

Tornesch, 12.05.2022

Information über eine Rohstoffumstellung zur Sicherstellung der Lieferfähigkeit

Sehr geehrte Damen und Herren,

aufgrund der aktuellen angespannten Rohstoffverfügbarkeit sind wir gezwungen alternative Rohstoffe einzusetzen. Dies dient der langfristigen Aufrechterhaltung unserer Lieferfähigkeit. Die betroffenen Artikel sind im Anhang aufgeführt.

Durch diesen Schritt können wir die Lieferkette aufrecht erhalten, um Ihnen auch weiterhin als verlässlicher Partner zur Seite zu stehen.

Die HellermannTyton Zeichnungen behalten ihre Gültigkeit. da es sich bei beiden Rohstoffen um die gleiche Materialklasse (PA66) handelt.

Die Performance der Artikel ist bei beiden Rohstoffen vergleichbar und liegen über den geforderten Werten. Die funktionsrelevanten Bauteile (Kabelbinder und Metallklammer) bleiben unverändert.

Rohstoff (alt) Akromid A31S3 (1139)
Rohstoff (neu) Grilon TSZ1 black

Bestelladresse, Artikelnummern, Versandort, Ansprechpartner, Produktionsstandort, Herkunftsland, Beutel-, Karton- und Palettengröße bleiben unverändert.

Die Umstellung auf den neuen Rohstoff findet einfließend ab dem 1.9.2022 statt.

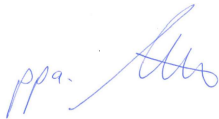
Wir bitten Sie um Rückmeldung bis zum 27.05.2022, falls ein neuer EMPB / PPAP benötigt wird.

Für weitere Fragen stehen wir Ihnen jederzeit gerne zur Verfügung.

Wir freuen uns auf eine weiterhin erfolgreiche Zusammenarbeit.

Mit freundlichen Grüßen

HellermannTyton GmbH



ppa. Harald Gottlieb
Director Automotive
Head of Automotive Global



i.A. Torben Konetzny
Product Manager
Cable Ties and Fixings

Anlagen:
Artikelübersicht

HellermannTyton

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.: 97969 with submission date 27.07.2022 will be considered as complete and valid auto- matically on 26.08.2022 unless otherwise disposed!

Part Submission Warrant

Part Name T50REC5B, Shown on Drawing No. 141441, Engineering Change Level 6, Cust. Part Number 2934854, Org. Part Number 15040582, Dated 14.06.2018, Weight (kg) 0,0029

ORGANIZATION MANUFACTURING INFORMATION

HellermannTyton GmbH, DUNS: 315430892, Großer Moorweg 45, Tornesch, Germany

CUSTOMER SUBMITTAL INFORMATION

REXEL Germany GmbH & Co. KG, Robert Grünert, various

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? Submitted by IMDS or other customer format: -

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, Level 2 - Warrant with product samples and limited supporting data, Level 3 - Warrant with product samples and complete supporting data, 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. 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.

EXPLANATION/COMMENTS:

Is each Customer Tool properly tagged and numbered? Organization Authorized Signature i.A. N. Lohse, Print Name i.A. N. Lohse, Title Quality Assistant

FOR CUSTOMER USE ONLY (IF APPLICABLE)

PPAP Warrant Disposition: Approved, Rejected, Other, Customer Signature, Print Name, Customer Tracking Number (optional)



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, GERMANY 25436
 Attention : AXEL LANG

Certificate Date : 11-Feb-22
 Delivery No : 382604159
 Shipped Qty : 47,450.000 Lbs
 21,523.320 Kgs
 Customer P.O. No: 4500155499/30
 Container : 0000000000002085153

Certificate of Analysis

This certifies that Nylon Resin shipped to you from Ascend Performance Materials Operations LLC has been tested and found to meet 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, GMW16036P-PA66.

