

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.:			
92768	with submission date	30.06.2021	will be considered as complete and valid auto-
atically on	30.07.2021	unless otherwise disposed!	

Part Submission Warrant

Part Name T50ROSEC5A Cust. Part Number 2M5T-14197-MA
 Shown on Drawing No. 141478 Org. Part Number 15040591
 Engineering Change Level 5 Dated 24.10.2011
 Additional Engineering Changes n/a Dated n/a
 Safety and/or Government Regulation ☐ Yes ☒ No Purchase Order No. 15040591 Weight (kg) 0,0030
 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

25436

Germany

City

Region

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:

13923953

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. V. Solse Date 30-Jun-21

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) _____

HellermannTyton

92768

Performance Test Results

Blanket statements of conformance are unacceptable for any test results.

<u>CREATOR</u>	<u>TITLE</u>	<u>DATE</u>
i.A. N. Lohse	Quality Assistant	30-Jun-21



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: 0000000000002010296

Certificate Date: 18-JAN-21
Delivery No: 0382548625
Shipped Qty: 36,500.000 Lbs
(16,556.400 Kgs)
Customer P.O. No: 4500129185 / 10

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: ASTM D4066 PA0121, ASTM D6779 PA0121, WSK-M4D648A (ESF-M4D 82A), MRS # 75, Rev. 7, Date 2-Jan-2019, GMP.PA66.018, CMP NY057 AA, MSDB 41 CPN 1076, MSDB 41 CPN 1899, FMVSS 302*, CPN3490, D4000 PA012, SAE J1639 PA0121, Ford WQ 100A.

Material Type: VYDYNE 22HSP NT

Material No: 10425537

Batch No IK11VY03

Date of Mfg 11-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>
Relative Visc.	ASTM D789[9.34]	45.0	48.0	46.2	N/A
VISCOSITY NUM. SULFURIC	ISO 307	136.9	142.8	139.4	ml/g
Moisture	ASTM D6869	0.12	0.20	0.15	%
Copper	STM 00667	80	100	90	PPM
Strength @ Yld	ISO 527-1,2 / 1A	78	98	84	MPa
Nom. Str.@ Brk	ISO 527-1,2 / 1A	17.5	35.0	28.5	%
Flex Modulus	ISO 178;2MM/MIN	2500		2833	MPa
Notched Izod	ISO 180 / 1A	3.5	8.0	4.7	kJ/m^2

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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Abnahmeprüfzeugnis/CoA

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

AKRO-PLASTIC GmbH
Ein Unternehmen der Fenderson-Gruppe

PROBENIDENTIFIKATION / DESCRIPTION OF PRODUCT:

Nummer / Item number: 02179-O

Bezeichnung / Material: AKROMID A3 1 S3 schwarz (1139)

PRODUKTIONSDATEN / PRODUCTION DATA:

Charge / LOT: OC03 120908

PRÜFERGEBNISSE / TESTRESULTS:

Prüfung Testing	Norm Norm	Prüfbedingung Testing condition	Spezifikation Target Value	Istwert Actual Value	Einheit Unit
Moisture content Restfeuchte	DIN EN ISO 15512 Verf. B		$\leq 0,15$	0.07	%
Tensile modulus Zug-E-Modul	DIN EN ISO 527- 2/1A	1 mm/min / RT	2550 +/- 300	2356	MPa
Strain at break Bruchdehnung	DIN EN ISO 527- 2/1A	50 mm/min / RT	35,0 +/- 15,0	39,6	%
Strain at yield Streckdehnung	DIN EN ISO 527- 2/1A	50 mm/min / RT	$\geq 4,0$	11,9	%
Stress at yield Streckspannung	DIN EN ISO 527- 2/1A	50 mm/min / RT	64,0 +/- 5,0	59,6	MPa
Charpy notched impact strength Charpy Kerbschlagzähigkeit	DIN EN ISO 179- 1/1eA	23°C	15,0 +/- 3,0	13,8	kJ/m ²

Freigabedatum / date of release: 27.01.2021

Zusatzvermerke / remarks:

Niederzissen, 27.01.2021

Gez. Abnahmebeauftragte / Inspection representative: i.V. Ute Bürger

Dieses Dokument wurde elektronisch erstellt und ist ohne Unterschrift gültig.

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Die in diesem Material eingesetzten Rohstoffe entsprechen der Forderung der Baureihe 20X03 des europäischen Normenstandards EN 10204-3.1. Es wird bestätigt, dass die Herstellung der verwendeten Rohstoffe der Baureihe 20X03 entspricht. Das Abnahmeprüfzeugnis enthält die Angabe, dass die Rohstoffe der Baureihe 20X03 mit der Kennzeichnung 20X03-1/1eA versehen sind. Die Rohstoffe der Baureihe 20X03-1/1eA sind in der Europäischen Norm EN 10204-3.1 als Rohstoffe der Baureihe 20X03-1/1eA gekennzeichnet. Es wird bestätigt, dass die Rohstoffe der Baureihe 20X03-1/1eA mit der Kennzeichnung 20X03-1/1eA versehen sind.

