3M458

Part Submission Warrant

MAGNA GETRAG

Part Name:	IS Outer (IS2)	Cust. Part No.:	251.6.1218.35
Shown on Drawing No.:	251.6.1218.35	Org. Part No.:	251.6.1218.35
Engineering Change Level:	3 Index "-" (C005149_MIP_1)	Dated:	18/07/2016
Additional Engineering Changes:	na	Dated:	na
Safety and/or Government Regulation:	☐ Yes ☑ No Purchase Order No.:	Weight (kg):	1.353
Checking Aid No.:	na Checking Aid Engineering Change Level: na	Dated:	na

ORGANIZATION MANUFACTURING INFORMATION

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

Via dei Ciclamini, 4
Street Address

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

CUSTOMER SUBMITTAL INFORMATION

Bari assembly line (GPS4)
Customer Name / Division

na
Buyer / Buyer Code

DCT300
Application

MATERIALS REPORTING

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

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

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

REASON FOR SUBMISSION (Check at least one)

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

REQUESTED SUBMISSION LEVEL (Check one)

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

SUBMISSION RESULTS

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

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

Mold / Cavity / Production Process na

DECLARATION

I hereby affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of 163 / 8 hours. I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from the declaration below.

EXPLANATION / COMMENTS: - First PPAP Submission (only differences from variant 251.6.1071.35).
- 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: [signature] Date: 10.01.2018

Print Name: Customer Tracking No.:

New P/N introduction - 1218.35
Short description: Initial PPAP (only differences from 1071)

	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	Shot peening report Metallurgical report	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

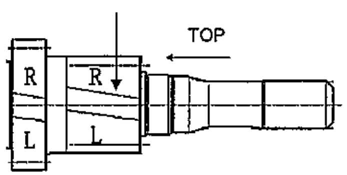
	Other requirements			
1	PSW Raw part	Yes		Yes
2	PSW E.P. part	NO		
3	PSW Engagement Rings	NO		

10/01/2018

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

STIRNRAD / GEAR	außenverzahnt / external	Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) gültig für Werte am Einzelzahn / Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth			(8)	
Zähnezahl / Number of teeth z	17		linke Fl. / left flank	rechte Fl. / right flank		
Modul / Normal module m_n	2.350000	Profil-Formabweichung / Profile form error $f_{f\alpha}$	0.004#		Eingriffsteilungs-Abweich. / Normal pitch error f_{pe}	0.014
Eingriffswinkel / Normal pressure angle α_n	20° 0' 0"	Profil-Gesamtabweichung / Total profile error F_α			Teilungs-Einzelabweichung / Adjacent pitch error f_p	0.014##
Schrägungswinkel / Helix angle β	26° 0' 0"	Profil-Winkelabweichung / Profile angle error $f_{H\alpha}$	0.000 ± 0.010	0.000 ± 0.010	Teilungssprung / Diff. bet. adjacent pitches f_u	0.018
Steigungsrichtung / Hand of helix	RECHTS	Flankenl.-Winkelabweich. / Tooth alignment error $f_{H\beta}$	0.000 ± 0.013	0.000 ± 0.013	Teilungs-Summenabweich. / Cumulative circ. pitch error F_{pk}	
Profilverschiebungsfaktor / Addendum modification coeff. x	0.700	Flankenl.-Gesamtabweich. / Total alignment error F_β			Rundlaufabweichung / Radial run-out F_r	0.032
Teilkreisdurchmesser / Pitch diameter d	44.448	Flankenl.-Formabweich. / Longitudinal alignment err. $f_{f\beta}$	0.004#		Zahndickenschwankung / Range of tooth thickn. error R_S	
Kopfkreisdurchmesser / Outside diameter d_a	53.00 $_{-0.26}$	Teilungs-Gesamtabweich. / Cumulative pitch error F_p	0.040			
Kopfnutzkreisd. theo. max. / Tip diam. usable theo. d_{Na}	52.67	Einf.-Wälzabweichung / Tangential composite error F_i'			Zweifl.-Wälzabweichung / Radial composite error F_i''	0.036
Kopfnutzkreisd. theo. min. / Tip diam. usable theo. d_{Na}	52.32	Einflanken-Wälzsprung / Tang. tooth to tooth comp. err. f_i'			Zweifl.-Wälzsprung / Radial tooth to tooth comp. err. f_i''	0.014
Fußkreisdurchmesser / Root diameter d_f	39.20 $_{-0.30}$	Radbreite im Meßkreis d_M / Facewidth in meas. diam. b	20.50		Meßkreis Krümmungsradius / Radius of curvature meas. diam. ρ_{dM}	10.66
Fußnutzkreisdurchmesser / Root diameter usable d_{Nf}	42.31					
Grundkreisradius / Base circle radius r_b	20.599					
Grundkreisdurchmesser / Base diameter d_b	41.199					
Normalzahndicke max. / Normal tooth thickness s_n	4.889					
Normalzahndicke min. / Normal tooth thickness s_n	4.859					
Meßzähnezahl / Number of teeth spanned k	4					
Zahnweite max. / Base tangent length W_k	26.164					
Zahnweite min. / Base tangent length W_k	26.136					
Meßkugeldurchmesser / Ball diameter D_M	4.0000					
Diam. Zweikugelmaß max. / Measurement o. balls M_{dK}	52.214					
Diam. Zweikugelmaß min. / Measurement o. balls M_{dK}	52.155					
Verdrehflankenspiel theo. / Circumferential backlash	0.065 0.175					

right fl. = drive

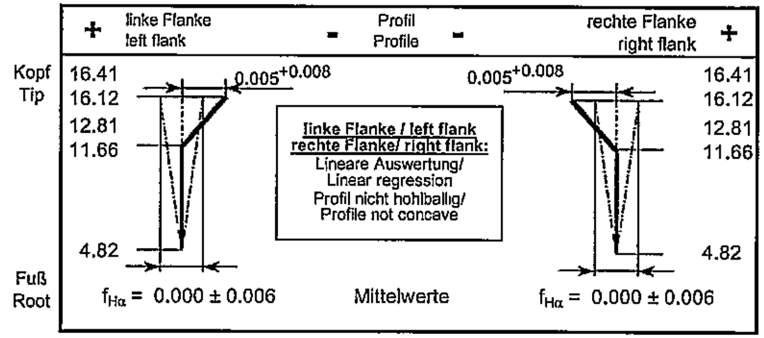


Hondurchmesser = 41.30 -0.30 = 1.44
honing diameter

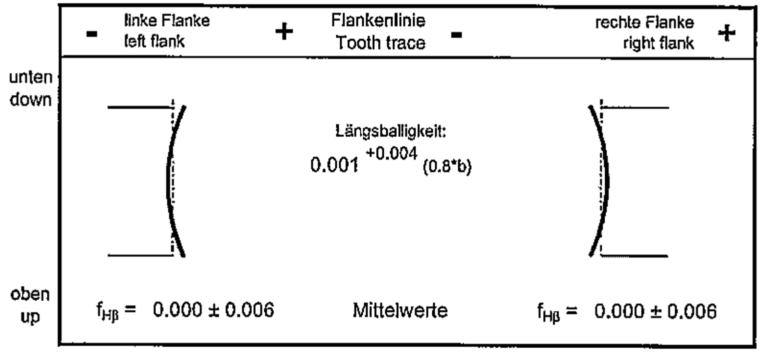
#Flanken- und Profilformabweichung ffa und ffb ausgewertet mit Fourier. Auswertung bis 30. Ordnung
Flank and profile fomr errors ffa and ffb evaluated using Fourier. Evaluation untill 30th order
ffb n0 = ?
K = ?
R = ?
ffa n0 = ?
K = ?
R = ?
Teilungs-Einzelabweichung fp ausgewertet mit Fourier. Auswertung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

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

Wkz-Profil siehe Werkzeugdatenblatt Nr.
For Tooth profile, see tool data sheet number 251.6.1183.35



* Schreibbeginn
* Start of checking
Ø = 41.30 $_{-0.30}$ ≡ 1.44



* ffα (zwischen dNf und dem Schreibbeginn ds) max ffα/2, jedoch 0.003 zulässig
* ffα (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			Remark:
			Erstverwendung bei Getriebetype: 251			
	Datum	Name	Verzahnungsblatt Endkontrolle / Final Check Gear Data			Zeichnungsnummer: / Drawing number:
gez.	04.08.2016	Cricenti, Fabrizio	Benennung: / Naming:			
gepr.			Antrw. aussen 2.Gg			251.6.1218.35

Document Revision: 20160804092749, printed on 2017-10-13 at 10:31 by Mirko.Vicenti