Material: VYDYNE 22HSP NT **Material No:** 10425537 **Batch No:** JK22VY05 **Date of Mfg:** 22-Nov-2021

Ascend Performance Materials Operations LLC Specification

<u>Lot Data Property</u>	<u>Test Method</u>	<u>Min</u>	<u>Max</u>	<u>Result</u>	<u>Units</u>
Copper	STM 00667	80	100	88	PPM
Flex Modulus	ISO 178;2MM/MIN	2500		3056	MPa
Moisture	ASTM D6869	0.12	0.20	0.13	%
Nom. Str.@ Brk	ISO 527-1,2 / 1A	17.5	35.0	26.9	%
Notched Izod	ISO 180 / 1A	3.5	8.0	4.9	kJ/m^2
Relative Visc.	ASTM D789[9.34]	45.0	48.0	46.0	N/A
Strength @ Yld	ISO 527-1,2 / 1A	78	98	80	MPa
VISCOSITY NUM. SULFURIC	ISO 307	136.9	142.8	138.9	ml/g

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. Ascend and Vidyne are registered trademarks of Ascend Performance Materials Operations LLC.



EMS-GRIVORY

Inspection certificate 21000189

according to: DIN EN 10204 3.1

Hellermann Tyton Sp.z.o.o.

Kotunia 111
PL, 62-400, StupcaConfirmation EMS: 524976/01
Ord. no. customer: 4500130335
Packing List: 233878
Date of delivery: 04.01.2021**To:**
Fax No.: +48632237110**Product:**

Grilon TSZ 1 schwarz 9835 (Sackware 25kg) 112

Quantity [kg]:

10500

Production Number Position:0131307 067, 068, 069, 070, 071, 072, 073, 074, 075, 076
, 077, 078, 079, 080

			Production Number:			
Properties	Method	Unit	0131307			
Moisture content 160°C Karl-Fischer	ISO15512	%	0.03			
MVR at 275°C 5 kg	ISO1133	ml/10min	120			

Gross-Umstadt, 05.01.2021
K. Hryniewicz, Quality Assurance

We hereby certify that the material fully corresponds to the agreed properties and condition. The applicable procedures such as sampling, test plan and methods are described in our quality system in accordance with IATF 16949 and certified by SQS. The test results have been determined to the best of our knowledge. Our company does not accept any liability for properties of parts manufactured from this material. In addition, the qualification of the product for a given application cannot be derived from the data and must be ascertained by the customer. The certificate does not release the customer from a received material inspection. The general sales terms and conditions of purchase of EMS-CHEMIE (Deutschland) GmbH apply. These can be downloaded at www.emsgrivory.com. This document is issued electronically and is valid without signature.



HFP BANDSTAHL
HUEHOCO GROUP

HFP Bandstahl GmbH | Postfach 1222 | DE-36422 Bad Salzungen

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

Eingegangen
29.06.2021

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

21003616

Abnahmeprüfzeugnis WZ-52106067

DIN EN 10204 3. (1.05) Datum: 28.06.2021

Zu Lieferschein LA-52106067
Zu Auftrag Lieferplan AL-21000412

vom: 28.06.2021
vom: 23.10.2020

Seite: 1
(FB_036)

Bestellnummer: E 20 00659 Bestelldatum: 21.10.2020 Lieferant: 1690000
Kundennummer: 10009 Fax-Nr.: +49 2754 375364 eMail: nadine.schuppert@osterrath.de
Abruf-Nr.: 9. Abruf 22.06.2021

Artikelnummer	Kundenartikel	Menge ME
0400003500101832 0,4B x 35,0 C75S +A_GK G DIN/EN/Norm 10132-4 / 10140 ** Im Übrigen wie bestätigt ** Lieferzustand geölt	BC-04003530 MA-RL	12.561 kg

Schmelzanalyse *									
Schmelzen-Nr.	C	Si	Mn	P	S	Cr	Mo	Ni	
Soll min	0,700	0,150	0,600						
Soll max	0,800	0,350	0,900	0,025	0,025	0,400	0,100	0,400	
582228	0,710	0,240	0,690	0,007	0,001	0,220	0,004	0,030	

Maßtoleranzen		Soll Dicke	0,4	-0,03 /
	Soll Breite	35,0		/ +0,2

Mechanische Werte *					
Packstück	Dicke (mm)	PA-Nr.	Rp (MPa)	Rm (MPa)	A (%) A80
Soll min	0,370				15,0
Soll max	0,400		510	640	

