Part Submission Warrant

MAGNA GETRAG

312785

Part Name:	Input Shaft 1 - Inner	Cust. Part No.:	251.6.1235.35
Shown on Drawing No.:	251.6.1235.35	Org. Part No.:	251.6.1235.35
Engineering Change Level:	3 Index "-" (C005854_MIP1)	Dated:	15/03/2017
Additional Engineering Changes:	na	Dated:	na
Safety and/or Government Regulation:	☐ Yes ☑ No Purchase Order No.:	Weight (kg):	1.068
Checking Aid No.:	na Checking Aid Engineering Change Level: na	Dated:	na

ORGANIZATION MANUFACTURING INFORMATION

Getrag S.p.A.
Organization Name & Supplier / Supplier Code

Via dei Ciclamini, 4
Street Address

Modugno (Ba) Puglia 70026 Italy
City Region Postal Code Country

CUSTOMER SUBMITTAL INFORMATION

Bari assembly line (GPS4)
Customer Name / Division

na
Buyer / Buyer Code

DCT300
Application

MATERIALS REPORTING

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

Submitted by IMDS or other customer format:
(IMDS=International Material Data System)

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 Other or Additional Location
- ☐ Other - please specify below (e.g. additional specific customer requirement or e.g. change of EP parts

REQUESTED SUBMISSION LEVEL (Check one)

- ☐ Level 1 - Warrant only (and for designated appearance items, an Appearrance 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 drawing and specification requirements: ☑ Yes ☐ No (If "NO" - Explanation Required)

Mold / Cavity / Production Process na

DECLARATION

I hereby 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 **163 / 8** hours. I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from the declaration below.

EXPLANATION / COMMENTS: - First PPAP Submission (only differences from variant 251.6.1073.35).
- Identification grooves according with change C006077

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

Organization Authorized Signature: Date: **18/05/2018**

Print Name: **Tursi Dario Maria** Phone No.: **+39 0805858360** Fax No.

Title: **7DCT300 Launch Manager** E-Mail: dario.tursi@magna.com

FOR CUSTOMER USE ONLY (If applicable))

Part Warrant Disposition: ☒ Approved ☐ Rejected ☐ Other

Customer Signature: Date: 18.05.18

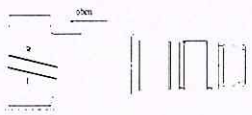
Print Name: F. SPEZZACATENA Customer Tracking No.:

Released by Fabrizio.Cricenti on 2017-11-10
Document Status: approved

STIRNRAD / GEAR	außenverzahnt / external
Zähnezahl / Number of teeth, z	13
Modul / Normal module, m_n	2.450000
Eingriffswinkel / Normal pressure angle, α_n	20° 0' 0"
Schrägungswinkel / Helix angle, β	24° 30' 0"
Steigungsrichtung / Hand of helix	RECHTS
Profilverschiebungsfaktor / Addendum modification coeff., x	0.800
Teilkreisdurchmesser / Pitch diameter, d	35.001
Kopfkreisdurchmesser / Outside diameter, d_a	43.60 -0.16
Kopfnutzkreisd. theo. max. / Tip diam. usable theo., d_{Na}	43.10
Kopfnutzkreisd. theo. min. / Tip diam. usable theo., d_{Na}	42.67
Fußkreisdurchmesser / Root diameter, d_f	30.55 -0.30
Fußnutzkreisdurchmesser / Root diameter usable, d_{Nf}	33.15
Grundkreisradius / Base circle radius, r_b	16.249
Grundkreisdurchmesser / Base diameter, d_b	32.498
Normalzahndicke max. / Normal tooth thickness, s_n	5.275
Normalzahndicke min. / Normal tooth thickness, s_n	5.245
Meßzähnezahl / Number of teeth spanned, k	3
Zahnweite max. / Base tangent length, W_k	20.006
Zahnweite min. / Base tangent length, W_k	19.978
Meßkugeldurchmesser / Ball diameter, D_M	5.0000
Diam. Zweikugelmaß max. / Measurement o. balls, M_{dK}	45.542
Diam. Zweikugelmaß min. / Measurement o. balls, M_{dK}	45.491
Verdrehflankenspiel theo. / Circumferential backlash	0.064 0.180

Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) gültig für Werte am Einzelzahn (8)
Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth

	linke Fl. / left flank	rechte Fl. / right flank		
Profil-Formabweichung / Profile form error, $f_{f\alpha}$	0.004		Eingriffsteilungs-Abweich. / Normal pitch error, $f_{p\theta}$	0.014
Profil-Gesamtabweichung / Total profile error, F_α			Teilungs-Einzelabweichung / Adjacent pitch error, f_p	0.014
Profil-Winkelabweichung / Profile angle error, $f_{H\alpha}$	0.000 ± 0.010	0.000 ± 0.010	Teilungssprung / Diff. bet. adjacent pitches, f_u	0.018
Flankenl.-Winkelabweich. / Tooth alignment error, $f_{H\beta}$	0.000 ± 0.013	0.000 ± 0.013	Teilungs-Summenabweich. / Cumulative circ. pitch error, F_{pk}	
Flankenl.-Gesamtabweich. / Total alignment error, F_β			Rundlaufabweichung / Radial run-out, F_r	0.032
Flankenl.-Formabweich. / Longitudinal alignment err., $f_{f\beta}$	0.004		Zahndickenschwankung / Range of tooth thickn. error, R_s	
Teilungs-Gesamtabweich. / Cumulative pitch error, F_p	0.040			
Einf.-Wälzabweichung / Tangential composite error, $F_{i'}$			Zweifl.-Wälzabweichung / Radial composite error, $F_{i''}$	0.036
Einflanken-Wälzsprung / Tang. tooth to tooth comp. err., $f_{i'}$			Zweifl.-Wälzsprung / Radial tooth to tooth comp. err., $f_{i''}$	0.014
Radbreite im Meßkreis d_M / Facewidth in meas. diam., b	24.73		Meßkreis Krümmungsradius / Radius of curvature meas. diam., ρ_{dM}	9.55

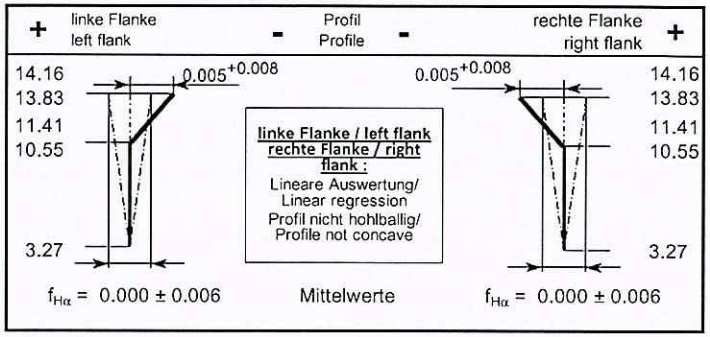


r.Fl. Zug

Hondurchmesser = 32.54 -0.30 ° 0.83
honing diameter

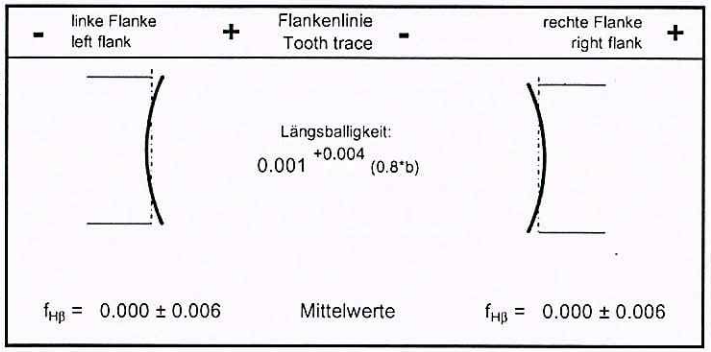
#Waviness evaluation (fitted sine) in profile and helix direction
until 4th gear order to be documented according to G_00_05_S_0012
Order referenced to the considered gear

(a)



* Schreibbeginn
* Start of checking

Ø = 32.54 -0.30 ≡ 0.83



* ffαf (zwischen dNf und dem Schreibbeginn ds) max ffα/2, jedoch 0.003 zulässig
* ffαf (between dNf and start of checking ds) max ffα/2, 0.003 allowable.

Profil- und Flankenlinienmessung nach G_808006 und VDI/VDE 2612
Flankenlinienprüfbereich Lβ = 0.8*b hochgerechnet auf 1.0*b
Begriffe für Stirnräder nach DIN 868, 3960, 3998

Profile and helix checking according to G_808006 and VDI/VDE 2612
Tooth trace testing area Lβ = 0.8*b calculated to 1.0*b
Terms of the tooth system according to DIN (German Industrial Standards) No. 868, 3960, 3998

Vorbearbeitungsdaten siehe Verzahnungsblatt Vorbearbeitung gleicher Nr.
For pre-machining dimensions, see gear data sheet same number

Wkz-Profil siehe Werkzeugdatenblatt Nr. / For Tooth profile, see tool data sheet number: 251.6.1235.35

Buch.	Anz.	Änd.Nr.		Datum	Name
a	1	C011518	See CO	20171108	Cricenti

Abbildungen sind unmaßstäblich. / Diagrams not to scale.

Ersatz für
Erstverwendung bei Getriebetype: 251

	Datum	Name
gez.	2015-01-20	Cricenti, Fabrizio
gepr.		

Verzahnungsblatt Endkontrolle
Final Check Gear Data
Benennung: / Naming:
Antrw. innen 1.Gg.

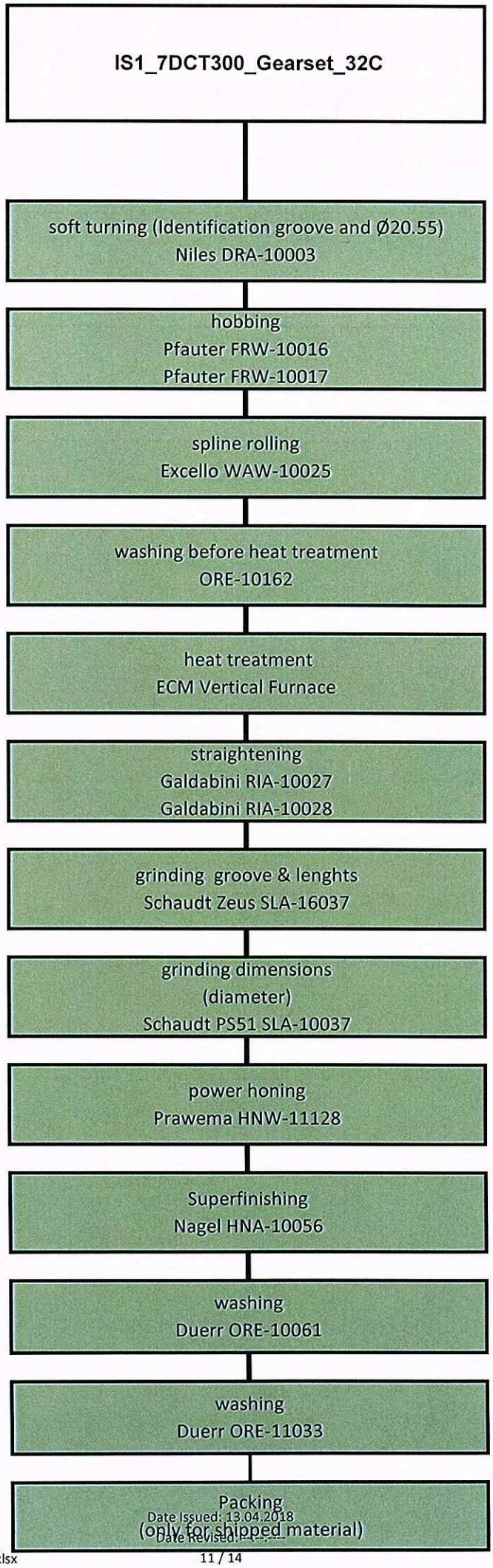
Verteiler:

Schutzvermerk nach ISO 16016 beachten
Protection per ISO 16016

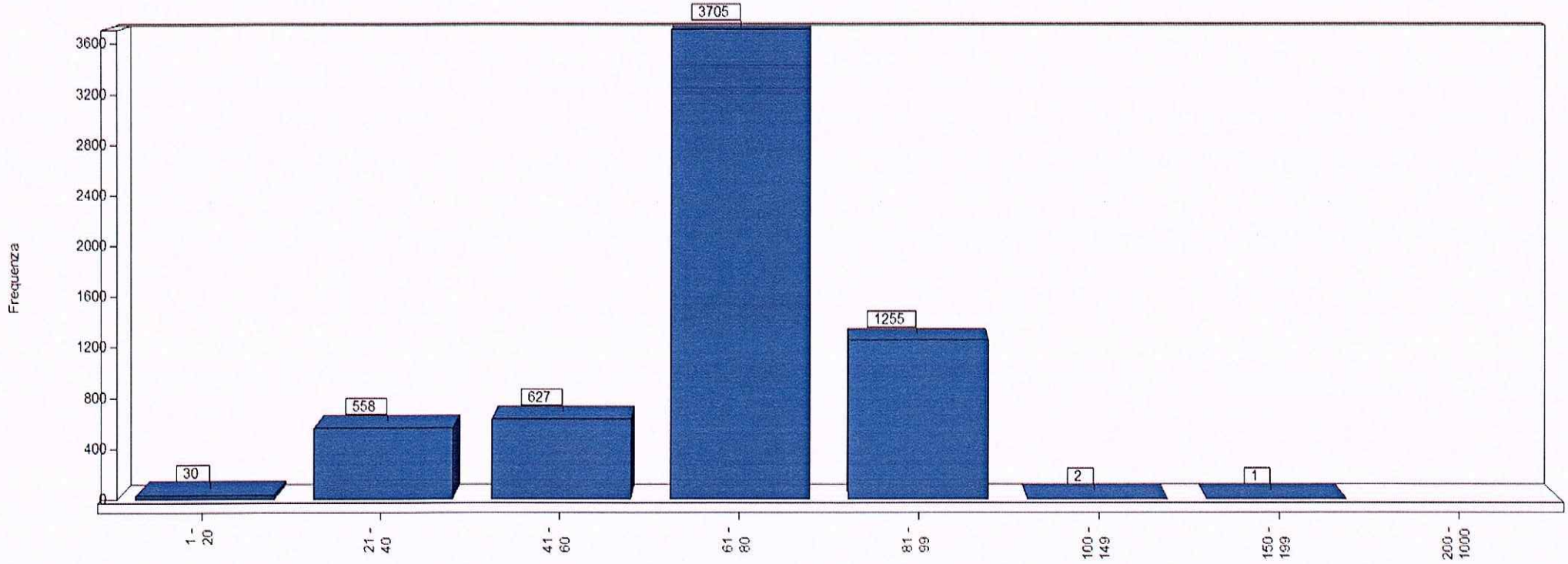
GETRAG
GETRAG Getriebe- und Zahnradfabrik Hermann Hagenmeyer GmbH & Cie KG