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

STIRNRAD / GEAR	außenverzahnt / external
Zähnezahl / Number of teeth z	41
Modul / Normal module m_n	2.050000
Eingriffswinkel / Normal pressure angle α_n	17° 30' 0"
Schrägungswinkel / Helix angle β	28° 54' 0"
Steigungsrichtung / Hand of helix	RECHTS
Profilverschiebungsfaktor / Addendum modification coeff. x	0.200
Teilkreisdurchmesser / Pitch diameter d	96.006
Kopfkreisdurchmesser / Outside diameter d_a	103.20 $_{-0.26}$
Kopfnutzkreisd. theo. max. / Tip diam. usable theo. d_{Na}	102.75
Kopfnutzkreisd. theo. min. / Tip diam. usable theo. d_{Na}	102.40
Fußkreisdurchmesser / Root diameter d_f	89.50 $_{-0.35}$
Fußnutzkreisdurchmesser / Root diameter usable d_{Nf}	92.93
Grundkreisradius / Base circle radius r_b	45.163
Grundkreisdurchmesser / Base diameter d_b	90.327
Normalzahndicke / Normal tooth thickness max. s_n	3.479
Normalzahndicke / Normal tooth thickness min. s_n	3.449
Meßzähnezahl / Number of teeth spanned k	7
Zahnweite / Base tangent length max. W_k	41.330
Zahnweite / Base tangent length min. W_k	41.301
Meßkugeldurchmesser / Ball diameter D_M	3.0000
Diam. Zweikugelmaß / Measurement o. balls max. M_{dK}	99.506
Diam. Zweikugelmaß / Measurement o. balls min. M_{dK}	99.415
Verdrehflankenspiel / Circumferential backlash theo.	0.065 0.168

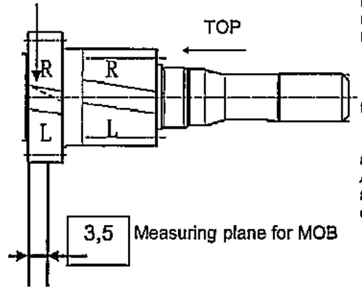
Vorbearbeitungsdaten siehe Verzahnungsblatt Vorbearbeitung gleicher Nr.
For pre-machining dimensions, see gear data sheet same number

Wkz-Profil siehe Werkzeugdatenblatt Nr.
For Tooth profile, see tool data sheet number 251.6.1218.35

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

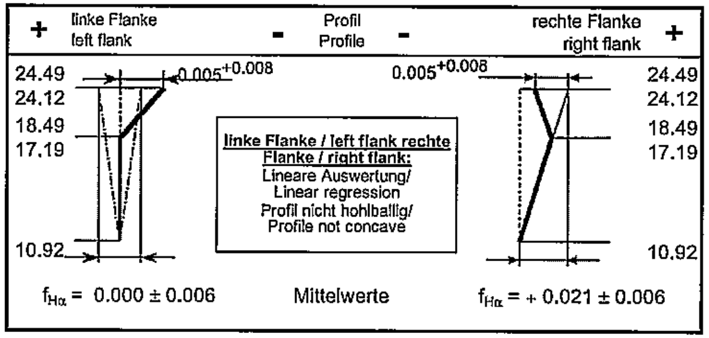
	linke Fl. / left flank	rechte Fl. / right flank		
Profil-Formabweichung / Profile form error $f_{f\alpha}$	0.004		Eingriffsteilungs-Abweich. / Normal pitch error f_{pe}	0.014
Profil-Gesamtabweichung / Total profile error F_α			Teilungs-Einzelabweichung / Adjacent pitch error f_p	0.014
Profil-Winkelabweichung / Profile angle error $f_{H\alpha}$	0.000 ± 0.010	0.021 ± 0.010	Teilungssprung / Diff. bet. adjacent pitches f_u	0.018
Flankenl.-Winkelabweich. / Tooth alignment error $f_{H\beta}$	0.000 ± 0.013	0.020 ± 0.013	Teilungs-Summenabweich. / Cumulative circ. pitch error F_{pk}	
Flankenl.-Gesamtabweich. / Total alignment error F_β			Rundlaufabweichung / Radial run-out F_r	0.040
Flankenl.-Formabweich. / Longitudinal alignment err. $f_{f\beta}$	0.004		Zahndickenschwankung / Range of tooth thickn. error R_S	
Teilungs-Gesamtabweich. / Cumulative pitch error F_p	0.050			
Einf.-Wälzabweichung / Tangential composite error F_i			Zweifl.-Wälzabweichung / Radial composite error F_i''	0.045
Einflanken-Wälzsprung / Tang. tooth to tooth comp. err. f_i			Zweifl.-Wälzsprung / Radial tooth to tooth comp. err. f_i''	0.018
Radbreite im Meßkreis d_M / Facewidth in meas. diam. b	14.56		Meßkreis Krümmungsradius / Radius of curvature meas. diam. ρ_{dM}	16.20

right fl. = drive

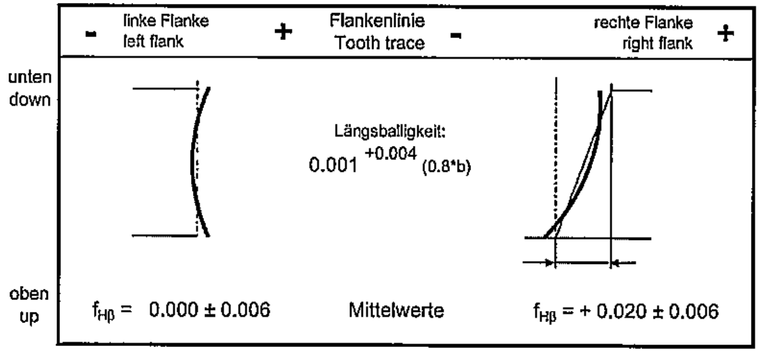


Hondurchmesser = 91.50 $_{-0.30}$ ≡ 7.30
honing diameter

#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 = ?



* Schreibbeginn
* Start of checking
Ø = 91.50 $_{-0.30}$ ≡ 7.30



* ffαf (zwischen dNf und dem Schreibbeginn ds) max ffα/2, jedoch 0.003 zulassig
* 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

Abbildungen sind unmaßstäblich.
Diagrams not to scale.

	Datum	Name
gez.	04.08.2016	Cricenti, Fabrizio
gepr.		

Ersatz für
Erstverwendung bei Getriebetype: 251

Verzahnungsblatt Endkontrolle
Final Check Gear Data
Benennung: / Naming:
Antrw. a. 4./6.Gg.

Verteiler:

Schutzvermerk nach ISO 16016 beachten
Protection per ISO 16016

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

Remark:

Zeichnungsnummer: / Drawing number:
251.6.1218.35

Document Revision: 20160804092736, printed on 2017-10-13 at 10:31 by Mirko.Vicenti

