SM452

Part Submission Warrant

MAGNA GETRAG

Part Name:	Speed Gear 3	Cust. Part No.:	251.1.1225.50
Shown on Drawing No.:	251.1.1225.50	Org. Part No.:	251.1.1225.50
Engineering Change Level:	3 Index "-" (C005149_MIP_1)	Dated:	19/07/2016
Additional Engineering Changes:	na	Dated:	na
Safety and/or Government Regulation:	☐ Yes ☑ No Purchase Order No.:	Weight (kg):	1.013
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 251.1.1086.50).
- Identification grooves deleted in according with change C006077

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

Organization Authorized Signature: [signature] Date: 10/01/2018

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: d Spotell Date: 10.01.18

Print Name: Customer Tracking No.:

New P/N introduction - 1225.50
Short description: Initial PPAP (only differences from 1086)

	PPAP Requirements	Required	Note	PPAP Docs updated
1	Design Records	Yes	Final Drawing + G.D. + VBZ	Yes
2	Authorized Engineering change documents	Yes	see dwg	Yes
3	Customer Engineering approval	n.a.		
4	DFMEA	NO		
5	Process flow diagram(s)	Yes		Yes
6	PFMEA	Yes		Yes
7	Control plan	Yes		Yes
8	Measurement system analysis studies	Yes	Studio Tipo 1 per MdK	Yes
9	Dimensional results	Yes		Yes
10	Records of Material / Performance test results	Yes		Yes
11	Initial process studies	Yes	Ppk for MdK and Fr	Yes
12	Qualified laboratory documentation	NO		
13	Appearance Approval Report (A.A.R.)	n.a.		
14	Sample Production Parts	Yes		Yes
15	Master sample	Yes		Yes
16	Checking aids	n.a.		
17	Customer-Specific Requirements	NO		
18	Part Submission Warrant (PSW)	Yes		Yes

	Other requirements			
1	PSW Raw part	NO		
2	PSW E.P. part	Yes		Yes
3	PSW Engagement Rings	NO		

10/01/2018

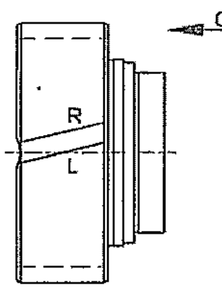
Released by Fabrizio.Cricenti on 2016-08-04
Document Status: approved

STIRNRAD GEAR	außenverzahnt external
Zähnezahl / Number of teeth z	46
Modul / Normal module m_n	2.100000
Eingriffswinkel / Normal pressure angle α_n	17° 30' 0"
Schrägungswinkel / Helix angle β	30° 0' 0"
Steigungsrichtung / Hand of helix	LINKS
Profilverschiebungsfaktor / Addendum modification coeff. x	0.418
Teilkreisdurchmesser / Pitch diameter d	111.544
Kopfkreisdurchmesser / Outside diameter d_a	119.60 $_{-0.26}$
Kopfnutzkreisd. theo. max. / Tip diam. usable theo. d_{Na}	119.20
Kopfnutzkreisd. theo. min. / Tip diam. usable theo. d_{Na}	118.80
Fußkreisdurchmesser / Root diameter d_f	106.00 $_{-0.40}$
Fußnutzkreisdurchmesser / Root diameter usable d_{Nf}	109.03
Grundkreisradius / Base circle radius r_b	52.407
Grundkreisdurchmesser / Base diameter d_b	104.814
Normalzahndicke max. / Normal tooth thickness s_n	3.774
Normalzahndicke min. / Normal tooth thickness s_n	3.749
Meßzähnezahl / Number of teeth spanned k	8
Zahnweite max. / Base tangent length W_k	49.018
Zahnweite min. / Base tangent length W_k	48.994
Meßkugeldurchmesser / Ball diameter D_M	3.0000
Diam. Zweikugelmaß max. / Measurement o. balls M_{dK}	115.534
Diam. Zweikugelmaß min. / Measurement o. balls M_{dK}	115.460
Verdrehflankenspiel theo. / Circumferential backlash	0.071 0.176

Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) gültig für Werte am Einzelzahn (7)
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 $f_{f\alpha}$	0.005		Eingriffsteilungs-Abweich. / Normal pitch error f_{pe}	0.010
Profil-Gesamtabweichung / Total profile error F_α			Teilungs-Einzelabweichung / Adjacent pitch error f_p	0.010
Profil-Winkelabweichung / Profile angle error $f_{H\alpha}$	0.000 ± 0.008	0.000 ± 0.008	Teilungssprung / Diff. bet. adjacent pitches f_u	0.012
Flankenl.-Winkelabweich. / Tooth alignment error $f_{H\beta}$	0.018 ± 0.008	0.000 ± 0.008	Teilungs-Summenabweich. / Cumulative circ. pitch error F_{pk}	
Flankenl.-Gesamtabweich. / Total alignment error F_β			Rundlaufabweichung / Radial run-out F_r	0.028
Flankenl.-Formabweich. / Longitudinal alignment err. $f_{f\beta}$	0.005		Zahndickenschwankung / Range of tooth thickn. error R_s	
Teilungs-Gesamtabweich. / Cumulative pitch error F_p	0.036			
Einf.-Wälzabweichung / Tangential composite error F_i'			Zweifl.-Wälzabweichung / Radial composite error F_i''	0.032
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	13.80		Meßkreis Krümmungsradius / Radius of curvature meas. diam. ρ_{dM}	20.65

R. Fl. Zug



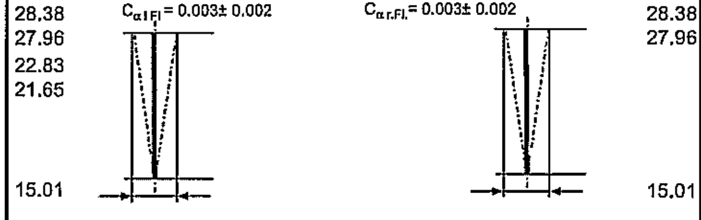
#Flanken- und Profilformabweichung ffa und ffb ausgewertet mit Fourier. Auswertung bis 30. Ordnung
Flank and profile fomr errors ffa and ffb evaluated using Fourier, Evaluation untill 30th order
ffb n0 = ? K = ? R = ?
ffa n0 = ? K = ? R = ?
Teilungs-Einzelabweichung fp ausgewertet mit Fourier. Auswertung bis 20. Ordnung
Adjacent pitch error evaluated using Fourier. Evaluation untill 20th order
n0 = ? K = ?

Bezugsprofil-Schleifscheibe
Grinding tool data

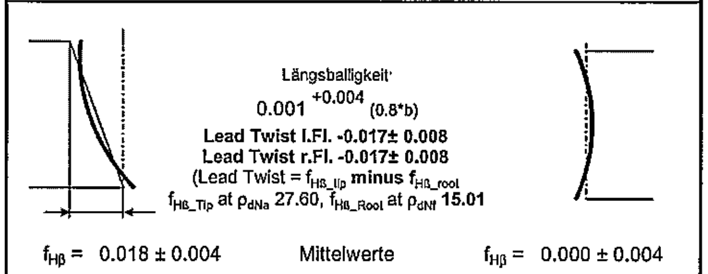
Schleifscheibenkopfhöhe / Grinding wheel tip height h_{aP0S} = 3.570
Schleifscheibenkopfradius / Grinding wheel tip radius ρ_{aP0S} = 0.714
Schleifdurchmesser / grinding diameter = 107.67 $_{-0.30}$ ≡ 12.32

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: 251.1.1225.50



* Schreibbeginn
* Start of checking
Ø = 107.67 $_{-0.30}$ ≡ 12.32



* 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

Buch.	Anz.	Änd.Nr.		Datum	Name

Verteiler:

Schutzvermerk nach ISO 16016 beachten
Protection per ISO 16016

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

Abbildungen sind unmaßstäblich.
Diagrams not to scale.

Ersatz für:
Erstverwendung bei Getriebetype: 251

Remark:

	Datum	Name
gez.	04.08.2016	Cricenti, Fabrizio
gepr.		

Verzahnungsblatt Endkontrolle
Final Check Gear Data
Benennung: / Naming: Schaltrad 3.Gg.

Zeichnungsnummer: / Drawing number: 251.1.1225.50

Document Revision: 20160804144702, printed on 2017-11-13 at 09:06 by Mirko.Vicenti

SG3_7DCT300_Gearset_1A_&_21A

shaping
Lorenz STW-12177

washing
Duerr ORE- 11033

pointing
Prawema FRD-19013

hobbing
Pfauter FRW-10077
Pfauter FRW-10079

heat Treatment
ECM Vertical Furnace

hard turning & cone grinding
Weisser AC SLA-11083

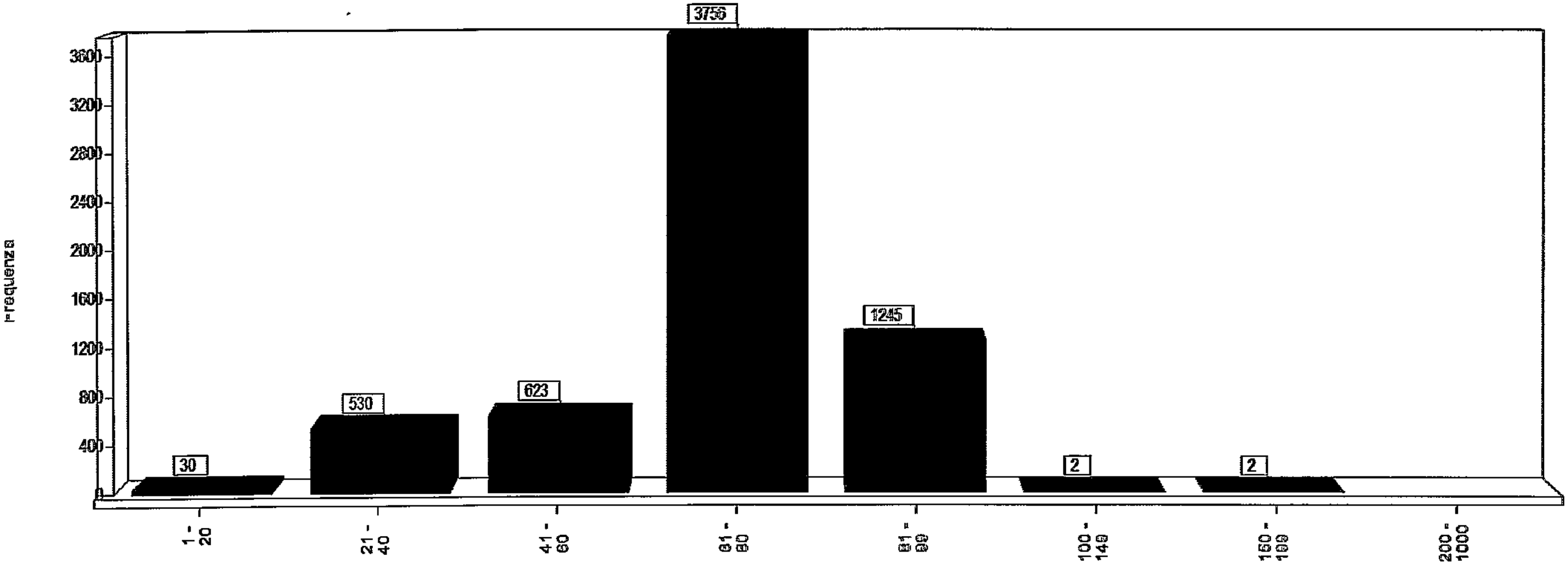
grinding gear teeth
Reishauer RZ303 SLW - 11046

washing
Duerr ORE- 11033

Packing

DCT300 – GEASRSET: PFMEA RPN Status

GETRAG	FMEA Processo		Numero: 1.2.1.1.1.1 Pagina:
Tipo/Modello/Produzione/Lotto: 7DCT300	Numero Disegno: Gearset 1A + 21A 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 Ditta:	Emesso: 13/01/2017 Modificato: 20/11/2017

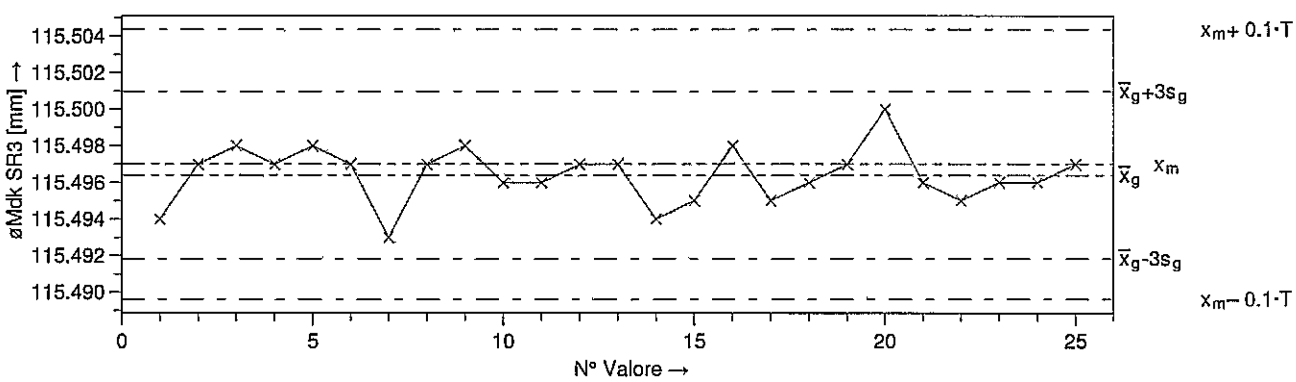


Capacità strumenti di misura

Data/ora	11/11/2017	Nome oper.	G.Sette	Reparto/Area/Prod.	NN	Posto di prova	Rettifica denti

Calibro		Master		Caratteristica	
Desc. calibro	Banchetto in acciaio	Desc. mast.	Master Mdk SR3	Desc. Car.	øMdk SR3
N° calibro	MVZ 406001 011	N° master	MVZ 400572 002	N° Caratt.	2511122550
Ris. calibro	0.001	Valore reale mast	115.497	Val. Nom 115.497	LSS 115.534 = 0.037
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di n mm	LSI 115.460 = -0.037

Nota: Banchetto øMdk MVZ 406001 011 per ruote dentate hard



i	x_i	i	x_i	i	x_i	i	x_i	i	x_i
1	115.494	6	115.497	11	115.496	16	115.498	21	115.496
2	115.497	7	115.493	12	115.497	17	115.495	22	115.495
3	115.498	8	115.497	13	115.497	18	115.496	23	115.496
4	115.497	9	115.498	14	115.494	19	115.497	24	115.496
5	115.498	10	115.496	15	115.495	20	115.500	25	115.497

Valori a disegno			Valori Calcolati			Statistiche		
$x_m + 0.1\cdot T$	=	115.50440	$x_{max\,g}$	=	115.500	$\overline{x}_g + 3s_g$	=	115.50098
x_m	=	115.49700	$x_{min\,g}$	=	115.493	$\overline{x}_g$	=	115.49640
$x_m - 0.1\cdot T$	=	115.48960	R_g	=	0.007	$\overline{x}_g - 3s_g$	=	115.49182
$0.2\cdot T$	=	0.01480	n_{tot}	=	25	$6s_g$	=	0.00917
T	=	0.074				s_g	=	0.00153
Unità di misura	=	mm				$\lvert Bi \rvert$	=	0.00060000
						n_{eff}	=	25

Test per Bias			Risultati del test : non significativo
Bias	=	0.81%	

Minimo riferimento per sistema di misura capace

Risoluzione	%RE = 1.35%	0 … 5	$T_{min\,(\%RE)}$	= 0.0200
$\%EV = \frac{EV}{T}$	= 12.39%	0 … 5	$T_{min\,(\%EV)}$	= 0.183
$C_g = \frac{0.2\cdot T}{4\cdot s_g}$	= 1.74 ≤ **2.42** ≤ 3.10	0 … 1 1.33	$T_{min\,(C_g)}$	= 0.0407
$C_{gk} = \frac{0.1\cdot T - \lvert \overline{x}_g - x_m \rvert}{2\cdot s_g}$	= 1.58 ≤ **2.23** ≤ 2.87	0 … 1 1.33	$T_{min\,(C_{gk})}$	= 0.0466

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

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

Data ______________ Firma ______________ Dipartimento ______________

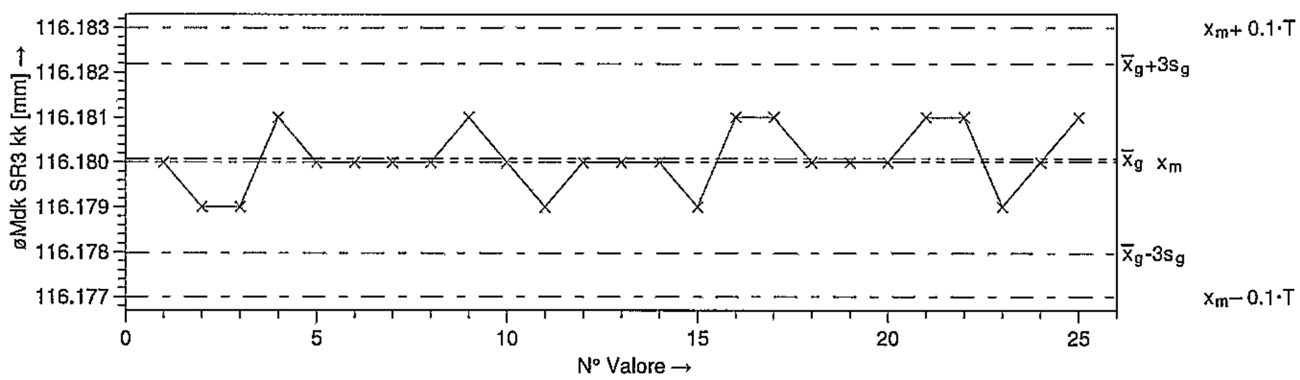
Capacità strumenti di misura

Q-DAS®

Data/ora 13/11/2017	Nome oper. G.Sette	Reparto/Area/Prod. NN	Posto di prova Dentatura SR3

Calibro		Master		Caratteristica	
Desc. calibro	Banchetto in acciaio	Desc. mast.	Serie KIT BPP	Desc. Car.	øMdk SR3 kk
N° calibro	MVZ 406001 004	N° master	MVZ 400572 001	N° Caratt.	2511122550
Ris. calibro	0.001	Valore reale mast	116.18	Val. Nom 116.180	LSS 116.195 $\hat{=}$ 0.015
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di n mm	LSI 116.165 $\hat{=}$ -0.015

Nota Banchetto øMdk MVZ 406001 004 per ruote dentate DCT 300 soft



i	x_i	i	x_i	i	x_i	i	x_i	i	x_i
1	116.180	6	116.180	11	116.179	16	116.181	21	116.181
2	116.179	7	116.180	12	116.180	17	116.181	22	116.181
3	116.179	8	116.180	13	116.180	18	116.180	23	116.179
4	116.181	9	116.181	14	116.180	19	116.180	24	116.180
5	116.180	10	116.180	15	116.179	20	116.180	25	116.181

Valori a disegno			Valori Calcolati			Statistiche		
x_m+0.1·T	=	116.18300	$x_{max\,g}$	=	116.181	$\overline{x}_g$+3s_g	=	116.18219
x_m	=	116.18000	$x_{min\,g}$	=	116.179	$\overline{x}_g$	=	116.18008
x_m-0.1·T	=	116.17700	R_g	=	0.002	$\overline{x}_g$-3s_g	=	116.17797
0.2·T	=	0.00600	n_{tot}	=	25	6s_g	=	0.00421
T	=	0.030				s_g	=	0.000702
Unità di misura	=	mm				|Bi|	=	0.000080000
						n_{eff}	=	25

Test per Bias			Risultati del test : non significativo
Bias	=	0.27%	

Minimo riferimento per sistema di misura capace

Risoluzione %RE = 3.33%	0 5	$T_{min\,(\%RE)}$	= 0.0200
$\%EV = \frac{EV}{T}$ = 14.05%	0 5	$T_{min\,(\%EV)}$	= 0.0843
$C_g = \frac{0.2 \cdot T}{4 \cdot s_g}$ = 1.54 ≤ **2.14** ≤ 2.74	0 1 1.33	$T_{min\,(C_g)}$	= 0.0186
$C_{gk} = \frac{0.1 \cdot T - \lvert \overline{x}_g - x_m \rvert}{2 \cdot s_g}$ = 1.48 ≤ **2.08** ≤ 2.68	0 1 1.33	$T_{min\,(C_{gk})}$	= 0.0195

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:	251.1.1225.50
Supplier/Vendor Code:	GETRAG Modugno	Part Name:	Speed Gear 3
INSPECTION FACILITY:		Design Record Change Level:	3 Index "-"
NA		Engineering Change Documents:	C005149_MIP_1 - 19/07/2016
			Organization Measurement Results (Data)

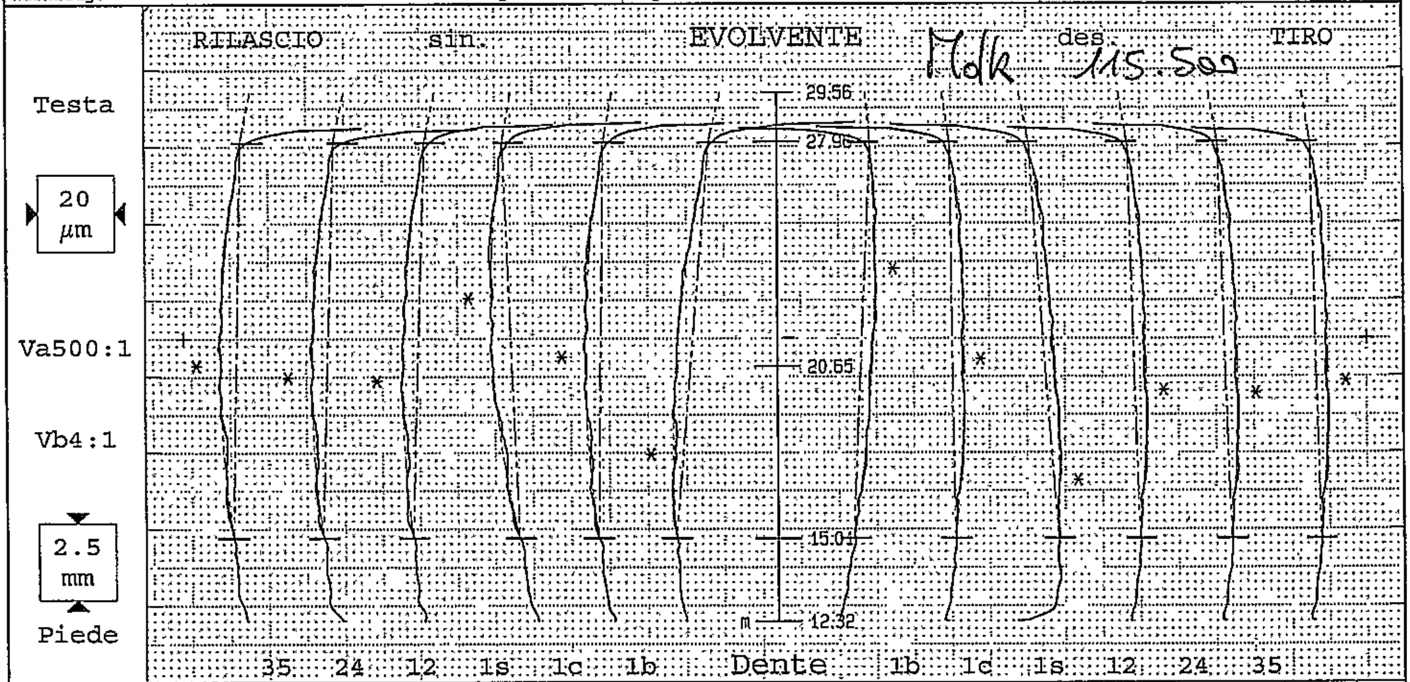
Item	Dimension/Specification	Specification / Limits		Classif.	Qty. Tested	1	2	3	4	5	controllo distruttivo	Ok	Not Ok
1	Teeth Profile & Lead, Pitch + Fourier Analysis	OK	NOK		5	OK	OK	OK	OK	OK		OK	
2	MdK	115.534	115.460	<M>	5	115.500	115.503	115.493	115.497	115.490		OK	
3	df	106.000	105.600		5	105.747	105.764	105.789	105.801	105.763		OK	
4	da	119.600	119.340		5	119.447	119.473	119.489	119.503	119.465		OK	
5	Fr	28	0	<M>	5	7.2	7.7	3.9	3.5	4.0		OK	
6	M1 Case Hardness HRA	83	80.5		1						81.4	OK	
7	M2 Gear Tooth flank CHD 550 HV1	0.9	0.5		1						0.83	OK	
8	M3 Dog Body Tooth flank CHD 550 HV1 0.5 min	-	0.5		1						0.90	OK	
9	M4 Bore CHD 550 HV1 0.3 min	-	0.3		1						0.78	OK	
10	M5 Cone CHD 550 HV1 0.4 min	-	0.4		1						0.80	OK	
11	M6 Core Hardness HV10 300 min	-	300		1						389	OK	