Abruf-Nr.: 9. Abruf 22.06.2021					
UP201777	0,379	21002060-5	409	557	25,2
UP201778	0,385	21002060-5	388	547	25,1
UP201779	0,379	21002060-5	409	557	25,2
UP201793	0,388	21002060-5	383	541	25,0
UP201794	0,388	21002060-5	383	541	25,0
UP201799	0,388	21002060-5	383	541	25,0
UP201816	0,379	21002060-5	409	557	25,2
UP201817	0,379	21002060-5	409	557	25,2
UP201820	0,388	21002060-5	383	541	25,0
UP201826	0,388	21002060-5	383	541	25,0
UP201830	0,385	21002060-5	388	547	25,1
UP201832	0,385	21002060-5	388	547	25,1

HFP Bandstahl GmbH | Ein Unternehmen der HUEHOCO GRUPPE | WE MAKE PRODUCTS PROUD

Lieferanschrift
Schäfergasse 1
DE-36433 Bad Salzungen

Geschäftsführer
Michael Frank
Helmut Germann

Telefon
0049 3695 663-0
Telefax
0049 3695 663-105
E-Mail
Info@hfp-bandstahl.de
Web
www.hfp-bandstahl.de

Register
Jena HRB 306033
UID-Nr.
DE289746684

GEPRÜFT
10.07.2021
Sebastian Damm



Management
System
LATE 16040:2016
www.tuv.com
ID 310603746

Bankverbindung
Wartburg-Sparkasse Konto-Nr. 126080 BLZ 84055050
IBAN: DE6784055050000126080 SWIFT: HELADEF1WAK
Commerzbank Bad Hersfeld Konto-Nr. 0460255900 BLZ 52080080
IBAN: DE78520800800460255900 SWIFT: DRESDEFF520
Deutsche Bank Erfurt Konto-Nr. 5377148 BLZ 82070000
IBAN: DE2182070000537714800 SWIFT: DEUTDE88XXX



HFP BANDSTAHL

HUEHOCO GROUP

21003616

HFP Bandstahl GmbH | Postfach 1222 | DE-36422 Bad Salzungen

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

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

Abnahmeprüfzeugnis WZ-52106067

DIN EN 10204 3. (1.05) Datum: 28.06.2021

Zu Lieferschein LA-52106067
Zu Auftrag Lieferplan AL-21000412

vom: 28.06.2021
vom: 23.10.2020

Seite: 2
(FB_036)

Bestellnummer: E 20 00659 Bestelldatum: 21.10.2020 Lieferant: 1690000

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

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

Abnahmebeauftragter
Sebastian Specht

GEPRÜFT
10.07.2021
Sebastian Damm

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Lieferanschrift
Schäfergasse 1
DE-36433 Bad Salzungen

Geschäftsführer
Michael Frank
Helmut Germann

Telefon
0049 3695 663-0
Telefax
0049 3695 663-106
E-Mail
info@hfp-bandstahl.de
Web
www.hfp-bandstahl.de

Register
Jona HRB 306033
UID-Nr.
DE289746684

Bankverbindung
Wartburg-Sparkasse Konto-Nr. 126080 BLZ 84050050
IBAN: DE67840550500000126080 SWIFT: HELADEF1WAK
Commerzbank Bad Hersfeld Konto-Nr. 0460255900 BLZ 52080080
IBAN: DE78520800800460255900 SWIFT: DRESDEFF520
Deutsche Bank Erfurt Konto-Nr. 5377148 BLZ 82070000
IBAN: DE2182070000537714800 SWIFT: DEUTDE33XXX



Management
System
IATF 16949:2016

www.tuv.com
ID 91086375-16



AU21-12434

Prüfzeugnis/inspection certificat DIN EN 10204/3.1

Kunde:	Osterrath GmbH & Co.KG
Artikel:	Stahl-Klammer 61-3944-15/6049 10004221F
Menge:	891kg
Auftragsnummer:	AU21-12434
Beschichtungsdatum: Beschichtung / coating:	19.08.21 microcor 500 silber GZ TL245 t647
Schichtstärke/thickness (middle)	18µm (ZnPHS,Protekt KL 100, VH301GZ)
Korrosionsbeständigkeit / corrosion protection : DIN EN ISO 9227 NSS : Rostgrad / rust grade DIN EN ISO 4628-3:	R10 840h (VW TL 245 t647)