IS2_7DCT300_Gearset_1A_&_21A

face & centering
Unior EBA-11047

Turning
Niles DRA-10008
Niles DRA-10209

multi diameter turning
Doosan DRA-11029
Doosan DRA-11030
Doosan DRA-11031

turning inner profile
Emag DRA-10112
Emag DRA-10117
Emag DRA-10118

hobbing teeth
(2nd gear & clutch spline)
Pfauter FRW-10015

hobbing teeth
(4/6th gear)
Pfauter FRW-10015

washing before heat treatment
ORE-10162

heat treatment
ECM Furnace 7

shot peening
Pangborn OKU-10238

staightening
Galdabini RIA-10027
Galdabini RIA-11054

grinding inner & outer dimensions
Buderus SLA-11026

hard turning
Weisser DRA-11022

power honing
Prawema HNW-11013

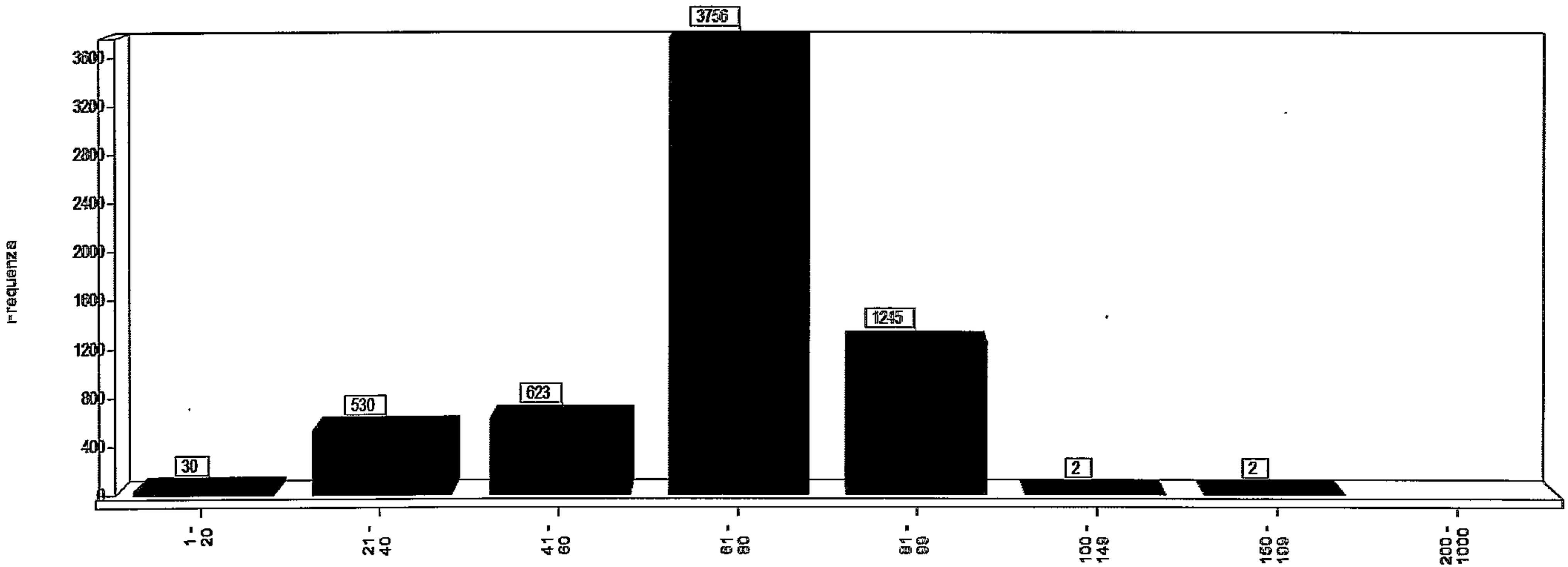
power honing
Prawema HNW-11013

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

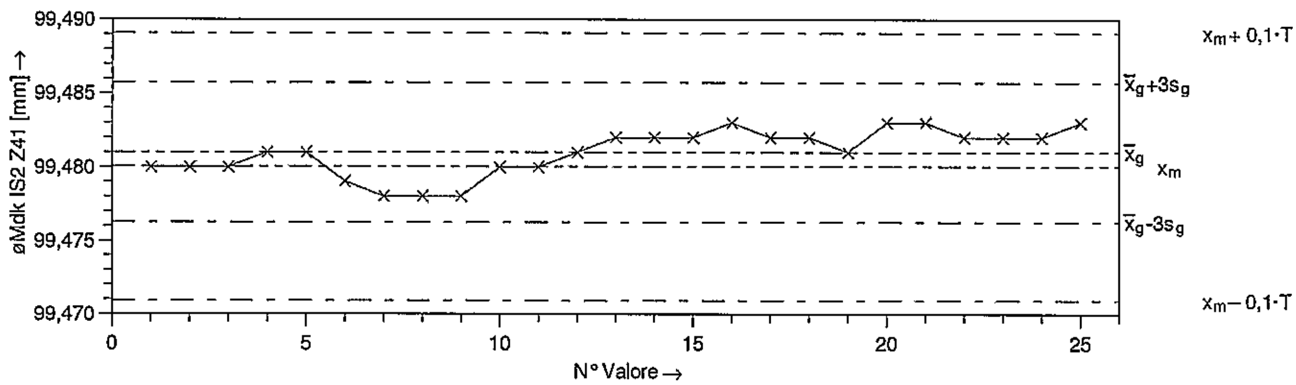
Q-DAS®

Pagina 1 / 1

Data od. 20/11/2017	Nome oper. mario.bozza	Reparto/Area/Prod. NN	Posto di prova Levigatura IS2

Calibro		Master		Caratteristica			
Desc. calibro	Calibro a forcella	Desc. mast.	Master IS2	Desc. Car.	øMdk IS2 Z41		
N° calibro	MAR 402091 007	N° master	MVZ 400590 002	N° Caratt.	2516121835		
Ris. calibro	0,001	Valore reale mast.	99,48	Val. Nom.	99,4605	LSS 99,5060	$\hat{=}$ 0,0455
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di m	mm	LSI 99,4150	$\hat{=}$ -0,0455

Nota



i	x_i	i	x_i	i	x_i	i	x_i	i	x_i
1	99,4800	6	99,4790	11	99,4800	16	99,4830	21	99,4830
2	99,4800	7	99,4780	12	99,4810	17	99,4820	22	99,4820
3	99,4800	8	99,4780	13	99,4820	18	99,4820	23	99,4820
4	99,4810	9	99,4780	14	99,4820	19	99,4810	24	99,4820
5	99,4810	10	99,4800	15	99,4820	20	99,4830	25	99,4830

Valori a disegno			Valori Calcolati			Statistiche		
x_m	=	99,480000				$\bar{x}_g$	=	99,481000
LSI	=	99,4150	$x_{min\,g}$	=	99,4780	s_g	=	0,00158
LSS	=	99,5060	$x_{max\,g}$	=	99,4830	$\lvert Bi \rvert = \lvert \bar{x}_g - x_m \rvert$	=	0,0010000
T	=	0,0910	R_g	=	0,0050			
			n_{tot}	=	25	n_{eff}	=	25

Minimo riferimento per sistema di misura capace

$C_g = \frac{0,2 \cdot T}{4 \cdot s_g}$	=	2,88	0 1 1,33	$T_{min\,(C_g)}$	=	0,0420
$C_{gk} = \frac{0,1 \cdot T - \lvert \bar{x}_g - x_m \rvert}{2 \cdot s_g}$	=	2,56	0 1 1,33	$T_{min\,(C_{gk})}$	=	0,0521
%RE	=	1,10%	0 5	$T_{min\,(\%RE)}$	=	0,0200

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

GETRAG Corp Group 2011: Type 1

Data ____________ Firma ____________ Dipartimento ____________

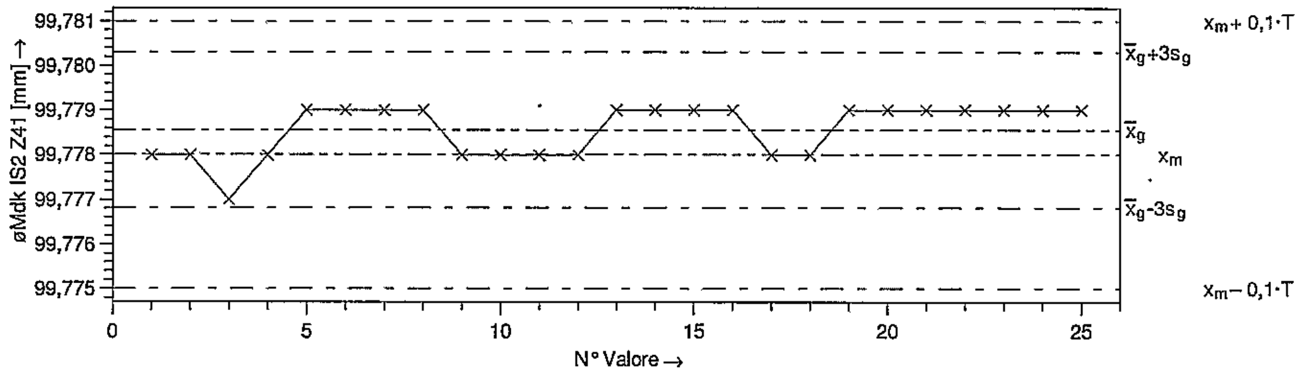
Capacità strumenti di misura

Q-DAS®

Data od. 20/11/2017	Nome oper. mario.bozza	Reparto/Area/Prod. NN	Posto di prova Dentatura IS2

Calibro		Master		Caratteristica			
Desc. calibro	Calibro a forcella	Desc. mast.	BPP	Desc. Car.	øMdk IS2 Z41		
N° calibro	MAR 402091 006	N° master	MJU 416161 001	N° Caratt.	2516121835		
Ris. calibro	0,001	Valore reale mast.	99,778	Val. Nom.	99,778	LSS 99,793	$\hat{=}$ 0,015
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di m	mm	LSI 99,763	$\hat{=}$ -0,015

Nota



i	x_i	i	x_i	i	x_i	i	x_i	i	x_i
1	99,778	6	99,779	11	99,778	16	99,779	21	99,779
2	99,778	7	99,779	12	99,778	17	99,778	22	99,779
3	99,777	8	99,779	13	99,779	18	99,778	23	99,779
4	99,778	9	99,778	14	99,779	19	99,779	24	99,779
5	99,779	10	99,778	15	99,779	20	99,779	25	99,779

Valori a disegno			Valori Calcolati			Statistiche		
x_m	=	99,77800				$\bar{x}_g$	=	99,77856
LSI	=	99,763	$x_{min\,g}$	=	99,777	s_g	=	0,000583
LSS	=	99,793	$x_{max\,g}$	=	99,779	$\lvert Bi \rvert = \lvert \bar{x}_g - x_m \rvert$	=	0,00056000
T	=	0,030	R_g	=	0,002			
			n_{tot}	=	25	n_{eff}	=	25

Minimo riferimento per sistema di misura capace

$C_g = \frac{0{,}2 \cdot T}{4 \cdot s_g}$	=	2,57	0 1 1,33	$T_{min\,(C_g)}$	=	0,0155
$C_{gk} = \frac{0{,}1 \cdot T - \lvert \bar{x}_g - x_m \rvert}{2 \cdot s_g}$	=	2,09	0 1 1,33	$T_{min\,(C_{gk})}$	=	0,0211
%RE	=	3,33%	0 5	$T_{min\,(\%RE)}$	=	0,0200