Remark:

Zeichnungsnummer: / Drawing number:
251.6.1235.35


IS1_7DCT300_Gearset_32C
soft turning (Identification groove and Ø20.55)
Niles DRA-10003
hobbing
Pfauter FRW-10016
Pfauter FRW-10017
spline rolling
Excello WAW-10025
washing before heat treatment
ORE-10162
heat treatment
ECM Vertical Furnace
straightening
Galdabini RIA-10027
Galdabini RIA-10028
grinding groove & lenghts
Schaudt Zeus SLA-16037
grinding dimensions
(diameter)
Schaudt PS51 SLA-10037
power honing
Prawema HNW-11128
Superfinishing
Nagel HNA-10056
washing
Duerr ORE-10061
washing
Duerr ORE-11033
Packing
(only for shipped material)

GETRAG	FMEA Processo		Numero: 1.2.1.1.1.1 Pagina:
Tipo/Modello/Produzione/Lotto: 7DCT300	Numero Disegno: Gearset 1A + 21A + 21H + 32C Stato modifica: -	Responsabile: Getrag Ditta: Getrag	Emesso: 31/08/2015
FMEA/Elemento: GEARSET 7DCT300	Codice dell'operazione: Tutte Stato modifica: -	Responsabile: Papagna, Oscuro, Nitti, Cicirelli, Tanzi T., Terlizzese, Landriscina, Guerra, Sinibaldi, Caponio, Vicenti, Picerno, Pierro, Cacciapaglia, Sisto. Ditta:	Emesso: 13/01/2017 Modificato: 14/05/2018



Record Owner: Vicenti D.	Date Issued: 06.03.2017	GIS1 Item Number: 28.04	Page: 1 / 2
Dept.: WLP	Date Revised: 14.05.2018	GIS2 Classification: Confidential	Retention Start Date (Year): 2017

Actions ongoing for RPN > 100:

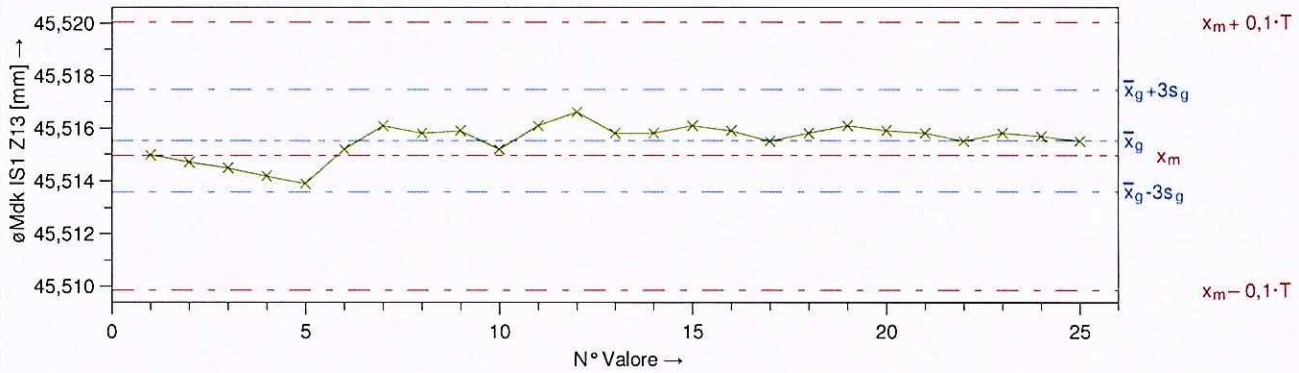
Chr. Classification	Project	Component	Operation	Chr. Description	Actual RPN				Action	Resp.	Due date	Min. RPN expected			
					S	O	D	RPN				S	O	D	RPN
<M>	DCT300	SG1	Hard Turning	Clutch body Height	7	4	4	112	Final drawing tolerance review + Dogbody height review on EP	Pierro	31-May-18	7	2	5	(70)
<M>	DCT300	SGRv	Hard Turning	Clutch body Height	7	3	5	105	Final drawing tolerance review + Dogbody height review on EP (100% Check --> Sampling check)	Pierro	30-Jun-18	7	2	5	(70)
std	DCT300	IS2	Diam. Grinding	Spline Fr	8	6	4	192	New operation implementation in order to ground new clamping surface for Diam. grinding operation (100% Check --> Sampling check)	Cacciapaglia	31-Jul-18	8	3	5	(120)
									New machine Junker implementation for Diam. grinding operation		31-Aug-18	8	2	5	(80)

Capacità strumenti di misura

Data/ora	18/06/2018	Nome oper.	mario.bozza	Reparto/Area/Prod.	WLQ	Posto di prova	Levigatura IS1

Calibro		Master		Caratteristica	
Desc. calibro	Calibro a forcella	Desc. mast.	IS1 Z13	Desc. Car.	øMdk IS1 Z13
N° calibro	MAR 402089 017	N° master	MVZ 400663 002	N° Caratt.	2516123535_32C
Ris. calibro	0,0001	Valore reale mast.	45,515	Val. Nom. 45,5170 LSS	45,5420 ^= 0,0250
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di m mm LSI	45,4910 ^= -0,0260

Nota



i	x_i	i	x_i	i	x_i	i	x_i	i	x_i
1	45,5150	6	45,5152	11	45,5161	16	45,5159	21	45,5158
2	45,5147	7	45,5161	12	45,5166	17	45,5155	22	45,5155
3	45,5145	8	45,5158	13	45,5158	18	45,5158	23	45,5158
4	45,5142	9	45,5159	14	45,5158	19	45,5161	24	45,5157
5	45,5139	10	45,5152	15	45,5161	20	45,5159	25	45,5155

Valori a disegno			Valori Calcolati			Statistiche		
$x_m + 0,1 \cdot T$	=	45,520100	$x_{max\,g}$	=	45,5166	$\bar{x}_g + 3s_g$	=	45,517472
x_m	=	45,515000	$x_{min\,g}$	=	45,5139	$\bar{x}_g$	=	45,515536
$x_m - 0,1 \cdot T$	=	45,509900	R_g	=	0,0027	$\bar{x}_g - 3s_g$	=	45,513600
$0,2 \cdot T$	=	0,010200	n_{tot}	=	25	$6s_g$	=	0,003873
T	=	0,0510				s_g	=	0,000645
Unità di misura	=	mm				$\lvert Bi \rvert$	=	0,00053600
						n_{eff}	=	25

Test per Bias			Risultati del test : significativo ($\alpha \leq 0,1\%$)
Bias	=	1,05%	

				Minimo riferimento per sistema di misura capace	
Risoluzione	%RE =	0,20%	0 5	$T_{min\,(\%RE)}$ =	0,00200
$C_g = \frac{0,2 \cdot T}{4 \cdot s_g}$	=	$2,84 \leq \mathbf{3,95} \leq 5,06$	0 1 1,33	$T_{min\,(C_g)}$ =	0,0172
$C_{gk} = \frac{0,1 \cdot T - \lvert \bar{x}_g - x_m \rvert}{2 \cdot s_g}$	=	$2,53 \leq \mathbf{3,54} \leq 4,54$	0 1 1,33	$T_{min\,(C_{gk})}$ =	0,0225

Sistema di misura capace (%RE,min,C_g,C_{gk})

☐ GETRAG MSA 2017: Capability of measuring system (Type-1 Study)

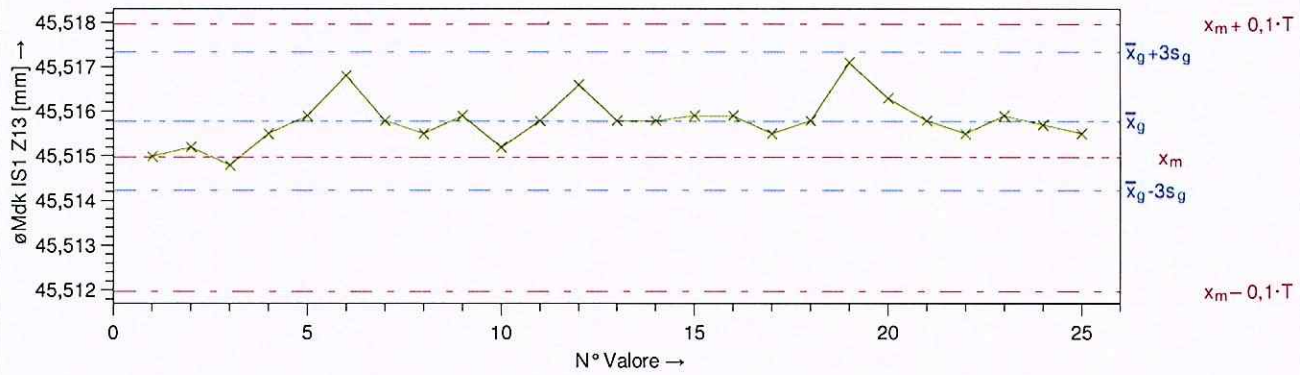
Data _____ Firma _____ Dipartimento _____

Capacità strumenti di misura

Data/ora	11/06/2018	Nome oper.	mario.bozza	Reparto/Area/Prod.	WLQ	Posto di prova	Dentatura IS1

Calibro		Master		Caratteristica				
Desc. calibro	Calibro a forcella	Desc. mast.	IS1	Desc. Car.	øMdk IS1 Z13			
N° calibro	MAR 402089 015	N° master	MVZ 400663 001	N° Caratt.	2516123535_32C			
Ris. calibro	0,0001	Valore reale mast.	45,515	Val. Nom. 45,6900	LSS	45,7050	≙ 0,0150	
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di m mm	LSI	45,6750	≙ -0,0150	

Nota



i	x_i	i	x_i	i	x_i	i	x_i	i	x_i
1	45,5150	6	45,5168	11	45,5158	16	45,5159	21	45,5158
2	45,5152	7	45,5158	12	45,5166	17	45,5155	22	45,5155
3	45,5148	8	45,5155	13	45,5158	18	45,5158	23	45,5159
4	45,5155	9	45,5159	14	45,5158	19	45,5171	24	45,5157
5	45,5159	10	45,5152	15	45,5159	20	45,5163	25	45,5155

Valori a disegno			Valori Calcolati			Statistiche		
$x_m + 0,1 \cdot T$	=	45,518000	$x_{max\,g}$	=	45,5171	$\bar{x}_g + 3s_g$	=	45,517334
x_m	=	45,515000	$x_{min\,g}$	=	45,5148	$\bar{x}_g$	=	45,515780
$x_m - 0,1 \cdot T$	=	45,512000	R_g	=	0,0023	$\bar{x}_g - 3s_g$	=	45,514226
$0,2 \cdot T$	=	0,006000	n_{tot}	=	25	$6s_g$	=	0,003108
T	=	0,0300				s_g	=	0,000518
Unità di misura	=	mm				|Bi|	=	0,00078000
						n_{eff}	=	25

Test per Bias			Risultati del test : significativo ($\alpha \leq 0,1\%$)
Bias	=	2,60%	

					Minimo riferimento per sistema di misura capace		
Risoluzione	%RE	=	0,33%	0 5	$T_{min\,(\%RE)}$	=	0,00200
$C_g = \frac{0,2 \cdot T}{4 \cdot s_g}$		=	$2,08 \leq \mathbf{2,90} \leq 3,71$	0 1 1,33	$T_{min\,(C_g)}$	=	0,0138
$C_{gk} = \frac{0,1 \cdot T - \lvert \bar{x}_g - x_m \rvert}{2 \cdot s_g}$		=	$1,52 \leq \mathbf{2,14} \leq 2,76$	0 1 1,33	$T_{min\,(C_{gk})}$	=	0,0216

Sistema di misura capace (%RE,min,C_g,C_{gk})

☐ GETRAG MSA 2017: Capability of measuring system (Type-1 Study)

Data _____ Firma _____ Dipartimento _____

GETRAG Production Part Approval

DIMENSIONAL TEST RESULTS

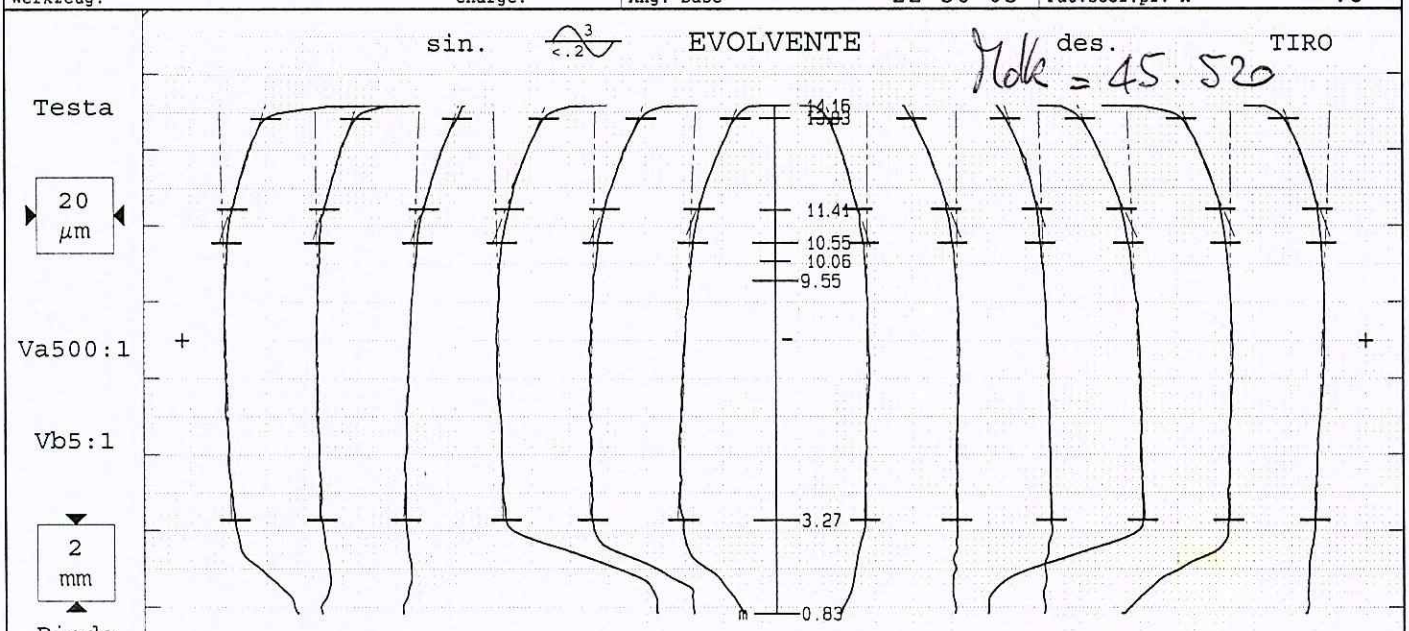
Organization:	GETRAG	Part Number:	251.1.1235.35
Supplier/Vendor Code:	GETRAG Modugno	Part Name:	Input Shaft 1 - Inner
INSPECTION FACILITY:		Design Record Change Level:	3 Index "-"
NA		Engineering Change Documents:	C005854_MIP1 - 15/03/2017