**WÄELZHOLZ****Eingegangen
27.07.2020****Abnahmeprüfzeugnis EN 10204 - 3.1**

HAGEN 16.07.2020 Telefon +49 2331 964-2879

Verkäufer Lechtenfeld, Sara

Vertreter

Kommission 0111956201 / 110000

Artikel 00060388

Kunde 04004192

Betriebsauftrag 7777824477

Schmelznummer 30274

Abnahmeprüfzeugnis WA00690152

Kundenidentnummer 830

Lieferant 1658266

C. D. Wälzholtz GmbH & Co. KG Postfach 60 02 52 58136 HAGEN**Osterrath GmbH & Co. KG
Wahlbachmühle 3****57334 Bad Laasphe****20002707**

O	Ihre Bestellung	E 19 00699			
r	Abmessungen	0,400 mm x	35,00 mm	Werkstoff nach	EN 10132-4
i	Toleranz +	0,000 mm	0,20 mm	Toleranz nach	EN 10140
g	Toleranz -	0,030 mm	0,00 mm		
i	Werkstoff	C75S			
n	Ausführung	LC			
a	Oberfläche	MA-RL (glatt)			
l	Kante	GK			
				Ihre Werengruppe 1	BC-04003530
				Ihre Werengruppe 2	000
				Bestellmenge	20000 kg
				Netto	9336 kg
				Lieferschein	11012910
					24.07.2020

Chemische Zusammensetzung

Schmelznummer	% C	% Si	% Mn	% P	% S	% Al	% Cr	% Ni	% Mo
030274	0,7200	0,2500	0,6500	0,0190	0,0030	0,0320	0,2400	0,0400	0,0020

Technologische Prüfwerte siehe Rückseite! =>**GEPRÜFT
31.07.2020
Sebastian Damm**C. D. Wälzholtz GmbH & Co. KG
Feldmühlenstr. 55
58093 HagenTelefon: +49 (0) 2331 964-0
Telefax: +49 (0) 2331 964-21 00
Internet: www.waelzholtz.com
E-Mail: info@waelzholtz.comHandelsregister: Hagen HRA 1920
UStIdNr.: DE 125144075
Steuernummer: 321/5988/0019Geschäftsführer Dr.-Ing. Hans-Toni Junius
Dipl.-Kfm. Holger Bierstedt
Dr.-Ing. Helmo Buddenberg
Dr. Matthias Glens

Abnahmeprüfzeugnis EN 10204 - 3.1

Abnahmeprüfzeugnis

WA00690152

20002707

O Technologische Prüfwerte

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	Dicke	Streckgrenze längs	Zugfestigkeit längs	Dehnung längs	
Pos.	Bandmitte [mm]	RP0,2 [MPa]	Rm [MPa]	A80 [%]	
1	0,395	415	555	22,5	

GEPRÜFT
31.07.2020
Sebastian Damm

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

C.D. Wälzholz GmbH
N.Brachthäuser
Leiter Qualitätssicherung
Abnahmebeauftragter

* Härterei Anibert Conrad GmbH

SPC / 112 / 001
Platz/Firma: 00/01

P R Ü F Z E U G N I S 3.1

Seite: 01
Datum: 30.09.20

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

Auftragsnummer : 00220140
Auftrag vom : 25.09.2020

Artikelnummer : 61-3910-15
Bezeichnung : Blechklammern C75
Zeichnungsnummer :
Abmessungen :

Arbeitsgang : 001 gehärtet u. angelassen 1

Prüfmerkmal : 001 Härte HV10 ()

Prüfart : Variabel, Normalverteilt
Toleranzen : AOT : 500.0 NENM: 475,0 AUT : 450.0
Stichproben-Frequenz : 5 alle 60 min.
Meßmittelbezeichnung : Härteprüfgerät

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

DEG-X/R	UEG-X/R	DEG-R	UEG-R	DEG-X/S	UEG-X/S	DEG-S	UEG-S	CP(Sges)	CPk(Sges)	Lkrt(Sges)
a) 0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1,1725	1,0581	3,1744
b) 484,8256	470,0544	27,0592	0,0	484,5504	470,3295	10,4090	0,0			

Basiswerte

für b)

für c)

Stichproben: von - bis		1 - 5	29.09.2020 - 29.09.2020
Anzahl gesamt	A	5	
gültig	M	5	
=> Meßwerte	H	25	
Summe der Werte	Ex	11936,0	
Summe der Werte ²	Ex ²	5699936,0	
(Summe der Werte) ²	(Ex) ²	142468096,0	
Mittelwert	X _{g0}	477,44	
Mittlere Spannweite	R _g	12,8	
Mittlere Standard.	S _g	4,982799	
Standardabweichung	S _{ges}	7,106804	
Sigmadach (R)	σ _R	5,303009	
Sigmadach (S)	σ _S	5,300850	

Unsere Auftragsnr.: 204349
Ihre Bestellnummer: LSHT01164

(Unterschrift)