March 2006 CFG-1003

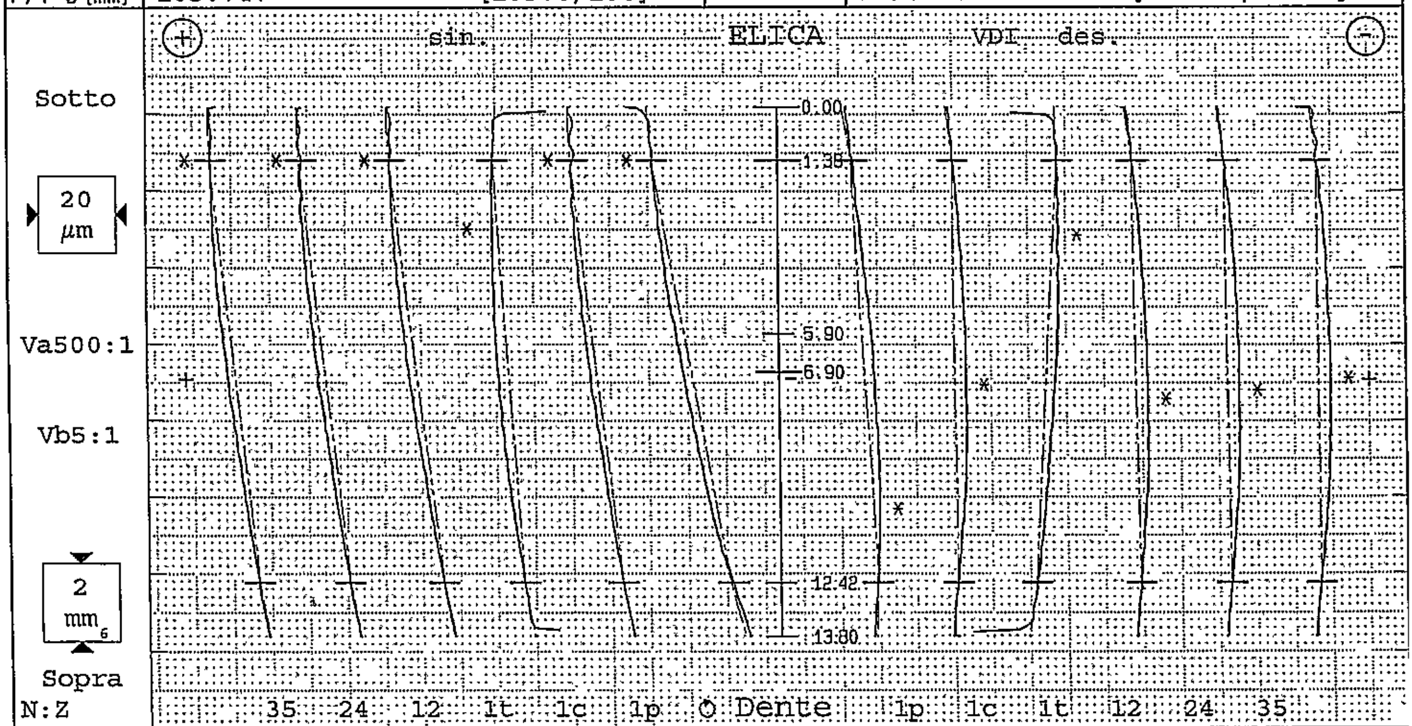
SIGNATURE	TITLE	DATE
Vicenti D.	ME	17/11/2017

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	P26 601265	Controllore:	turno A	Data:	08.11.2017 04:41
Denominazione:	SR3	Numero denti z	46	Largh.fasc.dent. b	13.8mm
Numero disegno.:	D51.1.1225.50-IF	Modulo m	2.1mm	Tratto evolv. Lα	12.95mm
Commessa/serie nr.:	2 – 1	Angolo pressione	17°30'00"	Tratto elica Lß	11.04mm
Masch.Nr.:	M001 Spindel: Formnest 1	Angolo elica	-30°00'00"	Inizio elab. M1	15.01mm
Untersuchungszweck:	Laufende Messung	Ø Base db	104.8136mm	Palpatore Ø	(#2D) 1mm
Werkzeug:	Charge:	Ang. Base	-28°28'50"	Fat.scor.pr. x	.418



Tolerance		Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
fHαm	±5	-2.5	Var a 2.1							±5	Var a 2.2						-2.6	
fHα	±8	-2.5	-2.1	-3.1	-3.4	4.3	-1.3	-8.7		±8	4.5	-1.2	-7.6	-3.2	-3.4	-2.6	-2.6	
Fα		5.3	4.8	6.4	5.9	5.8	3.9	10.0			4.4	3.2	9.6	5.0	5.0	4.9	4.5	
ffα	5	2.7	2.4	3.3	2.5	2.5	2.4	1.7		5	2.5	2.5	2.4	2.2	2.0	2.8	2.4	
cα	3±2	4.2	4.2	4.2	4.1	5.0	4.1	3.8		3±2	3.1	3.2	2.7	3.2	3.2	3.2	3.2	
ffαf	3	0.0	1.1	1.0	1.1	1.6	0.6	0.2		3	0.6	1.1	1.0	0.6	1.0	1.1	0.0	
P/T-ø [mm]		105.747				[105.6/106]					119.447				[119.34/119.6]			



fHßm	18±4	16.4	Var ß 2.4							±4	Var ß 1.5						1.2
fHß	18±8	16.4	15.3	16.1	17.7	9.5	16.4	24.9		±8	8.2	0.9	-7.8	2.0	1.3	0.5	1.2
Fß		2.4	2.7	2.8	1.6	7.0	2.3	11.4			6.0	2.5	6.3	3.2	2.9	2.8	2.9
ffß	5	0.8	0.5	1.1	0.7	0.5	1.0	0.9		5	0.9	0.5	0.8	0.5	0.6	0.6	0.6
cß	1/5	2.0	2.0	1.9	2.1	2.8	1.8	2.4		1/5	2.5	3.0	2.4	3.1	3.1	3.2	3.1
FV	-17±8	-15.4								-17±8							-16.0

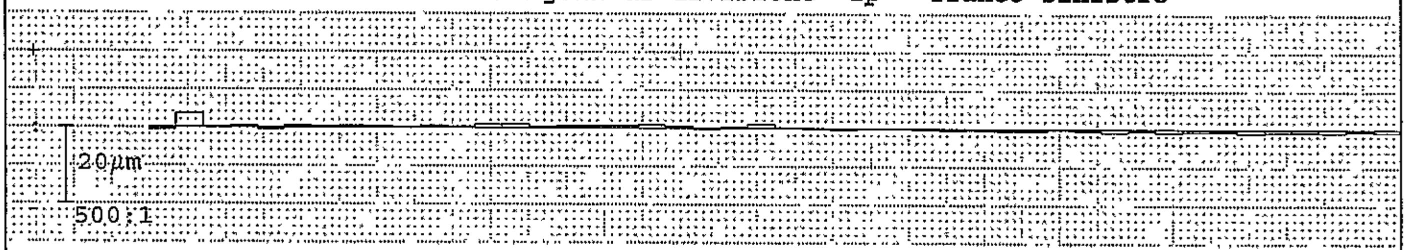
GCG 808006

KLINGELNBERG

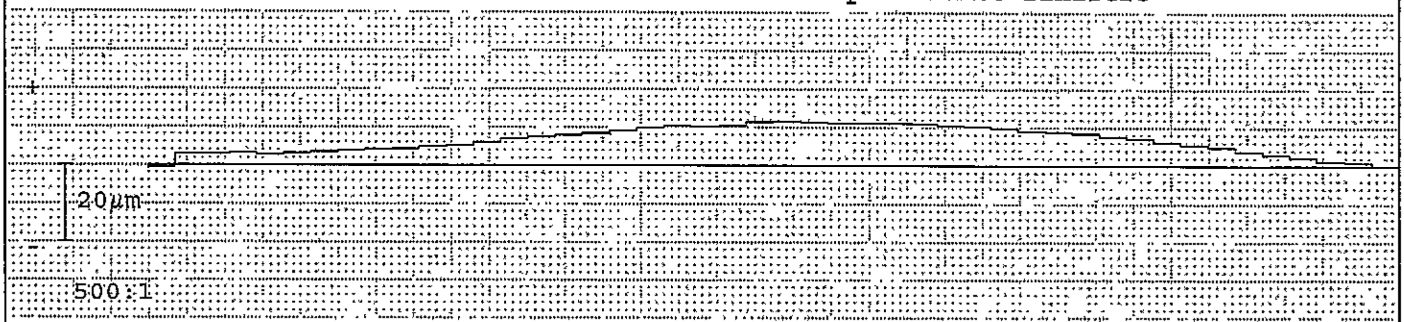
Ruota cilindrica Divisione

Nr. prog.: STI0412_06_0 P26 601265	Controllore: turno A	Data:	08.11.2017 04:41
Denominazione: SR3	Numero denti z 46	Angolo pressione	17°30'00"
Numero disegno.: D51.1.1225.50-IF	Modulo m 2.1mm	Angolo elica	-30°00'00"
Commessa/serie nr.: 2 - 1	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001 Spindel: Formmess	Werkzeug:	Charge:	

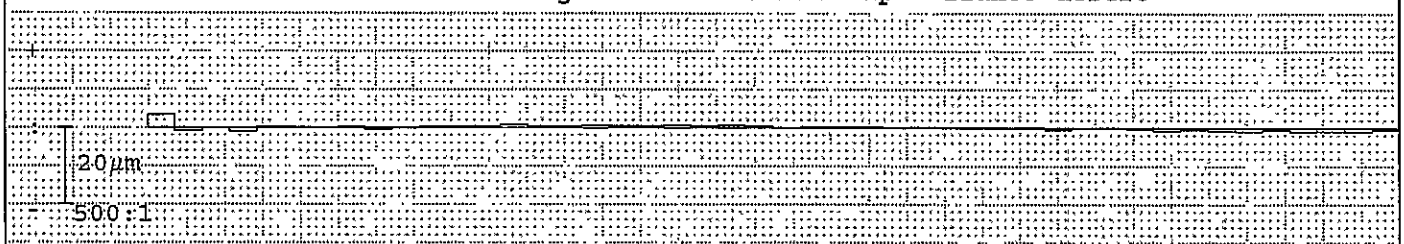
Errori singoli di divisione fp fianco sinistro



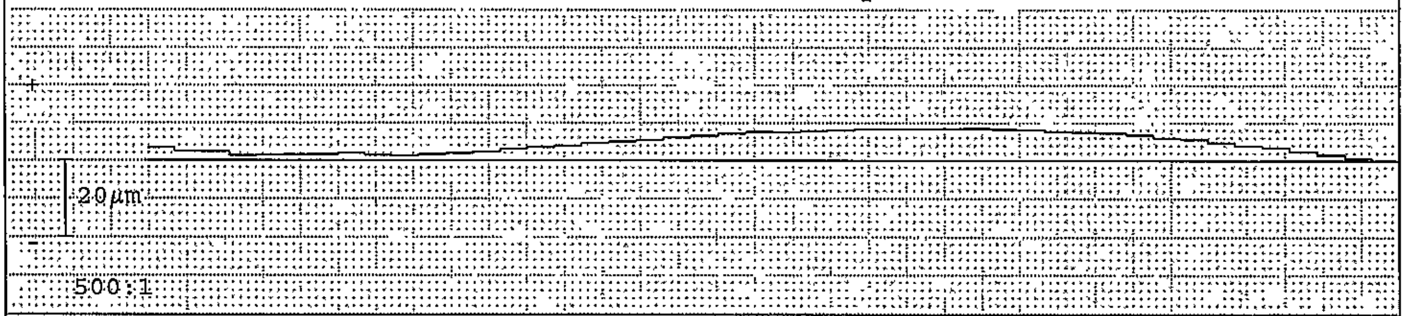
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



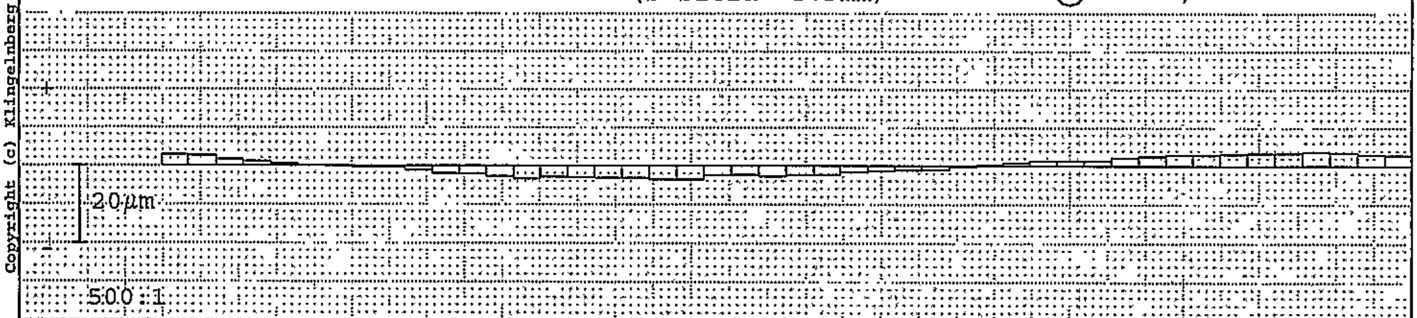
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:112.657 z=5.9mm

		fianco sinistro / RILASCIO				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	3.5		10.0		3.3		10.0	
Gr. salto di passo	fu max	4.2		12.0		4.2		12.0	
Scarto di divisione	Rp	4.6				4.3			
Err. globale di divisione	Fp	12.1		36.0		8.5		32.0	
Err. cordale di divisione	Fpz/8	4.9				5.0			

Centricità Fr (Ø-sfera =3.5mm) ◎ : 6.6µm



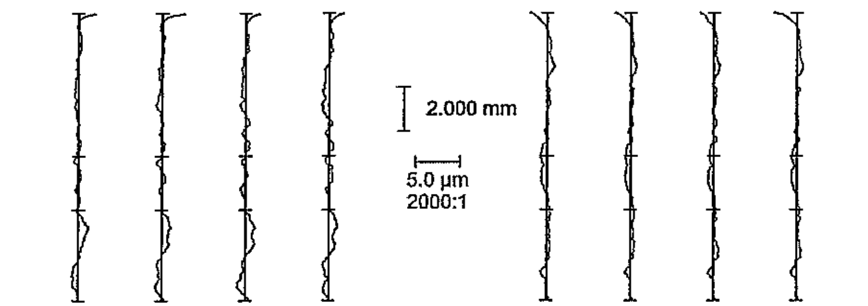
Err. di concentricità	Fr	7.2	28.0	
Variaz. spessore dente	Rs			

KLINGELNBERG

Numero di disegno: D51.1.1225.50-IF Denominazione: SR3 08.11.17
Serie nr: 2 - 1 Scopo: Laufende Messung 1 / 04:45
Macchina: M001 Mandrino: Formnest 1 z= 46

Evolvente senza modifiche effettive

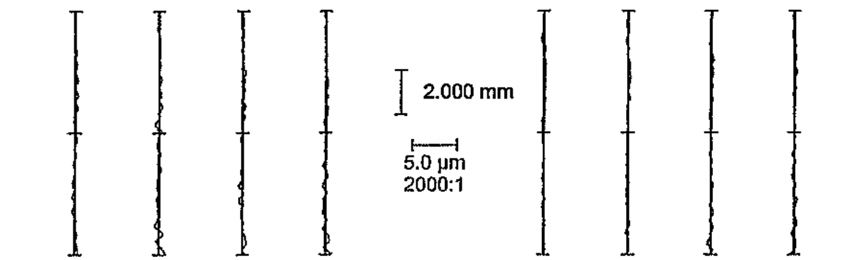
+/- sinistro destro -/+



	35	24	12	1 b	Valores medio		1 b	12	24	35
fhα	-2.2	-3.1	-3.4	-1.3	-2.5	-2.6	-1.2	-3.2	-3.4	-2.6
Fα	4.8	6.4	5.9	3.9	5.2	4.5	3.2	5.0	5.0	4.9
ffα	2.4	3.3	2.5	2.4	2.7	2.4	2.5	2.2	2.0	2.8
Cα	4.2	4.2	4.1	4.1	4.1	3.2	3.2	3.2	3.2	3.2

Elica senza modifiche effettive

+/- sinistro destro -/+



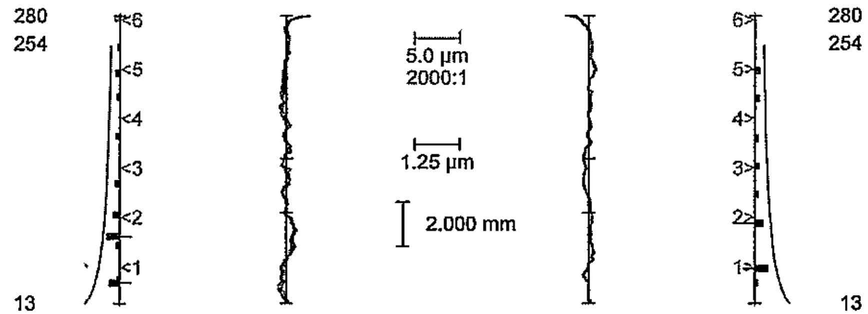
	35	24	12	1 b	Valores medio		1 b	12	24	35
fhβ	-15.3	-16.1	-17.7	-16.4	-16.4	-1.2	-0.9	-2.0	-1.3	-0.5
Fβ	26.3	26.3	28.2	27.0	27.0	3.2	2.9	3.5	3.2	3.2
ffβ	0.5	1.1	0.7	1.0	0.8	0.5	0.5	0.5	0.6	0.6
Cβ	3.1	2.9	3.3	2.8	3.0	4.8	4.6	4.8	4.8	5.0

KLINGELNBERG

Numero di disegno: D51.1.1225.50-IF Denominazione: SR3 08.11.17
Serie nr: 2 - 1 Scopo: Laufende Messung 1 / 04:45
Macchina: M001 Mandrino: Formnest 1 z= 46

Evolvente senza modifiche effettive

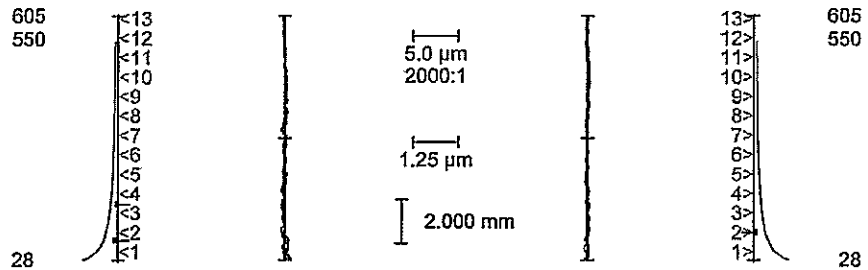
+/- sinistro Spettro medio



	sinistro	destro
A1	0.35	0.37
A2	0.28	0.22
O(1)	75	45
O(2)	32	87

Elica senza modifiche effettive

+/- sinistro destro -/+



	sinistro	destro
A1	0.13	0.08
A2	0.06	–
O(1)	75	93
O(2)	160	–

■ Spettro ■ tmpana_dat

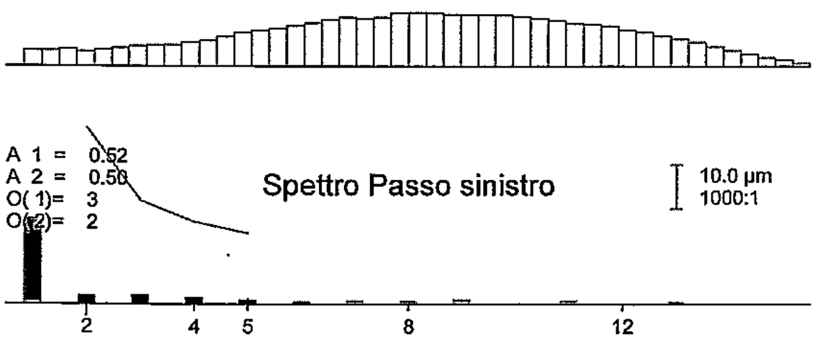
KLINGELNBERG	Numero di disegno: D51.1.1225.50-IF Denominazione: SR3	08.11.17
	Serie nr: 2 — 7	Scopo: Laufende Messung 1 / 04:45
	Macchina: M001	Mandrino: Formnest 1 z= 46

Ondulazione Passo destro

Spettro Passo destro

Ondulazione Passo sinistro

2.50 µm

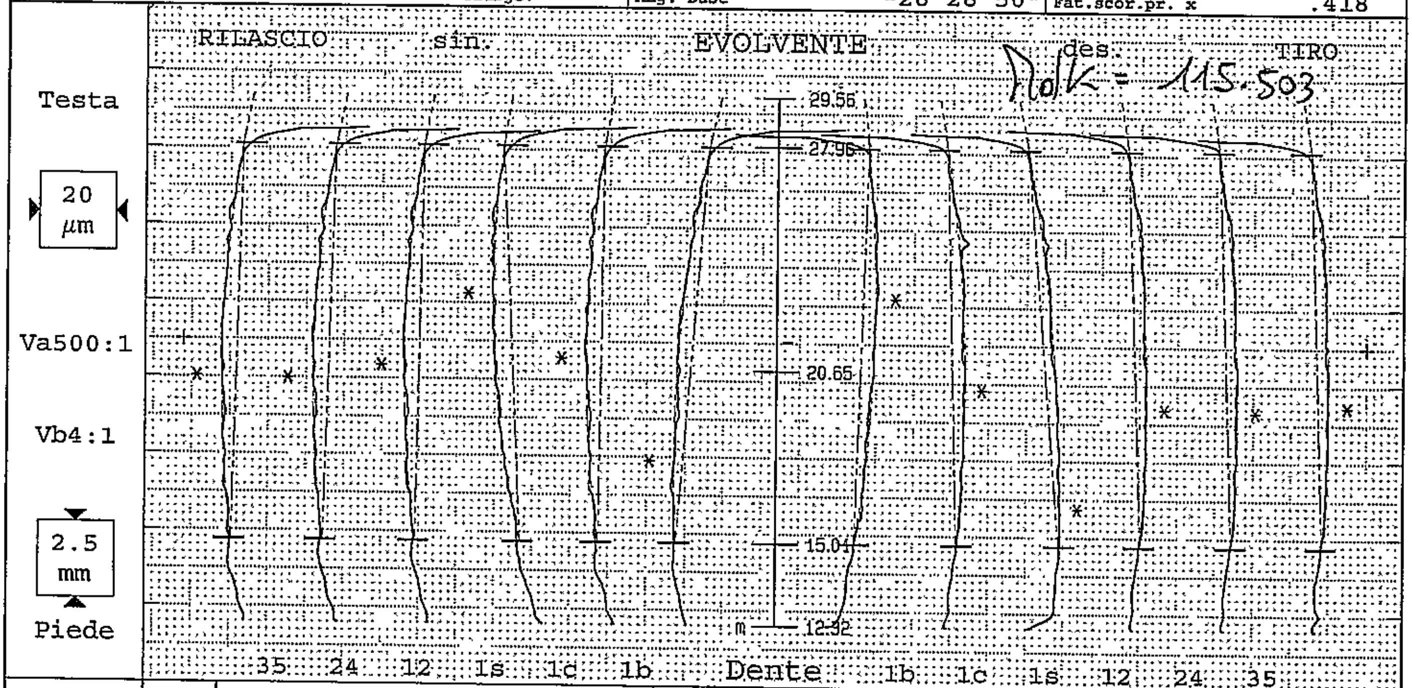


Spettro Passo sinistro

10.0 µm
1000:1

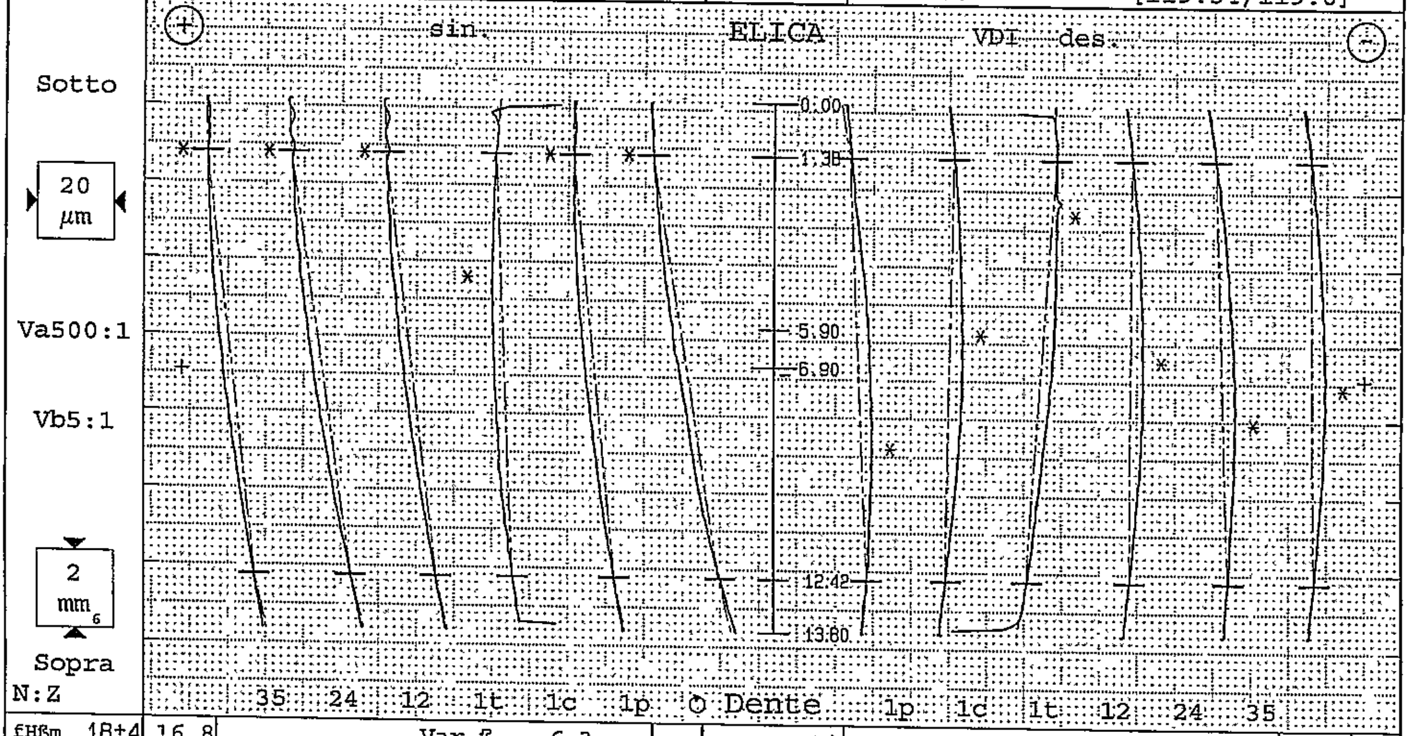
Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	P26 601265	Controllore:	turno A	Data:	08.11.2017 04:32
Denominazione:	SR3	Numero denti z	46	Largh.fasc.dent. b	13.8mm
Numero disegno.:	D51.1.1225.50-IF	Modulo m	2.1mm	Tratto evolv. La	12.95mm
Commessa/serie nr.:	3-2	Angolo pressione	17°30'00"	Tratto elica Lß	11.04mm
Masch.Nr.:	M001 Spindel: Formmeßtisch	Angolo elica	-30°00'00"	Inizio elab. M1	15.01mm
Untersuchungszweck:	Laufende Messung	ø Base db	104.8136mm	Palpatore ø	(#2D) 1mm
Werkzeug:	Charge:	Ang. Base	-28°28'50"	Fat.scor.pr. x	.418