Item	Dimension/Specification	Specification / Limits		Classif.	Qty. Tested	Organization Measurement Results (Data) 1	2	3	4	5	controllo distruttivo	Ok	Not Ok
1	Teeth Profile & Lead, Pitch	OK	NOK		5	OK	OK	OK	OK	OK		OK	
2	MdK	45.542	45.491	<M>	5	45.520	45.515	45.518	45.525	45.517		OK	
3	df	30.550	30.250		5	30.455	30.443	30.452	30.443	30.436		OK	
4	da	43.600	43.440		5	43.549	43.562	43.556	43.564	43.572		OK	
5	Fr	32	0	<M>	5	13.4	19.7	23.2	15.0	20.0		OK	

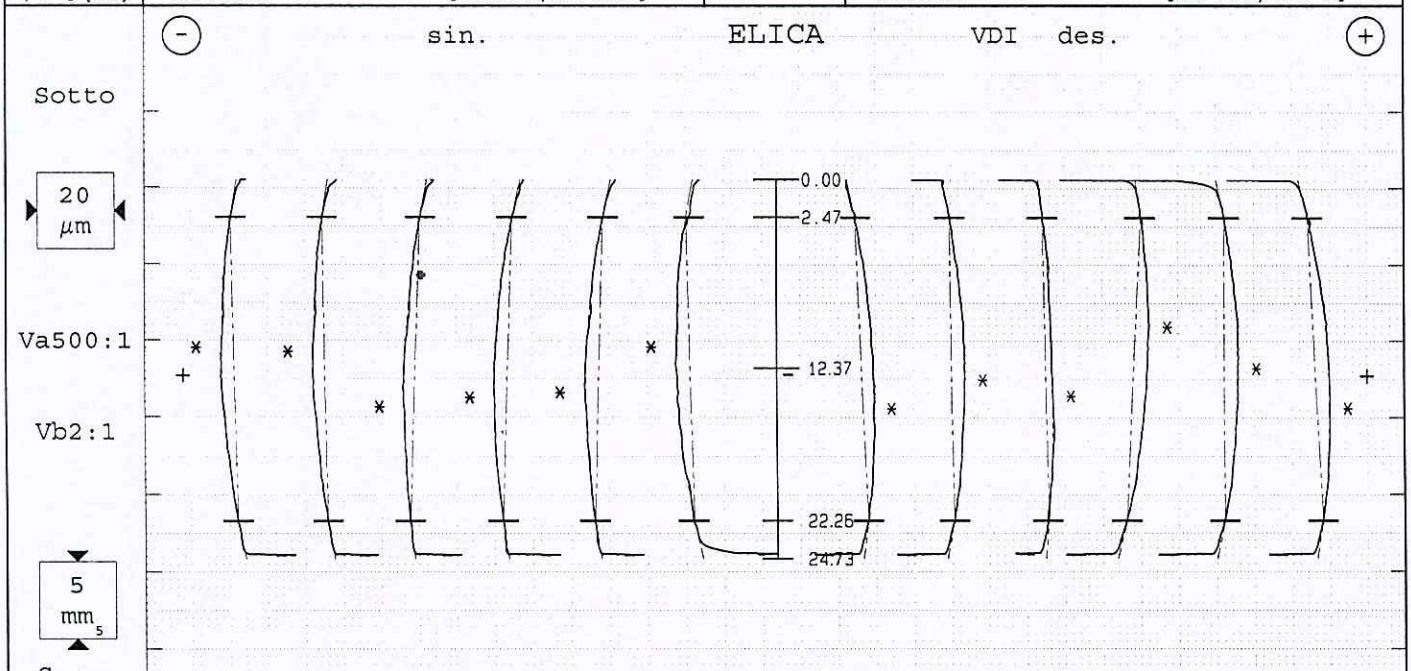
SIGNATURE	TITLE	DATE
Vicenti D.	ME	18/05/2018

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0416b04 0	P26 B7681	Controllore:	turno A	Data:	24.04.2018 02:26
Denominazione:	Input Inner Z13	Numero denti z	13	Largh.fasc.dent. b	24.73mm
Numero disegno.:	D51.6.1235.35-IF	Modulo m	2.45mm	Tratto evolv. La	7.28mm
Commessa/serie nr.:	1 - 1	Angolo pressione	20°00'00"	Tratto elica Lß	19.78mm
Masch.Nr.:	M001 Spindel: Formnost 1	Angolo elica	24°30'00"	Inizio elab. M1	3.27mm
Untersuchungszweck:	Laufende Messung	ø Base db	32.4982mm	Palpatore ø	(#2) 1mm
Werkzeug:	Charge:	Ang. Base	22°56'05"	Fat.scor.pr. x	.8



Tolerance	Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
fHαm ±6	-0.6	Var a 7.1							±6	Var a 8.3						0.0	
fHα ±10	-0.6	2.7	0.9	-4.4	2.1	-1.7	-5.0		±10	0.7	-0.1	-3.4	-4.3	0.4	4.0	0.0	
Fα	2.5	2.7	1.4	3.5	2.5	2.4	3.8			1.5	1.8	2.7	3.8	1.8	2.7	2.5	
ffα 4	1.5	1.7	1.1	1.2	2.1	1.9	2.0		4	1.7	1.8	1.4	1.9	1.9	1.9	1.9	
Cα -13/-5	-10.3	-10.9	-9.8	-9.3	-12.3	-11.3	-9.9		-13/-5	-9.9	-11.1	-8.0	-11.7	-11.9	-11.4	-11.5	
ffαf 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]	30.455	[30.25/30.55]								43.549	[43.44/43.6]						



fHßm ±6	0.6	Var ß 5.7							±6	Var ß 9.7						-0.3	
fHß ±13	0.6	-2.2	-1.6	3.5	3.3	2.8	-2.4		±13	-4.2	-1.4	-1.7	4.9	0.0	-4.8	-0.3	
Fß	3.4	3.3	2.8	3.6	3.8	3.9	3.5			4.3	3.0	2.4	5.2	2.9	5.1	4.1	
ffß 4	0.8	0.7	0.7	0.7	0.3	0.9	1.1		4	0.4	0.5	1.0	0.7	0.4	0.7	0.6	
Cß 1/5	3.1	3.3	3.0	2.7	3.3	3.3	3.5		1/5	3.1	3.4	1.8	3.6	3.7	3.6	3.6	
Rd	5.7															2.5	

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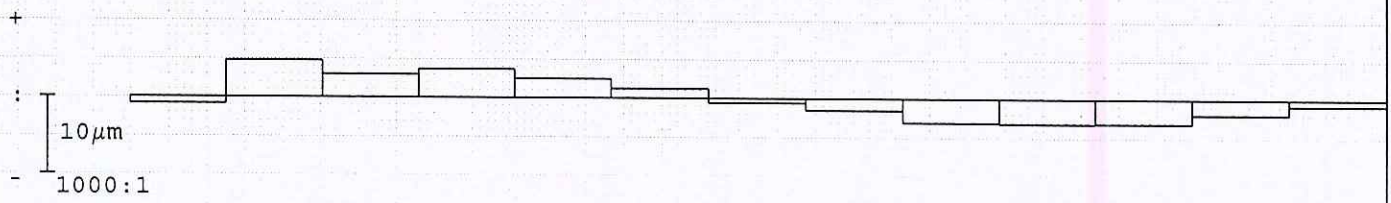
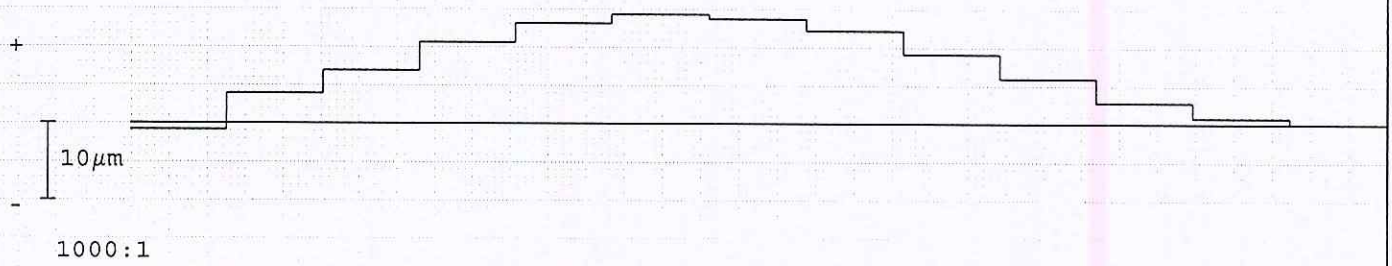
Ruota cilindrica Divisione

Nr. prog.: STI0416b04 0	P26 B7681	Controllore:	turno A	Data:	24.04.2018 02:26
Denominazione:	Input Inner Z13	Numero denti z	13	Angolo pressione	20°00'00"
Numero disegno.:	D51.6.1235.35-IF	Modulo m	2.45mm	Angolo elica	24°30'00"
Commessa/serie nr.:	1	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001 Spindel: Formnest 1	Werkzeug:		Charge:	

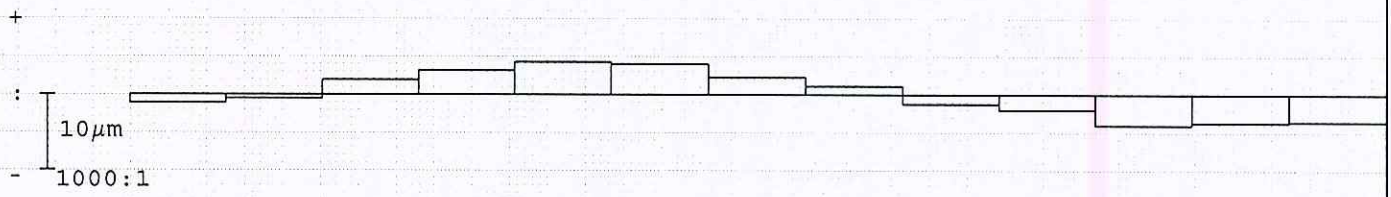
Errori singoli di divisione fp fianco sinistro



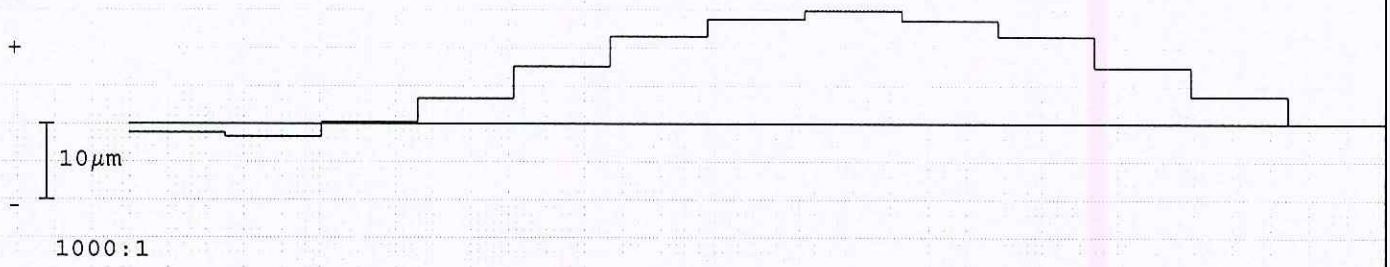
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



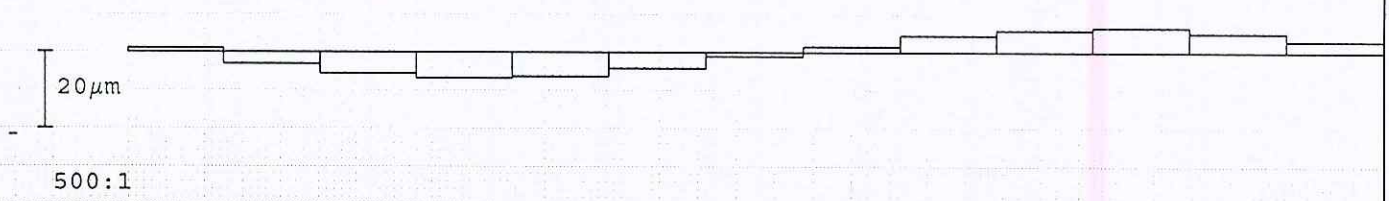
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:38.227 z=12.4mm		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	4.7		14.0		4.2		14.0	
Gr. salto di passo	fu max	5.6		18.0		2.4		18.0	
Scarto di divisione	Rp	7.9				8.3			
Err. globale di divisione	Fp	15.1		40.0		16.5		40.0	
Err. cordale di divisione	Fpz/8	7.8				8.2			

Centricità Fr (Ø-sfera =5mm)

