

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.

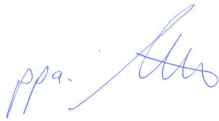
Wir bitten Sie um Rückmeldung bis zum 27.05.2022, falls ein neuer EMPB / PPAP benötigt wird.

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

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.:			
97976	with submission date	27.07.2022	will be considered as complete and valid auto-
atically on	26.08.2022	unless otherwise disposed!	

Part Submission Warrant

Part Name T50ROSEC10 Cust. Part Number 2539436
 Shown on Drawing No. 141683 Org. Part Number 15605904
 Engineering Change Level 2 Dated 28.07.2011
 Additional Engineering Changes n/a Dated n/a
 Safety and/or Government Regulation ☐ Yes ☒ No Purchase Order No. 15605904 Weight (kg) 0,0032
 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

REXEL Germany GmbH & Co. KG

Customer Name/Division

Robert Grünert

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:

-

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
usage of suitable material (Grilon TSZ1 instead of Akromid A31S3) for supplies starting from 01.09.2022

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.

Date 27-Jul-22

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)

Internal PB-No.: **97976**

Rev #: 01
Rev. Date: 25.07.2012

HellermannTyton

97976

Production Part Approval Performance Test Results

[illegible]

Blanket statements of conformance are unacceptable for any test results.

This letter is done automatically and is valid without signature.

<u>CREATOR</u>	<u>TITLE</u>	<u>DATE</u>
i.A. N. Lohse	Quality Assistant	27-Jul-22

Hellermann Tyton Sp.z.o.o.

Kotunia 111
PL, 62-400, Stupca

Confirmation 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.



HELLERMANN TYTON GMBH
GROSSER MOORWEG 45
TORNESCH, GERMANY 25436
Attention : AXEL LANG

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

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 Vydine are registered trademarks of Ascend Performance Materials Operations LLC.



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

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Lieferanschrift
Schäfergasse 1
DE-36433 Bad Salzungen

Geschäftsführer
Michael Frank
Helmut Germann

Telefon
0049 3695 663-0
Telefax
0049 3695 663-105
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: 310603740

Bankverbindung
Wartburg-Sparkasse Konto-Nr. 126080 BLZ 84055060
IBAN: DE6784055050000126080 SWIFT: HELADEF1WAK
Commerzbank Bad Hersfeld Konto-Nr. 0480255900 BLZ 52080080
IBAN: DE78520800800460255900 SWIFT: DRESDEFF520
Deutsche Bank Erfurt Konto-Nr. 5377148 BLZ 82070000
IBAN: DE2182070000537714800 SWIFT: DEUTDE8EXXX



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

vom: 28.06.2021

Seite: 2

Zu Auftrag Lieferplan AL-21000412

vom: 23.10.2020

(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 84055050
IBAN: DE57840550500000126080 SWIFT: HELADEF1WAK
Commerzbank Bad Hersfeld Konto-Nr. 0460255900 BLZ 52080080
IBAN: DE78520800800460255900 SWIFT: DRESDEFF330
Deutsche Bank Erfurt Konto-Nr. 5377148 BLZ 82070000
IBAN: DE2182070000537714800 SWIFT: DEUTDE33XXX



Management
System
ISO 9001:2015

www.tuv.com
ID 9108637546

Barth Galvanik GmbH | In den Schwarzwäldern 4 | 61440 Oberursel (Taunus) |

Osterrath GmbH & Co.KG
Wahlbachsmühle 3

57334 Bad Laasphe

Sammel-Prüfprotokoll

Lieferschein 450720

vom 03.08.2021

Kundennummer 17800

Prüfprotokoll Nr.:462141

Auftragsnr.: 641209-1

Chargenr.: 141-200 / S2103347

Bestellmenge

Artikel

891,000 kg

Blechklammer
vergüten

613944156049

Ihr Auftrag

Ihre BestellNr

LSHT02803

Ihr LS-Datum

30.07.2021

Merkmal 1	6001 Härteprüfung KH HV10				
Messwerte	Einheit: HV10				
1 Stichprobe					

Auswertung über: 1 Stichprobe

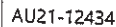
Fehler	UTG	OTG	Min	Max	Mittel
0	410,00	520,00	478,00	484,00	481,25