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

GETRAG Corp Group 2011: Type 1

Data ____________ Firma ____________ Dipartimento ____________

Capacità strumenti di misura

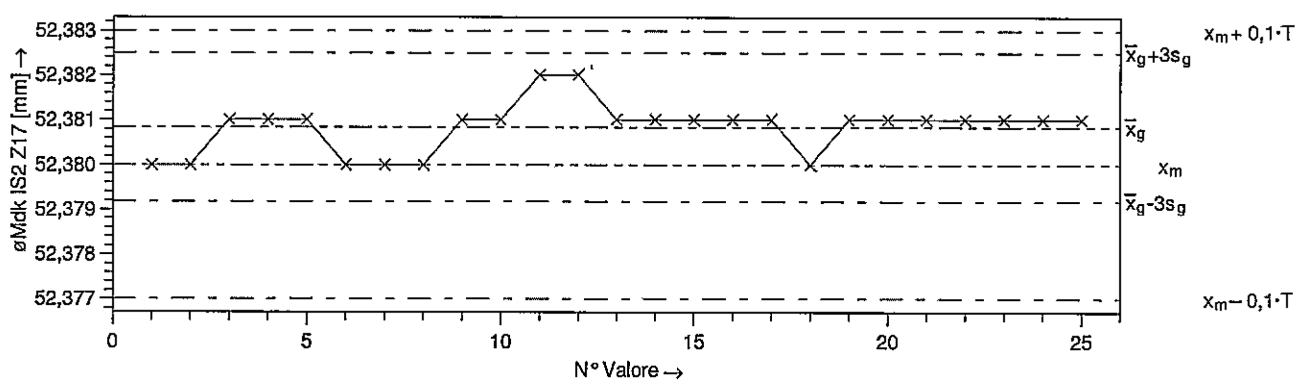
Q-DAS®

Pagina 1 / 1

Data od. 20/11/2017	Nome oper. mario.bozza	Reparto/Area/Prod. NN	Posto di prova Dentatura IS2

Calibro		Master		Caratteristica			
Desc. calibro	Calibro a forcella	Desc. mast.	BPP	Desc. Car.	øMdk IS2 Z17		
N° calibro	MAR 402090 045	N° master	MJU 416161 004	N° Caratt.	2516121835		
Ris. calibro	0,001	Valore reale mast.	52,38	Val. Nom. 50,380	LSS	50,395	$\hat{=}$ 0,015
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di m mm	LSI	50,365	$\hat{=}$ -0,015

Nota



i	x_i	i	x_i	i	x_i	i	x_i	i	x_i
1	52,380	6	52,380	11	52,382	16	52,381	21	52,381
2	52,380	7	52,380	12	52,382	17	52,381	22	52,381
3	52,381	8	52,380	13	52,381	18	52,380	23	52,381
4	52,381	9	52,381	14	52,381	19	52,381	24	52,381
5	52,381	10	52,381	15	52,381	20	52,381	25	52,381

Valori a disegno			Valori Calcolati			Statistiche		
x_m	=	52,38000				$\bar{x}_g$	=	52,38084
LSI	=	50,365	$x_{min\,g}$	=	52,380	s_g	=	0,000554
LSS	=	50,395	$x_{max\,g}$	=	52,382	$\lvert Bi \rvert = \lvert \bar{x}_g - x_m \rvert$	=	0,00084000
T	=	0,030	R_g	=	0,002			
			n_{tot}	=	25	n_{eff}	=	25

Minimo riferimento per sistema di misura capace

$C_g = \frac{0,2 \cdot T}{4 \cdot s_g}$	=	2,71	0 1 1,33	$T_{min\,(C_g)}$	=	0,0147
$C_{gk} = \frac{0,1 \cdot T - \lvert \bar{x}_g - x_m \rvert}{2 \cdot s_g}$	=	1,95	0 1 1,33	$T_{min\,(C_{gk})}$	=	0,0231
%RE	=	3,33%	0 5	$T_{min\,(\%RE)}$	=	0,0200

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

GETRAG Corp Group 2011: Type 1

Data ______________ Firma ______________ Dipartimento ______________

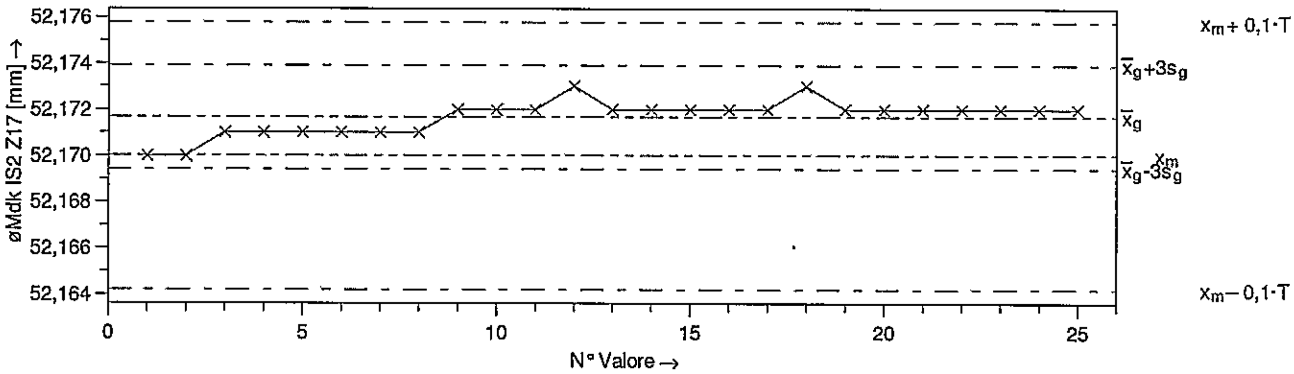
Q-DAS®

Capacità strumenti di misura

Data od. 20/11/2017	Nome oper. mario.bozza	Reparto/Area/Prod. NN	Posto di prova Levigatura IS2

Calibro		Master		Caratteristica			
Desc. calibro	Calibro a forcella	Desc. mast.	IS2 Z17	Desc. Car.	øMdk IS2 Z17		
N° calibro	MAR 402090 048	N° master	MVZ 400589 002	N° Caratt.	2516121835		
Ris. calibro	0,001	Valore reale mast.	52,17	Val. Nom. 52,1845	LSS	52,2135	$\hat{=}$ 0,0290
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di m mm	LSI	52,1555	$\hat{=}$ -0,0290

Nota



i	x_i	i	x_i	i	x_i	i	x_i	i	x_i
1	52,1700	6	52,1710	11	52,1720	16	52,1720	21	52,1720
2	52,1700	7	52,1710	12	52,1730	17	52,1720	22	52,1720
3	52,1710	8	52,1710	13	52,1720	18	52,1730	23	52,1720
4	52,1710	9	52,1720	14	52,1720	19	52,1720	24	52,1720
5	52,1710	10	52,1720	15	52,1720	20	52,1720	25	52,1720

Valori a disegno			Valori Calcolati			Statistiche		
x_m	=	52,170000				$\bar{x}_g$	=	52,171680
LSI	=	52,1555	$x_{min\,g}$	=	52,1700	s_g	=	0,000748
LSS	=	52,2135	$x_{max\,g}$	=	52,1730	$\lvert Bi \rvert = \lvert \bar{x}_g - x_m \rvert$	=	0,0016800
T	=	0,0580	R_g	=	0,0030			
			n_{tot}	=	25	n_{eff}	=	25

				Minimo riferimento per sistema di misura capace		
$C_g = \frac{0{,}2 \cdot T}{4 \cdot s_g}$	=	3,88	0 1 1,33	$T_{min\,(C_g)}$	=	0,0199
$C_{gk} = \frac{0{,}1 \cdot T - \lvert \bar{x}_g - x_m \rvert}{2 \cdot s_g}$	=	2,75	0 1 1,33	$T_{min\,(C_{gk})}$	=	0,0367
%RE	=	1,72%	0 5	$T_{min\,(\%RE)}$	=	0,0200