* Härterei Aribert Conrad GmbH

SPC / 110 / 001 EINZELWERTLISTE
Platz/Firma: 00/01

Seite: 02
Datum: 30.09.20

Nummer	Datum	Zeit	Prüfer-ID	Fehler	Meßwert	GSP?	AUT	AOT
0000001	29.09.20	16:48:57	BETRIEB	0	487,0	/	---	*...++
0000002	29.09.20	16:48:59	BETRIEB	0	483,0	/	---	*...++
0000003	29.09.20	16:49:01	BETRIEB	0	477,0	/	---	*...++
0000004	29.09.20	16:49:02	BETRIEB	0	480,0	/	---	*...++
0000005	29.09.20	16:49:04	BETRIEB	0	472,0	/	---	*...++
0000006	29.09.20	18:02:59	BETRIEB	0	479,0	/	---	*...++
0000007	29.09.20	18:03:05	BETRIEB	0	486,0	/	---	*...++
0000008	29.09.20	18:03:09	BETRIEB	0	474,0	/	---	*...++
0000009	29.09.20	18:03:11	BETRIEB	0	477,0	/	---	*...++
0000010	29.09.20	18:03:16	BETRIEB	0	482,0	/	---	*...++
0000011	29.09.20	19:05:41	BETRIEB	0	484,0	/	---	*...++
0000012	29.09.20	19:05:43	BETRIEB	0	486,0	/	---	*...++
0000013	29.09.20	19:05:45	BETRIEB	0	489,0	/	---	*...++
0000014	29.09.20	19:05:47	BETRIEB	0	485,0	/	---	*...++
0000015	29.09.20	19:05:52	BETRIEB	0	476,0	/	---	*...++
0000016	29.09.20	20:22:32	BETRIEB	0	470,0	/	---	*...++
0000017	29.09.20	20:22:33	BETRIEB	0	469,0	/	---	*...++
0000018	29.09.20	20:22:37	BETRIEB	0	477,0	/	---	*...++
0000019	29.09.20	20:22:42	BETRIEB	0	487,0	/	---	*...++
0000020	29.09.20	20:22:48	BETRIEB	0	471,0	/	---	*...++
0000021	29.09.20	22:49:26	BETRIEB	0	468,0	/	---	*...++
0000022	29.09.20	22:49:28	BETRIEB	0	466,0	/	---	*...++
0000023	29.09.20	22:49:31	BETRIEB	0	472,0	/	---	*...++
0000024	29.09.20	22:49:33	BETRIEB	0	469,0	/	---	*...++
0000025	29.09.20	22:49:36	BETRIEB	0	470,0	/	---	*...++



AU20-13634

Prüfzeugnis/inspection certificat DIN EN 10204/3.1

	Osterrath GmbH & Co.KG
Kunde:	Stahl-Klammer 61-3910-15/6049
Artikel:	10004223F
	1.212kg
Menge:	AU20-13634
Auftragsnummer:	16.10.20
Beschichtungsdatum:	
Beschichtung / coating:	microcor 500 silber GZ TL245 t647
Schichtstärke/thickness (middle)	18µm (ZnPHS,Protekt KL 100, VH 301GZ)
Korrosionsbeständigkeit / corrosion protection :	
DIN EN ISO 9227 NSS :	840h (TL 245 t647)
Rostgrad / rust grade DIN EN ISO 4628-3:	Ri0

Chargen:

02689

Datum: 16.10.20

QM: QMB Herr Schäfer

Eibach Oberflächentechnik GmbH
Goldsberger Straße 3
58513 Lüdenscheid

Telefon: 02351/9546-0
Telefax: 02351/9546-99
Internet: www.eot-gmbh.de

Sparkasse Mitten im Sauerland, Meschede - (BLZ: 46451012) 6080212
IBAN-Nr.: DE64-464510120006080212 · SWIFT-Nr.: WELADED1MES
Volksbank im Märkischen Kreis, Werdohl - (BLZ: 44761534) 5000607260
IBAN-Nr.: DE25-44761534000000000000 · SWIFT-Nr.: GENODE33HAN

USt-IdNr.: DE126174991
Gerichtsstand: Lüdenscheid
Handelsregister: AG Iserlohn HRB 4610
GmbH & Co. KG

P-FMEA	D-02	Project- No GPN / NT Nr.	variable	Revision date Überarbeitungsdatum	18.05.2020
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	18.05.2021
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	12	FMEA is electronic generated and administrated. 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	H T	no stocks	unable to start manufacture	N	poor stock control	P: bag stock on consignment	2	8	1	16							0
Goods Inwards	H T	incorrect goods	use wrong material	N	Supplier error	T: Goods in check	2	8	3	48							0
	H T	incorrect moisture content	cant't process	N	Supplier error	P: Cerificate of analysis	3	5	4	60							0
	H T	incorrect quantity	half production	N		P: Advised in advance	2	6	1	12							0
Cable tie/ clips goods in	H T	defect Clamps	no function of the part	N	deformation	Check parts at goods in	4	3	6	72							0
Clamp	H T	incorrect hardness	no function of the part	N	bad delivery resupply	P: certification report from supplier T: function check	2	6	6	72							0
	H T	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
			customer receives complete product		incomlete assembling	P: Installation instructions	3	7	2	42			Test device built/ interorated	1	7	2	14
						T: worker self-controll	3	7	2	42			optical controll/4eyes principle	2	7	2	28
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	6	72						0	
			clamp missing	N	machine defekt	T: check of assembling	2	6	5	60							
	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	N	wrong assembled	Spot check	3	3	2	18							0