Tolerance		Medio	Val.misur[µm]						Qual
fHαm	±5	-2.2	Var a 1.9						
fHα	±8	-2.2	-2.7	-3.0	-1.8	4.9	-1.1	-8.4	
Fα		5.0	5.4	5.7	4.9	5.7	3.9	10.4	
ffα	5	3.0	3.0	3.0	3.1	3.1	2.8	2.5	
cα	3±2	4.0	3.9	4.2	4.1	4.8	3.9	3.6	
ffαf	3	0.0	1.7	1.7	1.5	1.5	1.6	1.0	
P/T-ø [mm]		105.764				[105.6/106]			

Tolerance	Val.misur[µm]						Medio	Qual
±5	Var a 0.9						-3.4	
±8	3.2	-2.8	-8.7	-3.7	-3.7	-3.4	-3.4	
	3.5	4.4	10.0	4.3	4.2	5.1	4.5	
5	2.1	3.6	2.4	1.5	1.3	2.2	2.2	
3±2	3.3	3.3	2.7	3.0	2.9	3.0	3.1	
3	0.3	0.5	0.2	0.5	0.4	1.0	0.0	
119.473				[119.34/119.6]				



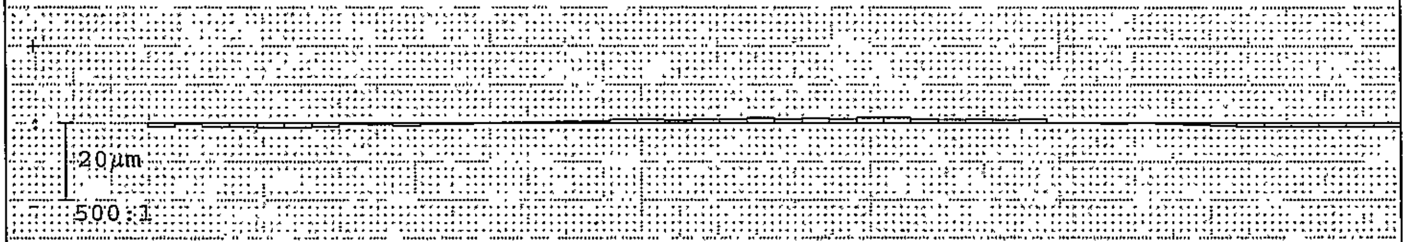
Tolerance		Medio							
fHßm	18±4	16.8	Var ß 6.3						
fHß	18±8	16.8	16.0	20.2	17.2	5.6	13.9	21.7	
Fß		2.9	2.6	2.5	2.5	10.0	4.0	3.7	
ffß	5	0.8	0.6	0.8	1.1	0.7	0.6	0.9	
cß	1/5	2.4	2.4	2.5	2.3	2.7	2.4	2.3	
FV	-17±8	-16.1							

Tolerance							Medio	
±4	Var ß 6.8						0.5	
±8	5.8	-2.7	-10.0	-0.7	4.1	1.3	0.5	
	4.7	3.5	8.6	2.6	4.3	3.0	3.4	
5	0.9	0.6	1.4	0.6	0.6	0.6	0.6	
1/5	3.1	3.3	2.7	3.2	3.3	3.3	3.3	
-17±8							-15.8	

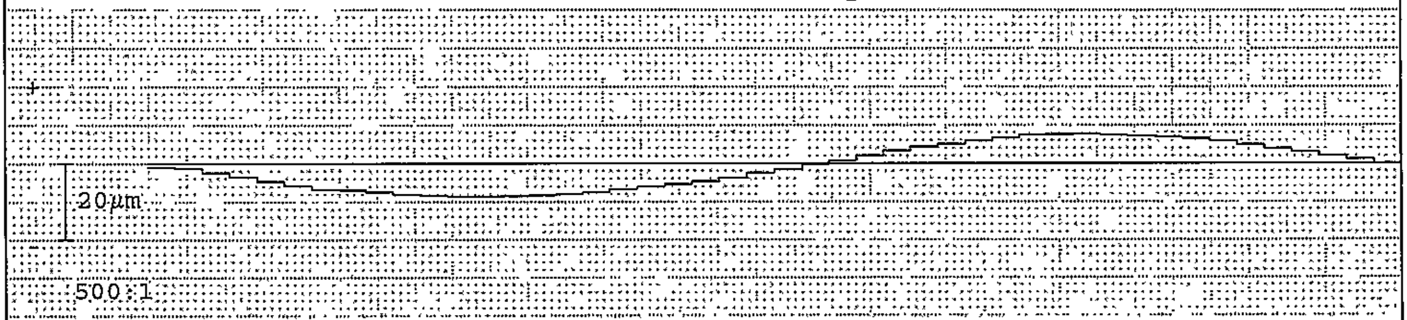
Ruota cilindrica Divisione

Nr. prog.: STI0412_06_0	P26 601265	Controllore:	turno A	Data:	08.11.2017 04:32
Denominazione:	SR3	Numero denti z	46	Angolo pressione	17°30′00″
Numero disegno.:	D51.1.1225.50-IF	Modulo m	2.1mm	Angolo elica	-30°00′00″
Commessa/serie nr.:	3 - 2	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formmeat	Werkzeug:	Charge:	

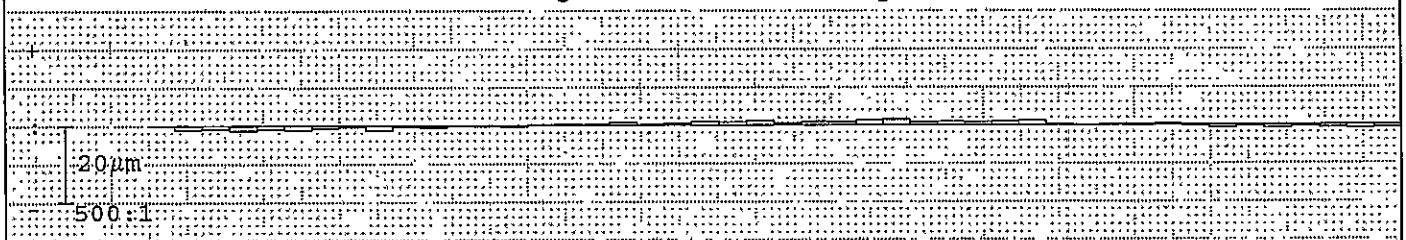
Errori singoli di divisione fp fianco sinistro



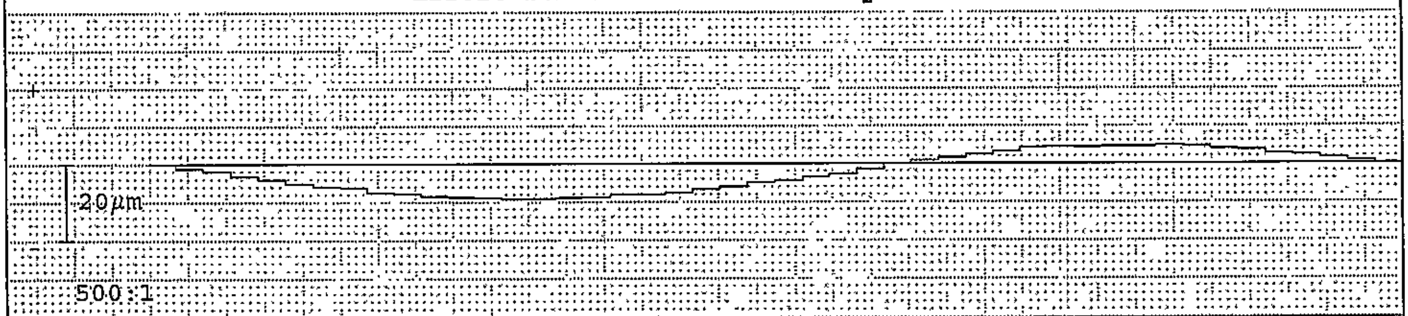
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



Errore somma di divisione Fp fianco destro

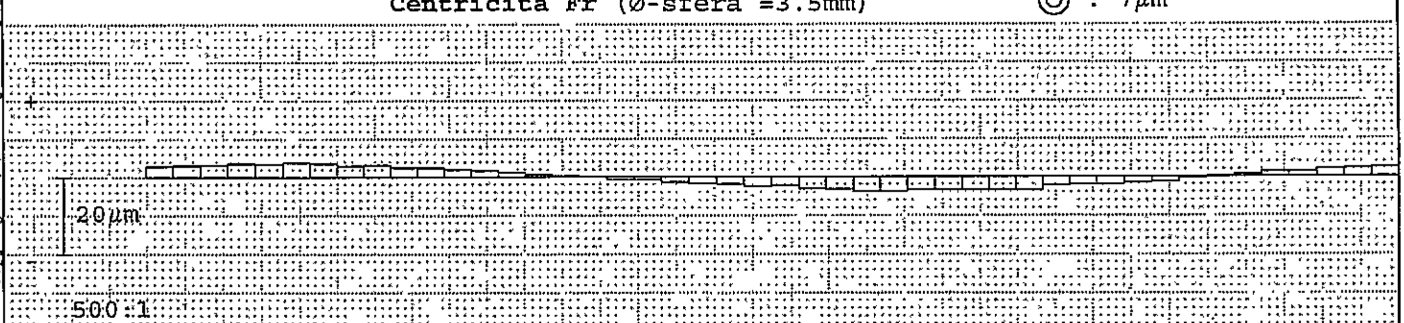


Corsa per misura divis.:112.657 z=5.9mm

		fianco sinistro / RILASCIO				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	1.3		10.0		1.4		10.0	
Gr. salto di passo	fu max	0.9		12.0		1.0		12.0	
Scarto di divisione	Rp	2.5				2.7			
Err. globale di divisione	Fp	16.3		36.0		14.1		32.0	
Err. cordale di divisione	Fpz/8	7.0				6.0		.	

Centricità Fr (Ø-sfera =3.5mm)

◎ : 7µm



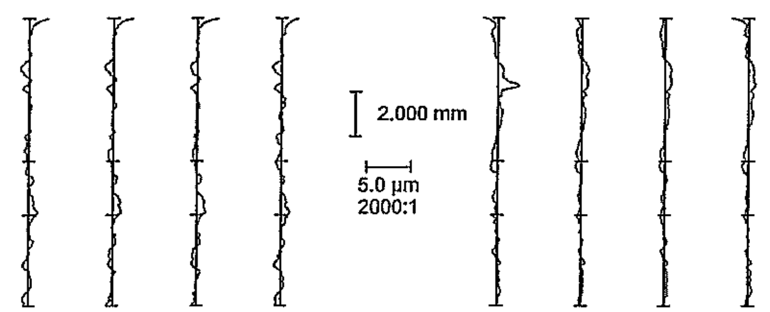
Err. di concentricità	Fr	7.7	28.0	
Variaz. spessore dente	Rs			

KLINGELNBERG

Numero di disegno: D51.1.1225.50-IF Denominazione: SR3 08.11.17
Serie nr: 3 - 2 Scopo: Laufende Messung 4/32 / 04:37
Macchina: M001 Mandrino: Formnest 1 z= 46

Evolvente senza modifiche effettive

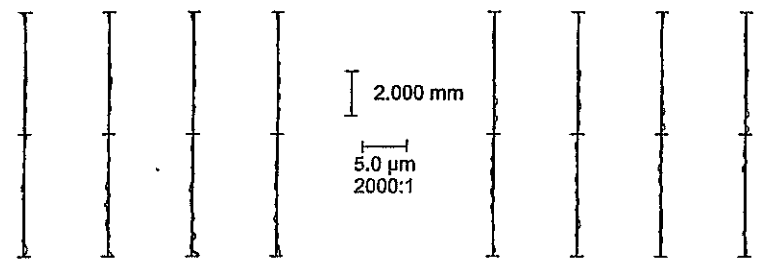
+/- sinistro destro -/+



	sinistro 35	24	12	1 b	Valores medio		1 b	12	24	35
fhα	-2.7	-3.0	-1.8	-1.1	-2.2	-3.4	-2.8	-3.7	-3.7	-3.4
Fα	5.4	5.7	4.9	3.9	5.0	4.5	4.4	4.3	4.2	5.1
ffα	3.0	3.0	3.1	2.8	3.0	2.1	3.6	1.5	1.3	2.2
Cα	3.9	4.2	4.1	3.9	4.0	3.1	3.3	3.0	2.9	3.0

Elica senza modifiche effettive

+/- sinistro destro -/+



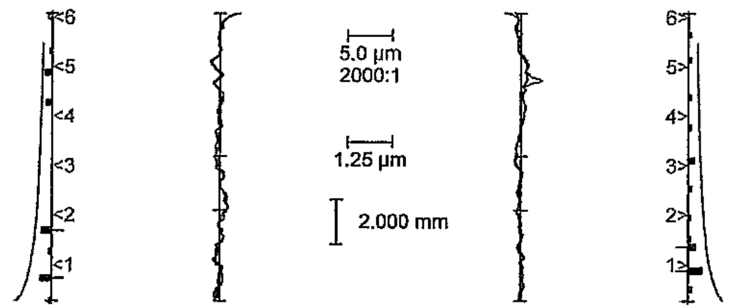
	sinistro 35	24	12	1 b	Valores medio		1 b	12	24	35
fhβ	-16.0	-20.2	-17.2	-13.9	-16.8	-0.5	2.7	0.7	-4.1	-1.3
Fβ	26.8	29.8	27.4	24.9	27.2	3.7	3.9	3.0	4.7	3.4
ffβ	0.6	0.8	1.1	0.6	0.8	0.6	0.6	0.6	0.6	0.6
Cβ	3.7	3.9	3.6	3.7	3.7	5.1	5.1	5.0	5.1	5.2

KLINGELNBERG

Numero di disegno: D51.1.1225.50-IF Denominazione: SR3 08.11.17
Serie nr: 3 - 2 Scopo: Laufende Messung 4/32 / 04:37
Macchina: M001 Mandrino: Formnest 1 z= 46

Evolvente senza modifiche effettive

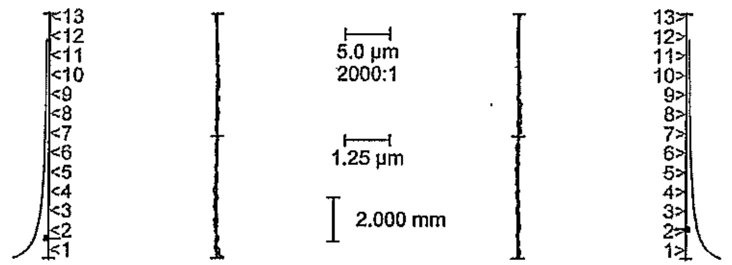
+/- sinistro Spettro medio



	sinistro	Spettro medio
A1	0.30	0.38
A2	0.28	0.21
O(1)	34	41
O(2)	78	63

Elica senza modifiche effettive

+/- sinistro destro -/+

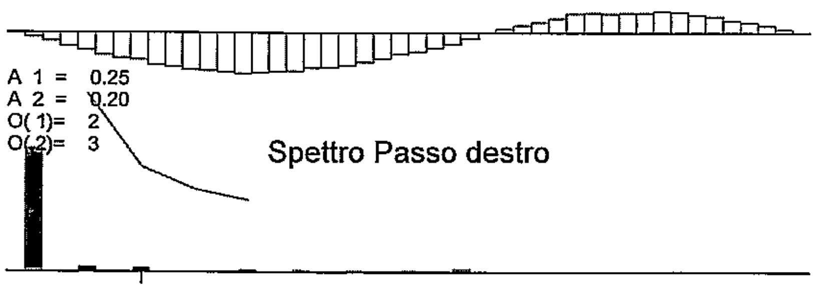


	sinistro	destro
A1	0.11	0.09
A2	–	–
O(1)	74	97
O(2)	–	–

Spettro tmpana_dat

KLINGELNBERG	Numero di disegno: D51.1.1225.50-IF	Denominazione: SR3 08.11.17
	Serie nr: 3-2	Scopo: Laufende Messung 04.02 / 04:37
	Macchina: M001	Mandrino: Formnest 1 z= 46

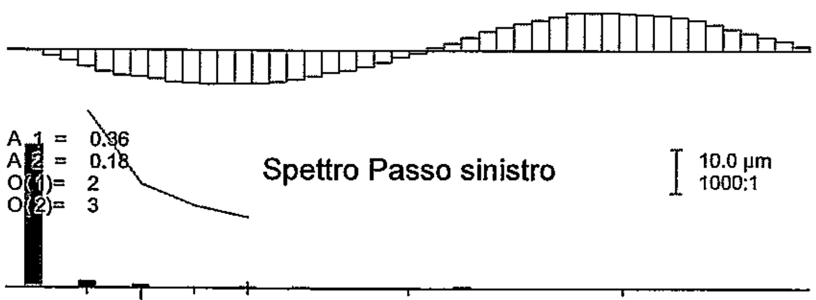
Ondulazione Passo destro



Spettro Passo destro

Ondulazione Passo sinistro

2.50 µm



Spettro Passo sinistro

Docum.archiviato elettronicamente.Archiviazione cartacea non necessaria

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412 06 0 P26 601265	Controllore: turno A		Data: 08.11.2017 04:23
Denominazione: SR3	Numero denti z	46	Largh.fasc.dent. b 13.8mm
Numero disegno.: D51.1.1225.50-IF	Modulo m	2.1mm	Tratto evolv. Lα 12.95mm
Commessa/serie nr.: 4-3	Angolo pressione	17°30'00"	Tratto elica Lß 11.04mm
Masch.Nr.: M001 Spindel: Formmeßt	Angolo elica	-30°00'00"	Inizio elab. M1 15.01mm
Untersuchungszweck: Laufende Messung	Ø Base db	104.8136mm	Palpatore ø (#2D) 1mm
Werkzeug: Charge:	Ang. Base	-28°28'50"	Fat.scor.pr. x .418

Testa

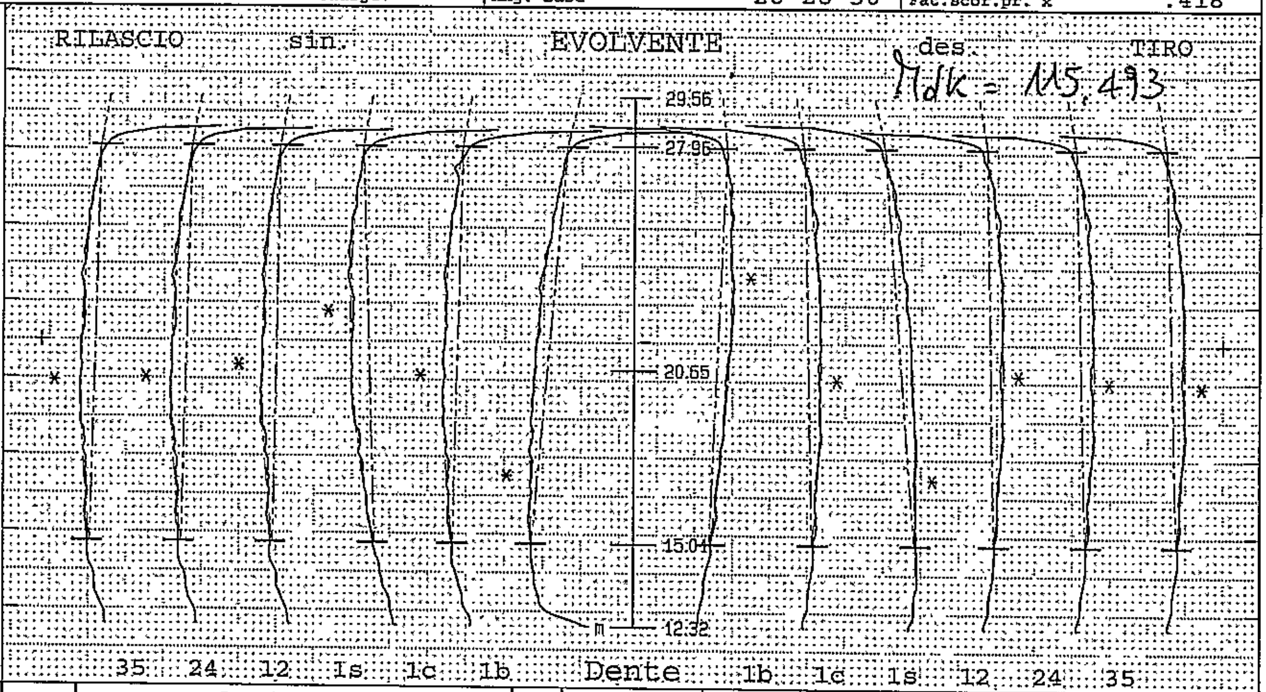
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm	±5	-2.4	Var a 1.1							±5	Var a 0.9						-2.5	
fHα	±8	-2.4	-2.8	-2.7	-1.7	3.2	-2.3	-9.2		±8	4.3	-2.4	-8.1	-2.0	-2.6	-2.9	-2.5	
Fα		4.9	5.1	5.1	4.4	4.3	5.0	10.6			4.4	4.4	9.4	3.9	4.7	4.7	4.4	
ffα	5	2.8	2.5	2.6	2.6	2.8	3.4	2.1		5	2.2	2.4	1.8	2.6	2.5	2.4	2.5	
cα	3±2	3.8	3.7	3.8	3.9	4.8	3.6	3.5		3±2	3.1	3.4	3.0	3.4	3.5	3.5	3.5	
ffαf	3	0.0	1.1	1.2	1.4	0.5	0.7	0.3		3	0.8	0.9	1.2	0.9	1.2	1.0	0.0	
P/T-ø [mm]		105.789				[105.6/106]					119.489				[119.34/119.6]			

Sotto

20 µm

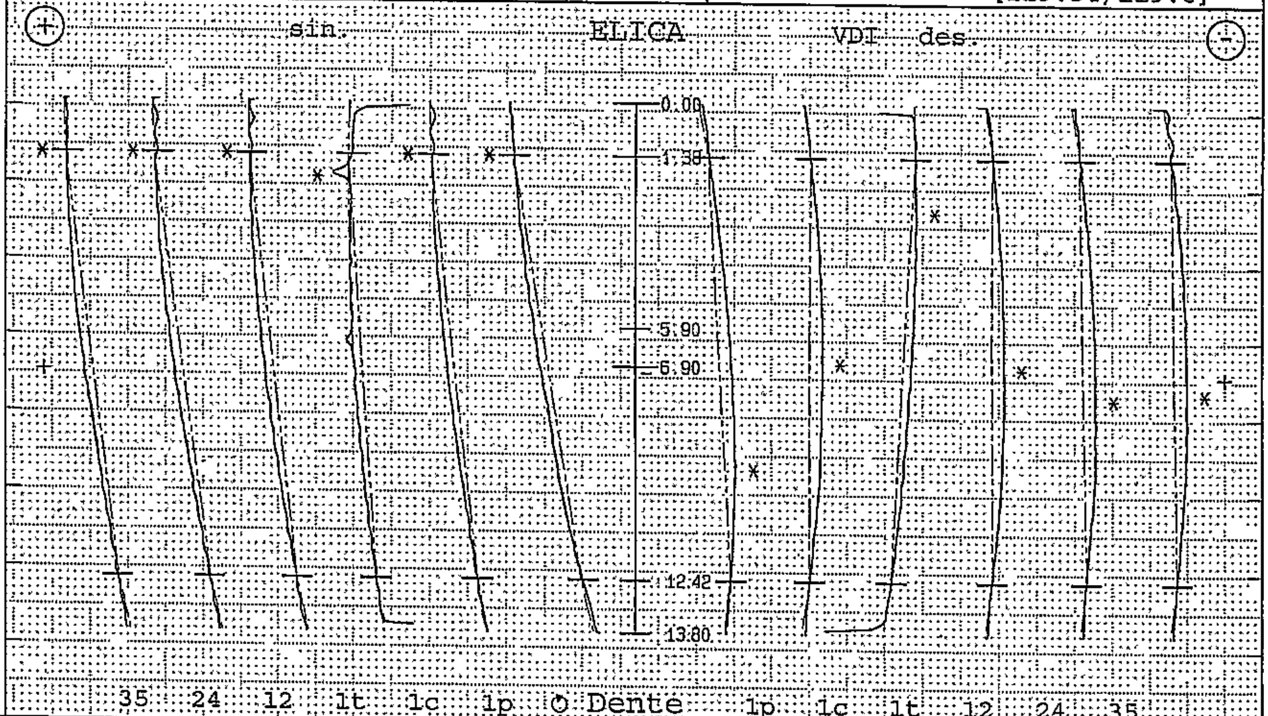
Va500:1

Vb5:1

2 mm

Sopra

N:Z



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHßm	18±4	17.1	Var ß 3.4							±4	Var ß 2.7						1.1	
fHß	18±8	17.1	17.8	18.9	16.2	9.3	15.5	22.2		±8	7.7	-0.3	-8.0	0.1	2.4	2.0	1.1	
Fß		2.5	2.0	2.1	2.9	8.1	3.0	4.2			6.4	2.5	6.4	2.3	3.4	3.8	3.0	
ffß	5	1.0	1.0	1.3	0.9	5.0	0.9	0.9		5	0.6	0.4	0.6	0.4	0.6	0.6	0.5	
cß	1/5	2.2	2.3	2.3	2.4	2.1	1.9	2.1		1/5	3.2	3.4	2.2	3.2	3.3	3.4	3.3	
FV	-17±8	-12.9								-17±8							-15.7	