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

GETRAG Corp Group 2011: Type 1

Data ____________ Firma ____________ Dipartimento ____________

GETRAG Production Part Approval

DIMENSIONAL TEST RESULTS

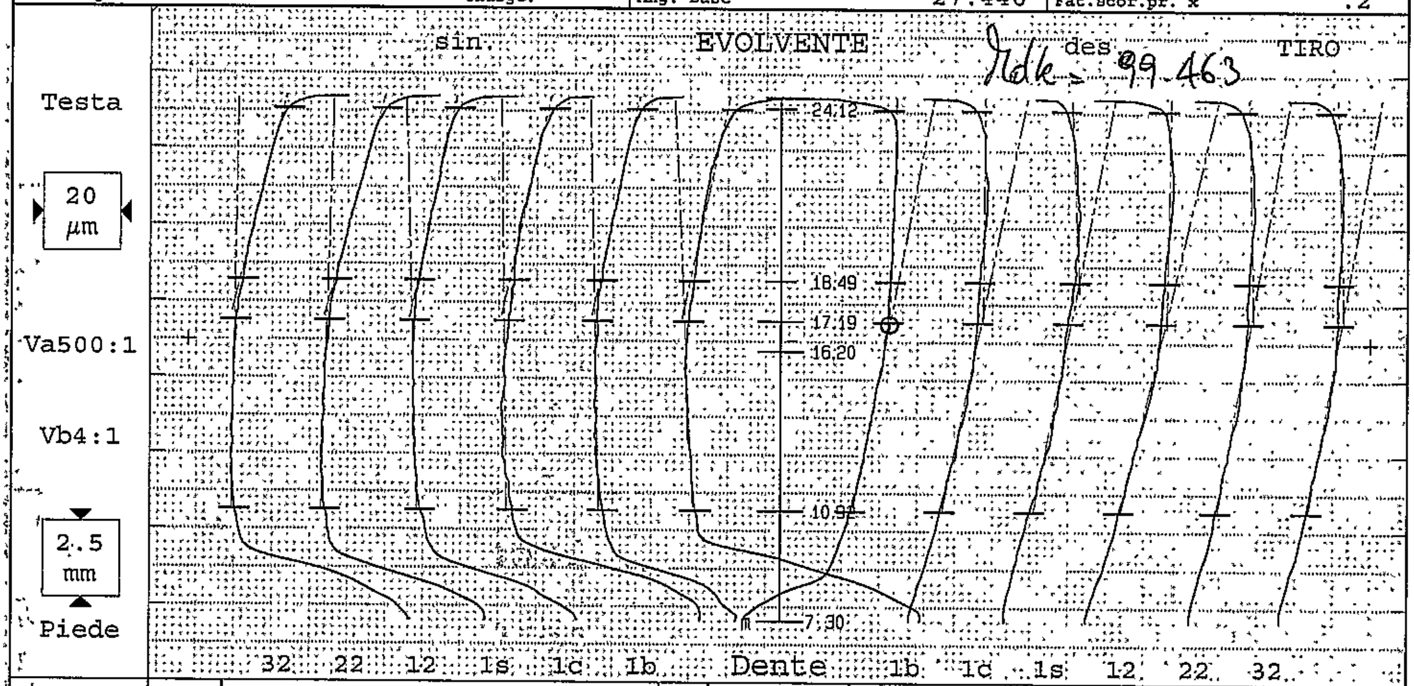
Organization: GETRAG		Part Number:	251.6.1218.35
Supplier/Vendor Code: GETRAG Modugno		Part Name:	IS Outer (IS2)
INSPECTION FACILITY:		Design Record Change Level:	3 Index "-"
NA		Engineering Change Documents:	C005149_MIP_1 - 18/07/2016

Item	Dimension/Specification	Specification / Limits		Classif.	Qty. Tested	Organization Measurement Results (Data)							
						1	2	3	4	5	controllo distruttivo	Ok	Not Ok
1	Teeth Profile & Lead, Pitch - Z41	OK	NOK		5	OK	OK	OK	OK	OK		OK	
2	MdK - Z41	99.506	99.415	<M>	5	99.463	99.458	99.470	99.462	99.460		OK	
3	df - Z41	89.500	89.150		5	89.291	89.324	89.275	89.288	89.300		OK	
4	da - Z41	103.200	102.940		5	103.068	103.099	103.059	103.081	103.071		OK	
5	Teeth Profile & Lead, Pitch - Z17	OK	NOK		5	OK	OK	OK	OK	OK		OK	
6	MdK - Z17	52.214	52.155	<M>	5	52.190	52.187	52.188	52.190	52.187		OK	
7	df - Z17	39.200	38.900		5	39.032	39.034	39.036	39.046	39.027		OK	
8	da - Z17	53.000	52.740		5	52.889	52.886	52.889	52.900	52.897		OK	
9	Residual Stress according GN4110 - Z41	OK	NOK		1						OK	OK	
10	Residual Stress according GN4110 - Z17	OK	NOK		1						OK	OK	
11	M1 Case Hardness HRA	83	80.5		1						81.8	OK	
12	M2 Tooth flank CHD 550 HV1	1.2	0.7		1						1.15	OK	
13	M3 Bore after grinding CHD 550 HV1 0.2 min	-	0.2		1						0.85	OK	
14	M4 Core Hardness HV10 300 min	-	300		1						372	OK	
15	Fr - Z41	40	0	<M>	5	20.0	10.2	24.2	20.0	14.8		OK	
16	Fr - Z17	32	0	<M>	5	13.8	6.6	16.9	22.8	8.0		OK	

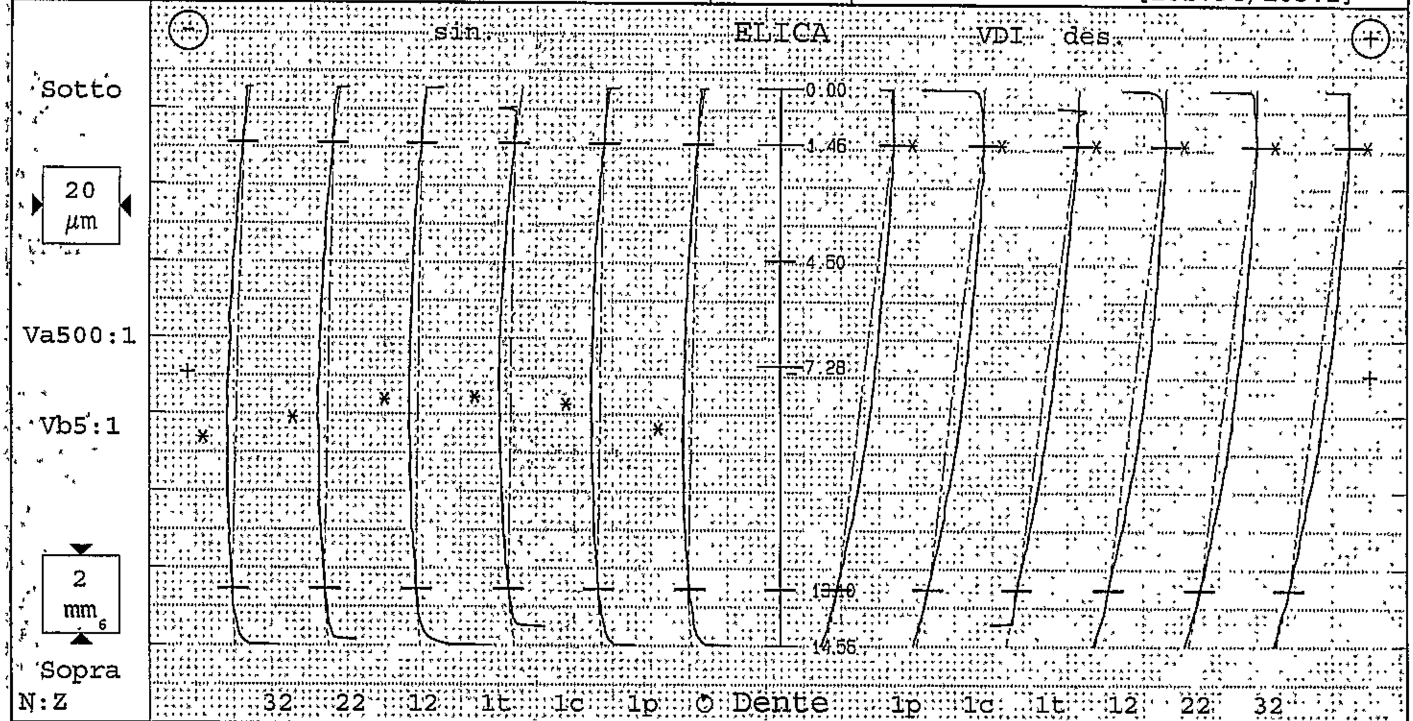
SIGNATURE	TITLE	DATE
Vicenti D.	ME	17/11/2017

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412 06 0 PNC35 B4784	Controllore: Turno C		Data: 03.10.2017 22:03
Denominazione: Input Outer Z41	Numero denti z	41	Largh.fasc.dent. b 14.56mm
Numero disegno.: D51.6.1218.35-IF	Modulo m	2.05mm	Tratto evolv. La 6.27mm
Commessa/serie nr.: 4.D61-01	Angolo pressione	17.5°	Tratto elica Lß 11.65mm
Masch.Nr.: M001 Spindel: Formnest	Angolo elica	28.9°	Inizio elab. M1 10.92mm
Untersuchungszweck: Laufende Messung	Ø Base db	90.3267mm	Palpatore Ø (#2)1mm
Werkzeug: Charge:	Ang. Base	27.446°	Fat.scor.pr. x .2