Chargen: 2103347

Datum: 19.08.21

QM: QMB Herr Schäfer

P-FMEA	D-02	Project- No GPN / NT Nr.	variable	Revision date Überarbeitungsdatum	04.05.2022
Product Group 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	04.05.2023
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, Ch. Sievert NT-PM				
Process Responsibility Prozessverantwortung bei	HT-Tornesch	Version of FMEA Version der FMEA	15	This FMEA is generated and administrated electronically. Valid without signature. Diese FMEA ist elektronisch erstellt und verwaltet. Gültig ohne Unterschrift.	
Prepared by Erstellt von	Marco Michel	Original Issue Date Erstausgabe Datum	01.07.2010		

We confirm that we have process FMEA's available - They are valid for the parts belonging to the Product Group mentioned above.

Due to confidentially reasons all further pages of this Process-FMEA need to remain internally, they should not be distributed to external!

In case of entitled interests this documents can be reviewed upon request and on site.

Process Flow Chart

PART NUMBER: 150-40582	GPN: 97-0405	CORE TEAM: PE, NTPM, QM, PR
PART NAME: T50REC5B-PA66HS/PA66HIRHS-BK		KEY CONTACT PHONE: +49 4122 701 330
DRAWING : 141441		DATE REVIEWED: 01.07.2022
PRODUCT GROUP: D-02	PRODUCTION PLANT: HT Tornesch	CUSTOMER APPROVAL:

Process / test procedure document

100 goods in

↳ 20 incoming inspection

010-40597	EDGE CLIP 5
011-20130	PA66 HIR HS BK
011-30163	PA66+PA6 HIR HS BK
019-00520	metal clip
010-04950	T50R-HS-BK-D1



VA13.1

200 injection moulding

↳ 50 process inspection
first / final shot + 1 per shift visual attributes 1-9 by production / for process parameter see EDP-System

010-40597	EDGE CLIP 5
-----------	-------------



VA13.1

400 assembling at HT Supplier

↳ 58 assembling inspection HT Supplier

010-40598	EC5-HIRHS-BK
-----------	--------------



VA13.1

101 goods in HT Supplier

↳ 81 final inspection (3 times)

150-40582	T50REC5B-PA66HS/PA66HIRHS-BK
010-40598	EC5-HIRHS-BK

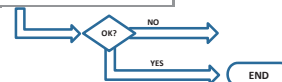


VA13.1

1000 ARTICLE-AUDIT

↳ 100 annual layout

150-40582	T50REC5B-PA66HS/PA66HIRHS-BK
-----------	------------------------------



VA13.1

Control Plan

rev: 26.01.2022

<input type="radio"/> Prototyp <input type="radio"/> Pre-Launch <input checked="" type="radio"/> Production	PART NUMBER: 150-40582	GPN: 97-0405	CORE TEAM: PE, NTPM, QM, PR
	PART NAME: T50RECSB-PA66HS/PA66HIRHS-BK		KEY CONTACT PHONE: +49 4122 701 330
	DRAWING : 141441		DATE REVIEWED: 01.07.2022
	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
010-04950 T50R-HS-BK-D1						
116 compare with master sample			1 pcs	1 / delivery	500738 Master Samples, 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	
011-30163 PA66+PA6 HIR HS BK						
302 COC residual moisture			1 bag	1 / delivery	410000 manual / visual	
306 COC meld volume index			1 bag	1 / delivery	410000 manual / visual	
019-00520 metal clip						
40-1 dimension		5 - 6,5 mm	5 pcs	SKIP LOT PLAN	140000 profile projector	
40-2 dimension		0 - 0,4 mm	5 pcs	SKIP LOT PLAN	140000 profile projector	
40-3 dimension		0 - 0,6 mm	5 pcs	SKIP LOT PLAN	140000 profile projector	
40-4 dimension		3,9 - 4,2 mm	5 pcs	SKIP LOT PLAN	140000 profile projector	
40-5 dimension		7,75 - 8,2 mm	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		410 - 520 HV10	1	SKIP LOT PLAN	410000 manual / visual	

