

Part Submission Warrant

Part Name: RET WIR HRNS,TIE STRAP Cust. Part Number: 72527037
Shown on Drawing No. EU5T-14E047-FA Org. Part Number: 230347001
Engineering Change Level: AELE E 12982958 216 Dated: 06.07.2016
Additional Engineering Changes: _____ Dated: _____
Safety and/or Government Regulation: ☐ Yes ☒ No Purchase Order No. _____ Weight (kg): 0,0023
Checking Aid No: _____ Checking Aid Engineering Change Level _____ Dated: _____

ORGANIZATION MANUFACTURING INFORMATION

A.Raymond Jablonec s.r.o. 49-504-2616
Organization Name & Supplier/Vendor Code
Čs.Armády 27/4609
Street Address
Jablonec nad Nisou 466 05 Czech republic
City Region Postal Code Country

CUSTOMER SUBMITTAL INFORMATION

YAZAKI EUROPE LIMITED
Customer Name/Division
Anabela Moreira
Buyer/Buyer Code
Ford
Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? ☒ Yes ☐ No ☐ n/a
Submitted by IMDS or other customer format: IMDS ID - 679232676

Are polymeric parts identified with appropriate ISO marking codes? ☐ Yes ☐ No ☒ n/a

REASON FOR SUBMISSION (Check at least one)

- | | |
|---|--|
| ☒ Initial Submission | ☐ Change to optional Construction or Material |
| ☐ Engineering Change(s) | ☐ Supplier or Material Source Change |
| ☐ Tooling: Transfer, Replacement, Refurbishment, or additional | ☐ Change in part Processing |
| ☐ Correction of Discrepancy | ☐ Parts Produced at Additional Location |
| ☐ Tooling Inactive > Than 1 year | ☐ Other -please specify below |

Cavities no : 65 - 80

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 Result 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 _____ / 16

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 20000 / 8 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: FMEA in our plant for inspection available.

Is each Customer Tool properly tagged and numbered? ☐ Yes ☐ No ☒ n/a

Organization Authorized Signature  Date 01.11.2018

Print Name Ondrejкова, Martina Phone No. +420 483 358 109 FAX No. _____

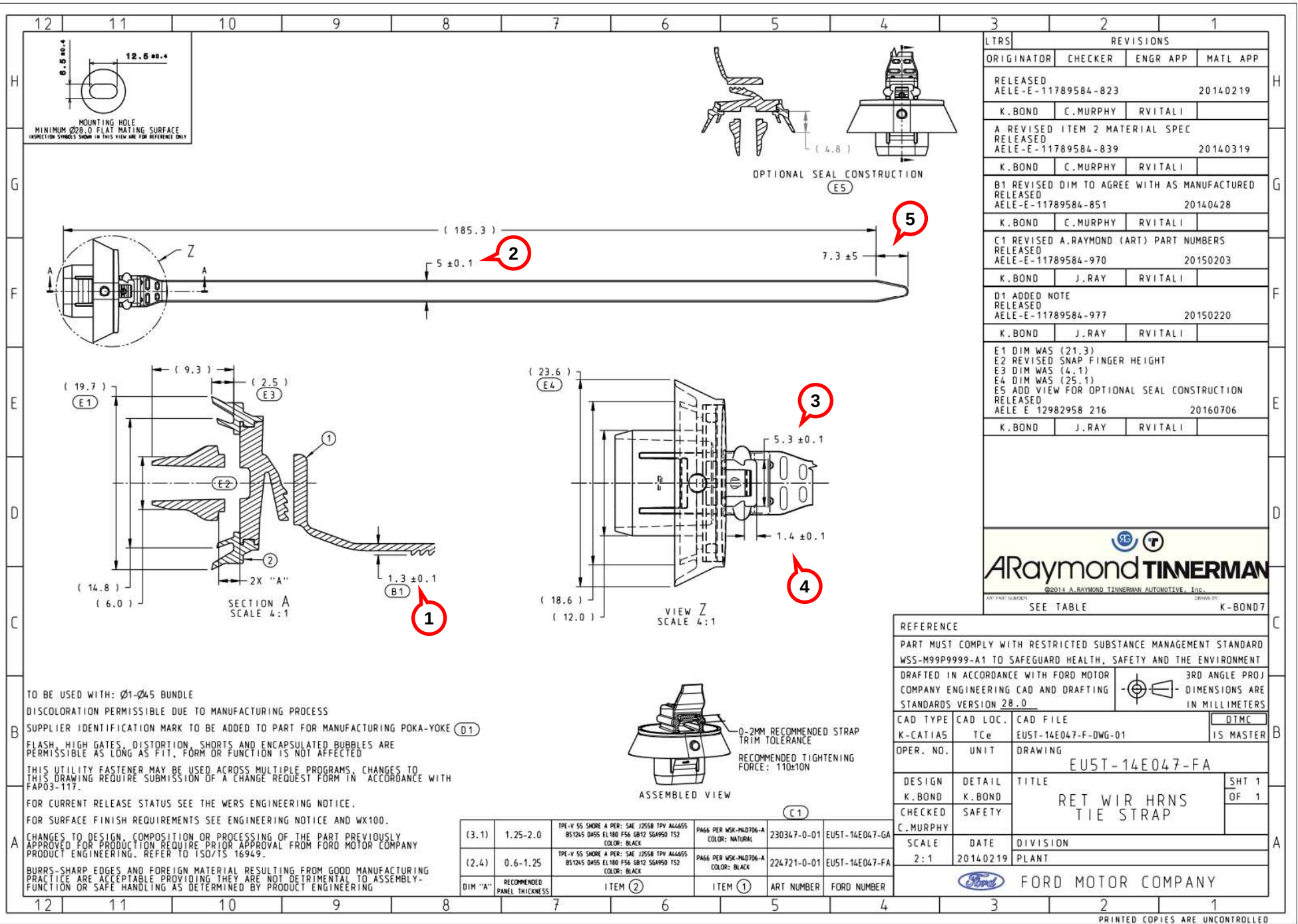
Title Quality engineer E-mail: Martina.Ondrejкова@araymond.com

FOR CUSTOMER USE ONLY (IF APPLICABLE)