Messwerte der Stichproben:

Nr.	Messwerte									
1	481,00	478,00	480,00	483,00	484,00	483,00	480,00	481,00		

Die beiliegenden Teile wurden in unserem Betrieb nach den entsprechenden Normen bzw. gemäß Kundenvorschrift gewissenhaft bearbeitet und geprüft. Unsere Qualitätssicherung entbindet Sie aber nicht von der Notwendigkeit, die Teile vor der Weiterverarbeitung entsprechenden Kontrollen und Prüfungen zu unterziehen.

Dieses Protokoll wurde maschinell erstellt und ist ohne Unterschrift gültig.



Kunde:	Osterrath GmbH & Co.KG
Artikel:	Stahl-Klammer 61-3944-15/6049
	10004221F
Menge:	891kg
Auftragsnummer:	AU21-12434
Beschichtungsdatum:	19.08.21
Beschichtung / coating:	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:	Ri0
	840h (VW TL 245 t647)

USt.-IdNr.: DE126174991
Gerichtsstand: Lüdenscheid

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 Verbautort 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.

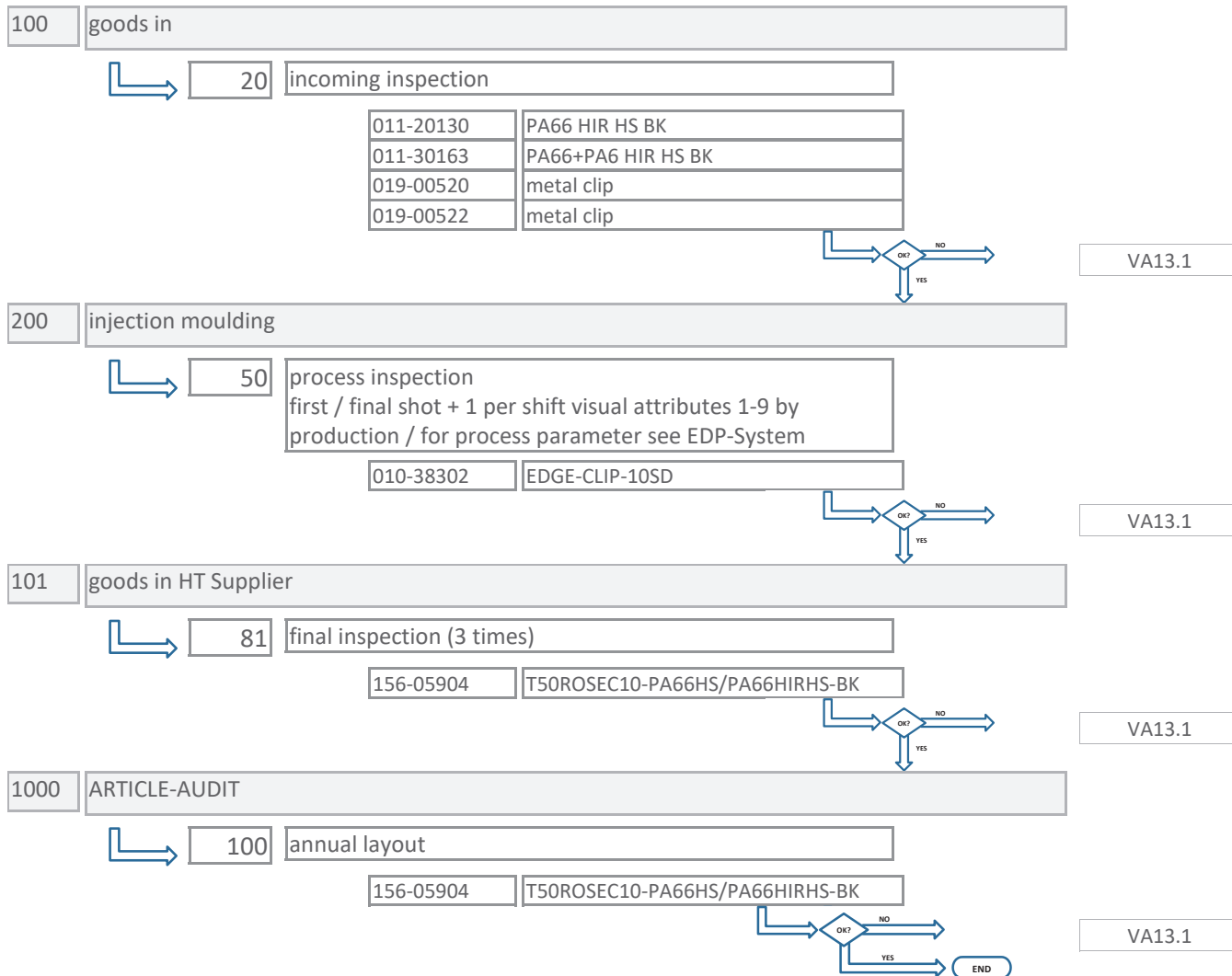
Due to confidentially reasons all further pages of this Process-FMEA need to remain internally, they should not be distributed to external!