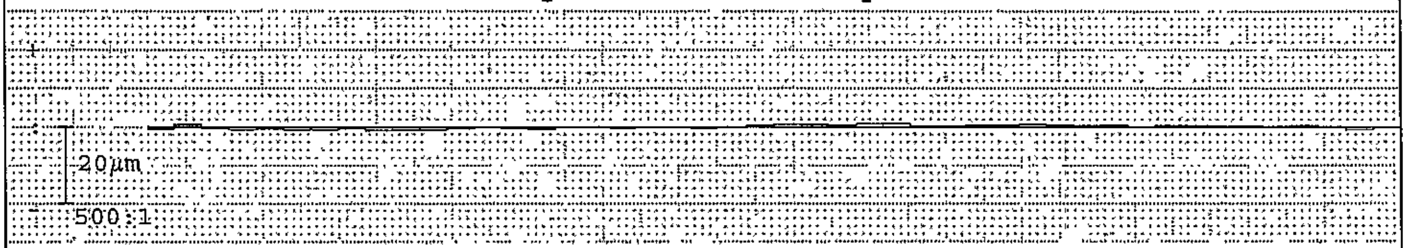
GCG 808006

KLINGELNBERG

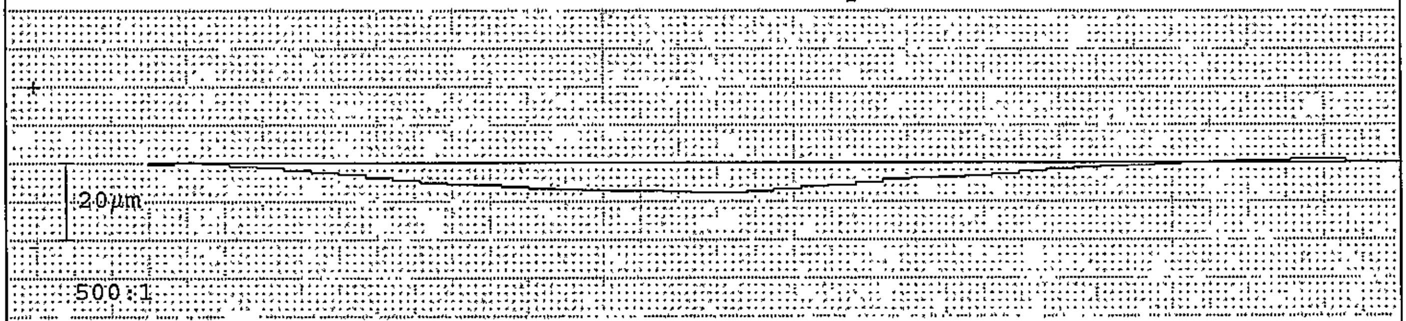
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0 P26 601265	Controllore: turno A	Data: 08.11.2017 04:23
Denominazione: SR3	Numero denti z 46	Angolo pressione 17°30'00"
Numero disegno.: D51.1.1225.50-IF	Modulo m 2.1mm	Angolo elica -30°00'00"
Commessa/serie nr.: 4-3	Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001 Spindel: Formnest	Werkzeug:	Charge:

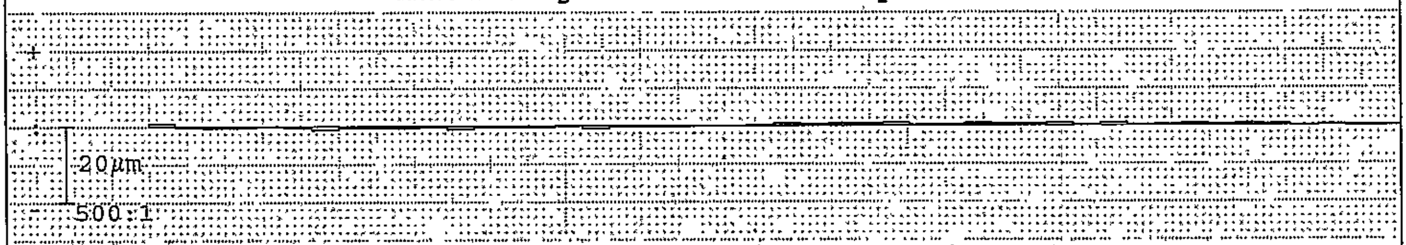
Errori singoli di divisione fp fianco sinistro



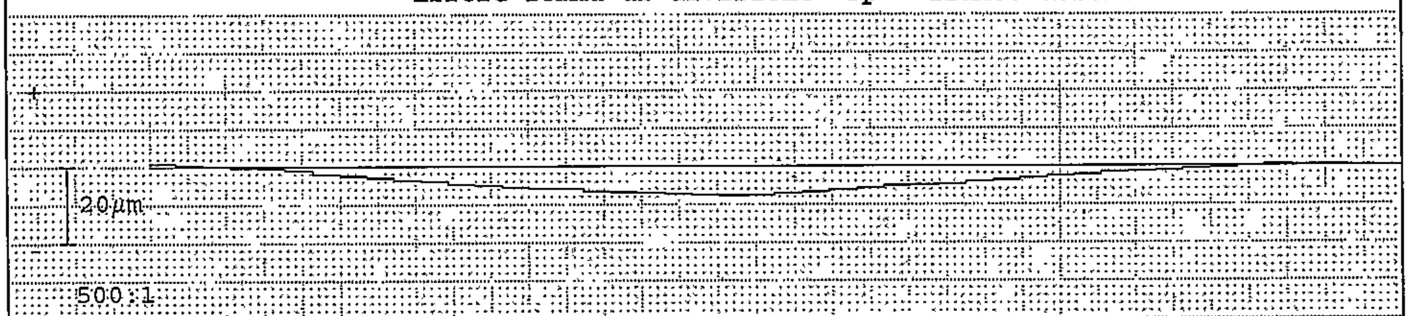
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

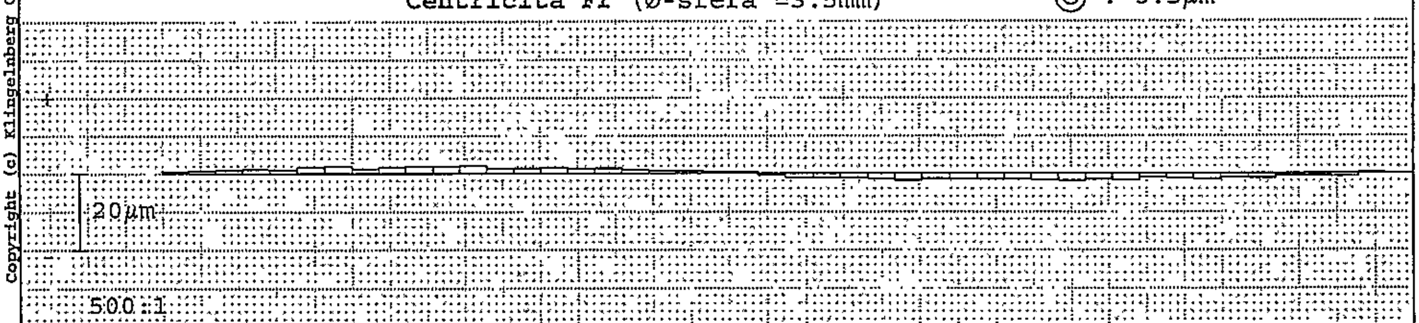


Errore somma di divisione Fp fianco destro



Corsa per misura divis.:112.657 z=5.9mm		fianco sinistro / RILASCIO				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	0.9		10.0		1.0		10.0	
Gr. salto di passo	fu max	1.1		12.0		1.1		12.0	
Scarto di divisione	Rp	1.7				1.8			
Err. globale di divisione	Fp	8.7		36.0		8.6		32.0	
Err. cordale di divisione	Fpz/8	4.0				3.7			

Centricità Fr (Ø-sfera =3.5mm)   ◎ : 3.5µm

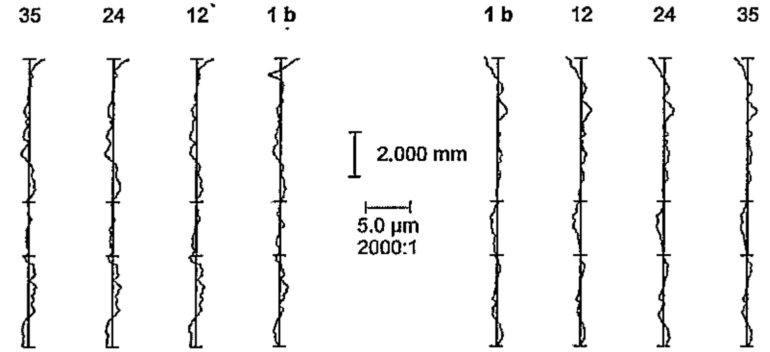


Err. di concentricità	Fr	3.9	28.0	
Variaz. spessore dente	Rs			

KLINGELNBERG	Numero di disegno: D51.1.1225.50-IF Denominazione: SR3	08.11.17
	Serie nr: 4-3 Scopo: Laufende Messung3	/ 04:27
	Macchina: M001 Mandrino: Formnest 1	z= 46

Evolvente senza modifiche effettive

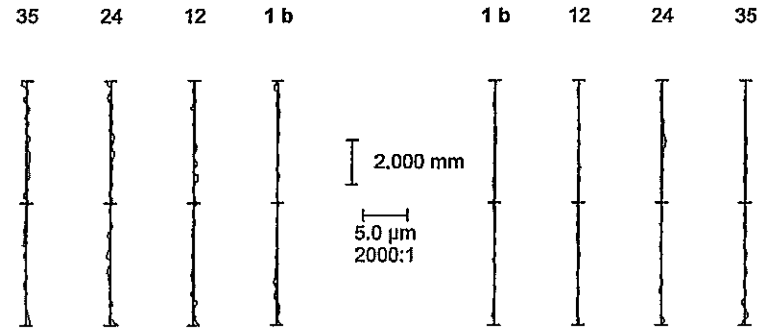
+/- sinistro — destro -/+



	35	24	12	1 b	Valores medio		1 b	12	24	35
fHα	-2.8	-2.7	-1.7	-2.3	-2.4	-2.5	-2.4	-2.0	-2.6	-2.9
Fα	5.1	5.1	4.4	5.0	4.9	4.4	4.4	3.9	4.7	4.7
ffα	2.5	2.6	2.6	3.4	2.8	2.5	2.4	2.6	2.5	2.4
Cα	3.7	3.8	3.9	3.6	3.8	3.5	3.4	3.4	3.5	3.5

Elica senza modifiche effettive

+/- sinistro — destro -/+

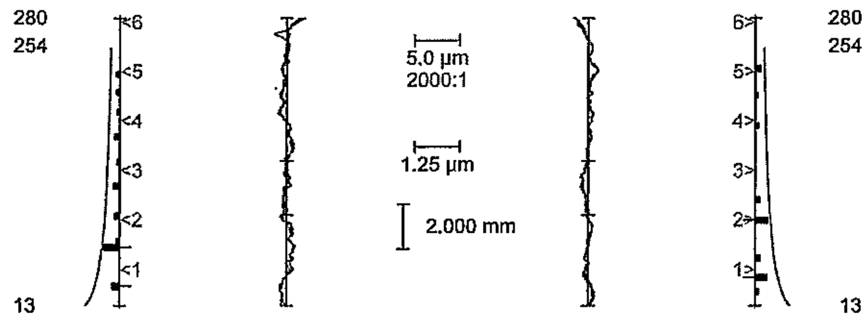


	35	24	12	1 b	Valores medio		1 b	12	24	35
fHβ	-17.8	-18.9	-16.2	-15.5	-17.1	-1.0	0.3	-0.1	-2.4	-2.0
Fβ	27.8	28.5	26.7	26.2	27.3	3.3	2.9	2.6	3.7	4.1
ffβ	1.0	1.3	0.9	0.9	1.0	0.5	0.4	0.4	0.6	0.6
Cβ	3.5	3.6	3.8	3.0	3.5	5.3	5.4	5.1	5.2	5.3

KLINGELNBERG	Numero di disegno: D51.1.1225.50-IF Denominazione: SR3	08.11.17
	Serie nr: 4 - 3 Scopo: Laufende Messung3	/ 04:27
	Macchina: M001 Mandrino: Formnest 1	z= 46

Evolvente senza modifiche effettive

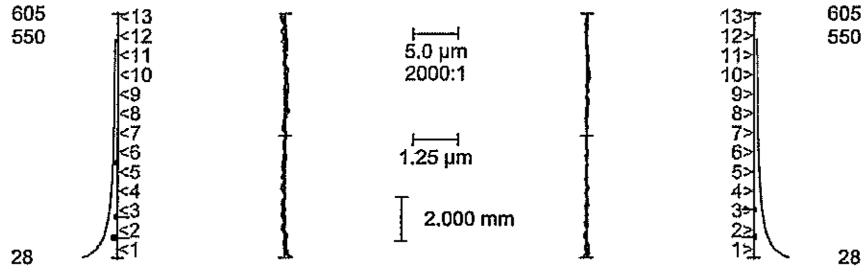
+/- sinistro — Spettro medio



	sinistro	destro
A1	0.45	0.36
A2	0.21	0.33
O(1)	67	92
O(2)	31	39

Elica senza modifiche effettive

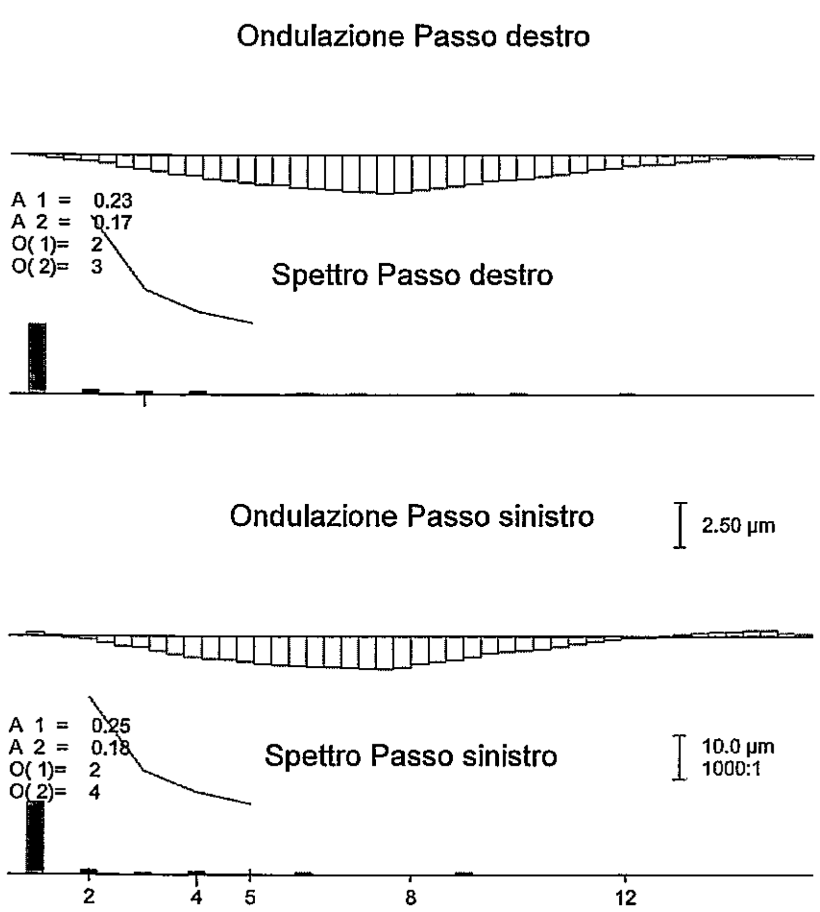
+/- sinistro — destro -/+



	sinistro	destro
A1	0.16	0.06
A2	0.06	0.06
O(1)	75	141
O(2)	124	77

■ Spettro   ■ tmpana_dat

KLINGELNBERG	Numero di disegno: D51.1.1225.50-IF Denominazione: SR3	08.11.17
	Serie nr: 4 - 3 Scopo: Laufende Messung 04:23	/ 04:27
	Macchina: M001 Mandrino: Formnest 1	z= 46



Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	P26 601265	Controllore:	turno A	Data:	08.11.2017 04:03
Denominazione:	SR3	Numero denti z	46	Largh.fasc.dent. b	13.8mm
Numero disegno.:	D51.1.1225.50-IF	Modulo m	2.1mm	Tratto evolv. Lα	12.95mm
Commessa/serie nr.:	6 - 4	Angolo pressione	17°30'00"	Tratto elica Lß	11.04mm
Masch.Nr.:	M001 Spindel: Formnest 1	Angolo elica	-30°00'00"	Inizio elab. M1	15.01mm
Untersuchungszweck:	Laufende Messung	Ø Base db	104.8136mm	Palpatore Ø	(#2D) 1mm
Werkzeug:	Charge:	Ang. Base	-28°28'50"	Fat.scor.pr. x	.418

Testa

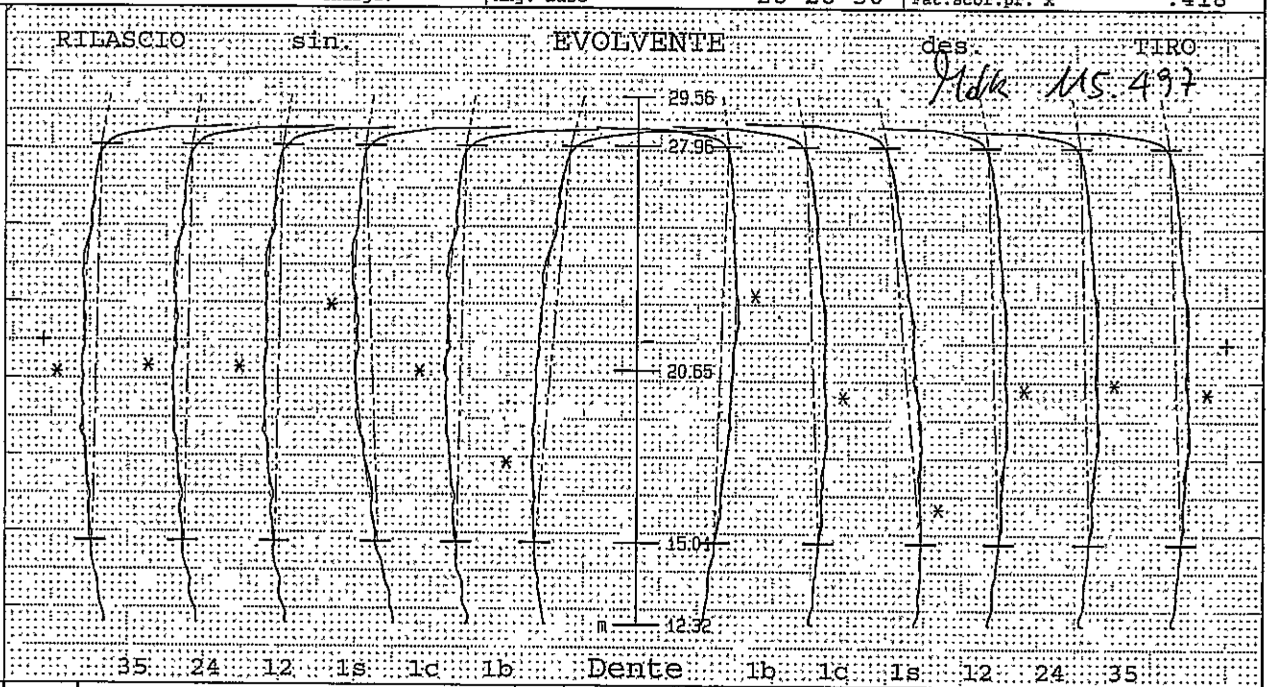
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
fHαm	±5	-2.0	Var a 0.6							±5	Var a 0.9						-3.1	
fHα	±8	-2.0	-2.3	-1.7	-1.8	3.6	-2.1	-9.2		±8	3.5	-3.5	-9.1	-3.0	-2.6	-3.3	-3.1	
Fα		4.1	4.5	3.8	4.1	4.4	4.1	11.0			3.6	4.8	10.0	4.2	4.1	4.6	4.4	
ffα	5	2.3	2.4	2.3	2.3	2.3	2.2	2.7		5	1.6	1.6	1.4	1.3	1.7	1.6	1.6	
cα	3±2	3.8	3.8	3.8	3.8	4.4	3.9	3.9		3±2	3.5	3.4	2.8	3.4	3.4	3.5	3.4	
ffαf	3	0.0	0.7	1.0	1.0	1.4	1.3	0.4		3	1.1	1.2	0.3	0.5	1.2	1.1	0.0	
P/T-ø [mm]		105.801				[105.6/106]					119.503				[119.34/119.6]			

Sotto

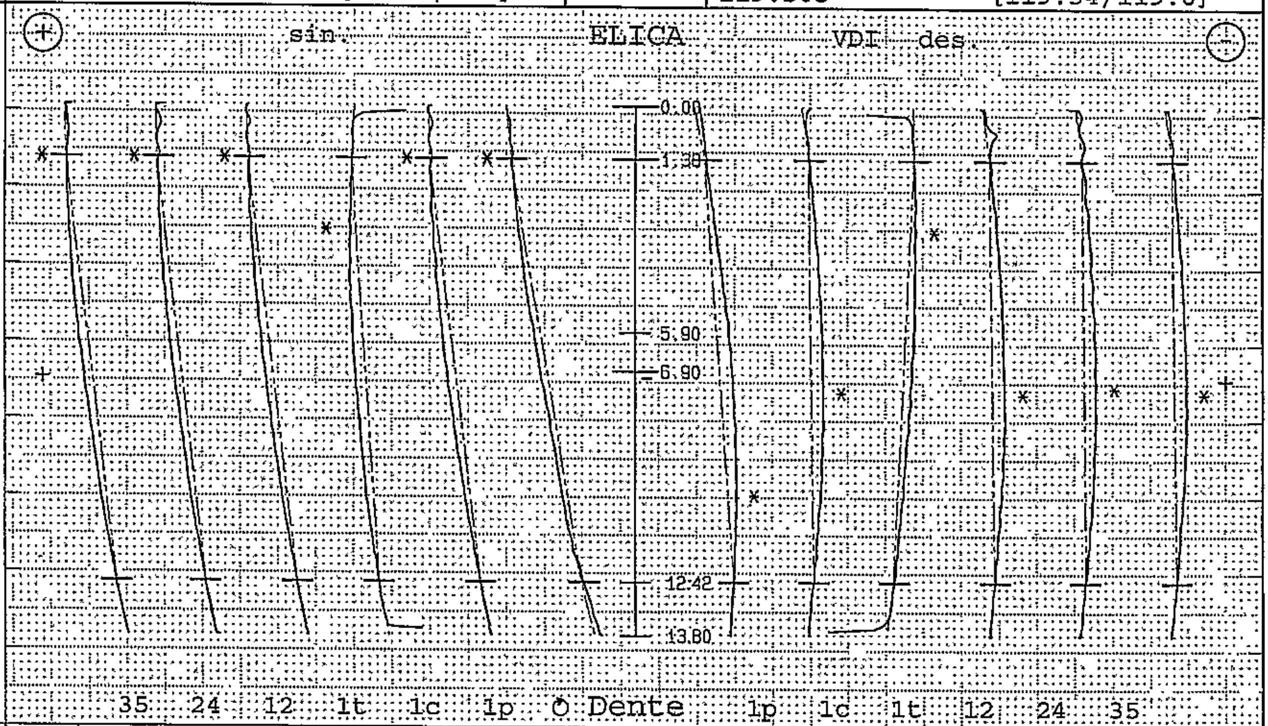
20 µm

Va500:1

Vb5:1

2 mm

Sopra



N:Z

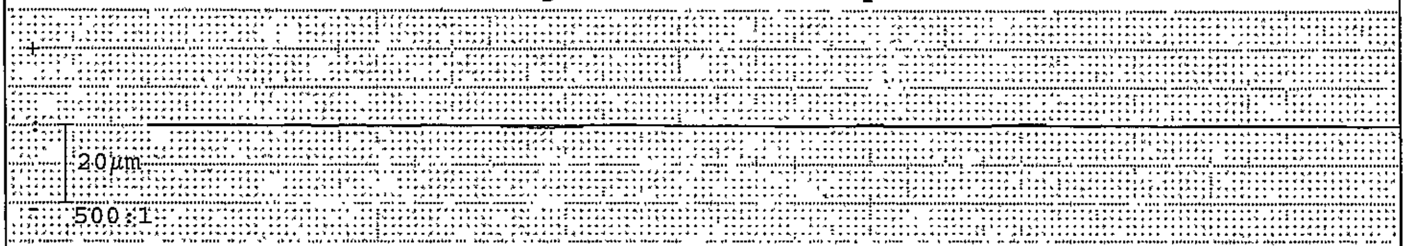
fHßm	18±4	16.7	Var ß 0.4						±4	Var ß 0.5						1.5	
fHß	18±8	16.7	16.8	16.5	16.7	9.2	16.9	23.2	±8	9.6	1.6	-7.1	1.7	1.2	1.6	1.5	
Fß		2.3	2.0	2.4	2.3	7.3	2.4	4.8		7.3	2.9	5.5	3.1	3.0	3.0	3.0	
ffß	5	0.7	0.5	0.8	0.8	0.7	0.8	1.0	5	0.8	0.5	0.6	0.5	0.9	0.6	0.6	
cß	1/5	2.3	2.3	2.2	2.2	2.8	2.3	1.8	1/5	3.3	3.1	2.2	3.2	3.0	3.1	3.1	
FV	-17±8	-14.0							-17±8							-16.7	

GCG 808006

Ruota cilindrica Divisione

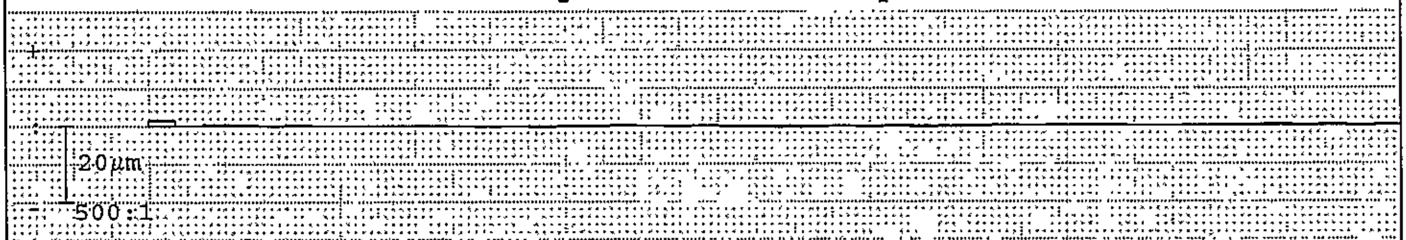
Nr. prog.: STI0412_06 0	P26 601265	Controllore:	turno A	Data:	08.11.2017 04:03
Denominazione:	SR3	Numero denti z	46	Angolo pressione	17°30'00"
Numero disegno.:	D51.1.1225.50-IF	Modulo m	2.1mm	Angolo elica	-30°00'00"
Commessa/serie nr.:	6 ~ 4	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formmeast1	Werkzeug:	Charge:	