Control Plan

rev: 26.01.2022

<input type="radio"/> Prototyp <input type="radio"/> Pre-Launch <input checked="" type="radio"/> Production	PART NUMBER: 150-40582	GPN: 97-0405	CORE TEAM: PE, NTPM, QM, PR
	PART NAME: T50RECSB-PA66HS/PA66HIRHS-BK		KEY CONTACT PHONE: +49 4122 701 330
	DRAWING : 141441		DATE REVIEWED: 01.07.2022
	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
019-00520 metal clip						
1007 pull out force		min 70 N / HTQS-Blech	20 pcs	SKIP LOT PLAN	10000 Tensile tester	
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	
58 assembling inspection HT Supplier						VA13.1
010-40598 EC5-HIRHS-BK						
85 assembling				100%	1000001 automatic check unit 1000001 automatic check unit	

Control Plan

rev: 26.01.2022

<input type="radio"/> Prototyp <input type="radio"/> Pre-Launch <input checked="" type="radio"/> Production	PART NUMBER: 150-40582	GPN: 97-0405	CORE TEAM: PE, NTPM, QM, PR
	PART NAME: T50REC5B-PA66HS/PA66HIRHS-BK		KEY CONTACT PHONE: +49 4122 701 330
	DRAWING : 141441		DATE REVIEWED: 01.07.2022
	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
81 final inspection (3 times)						VA13.1
010-40598 EC5-HIRHS-BK						
116 compare with master sample			1 pcs	1 / delivery	420000 sample / visual	
150-40582 T50REC5B-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	500892 Master Samples, visual	
118 identification single parts			1 bag	1 / delivery	500892 Master Samples, visual	
100 annual layout						VA13.1
150-40582 T50REC5B-PA66HS/PA66HIRHS-BK						
1200 requalification / product audit acc. DRW-spec incl. packageing (1 part-No for mentioned part group)			1 shot	1 acc. AUDITPLAN		

Capability study (ppk)

partname: EDGE CLIP 5
GPN: 97-0405

Date: 13.07.2022

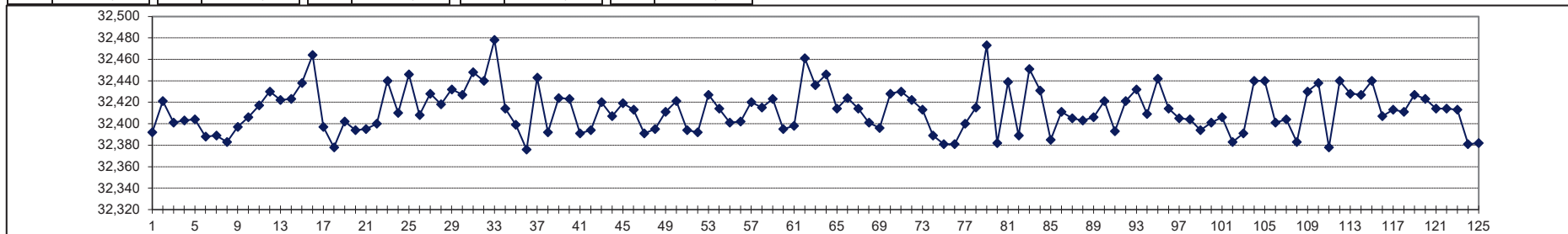
No.:	weight (g)	No.:	weight (g)	No.:	weight (g)	No.:	weight (g)	No.:	weight (g)
1	32,392	26	32,408	51	32,394	76	32,381	101	32,406
2	32,421	27	32,428	52	32,392	77	32,400	102	32,383
3	32,401	28	32,418	53	32,427	78	32,415	103	32,391
4	32,403	29	32,432	54	32,414	79	32,473	104	32,440
5	32,404	30	32,427	55	32,401	80	32,382	105	32,440
6	32,388	31	32,448	56	32,402	81	32,439	106	32,401
7	32,389	32	32,440	57	32,420	82	32,389	107	32,404
8	32,383	33	32,478	58	32,415	83	32,451	108	32,383
9	32,397	34	32,414	59	32,423	84	32,431	109	32,430
10	32,406	35	32,399	60	32,395	85	32,385	110	32,438
11	32,417	36	32,376	61	32,398	86	32,411	111	32,378
12	32,430	37	32,443	62	32,461	87	32,405	112	32,440
13	32,422	38	32,392	63	32,436	88	32,403	113	32,428
14	32,423	39	32,424	64	32,446	89	32,406	114	32,427
15	32,438	40	32,423	65	32,414	90	32,421	115	32,440
16	32,464	41	32,391	66	32,424	91	32,393	116	32,407
17	32,397	42	32,394	67	32,414	92	32,421	117	32,413
18	32,378	43	32,420	68	32,401	93	32,432	118	32,411
19	32,402	44	32,407	69	32,396	94	32,409	119	32,427
20	32,394	45	32,419	70	32,428	95	32,442	120	32,423
21	32,395	46	32,413	71	32,430	96	32,414	121	32,414
22	32,400	47	32,391	72	32,422	97	32,405	122	32,414
23	32,440	48	32,395	73	32,413	98	32,404	123	32,413
24	32,410	49	32,411	74	32,389	99	32,394	124	32,381
25	32,446	50	32,421	75	32,381	100	32,401	125	32,382