◎ : 13.1µm



Err. di concentricitá	Fr	13.4	32.0	
Variaz. spessore dente	Rs			

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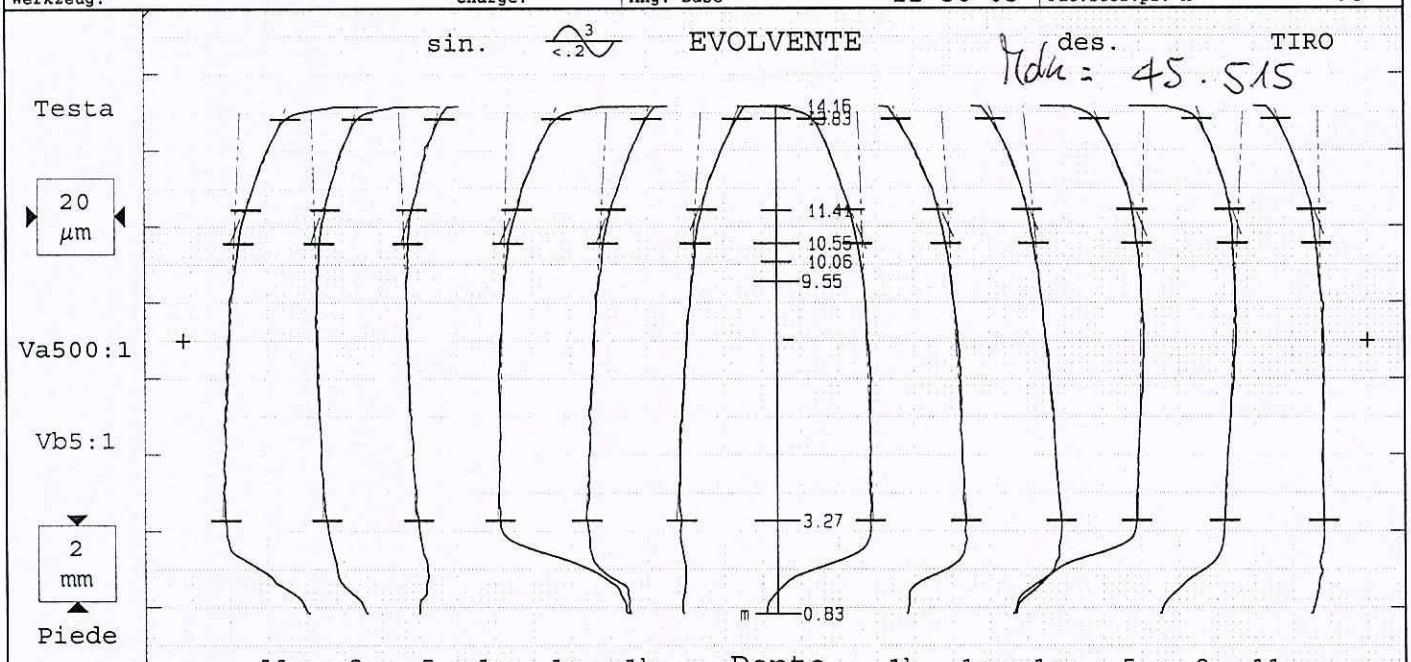
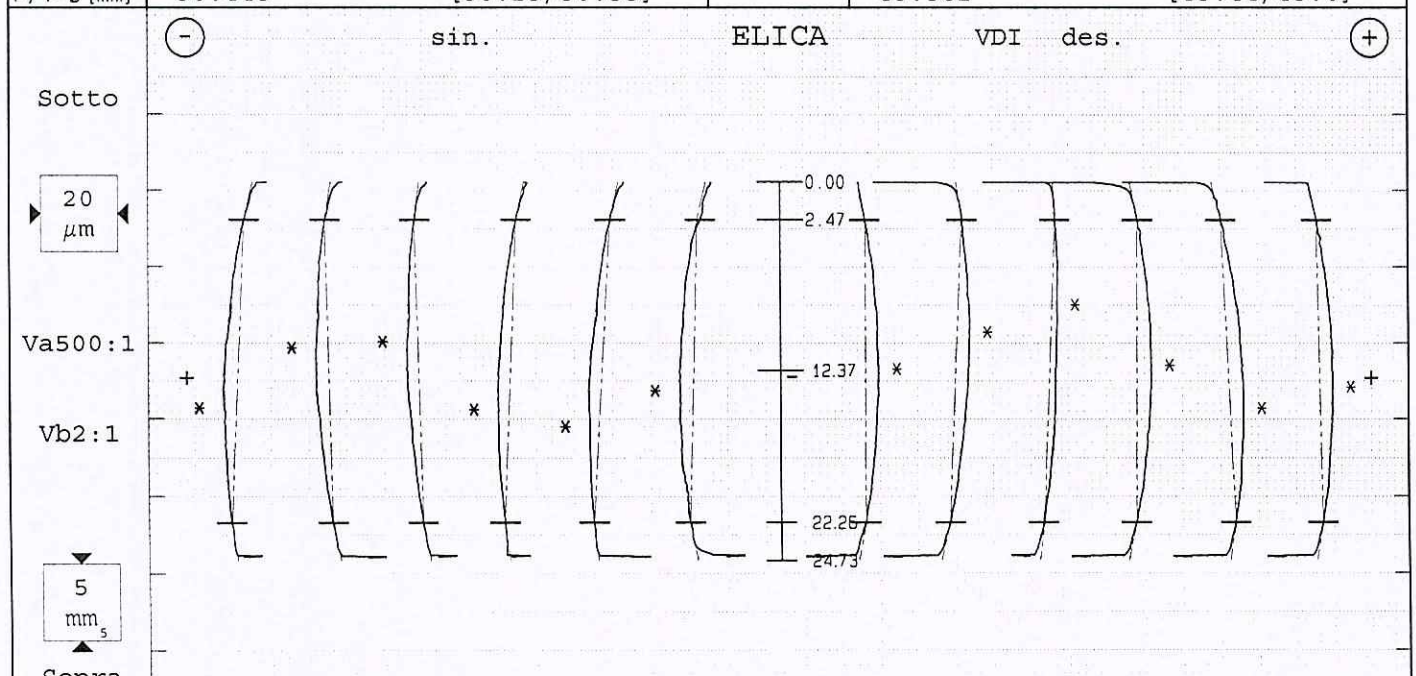
Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0416b04 0	P26 B7681	Controllore:	turno A	Data:	24.04.2018 03:02
Denominazione:	Input Inner Z13	Numero denti z	13	Largh.fasc.dent. b	24.73mm
Numero disegno.:	D51.6.1235.35-IF	Modulo m	2.45mm	Tratto evolv. La	7.28mm
Commessa/serie nr.:	4 – 2	Angolo pressione	20°00'00"	Tratto elica Lß	19.78mm
Masch.Nr.:	M001 Spindel: Formnestol	Angolo elica	24°30'00"	Inizio elab. Ml	3.27mm
Untersuchungszweck:	Laufende Messung	ø Base db	32.4982mm	Palpatore ø	(#2) 1mm
Werkzeug:	Charge:	Ang. Base	22°56'05"	Fat.scor.pr. x	.8



Tolerance	Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
fHam ±6	-1.0	Var a 9.8							±6	Var a 10.8						-0.2	
fHα ±10	-1.0	-4.9	2.7	4.0	-2.9	-5.8	-6.6		±10	-3.7	-6.1	-9.6	2.0	4.7	-1.4	-0.2	
Fα	3.7	4.1	2.7	3.2	2.7	4.6	4.4			3.4	5.1	7.1	2.1	3.2	2.0	3.1	
ffα 4	1.5	1.7	1.6	1.4	1.7	1.4	1.8		4	2.2	2.0	1.2	2.3	1.9	1.8	2.0	
Cα -13/-5	-10.5	-11.0	-11.1	-9.8	-11.6	-9.9	-8.9		-13/-5	-11.2	-11.5	-8.2	-12.3	-11.0	-10.5	-11.3	
ffaf 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]	30.443	[30.25/30.55]								43.562	[43.44/43.6]						



fHßm ±6	1.2	Var ß 8.3							±6	Var ß 8.9						-0.5	
fHß ±13	1.2	4.3	-2.4	-2.7	4.0	5.6	2.5		±13	0.1	4.2	3.8	0.6	-4.7	-1.9	-0.5	
Fß	4.0	4.7	3.4	3.1	4.0	4.8	4.6			2.6	4.6	3.6	3.1	5.1	3.3	4.0	
ffß 4	0.8	0.8	0.8	0.7	0.3	0.8	1.2		4	0.4	0.4	0.7	0.6	0.4	0.5	0.5	
Cß 1/5	3.1	3.4	3.2	2.8	3.0	2.9	3.6		1/5	3.4	3.4	1.7	3.7	3.7	3.4	3.6	

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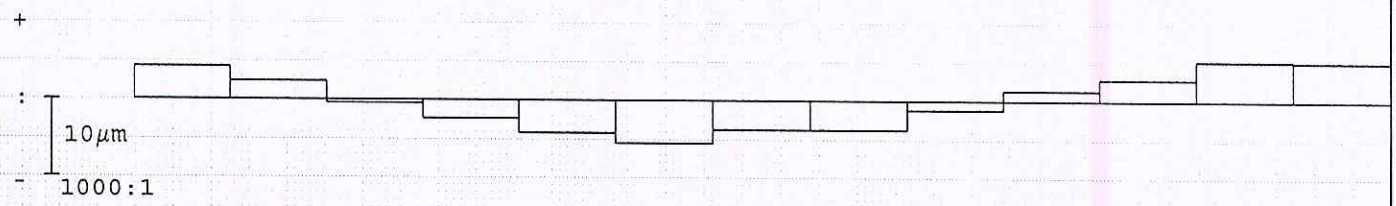
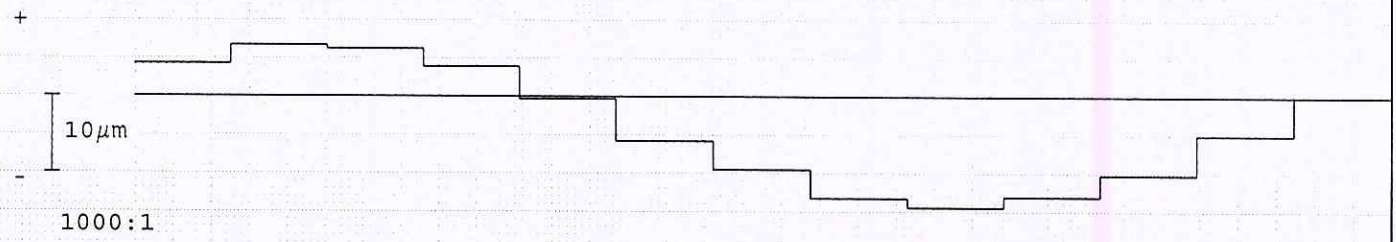
Ruota cilindrica Divisione

Nr. prog.: STI0416b04 0	P26 B7681	Controllore:	turno A	Data:	24.04.2018 03:02
Denominazione:	Input Inner Z13	Numero denti z	13	Angolo pressione	20°00'00"
Numero disegno.:	D51.6.1235.35-IF	Modulo m	2.45mm	Angolo elica	24°30'00"
Commessa/serie nr.:	4	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001 Spindel: Formnestel	Werkzeug:		Charge:	

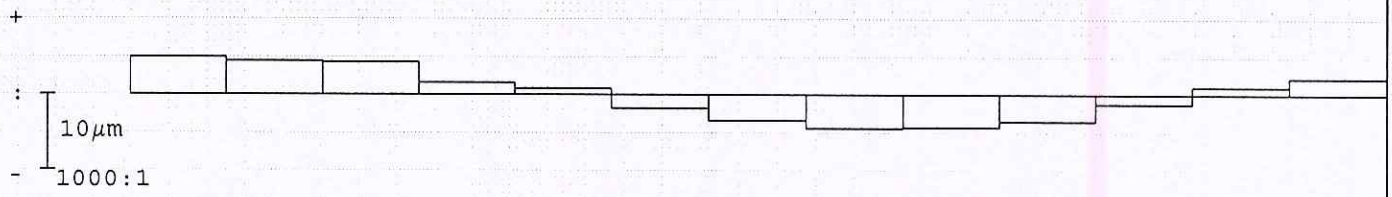
Errori singoli di divisione fp fianco sinistro



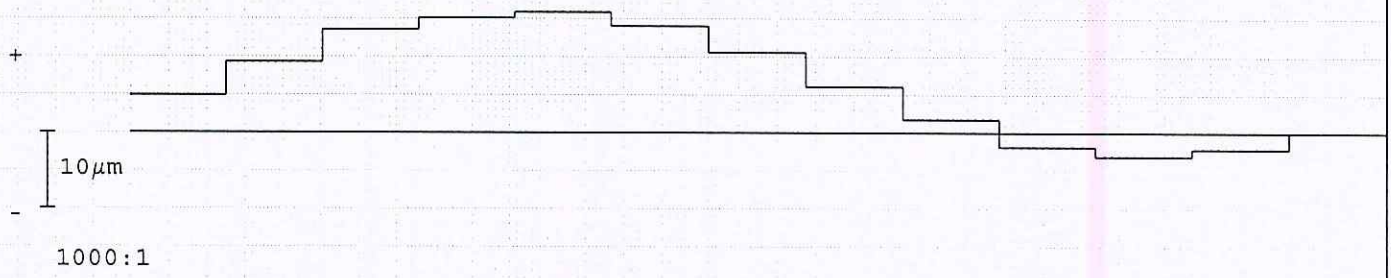
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

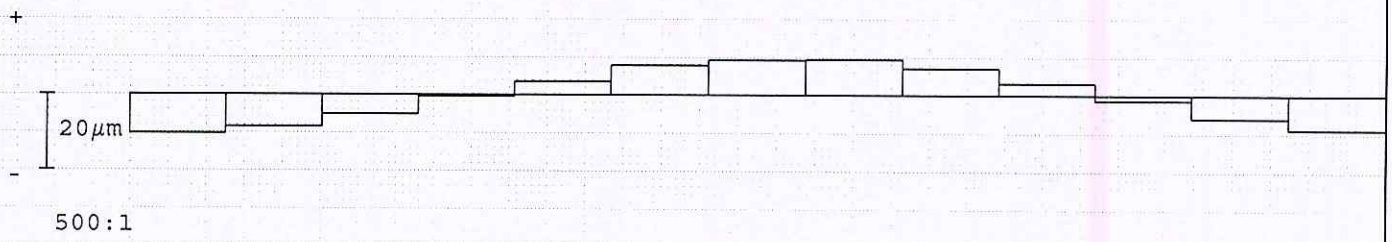


Errore somma di divisione Fp fianco destro



Corsa per misura divis.:38.227 z=12.4mm		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	5.5		14.0		4.9		14.0	
Gr. salto di passo	fu max	2.8		18.0		2.7		18.0	
Scarto di divisione	Rp	10.7				9.4			
Err. globale di divisione	Fp	21.1		40.0		19.0		40.0	
Err. cordale di divisione	Fpz/8	10.3				9.3			