Errori singoli di divisione fp fianco sinistro

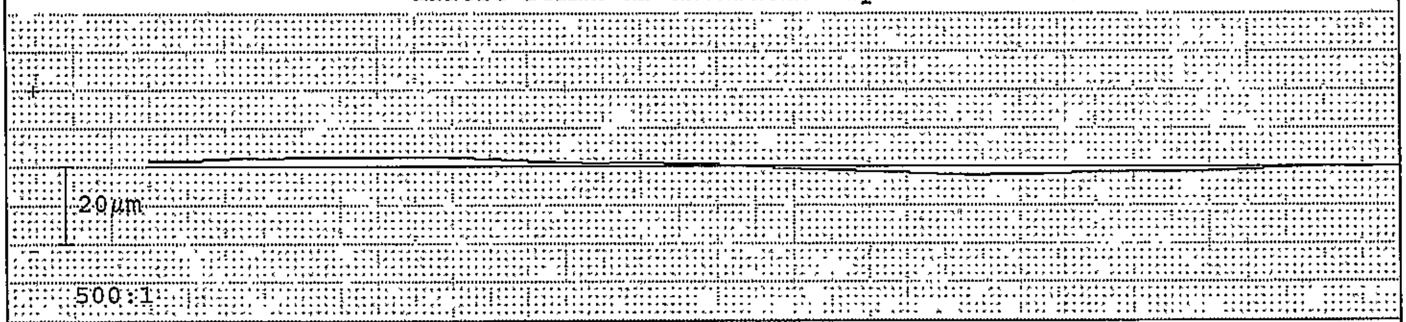


Errore somma di divisione Fp fianco sinistro

Errori singoli di divisione fp fianco destro



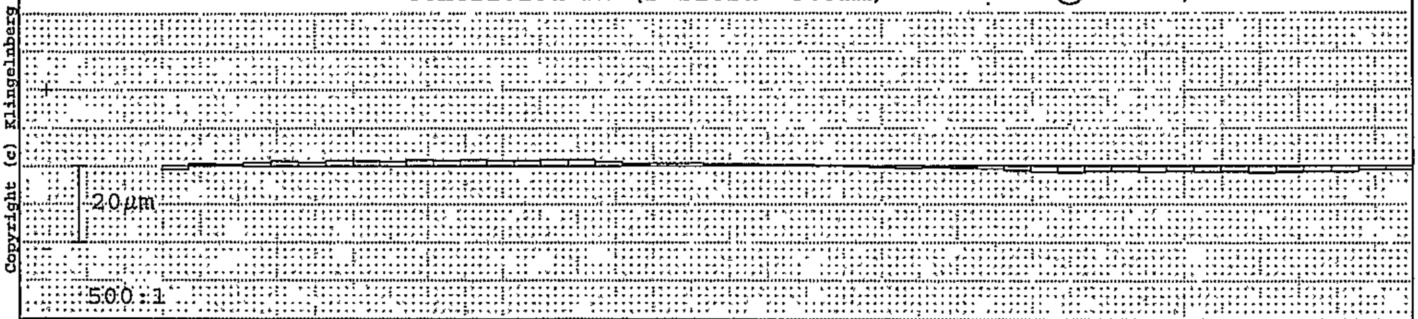
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:112.657 z=5.9mm

		fianco sinistro / RILASCIO				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	0.6		10.0		1.4		10.0	
Gr. salto di passo	fu max	0.6		12.0		1.4		12.0	
Scarto di divisione	Rp	1.1				2.0			
Err. globale di divisione	Fp	2.9		36.0		4.8		32.0	
Err. cordale di divisione	Fpz/8	1.5				2.3			

Centricità Fr (Ø-sfera =3.5mm) ◎ : 3.2µm



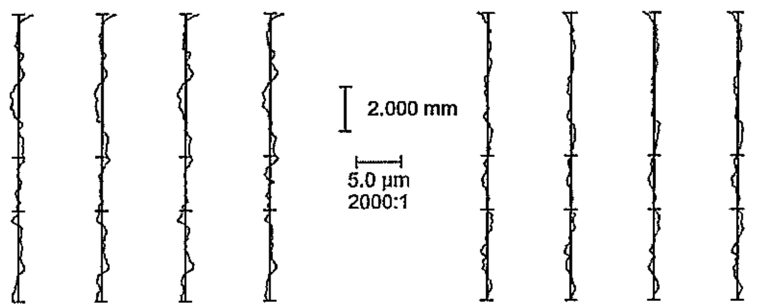
Err. di concentricitá	Fr	3.5	28.0	
Variaz. spessore dente	Rs			

KLINGELNBERG

Numero di disegno: D51.1.1225.50-IF Denominazione: SR3 08.11.17
Serie nr: 6 - 4 Scopo: Laufende Messung 04.03 / 04:07
Macchina: M001 Mandrino: Formnest 1 z= 46

Evolvente senza modifiche effettive

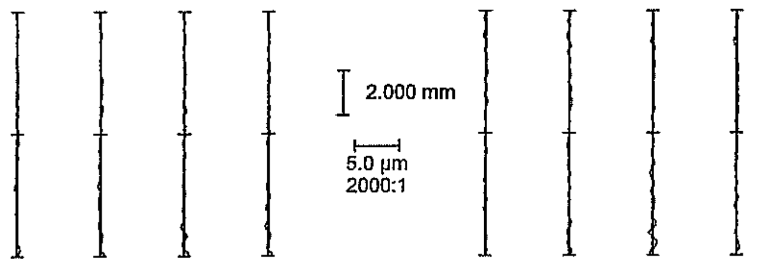
+/- sinistro destro -/+



	sinistro 35	24	12	1 b	Valores medio		1 b	12	24	35
fhα	-2.3	-1.7	-1.8	-2.1	-2.0	-3.1	-3.5	-3.0	-2.6	-3.3
Fα	4.4	3.8	4.1	4.1	4.1	4.4	4.8	4.2	4.1	4.6
ffα	2.4	2.3	2.3	2.2	2.3	1.5	1.6	1.3	1.7	1.6
Cα	3.8	3.8	3.8	3.9	3.8	3.4	3.4	3.4	3.4	3.5

Elica senza modifiche effettive

+/- sinistro destro -/+



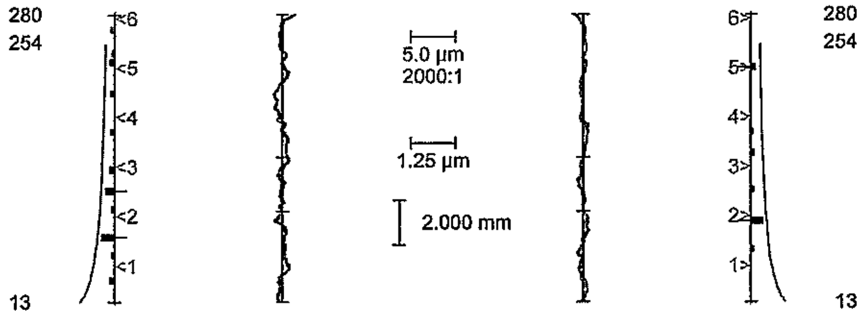
	sinistro 35	24	12	1 b	Valores medio		1 b	12	24	35
fhβ	-16.8	-16.5	-16.7	-16.9	-16.7	-1.5	-1.6	-1.7	-1.2	-1.6
Fβ	27.5	26.9	27.2	27.2	27.2	3.3	3.3	3.4	3.3	3.3
ffβ	0.5	0.8	0.8	0.8	0.7	0.6	0.5	0.5	0.9	0.6
Cβ	3.5	3.3	3.4	3.6	3.5	4.9	4.8	5.0	4.7	4.9

KLINGELNBERG

Numero di disegno: D51.1.1225.50-IF Denominazione: SR3 08.11.17
Serie nr: 6 - 4 Scopo: Laufende Messung 04.03 / 04:07
Macchina: M001 Mandrino: Formnest 1 z= 46

Evolvente senza modifiche effettive

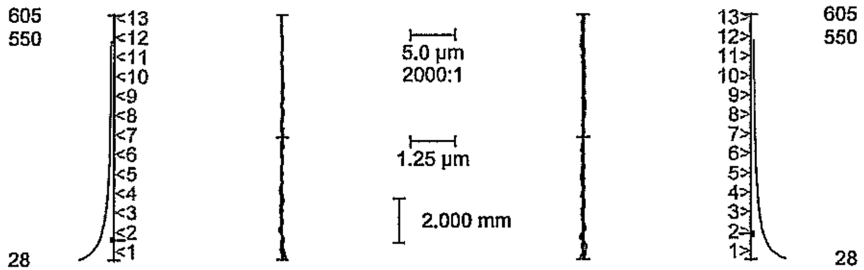
+/- sinistro Spettro medio



	sinistro	destro
A1	0.36	0.34
A2	0.24	0.12
O(1)	73	88
O(2)	116	231

Elica senza modifiche effettive

+/- sinistro destro -/+

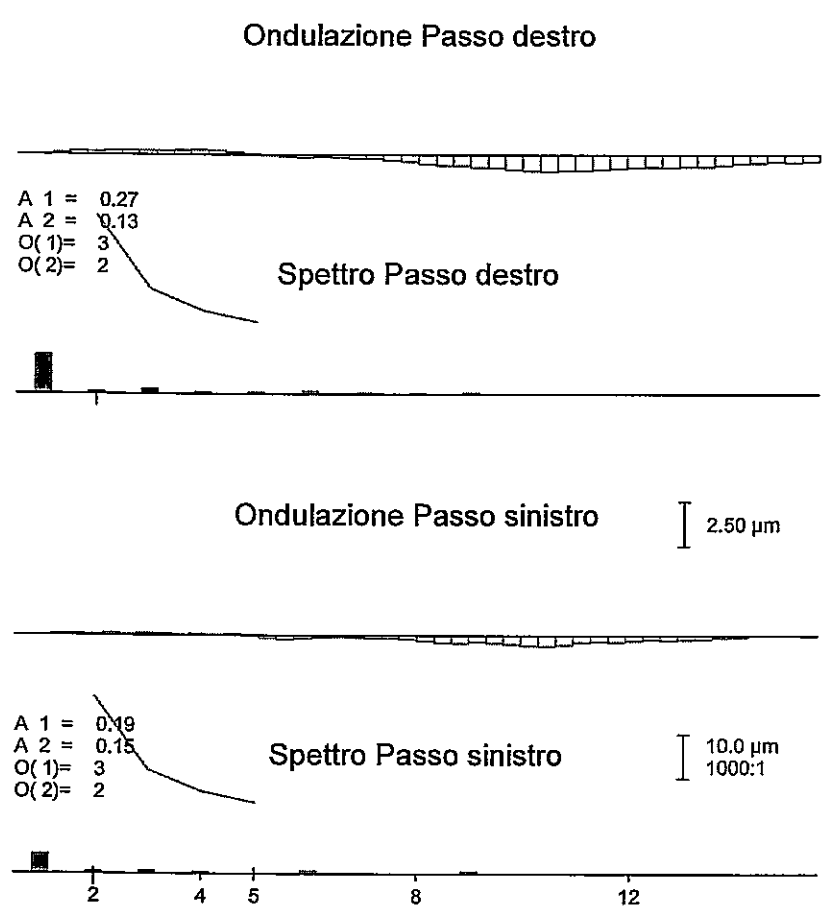


	sinistro	destro
A1	0.08	0.07
A2	–	–
O(1)	75	87
O(2)	–	–

■ Spettro ■ tmpana_dat

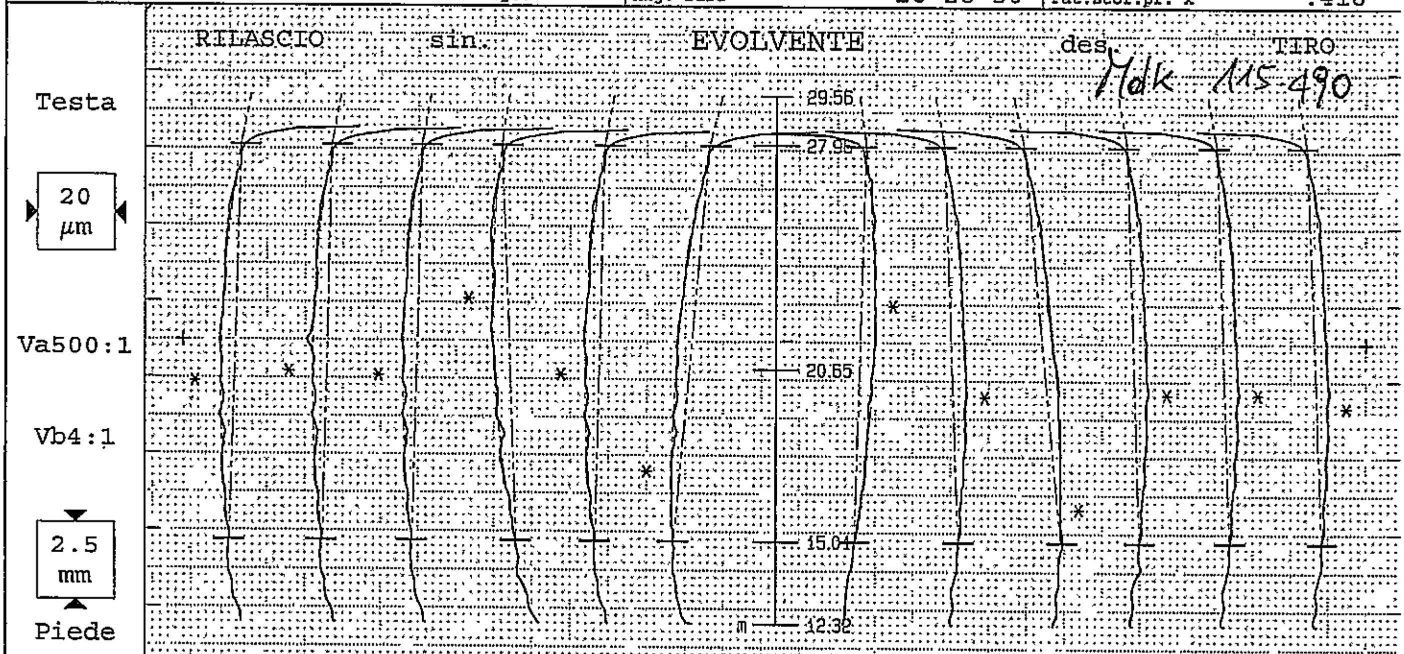
KLINGELNBERG

Numero di disegno: D51.1.1225.50-IF Denominazione: SR3 08.11.17
Serie nr: 6 - 4 Scopo: Laufende Messung 04.03 / 04:07
Macchina: M001 Mandrino: Formnest 1 z= 46



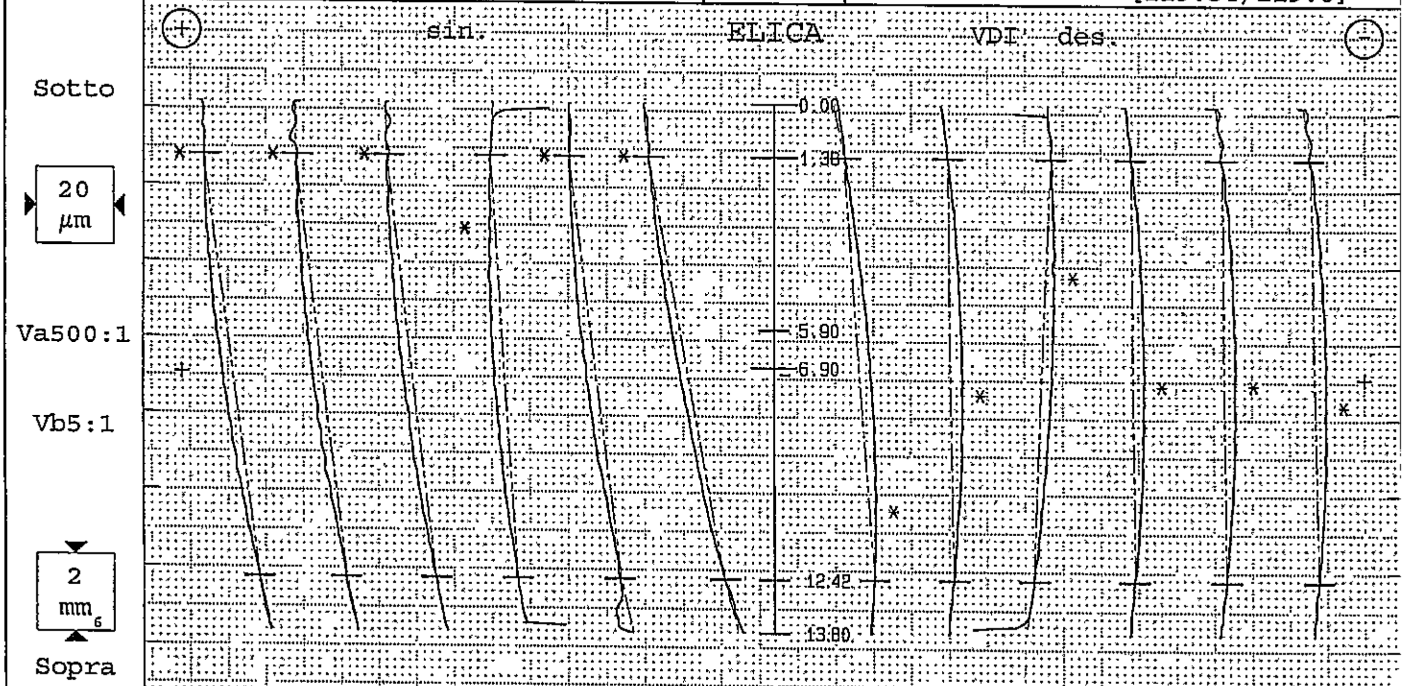
Ruota cilindrica Evolvente/Elica

Nr. prog.:	STI0412_06 0 P26 601265	Controllore:	turno A	Data:	08.11.2017 03:47
Denominazione:	SR3	Numero denti z	46	Largh.fasc.dent. b	13.8mm
Numero disegno.:	D51.1.1225.50-IF	Modulo m	2.1mm	Tratto evolv. La	12.95mm
Commessa/serie nr.:	7 - 5	Angolo pressione	17°30'00"	Tratto elica Lß	11.04mm
Masch.Nr.:	M001 Spindel: Formnest	Angolo elica	-30°00'00"	Inizio elab. M1	15.01mm
Untersuchungszweck:	Laufende Messung	Ø Base db	104.8136mm	Palpatore Ø	(#2D) 1mm
Werkzeug:	Charge:	Ang. Base	-28°28'50"	Fat.scor.pr. x	.418



35 24 12 1s 1c 1b Dente 1b 1c 1s 12 24 35

Tolerance		Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
fHαm	±5	-2.5	Var a 0.7							±5	Var a 0.8						-3.7	
fHα	±8	-2.5	-3.0	-2.3	-2.4	3.8	-2.4	-9.5		±8	2.9	-3.7	-9.8	-3.4	-3.5	-4.2	-3.7	
Fα		4.5	4.7	4.8	4.1	4.6	4.3	11.1			3.5	5.1	11.3	4.7	4.8	5.7	5.1	
ffα	5	2.2	1.9	2.9	1.9	2.4	2.1	2.0		5	1.9	1.7	1.7	1.6	1.5	1.9	1.7	
cα	3±2	3.8	3.8	3.8	3.7	4.3	3.8	3.7		3±2	3.7	3.6	3.0	3.5	3.6	3.3	3.5	
ffαf	3	0.0	1.3	1.5	1.1	1.5	1.1	0.7		3	1.3	1.3	0.5	1.2	1.4	1.1	0.0	
P/T-ø [mm]		105.763	[105.6/106]								119.465	[119.34/119.6]						



N:Z 35 24 12 1t 1c 1p Dente 1p 1c 1t 12 24 35

Tolerance		Medio							Qual	Tolerance							Medio	Qual
fHßm	18±4	17.2	Var ß 2.0							±4	Var ß 1.5						1.7	
fHß	18±8	17.2	18.4	16.9	16.4	8.9	17.1	24.9		±8	10.0	1.8	-5.8	1.1	1.1	2.6	1.7	
Fß		2.9	2.0	2.9	3.0	7.3	3.7	5.8			7.7	3.1	4.9	2.8	3.1	3.8	3.2	
ffß	5	0.8	0.5	1.1	0.9	0.8	0.7	0.6		5	0.6	0.5	0.7	0.4	0.8	0.8	0.6	
cß	1/5	2.6	2.8	2.6	2.5	2.7	2.6	2.2		1/5	2.9	3.1	2.6	2.9	3.0	3.0	3.0	
FV	-17±8	-16.0								-17±8							-15.8	

GCG 808006

Ruota cilindrica Divisione

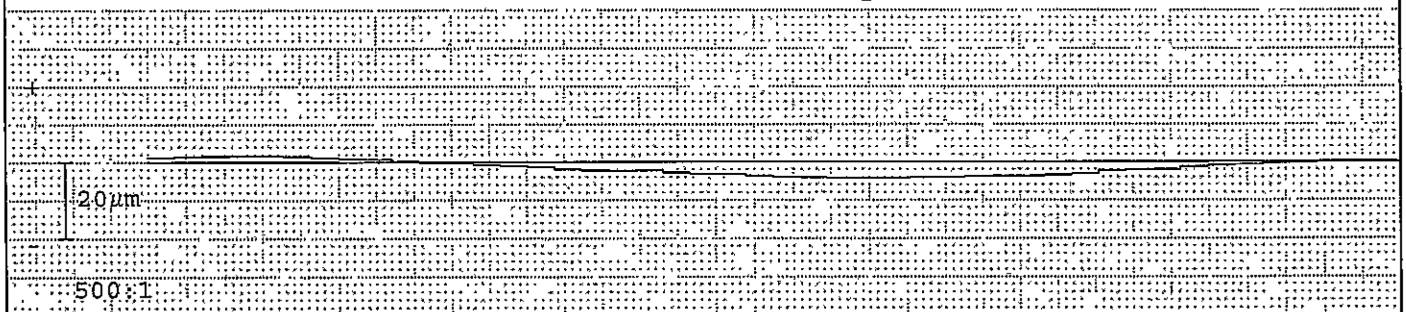
Nr. prog.: STI0412_06 0	P26 601265	Controllore: turno A	Data: 08.11.2017 03:47
Denominazione:	SR3	Numero denti z 46	Angolo pressione 17°30'00"
Numero disegno.:	D51.1.1225.50-IF	Modulo m 2.1mm	Angolo elica -30°00'00"
Commessa/serie nr.:	7 - 5	Untersuchungszweck: Laufende Messung	
Masch.Nr.:	M001	Spindel: Formmeßzeug:	Charge:

Errori singoli di divisione fp fianco sinistro

Errore somma di divisione Fp fianco sinistro

Errori singoli di divisione fp fianco destro

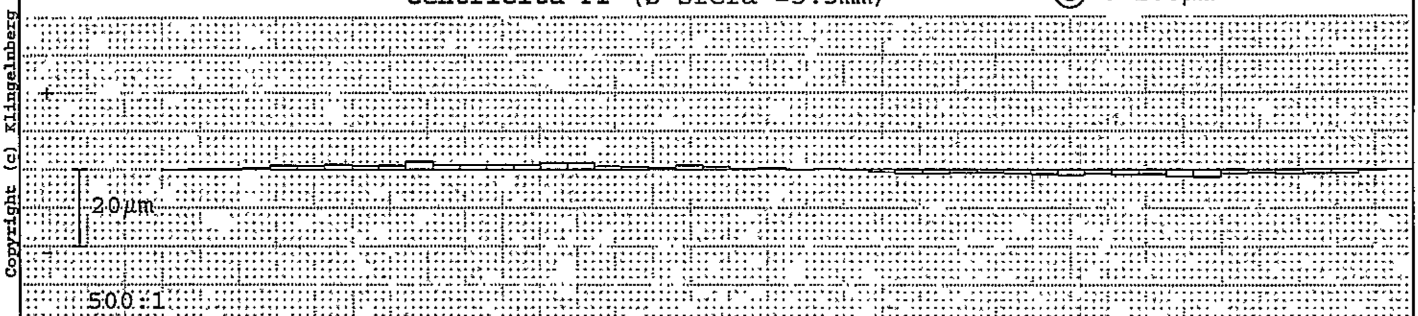
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:112.657 z=5.9mm

		fianco sinistro / RILASCIO		fianco destro / TIRO	
		Val.misur Qual.	Val. amm Qual.	Val.misur Qual.	Val. amm Qual.
Gr. err. singoli divisione	fp max	0.9	10.0	1.2	10.0
Gr. salto di passo	fu max	1.0	12.0	1.4	12.0
Scarto di divisione	Rp	1.8		1.8	
Err. globale di divisione	Fp	5.4	36.0	6.0	32.0
Err. cordale di divisione	Fpz/8	2.4		2.5	

