B	**21,5596**
Range		0,001	0,001	0,001	0,002	0,001	0,001	0,002	0,001	0,000	0,002	R_B	**0,0012**
C	1	21,565	21,638	21,567	21,496	21,567	21,642	21,531	21,481	21,628	21,478	C_1	
	2	21,565	21,637	21,567	21,496	21,569	21,641	21,530	21,481	21,627	21,479	C_2	
	3	21,563	21,638	21,567	21,495	21,568	21,642	21,530	21,482	21,627	21,479	C_3	
Average		21,564	21,638	21,567	21,496	21,568	21,642	21,530	21,481	21,627	21,479	X_C	**21,5592**
Range		0,002	0,001	0,000	0,001	0,002	0,001	0,001	0,001	0,001	0,001	R_C	**0,0011**
PART		21,5641	21,6380	21,5673	21,4957	21,5680	21,6412	21,5302	21,4811	21,6278	21,4788	R_{PART} =	0,1624

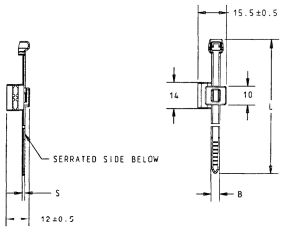
$R = R_A + R_B + R_C$ / No of operators	0,0013	+	0,0012	+	0,0011	/	3	R =	0,0012
X_{DIFF} = [Max $(X)_{ABC}$] - [Min $(X)_{ABC}$]	= 21,5596	-	21,5589					X_{DIFF} =	0,0007
UCL_R = R * D_4 =	0,0012	*	2,58					UCL_R =	0,0031
D_4 = 3,27 for 2 trials	2,58 for 3 trials								

Measurement Unit Analysis

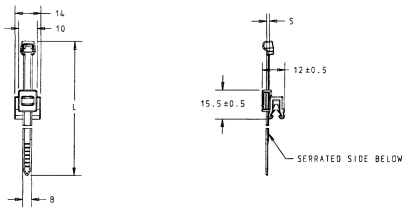
	Total Variation Method	Tolerance Method
Repeatability : Equipment Variation (EV)		
EV = $R * K_1$	% EV = 100[EV/TV]	% EV = 100[EV/(tol/6)]
EV = 0,0007 (Trials: 3, K_1: 0,5908)	**% EV =** **1,39**	**% EV =** **0,94**
Reproducibility : Appraiser Variation (AV)		
AV = $[(X_{DIFF} * K_2)^2 - (EV^2 / nr)]^{1/2}$ (n parts, r trials)	% AV = 100[AV/TV]	% AV = 100[AV/(tol/6)]
AV = 0,0004 (Oper: 3, K_2: 0,5231)	**% AV =** **0,71**	**% AV =** **0,48**
Repeatability & Reproducibility (GRR)		
GRR = $(EV^2 + AV^2)^{1/2}$	%GRR=100[GRR/TV]	%GRR=100[GRR/(tol/6)]
GRR = 0,0008	**%GRR =** **1,56**	**%GRR=** **1,05**
Part Variation (PV)		
PV = $R_{PART} * K_3$	% PV = 100[PV/TV]	
PV = 0,0511 (Parts: 10, K_3: 0,3146)	**% PV =** **99,99**	
Total Variation (TV)	**CONCLUSION:**	
TV = $(GRR^2 + PV^2)^{1/2}$		
TV = 0,0511		
Number of Distinct Categories (ndc)	**Gage system is satisfactory.**	
ndc = 1.41(PV / GRR)		
ndc = 90,5675		

- Under 10% error	Gage system is satisfactory.
- 10% to 30% error	May be acceptable based upon importance of application, cost of gage, cost of repairs, etc.
- Over 30% error	Gage system is not satisfactory. Identify the causes and take corrective action.

Remarks:



2MST-14197-HA GEOMETRY PART



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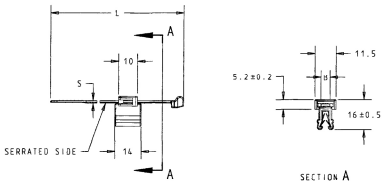
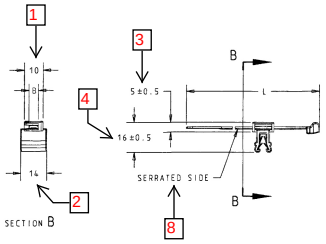