Centricità Fr (Ø-sfera =5mm) ◎ : 19.7µm



Err. di concentricitá	Fr	19.7	32.0	
Variaz. spessore dente	Rs			

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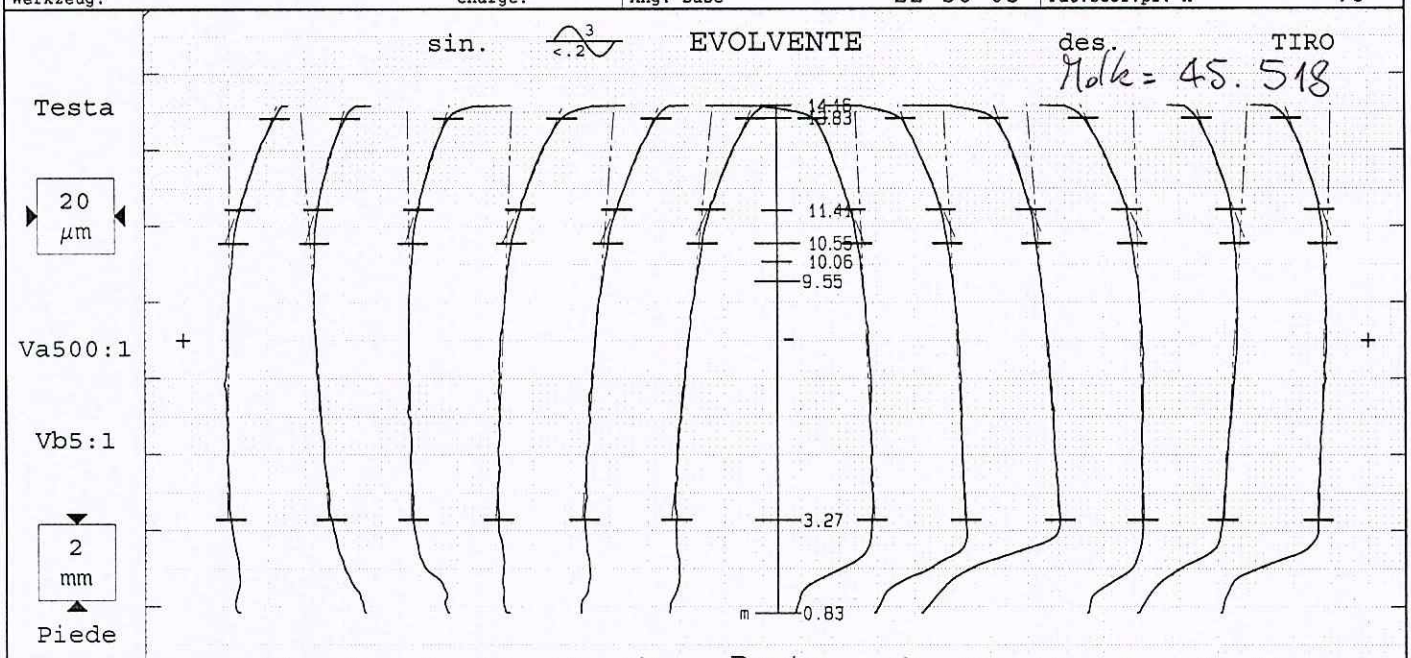
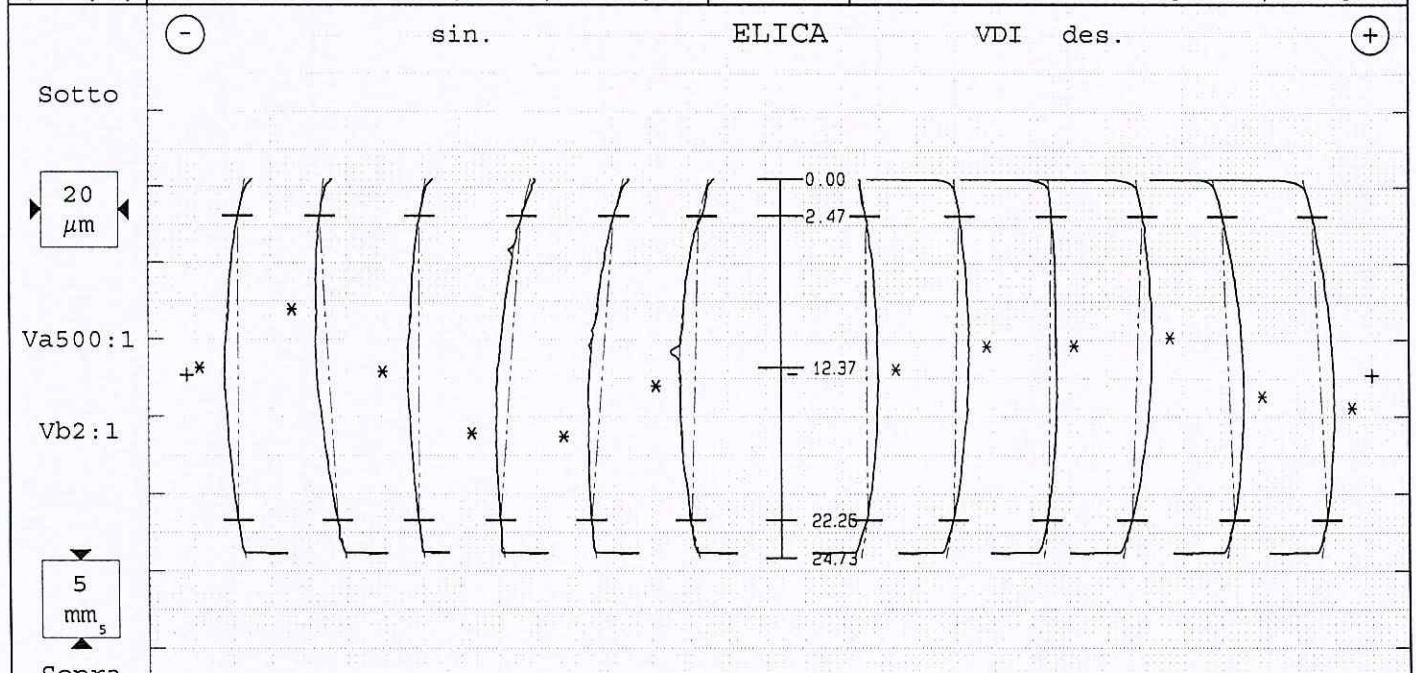
Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0416b04 0	P26 B7681	Controllore:	turno A	Data:	24.04.2018 03:31
Denominazione:	Input Inner Z13	Numero denti z	13	Largh.fasc.dent. b	24.73mm
Numero disegno.:	D51.6.1235.35-IF	Modulo m	2.45mm	Tratto evolv. La	7.28mm
Commessa/serie nr.:	7 - 3	Angolo pressione	20°00'00"	Tratto elica Lß	19.78mm
Masch.Nr.:	M001 Spindel: Formnestl	Angolo elica	24°30'00"	Inizio elab. M1	3.27mm
Untersuchungszweck:	Laufende Messung	ø Base db	32.4982mm	Palpatore ø	(#2) 1mm
Werkzeug:	Charge:	Ang. Base	22°56'05"	Fat.scor.pr. x	.8



Tolerance	Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
		11	8	5	1s	1c	1b			1b	1c	1s	5	8	11		
fHαm ±6	-0.6	Var a 15.4							±6	Var a 11.8						0.4	
fHα ±10	-0.6	-0.9	6.7	0.6	-4.5	-8.7	-10.7		±10	-4.7	-5.6	-8.3	-2.3	6.2	3.3	0.4	
Fα	3.8	2.4	4.8	1.4	3.8	6.4	7.3			4.0	4.7	6.1	2.9	4.1	2.4	3.5	
ffα 4	1.8	2.1	1.6	1.6	2.0	1.8	1.9		4	1.9	1.7	1.2	2.3	2.2	1.8	2.0	
Ca -13/-5	-10.6	-11.2	-10.7	-9.9	-12.2	-10.5	-9.5		-13/-5	-10.2	-10.9	-7.9	-12.6	-12.3	-10.9	-11.7	
ffαf 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]	30.452	[30.25/30.55]								43.556					[43.44/43.6]		



N:Z																	
		11	8	5	1t	1c	1p			1p	1c	1t	5	8	11		
fHßm ±6	0.5	Var ß 13.1							±6	Var ß 8.4						-0.7	
fHß ±13	0.5	0.0	-5.7	0.4	7.1	7.4	2.6		±13	-0.2	2.2	1.3	3.6	-3.7	-4.8	-0.7	
Fß	4.1	2.7	4.9	2.4	6.2	6.3	7.2			2.3	3.4	1.9	4.6	4.6	4.8	4.4	
ffß 4	0.9	0.8	0.7	0.7	1.7	1.3	3.1		4	0.4	0.5	0.7	0.5	0.4	0.3	0.4	
Cß 1/5	3.2	3.3	3.1	2.9	3.3	3.3	4.2		1/5	3.0	3.2	1.8	3.7	3.9	3.5	3.6	

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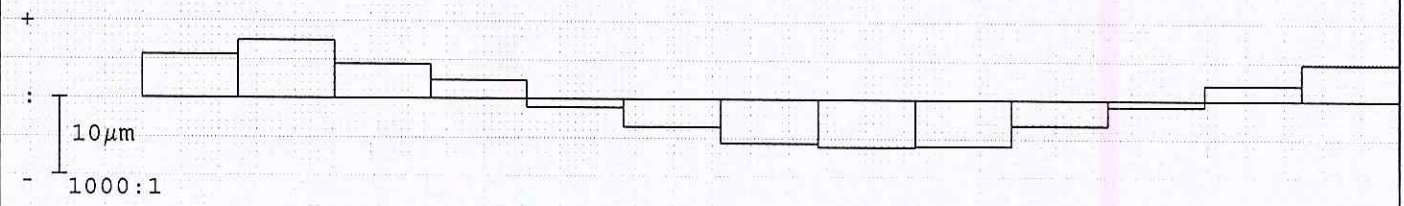
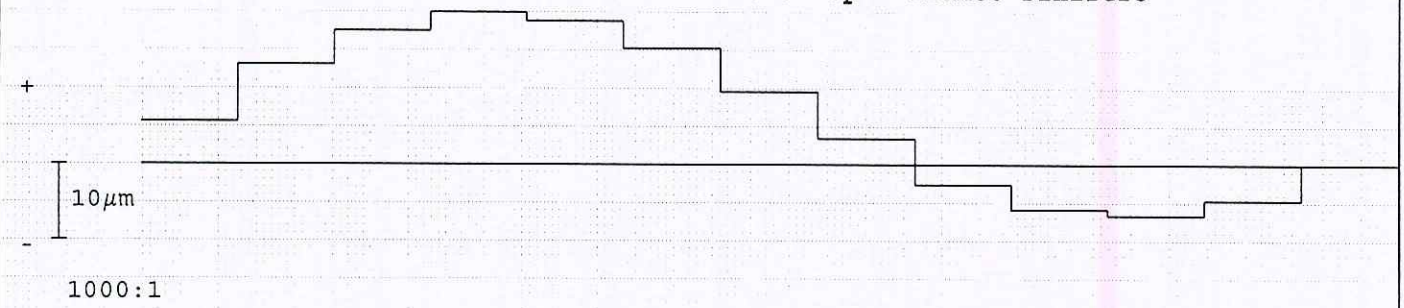
Ruota cilindrica Divisione

Nr. prog.: STI0416b04 0 P26 B7681	Controllore: turno A	Data:	24.04.2018 03:31
Denominazione: Input Inner Z13	Numero denti z 13	Angolo pressione	20°00'00"
Numero disegno.: D51.6.1235.35-IF	Modulo m 2.45mm	Angolo elica	24°30'00"
Commessa/serie nr.: 7	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001 Spindel: Formnestel	Werkzeug:	Charge:	

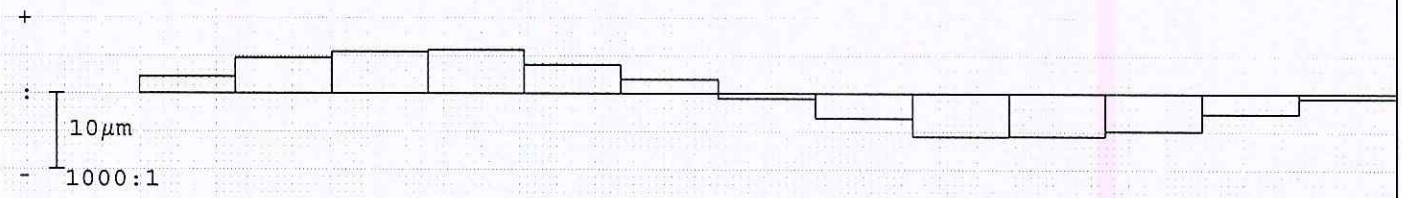
Errori singoli di divisione fp fianco sinistro



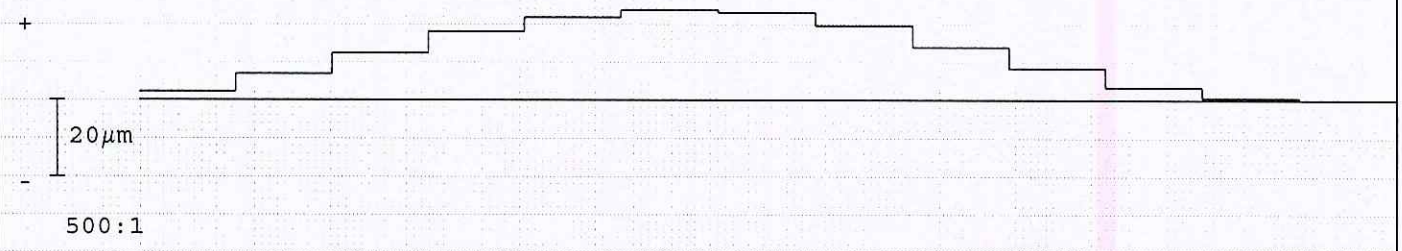
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

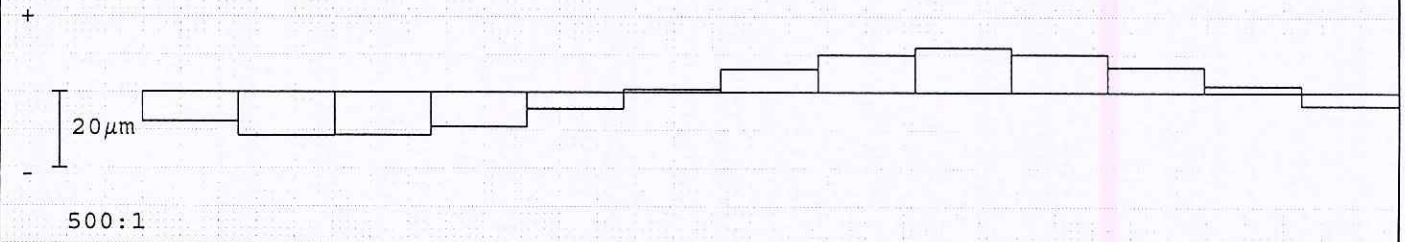


Errore somma di divisione Fp fianco destro



Corsa per misura divis.:38.227 z=12.4mm		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	7.5		14.0		5.7		14.0	
Gr. salto di passo	fu max	3.5		18.0		2.8		18.0	
Scarto di divisione	Rp	13.6				11.4			
Err. globale di divisione	Fp	26.6		40.0		23.6		40.0	
Err. cordale di divisione	Fpz/8	13.0				11.3			