PPAP Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other _____

Customer Signature: _____ Date: _____

Print Name: _____ Customer Tracking Number (optional): _____



Appendix C - Production Part Approval, Dimensional Results

DAIMLERCHRYSLER



Production Part Approval Dimensional Test Results

ARaymond

A. RAYMOND JABLONEC s.r.o.

ORGANIZATION: A.Raymond Jablonec s.r.o. SUPPLIER/VENDOR CODE: 49-504-2616 ARAYMOND PART NO.: 230347001						PART NUMBER: 72527037 PART NAME: RET WIR HRNS,TIE STRAP DESIGN RECORD CHANGE LEVEL: ENGINEERING CHANGE DOCUMENTS: AELE E 12982958 216		
INSPECTION FACILITY: TW - Torque Wrench OS - 3D Optical Scanner 3D - 3D Measuring Machine GP - Gauge Plug OP - Optical Projector C - Calliper M - Micrometer TM - Tensile Machine DI - Dial Indicator PP - Profile Projector HA - Halogen moisture analyzer								
ITEM / CAVITY	DIMENSION / SPECIFICATION	SPECIFICATION / LIMITS	INS. FACIL.	TEST DATE	QTY. TESTED	ORGANIZATION MEASUREMENT RESULT (DATA)	OK	NOT OK
01 /	length	1,30 ±0,10	C	25.10.2018	16	1,32; 1,30; 1,31; 1,32; 1,32; 1,31; 1,34; 1,32; 1,30; 1,32; 1,32; 1,31; 1,30; 1,30; 1,31; 1,31	☒	☐
02 /	length	5,00 ±0,10	C	25.10.2018	16	5,01; 5,02; 5,02; 5,02; 5,02; 5,01; 5,03; 4,99; 5,01; 5,01; 5,02; 5,02; 5,01; 5,01; 5,02; 5,01	☒	☐
03 /	length	5,30 ±0,10	C	25.10.2018	16	5,31; 5,35; 5,32; 5,36; 5,35; 5,34; 5,32; 5,31; 5,30; 5,29; 5,32; 5,31; 5,33; 5,32; 5,31; 5,34	☒	☐
04 /	length	1,40 ±0,10	OP	25.10.2018	16	1,37; 1,38; 1,41; 1,42; 1,44; 1,42; 1,39; 1,38; 1,41; 1,38; 1,40; 1,40; 1,43; 1,46; 1,42; 1,43	☒	☐
05 /	length	7,30 ±5,00	OP	25.10.2018	16	7,88; 7,86; 7,69; 7,82; 7,80; 7,80; 7,81; 7,79; 7,78; 7,85; 7,71; 7,87; 7,88; 7,68; 7,76; 7,79	☒	☐

Blanket statements of conformance are unacceptable for any test results.

March
2006

CFG-1003

SIGNATURE

TITLE

DATE

Ondrej kova, Mart

1.11.2018

Appendix D+E - Production Part Approval, Material and Performance Test Results



DAIMLERCHRYSLER



Production Part Approval Material
and Performance Test Results

A. RAYMOND JABLONEC s.r.o.

ORGANIZATION: A.Raymond Jablonec s.r.o. SUPPLIER/VENDOR CODE: 49-504-2616 ARAYMOND PART NO.: 230347001						PART NUMBER: 72527037 PART NAME: RET WIR HRNS,TIE STRAP DESIGN RECORD CHANGE LEVEL: AELE E 12982958 216 ENGINEERING CHANGE DOCUMENTS: 6.7.2016		
INSPECTION FACILITY: TW - Torque Wrench OS - 3D Optical Scanner 3D - 3D Measuring Machine GP - Gauge Plug OP - Optical Projector C - Calliper M - Micrometer TM - Tensile Machine DI - Dial Indicator PP - Profile Projector HA - Halogen moisture analyzer								
ITEM	DIMENSION / SPECIFICATION	SPECIFICATION / LIMITS	INS. FACIL.	TEST DATE	QTY. TESTED	ORGANIZATION MEASUREMENT RESULT (DATA)	OK	NOT OK
06	application	to be used in hole:6,5x12,50±0,4 slot / thickness:1,25-2,0 panel min dia. 28,0 flat mating surface		25.10.2018	16	OK	☒	☐
07	application	to be used with dia.1 - 45 bundle		25.10.2018	16	OK	☒	☐
08	appearance	discoloration permissible due to manufacturing process		25.10.2018	16	OK	☒	☐
09	appearance	flash, high gates, distortion, shorts and encapsulated bubbles are permissible as long as fit...		25.10.2018	16	OK	☒	☐
10	appearance	burrs, shar edges and foreign material resulting from good manufacturing practice are acceptable...		25.10.2018	16	OK	☒	☐
11	material	TPE-V 55 Shore A		25.10.2018	16	RTP - 6091-55A	☒	☐
12	colour	black		25.10.2018	16	OK	☒	☐
13	material	PA 66		25.10.2018	16	Zytel MT 409 AHS	☒	☐
14	colour	natural		25.10.2018	16	OK	☒	☐

Blanket statements of conformance are unacceptable for any test results.

March
2006

CFG-1003

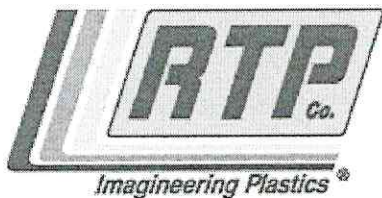
SIGNATURE

TITLE

DATE

Ondrej kova, Ma

1.11.2018



RTP Deutschland GmbH
Wallstadter Strasse 63
D - 68526 Ladenburg

**CERTIFICATE
OF
ANALYSIS**

18000576



TO: STRECK TRANSPORTE GMBH
FRAU EMMI LAGER BIGLER AG
BROMBACHER STR.61

DE-79539 LOERRACH

CUSTOMER NO	RTP ORDER NUMBER	SHIP DATE
100965	A20909-001	22-05-18
CUSTOMER ITEM NUMBER		
RTP6091-55 BK-1		
22-05-18		

TO THE ATTENTION OF QUALITY DEPARTMENT
THIS IS TO CERTIFY THAT THE PRODUCT LISTED
BELOW CONFORMS TO ALL BATCH ACCEPTANCE
REQUIREMENTS OF RTP COMPANY FORMULATION
AND QUALITY CONTROL.

LOT NUMBER	DESCRIPTION	CUSTOMER ORDER NUMBER
618Y1949T	RTP 6091-55A BLACK	618292-01

This COA is in accordance with EN 10204 section 3.1.