Tolerance	Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm ±6	0.1	Var a 6.0							21±6	Var a 6.3						21.1	
fHα ±10	0.1	-1.6	-3.2	2.8	1.4	2.3	4.6		21±10	20.9	21.8	20.8	24.9	18.6	18.9	21.1	
Fα	2.0	1.2	2.2	2.1	3.0	2.3	2.8			0.9	1.7	1.9	2.5	2.1	2.2	2.1	
ffα 4	1.5	1.3	1.6	1.4	2.6	1.7	1.5		4	1.0	1.8	1.9	1.9	1.6	1.7	1.8	
Cα -13/-5	-12.4	-12.0	-12.8	-12.6	-12.3	-12.2	-13.6		-13/-5	-9.5	-10.7	-10.7	-11.8	-10.4	-11.1	-11.0	
ffαf 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]	89.291	[89.15/89.5]							103.068	[102.94/103.2]							



Tolerance	Medio							Qual	Tolerance							Medio	Qual
fHßm ±6	2.7	Var ß 2.0							20±6	Var ß 1.6						18.6	
fHß ±13	2.7	3.8	3.0	1.8	2.2	2.0	3.3		20±13	18.1	18.0	19.4	18.5	18.1	19.6	18.6	
Fß	2.9	3.4	3.1	2.5	4.6	2.5	3.2			2.5	3.0	1.6	2.8	2.8	2.1	2.7	
ffß 4	0.8	0.9	0.8	0.8	0.6	0.6	0.9		4	0.7	0.7	0.8	0.6	0.7	0.6	0.7	
Cß 1/5	2.4	2.3	2.5	2.3	3.1	2.3	2.3		1/5	2.8	2.9	2.3	3.2	2.9	2.9	3.0	
Bd	-1.1															1.3	

GCG 808006

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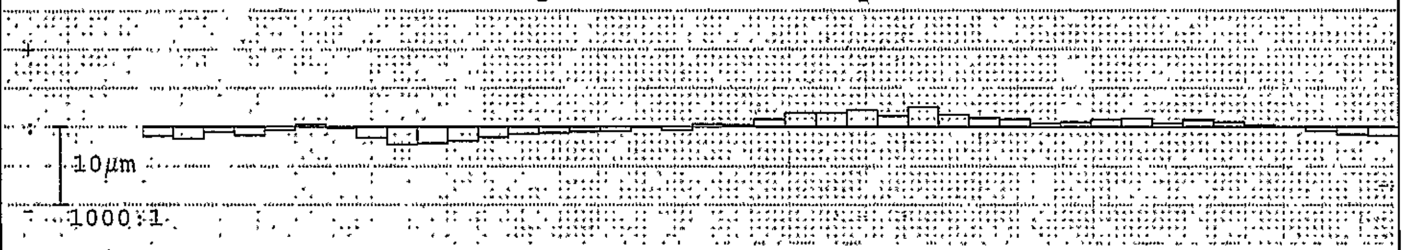
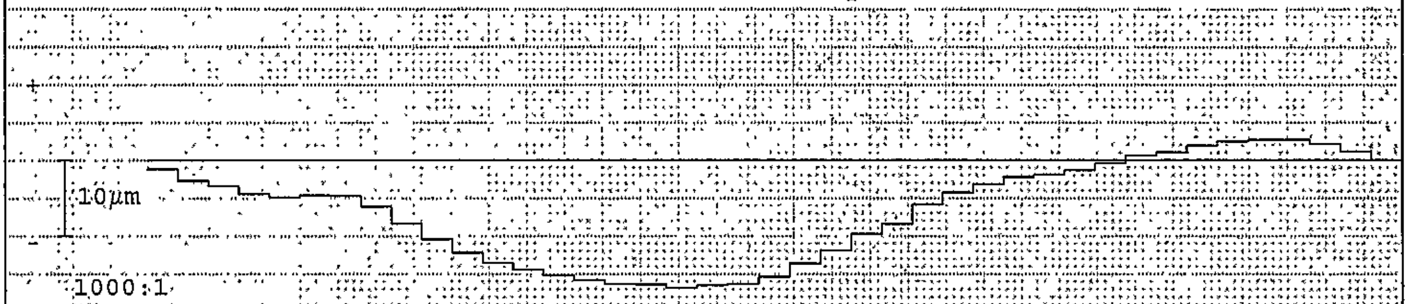
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	03.10.2017 22:03
Denominazione:	Input Outer Z41	Numero denti z	41	Angolo pressione	17.5°
Numero disegno.:	D51.6.1218.35-IF	Modulo m	2.05mm	Angolo elica	28.9°
Commessa/serie nr.:	4.D61-9	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formneat 1	Fahrzeug:	Charge:	

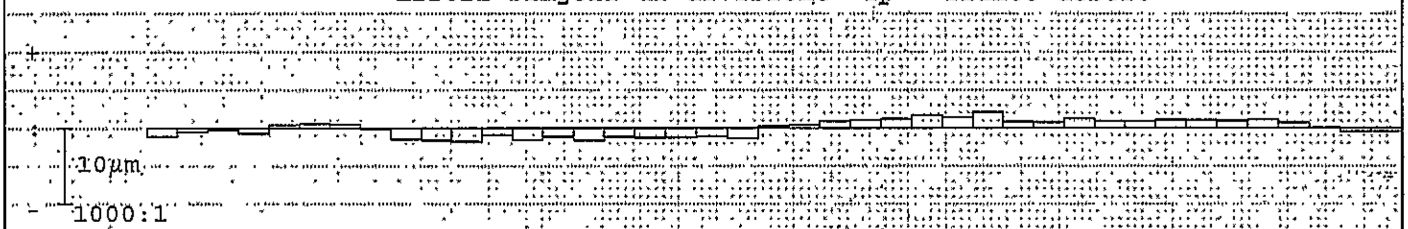
Errori singoli di divisione fp fianco sinistro



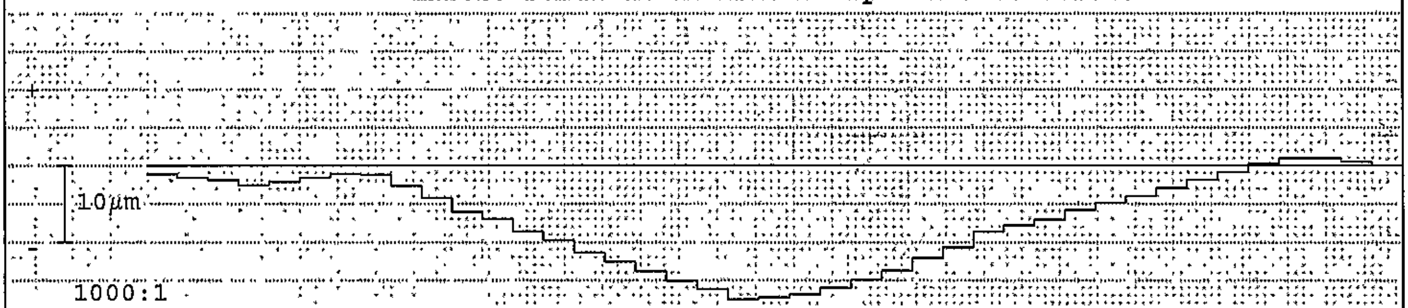
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



Errore somma di divisione Fp fianco destro

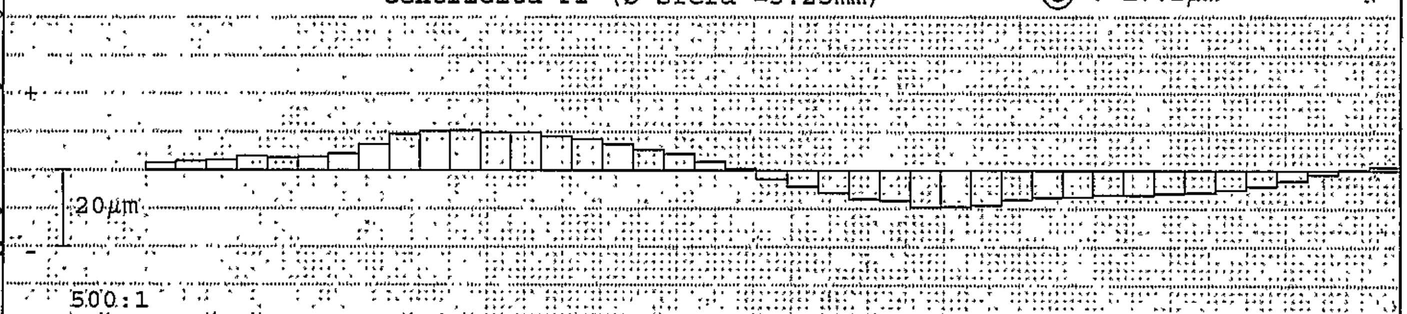


Corsa per misura divis.:95.962 z=4.5mm

		fianco sinistro		fianco destro / TIRO	
		Val.misur Qual.	Val. amm Qual.	Val.misur Qual.	Val. amm Qual.
Gr. err. singoli divisione	fp max	2.5	14.0	2.1	14.0
Gr. salto di passo	fu max	1.3	18.0	1.6	18.0
Scarto di divisione	Rp	4.8		3.8	
Err. globale di divisione	Fp	19.5	50.0	18.5	50.0
Err. cordale di divisione	Fpz/8	9.5		7.4	