Centricità Fr (Ø-sfera =5mm) ◎ : 22.9µm



Err. di concentricitá	Fr	23.2	32.0	
Variaz. spessore dente	Rs			

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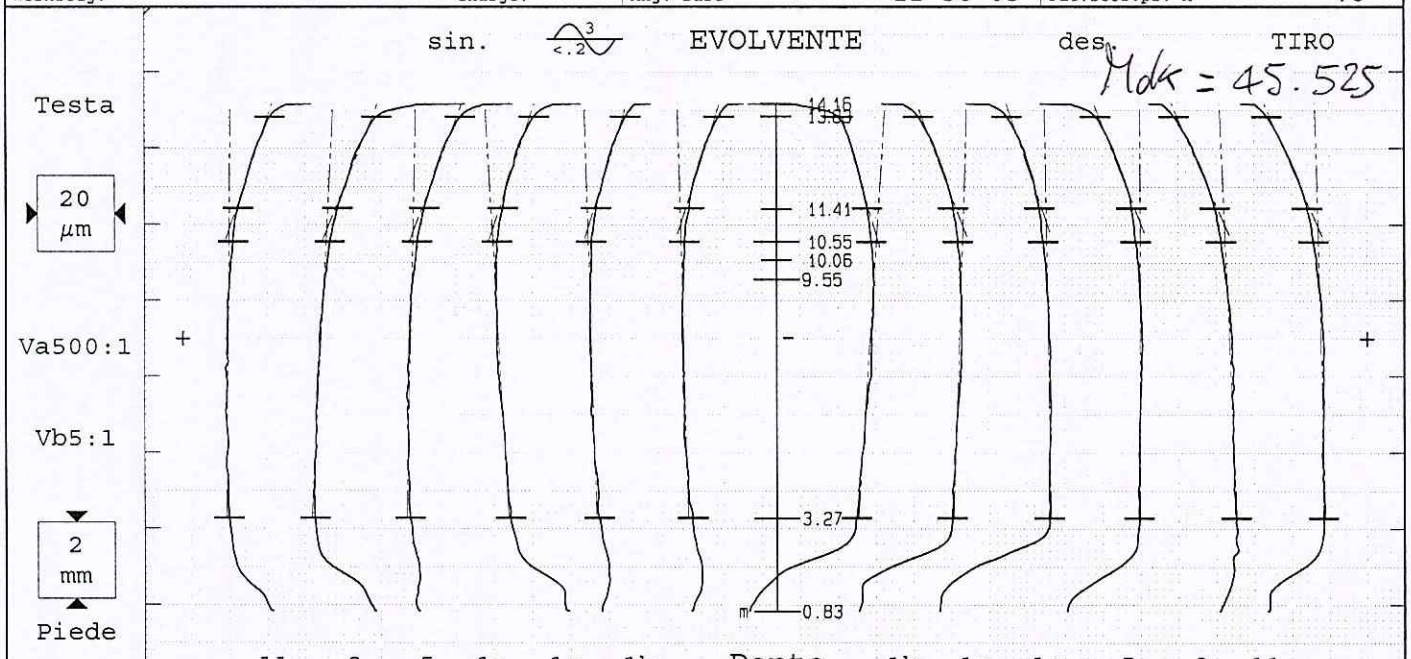
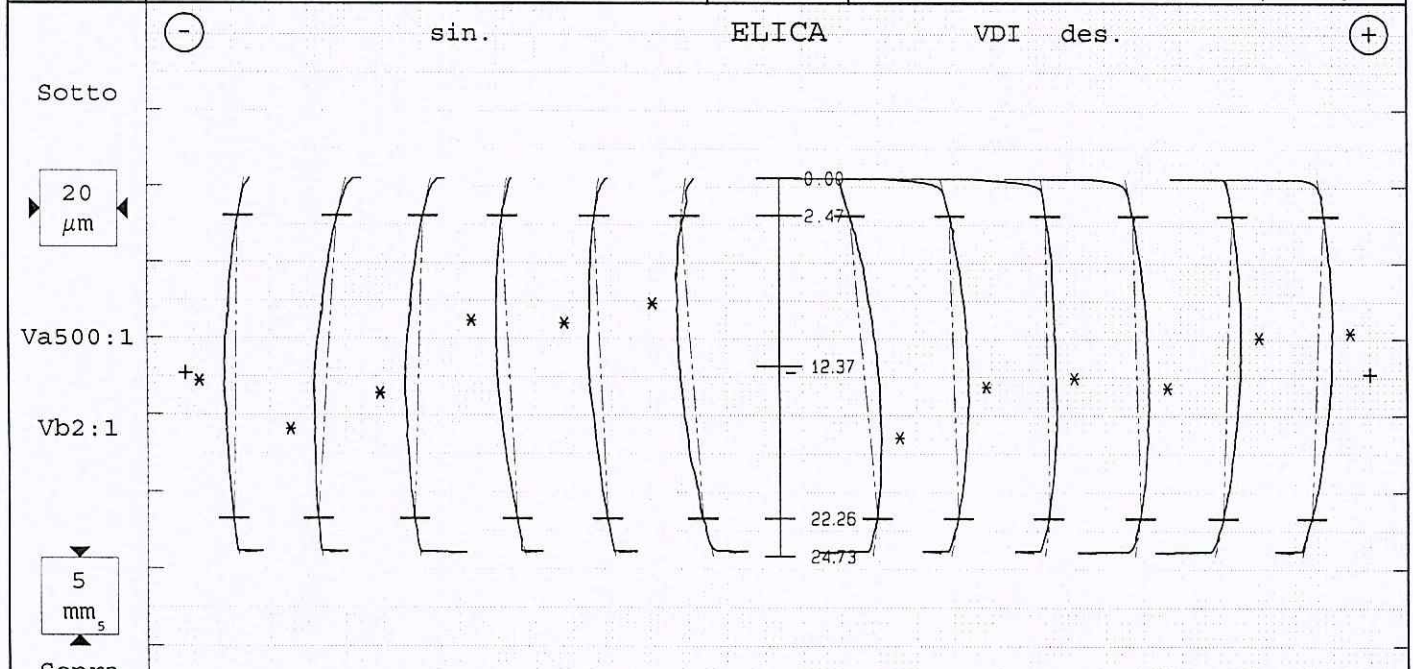
Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0416b04 0	P26 B7681	Controllore:	turno A	Data:	24.04.2018 03:52
Denominazione:	Input Inner Z13	Numero denti z	13	Largh.fasc.dent. b	24.73mm
Numero disegno.:	D51.6.1235.35-IF	Modulo m	2.45mm	Tratto evolv. La	7.28mm
Commessa/serie nr.:	9 – 4	Angolo pressione	20°00'00"	Tratto elica Lß	19.78mm
Masch.Nr.:	M001 Spindel: Formnestl	Angolo elica	24°30'00"	Inizio elab. M1	3.27mm
Untersuchungszweck:	Laufende Messung	ø Base db	32.4982mm	Palpatore ø	(#2) 1mm
Werkzeug:	Charge:	Ang. Base	22°56'05"	Fat.scor.pr. x	.8



Tolerance	Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
		11	8	5	1s	1c	1b			1b	1c	1s	5	8	11		
fHαm ±6	-1.5	Var a 8.5							±6	Var a 7.9						-0.9	
fHα ±10	-1.5	-1.1	-5.5	-2.5	5.8	3.0	2.5		±10	7.0	3.5	-1.6	0.1	-4.4	-2.6	-0.9	
Fα	2.8	2.0	4.2	2.7	3.8	2.4	2.7			4.7	2.7	2.1	1.8	3.9	2.8	2.8	
ffα 4	1.6	1.7	1.5	1.8	1.7	1.3	1.7		4	2.2	2.0	1.5	1.8	1.9	2.1	2.0	
Cα -13/-5	-10.4	-9.8	-10.6	-11.0	-11.6	-10.0	-9.8		-13/-5	-11.2	-11.9	-8.9	-10.8	-11.3	-12.1	-11.5	
ffαf 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]	30.443	[30.25/30.55]								43.564					[43.44/43.6]		



N:Z																	
		11	8	5	1t	1c	1p			1p	1c	1t	5	8	11		
fHßm ±6	1.7	Var ß 10.5							±6	Var ß 6.9						0.6	
fHß ±13	1.7	1.4	6.4	2.9	-4.8	-4.1	-6.9		±13	-8.7	-2.7	-0.9	-2.3	3.3	4.2	0.6	
Fß	4.1	2.8	5.5	4.0	4.6	3.9	6.2			7.5	4.0	2.1	3.1	4.0	4.9	4.0	
ffß 4	0.8	0.7	0.8	0.7	0.3	0.8	1.2		4	0.5	0.6	0.7	0.5	0.4	0.4	0.5	
Cß 1/5	3.0	2.8	3.1	3.3	3.2	2.9	3.3		1/5	3.7	3.8	2.3	3.1	3.4	3.8	3.5	

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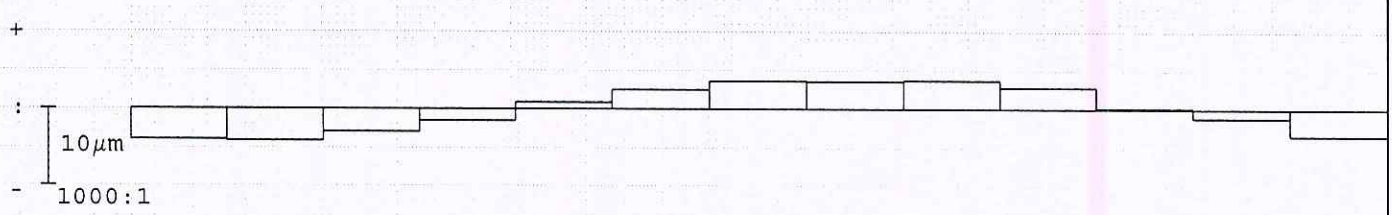
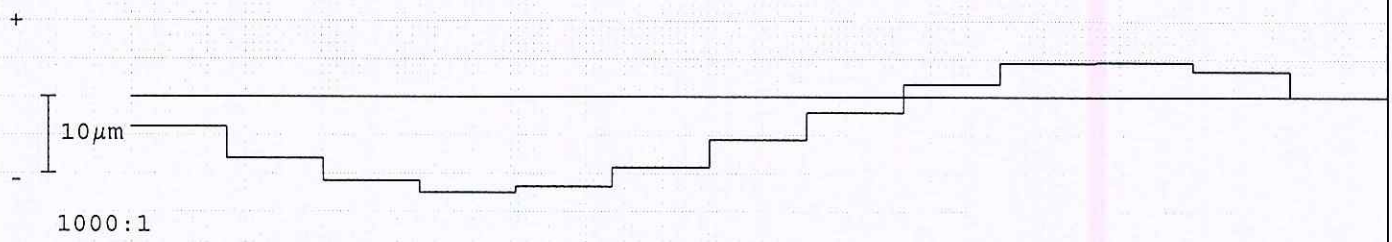
Ruota cilindrica Divisione

Nr. prog.: STI0416b04 0 P26 B7681	Controllore: turno A	Data:	24.04.2018 03:52
Denominazione: Input Inner Z13	Numero denti z 13	Angolo pressione	20°00'00"
Numero disegno.: D51.6.1235.35-IF	Modulo m 2.45mm	Angolo elica	24°30'00"
Commessa/serie nr.: 9	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001 Spindel: Formnestzeug	Charge:		

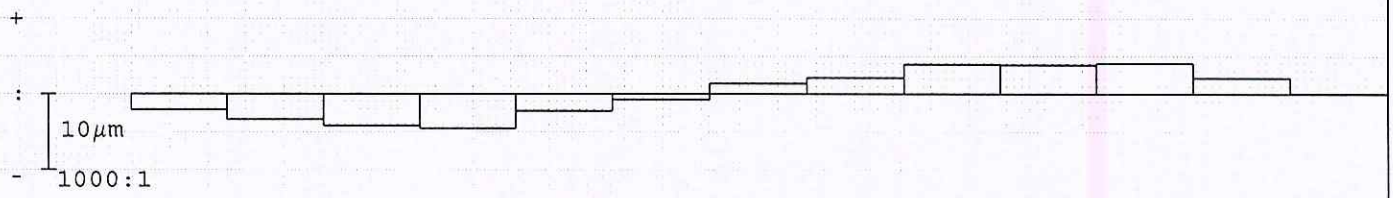
Errori singoli di divisione fp fianco sinistro



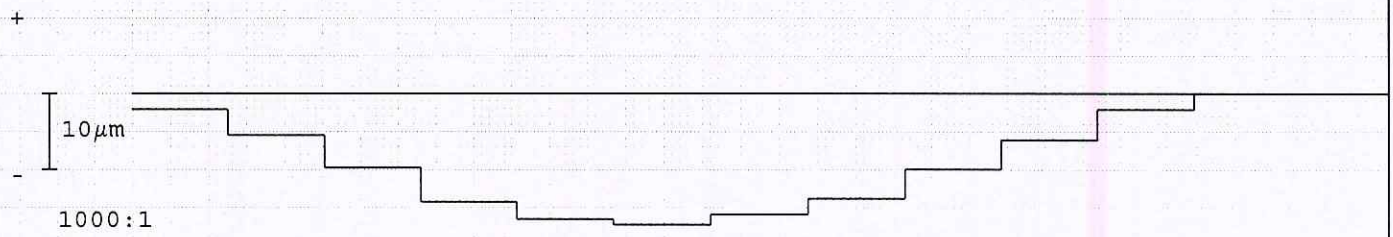
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



Errore somma di divisione Fp fianco destro

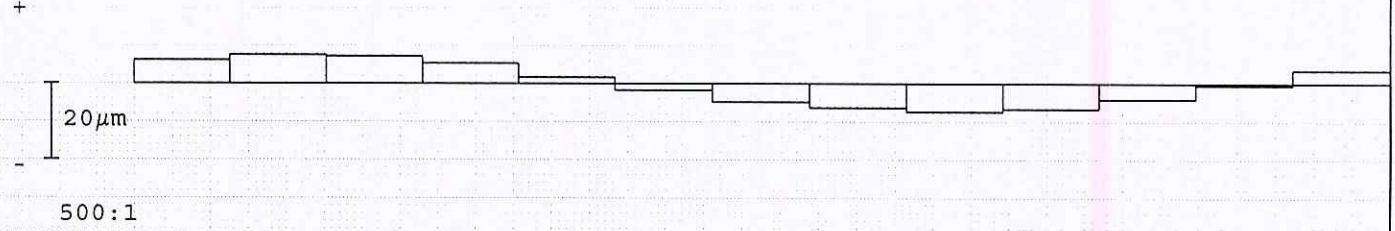


Corsa per misura divis.:38.227 z=12.4mm

		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	4.1		14.0		4.6		14.0	
Gr. salto di passo	fu max	2.7		18.0		2.3		18.0	
Scarto di divisione	Rp	7.8				8.6			
Err. globale di divisione	Fp	17.1		40.0		17.3		40.0	
Err. cordale di divisione	Fpz/8	8.0				8.8			

Centricità Fr (Ø-sfera =5mm)