Centricità Fr (Ø-sfera =3.5mm) ◎ : 2.8µm

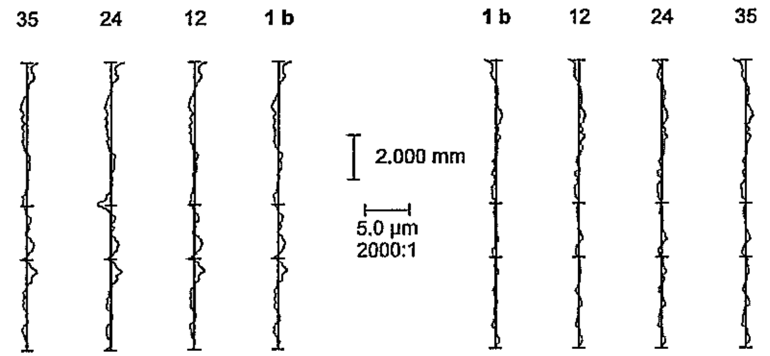


Err. di concentricitá	Fr	4.0	28.0	/
Variaz. spessore dente	Rs			

Numero di disegno: D51.1.1225.50-IF Denominazione: SR3 08.11.17
Serie nr: 7 Scopo: Laufende Messung7 / 03:51
Macchina: M001 Mandrino: Formnest 1 z= 46

Evolvente senza modifiche effettive

+/- sinistro destro -/+

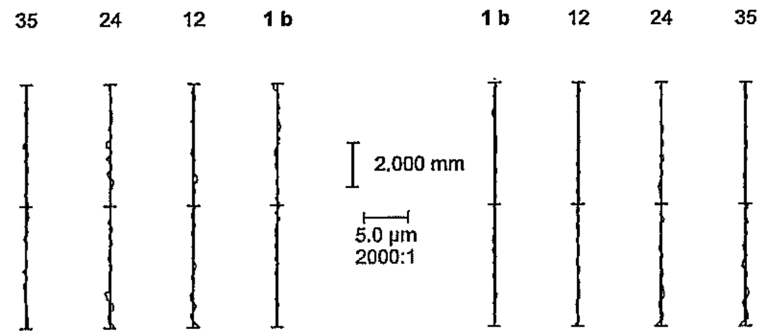


Valores medio

	35	24	12	1 b	Valores medio		1 b	12	24	35
fhα	-3.0	-2.3	-2.4	-2.4	-2.5	-3.7	-3.8	-3.5	-3.6	-4.2
Fα	4.7	4.8	4.1	4.3	4.5	5.1	5.1	4.7	4.8	5.7
ffα	1.9	2.9	1.9	2.1	2.2	1.7	1.7	1.6	1.5	1.9
Cα	3.8	3.8	3.7	3.8	3.8	3.5	3.6	3.5	3.6	3.3

Elica senza modifiche effettive

+/- sinistro destro -/+



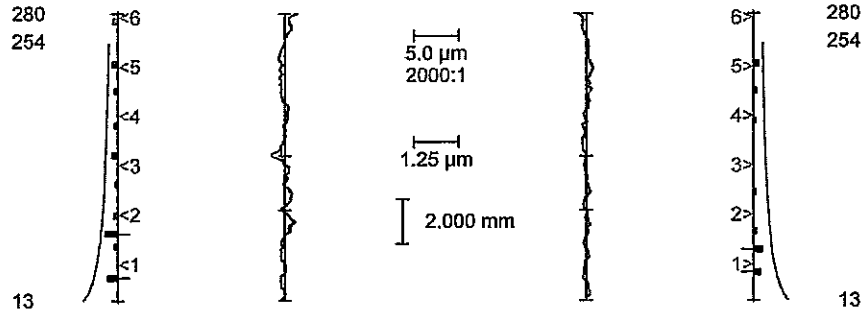
Valores medio

	35	24	12	1 b	Valores medio		1 b	12	24	35
fhβ	-18.4	-16.9	-16.4	-17.1	-17.2	-1.7	-1.8	-1.1	-1.1	-2.6
Fβ	28.9	27.2	27.1	27.5	27.7	3.5	3.4	3.2	3.5	4.1
ffβ	0.5	1.1	0.9	0.7	0.8	0.6	0.5	0.4	0.8	0.8
Cβ	4.4	4.1	3.9	4.0	4.1	4.7	4.8	4.6	4.7	4.7

Numero di disegno: D51.1.1225.50-IF Denominazione: SR3 08.11.17
Serie nr: 7 Scopo: Laufende Messung7 / 03:51
Macchina: M001 Mandrino: Formnest 1 z= 46

Evolvente senza modifiche effettive

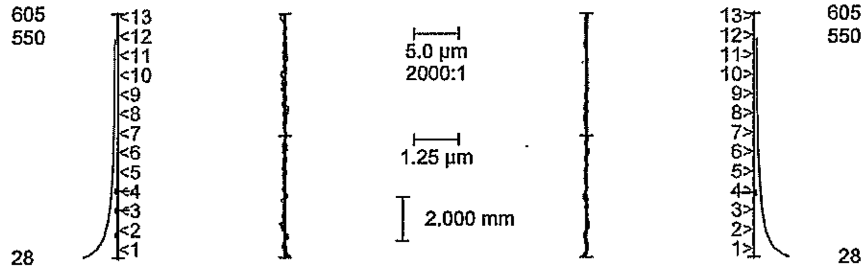
+/- sinistro Spettro medio



	sinistro	Spettro medio
A1	0.35	0.25
A2	0.27	0.18
O(1)	75	60
O(2)	34	39

Elica senza modifiche effettive

+/- sinistro destro -/+



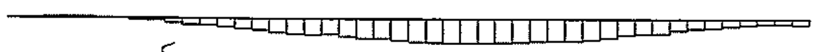
	sinistro	destro
A1	0.07	0.06
A2	0.06	–
O(1)	186	180
O(2)	140	–

■ Spettro ■ tmpana_dat

KLINGELNBERG

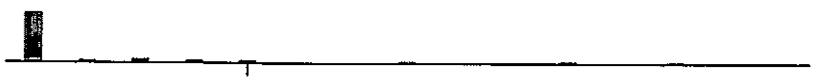
Numero di disegno: D51.1.1225.50-IF Denominazione: SR3 08.11.17
Serie nr: 7 – 5 Scopo: Laufende Mess06g47 / 03:51
Macchina: M001 Mandrino: Formnest 1 z= 46

Ondulazione Passo destro



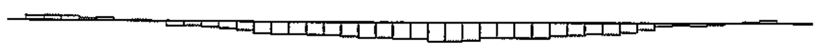
A 1 = 0.18
A 2 = 0.13
O(1)= 3
O(2)= 5

Spettro Passo destro



Ondulazione Passo sinistro

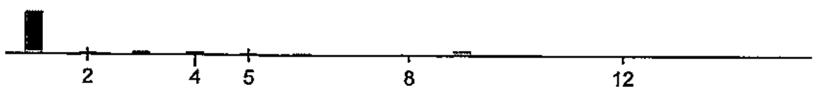
2.50 µm



A 1 = 0.16
A 2 = 0.15
O(1)= 3
O(2)= 4

Spettro Passo sinistro

10.0 µm
1000:1



MAGNA GETRAG

REPORT 17/196

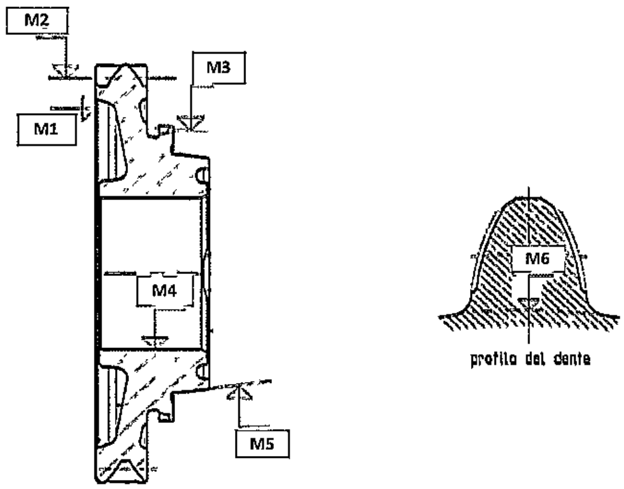
Date: 09/11/16
Author: R.Signorile

Reason for analysis: *Motivo dell'indagine:*	PPAP
Requester: *Richiedente:*	WLQ - Stefano Picerno

Part Name: *Nome particolare:*	SPEED GEAR 3rd
Material: *Materiale:*	GCG_805000 Part 2
State of part: *Stato del particolare:*	Finished
P/N:	2511122550
S/N:	-
Customer: *Cliente:*	-

Result: *Risultato:*	OK
Notes: *Note:*	
Distribution list: *Lista di distribuzione:*	WLQ - S. Picerno

***Drawing** (Disegno)*



Picture 1: extract from the part drawing, showing the metallurgical parameters measuring points.

***Surface Hardness Verification** (Verifica Durezza Superficiale)*

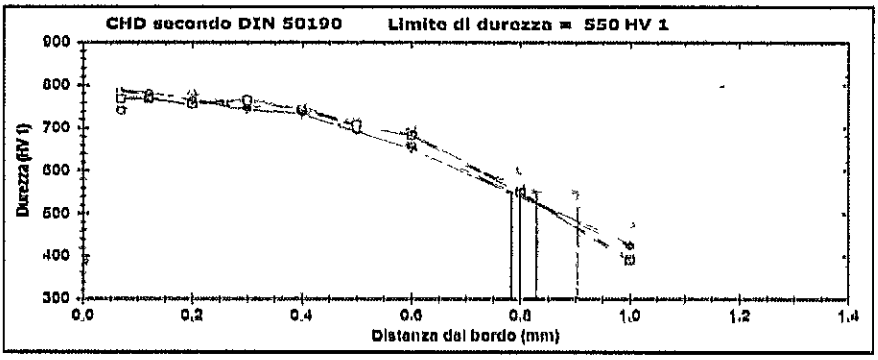
Scale	Position	Values [mm]	Range	Component
HRC	M1	61.5	-	Ruota
HRA	M1	81.4	80.5 + 2.5	Ruota

REPORT 17/196

Date: 09/11/16
Author: R.Signorile

CHD and Core Hardness Verification *(Verifica CHD e Durezza a Cuore)*

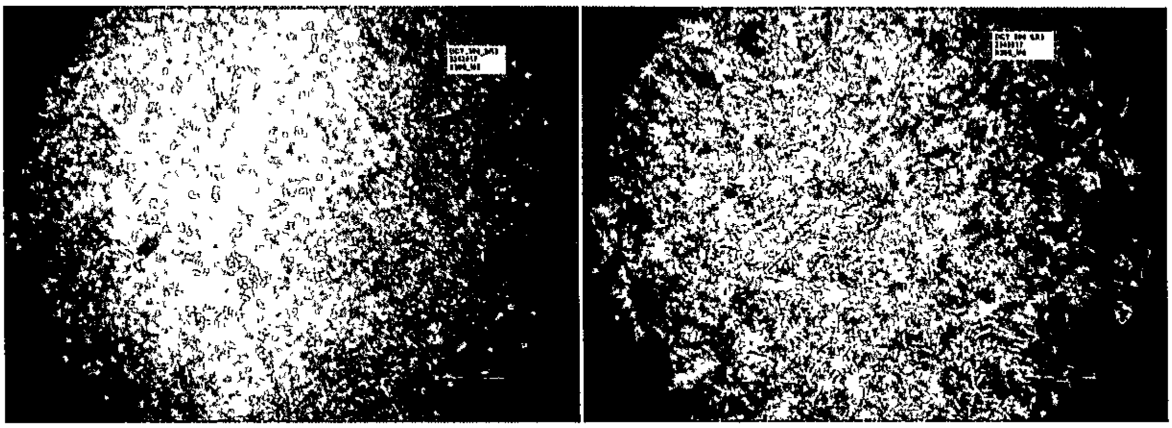
	Sample	Position	Measured Value	Range
CHD 550 HV1	3342/17	M2	0.83	0.50 + 0.40 mm
CHD 550 HV1	3342/17	M3	0.90	min 0.50 mm
CHD 550 HV1	3342/17	M4	0.78	min 0.30 mm
Core hardness HV10	3342/17	M5	0.80	min 0.40 mm
Core hardness HV10	3342/17	M6	389	≥ 300



Picture 2: hardness profiles.

Analysis at Metallographic Microscope *(Analisi al Microscopio Metallografico)*

Sample #	3342/17
Gear - Tooth flank surface structure:	martensite and 5% retained austenite
Gear - Tooth base core structure:	martensite + bainite



Picture 3: microstructure at tooth flank (at left) and at tooth core (at right), magnification 500x.

LABORATORY REPORT
GETRAG S.p.A. - B/WLQ 2

MAGNA GETRAG

REPORT 18/009	Date: 04/01/18 Author: R. Padolecchia

Reason for analysis: *Motivo dell'indagine:*	PPAP G_904340-2 part compliance control

Requester: *Richiedente:*	WLQ - Stefano Picerno

Part Name: *Nome particolare:*	7 DCT 300 gearset - 21A variant
Material: *Materiale:*	GCG_805000 Part 2
State of part: *Stato del particolare:*	Finished

P/N:	-
S/N:	-
Customer: *Cliente:*	Renault

Result: *Risultato:*	OK

Distribution list: *Lista di distribuzione:*	WLQ - S. Picerno ME - L. Landriscina

Notes: *Note:*	**Spray equipment:** Flushing cabinet Hydac CTU-1230-M-Z-R **Spray method:** QPS 130033 (gears) QPS 130034 (shafts) **Membrane material:** cellulose nitrate **Pore size [mm]:** 5,0

Cleanliness Analysis *(Analisi della Pulizia)*

Part	P/N	Washing Machine	Detergent	Sampling date	Wetted surface [cm2]	Gravimetric evaluation [mg/1000cm²]	Max Allowable [mg/1000cm²]
SG1	251.1.1081.50	ORE 11033	NC 3300	21/12/17	627.41	0.70	2.5
DG	251.1.1223.50	ORE 11033	NC 3300	18/12/17	613.40	1.40	2.5
SG3	251.1.1225.50	ORE 11033	NC 3300	21/12/17	401.6	1.80	2.5
SG4	251.1.1226.50	ORE 11033	NC 3300	21/12/17	344.46	1.05	2.5
SG5	251.1.1228.50	ORE 11033	NC 3300	20/12/17	340.18	1.16	2.5
SG6	251.1.1230.50	ORE 11033	NC 3300	20/12/17	277.62	1.02	2.5
SG7	251.1.1232.50	ORE 11033	NC 3300	20/12/17	152.64	0.85	2.5
REV	251.1.1094.50	ORE 11033	NC 3300	02/01/18	434.08	1.04	2.5
RG	251.1.1080.50	ORE 11033	NC 3300	02/01/18	1036.22	1.25	2.5
DG_Fix	251.1.1220.35	ORE 11033	NC 3300	02/01/18	561.69	1.55	2.5
IS1	251.6.1073.35	ORE 11033	NC 3300	03/01/18	416.99	2.03	2.5
IS2	251.6.1218.35	ORE 11033	NC 3300	03/01/18	671.89	1.09	2.5
OS1	251.6.1076.35	ORE 11033	NC 3300	04/01/18	610.51	1.98	2.5
OS2	251.6.1078.35	ORE 11033	NC 3300	04/01/18	514.21	1.51	2.5

Component	Operation	Machine	Part Number	Transferability	Items	Spec	hrs	ORI	Target	Cm	CmK	CM Last Update	N	Pp	Ppk	PP Last Update	Containment Actions	Corrective Actions	Owner	Due date
DG-FIX	Grind Gear Teeth (5/7th Gear)	SLW11009	251 1 1074.35	1A - 21A	Fr	22	x	PPAP	1,67	-	1.68	27/02/2017		-	2.42	08/03/2017				
DG-FIX	Grind Gear Teeth (5/7th Gear)	SLW11009	251.1 1074.35	1A - 21A	MEDIO M1-M3	max. 104,901min. 104,824	x	PPAP	1,67	2.40	1.95	27/02/2017		2.52	2.06	08/03/2017				
DG-FIX	Grind Gear Teeth (5/7th Gear)	SLW11012	251 1 1220.35	21A	Fr	22	x	capacity increase	1,67	SIM	SIM	26/02/2018		-	2.23	26/02/2018				
DG-FIX	Grind Gear Teeth (5/7th Gear)	SLW11012	251 1 1220.35	21A	MEDIO M1-M3	max. 111,370 min. 111,297	x	capacity increase	1,67	SIM	SIM	26/02/2018		2.16	2.13	26/02/2018				
DG-FIX	Hard Turning	DRA10109	251,1 1074.35	1A - 21A	DIA_001	Ø 28 9 +0,016	x	PPAP	1,67	2.10	2.11	17/02/2017		1 93	1 87	08/03/2017				
DG-FIX	Hard Turning	DRA10109	251 1.1074.35	1A - 21A	DIA_004	Ø 28.5 +0,016	x	PPAP	1,67	1.92	1.76	17/02/2017		1.05	1 01	08/03/2017				
DG-FIX	Hard Turning	DRA10109	251,1.1074.35	1A - 21A	DIS_062	68,26 +0,035 -0 035	x	PPAP	1,67	3.83	3.61	17/02/2017		8.08	8.49	08/03/2017				
DG-FIX	Power Honing (3rd Gear)	HNW11013	251,1.1074,35	1A - 21A	Fr	32	x	PPAP	1,67	-	1.83	28/10/2017		-	2.11	08/03/2017				
DG-FIX	Power Honing (3rd Gear)	HNW11013	251,1.1074,35	1A - 21A	MEDIO M1-M3	max. 77,305min. 77,236	x	PPAP	1,67	2.86	2.30	28/10/2017		5.64	5.34	08/03/2017				
DG-FIX	Power Honing (3rd Gear)	HNW11127	251,1.1220,35	21A	Fr	32	x	capacity increase	1,67	-	1.90	11/01/2018		-	2.15	27/02/2018				
DG-FIX	Power Honing (3rd Gear)	HNW11127	251 1.1220.35	21A	MEDIO M1-M3	max. 81,344 min. 81,255	x	capacity increase	1,67	2.32	2.31	11/01/2018		2.42	2.4	27/02/2018				
DR2-Rw	Grind Gear Teeth	SLW11046	251 1.1084.50	1A - 21A	Fr	32	x	PPAP	1,67	SIM	SIM	26/02/2018		-	1.74	08/03/2017				
DR2-Rw	Grind Gear Teeth	SLW11046	251 1.1084.50	1A - 21A	MEDIO M1-M3	min. 126 097 max.126,157	x	PPAP	1,67	SIM	SIM	26/02/2018		1.96	1.74	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11083	251 1.1083.50	1A - 21A	ANG_039	7,5°+0 03°-0 03°	x	PPAP	1 67	3.01	2.03	10/10/2016		6.27	5 98	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11083	251 1.1083.50	1A - 21A	DIA_001	Ø 48G6	x	PPAP	1,67	2.70	2.02	10/10/2016		2.2	1 85	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11083	251,1.1083.50	1A - 21A	DIA_021	Ø 70,5+0 01-0 01	x	PPAP	1,67	2.13	1.96	10/10/2016		2.16	1.99	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11083	251,1.1083,50	1A - 21A	DIS_076	31,965+0 04-0.04	x	PPAP	1,67	2.23	2.13	10/10/2016		2.32	2.2	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11083	251,1.1083,50	1A - 21A	DIS_079	32,85+0,03-0,03	x	PPAP	1,67	2.71	2.29	10/10/2016		2,64	2.29	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11083	251,1.1083,50	1A - 21A	MAX_062	29 665+0,22-0,12	x	PPAP	1,67	2.75	2.70	10/10/2016		1.96	1.67	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11083	251.1.1083.50	1A - 21A	Rmax Foro	Rz 2Rmax 2,5	x	PPAP	1,67	-	6.00	10/10/2016		-	5	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11083	251.1.1083.50	1A - 21A	Rz Cono	Rz 1,5 - 3	x	PPAP	1,67	2.44	1.69	10/10/2016		2.22	1.69	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11083	251.1.1083.50	1A - 21A	Rz Foro	Rz 4	x	PPAP	1,67	-	2.08	10/10/2016		-	2.39	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11088	251.1.1223.50	21A	ANG_039	7,5°+0 03°-0,03°	x	capacity increase	1 67	SIM	SIM	26/02/2018		1.97	1 95	08/03/2018				
DR2-Rw	Hard Turning & Cone Grinding	SLA11088	251.1.1223.50	21A	DIA_001	Ø 48G6	x	capacity increase	1 67	SIM	SIM	26/02/2018		2.31	2.3	08/03/2018				
DR2-Rw	Hard Turning & Cone Grinding	SLA11088	251,1.1223.50	21A	DIA_021	Ø 70,5+0 01-0,01	x	capacity increase	1.67	SIM	SIM	26/02/2018		2.05	1.95	08/03/2018				
DR2-Rw	Hard Turning & Cone Grinding	SLA11088	251,1,1223.50	21A	DIS_076	31,965+0,04-0 04	x	capacity increase	1.67	SIM	SIM	26/02/2018		2.08	1.99	08/03/2018				
DR2-Rw	Hard Turning & Cone Grinding	SLA11088	251,1,1223.50	21A	DIS_079	32,85+0 03-0,03	x	capacity increase	1.67	SIM	SIM	26/02/2018		2.55	2.53	08/03/2018				
DR2-Rw	Hard Turning & Cone Grinding	SLA11088	251,1,1223,50	21A	MAX_062	29,665+0,22-0,12	x	capacity increase	1.67	SIM	SIM	26/02/2018		6.65	1.91	08/03/2018				
DR2-Rw	Hobbing Rev	FRW10217	251.1.1083.50	1A - 21A	MEDIO M1-M3	98.375 - 98.286	x	PPAP	1,67	2.48	2.45	10/10/2016		2.42	2.19	08/03/2017				
INPUT1	Grinding Diameters	SLA10037	251.6 1073.35	1A - 21A	Ø 25m6	Ø 25m6	x	PPAP	1,67	1.90	1.77	25/10/2017		1.83	1 67	08/03/2017				
INPUT1	Grinding Diameters	SLA10037	251.6.1073.35	1A - 21A	Ø 28,5+0,031+0 020	Ø 28,5+0 031+0,020	x	PPAP	1,67	1.94	1.79	25/10/2017		1.92	1.75	08/03/2017				
INPUT1	Grinding Diameters	SLA10037	251.6 1073.35	1A - 21A	Ø 28,59+0,016'+0 005	Ø 28,59+0,016'+0 005	x	PPAP	1,67	3.22	2.61	25/10/2017		2.22	1.70	08/03/2017				
INPUT1	Grinding Diameters	SLA10037	251.6 1073.35	1A - 21A	Ø 28,9+0 031+0 020	Ø 28.9+0 031+0 020	x	PPAP	1 67	1.75	1.57	25/10/2017		2.08	1.78	08/03/2017				
INPUT1	Grinding Grooves	SLA15037	251.6 1073.35	1A - 21A	267,22+0 05-0 05	267 22+0 05-0 05	x	PPAP	1 67	2.73	2.71	25/10/2017		2.42	1.71	08/03/2017				
INPUT1	Grinding Grooves	SLA15037	251.6 1073.35	1A - 21A	38.05+0,1	38 05+0 1	x	PPAP	1,67	2.76	2.76	25/10/2017		2.32	2.27	08/03/2017				
INPUT1	Grinding Grooves	SLA15037	251.6,1073,35	1A - 21A	Ø 15,2-0,11	Ø 15,2-0,11	x	PPAP	1,67	1 80	1.66	25/10/2017		1 82	1.8	08/03/2017				
INPUT1	Power Honing (1st Gear)	HNW11128	251.6,1073,35	1A - 21A	Fr	32	x	PPAP	1,67	-	3.48	08/02/2017		-	3.84	08/03/2017				
INPUT1	Power Honing (1st Gear)	HNW11128	251.6,1073,35	1A - 21A	MEDIO M1-M3	Max. 40 664Min. 40,617	x	PPAP	1,67	3.29	3.02	08/02/2017		2.79	2.06	08/03/2017				
INPUT1	Splines Rolling	WAW10025	251.6,1073,35	1A - 21A	MEDIO M1-M3	Max. 21,108Min. 21,061	x	capacity increase	1,67	-	-	14/09/2016		1.97	1.96	28/02/2018				
INPUT1	Superfinishing	HNA10055	251.6 1073.35	1A - 21A	Ø 25.993h6	Ø 25.993h6	x	PPAP	1,67	1.77	1.75	07/02/2017		1.93	1.9	08/03/2017				
INPUT1	Superfinishing	HNA10055	251.6,1073,35	1A - 21A	Ø 27 963h6	Ø 27 963h6	x	PPAP	1,67	4 06	1.69	07/02/2017		2.31	1 94	08/03/2017				
INPUT2	Grinding Diameters	SLA11026	251.6 1071.35	1A - 21A	DIA_008	Ø 36G6	x	PPAP	1,67	1.84	1.49	24/02/2017		2.23	2.21	08/03/2017	Reinforced Control Plan	Process centering	Cacciapaglia	W07
INPUT2	Grinding Diameters	SLA11026	251.6 1071.35	1A - 21A	DIA_060	Ø 35k6	x	PPAP	1,67	3.08	-0.01	24/02/2017		3 64	2.35	08/03/2017	100% checked	Process centering	Cacciapaglia	W07
INPUT2	Grinding Diameters	SLA11026	251.6 1071.35	1A - 21A	DIA_120	Ø 30G6	x	PPAP	1,67	1.01	0.61	24/02/2017		1 01	0.67	08/03/2017	100% checked on PP Marposs	n/a		
INPUT2	Hard Turning	DRA11022	251.6 1071.35	1A - 21A	Diameter	Ø 32,8+0 1-0 1	x	PPAP	1,67	8.86	5.97	18/05/2017		8.56	5 72	08/03/2017				
INPUT2	Hard Turning	DRA11022	251.6 1071.35	1A - 21A	Length	18 985+0 03-0.03	x	PPAP	1,67	3.16	3.09	18/05/2017		3.17	3.08	08/03/2017				
INPUT2	spline)	FRW10015	251.6,1071,35	1A - 21A	MEDIO M1-M3	Max. 33 245Min. 33,190	x	PPAP	1,67	1.94	1.76	17/10/2017		1.95	1.79	08/03/2017				
INPUT2	hobbing Teeth (2nd gear & clutch spline)	FRW11009	251.6,1218,35	21A	MEDIO M1-M3	Max. 33,245Min. 33,190	x	capacity increase	1,67	SIM	SIM	26/02/2018		2.53	2.28	28/02/2018				
INPUT2	Power Honing (2nd Gear Z17)	HNW11013	251.6 1121.83	21A	Fr	32	x	PPAP	1,67	-	1.56	09/10/2017		-	1.67	08/03/2017	Reinforced Control Plan	Improved quality and clearness on premachining	Galassi	W05
INPUT2	Power Honing (2nd Gear Z17)	HNW11013	251.6,1121,83	21A	MEDIO M1-M3	Max. 50 141Min. 50 083	x	PPAP	1,67	4 75	2.98	09/10/2017		7.21	6.76	08/03/2017				
INPUT2	Power Honing (4th Gear Z35)	HNW11014	251.6,1071.35	1A - 21A	Fr	40	x	PPAP	1,67	-	1.74	09/10/2017		-	1.75	08/03/2017				
INPUT2	Power Honing (4th Gear Z35)	HNW11014	251.6,1071,35	1A - 21A	MEDIO M1-M3	Min. 92,611Max. 92, 513	x	PPAP	1,67	3.87	3.24	09/10/2017		4.26	3.62	08/03/2017				
INPUT2	Power Honing (4th Gear Z35)	HNW11015	251.6,1218,35	21A	Fr	40	x	capacity increase	1,67	SIM	SIM	26/02/2018		-	2.84	28/02/2018				
INPUT2	Power Honing (4th Gear Z35)	HNW11015	251.6,1218.35	21A	MEDIO M1-M3	Max. 99,506 Min. 99 415	x	capacity increase	1,67	SIM	SIM	26/02/2018		2.25	2.21	28/02/2018				
OUTPUT1	Grinding Diameters	SLA10038	251.6,1076.35	1A - 21A	DIA_055_1	36 +36 -35 987	x	PPAP	1,67	2.72	2.31	08/08/2017		2.82	2.81	08/03/2017				
OUTPUT1	Grinding Diameters	SLA10038	251.6 1076.35	1A - 21A	DIA_056_1	25 +25.031 -25,018	x	PPAP	1,67	3.55	3.16	08/08/2017		2.7	2.22	08/03/2017				
OUTPUT1	Grinding Diameters	SLA10038	251.6 1076.35	1A - 21A	DIA_059_2_(D)	40 +40 -39 987	x	PPAP	1,67	2.18	2.09	08/08/2017		1 99	1.9	08/03/2017				
OUTPUT1	Grinding Diameters	SLA10036	251.6.1076.35	1A - 21A	DIA_060_2_(E)	40 +40 -39 987	x	PPAP	1,67	2.09	1.82	08/08/2017		2.65	2.61	08/03/2017				
OUTPUT1	Grinding Diameters	SLA10036	251.6,1076.35	1A - 21A	DIA_063_2_(F)	40 003 +40 003 -39 993	x	PPAP	1,67	2.05	2.04	08/08/2017		1.82	1.69	08/03/2017				
OUTPUT1	Grinding Diameters	SLA10036	251.6,1076.35	1A - 21A	DIA_065	39.503 +39.503 -39.49	x	PPAP	1,67	2.12	1.94	08/08/2017		1.97	1.7	08/03/2017				
OUTPUT1	Grinding Diameters	SLA10038	251.6,1076.35	1A - 21A	DIA_055_1	36 +36 -35 987	x	capacity increase	1,67	2.93	2.62	28/11/2017		1.99	1.95	28/02/2018				
OUTPUT1	Grinding Diameters	SLA10038	251.6,1076.35	1A - 21A	DIA_056_1	25 +25.031 -25,018	x	capacity increase	1,67	3.67	2.10	28/11/2017		2.13	1.72	28/02/2018				
OUTPUT1	Grinding Diameters	SLA10038	251 6.1076.35	1A - 21A	DIA_059_2_(D)	40 +40 -39,987	x	capacity increase	1,67	2.43	2.15	28/11/2017		2.26	2 12	28/02/2018				
OUTPUT1	Grinding Diameters	SLA10038	251.6.1076.35	1A - 21A	DIA_060_2_(E)	40 +40 -39,987	x	capacity increase	1,67	2.18	1.73	28/11/2017		2.01	1.97	28/02/2018				
OUTPUT1	Grinding Diameters	SLA10038	251.6.1076.35	1A - 21A	DIA_063_2_(F)	40 003 +40 003 -39 993	x	capacity increase	1,67	1.94	1.83	28/11/2017		1.95	1 89	28/02/2018				
OUTPUT1	Grinding Diameters	SLA10038	251.6,1076.35	1A - 21A	DIA_065	39,503 +39.503 -39.49	x	capacity increase	1,67	2.05	1.70	28/11/2017		2.05	2.04	28/02/2018				
OUTPUT1	Grinding Grooves	SLA11055	251.6,1076.35	1A - 21A	DIA_097	Ø 37,4+0,1-0,1	x	PPAP	1,67	3 63	1.42	08/09/2017		3,41	1.88	08/03/2017	Reinforced Control Plan	Process centering	Sinibaldi	W08
OUTPUT1	Grinding Grooves	SLA11055	251 6.1076.35	1A - 21A	DIA_121	Ø 36,6+0,1-0,1	x	PPAP	1,67	10.94	10 84	08/09/2017		4.13	3.3	08/03/2017				
OUTPUT1	Grinding Grooves	SLA11055	251,6.1076.35	1A - 21A	DIA_132	Ø 41 4+0,1-0,1	x	PPAP	1,67	3.55	1.39	08/09/2017		3.62	2.13	08/03/2017	Reinforced Control Plan	Process centering	Sinibaldi	W08
OUTPUT1	Grinding Grooves	SLA11055	251 6.1076.35	1A - 21A	Length	155,43+0 05-0 05	x	PPAP	1,67	5.67	3 67	08/09/2017		13.12	9.44	08/03/2017				
OUTPUT1	Grinding Grooves	SLA11055	251 6.1076.35	1A - 21A	Length	124.57+0,025-0 025	x	PPAP	1,67	10.39	2.56	08/09/2017		12.31	3.6	08/03/2017				
OUTPUT1	Grinding Grooves	SLA11055	251 6.1076.35	1A - 21A	Length	79 85+0.025-0,025	x	PPAP	1,67	6.77	0 69	08/09/2017		7.97	2.1	08/03/2017	100% checked	Process centering	Sinibaldi	W08
OUTPUT1	Grinding Grooves	SLA11055	251 6.1076.35	1A - 21A	Length	52.52+0,025-0 025	x	PPAP	1,67	20.22	15 13	08/09/2017		17.71	12.76	08/03/2017				
OUTPUT1	Grinding Grooves	SLA11055	251.6.1076.35	1A - 21A	Length	20 19+0,025-0,025	x	PPAP	1,67	3.57	1 07	08/09/2017		3.55	1.87	08/03/2017				
OUTPUT1	Grinding Grooves	SLA11055	251.6.1076.35	1A - 21A	Length	17 45+0 025-0,025	x	PPAP	1,67	2.12	1.70	08/09/2017		2.13	1.72	08/03/2017				
OUTPUT1	Grinding Grooves	SLA11055	251,6.1076.35	1A - 21A	Length	3+0 025-0 025	x	PPAP	1,67	6.08	2.00	08/09/2017		8.1	3.47	08/03/2017				
OUTPUT1	Power Honing	HNW11006	251 6.1076.35	1A - 21A	Fr	32	x	PPAP	1,67	-	2.52	16/02/2017		-	2.21	08/03/2017				
OUTPUT1	Power Honing	HNW11006	251 6.1076.35	1A - 21A	MEDIO M1-M3	Max. 58 044Min. 57,984	x	PPAP	1,67	3.89	2.04	16/02/2017		3.65	2.05	08/03/2017				
OUTPUT1	Splines Rolling	WAW10023	251 6.1076.35	1A - 21A	MEDIO M1-M3	46.231 - 46,167	x	PPAP	1,67	4.20	3.13	19/05/2017		4.45	3.25	08/03/2017				
OUTPUT1	Splines Rolling	WAW10023	251 6.1076.35	1A - 21A	MEDIO M1-M3	42.188 - 42.088	x	PPAP	1,67	4.04	3.37	19/05/2017		4.01	3.05	08/03/2017				
OUTPUT1	Superfinishing	HNA10055	251 6.1076.35	1A - 21A	DIA_055_1	36 +36 -35 987	x	PPAP	1,67	4.68	4.19	25/01/2018		2.02	2.81	08/03/2017				
OUTPUT1	Superfinishing	HNA10055	251 6.1076.35	1A - 21A	DIA_060_2_(E)	40 +40 -39 987	x	PPAP	1,67	1.99	1.89	25/01/2018		2.65	2.61	08/03/2017				
OUTPUT1	Superfinishing	HNA10055	251 6.1076.35	1A - 21A	DIA_063_2_(F)	40,003 +40,003 -39,993	x	PPAP	1,67	2.65	2.54	25/01/2018		1.82	1.59	08/03/2017				