acceptable tolerance (+/-) 5 [‰]

max	32,4780
min	32,3760
R	0,1020
S	0,0209
X/	32,4129
LT	32,2508
UT	32,5749
valid +/-	0,1621

ppk 2,58

(demand: >= 1.67)



REPEATABILITY AND REPRODUCIBILITY ANALYSIS REPORT

acc. to MSA 4th Edition

NON DESTRUCTIVE TEST

Specimen : Plastic reference part (GPN20-1304)	Gage type : Weight scale	Plant : Tornesch
Part. No. : 01021304	Gage number : PMN 02-0111	Date : 31.01.2022
Characteristic : Shot weight (±3,5‰)	performed by: Name: Tobias Cohrt	approved by: Jens Feil
Tolerance : 0,064 Units gramm	Signature:	

# of operators:	3	# of trials:	3	# of parts:	10						
OPERATOR	A: Victor Salogin			B: Stefan Specker			C: Frank Werner				
TRIAL #	P		A		R		T		RESULTS		
	1	2	3	4	5	6	7	8	9	10	AVG
A 1	8,086	8,096	8,092	8,094	8,097	8,090	8,088	8,091	8,094	8,093	A ₁
A 2	8,087	8,095	8,093	8,094	8,097	8,090	8,088	8,092	8,094	8,093	A ₂
A 3	8,086	8,096	8,093	8,095	8,098	8,091	8,089	8,091	8,093	8,095	A ₃
Average	8,086	8,096	8,093	8,094	8,097	8,090	8,088	8,091	8,094	8,094	X _A 8,0924
Range	0,001	0,001	0,001	0,001	0,001	0,001	0,001	0,001	0,001	0,002	R _A 0,0011
B 1	8,087	8,096	8,093	8,094	8,097	8,090	8,088	8,091	8,094	8,093	B ₁
B 2	8,087	8,097	8,093	8,094	8,097	8,091	8,087	8,092	8,093	8,093	B ₂
B 3	8,086	8,098	8,093	8,095	8,097	8,092	8,089	8,090	8,094	8,093	B ₃
Average	8,087	8,097	8,093	8,094	8,097	8,091	8,088	8,091	8,094	8,093	X _B 8,0925
Range	0,001	0,002	0,000	0,001	0,000	0,002	0,002	0,002	0,001	0,000	R _B 0,0011
C 1	8,087	8,097	8,092	8,095	8,097	8,091	8,089	8,091	8,093	8,093	C ₁
C 2	8,086	8,098	8,095	8,095	8,096	8,091	8,089	8,091	8,094	8,094	C ₂
C 3	8,088	8,097	8,093	8,094	8,097	8,090	8,088	8,092	8,095	8,093	C ₃
Average	8,087	8,097	8,093	8,095	8,097	8,091	8,089	8,091	8,094	8,093	X _C 8,0927
Range	0,002	0,001	0,003	0,001	0,001	0,001	0,001	0,001	0,002	0,001	R _C 0,0014
PART	8,0867	8,0967	8,0930	8,0944	8,0970	8,0907	8,0883	8,0912	8,0938	8,0933	R _{PART} = 0,0103
R = R _A + R _B + R _C / No of operators											R = 0,0012
X _{DIFF} = [Max (X) _{ABC}] - [Min (X) _{ABC <td>X_{DIFF} = 0,0003</td>}											X _{DIFF} = 0,0003
UCL _R = R * D ₄											UCL _R = 0,0031
D ₄ = 3,27 for 2 trials											D ₄ = 2,58 for 3 trials