◎ : 15.1µm



Err. di concentricitá	Fr	15.0	32.0	
Variaz. spessore dente	Rs			

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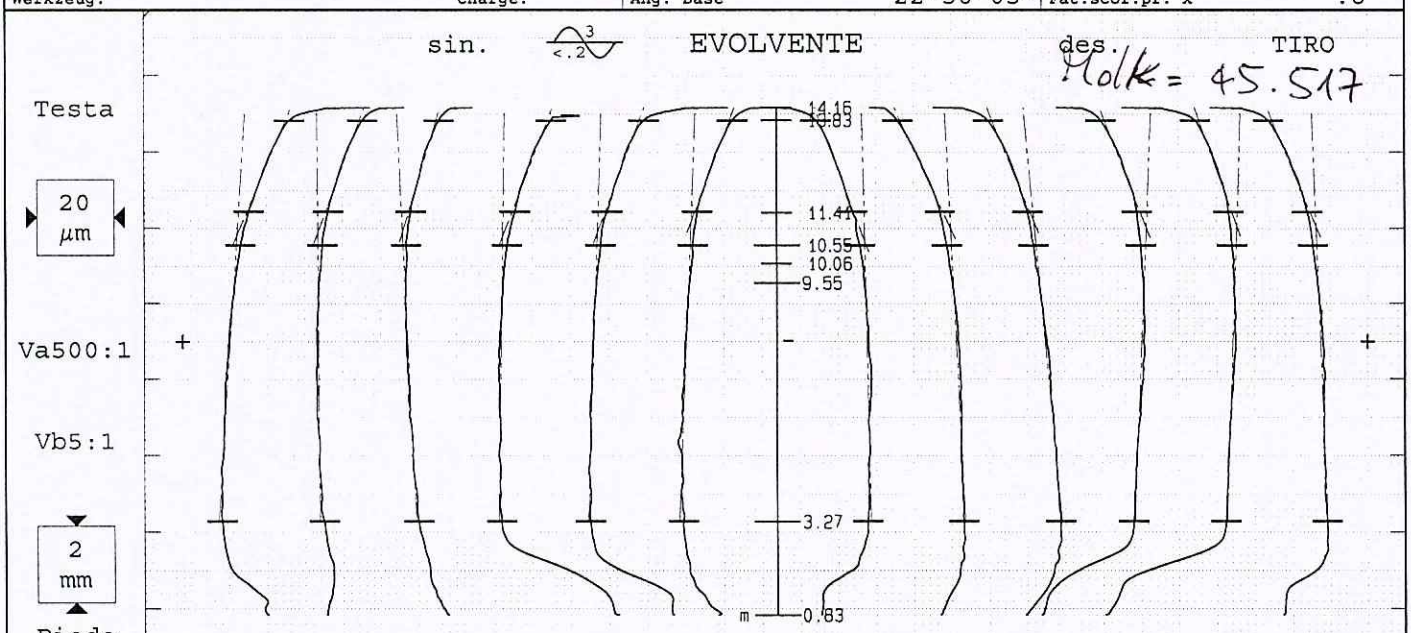
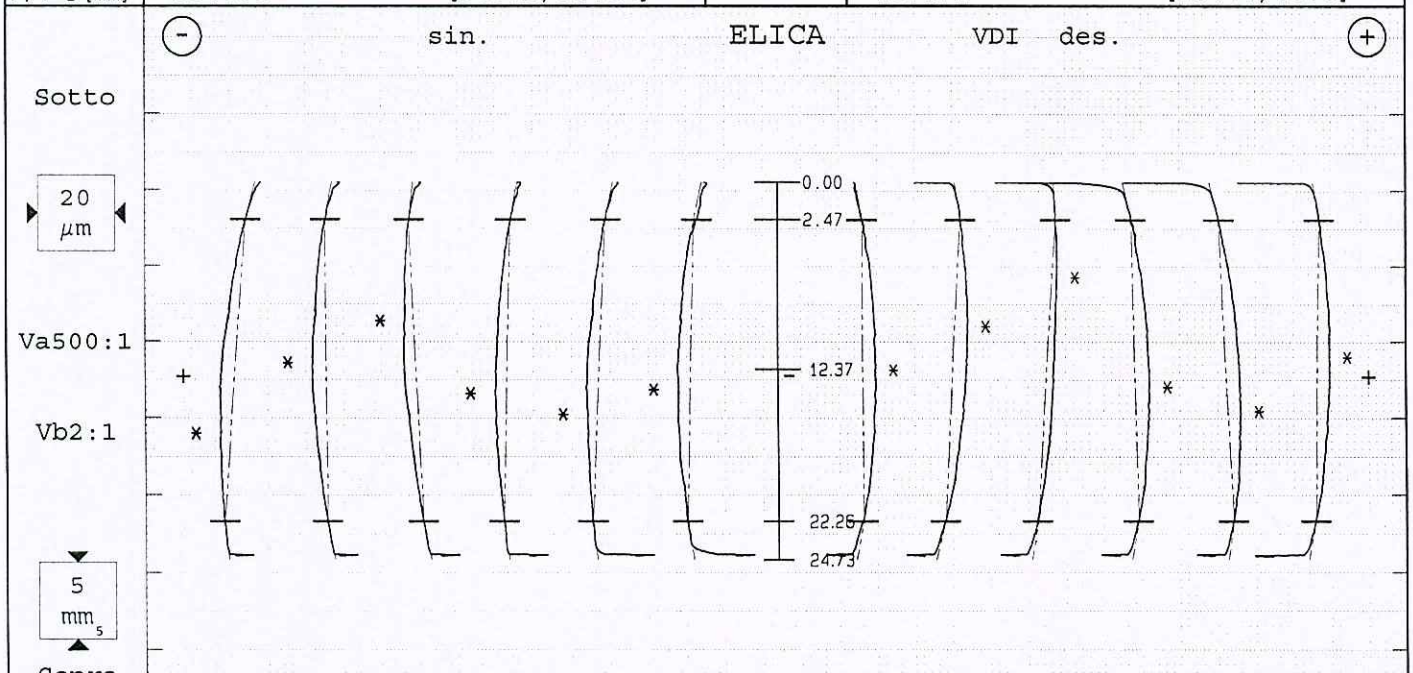
Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0416b04 0	P26 B7681	Controllore:	turno A	Data:	24.04.2018 04:24
Denominazione:	Input Inner Z13	Numero denti z	13	Largh.fasc.dent. b	24.73mm
Numero disegno.:	D51.6.1235.35-IF	Modulo m	2.45mm	Tratto evolv. La	7.28mm
Commessa/serie nr.:	10 - 5	Angolo pressione	20°00'00"	Tratto elica Lß	19.78mm
Masch.Nr.:	M001 Spindel: Formnext	Angolo elica	24°30'00"	Inizio elab. M1	3.27mm
Untersuchungszweck:	Laufende Messung	ø Base db	32.4982mm	Palpatore ø	(#2)1mm
Werkzeug:	Charge:	Ang. Base	22°56'05"	Fat.scor.pr. x	.8



Tolerance	Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm ±6	-1.3	Var a 11.7							±6	Var a 9.3						-0.4	
fHα ±10	-1.3	-6.9	0.6	4.8	-1.7	-3.6	-4.2		±10	-2.2	-5.2	-9.8	4.1	3.7	-4.0	-0.4	
Fα	3.5	5.1	2.0	3.5	2.3	3.2	3.9			3.0	4.4	7.0	3.0	2.6	3.7	3.4	
ffα 4	1.6	1.6	1.8	1.4	1.8	1.4	2.3		4	2.3	1.9	1.3	2.1	1.8	1.9	1.9	
Cα -13/-5	-10.6	-10.8	-11.2	-10.3	-11.2	-10.0	-9.0		-13/-5	-11.2	-12.0	-8.6	-12.1	-10.9	-10.6	-11.4	
ffαf 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]	30.436	[30.25/30.55]								43.572	[43.44/43.6]						



fHßm ±6	1.5	Var ß 11.7							±6	Var ß 10.0						-0.1	
fHß ±13	1.5	7.1	-0.7	-4.6	2.4	4.2	2.2		±13	-0.1	5.2	5.9	-2.2	-4.8	1.3	-0.1	
Fß	4.3	6.0	2.9	4.1	3.2	4.1	4.1			2.7	5.3	5.2	3.9	4.8	3.1	4.3	
ffß 4	0.7	0.7	0.7	0.6	0.3	0.7	1.1		4	0.4	0.5	0.6	0.8	0.4	0.4	0.5	
Cß 1/5	3.1	3.3	3.4	2.9	2.8	2.8	3.3		1/5	3.4	3.6	2.0	3.7	3.5	3.2	3.5	
Rd	0.2															6.0	

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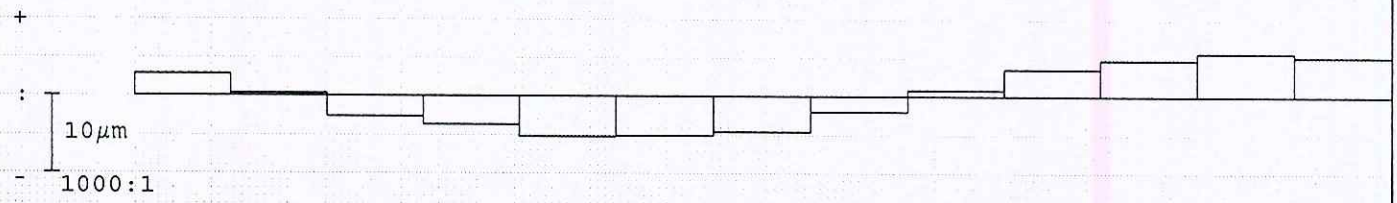
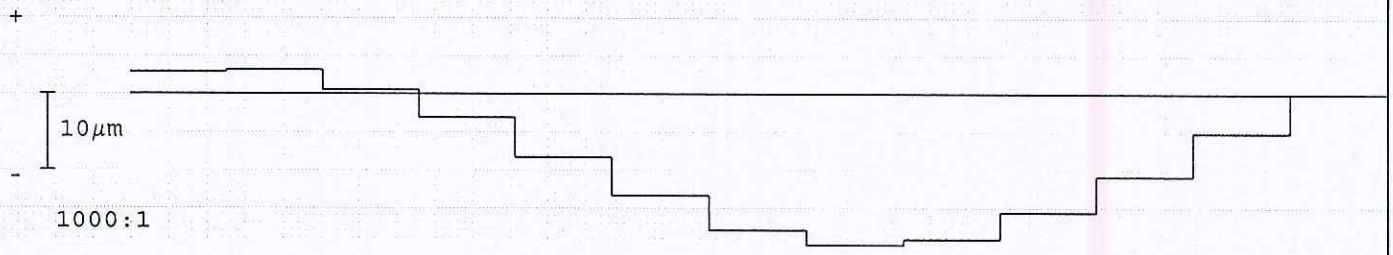
Ruota cilindrica Divisione

Nr. prog.: STI0416b04 0	P26 B7681	Controllore:	turno A	Data:	24.04.2018 04:24
Denominazione:	Input Inner Z13	Numero denti z	13	Angolo pressione	20°00'00"
Numero disegno.:	D51.6.1235.35-IF	Modulo m	2.45mm	Angolo elica	24°30'00"
Commessa/serie nr.:	10	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001 Spindel: Formnestel	Werkzeug:		Charge:	

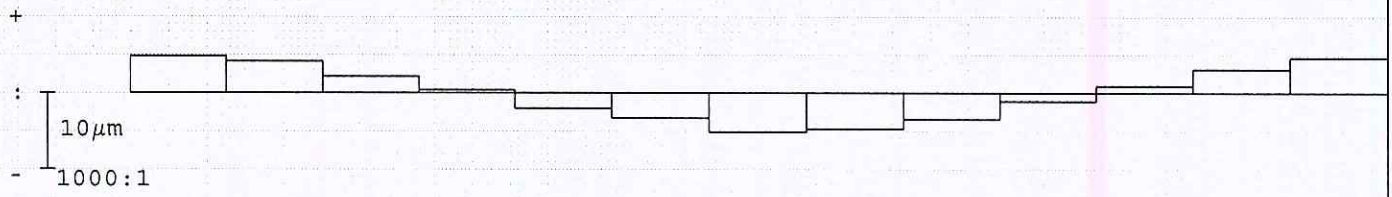
Errori singoli di divisione fp fianco sinistro



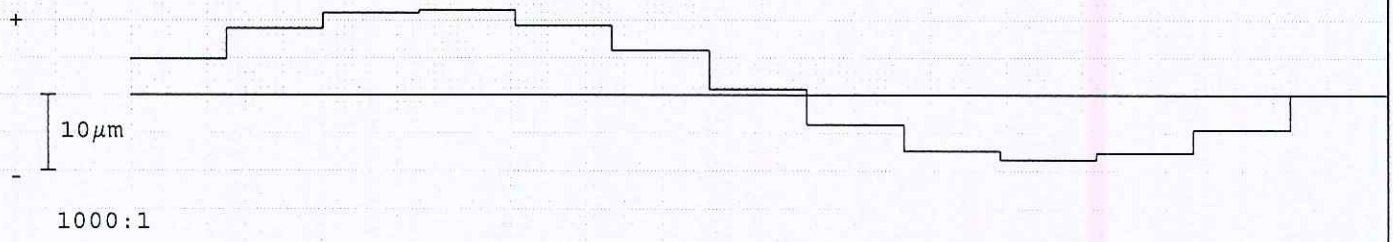
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

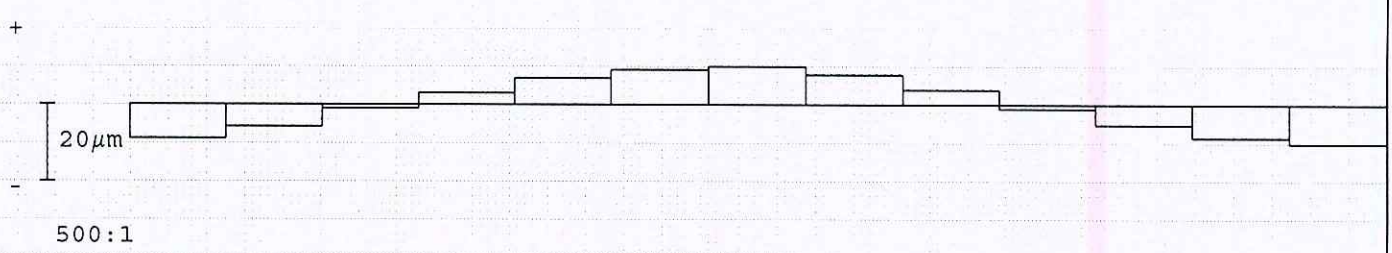


Errore somma di divisione Fp fianco destro



Corsa per misura divis.:38.227 z=12.4mm		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	5.7		14.0		5.1		14.0	
Gr. salto di passo	fu max	2.9		18.0		2.4		18.0	
Scarto di divisione	Rp	10.9				9.9			
Err. globale di divisione	Fp	23.1		40.0		19.8		40.0	
Err. cordale di divisione	Fpz/8	10.9				9.8			

Centricità Fr (Ø-sfera =5mm) ◎ : 19.6µm



Err. di concentricitá	Fr	20.0	32.0	
Variaz. spessore dente	Rs			

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MAGNA GETRAG

REPORT 18/071

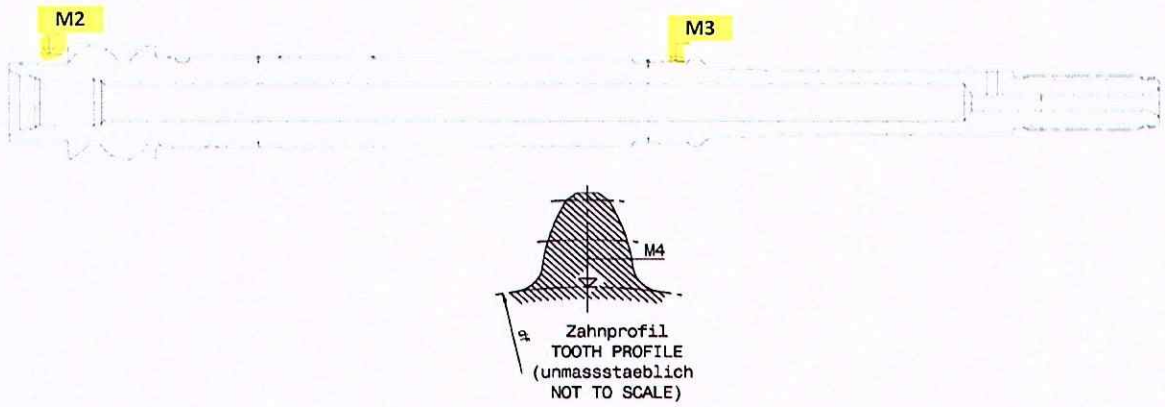
Date: 08/05/2018
Author: M.Corsini

Reason for analysis: *Motivo dell'indagine:*	PPAP	**Requester:** *Richiedente:*	WLQ - M. Vicenti

Part Name: *Nome particolare:*	IS1	**P/N:**	251.6.1235.35
Material: *Materiale:*	GCG_805000 Part 2	**S/N:**	-
State of part: *Stato del particolare:*	Finito	**Customer:** *Cliente:*	

Result: *Risultato:*	**OK**	**Distribution list:** *Lista di distribuzione:*	WLQ - M. Vicenti
Notes: *Note:*	Gearset 32C		

Drawing *(disegno)*



Picture 1: posizioni di misura a disegno.