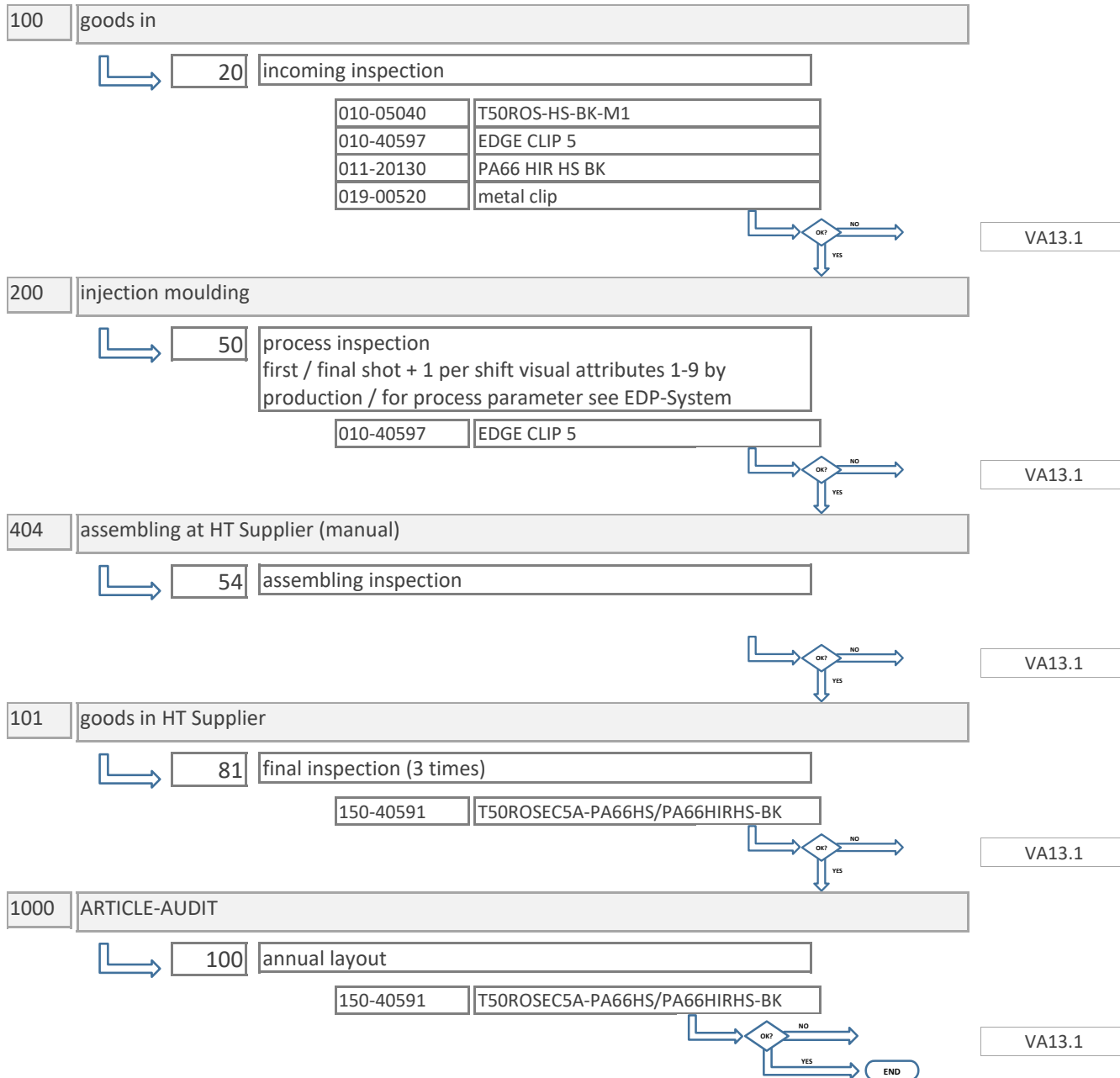
FMEA No.: D-02					Current status Derzeitiger Zustand							improved stage Verbesserter Zustand					
Feature / System / Process Merkmal / System / Prozess	location	Potential failure Potentieller Fehler	Potential consequences of failure Potentielle Folgen des Fehlers	D	Potential cause Potentielle Fehlerursache	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
			customer		by worker												

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	no storage	no delivery to customer	N	incorrect master-data	T : crosscheck data	6	8	2	96							0
	T																
commissioning	H	incorrect charge carrier	wrong parts to customer	N	insufficient charge carrier	L : Logistic verify charge carrier	3	2	1	6							0
	T																
	H	ncorrect charge carrier	wrong parts to customer	N	human error	L : Logistic verify charge carrier	3	2	1	6							0
	T																
	H	no storage	no delivery	N	damaged packing	L : visual check / repacking	2	4	1	8							0
	T																
Shipping goods	H	wrong VDA label	missing /wrong parts at customer side	N	human error	L : crosscheck shipment / daily shipping audits	2	6	8	96							0
	T																

Process Flow Chart

PART NUMBER:	150-40591	GPN:	97-0405	CORE TEAM:	PE, NTPM, QM, PR
PART NAME:	T50ROSEC5A-PA66HS/PA66HIRHS-BK	KEY CONTACT PHONE:	+49 4122 701 330	DATE REVIEWED:	16.11.2020
DRAWING :	2M5T-14197-MA	CUSTOMER APPROVAL:			
PRODUCT GROUP:	D-02	PRODUCTION PLANT:	HT Tornesch		

Process / test procedure	document
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Control Plan

rev: 17.07.2020

☐ Prototyp ☐ Pre-Launch ☒ Production	PART NUMBER:	150-40591	GPN:	97-0405	CORE TEAM:	PE, NTPM, QM, PR
	PART NAME:	T50ROSEC5A-PA66HS/PA66HIRHS-BK			KEY CONTACT PHONE:	+49 4122 701 330
	DRAWING :	2M5T-14197-MA			DATE REVIEWED:	16.11.2020
	PRODUCT GROUP:	D-02	PRODUCTION PLANT:	HT Tornesch	CUSTOMER APPROVAL:	