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

Process Flow Chart

PART NUMBER:	156-05904	GPN:	02-0383	CORE TEAM:	PE, NTPM, QM, PR
PART NAME:	T50ROSEC10-PA66HS/PA66HIRHS-BK			KEY CONTACT PHONE:	+49 4122 701 330
DRAWING :	141683			DATE REVIEWED:	01.07.2022
PRODUCT GROUP:	D-02	PRODUCTION PLANT:	HT Tornesch	CUSTOMER APPROVAL:	

Process / test procedure	document
--------------------------	----------



Control Plan

rev: 26.01.2022

☐ Prototyp ☐ Pre-Launch ☒ Production	PART NUMBER:	156-05904	GPN:	02-0383	CORE TEAM:	PE, NTPM, QM, PR
	PART NAME:	T50ROSEC10-PA66HS/PA66HIRHS-BK			KEY CONTACT PHONE:	+49 4122 701 330
	DRAWING :	141683			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
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	
1007 pull out force		min 70 N / HTQS-Blech	20 pcs	SKIP LOT PLAN	10000 Tensile tester	
019-00522 metal clip						
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	

Control Plan

rev: 26.01.2022

☐ Prototyp ☐ Pre-Launch ☒ Production	PART NUMBER:	156-05904	GPN:	02-0383	CORE TEAM:	PE, NTPM, QM, PR
	PART NAME:	T50ROSEC10-PA66HS/PA66HIRHS-BK			KEY CONTACT PHONE:	+49 4122 701 330
	DRAWING :	141683	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
019-00522 metal clip						
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 expanding test			50 pcs	1 / delivery	80243 check gauge	
116 compare with master sample			5 pcs	1 / delivery	500353 Master Samples, visual	
307 COC hardness		410 - 520 HV10	1	1 / delivery	410000 manual / visual	
1007 pull out force		min 70 N / HTQS-Blech	25 pcs	1 / delivery	10000 Tensile tester	
50 process inspection						VA13.1
010-38302 EDGE-CLIP-10SD						
1 sink marks			1 shot	1 / day	501113 Master Samples, visual	
2 shortage			1 shot	1 / day	501113 Master Samples, visual	
3 Flashes			1 shot	1 / day	501113 Master Samples, visual	
4 mould mis alignment			1 shot	1 / day	501113 Master Samples, visual	
5 moulding lines			1 shot	1 / day	501113 Master Samples, visual	
6 burnings			1 shot	1 / day	501113 Master Samples, visual	
7 dirt			1 shot	1 / day	501113 Master Samples, visual	
8 deformation			1 shot	1 / day	501113 Master Samples, visual	
9 inclusions			1 shot	1 / day	501113 Master Samples, visual	
54 expanding test			1 shot	1 / day	80066 check gauge 80073 check gauge	