Measurement Unit Analysis	Total Variation Method	Tolerance Method				
Repeatability : Equipment Variation (EV) $EV = R * K_1$ $EV = 0,0007$	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Trials</th> <th>K₁</th> </tr> <tr> <td>3</td> <td>0,5908</td> </tr> </table>	Trials	K ₁	3	0,5908	$% EV = 100[EV/TV]$ $% EV = 21,29$
Trials	K ₁					
3	0,5908					
Reproducibility : Appraiser Variation (AV) $AV = [(X_{DIFF} * K_2)^2 - (EV^2 / nr)]^{1/2}$ $AV = 0,0001$	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Oper</th> <th>K₂</th> </tr> <tr> <td>3</td> <td>0,5231</td> </tr> </table>	Oper	K ₂	3	0,5231	$% AV = 100[AV/TV]$ $% AV = 3,51$
Oper	K ₂					
3	0,5231					
Repeatability & Reproducibility (GRR) $GRR = (EV^2 + AV^2)^{1/2}$ $GRR = 0,0007$	$% GRR = 100[GRR/TV]$ $% GRR = 21,58$	$% GRR = 100[GRR/(tol/6)]$ $% GRR = 6,74$				
Part Variation (PV) $PV = R_{PART} * K_3$ $PV = 0,0033$	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Parts</th> <th>K₃</th> </tr> <tr> <td>10</td> <td>0,3146</td> </tr> </table>	Parts	K ₃	10	0,3146	$% PV = 100[PV/TV]$ $% PV = 97,64$
Parts	K ₃					
10	0,3146					
Total Variation (TV) $TV = (GRR^2 + PV^2)^{1/2}$ $TV = 0,0033$	CONCLUSION: <div style="border: 1px solid black; padding: 5px; display: inline-block;">Gage system is satisfactory.</div>					
Number of Distinct Categories (ndc) $ndc = 1.41(PV / GRR)$ $ndc = 6,37938$						

- 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:

Durch das Herstellverfahren bedingte Geometrieaenderungen (Anspritzung, 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.

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					
6	0	CAD system changed, Tensile force and view added, Material specification revised, Dimensions of cable ties matched with Group Standard	I. Langeloh	14.06.18	B. Schiwiek	14.06.18

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

Tensile Force (N)
Tenue au serrage (N)
Schlaufenhaltekräft (N)
siehe Tabelle / see table ⑥