Surface hardness verification *(verifica durezza superficiale)*

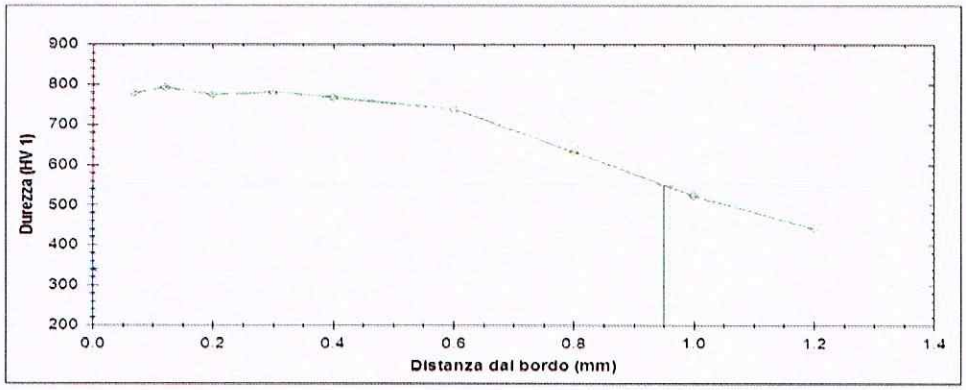
Component	Scale	Position	Measured Value	Range
Shaft	HRC	M1	61.8	-
Shaft	HRA	M1	82.0	80.5 + 2.5

REPORT 18/071

Date: 08/05/2018
Author: M.Corsini

CHD and core hardness verification *(verifica CHD e durezza a cuore)*

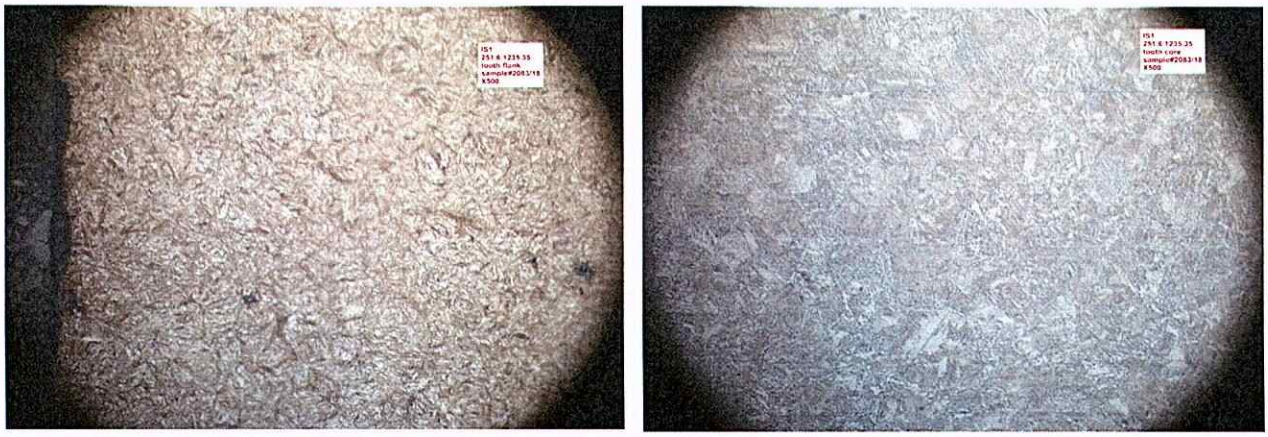
Component	Scale	Sample #	Position	Measured Value	Range
Shaft	CHD 550 HV1	2083/18	M2 (tooth flank)	0.96	0.70+0.50 mm
Shaft	CHD 550 HV1	2083/18	M3	0.95	0.50 mm min.
Shaft	Core hardness HV10	2083/18	M4 (tooth core)	341	≥ 300



Picture 2: profili di durezza.

Microstructure analysis *(analisi della microstruttura)*

Sample #	2083/18
Shaft - Tooth flank surface structure:	Martensite e austenite residua (5%)
Shaft - Tooth base core structure:	Martensite, bainite



Picture 2: Microstruttura sul fianco dente (a sinistra) ed a cuore sulla base dente (a destra).

GETRAG

Analisi di similitudine Ppk

Formular Nr:
Datum:
Status: Entwurf
Formular Eigner / Fachbereich:
Prozess-/VA-verweis:

Macchina da confrontare: **HNW11013**
Capability da confrontare Nr.: **07/03/2017**

Data: **18/05/2018**
Owner: **G.Sette**
Abt.: **WLQ1**

Codice Pezzo di riferimento: **251.6.1071.35**

Partnumber in esame: **251.6.1235.35**

Esito Correlazione: **Il processo è paragonabile capacità di processo confermata**

	Si	No	
Il grezzo è uguale?	X		Stesso grezzo
Stesso processo di TT?	X		Stesso processo di trattamento termico
Stesso clamping system?	X		Stesso sistema di serraggio
Gli uomini sono gli stessi?	X		Stessi uomini
Il metodo è uguale?	X		Stesso metodo applicato
MSA eseguita e ok?	X		MSA eseguita e ok
Condizioni ambientali ok?	X		Condizioni ambientali adeguate

Deviazione Std. Ammessa: ± 25 %

Componente di riferimento					Componente in esame					
DIMENSIONEN					DIMENSIONEN					
Merkmal	**Einheit**	**Nominale**		**Deviazione ammessa in %**	**Nominale**	.	**Deviazione %**	**i.O./n.i.O.**		
numero denti Z	---	13			13			i.O.		
diam.primitivo - Ø	mm	27.624			32.498			i.O.		
Altezza dentatura	mm	5.65			6.525			i.O.		
diam.testa - Ø (da)	mm	36.95			43.60			i.O.		

Studio delle specifiche						Studio delle specifiche					
Merkmal	**Einheit**	**Nominale**	**Toleranz T_1**	**P_p**	**P_{Pk} (solo per caratteristiche unilaterali)**	**Nominale**	**Toleranz T_2**	**Taregt (1,00/1,33/1,67)**	**i.O./n.i.O.**	**Min. P_p**	**Min. P_{pk}**
Mdk - Ø	mm	40.617	0.047	9.03		45.491	0.051	1.67	i.O	9.80	
Fr (Eccentricità)	µm	0	32	3.08		0	32	1.67	i.O	3.08	
	µm								---		
	µm								---		
	µm								---		
	µm								---		
	µm								---		
...									---		

Part Submission Warrant

106/17

Part Name: Antriebswelle innen
Cust. Part Number: 2516093380
Shown on Drawing No.: 010-804343
Org. Part Number:
Engineering Change Level: c
Dated: 04. Okt 17
Additional Engineering Changes:
Dated:
Safety and/or Government Regulation: ☐ Yes ☑ No
Purchase Order No.: 5500034020
Weight (kg): 1,15
Checking Aid No.: 2516093380_c_KP
Checking Aid Engineering Change Level: C
Dated: 14. Nov 17

ORGANIZATION MANUFACTURING INFORMATION

GeWiS Slovakia s.r.o. Prievidza 90090
Organization Name & Supplier/Vendor Code

Vápenická 30
Street Address

Prievidza | Slovakei | 971 01 | Slovakia
City | Region | Postal Code | Country

CUSTOMER SUBMITTAL INFORMATION

Getrag
Customer Name/Division

1/1001
Buyer/Buyer Code

Application

MATERIALS REPORTING

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

Submitted by IMDS or other customer format: 575396539 / 2.01

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

REASON FOR SUBMISSION (Check at least one)

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

REQUESTED SUBMISSION LEVEL (Check one)

- ☐ Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
- ☐ Level 2 - Warrant with product samples and limited supporting data submitted to customer.
- ☑ Level 3 - Warrant with product samples and complete supporting data submitted to customer.
- ☐ Level 4 - Warrant and other requirements as defined by customer.
- ☐ Level 5 - Warrant with product samples and complete supporting data reviewed at organization's manufacturing location.

SUBMISSION RESULTS

The results for ☑ dimensional measurements ☑ material and functional tests ☐ appearance criteria ☑ statistical process package

These results meet all drawing and specification requirements: ☑ Yes ☐ No (If "NO" - Explanation Required)

Mold / Cavity / Production Process: 2516093380_c_PFD

DECLARATION

I hereby 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 120 / 8 hours. I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from the declaration below.

EXPLANATION/COMMENTS:

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

Organization Authorized Signature: Baláž
Date: 04. Dez 17

Print Name: Ing. Andrej Baláž
Phone No.: 00421/0465117-479
Fax No.: -310

Title: QS
E-mail: abalaz@gewis.eu

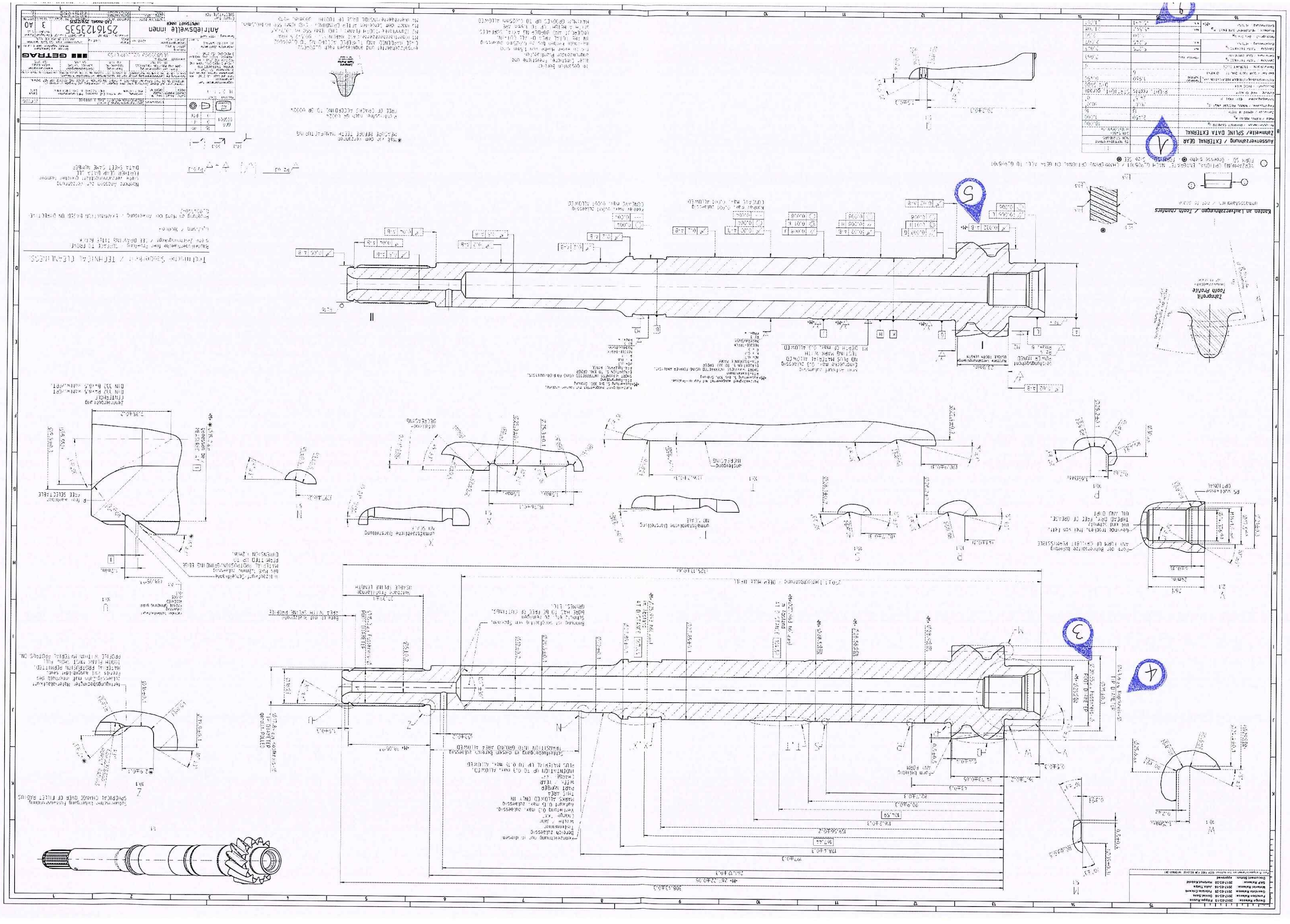
FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: ☒ Approved ☐ Rejected ☐ Other

Customer Signature: A. Hett
Date: 05.12.17

Print Name: A. Hettinger
Customer Tracking Number (optional): 17-01293

based on CFG-1001 PPAP Vesion 4 MAGNA GETRAG


Antriebswelle innen
2516123535
3
A0
GETRAG
Zahnwelle/ SPLINE DATA EXTERNAL
Aussenverzahnung / EXTERNAL GEAR
Zahnprofil
Tooth Profile
Kanten an Laufverzahnungen / Tooth chamfers
Technische Spezifikat / TECHNICAL FEATURES
Werkstoffangabe über Fertigung - Superior to DIN332
Schmiedeteil / 30CR4
Bearbeitung ist nicht der Anwendung / Examination based on drawing
Material Clear Data LLC
Material Specification
Material Data Sheet Number
DIN 332 Form A
DIN 332 Form B
DIN 332 Form C
Zentrierbohrung
CENTERHOLE
Spezielle Änderung Fussverrundung
SPECIAL CHANGE OVER OF FILLET RADIUS
Werkstoffbezeichnung Materialwahl
Material Specification
Material Data Sheet Number
Material Clear Data LLC
Material Specification
Material Data Sheet Number
Material Clear Data LLC
Design Review
Function Review
Operation Review
Manufact Review
Document Status
approved
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