Control Plan

rev: 26.01.2022

☐ Prototyp ☐ Pre-Launch ☒ Production	PART NUMBER:	156-05904	GPN:	02-0383	CORE TEAM:	PE, NTPM, QM, PR
	PART NAME:	T50ROSEC10-PA66HS/PA66HIRHS-BK			KEY CONTACT PHONE:	+49 4122 701 330
	DRAWING :	141683	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
50 process inspection						VA13.1
010-38302 EDGE-CLIP-10SD						
65 shot weight		see test procedure	1 shot	1 / day	20000 balance	
81 final inspection (3 times)						VA13.1
156-05904 T50ROSEC10-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		
118 identification single parts			1 bag	1 / delivery		
100 annual layout						VA13.1
156-05904 T50ROSEC10-PA66HS/PA66HIRHS-BK						
1200 requalification / product audit acc. DRW-spec incl. packaging (1 part-No for mentioned part group)			1 shot	1 acc. AUDITPLAN		

Capability study (ppk)

partname: EC 10
GPN: 02-0383

Date: 04.07.2022

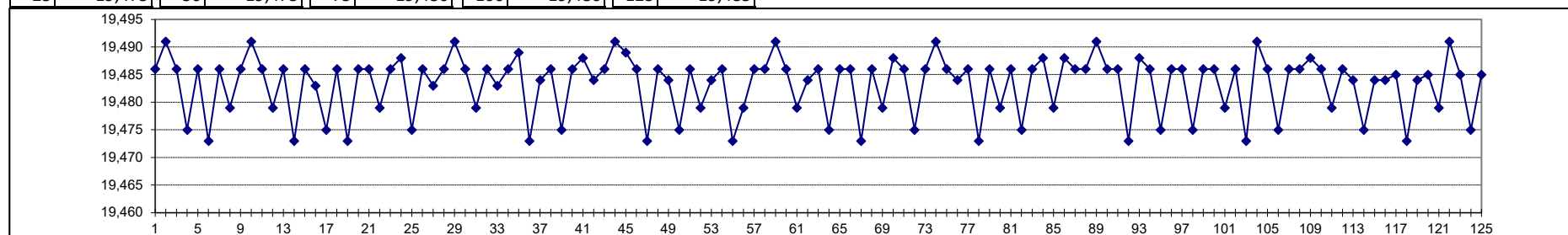
No.:	weight (g)	No.:	weight (g)	No.:	weight (g)	No.:	weight (g)	No.:	weight (g)
1	19,486	26	19,486	51	19,486	76	19,484	101	19,479
2	19,491	27	19,483	52	19,479	77	19,486	102	19,486
3	19,486	28	19,486	53	19,484	78	19,473	103	19,473
4	19,475	29	19,491	54	19,486	79	19,486	104	19,491
5	19,486	30	19,486	55	19,473	80	19,479	105	19,486
6	19,473	31	19,479	56	19,479	81	19,486	106	19,475
7	19,486	32	19,486	57	19,486	82	19,475	107	19,486
8	19,479	33	19,483	58	19,486	83	19,486	108	19,486
9	19,486	34	19,486	59	19,491	84	19,488	109	19,488
10	19,491	35	19,489	60	19,486	85	19,479	110	19,486
11	19,486	36	19,473	61	19,479	86	19,488	111	19,479
12	19,479	37	19,484	62	19,484	87	19,486	112	19,486
13	19,486	38	19,486	63	19,486	88	19,486	113	19,484
14	19,473	39	19,475	64	19,475	89	19,491	114	19,475
15	19,486	40	19,486	65	19,486	90	19,486	115	19,484
16	19,483	41	19,488	66	19,486	91	19,486	116	19,484
17	19,475	42	19,484	67	19,473	92	19,473	117	19,485
18	19,486	43	19,486	68	19,486	93	19,488	118	19,473
19	19,473	44	19,491	69	19,479	94	19,486	119	19,484
20	19,486	45	19,489	70	19,488	95	19,475	120	19,485
21	19,486	46	19,486	71	19,486	96	19,486	121	19,479
22	19,479	47	19,473	72	19,475	97	19,486	122	19,491
23	19,486	48	19,486	73	19,486	98	19,475	123	19,485
24	19,488	49	19,484	74	19,491	99	19,486	124	19,475
25	19,475	50	19,475	75	19,486	100	19,486	125	19,485