Part / Prozess No / Characteristic	SC	Part / Prozess Specification / Tolerance	Sample Size	Frequenz	Evaluation / Measurement Technique Control Method	Reaction Plan
20		incoming inspection				VA13.1
010-05040		T50ROS-HS-BK-M1				
116		compare with master sample	1 bag	1 / delivery	420000 sample / visual	
010-40597		EDGE CLIP 5				
116		compare with master sample	1 pcs	1 / delivery	420000 sample / visual	
011-20130		PA66 HIR HS BK				
302		COC residual moisture	1 bag	1 / delivery	410000 manual / visual	
304		COC notch impact strength	1 bag	1 / delivery	410000 manual / visual	
305		COC yield stress	1 bag	1 / delivery	410000 manual / visual	
019-00520		metal clip				
40-1		dimension	5 pcs	SKIP LOT PLAN	140000 profile projector	
40-2		dimension	5 pcs	SKIP LOT PLAN	140000 profile projector	
40-3		dimension	5 pcs	SKIP LOT PLAN	140000 profile projector	
40-4		dimension	5 pcs	SKIP LOT PLAN	140000 profile projector	
40-5		dimension	5 pcs	SKIP LOT PLAN	140000 profile projector	
54		expanding test	50 pcs	SKIP LOT PLAN	80243 check gauge	
116		compare with master sample	5 pcs	SKIP LOT PLAN	500353 Master Samples, visual	
307		COC hardness	1	SKIP LOT PLAN	410000 manual / visual	
1007		pull out force	20 pcs	SKIP LOT PLAN	10000 Tensile tester	
50		process inspection				VA13.1
010-40597		EDGE CLIP 5				

Control Plan

rev: 17.07.2020

☐ Prototyp ☐ Pre-Launch ☒ Production	PART NUMBER:	150-40591	GPN:	97-0405	CORE TEAM:	PE, NTPM, QM, PR
	PART NAME:	T50ROSEC5A-PA66HS/PA66HIRHS-BK			KEY CONTACT PHONE:	+49 4122 701 330
	DRAWING :	2M5T-14197-MA			DATE REVIEWED:	16.11.2020
	PRODUCT GROUP:	D-02	PRODUCTION PLANT:	HT Tornesch	CUSTOMER APPROVAL:	

Part / Prozess No / Characteristic	SC	Part / Prozess Specification / Tolerance	Sample Size	Frequenz	Evaluation / Measurement Technique Control Method	Reaction Plan
50 process inspection						VA13.1
010-40597 EDGE CLIP 5						
1 sink marks			1 shot	1 / day	500338 Master Samples, visual	
2 shortage			1 shot	1 / day	500338 Master Samples, visual	
3 Flashes			1 shot	1 / day	500338 Master Samples, visual	
4 mould mis alignment			1 shot	1 / day	500338 Master Samples, visual	
5 moulding lines			1 shot	1 / day	500338 Master Samples, visual	
6 burnings			1 shot	1 / day	500338 Master Samples, visual	
7 dirt			1 shot	1 / day	500338 Master Samples, visual	
8 deformation			1 shot	1 / day	500338 Master Samples, visual	
9 inclusions			1 shot	1 / day	500338 Master Samples, visual	
54 expanding test			1 shot	1 / day	80066 check gauge 80136 check gauge	
65 shot weight		see test procedure	1 shot	1 / day	20000 balance	
81 final inspection (3 times)						VA13.1
150-40591 T50ROSEC5A-PA66HS/PA66HIRHS-BK						
18 quantity			1 bag	1 / delivery	430000 scale counter / manual	
45 mixed parts in pack unit			1 bag	1 / delivery	410000 manual / visual	
59 assembling			1 bag	1 / delivery	500886 Master Samples, visual	
118 identification single parts			1 bag	1 / delivery	500886 Master Samples, visual	
100 annual layout						VA13.1