2MST-14197-KA GEOMETRY PART



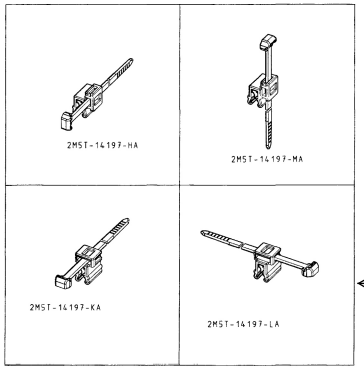
2MST-14197-LA GEOMETRY PART

NO. REQ'D.				ITEM	DESCRIPTION	COLOR	FORD COMPONENT PART NUMBER	SUPPLIER PART NUMBER	MATERIAL SPECYFICATION	RECYCLING CODE	WEIGHT (GRAM)
1				1	SOCKET	BLACK	N/A	...EC4A	PA 6.6 MATERIAL GRADE DEFINED BY SUPPLIER	10	
	1			1	SOCKET	BLACK	N/A	...EC4B	PA 6.6 MATERIAL GRADE DEFINED BY SUPPLIER		
		1		1	SOCKET	BLACK	N/A	...EC5A	PA 6.6 MATERIAL GRADE DEFINED BY SUPPLIER		
			1	1	SOCKET	BLACK	N/A	...EC5B	PA 6.6 MATERIAL GRADE DEFINED BY SUPPLIER		
1	1	1	1	2	FIXING TIE	BLACK	N/A	T50ROS...	PA 6.6 MATERIAL GRADE DEFINED BY SUPPLIER	11	
1	1	1	1	3	CLAMP	SILVER	N/A	TE4-511-000-K	SPRING STEEL DIN 17222	12	
2MST-14197-LA	2MST-14197-KA	2MST-14197-MA	2MST-14197-HA								

X

PRODUCT TYPE	LENGTH L	STRAP WIDTH B±0.2	THICKNESS S±0.2	BUNDLE
T50ROS	200±10	4.6	1.3	4-45 mm

5 6 7 9



LTRS	REVISIONS			
ORIGINATOR	CHECKER	ENGR APP	MATL APP	

RELEASE OF PART 14.1476
RELEASE OF PART 14.1478
RELEASE OF PART 14.1501
RELEASE OF PART 14.1457

EV60-E-11341136-000 DATE: 020318

HELLTY	BSCHIWEK	HELLE.DATE	HELLE.DATE

NOTES

THE MASTER SOURCE OF INFORMATION FOR THIS DRAWING IS IN A PE COMPUTER DATABASE. CHANGES ARE NOT PERMITTED WITHOUT JOINT AUTHORISATION FROM THE WORLDWIDE FASTENER STANDARDS COMMITTEE AND THE RELEVANT ENGINEERING CAD ACTIVITY.

CHANGES AFFECTING DESIGN, COMPOSITION OR PROCESSING OF THE PART PREVIOUSLY APPROVED FOR PRODUCTION, REQUIRE PRIOR APPROVAL FROM FORD PRODUCT ENGINEERING REF.: QI01

ENGINEERING APPROVAL OF PRODUCTION SAMPLES FROM EACH SUPPLIER REQUIRED PRIOR TO AUTHORISATION OF INITIAL PRODUCTION. FOR SAMPLE REQUIREMENTS SEE ENGINEERING RELEASE.

DIMENSIONS AND INSTRUCTIONS WHICH ARE NOT DEFINED ARE LEFT TO THE SUPPLIERS DISCRETION PROVIDING THE FUNCTION OF THE PART IS NOT IMPAIRED.

NOT TO BE ISSUED OUTSIDE FORD/F.M.C. LTD/FORD-WERKE A.G. OR USED FOR MANUFACTURING PURPOSES WITHOUT THE APPROVAL OF "HellermannTyton GmbH".

GENERAL TOLERANCE ±0.3 MM

DESIGN OF FEATURES AT MANUFACTURERS DISCRETION PROVIDED PUSH IN AND PULL OUT REQUIREMENTS ARE MET.

PLASTIC PARTS MATERIAL IDENTIFICATION SYMBOL >... PA...< TO BE LOCATED AS SHOWN. SIZE TO SUIT MANUFACTURER BUT MUST BE CLEARLY VISIBLE.

SHARP EDGES REMOVE

DRAFT ANGLE 2°

13

REFERENCE	MP
PART MUST COMPLY WITH MATERIAL SPECIFICATION WSS-M99P9999-A1 TO HELP SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT	
DRAFTED IN ACCORDANCE WITH FORD MOTOR COMPANY ENGINEERING CAD AND DRAFTING STANDARDS CURRENT AT INITIAL RELEASE	3RD ANGLE PROJ DIMENSIONS ARE IN MILLIMETERS
CAD TYPE I-IDEAS	CAD LOC. METAPH
CAD FILE DRW 2MST-14197-H v 4	IS MASTER
OPER. NO.	UNIT MM
DRAWING 2MST-14197-HA	
DESIGN SCHIWEK	DETAIL SCHIWEK
TITLE CLIP	SHT 1 OF 1
CHECKED SPIESZ	SAFETY
SCALE 1.1	DATE 020318
DIVISION	
PLANT	

Ford Motor Company

2MST-14197-HA
2MST-14197-MA
2MST-14197-KA
2MST-14197-LA

DRW SIZE A0/E