acceptable tolerance (+/-) **3,5** [‰]

max	19,4910
min	19,4730
R	0,0180
S	0,0053
X/	19,4832
LT	19,4150
UT	19,5514
valid +/-	0,0682

ppk 4,30

(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 ($\pm 3,5\%$)	performed by: Name: Tobias Cohrt	approved by: Jens Feil																																																																																																																																																																																																																																																																																																																																																																																																		
Tolerance : 0,064 Units gramm	Signature:																																																																																																																																																																																																																																																																																																																																																																																																			
# of operators: 3	# of trials: 3	# of parts: 10																																																																																																																																																																																																																																																																																																																																																																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">OPERATOR A: Victor Salogin</td> <td style="width: 33%;">B: Stefan Specker</td> <td style="width: 33%;">C: Frank Werner</td> </tr> </table>			OPERATOR A: Victor Salogin	B: Stefan Specker	C: Frank Werner																																																																																																																																																																																																																																																																																																																																																																																															
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vertical-align: middle;"> CONCLUSION: Gage system is satisfactory. </td> </tr> <tr> <td colspan="11"> Number of Distinct Categories (ndc) $ndc = 1.41(PV / GRR)$ $ndc = 6,37938$ </td> </tr> <tr> <td colspan="12"> - 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. </td> </tr> <tr> <td colspan="12">Remarks:</td> </tr> </table>											TRIAL #	P A R T										RESULTS	1	2	3	4	5	6	7	8	9	10	A 1	8,086	8,096	8,092	8,094	8,097	8,090	8,088	8,091	8,094	8,093	A ₁	2	8,087	8,095	8,093	8,094	8,097	8,090	8,088	8,092	8,094	8,093	A ₂	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	2	8,087	8,097	8,093	8,094	8,097	8,091	8,087	8,092	8,093	8,093	B ₂	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	2	8,086	8,098	8,095	8,095	8,096	8,091	8,089	8,091	8,094	8,094	C ₂	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	$R = R_A + R_B + R_C / \text{No of operators} = 0,0011 + 0,0011 + 0,0014 / 3$											R = 0,0012	$X_{DIFF} = [\text{Max}(X)_{ABC}] - [\text{Min}(X)_{ABC}] = 8,0927 - 8,0924$											X _{DIFF} = 0,0003	$UCL_R = R * D_4 = 0,0012 * 2,58$											UCL _R = 0,0031	$D_4 = 3,27 \text{ for 2 trials} \quad 2,58 \text{ for 3 trials}$											Measurement Unit Analysis											Total Variation Method	Tolerance Method	Repeatability : Equipment Variation (EV) $EV = R * K_1$ $EV = 0,0007$											Trials 3 $K_1 = 0,5908$	$\% EV = 100[EV/TV]$ $\% EV = 21,29$	$\% EV = 100[EV/(tol/6)]$ $\% EV = 6,65$	Reproducibility : Appraiser Variation (AV) $AV = [(X_{DIFF} * K_2)^2 - (EV^2 / nr)]^{1/2}$ $AV = 0,0001$											(n parts, r trials) Oper 3 $K_2 = 0,5231$	$\% AV = 100[AV/TV]$ $\% AV = 3,51$	$\% AV = 100[AV/(tol/6)]$ $\% AV = 1,10$	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) $PV = R_{PART} * K_3$ $PV = 0,0033$											Parts 10 $K_3 = 0,3146$	$\% PV = 100[PV/TV]$ $\% PV = 97,64$		Total Variation (TV) $TV = (GRR^2 + PV^2)^{1/2}$ $TV = 0,0033$											CONCLUSION: Gage system is satisfactory.			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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																																																																																																																																																																																																																																																																																																																																																																																									
$R = R_A + R_B + R_C / \text{No of operators} = 0,0011 + 0,0011 + 0,0014 / 3$											R = 0,0012																																																																																																																																																																																																																																																																																																																																																																																									
$X_{DIFF} = [\text{Max}(X)_{ABC}] - [\text{Min}(X)_{ABC}] = 8,0927 - 8,0924$											X _{DIFF} = 0,0003																																																																																																																																																																																																																																																																																																																																																																																									
$UCL_R = R * D_4 = 0,0012 * 2,58$											UCL _R = 0,0031																																																																																																																																																																																																																																																																																																																																																																																									
$D_4 = 3,27 \text{ for 2 trials} \quad 2,58 \text{ for 3 trials}$																																																																																																																																																																																																																																																																																																																																																																																																				
Measurement Unit Analysis											Total Variation Method	Tolerance Method																																																																																																																																																																																																																																																																																																																																																																																								
Repeatability : Equipment Variation (EV) $EV = R * K_1$ $EV = 0,0007$											Trials 3 $K_1 = 0,5908$	$\% EV = 100[EV/TV]$ $\% EV = 21,29$	$\% EV = 100[EV/(tol/6)]$ $\% EV = 6,65$																																																																																																																																																																																																																																																																																																																																																																																							
Reproducibility : Appraiser Variation (AV) $AV = [(X_{DIFF} * K_2)^2 - (EV^2 / nr)]^{1/2}$ $AV = 0,0001$											(n parts, r trials) Oper 3 $K_2 = 0,5231$	$\% AV = 100[AV/TV]$ $\% AV = 3,51$	$\% AV = 100[AV/(tol/6)]$ $\% AV = 1,10$																																																																																																																																																																																																																																																																																																																																																																																							
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) $PV = R_{PART} * K_3$ $PV = 0,0033$											Parts 10 $K_3 = 0,3146$	$\% PV = 100[PV/TV]$ $\% PV = 97,64$																																																																																																																																																																																																																																																																																																																																																																																								
Total Variation (TV) $TV = (GRR^2 + PV^2)^{1/2}$ $TV = 0,0033$											CONCLUSION: Gage system is satisfactory.																																																																																																																																																																																																																																																																																																																																																																																									
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:																																																																																																																																																																																																																																																																																																																																																																																																				