Property	Value (Metric)	Spec (Metric)	Method
Elastomer Tensile Strength(MPa)	2,71	Min:1,98	ASTM D 412
Elastomer Tensile Elongation(%)	289,0	Min:180,0	ASTM D 412
Specific Gravity	0,95	Rng:0,93 - 0,97	ASTM D 792
Shore A Hardness	59	Rng:54 - 60	ASTM D 2240
LCR Viscosity @1200/s (Pa.s)	73	Max:100	ASTM D 3835
STress @100% Elongation (MPa)	1,60	Rng:1,19-2,19	ASTM D 412

OBJEDNÁVKA č.: 4500698655

DODACÍ LIST č.: 253029

Ch. 
Christopher Grimm
Quality Manager RTP Ladenburg

INSPECTION CERTIFICATE

According to EN10204 3.1

From: **DuPont CZ s.r.o.**
Pekarská 14/628
155 00 PRAHA 5 - JINONICE
CZECH REPUBLIC

To: **A.RAYMOND JABLONEC S.R.O.**
CS. ARMADY 27
466 05 JABLONEC NAD NISOU

Your order ref: **4500626297**
Your product ref: **505003420 (ZYTMT409AHS NC010 25 KG BAG)**

Product: **ZYTMT409AHS NC010 25 KG BAG**
Identification: **EMSRK81101**

Country of Origin: **Belgium**
Shipping Point: **GENK CLEARED WHSE 1153 B9** **05 Jan 2018**
DuPont Order /
Delivery Note: **4801844 / 179565228**

We confirm that this product is standard according to the DuPont Standard Product Criteria.

The following values result from measurements made on a representative sample for the above mentioned lot number according to the defined sampling plan.

Characteristic	Test Method	Unit	Value	Limits	
				Lower	Upper
Water Content at Packout, %	ISO 15512	%	0,11		0,18
Melt Viscosity, Pa.s	ISO 11443	Pa.s	91	40	120

Please consult our product literature or refer all inquiries to your DuPont representative at our local Sales Office.
This certificate has been produced electronically and therefore does not require a signature.

Quality Group

THIS PRODUCT CERTIFICATION IS NON-TRANSFERABLE AND IS VALID ONLY TO THE FIRST END-USER PURCHASING THIS PRODUCT DIRECTLY FROM DUPONT OR FROM A DUPONT-AUTHORIZED DISTRIBUTOR. PRODUCT AND/OR PRODUCT CERTIFICATION OBTAINED FROM AN UNAUTHORIZED SOURCE IS ASSUMED COUNTERFEIT, AND DUPONT MAKES NO WARRANTIES AND ASSUMES NO LIABILITY IN CONNECTION WITH THE USE OF PRODUCT OR PRODUCT CERTIFICATION OBTAINED FROM AN UNAUTHORIZED SOURCE. Call +800-3876-6838 for a list of authorized distributors in your area. Copyright © 2006 du Pont de Nemours International S.A. All Rights Reserved.
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X Série/Production		KONTROLNÍ PLÁN / CONTROL PLAN							Pozn. / Remark: For Information only		
ARaymond MORE THAN FASTENING		Díl / Part:		Index změny / Change Level:		Název / Name:		Číslo zákazníka / CustPart:		Zákazník / Customer:	
		230347001		Eb / 21.012016		TIE -STRAP & SEAL- RETAINER OVAL		72527037		YAZAKI EUROPE LIMITED	
		Znak / Characteristic				Metoda / Method					
Číslo	Proces / Diagram procesu	Číslo	Popis	KI	Specifikace	Způsob kontroly	Rozsah	Četnost	Metoda kontroly	Plán reakce	
No.	Process / Flow-Chart	No.	Description	CI	Characteristics	Evaluation	Size	Frequency	Control Method	Reaction Plan	
1	Příjem základního materiálu Receipt of raw material		Dodací list		Shoda s dokumentací	Vizuálně	1	Šarže	TOP 06-01-96 ;	TOP 13-01-96 ; TOP 19-01-97	
			Delivery note		According to contract	Visual		Charge	TOP 10-01-96		
		1	Množství		Shoda s objednávkou	Vizuálně	1	Šarže	TOP 06-01-96 ;	TOP 13-01-96 ; TOP 19-01-97	
			Quantity		According to order	Visual		Charge	TOP 10-01-96		
2	Zaskladnění Storage	2	Kontrola hodnot uvedených na atestu		Hodnoty dle specifikace	Administrativní kontrola	1	Šarže	TOP 06-01-96 ;	TOP 13-01-96 ; TOP 19-01-97	
			Check of values mentioned on material atest		Results acc. to specification	Administrative check		Charge	TOP 10-01-96		
		3	Kontrola balení		Bez porušení	Měření, funkční test	1	Šarže	TOP 10-01-96	TOP 13-01-96 ; TOP 19-01-97	
			Packaging		No damage	Measuring, function test		Charge			
			Check acc. to Q-drawing								
3	Příprava základního materiálu		Příjem materiálu na hlavní sklad		Mat. označen žlutým štítkem	Vizuálně	1	Paleta	TOP 15-01-96	TOP 13-01-96 ; TOP 19-01-97	
	Raw material preparation		Material storage		Mat. marked by yellow label	Visual		Palette			
4	Příprava základního materiálu Raw material preparation		Druh a typ základního materiálu, použití vtoků		Shoda s dokumentací	Vizuálně	1	Paleta	PP 09-14-99 ; PP 09-15-99	TOP 13-01-96 ; TOP 19-01-97	
			Type of raw material, using of sprues		According to instruction	Visual		Palette			
		1	Množství		Shoda s objednávkou	Vizálně	1	Paleta	PP 09-14-99 ; PP 09-15-99	PP 09-14-99 ; PP 09-15-99	
			Quantity		According to order	Visual		Palette			
4	Sušení granulátu		Teplota a čas sušení		Shoda s objednávkou	Vizuálně	1	Zakázka	PP 09-14-99 ; PP 09-15-99	PP 09-14-99 ; PP 09-15-99	
	Granulate drying		Temperature and time of drying		According to order	Visual		Order			
5	Vstřikování		Nasazení formy a seřízení lisu		Vstřikovací parametry dle SL	Porovnáním nastavených hodnot a SL		Každé seřízení	PP 09-01-96	TOP 13-01-96 ; TOP 19-01-97	
	Injection moulding		Preparation of mould and machine		Acc. to set-up card	Review of set-up card and machine settings		Each set-up			
6	Kontrola 1.zdvihu Production approval		Kontrola 1.zdvihu		Kontrola dle Q-výkresu	Měření, funkční test	1 zdvih	Zakázka	PP 09-01-96	Přeseřídít nastavení vstřik. lisu	
			Production approval		Check acc. to Q-drawing	Measuring, function test	1 stroke	Order		Adjust machine setting	
		1	Vizuální kontrola		Kontrola dle Q-výkresu	Vizuálně	1 zdvih	Zakázka	PP 09-01-96 ; Q-výkres	Přeseřídít nastavení vstřik. lisu	
			Visual check		Check acc. to Q-drawing	Visual	1 stroke	Order		Adjust machine setting	
		2	Zkoušky dle Q-výkresu		Kontrola dle Q-výkresu	Měření, funkční test	1 zdvih	Zakázka	PP 09-01-96 ; Q-výkres	Přeseřídít nastavení vstřik. lisu	
			Check acc. Q-drawing		Check acc. to Q-drawing	Measuring, function test	1 stroke	Order		Adjust machine setting	