Centricità Fr (Ø-sfera =3.25mm)

◎ : 17.2µm



Err. di concentricitá	Fr	20.0	40.0	
Variaz. spessore dente	Rs			

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	02.10.2017 20:31
Denominazione:	Input Outer Z17	Numero denti z	17	Largh.fasc.dent. b	20.5mm
Numero disegno.:	D51.6.1218.35-IIF	Modulo m	2.35mm	Tratto evolv. La	6.84mm
Commessa/serie nr.:	34.D5C-~~01~~ 1	Angolo pressione	20°	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formneat	Angolo elica	26°	Inizio elab. Ml	4.82mm
Untersuchungszweck:	Laufende Messung	Ø Base db	41.1986mm	Palpatore Ø	(#2) 1mm
Werkzeug:	Charge:	Ang. Base	24.326°	Fat.scor.pr. x	.7

Testa

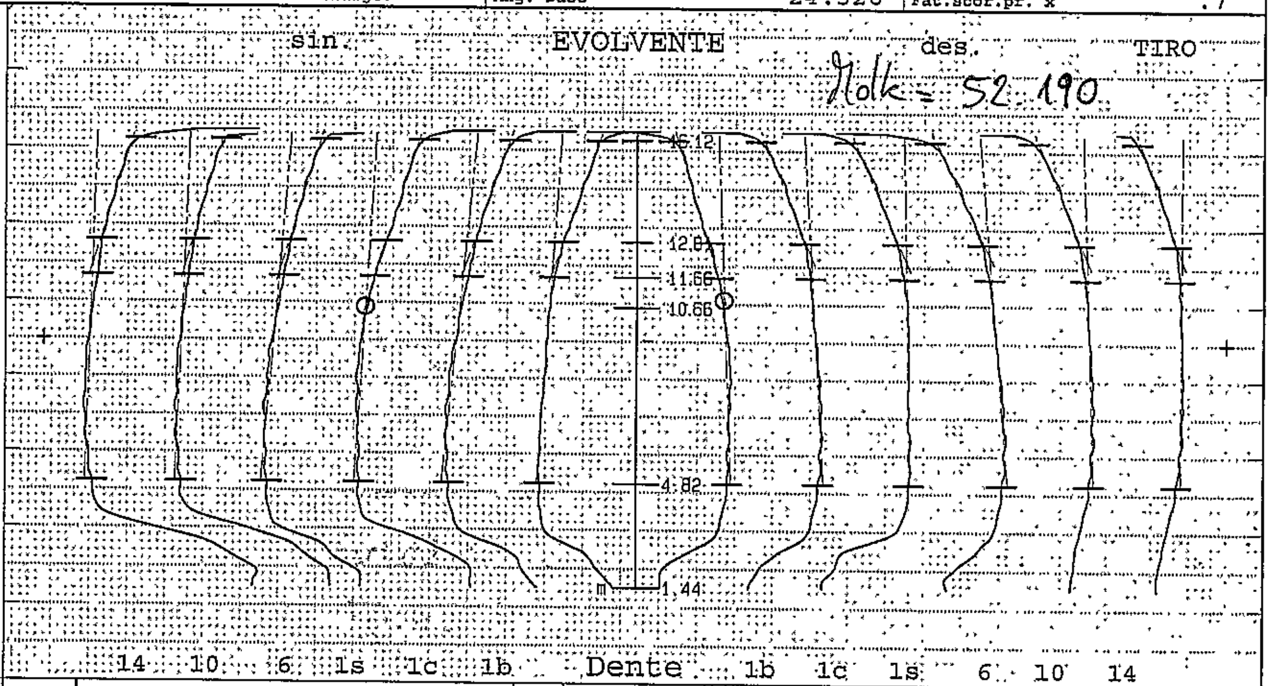
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm	±6	-5.9	Var a 6.0							±6	Var a 7.7						-3.8	
fHα	±10	-5.9	-3.0	-3.7	-7.8	-5.6	-9.0	-6.3		±10	-3.4	-5.2	-1.9	-7.4	-2.8	0.3	-3.8	
Fα		4.5	3.5	3.5	5.2	4.9	5.9	4.1			3.5	3.4	1.9	4.6	2.5	1.9	3.1	
ffα	4	2.8	3.0	2.6	2.7	3.2	2.8	1.0		4	2.5	2.2	1.0	2.1	2.0	1.9	2.1	
Cα	-13/-5	-8.7	-9.4	-8.6	-8.0	-11.4	-8.7	-10.1		-13/-5	-10.8	-10.6	-13.1	-11.7	-12.0	-11.2	-11.4	
ffαf	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]		39.032				[38.9/39.2]					52.889				[52.74/53]			

Sotto

20 µm

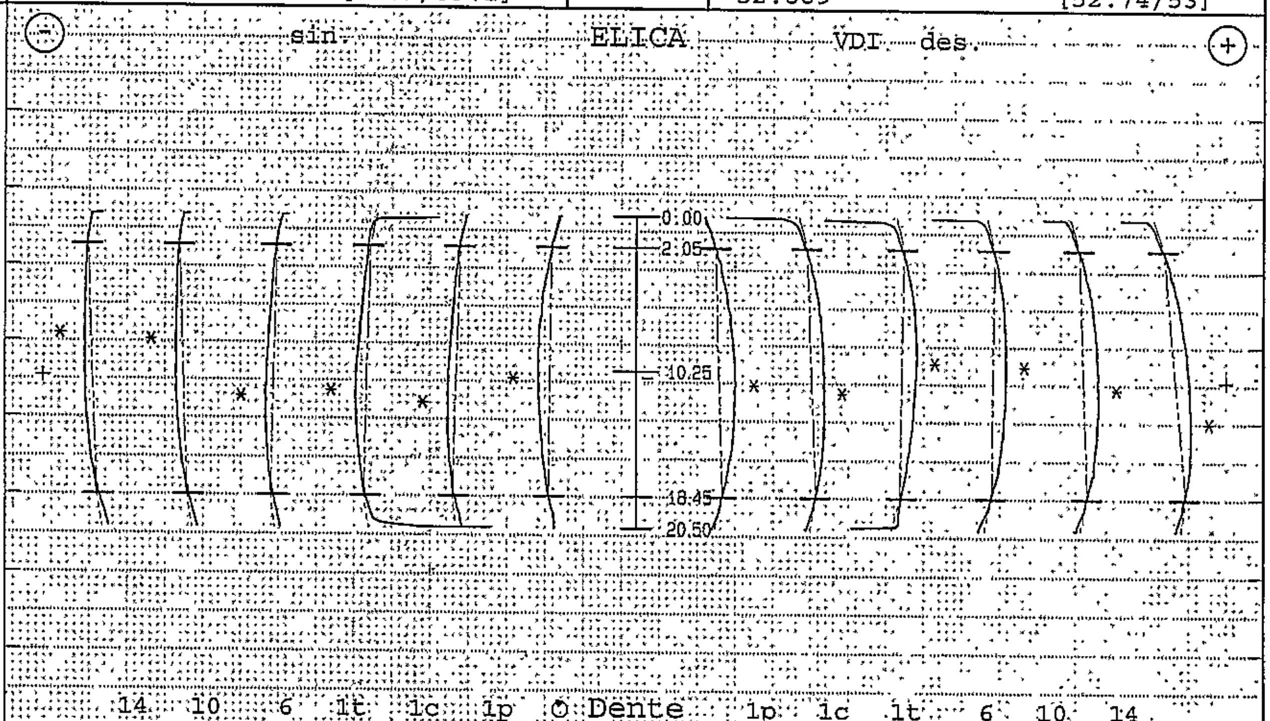
Va500:1

Vb2:1

5 mm

Sopra

N:Z

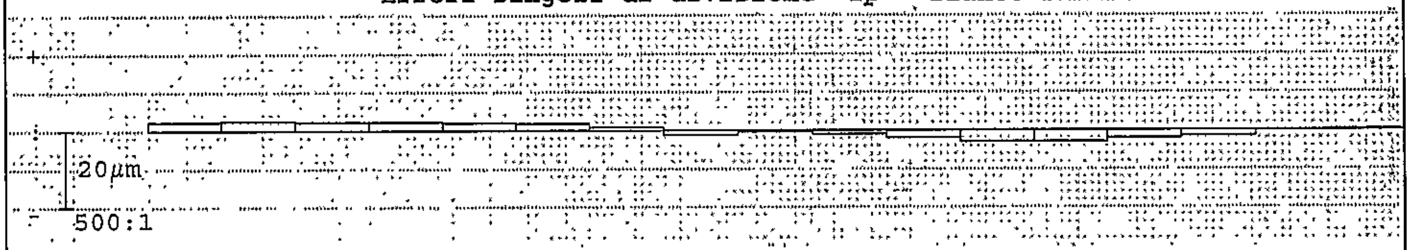


fHßm	±6	-0.1	Var ß 5.4							±6	Var ß 8.1						-2.9	
fHß	±13	-0.1	-2.8	-2.3	2.1	2.3	2.6	1.0		±13	-2.3	-2.9	1.5	0.9	-2.5	-7.2	-2.9	
Fß		2.6	3.1	2.6	2.1	2.5	2.5	2.7			4.4	4.0	3.2	3.3	4.4	7.0	4.7	
ffß	4	0.8	0.8	0.7	0.9	1.1	0.7	0.6		4	0.6	0.6	1.0	0.7	0.8	0.8	0.7	
Cß	1/5	2.0	2.0	2.0	1.9	2.7	2.0	3.1		1/5	4.2	3.4	3.8	3.5	3.9	3.7	3.6	
Bd		1.3															3.8	