Hole Size / Trou Ø / Loch Ø

Panel Thickness / Epaisseur Support / Blechdicke

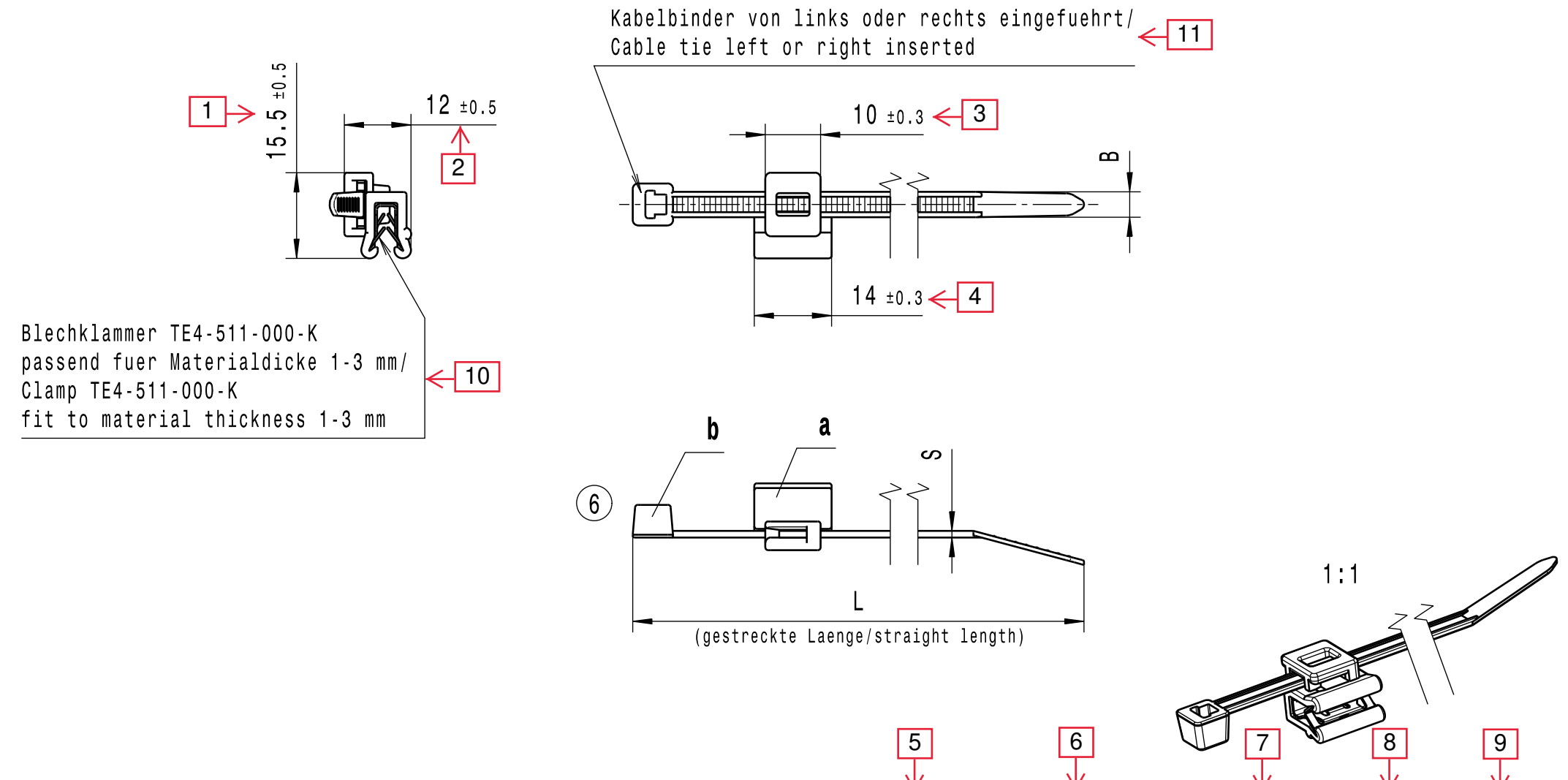
Bundle Ø / Toron Ø / Buendel Ø
siehe Tabelle / see table

Material / Matière / Werkstoff
a: PA6.6
b: PA6.6 ⑥

Tolerances / Dimension without tolerances: / Tolérances / Cotes sans tolérances: / Toleranzen / Masse ohne / Toleranzangaben:

Angle / Winkel
≤ 6
≤ 30
≤ 60
≤ 120
≤ 400
≤ 1000

PERFORMANCE SPECIFICATION
AUSFUEHRUNG SPEZIFIKATION



Projektnr. / Project no.	NT 405-97
Halbfabrikat / semi-finished part	EC5
	T50R
	T30R

Zeile / line	Artikelbezeichnung / Product type	Projektnr. / Project no.	Laenge / Length L	Bandbreite / Strap width B	Dicke / Thickness S	Buendel / Bundle Ø	Schlaufenhaltekräft / Tensile force N min.
1	T50REC5B	NT 405-97	202 ± 10	4.6 ± 0.2	1.2 ± 0.3	4-45	225
2	T30REC5B	NT 405-97	148 ± 7	3.6 ± 0.5	1.1 ± 0.2	4-35	135

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Scale / Echelle / Maszstab: 1:1
Project Number / Numéro de projet / Projektnummer: siehe Tabelle / see table
Title / Titre / Benennung: Befestigungsbinder / Fixing tie ... EC5B
Drawing-No / Plan-No / Zeichnungs-Nr: 14.1441
Format / D.Size: A3
Sheet / Page / Blatt: 1 / 1