X Série/Production		KONTROLNÍ PLÁN / CONTROL PLAN								Pozn. / Remark: For Information only		
ARaymond MORE THAN FASTENING		Díl / Part: 230347001			Index změny / Change Level: Eb / 21.012016		Název / Name: TIE -STRAP & SEAL- RETAINER OVAL		Číslo zákazníka / CustPart: 72527037		Zákazník / Customer: YAZAKI EUROPE LIMITED	
		Znak / Characteristic						Metoda / Method				
Číslo	Proces / Diagram procesu	Číslo	Popis	KI	Specifikace	Způsob kontroly	Rozsah	Četnost	Metoda kontroly	Plán reakce		
No.	Process / Flow-Chart	No.	Description	CI	Characteristics	Evaluation	Size	Frequency	Control Method	Reaction Plan		
7	Průběžná kontrola Current check	3	Hmotnost zdvihu - SPC Weigth of stroke - SPC		Dodržení regulačních mezí Cp, Cpk > 1,67	Vážení weighing	3 zdvihy 3 strokes	Zakázka Order	PP 09-01-96 ; Q- výkres	Přeseřídít nastavení vstřík. lisu Adjust machine setting		
		4	Významné znaky Significant characteristics	SC	Kontrola dle Q-výkresu Check acc. to Q-drawing	Měření, funkční test Measuring, function test	1 zdvih 1 stroke	Zakázka Order	PP 09-01-96 ; Q- výkres	Přeseřídít nastavení vstřík. lisu Adjust machine setting		
			Průběžná kontrola Production approval		Kontrola dle Q-výkresu Check acc. to Q-drawing	Měření, funkční test Measuring, function test	1 zdvih 1 stroke	Po 2 hod. Every 2 hours	PP 09-02-96	Informovat seřizovače Notify adjuster		
		1	Vizuální kontrola Visual check		Kontrola dle Q-výkresu Check acc. to Q-drawing	Vizuálně Visual	1 zdvih 1 stroke	Po 2 hod. Every 2 hours	PP 09-02-96 ; Q- výkres	Informovat seřizovače Notify adjuster		
		2	Zkoušky dle Q-výkresu Check acc. Q-drawing		Kontrola dle Q-výkresu Check acc. to Q-drawing	Měření, funkční test Measuring, function test	1 zdvih 1 stroke	Po 2 hod. Every 2 hours	PP 09-02-96 ; Q- výkres	Informovat seřizovače Notify adjuster		
8	Výstupní kontrola Final inspection	3	Hmotnost zdvihu - SPC Weigth of stroke - SPC		Dodržení regulačních mezí ; Cp, Cpk > 1,67	Vážení weighing	3 zdvihy 3 strokes	Po 2 hod. Every 2 hours	PP 09-02-96 ; Q- výkres	Informovat seřizovače Notify adjuster		
		4	Významné znaky Significant characteristics	SC	Kontrola dle Q-výkresu Check acc. to Q-drawing	Měření, funkční test Measuring, function test	1 zdvih 1 stroke	Po 2 hod. Every 2 hours	PP 09-02-96 ; Q- výkres	Informovat seřizovače Notify adjuster Adjust machine setting		
			Kontrola posledního zdvihu Check of last stroke		Kontrola dle Q-výkresu Check acc. to Q-drawing	Měření, funkční test Measuring, function test	1 zdvih 1 stroke	Dávka Batch	TOP 10-01-96	TOP 13-01-96 ; TOP 19-01- 97		
		1	Vizuální kontrola Visual check		Kontrola dle Q-výkresu Check acc. to Q-drawing	Vizuálně Visual	1 zdvih 1 stroke	Dávka Batch	TOP 10-01-96	TOP 13-01-96 ; TOP 19-01- 97		
		2	Zkoušky dle Q-výkresu Check acc. Q-drawing		Kontrola dle Q-výkresu Check acc. to Q-drawing	Měření, funkční test Measuring, function test	1 zdvih 1 stroke	Dávka Batch	TOP 10-01-96	TOP 13-01-96 ; TOP 19-01- 97		
9	Rekvalifikace Layout inspection and functional testing	3	Významné znaky Significant characteristics	SC	Kontrola dle Q-výkresu Check acc. to Q-drawing	Měření, funkční test Measuring, function test	1 zdvih 1 stroke	Dávka Batch	TOP 10-01-96	TOP 13-01-96 ; TOP 19-01- 97 Adjust machine setting		
			Rekvalifikace na zástupce Layout inspection and fucntional testing for representative		Rozměry a tce dle PPAP výkresu Dimensions and fucntional testing acc. to PPAP dwg	Měření, funkční test Measuring, function test	1 zdvih 1 stroke	1 ročně annulay	TOP 17-04-03	TOP 17-04-03 ; TOP 13-01- 96		
10	Zaskladnění Storage		Hmotnost dílu Weight of part		Shoda se skl. systémem Acc. storage systém	Vážení weighing	1	Dávka Batch	PP 15-01-96 ; PP 15-06-99	TOP 13-01-96 ; TOP 19-01- 97		

X Série/Production		KONTROLNÍ PLÁN / CONTROL PLAN							Pozn. / Remark: For Information only		
		Díl / Part: 230347001		Index změny / Change Level: Eb / 21.012016		Název / Name: TIE -STRAP & SEAL- RETAINER OVAL		Číslo zákazníka / CustPart: 72527037		Zákazník / Customer: YAZAKI EUROPE LIMITED	
		Znak / Characteristic					Metoda / Method				
Číslo	Proces / Diagram procesu	Číslo	Popis	KI	Specifikace	Způsob kontroly	Rozsah	Četnost	Metoda kontroly	Plán reakce	
No.	Process / Flow-Chart	No.	Description	CI	Characteristics	Evaluation	Size	Frequency	Control Method	Reaction Plan	
11	Balení Packaging		Množství a druh balení Quantity and sort of package		Shoda se skl. systémem Acc. storage systém	Vizuálně Visual	1	Dávka Batch	PP 15-01-96 ; PP 15-06-99	TOP 13-01-96 ; TOP 19-01-97	
12	Doprava Shipping		Číslo dílu a množství Part Number and quantity		Shoda s dodacím listem Acc. delivery note	Vizuálně Visual	1	Dodávka Delivery	PP 15-01-96 ; PP 15-06-99	TOP 13-01-96 ; TOP 19-01-97	