Revision level Indice Aenderungsstand		Revision Record Désignation Beschreibung der Aenderung	Changed Modifié Geaendert	Date Datum	Approved Approuvé Geprueft	Date Datum
Drawing Dessin Zeichnung	Part Pièce Solid					
1	0	Benennung war ...EC10SD; Rahmen neu	Langeloh	03.08.06	Schiwek	03.08.06
2	0	CAD-Systemwechsel; Farbeintrag entfernt	Langeloh	28.07.11	Schiwek	28.07.11

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Zeile/ line	Artikelbezeichnung/ Product type	Projektnr./ Project no.	Laenge/ Length L	Bandbreite/ Strap width B	Dicke/ Thickness S	Buendel/ Bundle Ø	Schlaufenhaltekraft/ Tensile force N min.				
1	T50R0SEC10	NT 383-02	200 ±5	4.6 ±0.2	1.3 ±0.2	1-45	225	X	X		
2	T50S0SEC10	NT 383-02	150 ±5	4.6 ±0.2	1.3 ±0.2	1-31	225	X		X	
3	T18R0SEC10	NT 383-02	100 ±5	2.5 ±0.2	1.0 ±0.2	1-20	80	X			X

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Tornesche

Telefon: +49 (0) 41 22 / 701 - 1
Telefax: +49 (0) 41 22 / 701 - 400

22 / 701 - 1
22 / 701 - 400

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