rev: 17.07.2020

- ☐ Prototyp
- ☐ Pre-Launch
- ☒ Production

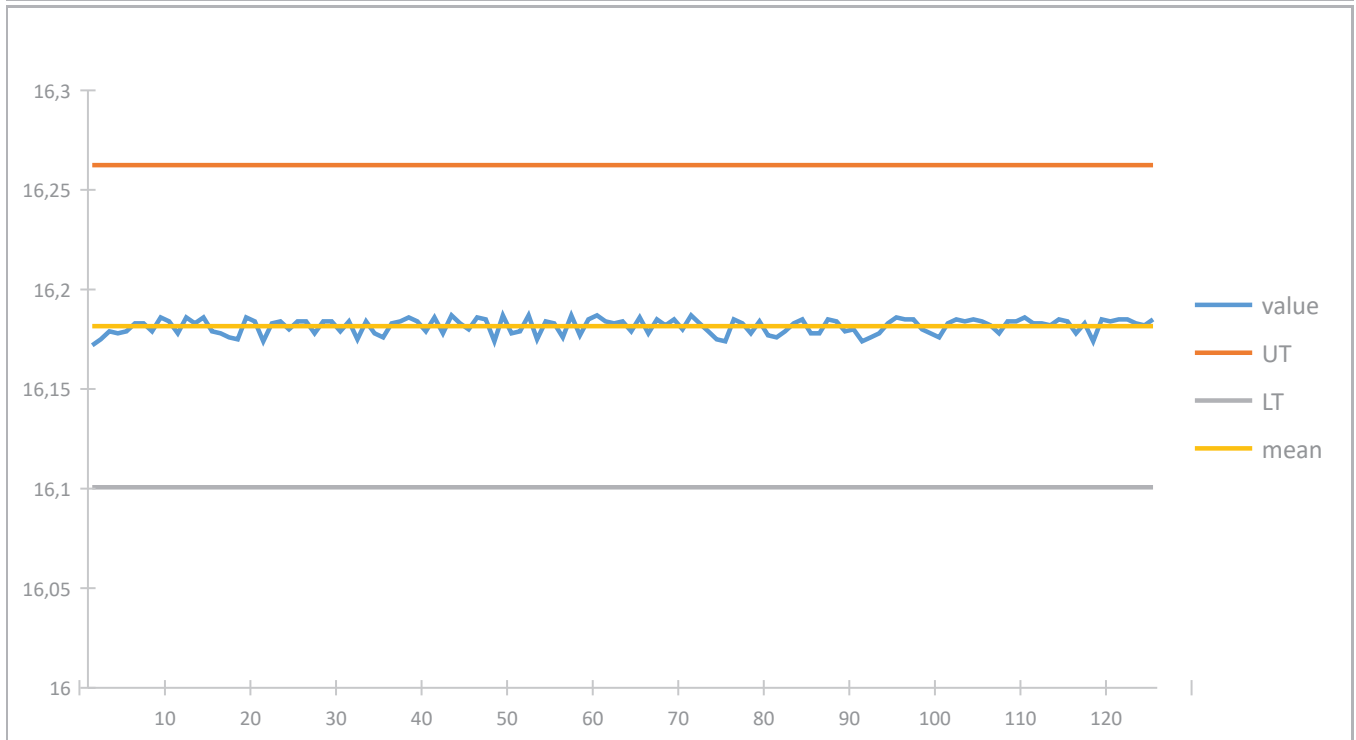
100	annual layout	VA13.1
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CAPABILITY STUDY

06.08.2020

-shot weight-

gpn:	97-0405		
part name:	EDGE CLIP 5		
spec (+/- [%])	0,500	ppk:	7,03
tolerance (+/- [g])	0,081	ppk spec (min):	1,67
min:	16,172	mean:	16,182
max:	16,187	stddiv:	0,004



data tab:

no	value														
1	16,172	17	16,176	33	16,184	49	16,187	65	16,186	81	16,176	97	16,185	113	16,182
2	16,175	18	16,175	34	16,178	50	16,178	66	16,178	82	16,179	98	16,180	114	16,185
3	16,179	19	16,186	35	16,176	51	16,179	67	16,185	83	16,183	99	16,178	115	16,184
4	16,178	20	16,184	36	16,183	52	16,187	68	16,182	84	16,185	100	16,176	116	16,178
5	16,179	21	16,174	37	16,184	53	16,175	69	16,185	85	16,178	101	16,183	117	16,183
6	16,183	22	16,183	38	16,186	54	16,184	70	16,180	86	16,178	102	16,185	118	16,174
7	16,183	23	16,184	39	16,184	55	16,183	71	16,187	87	16,185	103	16,184	119	16,185
8	16,179	24	16,180	40	16,179	56	16,176	72	16,183	88	16,184	104	16,185	120	16,184
9	16,186	25	16,184	41	16,186	57	16,187	73	16,179	89	16,179	105	16,184	121	16,185
10	16,184	26	16,184	42	16,178	58	16,177	74	16,175	90	16,180	106	16,182	122	16,185
11	16,178	27	16,178	43	16,187	59	16,185	75	16,174	91	16,174	107	16,178	123	16,183
12	16,186	28	16,184	44	16,183	60	16,187	76	16,185	92	16,176	108	16,184	124	16,182
13	16,183	29	16,184	45	16,180	61	16,184	77	16,183	93	16,178	109	16,184	125	16,185
14	16,186	30	16,179	46	16,186	62	16,183	78	16,178	94	16,183	110	16,186		
15	16,179	31	16,184	47	16,185	63	16,184	79	16,184	95	16,186	111	16,183		
16	16,178	32	16,175	48	16,174	64	16,179	80	16,177	96	16,185	112	16,183		

REPEATABILITY AND REPRODUCIBILITY ANALYSIS REPORT

acc. to MSA 4th Edition

NON DESTRUCTIVE TEST

Specimen : Plastic reference part (GPN20-1853)	Gage type : Weight scale	Plant : Tornesch
Part. No. : not yet assigned (MF0811/001)	Gage number : PMN 02-0111	Date : 16.02.2021
Characteristic : Shot weight ($\pm 3,5\%$)	performed by: approved by:	
Tolerance : 0,052 Units gramm	Name: Tobias Cohrt	Jens Feil
Signature: _____		