Initial Process Study - SPC

Variable characteristic - weight

Part number: **230347001**

Mould number: **400009344**

Gauge: **Sartorius LP 1200 (0 - 1200 g)**

Part name: **Páska 2K**

Sample size: **4**

Char. code: **41**

Sample freq.: **0**

Char. name: **Hmotnost/weight**

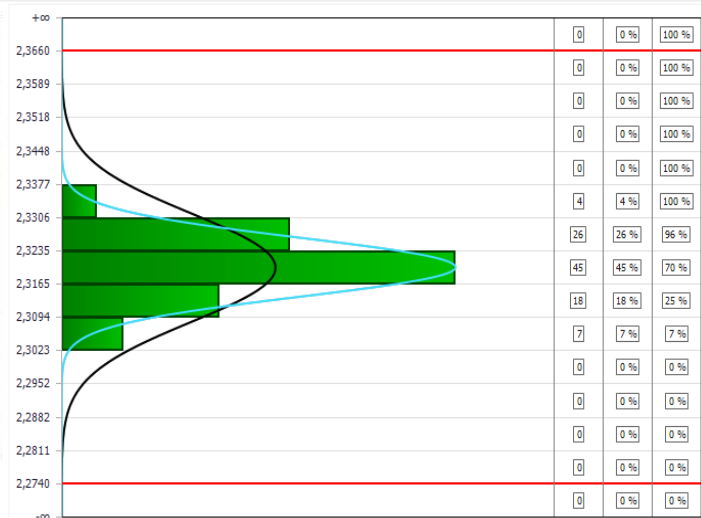
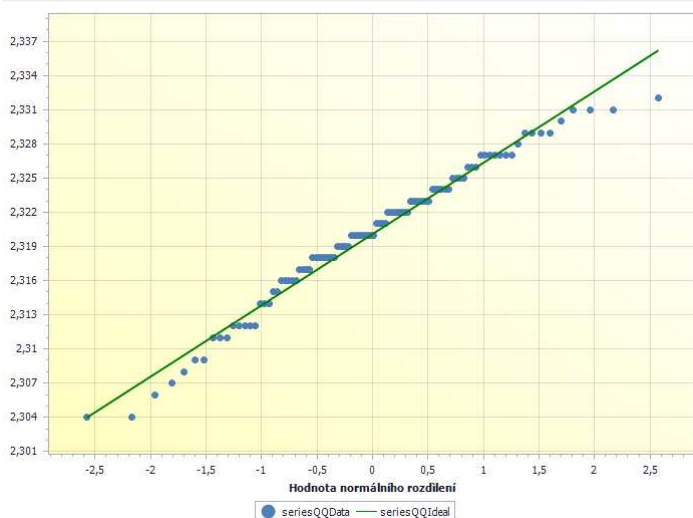
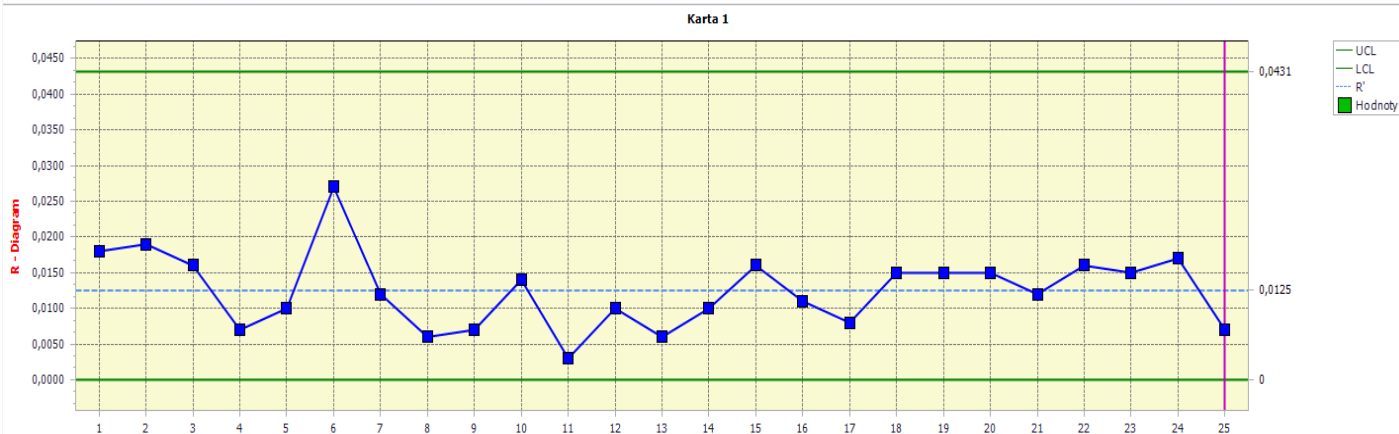
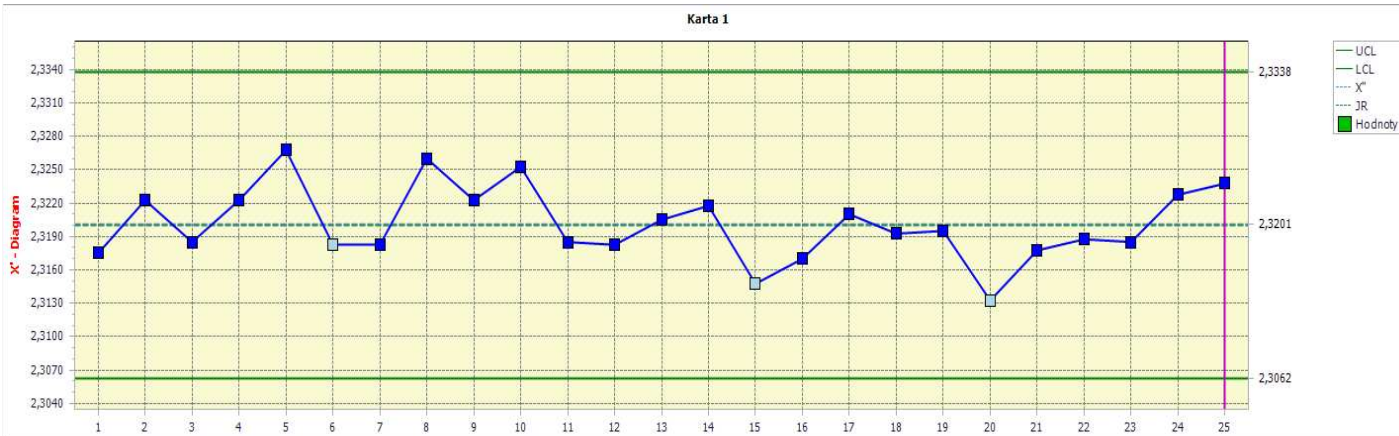
Card size: **25**