Component	Operation	Machine	Part Number	Transferability	Items	Spec.	hrs	ORI	Target	Cm	Cmk	CM Last Update	N	Pp	Ppk	PP Last Update	Containment Actions	Corrective Actions	Owner	Due date
OUTPUT1	Superfinishing	HNA10055	251.6 1078.35	1A - 21A	DIA_065	39,503 +39,503 -39,49	x	PPAP	1.67	3.20	2.79	25/01/2018		1.97	1.7	08/03/2017				
OUTPUT2	Grinding Diameters	SLA10031	251.6.1078.35	1A - 21A	DIA_045	Ø 25m6	x	PPAP	1.67	5 75	4.25	13/10/2017		2.6	1.79	02/03/2017				
OUTPUT2	Grinding Diameters	SLA10031	251.6.1078.35	1A - 21A	DIA_046	Ø 31,5m6	x	PPAP	1.67	6.31	3.52	13/10/2017		2.88	2.26	02/03/2017				
OUTPUT2	Grinding Diameters	SLA10031	251.6 1078.35	1A - 21A	DIA_053	Ø 39,7m6	x	PPAP	1.67	4.03	2.29	13/10/2017		1.91	1.77	02/03/2017				
OUTPUT2	Grinding Diameters	SLA10033	251.6 1078.35	1A - 21A	DIA_045	Ø 25m6	x	capacity increase	1.67	3 58	1.50	02/08/2017		2.01	1.92	28/02/2018	Reinforced Control Plan	Process centering	Sinibaldi	W08
OUTPUT2	Grinding Diameters	SLA10033	251.6 1078.35	1A - 21A	DIA_046	Ø 31,5m6	x	capacity increase	1.67	4 06	1.60	02/08/2017		2.39	2.18	28/02/2018	Reinforced Control Plan	Process centering	Sinibaldi	W08
OUTPUT2	Grinding Diameters	SLA10033	251.6 1078.35	1A - 21A	DIA_053	Ø 39,7m6	x	capacity increase	1.67	2.31	1.67	02/08/2017		2.59	2.59	28/02/2018				
OUTPUT2	Grinding Grooves	SLA11058	251.6 1078.35	1A - 21A	DIA_037	Ø 33,7±0,1	x	PPAP	1.67	5.14	5.11	02/08/2017		4.24	3.95	02/03/2017				
OUTPUT2	Grinding Grooves	SLA11058	251.6.1078.35	1A - 21A	DIA_048	48 84+0 025-0 025	x	PPAP	1.67	2.45	2.44	02/08/2017		2.23	2.22	02/03/2017				
OUTPUT2	Grinding Grooves	SLA11058	251.6.1078.35	1A - 21A	DIA_37,4	Ø 37 4+0,1-0,1	x	PPAP	1.67	2.24	2.23	02/08/2017		2.71	2.3	02/03/2017				
OUTPUT2	Grinding Grooves	SLA11058	251.6.1078.35	1A - 21A	Length	108,1+0 025-0,025	x	PPAP	1.67	3.50	1.12	02/08/2017		3.03	1.66	02/03/2017	Reinforced Control Plan	Process centering	Sinibaldi	W08
OUTPUT2	Grinding Grooves	SLA11058	251.6.1078.35	1A - 21A	Length	21 11+0,025-0,025	x	PPAP	1.67	12.77	3.79	02/08/2017		14.53	4 6	02/03/2017				
OUTPUT2	Power Honing	HNW11007	251.6.1078.35	1A - 21A	Fr	32	x	PPAP	1.67	-	3.03	10/10/2016		-	3.45	02/03/2017				
OUTPUT2	Power Honing	HNW11007	251.6.1078.35	1A - 21A	MEDIO M1-M3	Min. 56,728Max. 56 778	x	PPAP	1.67	2.06	1.75	10/10/2016		2.36	2.04	02/03/2017				
OUTPUT2	Splines Rolling	WAW10024	251.6.1078.35	1A - 21A	MEDIO M1-M3	Min. 42,148Max. 42,209	x	PPAP	1.67	8.80	7.90	03/03/2017		7.24	8.54	02/03/2017				
OUTPUT2	Splines Rolling	WAW10024	251.6.1078.35	1A - 21A	MEDIO M1-M3	Min. 41,997Max. 42,057	x	PPAP	1.67	7.03	4.21	03/03/2017		8.35	5.19	02/03/2017				
OUTPUT2	Superfinishing	HNA10057	251.6.1078.35	1A - 21A	DIA_050	Ø 37 (D & E)-0 013	x	PPAP	1.67	1.76	1.40	24/02/2017		1.77	1.68	02/03/2017	Reinforced Control Plan	Process centering	Sinibaldi	W08
OUTPUT2	Superfinishing	HNA10057	251.6.1078.35	1A - 21A	DIA_37,4	Ø 37,5h6	x	PPAP	1.67	2.31	2.02	24/02/2017		1.85	1.84	02/03/2017				
R.GEAR	Grind Gear Teeth	SLW11018-1	251.1.1080.50	1A - 21A	Fr	32	x	capacity increase	1.67	-	1.10	01/02/2018		-	1.64	01/03/2018	Reinforced Control Plan	Process centering	Sinibaldi	W08
R.GEAR	Grind Gear Teeth	SLW11018-1	251.1.1080.50	1A - 21A	MEDIO M1-M3	min 211,162max211,233	x	capacity increase	1.67	3.89	2.00	12/12/2017		2.59	2.50	01/03/2018				
R.GEAR	Grind Gear Teeth	SLW11018-2	251.1.1080.50	1A - 21A	Fr	32	x	capacity increase	1.67	-	1.74	21/11/2017		-	2.60	01/03/2018				
R.GEAR	Grind Gear Teeth	SLW11018-2	251.1.1080.50	1A - 21A	MEDIO M1-M3	min 211,162max211,233	x	capacity increase	1.67	4 05	2.66	21/11/2017		2.62	2.51	01/03/2018				
R.GEAR	Grind Gear Teeth	SLW11046	251.1.1080.50	1A - 21A	Fr	32	x	PPAP	1.67	-	1.59	17/05/2017		-	3.35	02/03/2017				
R.GEAR	Grind Gear Teeth	SLW11046	251.1.1080.50	1A - 21A	MEDIO M1-M3	min 211,162max211,233	x	PPAP	1.67	2.29	2.07	17/05/2017		2.29	2.07	02/03/2017				
R.GEAR	Hard Turning	DRA10096	251.1.1080.50	1A - 21A		Planarity 0 05	x	capacity increase	1.67	SIM	SIM	26/02/2018		-	2.01	28/02/2018				
R.GEAR	Hard Turning	DRA10096	251.1.1080.50	1A - 21A		Ø116 H6	x	capacity increase	1.67	SIM	SIM	26/02/2018		2.68	2.65	28/02/2018				
R.GEAR	Hard Turning	DRA10190	251.1.1080.50	1A - 21A		Ø116 H6	x	PPAP	1.67	1 70	1.64	09/10/2017		2.42	1.96	02/03/2017	Reinforced Control Plan	Process centering	Sinibaldi	W08
R.GEAR	Hard Turning	DRA10190	251.1.1080.50	1A - 21A		Planarity 0.05	x	PPAP	1.67	-	3.47	09/10/2017		-	10.93	02/03/2017				
SG1	Grind Gear Teeth	SLW11009	251.1 1082.50	1A - 21A	Fr	32	x	PPAP	1.67	-	2.40	17/03/2017		-	3.22	22/02/2017				
SG1	Grind Gear Teeth	SLW11009	251.1 1082.50	1A - 21A	MEDIO M1-M3	max. 137,584 min. 137,507	x	PPAP	1.67	4.83	2.75	17/03/2017		6.36	3.97	22/02/2017				
SG1	Grind Gear Teeth	SLW11011-1	251.1 1082.50	1A - 21A	Fr	32	x	capacity increase	1.67	-	2.54	21/12/2017		-	2.40	26/02/2018				
SG1	Grind Gear Teeth	SLW11011-1	251.1 1082.50	1A - 21A	MEDIO M1-M3	max. 137,584 min. 137,507	x	capacity increase	1.67	2.40	1.90	21/12/2017		2.19	1.94	26/02/2018				
SG1	Grind Gear Teeth	SLW11011-2	251.1 1082.50	1A - 21A	Fr	32	x	capacity increase	1.67	-	1.73	21/11/2017		-	2.33	01/03/2018				
SG1	Grind Gear Teeth	SLW11011-2	251.1.1082.50	1A - 21A	MEDIO M1-M3	max. 137,584 min. 137,507	x	capacity increase	1.67	4.06	2.36	21/11/2017		2.10	1.64	01/03/2018				
SG1	Hard Turning	DRA10110	251.1.1081.50	1A - 21A	DIA_001	Ø 41G6	x	PPAP	1.67	2.06	T.C.	12/10/2016		1.88	1.84	02/03/2017				
SG1	Hard Turning	DRA10110	251.1.1081.50	1A - 21A	DIS_076	33,64 +0,03 -0,03	x	PPAP	1.67	6.27	6.43	12/10/2016		5.62	6.56	02/03/2017				
SG1	Hard Turning	DRA10110	251.1.1081.50	1A - 21A	MAX_062	31,74+0,18-0,08	x	PPAP	1.67	1.16	0.60	12/10/2016		1.23	0.65	02/03/2017	100% checked by using a specific measurement device (as for Control Plan)	Review specifiche / mod.prodotto	Pierro	wk16
SG1	Hard Turning	DRA10111	251.1 1081.50	1A - 21A	DIA_001	Ø 41G6	x	capacity increase	1.67	SIM	SIM	26/02/2018		2.08	2.04	28/02/2018				
SG1	Hard Turning	DRA10111	251.1.1081.50	1A - 21A	DIS_076	33 64 +0,03 -0 03	x	capacity increase	1.67	SIM	SIM	26/02/2018		2.13	2.00	28/02/2018				
SG1	Hard Turning	DRA10111	251.1.1081.50	1A - 21A	MAX_062	31,74+0,18-0,08	x	capacity increase	1.67	SIM	SIM	26/02/2018		2.43	2.4	28/02/2018				
SG3	Grind Gear Teeth	SLW11009	251.1.1225.50	21A	Fr	28	x	capacity increase	1.67	-	2.55	13/01/2018		-	2.32	26/02/2018				
SG3	Grind Gear Teeth	SLW11009	251 1.1225.50	21A	MEDIO M1-M3	Max. 115,534 Min. 115,460	x	capacity increase	1.67	SIM	SIM	26/02/2018		2.08	2.01	26/02/2018				
SG3	Grind Gear Teeth	SLW11046	251 1 1086.50	1A - 21A	Fr	22	x	PPAP	1.67	-	2.49	11/05/2017		-	1.97	22/02/2017				
SG3	Grind Gear Teeth	SLW11046	251 1.1086.50	1A - 21A	MEDIO M1-M3	Min 120 878Max. 120 962	x	PPAP	1.67	3.38	3.33	11/05/2017		3.67	3.59	22/02/2017				
SG3	Hard Turning & Cone Grinding	SLA11083	251.1.1086.50	1A - 21A	ANG_050	7,5°+0 03°-0 03°	x	PPAP	1.67	4.12	3.85	12/10/2017		2.46	2.07	06/03/2017				
SG3	Hard Turning & Cone Grinding	SLA11083	251.1.1086.50	1A - 21A	DIA_001	Ø 45G6	x	PPAP	1.67	1.33	0 78	12/10/2017		1.57	1.26	06/03/2017	100% checked on PP Marposs	n/a		
SG3	Hard Turning & Cone Grinding	SLA11083	251.1.1086.50	1A - 21A	DIA_032	Ø 70,5+0,01-0 01	x	PPAP	1.67	2.01	T.C.	12/10/2017		2.66	2.4	06/03/2017				
SG3	Hard Turning & Cone Grinding	SLA11083	251.1.1086.50	1A - 21A	DIS_020	22,17+0,04-0,04	x	PPAP	1.67	2.20	T.C.	12/10/2017		2.89	2.72	06/03/2017				
SG3	Hard Turning & Cone Grinding	SLA11083	251.1.1086.50	1A - 21A	DIS_037	28,86+0,03-0,03	x	PPAP	1.67	8.50	T.C.	12/10/2017		7.86	6.68	06/03/2017				
SG3	Hard Turning & Cone Grinding	SLA11083	251 1.1086.50	1A - 21A	MAX_083	19 87+0,1-0,1	x	PPAP	1.67	2.21	T.C.	12/10/2017		3.57	2.89	06/03/2017				
SG3	Hard Turning & Cone Grinding	SLA11083	251.1.1086.50	1A - 21A	Rz Cono	Rz 1,5 - 3	x	PPAP	1.67	2.15	XR-OK	12/10/2017		2.02	1.67	06/03/2017				
SG3	Hard Turning & Cone Grinding	SLA11084	251.1.1086.50	1A - 21A	ANG_050	7,5°+0 03°-0 03°	x	capacity increase	1.67	6.21	6.13	11/12/2017		2.29	2.28	07/03/2018				
SG3	Hard Turning & Cone Grinding	SLA11084	251.1.1088.50	1A - 21A	DIA_001	Ø 45G6	x	capacity increase	1.67	3.23	2.24	11/12/2017		1.87	1.71	07/03/2018				
SG3	Hard Turning & Cone Grinding	SLA11084	251.1.1088,50	1A - 21A	DIA_032	Ø 70,5+0 01-0,01	x	capacity increase	1.67	3.10	2.42	11/12/2017		1.91	1.76	07/03/2018				
SG3	Hard Turning & Cone Grinding	SLA11084	251.1.1086.50	1A - 21A	DIS_020	22 17+0 04-0 04	x	capacity increase	1.67	3.27	2.59	11/12/2017		2.16	2.18	07/03/2018				
SG3	Hard Turning & Cone Grinding	SLA11084	251.1.1086.50	1A - 21A	DIS_037	28,86+0,03-0,03	x	capacity increase	1.67	21.19	20 73	11/12/2017		1.94	1.94	07/03/2018				
SG3	Hard Turning & Cone Grinding	SLA11084	251.1.1086,50	1A - 21A	MAX_033	19,87+0,1-0,1	x	capacity increase	1.67	1.95	1.04	11/12/2017		4.21	2.18	07/03/2018	100% checked by using a specific measurement device (as for Control Plan)	Process centering	Papagna	W08
SG3	Shaping & Pointing	FRD19013	251.1.1086.50	1A - 21A	Angle	50°+2°-1°	x	PPAP	1.67	6 76	3.96	16/05/2017		8.06	2.11	03/03/2017				
SG3	Shaping & Pointing	FRD19013	251.1.1086.50	1A - 21A	Length	19,241+0,1-0,1	x	PPAP	1.67	2 74	2.35	16/05/2017		2.72	2.33	03/03/2017				
SG3	Shaping & Pointing	STW12177	251 1.1086.50	1A - 21A	βHbm des	4 5°+0,75°-0 75°	x	PPAP	1.67	1.81	1.77	24/09/2015		1.85	1.73	07/03/2017				
SG3	Shaping & Pointing	STW12177	251 1.1086.50	1A - 21A	βHbm sin	4,5°+0,75°-0 75°	x	PPAP	1.67	2.07	2.00	24/09/2015		2.05	1.63	07/03/2017				
SG3	Shaping & Pointing	STW12177	251.1.1086.50	1A - 21A	MEDIO M1-M3	Min 94.295Max 94,406	x	PPAP	1.67	1.75	1.74	24/09/2015		1.8	1 68	07/03/2017				
SG4	Grind Gear Teeth	SLW11009	251.1.1088.50	1A - 21A - 32C	Fr	28	x	PPAP	1.67	-	2.48	16/05/2017		-	2.28	22/03/2017				
SG4	Grind Gear Teeth	SLW11009	251.1.1088.50	1A - 21A	MEDIO M1-M3	min. 102,464max.102,549	x	PPAP	1.67	2.26	2.25	16/05/2017		2.33	2.3	22/03/2017				
SG4	Hard Turning & Cone Grinding	SLA11083	251.1.1088,50	1A - 21A	ANG_074	7,5°+0,03°-0 03°	x	PPAP	1.67	3.62	3.61	14/02/2017		5 64	5 55	22/03/2017				
SG4	Hard Turning & Cone Grinding	SLA11083	251.1.1088,50	1A - 21A	DIA_001	Ø 42G6	x	PPAP	1.67	1.92	1 69	14/02/2017		2.02	1.79	22/03/2017				
SG4	Hard Turning & Cone Grinding	SLA11083	251.1.1088.50	1A - 21A	DIA_075	Ø 70,5+0,01-0,01	x	PPAP	1.67	3 01	2.70	14/02/2017		2.24	2.15	22/03/2017				
SG4	Hard Turning & Cone Grinding	SLA11083	251.1.1088.50	1A - 21A	DIS_081	22,74+0 04-0,04	x	PPAP	1.67	1.90	1 77	14/02/2017		2.13	2.01	22/03/2017				
SG4	Hard Turning & Cone Grinding	SLA11083	251.1.1088.50	1A - 21A	DIS_085	25 01+0,03-0,03	x	PPAP	1.67	5.12	5.06	14/02/2017		7.85	7.75	22/03/2017				
SG4	Hard Turning & Cone Grinding	SLA11083	251.1.1088.50	1A - 21A	MIN_080	20 44+0,18-0,08	x	PPAP	1.67	2.54	2.35	14/02/2017		2.54	2.35	22/03/2017				
SG4	Hard Turning & Cone Grinding	SLA11083	251.1.1088.50	1A - 21A	Rz Foro	Rz 1,5 - 3	x	PPAP	1.67	2.17	1.71	14/02/2017		1.75	1.45	22/03/2017				
SG4	Hard Turning & Cone Grinding	SLA11088	251.1.1087.50	1A - 21A	ANG_074	7,5°+0,03°-0,03°	x	capacity increase	1.67	5 28	5 07	11/01/2018		1 88	1.87	08/03/2018				
SG4	Hard Turning & Cone Grinding	SLA11088	251.1 1087.50	1A - 21A	DIA_001	Ø 42G6	x	capacity increase	1.67	3 09	2.24	11/01/2018		1.93	1.70	08/03/2018				
SG4	Hard Turning & Cone Grinding	SLA11088	251.1.1087.50	1A - 21A	DIA_075	Ø 70,5+0 01-0,01	x	capacity increase	1.67	2.54	2.21	11/01/2018		2.38	2.35	08/03/2018				
SG4	Hard Turning & Cone Grinding	SLA11088	251.1.1087.50	1A - 21A	DIS_081	22,74+0,04-0,04	x	capacity increase	1.67	2.67	2.35	11/01/2018		2.67	2.26	08/03/2018				
SG4	Hard Turning & Cone Grinding	SLA11088	251.1.1087.50	1A - 21A	DIS_085	25,01+0,03-0,03	x	capacity increase	1.67	6.43	6 60	11/01/2018		2.92	2.69	08/03/2018				
SG4	Hard Turning & Cone Grinding	SLA11088	251.1.1087.50	1A - 21A	MIN_080	20,44+0,18-0,08	x	capacity increase	1.67	2.61	2.56	11/01/2018		5.52	1.90	08/03/2018				
SG5	Grind Gear Teeth	SLW11009	251.1.1090.50	1A - 21A	Fr	28	x	PPAP	1.67	-	2.51	22/02/2017		-	2.25	03/03/2017				
SG5	Grind Gear Teeth	SLW11009	251.1.1090.50	1A - 21A	MEDIO M1-M3	93.85 ±0.035	x	PPAP	1.67	4.85	3.53	22/02/2017		2.87	2.75	03/03/2017				
SG5	Grind Gear Teeth	SLW11012-1	251.1.1229.50	21A	Fr	32	x	capacity increase	1.67	SIM	SIM	26/02/2018		-	2.28	26/02/2018				
SG5	Grind Gear Teeth	SLW11012-1	251.1.1229.50	21A	MEDIO M1-M3	88.320 ±0.030	x	capacity increase	1.67	SIM	SIM	26/02/2018		2.25	2.21	26/02/2018				
SG5	Grind Gear Teeth	SLW11012-2	251.1 1229.50	21A	Fr	32	x	capacity increase	1.67	SIM	SIM	26/02/2018		-	3.18	01/03/2018				
SG5	Grind Gear Teeth	SLW11012-2	251 1 1229.50	21A	MEDIO M1-M3	88,320 ±0,030	x	capacity increase	1.67	SIM	SIM	26/02/2018		2.43	2.22	01/03/2018				
SG5	Hard Turning & Cone Grinding	SLA11083	251 1 1090.50	1A - 21A	ANG_078	7,5 ±0,050	x	PPAP	1.67	4 87	4.15	22/02/2017		3 88	3.61	03/03/2017				