# of operators: 3		# of trials: 3					# of parts: 10						
OPERATOR		A: Esref Ekinici				B: Marco Schröder			C: Frank Werner				
TRIAL #		P		A		R		T		RESULTS			
		1	2	3	4	5	6	7	8	9	10	AVG	
A	1	0,733	0,735	0,734	0,735	0,733	0,733	0,734	0,735	0,733	0,734	A ₁	
	2	0,733	0,735	0,734	0,735	0,734	0,733	0,734	0,736	0,734	0,735	A ₂	
	3	0,733	0,736	0,735	0,735	0,734	0,733	0,734	0,736	0,734	0,735	A ₃	
	Average	0,733	0,735	0,734	0,735	0,734	0,733	0,734	0,736	0,734	0,735	X _A 0,7342	
	Range	0,000	0,001	0,001	0,000	0,001	0,000	0,000	0,001	0,001	0,001	R _A 0,0006	
B	1	0,733	0,735	0,734	0,735	0,734	0,733	0,734	0,736	0,734	0,735	B ₁	
	2	0,734	0,735	0,734	0,735	0,734	0,733	0,734	0,736	0,735	0,735	B ₂	
	3	0,734	0,736	0,735	0,736	0,735	0,734	0,734	0,736	0,735	0,735	B ₃	
	Average	0,734	0,735	0,734	0,735	0,734	0,733	0,734	0,736	0,735	0,735	X _B 0,7346	
	Range	0,001	0,001	0,001	0,001	0,001	0,001	0,000	0,000	0,001	0,000	R _B 0,0007	
C	1	0,734	0,736	0,735	0,736	0,734	0,734	0,734	0,736	0,735	0,735	C ₁	
	2	0,735	0,736	0,736	0,736	0,735	0,734	0,735	0,736	0,735	0,736	C ₂	
	3	0,735	0,736	0,736	0,736	0,735	0,735	0,735	0,736	0,735	0,736	C ₃	
	Average	0,735	0,736	0,736	0,736	0,735	0,734	0,735	0,736	0,735	0,736	X _C 0,7353	
	Range	0,001	0,000	0,001	0,000	0,001	0,001	0,001	0,000	0,000	0,001	R _C 0,0006	
PART		0,7338	0,7356	0,7348	0,7354	0,7342	0,7336	0,7342	0,7359	0,7344	0,7351	R _{PART} = 0,0023	
R = R _A + R _B + R _C / No of operators		0,0006		+		0,0007		+		0,0006		/ 3	R = 0,0006
X _{DIFF} = [Max (X) _{ABC}] - [Min (X) _{ABC<td colspan="2">= 0,7353</td><td colspan="2">-</td><td colspan="2">0,7342</td><td colspan="5"></td><td>X_{DIFF} = 0,0010</td>}		= 0,7353		-		0,7342							X _{DIFF} = 0,0010
UCL _R = R * D ₄		= 0,0006		*		2,58							UCL _R = 0,0016
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		Trials		K ₁		% EV = 100[EV/TV]	
EV = 0,0004		3		0,5908		% EV = 38,06	
Reproducibility : Appraiser Variation (AV)				(n parts, r trials)			
AV = [(X _{DIFF} * K ₂) ² - (EV ² / nr)] ^{1/2}		Oper		K ₂		% AV = 100[AV/TV]	
AV = 0,0005		3		0,5231		% AV = 54,55	
Repeatability & Reproducibility (GRR)							
GRR = (EV ² + AV ²) ^{1/2}						%GRR=100[GRR/TV]	
GRR = 0,0007						%GRR = 66,51	
Part Variation (PV)							
PV = R _{PART} * K ₃		Parts		K ₃		% PV = 100[PV/TV]	
PV = 0,0007		10		0,3146		% PV = 74,67	
Total Variation (TV)							
TV = (GRR ² + PV ²) ^{1/2}							
TV = 0,0010							
Number of Distinct Categories (ndc)							
ndc = 1.41(PV / GRR)							
ndc = 1,58299							

- 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:

Intended For Welded Screw Ø
Pour Goujon Soudé à Filets Couchés Ø
Aufnahme fuer Schweissbolzen Ø

Tensile Force (N)
Tenue au serrage (N)
Schlaufenhaltekraft (N)
siehe Tabelle/
see table