Nom.: **2,320**

USL: **2,366**

LSL: **2,274**

g



Pp **2,45** Cp **2,50**
 Ppk **2,44** Cpk **2,50**
 Calculation method: DIN 21747
 M1 (L1;D4) M1 (L1;D2)

X': **2,3201**

Over USL: **0**

PE: **0**

R: **0,0280**

Under LSL: **0**

Expected error % **0**

S: **0,0063**

A.RAYMOND JABLONEC s.r.o.						MSA (GRR method)					
Part Number 164460000					Gage Name Váha - scale			Appraiser A Kobr Tomáš			
Part Name Tie strap - retainer					Gage Number F 018			Appraiser B Knajfl Patrik			
Characteristic	DT 19,375	JR 19,77	HT 20,165	Tolerance +/- 0,395	Gage Type Scale Sartorius LP-1200S			Appraiser C Janoušek Milan			
Classification weight			Units g	Result Measurement system passed			Parts 10	Appraisers 3	Date 08.01.2018		

APPRAISER TRIAL	PART										AVERAGE	
	1	2	3	4	5	6	7	8	9	10		
A	1	19,755	19,76	19,722	19,731	19,745	19,755	19,754	19,724	19,767	19,754	19,7467
	2	19,755	19,759	19,725	19,732	19,746	19,756	19,755	19,723	19,766	19,754	19,7471
	3	19,756	19,759	19,727	19,735	19,747	19,755	19,756	19,724	19,767	19,753	19,7479
	AVE	19,7553	19,7593	19,7247	19,7327	19,746	19,7553	19,755	19,7237	19,7667	19,7537	Xa = 19,7472
	R	0,001	0,001	0,005	0,004	0,002	0,001	0,002	0,001	0,001	0,001	Ra = 0,0019
PART AVERAGE		19,7559	19,7563	19,724	19,7342	19,7467	19,7553	19,7544	19,7247	19,767	19,7557	X" = 19,7474Rp = 0,043
B	1	19,758	19,755	19,726	19,735	19,749	19,753	19,755	19,728	19,769	19,757	19,7485
	2	19,758	19,753	19,726	19,734	19,749	19,754	19,755	19,726	19,768	19,756	19,7479
	3	19,757	19,754	19,725	19,735	19,748	19,754	19,754	19,727	19,77	19,757	19,7481
	AVE	19,7577	19,754	19,7257	19,7347	19,7487	19,7537	19,7547	19,727	19,769	19,7567	Xb = 19,7482
	R	0,001	0,002	0,001	0,001	0,001	0,001	0,001	0,002	0,002	0,001	Rb = 0,0013
PART AVERAGE		19,7559	19,7563	19,724	19,7342	19,7467	19,7553	19,7544	19,7247	19,767	19,7557	X" = 19,7474Rp = 0,043
C	1	19,755	19,756	19,722	19,737	19,745	19,757	19,754	19,724	19,766	19,757	19,7473
	2	19,754	19,755	19,721	19,734	19,746	19,756	19,753	19,722	19,765	19,757	19,7463
	3	19,755	19,756	19,722	19,735	19,745	19,758	19,754	19,724	19,765	19,756	19,747
	AVE	19,7547	19,7557	19,7217	19,7353	19,7453	19,757	19,7537	19,7233	19,7653	19,7567	Xc = 19,7469
	R	0,001	0,001	0,001	0,003	0,001	0,002	0,001	0,002	0,001	0,001	Rc = 0,0014
PART AVERAGE		19,7559	19,7563	19,724	19,7342	19,7467	19,7553	19,7544	19,7247	19,767	19,7557	X" = 19,7474Rp = 0,043
([Ra = 0,0019] + [Rb = 0,0013] + [Rc = 0,0014]) / [Count Appraiser = 3] = R" = 0,00153												
[Max X = 19,770] - [Min X = 19,72] = Xdiff = 0,001 1												
* [R" = 0,002] x [D4 = 2,574] = UCLr = 0												

Repeatability - Equipment Variation (EV) $EV = \bar{R} * K_1$ $EV = 0,002 * 0,591$ $= 0,001$	<table border="1" style="margin-right: 10px;"> <tr><td>Trials</td><td>K1</td></tr> <tr><td>2</td><td>0,8862</td></tr> <tr><td>3</td><td>0,5908</td></tr> </table> %EV = TV = 100 [0,001/0,014] = 6,67 %	Trials	K1	2	0,8862	3	0,5908														
Trials	K1																				
2	0,8862																				
3	0,5908																				
Reproducibility - Appraiser Variation (AV) $AV = \sqrt{(\bar{X}_{DIFF} * K_2)^2 - \left(\frac{EV^2}{n * r}\right)}$ $AV = \sqrt{(0,001 * 0,523)^2 - \left(\frac{0,001^2}{10 * 9}\right)}$ $= 0,001$ n = dily r = měření	<table border="1" style="margin-right: 10px;"> <tr><td>Appraisers</td><td>2</td><td>3</td></tr> <tr><td>K2</td><td>0,7071</td><td>0,5231</td></tr> </table> %AV = TV = 100 [0,001/0,014] = 4,86 %	Appraisers	2	3	K2	0,7071	0,5231														
Appraisers	2	3																			
K2	0,7071	0,5231																			
Repeatability & Reproducibility (GRR) $GRR = \sqrt{EV^2 + AV^2}$ $GRR = \sqrt{0,001^2 + 0,001^2}$ $= 0,001$	<table border="1" style="margin-right: 10px;"> <tr><td>Parts</td><td>K3</td></tr> <tr><td>2</td><td>0,7071</td></tr> <tr><td>3</td><td>0,5231</td></tr> <tr><td>4</td><td>0,4467</td></tr> <tr><td>5</td><td>0,4030</td></tr> <tr><td>6</td><td>0,3742</td></tr> <tr><td>7</td><td>0,3534</td></tr> <tr><td>8</td><td>0,3375</td></tr> <tr><td>9</td><td>0,3249</td></tr> <tr><td>10</td><td>0,3146</td></tr> </table> %GRR = TV = 100 [0,001/0,014] = 8,26 %	Parts	K3	2	0,7071	3	0,5231	4	0,4467	5	0,4030	6	0,3742	7	0,3534	8	0,3375	9	0,3249	10	0,3146
Parts	K3																				
2	0,7071																				
3	0,5231																				
4	0,4467																				
5	0,4030																				
6	0,3742																				
7	0,3534																				
8	0,3375																				
9	0,3249																				
10	0,3146																				
Part Variation (PV) $PV = R_P * K_3$ $PV = 0,043 * 0,315$ $= 0,014$	<table border="1" style="margin-right: 10px;"> <tr><td>4</td><td>0,4467</td></tr> <tr><td>5</td><td>0,4030</td></tr> <tr><td>6</td><td>0,3742</td></tr> <tr><td>7</td><td>0,3534</td></tr> <tr><td>8</td><td>0,3375</td></tr> <tr><td>9</td><td>0,3249</td></tr> <tr><td>10</td><td>0,3146</td></tr> </table> %PV = TV = 100 [0,014/0,014] = 99,66 %	4	0,4467	5	0,4030	6	0,3742	7	0,3534	8	0,3375	9	0,3249	10	0,3146						
4	0,4467																				
5	0,4030																				
6	0,3742																				
7	0,3534																				
8	0,3375																				
9	0,3249																				
10	0,3146																				
Tolerance (TV) $TV = \sqrt{GRR^2 + PV^2}$ $TV = \sqrt{0,001^2 + 0,014^2}$ $= 0,014$	ndc = 1.41[PV/GRR] = 1.41 [0,014/0,001] = 17,022 ~ 17																				