Component	Operation	Machine	Part Number	Transferability	Items	Spec.	hrs	ORI	Target	Cm	Cmk	CM Last Update	N	Pp	Ppk	PP Last Update	Containement Actions	Corrective Actions	Owner	Due date
SG5	Hard Turning & Cone Grinding	SLA11083	251.1.1090.50	1A - 21A	DIA_001	42 +0.025 0 009	x	PPAP	1.67	2.73	2.46	12/10/2017		1.15	1.02	03/03/2017	100% checked on PP Marposs	n/a		
SG5	Hard Turning & Cone Grinding	SLA11083	251.1.1090.50	1A - 21A	DIA_077	70.5 ±0.010	x	PPAP	1.67	1.98	1.68	22/02/2017		1.26	1.02	03/03/2017	100% checked on PP Marposs	n/a		
SG5	Hard Turning & Cone Grinding	SLA11083	251.1.1090.50	1A - 21A	DIS_038	20.96 ±0.030	x	PPAP	1.67	3.58	1.89	12/10/2017		2.59	2.13	03/03/2017				
SG5	Hard Turning & Cone Grinding	SLA11083	251.1.1090.50	1A - 21A	DIS_082	21.5 ±0.040	x	PPAP	1.67	2.14	1.82	22/02/2017		1.76	1.59	03/03/2017				
SG5	Hard Turning & Cone Grinding	SLA11083	251.1.1090.50	1A - 21A	MAX_069	19.2 +0,180 -0,080	x	PPAP	1.67	2.35	2.29	22/02/2017		2.05	2.01	03/03/2017				
SG5	Hard Turning & Cone Grinding	SLA11083	251.1 1090.50	1A - 21A	Rz Cono	1,5 +3,0	x	PPAP	1.67	1.96	1.73	22/02/2017		1.89	1 67	03/03/2017				
SG5	Hard Turning & Cone Grinding	SLA11088	251.1 1089.50	1A - 21A	ANG_076	7,5 ±0,050	x	capacity increase	1.67	4 82	4.02	12/01/2018		1 91	1.88	08/03/2018				
SG5	Hard Turning & Cone Grinding	SLA11088	251.1 1089.50	1A - 21A	DIA_001	42 +0 025 0.009	x	capacity increase	1,67	3,19	2.72	12/01/2018		2.10	2.08	08/03/2018				
SG5	Hard Turning & Cone Grinding	SLA11089	251.1 1089.50	1A - 21A	DIA_077	70.5 ±0 010	x	capacity increase	1,67	2 89	2.66	12/01/2018		2,38	2 00	08/03/2018				
SG5	Hard Turning & Cone Grinding	SLA11089	251.1 1089.50	1A - 21A	DIS_038	20 96 ±0.030	x	capacity increase	1.67	5,99	3,88	12/01/2018		2,12	2,11	08/03/2018				
SG5	Hard Turning & Cone Grinding	SLA11089	251.1 1089.50	1A - 21A	DIS_082	21.5 ±0 040	x	capacity increase	1 67	2.83	2.68	12/01/2018		2.19	2 00	08/03/2018				
SG5	Hard Turning & Cone Grinding	SLA11089	251 1.1089.50	1A - 21A	MAX_068	19.2 +0 180 -0 080	x	capacity increase	1.67	2.55	1.39	12/01/2018		5,58	1.54	08/03/2018	100% checked by using a specific measurement device (as for Control Plan)	Process centering	Papagna	W08
SG6	Grind Gear Teeth	SLW11009	251 1.1092.50	1A - 21A	Fr	32	x	PPAP	1.67	-	1.74	25/09/2017		-	1.73	22/05/2017				
SG6	Grind Gear Teeth	SLW11009	251.1.1092.50	1A - 21A	MEDIO M1-M3	min. 82,936max.82,965	x	PPAP	1.67	2.21	2.12	25/09/2017		2.03	1.99	22/05/2017				
SG6	Hard Turning & Cone Grinding	SLA11083	251.1.1092.50	1A - 21A	ANG_064	7,5°+0,03°-0,03°	x	PPAP	1.67	6.27	6.56	28/02/2017		6.27	5.94	22/05/2017				
SG6	Hard Turning & Cone Grinding	SLA11083	251.1.1092.50	1A - 21A	DIA_001	Ø 45G6	x	PPAP	1.67	1.14	0.98	28/02/2017		1.36	1.3	22/05/2017	100% checked on PP Marposs	n/a		
SG6	Hard Turning & Cone Grinding	SLA11083	251.1.1092.50	1A - 21A	DIA_070	Ø 70,5+0,01-0,01	x	PPAP	1.67	1.80	1.42	28/02/2017		1.22	0 97	22/05/2017	100% checked on PP Marposs	n/a		
SG6	Hard Turning & Cone Grinding	SLA11083	251.1.1092.50	1A - 21A	DIS_072	21,22+0,04-0 04	x	PPAP	1 67	1 88	1.49	28/02/2017		1.25	0 99	22/05/2017	100% checked on PP Marposs	n/a		
SG6	Hard Turning & Cone Grinding	SLA11083	251.1.1092.50	1A - 21A	DIS_075	28 62+0,03-0 03	x	PPAP	1,67	4.60	1.78	28/02/2017		3.62	1.96	22/05/2017				
SG6	Hard Turning & Cone Grinding	SLA11083	251.1.1092.50	1A - 21A	MAX_058	18,92+0,18-0,08	x	PPAP	1,67	2.47	2.44	28/02/2017		2.17	2	22/05/2017				
SG6	Hard Turning & Cone Grinding	SLA11083	251.1.1092.50	1A - 21A	Rz Cono	Rz 1,5 - 3	x	PPAP	1 67	2.72	2.39	28/02/2017		1.92	1.72	22/05/2017				
SG6	Hard Turning & Cone Grinding	SLA11083	251.1.1092.50	1A - 21A	Rz Foro	Rz 0 - 3,0	x	PPAP	1 67	-	1.68	28/02/2017		-	1.89	22/05/2017				
SG6	Hard Turning & Cone Grinding	SLA11084	251.1.1091.50	1A - 21A	ANG_064	7,5°+0,03°-0 03°	x	capacity increase	1 67	3.01	2.45	15/12/2017		2.13	1.66	07/03/2018				
SG6	Hard Turning & Cone Grinding	SLA11084	251.1.1091.50	1A - 21A	DIA_001	Ø 45G6	x	capacity increase	1 67	1.55	0 67	15/12/2017		1.89	1.85	07/03/2018	100% checked on PP Marposs	n/a		
SG6	Hard Turning & Cone Grinding	SLA11084	251.1.1091.50	1A - 21A	DIA_070	Ø 70,5+0,01-0 01	x	capacity increase	1.67	2.14	1.90	15/12/2017		2.08	1.74	07/03/2018				
SG6	Hard Turning & Cone Grinding	SLA11084	251.1.1091.50	1A - 21A	DIS_075	28,62+0,03-0 03	x	capacity increase	1 67	12.96	10.99	15/12/2017		2.01	1 99	07/03/2018				
SG6	Hard Turning & Cone Grinding	SLA11084	251.1 1091.50	1A - 21A	MAX_000	18,92+0,18-0,08	x	capacity increase	1 67	3.03	1,99	15/12/2017		4.33	2.17	07/03/2018				
SG7	Grind Gear Teeth	SLW11009	251.1 1093.50	1A - 21A	Fr	22	x	PPAP	1,67	-	2.34	16/05/2017		-	2.71	22/05/2017				
SG7	Grind Gear Teeth	SLW11009	251.1 1093.50	1A - 21A	MEDIO M1-M3	max. 68,305min. 68,215	x	PPAP	1,67	7,23	6.72	16/05/2017		3.64	2.42	22/05/2017				
SG7	Hard Turning	DRA10113	251,1 1093.50	1A - 21A	DIA_001	Ø 45G6	x	PPAP	1 67	1.75	1.69	27/10/2017		1.84	1.75	22/05/2017				
SG7	Hard Turning	DRA10113	251,1 1232.50	21A - 1A	DIA_001	Ø 45G6	x	capacity increase	1 67	2.34	T.C.	27/10/2017		1.95	1.65	01/03/2018				
SG7	Hard Turning	DRA10113	251.1.1093.50	1A - 21A	DIS_018	27,15+0,035-0 035	x	PPAP	1 67	3.07	2.21	27/10/2017		5.00	4.98	22/05/2017				
SG7	Hard Turning	DRA10113	251.1.1232.50	21A - 1A	DIS_018	27,15+0 035-0 035	x	capacity increase	1 67	3.85	1.78	27/10/2017		1.88	1.50	01/03/2018				
SG7	Hard Turning	DRA10113	251 1 1093.50	1A - 21A	DIS_020	15 85+0 04-0 04	x	PPAP	1,67	4.89	2.55	27/10/2017		1.4	1.31	22/05/2017	100% checked by using a specific measurement device (as for Control Plan)	Review specifiche / mod.prodotto	Pierro	wk18
SG7	Hard Turning	DRA10113	251 1 1232.50	21A - 1A	DIS_020	15,85+0,04-0,04	x	capacity increase	1,67	2.97	1.88	27/10/2017		2.26	2.24	01/03/2018				
SG7	Hard Turning	DRA10113	251 1.1093.50	1A - 21A	Short waviness	Fourier-Analysis	x	PPAP	1,67	OK	OK	27/10/2017		OK	OK	22/05/2017				
SG7	Hard Turning	DRA10114	251,1.1093,50	1A - 21A	DIA_001	Ø 45G6	x	capacity increase	1.67	1.60	T.C.	24/10/2016		2.08	2.02	01/03/2018				
SG7	Hard Turning	DRA10114	251,1.1093.50	1A - 21A	DIS_018	27,15+0 035-0 035	x	capacity increase	1.67	4.66	2.56	24/10/2016		2.26	2.22	01/03/2018				
SG7	Hard Turning	DRA10114	251.1.1093.50	1A - 21A	DIS_020	15 85+0 04-0,04	x	capacity increase	1.67	3.07	2.21	24/10/2016		2.43	2.35	01/03/2018				
SG7	Shaping	STW12177	251.1.1093.50	1A - 21A	MEDIO M1-M3	max. 57 048min. 56,974	x	PPAP	1.67	1 98	1.86	27/03/2017		2.92	2.55	22/05/2017				
SRW	Grind Gear Teeth	SLW11009	251.1.1094.50	1A - 21A	Fr	28	x	PPAP	1.67	-	3.98	11/05/2017		-	2.39	22/05/2017				
SRW	Grind Gear Teeth	SLW11009	251.1.1094.50	1A - 21A	MEDIO M1-M3	Max. 131,659Min. 131,571	x	PPAP	1.67	2.58	2.40	11/05/2017		3.56	1.88	22/05/2017				
SRW	Grind Gear Teeth	SLW11011-1	251.1.1094.50	1A - 21A	Fr	28	x	capacity increase	1.67	-	2.28	13/11/2017		-	2.30	26/02/2018				
SRW	Grind Gear Teeth	SLW11011-1	251.1.1094.50	1A - 21A	MEDIO M1-M3	Max.129,355 Min.129,305	x	capacity increase	1.67	2 93	2.20	13/11/2017		2.19	2.06	26/02/2018				
SRW	Grind Gear Teeth	SLW11011-2	251.1.1094.50	1A - 21A	Fr	28	x	capacity increase	1.67	-	1 69	13/11/2017		-	2.64	01/03/2018				
SRW	Grind Gear Teeth	SLW11011-2	251.1.1094.50	1A - 21A	MEDIO M1-M3	Max.129,355 Min.129,305	x	capacity increase	1.67	2.48	2.40	13/11/2017		2.23	2.21	01/03/2018				
SRW	Hard Turning	DRA10101	251.1.1095.50	1A - 21A	DIA_001	Ø 50G6	x	PPAP	1.67	2.57	1.84	26/01/2017		1 91	1.83	22/05/2017				
SRW	Hard Turning	DRA10101	251.1.1095.50	1A - 21A	DIS_025	25,865+0 03-0,03	x	PPAP	1.67	3.53	2.10	26/01/2017		4 08	3.2	22/05/2017				
SRW	Hard Turning	DRA10101	251.1.1095.50	1A - 21A	MAX_052	17,735+0,18-0,08	x	PPAP	1 67	1.49	0.45	26/01/2017		1.77	0.92	22/05/2017	100% checked by using a specific measurement device (as for Control Plan)	Review specifiche / mod.prodotto	Pierro	wk18
SRW	Hard Turning	DRA10107	251.1.1094.50	1A - 21A	DIA_001	Ø 50G6	x	capacity increase	1,67	1,46	1.06	19/10/2017		2.16	2.13	28/02/2018	Reinforced Control Plan	Process centering		
SRW	Hard Turning	DRA10107	251.1.1094.50	1A - 21A	DIS_025	25,865+0 03-0,03	x	capacity increase	1.67	13,51	9.63	19/10/2017		2.56	2.30	28/02/2018				
SRW	Hard Turning	DRA10107	251 1 1094.50	1A - 21A	MAX_052	17,735+0,18-0,08	x	capacity increase	1,67	1.74	0.96	19/10/2017		2.27	0.96	28/02/2018	100% checked by using a specific measurement device (as for Control Plan)	Review specifiche / mod.prodotto	Pierro	wk18

Part Submission Warrant **PSWNr.: gross** GETRAG

Part Name	Speed Gear 3rd	Cust. Part Number	251.1.1225.80
Shown on Drawing No.	251.1.1225.80	Org. Part Number	17.5.00638.00
Engineering Change Level	-	Dated	12.04.2017
Additional Engineering Changes	n/a	Dated	n/a
Safety and/or Government Regulation	☐Yes ☑No Purchase Order No. 4500484903	Weight (kg)	1,1500
Checking Aid No.	Höhenreißer — Checking Aid Engineering Change Level: n/a	Dated	01.05.2016
	Std. Messmittel		01.05.2017
	Contour measuring		20.03.2017
	Sirio 688		09.03.2017

ORGANIZATION MANUFACTURING INFORMATION	CUSTOMER SUBMITTAL INFORMATION
Cotarko GmbH — DCZSA	Getrag S.p.A.
Organization Name & Supplier/Vendor Code	Customer Name/Division
Henry-Ford-Str. 1	Werner Straub
Street Address	Buyer/Buyer Code
Köln (City), NRW (Region), 50725 (Postal Code), Germany (Country)	Getrag Radsatz 251
City / Region / Postal Code / Country	Application

MATERIALS REPORTING

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

Submitted by IMDS or other customer format: IMDS-Nr.: 684871428 / 1

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: Machining

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 200 / 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: Neuteil Getrag Bari (Streuband 02)

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

Organization Authorized Signature: [signature] Date: 12. Sep 17

Print Name: Gerd Nöthen Phone No.: +49 221 90 10337 Fax No.: +49-221-76803205

Title: QS Manager E-mail: gnoethel@cotarko.com

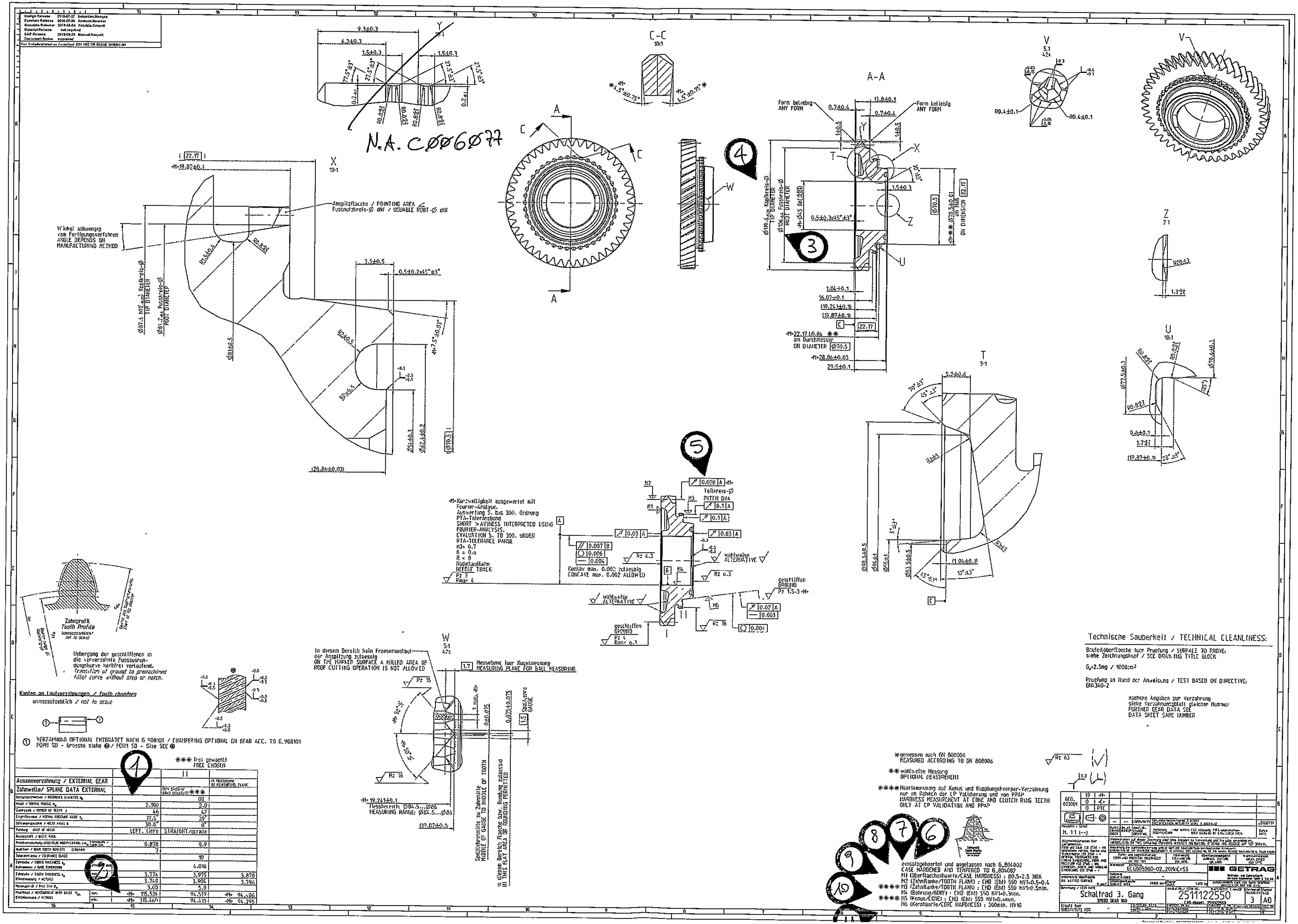
FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: ☒Approved ☐Rejected ☐Other

Customer Signature: W. Tefke Date: 15.3.17

Print Name: Wadim Tefke Customer Tracking Number (optional) MAGNA GETRAG

GETRAG B.V. & Co. KG



N.A. C006077
Anspitzflaeche / POINTING AREA
Fussnutzkreis-Ø dNf / USUABLE ROOT-Ø dNf
Winkel abhaengig vom Fertigungsverfahren
ANGLE DEPENDS ON MANUFACTURING METHOD
Ø87.5 Kopfkreis-Ø TIP DIAMETER
Ø81.2 Fusskreis-Ø ROOT DIAMETER
Ø119.6 Kopfkreis-Ø TIP DIAMETER
Ø106 Fusskreis-Ø ROOT DIAMETER
Form beliebig ANY FORM
am Mass ON DIMENSION
am Durchmesser ON DIAMETER
Teilkreis-Ø PITCH DIA
Kurzwelligkeit ausgewertet mit Fourier-Analyse.
Auswertung 5. bis 300. Ordnung
PTA-Toleranzband
SHORT WAVINESS INTERPRETED USING FOURIER-ANALYSIS.
EVALUATION 5. TO 300. ORDER
RTA-TOLERANCE RANGE
Nadellaufbahn NEEDLE TRACK
Konkav max. 0.002 zulaessig
CONCAVE max. 0.002 ALLOWED
wahlweise ALTERNATIVE
geschliffen GROUND
Zahnprofil Tooth Profile
Uebergang der geschliffenen in die vorverzahnte Fussausrundungskurve kerbfrei verlaufend.
Transition of ground to premachined fillet curve without step or notch.
Kanten an Laufverzahnungen / Tooth chamfers
unmassstaeblich / not to scale
VERZAHNUNG OPTIONAL ENTGRATET NACH G.908101 / CHAMFERING OPTIONAL ON GEAR ACC. TO G.908101
FORM SD - Groesse siehe / FORM SD - Size SEE
*** frei gewaehlt FREE CHOSEN
Aussenverzahnung / EXTERNAL GEAR
Zahnwelle/ SPLINE DATA EXTERNAL
In diesem Bereich kein Fraeserauslauf der Anspitzung zulaessig
ON THE MARKED SURFACE A MILLED AREA OF ROOF CUTTING OPERATION IS NOT ALLOWED
Messebene fuer Kugelmessung
MEASURING PLANE FOR BALL MEASURING
Messbereich Ø84.5...Ø86
MEASURING RANGE Ø84.5...Ø86
Spaltlehrenmitte zu Zahnmitte
MIDDLE OF GAUGE TO MIDDLE OF TOOTH
In diesem Bereich Flaeche bzw. Rundung zulaessig
IN THIS FLAT AREA OR ROUNDING PERMITTED
Spaltlehre GAUGE
Technische Sauberkeit / TECHNICAL CLEANLINESS:
Bauteiloberflaeche fuer Pruefung / SURFACE TO PROVE:
siehe Zeichnungskopf / SEE DRAWING TITLE BLOCK
G_x=2.5mg / 1000cm²
Pruefung an Hand der Anweisung / TEST BASED ON DIRECTIVE: GN340-2
naehere Angaben zur Verzahnung siehe Verzahnungsblatt gleicher Nummer
FURTHER GEAR DATA SEE DATA SHEET SAME NUMBER
* gemessen nach GN 808006
MEASURED ACCORDING TO GN 808006
** wahlweise Messung
OPTIONAL MEASUREMENT
**** Haertemessung auf Konus und Kupplungskoerper-Verzahnung nur im Rahmen der CP Validierung und von PPAP
HARDNESS MEASUREMENT AT CONE AND CLUTCH RING TEETH ONLY AT CP VALIDATION AND PPAP
einsatzgehaertet und angelassen nach G.804002
CASE HARDENED AND TEMPERED TO G.804002
M1 (Oberflaechenhaerte/CASE HARDNESS) : 80.5-2.5 HRA
M2 (Zahnflanke/TOOTH FLANK) : CHD (Eht) 550 HV1=0.5-0.4
M3 (Zahnflanke/TOOTH FLANK) : CHD (Eht) 550 HV1=0.5min.
M4 (Bohrung/BORE) : CHD (Eht) 550 HV1=0.3min.
M5 (Konus/CONE) : CHD (Eht) 550 HV1=0.4min.
M6 (Kernhaerte/CORE HARDNESS) : 300min. HV10
GETRAG
Schaltrad 3. Gang
SPEED GEAR 3RD
2511122550
GLGB05000-02_20MnCrS5
A0