Hole Size
Trou Ø
Loch Ø

Panel Thickness
Épaisseur Support
Blechdicke

Bundle Ø
Toron Ø
Buendel Ø
siehe Tabelle/
see table

Material
Matière
Werkstoff

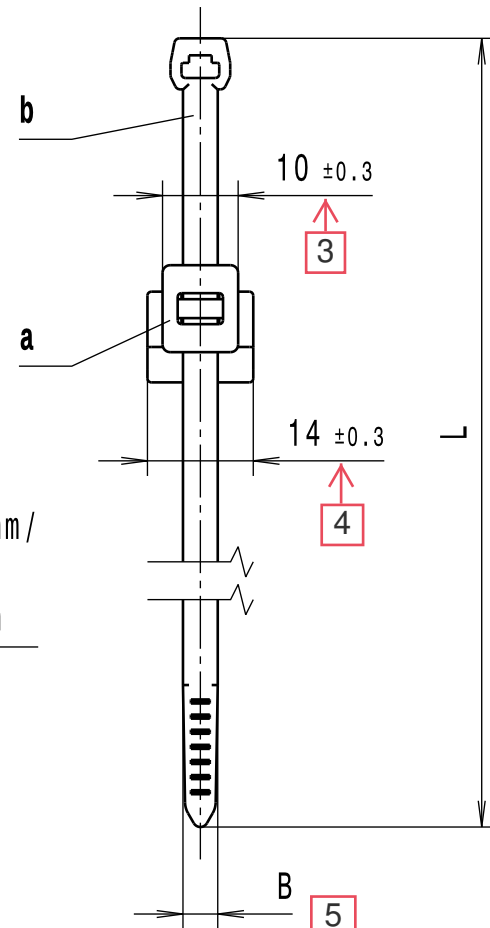
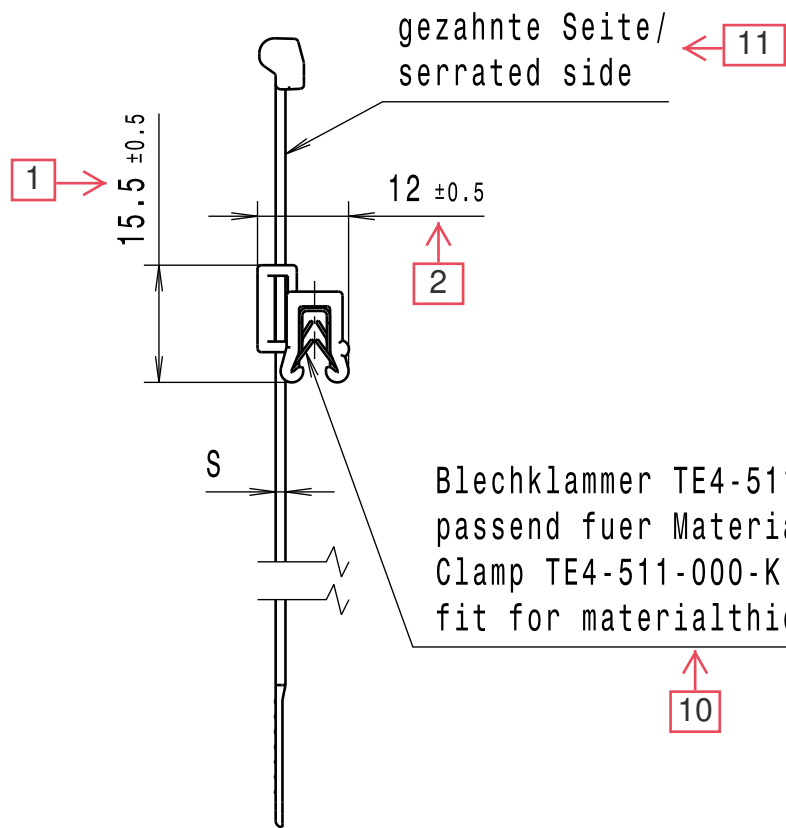
a:
PA 6.6

b:
PA 6.6

Tolerances
Dimension without tolerances
details to:
Tolérances
Cotes sans tolérances:
Toleranzen
Masse ohne
Toleranzangaben nach:

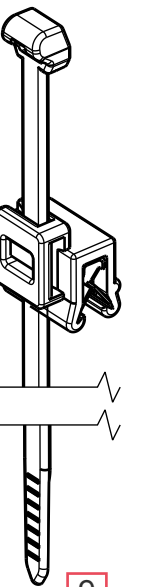
PERFORMANCE
SPECIFICATION
AUSFUEHRUNG
SPEZIFIKATION

Durch das Herstellverfahren bedingte Geometrieaenderungen (Anspritzen, Auswerfermarkierungen, etc.) zulaessig. Einzelheiten der Ausfuehrung bleiben dem Hersteller ueberlassen. The manufacturing-related geometry changes (injection point, ejectors marks, etc.) allowed. Design of the details are left to suppliers discretion.



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ISO
1:1



Bezeichnungsbeispiel: ① ②
a: Sockel EC5A und
b: Kabelbinder T50ROS
ist: Befestigungsbinder T50ROSEC5A
Example of designation:
a: Socket EC5A and
b: Cable tie T50ROS
being: Fixing tie T50ROSEC5A

deutscher Text ist verbindlich /
german text is valid

Revision level Indice Aenderungsstand		Revision Record Désignation Beschreibung der Aenderung	Changed Modifié Geändert	Date Datum	Approved Approuvé Geprüft	Date Datum
Drawing Dessin Zeichnung	Part Pièce Solid					
1	0	Bezeichnung ...EC5A war ...EC5B	Steiner	16.11.00	Mueller	16.11.00
2	0	T50SOSEC5A in Tabelle hinzu, Bezeichnung -MC5-BK entfaellt	Steiner	23.04.01	Wien	23.04.01
3	0	Buendel Ø 31 mm war Ø 45 mm	Mueller	26.04.02	Wien	26.04.02
4	0	Farbe natur und Schlaufenhaltekraft hinzu, Mass 200 ±5 war 200 ±10, Rahmen neu, CAD-Systemwechsel	Langeloh	07.08.08	Spiesz	07.08.08
5	0	Materialangaben ueberarbeitet	Langeloh	24.10.11	Schiwek	24.10.11

Zeile/ line	Artikelbezeichnung/ product type	Laenge/ length L	Bandbreite/ strap width B	Dicke/ thickness S	Buendel/ bundle Ø	Schlaufenhaltekraft/ tensile force N min.
1	T50ROSEC5A	200 ±5	4.6 ±0.2	1.3 ±0.2	4-45	225
2	T50SOSEC5A	150 ±5	4.6 ±0.2	1.3 ±0.2	4-31	225

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	Approved Approuvé Par Geprueft	Spiesz	27.09.00	Title Titre Benennung	Befestigungsbinder/Fixing tie ...EC5A		
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					Sheet Page Blatt 1 / 1		