Notes: Notes: This analysis could be use as a representative for the similar group of parts ☒ yes

A.RAYMOND JABLONEC s.r.o.						MSA (GRR method)					
Part Number 203449000					Gage Name Posuvka digi. - caliper			Appraiser A Kobr Tomáš			
Part Name Cable tie for weld stud					Gage Number A 084			Appraiser B Knajfl Patrik			
Characteristic	DT 17	JR 17,5	HT 18	Tolerance +/- 0,5	Gage Type CD-15CPX			Appraiser C Janoušek Milan			
Classification length			Units mm	Result Measurement system passed			Parts 10	Appraisers 3	Date 08.01.2018		

APPRAISER TRIAL	PART										AVERAGE	
	1	2	3	4	5	6	7	8	9	10		
A	1	17,36	17,4	17,37	17,39	17,37	17,39	17,4	17,37	17,39	17,35	17,379
	2	17,36	17,41	17,37	17,38	17,37	17,39	17,4	17,37	17,4	17,35	17,38
	3	17,37	17,41	17,36	17,38	17,36	17,39	17,4	17,37	17,4	17,35	17,379
	AVE	17,3633	17,4067	17,3667	17,3833	17,3667	17,39	17,4	17,37	17,3967	17,35	Xa = 17,3793
	R	0,01	0,01	0,01	0,01	0,01	0	0	0	0,01	0	Ra = 0,006
PART AVERAGE		17,3711	17,4067	17,3633	17,3844	17,3622	17,3878	17,3967	17,3733	17,3989	17,3556	X" = 17,38Rp = 0,0511
B	1	17,37	17,41	17,36	17,39	17,36	17,39	17,39	17,37	17,4	17,36	17,38
	2	17,37	17,4	17,36	17,38	17,36	17,38	17,39	17,37	17,4	17,36	17,377
	3	17,37	17,4	17,36	17,38	17,36	17,38	17,39	17,37	17,4	17,36	17,377
	AVE	17,37	17,4033	17,36	17,3833	17,36	17,3833	17,39	17,37	17,4	17,36	Xb = 17,378
	R	0	0,01	0	0,01	0	0,01	0	0	0	0	Rb = 0,003
PART AVERAGE		17,3711	17,4067	17,3633	17,3844	17,3622	17,3878	17,3967	17,3733	17,3989	17,3556	X" = 17,38Rp = 0,0511
C	1	17,38	17,41	17,36	17,38	17,36	17,39	17,4	17,38	17,4	17,36	17,382
	2	17,38	17,41	17,36	17,39	17,36	17,39	17,4	17,38	17,4	17,36	17,383
	3	17,38	17,41	17,37	17,39	17,36	17,39	17,4	17,38	17,4	17,35	17,383
	AVE	17,38	17,41	17,3633	17,3867	17,36	17,39	17,4	17,38	17,4	17,3567	Xc = 17,3827
	R	0	0	0,01	0,01	0	0	0	0	0	0,01	Rc = 0,003
PART AVERAGE		17,3711	17,4067	17,3633	17,3844	17,3622	17,3878	17,3967	17,3733	17,3989	17,3556	X" = 17,38Rp = 0,0511
([Ra = 0,006] + [Rb = 0,003] + [Rc = 0,003]) / [Count Appraiser = 3] = R" = 0,004												
[Max X = 17,410] - [Min X = 17,35] = Xdiff = 0,005												
* [R" = 0,004] x [D4 = 2,574] = UCLr = 0												

Repeatability - Equipment Variation (EV) $EV = \bar{R} * K_1$ $EV = 0,004 * 0,591$ $= 0,002$	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr><th>Trials</th><th>K1</th></tr> <tr><td>2</td><td>0,8862</td></tr> <tr><td>3</td><td>0,5908</td></tr> </table>	Trials	K1	2	0,8862	3	0,5908	%EV = T/6 = 100 [0,002/0,167] = 1,42 %				
Trials	K1											
2	0,8862											
3	0,5908											
Reproducibility - Appraiser Variation (AV) $AV = \sqrt{(\bar{X}_{DIFF} * K_2)^2 - \left(\frac{EV^2}{n * r}\right)}$ $AV = \sqrt{(0,005 * 0,523)^2 - \left(\frac{0,002^2}{10 * 3}\right)}$ $= 0,002$ n = díly r = měření	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr><th>Appraisers</th><th>2</th><th>3</th></tr> <tr><td>K2</td><td>0,7071</td><td>0,5231</td></tr> </table>	Appraisers	2	3	K2	0,7071	0,5231	%AV = T/6 = 100 [0,002/0,167] = 1,44 %				
Appraisers	2	3										
K2	0,7071	0,5231										
Repeatability & Reproducibility (GRR) $GRR = \sqrt{EV^2 + AV^2}$ $GRR = \sqrt{0,002^2 + 0,002^2}$ $= 0,003$	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr><th>Parts</th><th>K3</th></tr> <tr><td>2</td><td>0,7071</td></tr> <tr><td>3</td><td>0,5231</td></tr> </table>	Parts	K3	2	0,7071	3	0,5231	%GRR = T/6 = 100 [0,003/0,167] = 2,02 %				
Parts	K3											
2	0,7071											
3	0,5231											
Part Variation (PV) $PV = R_P * K_3$ $PV = 0,051 * 0,315$ $= 0,016$	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr><td>4</td><td>0,4467</td></tr> <tr><td>5</td><td>0,4030</td></tr> <tr><td>6</td><td>0,3742</td></tr> <tr><td>7</td><td>0,3534</td></tr> <tr><td>8</td><td>0,3375</td></tr> </table>	4	0,4467	5	0,4030	6	0,3742	7	0,3534	8	0,3375	%PV = T/6 = 100 [0,016/0,167] = 9,65 %
4	0,4467											
5	0,4030											
6	0,3742											
7	0,3534											
8	0,3375											
Tolerance (TV) $TV = \sqrt{GRR^2 + PV^2}$ $TV = \sqrt{0,003^2 + 0,016^2}$ $= 0,016$	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr><td>9</td><td>0,3249</td></tr> <tr><td>10</td><td>0,3146</td></tr> </table>	9	0,3249	10	0,3146	ndc = 1.41[PV/GRR] = 1.41 [0,016/0,003] = 6,727 ~ 6						
9	0,3249											
10	0,3146											

Notes: Notes: This analysis could be use as a representative for the similar group of parts ☒ yes

A.RAYMOND JABLONEC s.r.o.						MSA (GRR method)					
Part Number 203132000					Gage Name Optical profilprojector			Appraiser A Kobr Tomáš			
Part Name connector / hose clip rotatable					Gage Number I 002			Appraiser B Knajfl Patrik			
Characteristic	DT 22,4	JR 23,4	HT 24,4	Tolerance +/- 1	Gage Type Merlin			Appraiser C Janoušek Milan			
Classification length			Units mm	Result Measurement system passed			Parts 10	Appraisers 3	Date 09.01.2018		

APPRAISER TRIAL	PART										AVERAGE	
	1	2	3	4	5	6	7	8	9	10		
A	1	23,64	23,8	23,78	23,67	23,74	23,7	23,79	23,75	23,78	23,74	23,739
	2	23,64	23,81	23,78	23,66	23,74	23,71	23,79	23,74	23,78	23,75	23,74
	3	23,65	23,81	23,78	23,66	23,74	23,7	23,78	23,75	23,78	23,74	23,739
	AVE	23,6433	23,8067	23,78	23,6633	23,74	23,7033	23,7867	23,7467	23,78	23,7433	Xa = 23,7393
	R	0,01	0,01	0	0,01	0	0,01	0,01	0,01	0	0,01	Ra = 0,007
PART AVERAGE		23,6467	23,8056	23,7767	23,6633	23,7422	23,7056	23,7856	23,7467	23,7811	23,7422	X" = 23,7396Rp = 0,1589
B	1	23,65	23,81	23,77	23,67	23,74	23,7	23,78	23,74	23,78	23,73	23,737
	2	23,65	23,81	23,78	23,67	23,74	23,7	23,78	23,75	23,79	23,73	23,74
	3	23,64	23,8	23,77	23,66	23,74	23,71	23,79	23,75	23,79	23,75	23,74
	AVE	23,6467	23,8067	23,7733	23,6667	23,74	23,7033	23,7833	23,7467	23,7867	23,7367	Xb = 23,739
	R	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0,01	0,02	Rb = 0,01
PART AVERAGE		23,6467	23,8056	23,7767	23,6633	23,7422	23,7056	23,7856	23,7467	23,7811	23,7422	X" = 23,7396Rp = 0,1589
C	1	23,65	23,8	23,77	23,66	23,74	23,71	23,78	23,75	23,77	23,75	23,738
	2	23,65	23,8	23,78	23,66	23,75	23,71	23,79	23,75	23,77	23,74	23,74
	3	23,65	23,81	23,78	23,66	23,75	23,71	23,79	23,74	23,79	23,75	23,743
	AVE	23,65	23,8033	23,7767	23,66	23,7467	23,71	23,7867	23,7467	23,7767	23,7467	Xc = 23,7403
	R	0	0,01	0,01	0	0,01	0	0,01	0,01	0,02	0,01	Rc = 0,008
PART AVERAGE		23,6467	23,8056	23,7767	23,6633	23,7422	23,7056	23,7856	23,7467	23,7811	23,7422	X" = 23,7396Rp = 0,1589
([Ra = 0,007] + [Rb = 0,01] + [Rc = 0,008]) / [Count Appraiser = 3] =												R" = 0,00833
[Max X = 23,810] - [Min X = 23,64] = Xdiff = 0,001												
* [R" = 0,008] x [D4 = 2,574] = UCLr = 0												

Repeatability - Equipment Variation (EV) $EV = \bar{R} * K_1$ $EV = 0,008 * 0,591$ $= 0,005$	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr><td>Trials</td><td>K1</td></tr> <tr><td>2</td><td>0,8862</td></tr> <tr><td>3</td><td>0,5908</td></tr> </table>	Trials	K1	2	0,8862	3	0,5908								
Trials	K1														
2	0,8862														
3	0,5908														
Reproducibility - Appraiser Variation (AV) $AV = \sqrt{(\bar{X}_{DIFF} * K_2)^2 - \left(\frac{EV^2}{n * r}\right)}$ $AV = \sqrt{(0,001 * 0,523)^2 - \left(\frac{0,005^2}{10 * 3}\right)}$ $= 0,000$ n = díly r = měření	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr><td>Appraisers</td><td>2</td><td>3</td></tr> <tr><td>K2</td><td>0,7071</td><td>0,5231</td></tr> </table>	Appraisers	2	3	K2	0,7071	0,5231								
Appraisers	2	3													
K2	0,7071	0,5231													
Repeatability & Reproducibility (GRR) $GRR = \sqrt{EV^2 + AV^2}$ $GRR = \sqrt{0,005^2 + 0^2}$ $= 0,005$	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr><td>Parts</td><td>K3</td></tr> <tr><td>2</td><td>0,7071</td></tr> <tr><td>3</td><td>0,5231</td></tr> </table>	Parts	K3	2	0,7071	3	0,5231								
Parts	K3														
2	0,7071														
3	0,5231														
Part Variation (PV) $PV = R_P * K_3$ $PV = 0,159 * 0,315$ $= 0,050$	<table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <tr><td>4</td><td>0,4467</td></tr> <tr><td>5</td><td>0,4030</td></tr> <tr><td>6</td><td>0,3742</td></tr> <tr><td>7</td><td>0,3534</td></tr> <tr><td>8</td><td>0,3375</td></tr> <tr><td>9</td><td>0,3249</td></tr> <tr><td>10</td><td>0,3146</td></tr> </table>	4	0,4467	5	0,4030	6	0,3742	7	0,3534	8	0,3375	9	0,3249	10	0,3146
4	0,4467														
5	0,4030														
6	0,3742														
7	0,3534														
8	0,3375														
9	0,3249														
10	0,3146														
Tolerance (TV) $TV = \sqrt{GRR^2 + PV^2}$ $TV = \sqrt{0,005^2 + 0,050^2}$ $= 0,050$	ndc = 1.41[PV/GRR] = 1.41 [0,050/0,005] = 14,316 ~ 14														

Notes: Notes: This analysis could be use as a representative for the similar group of parts ☒ yes