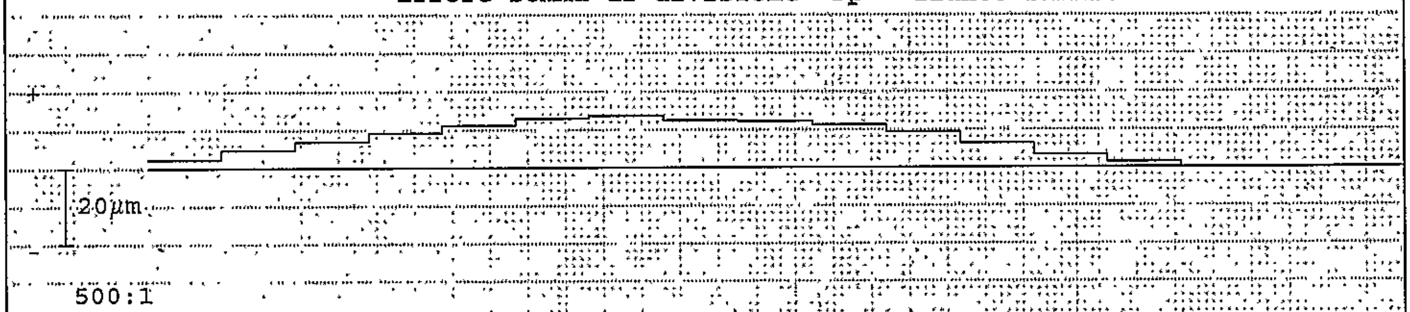
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	02.10.2017 20:31
Denominazione:	Input Outer Z17	Numero denti z	17	Angolo pressione	20°
Numero disegno.:	D51.6.1218.35-IIF	Modulo m	2.35mm	Angolo elica	26°
Commessa/serie nr.:	34.D5C-9	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formmeat	Werkzeug:	Charge:	

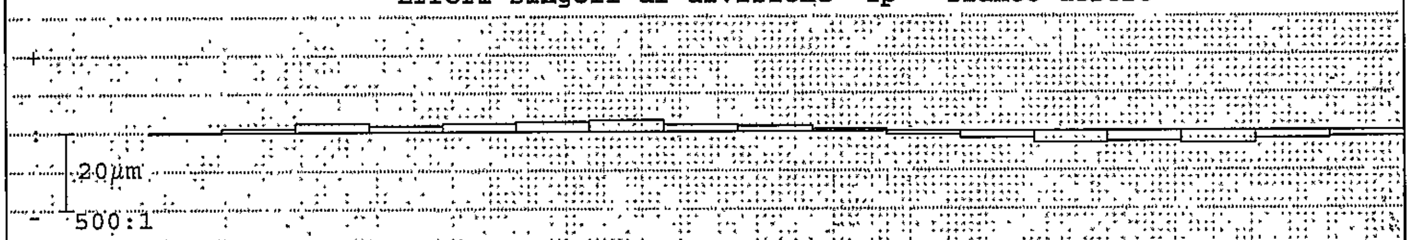
Errori singoli di divisione fp fianco sinistro



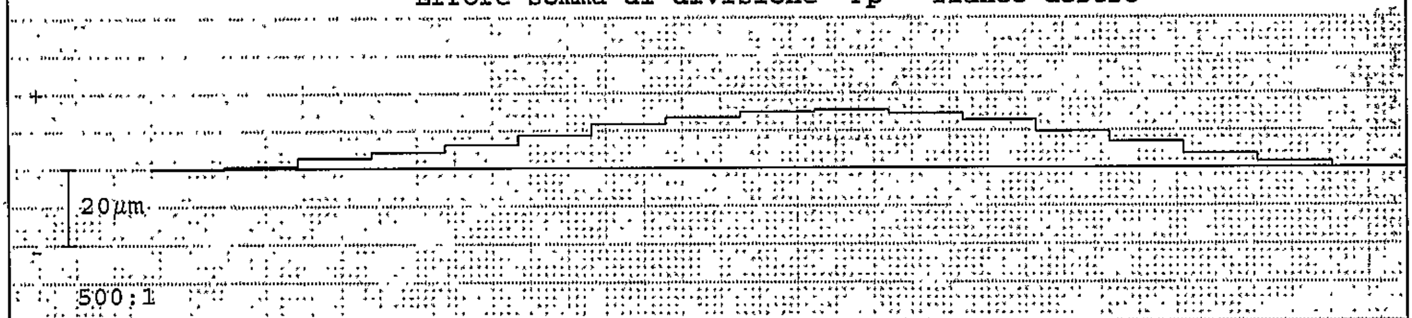
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



Errore somma di divisione Fp fianco destro

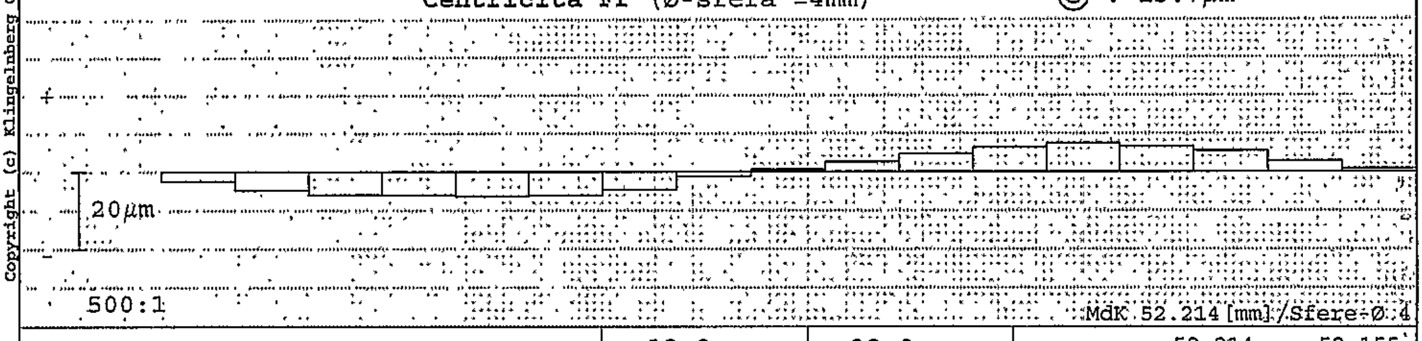


Corsa per misura divis.:46.388 z=10.3mm

		fianco sinistro		fianco destro / TIRO	
		Val.misur Qual.	Val. amm Qual.	Val.misur Qual.	Val. amm Qual.
Gr. err. singoli divisione	fp max	3.0	14.0	3.2	14.0
Gr. salto di passo	fu max	2.1	18.0	1.4	18.0
Scarto di divisione	Rp	5.5		6.1	
Err. globale di divisione	Fp	13.8	40.0	15.7	40.0
Err. cordale di divisione	Fpz/8	6.0		6.0	

Centricità Fr (Ø-sfera =4mm)

◎ : 13.7µm



Err. di concentricità	Fr	13.8	32.0	Val. amm	52.214	52.155
Variaz. spessore dente	Rs			Val.	52.181 52.182	52.18

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Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	03.10.2017 23:07
Denominazione:	Input Outer Z41	Numero denti z	41	Largh.fasc.dent. b	14.56mm
Numero disegno.:	D51.6.1218.35-IF	Modulo m	2.05mm	Tratto evolv. La	6.27mm
Commessa/serie nr.:	4.D61-2	Angolo pressione	17.5°	Tratto elica Lß	11.65mm
Masch.Nr.:	M001 Spindel: Formmessung	Angolo elica	28.9°	Inizio elab. MI	10.92mm
Untersuchungszweck:	Laufende Messung	Ø Base db	90.3267mm	Palpatore Ø	(#2)1mm
Werkzeug:	Charge:	Ang. Base	27.446°	Fat.scor.pr. x	.2

Testa

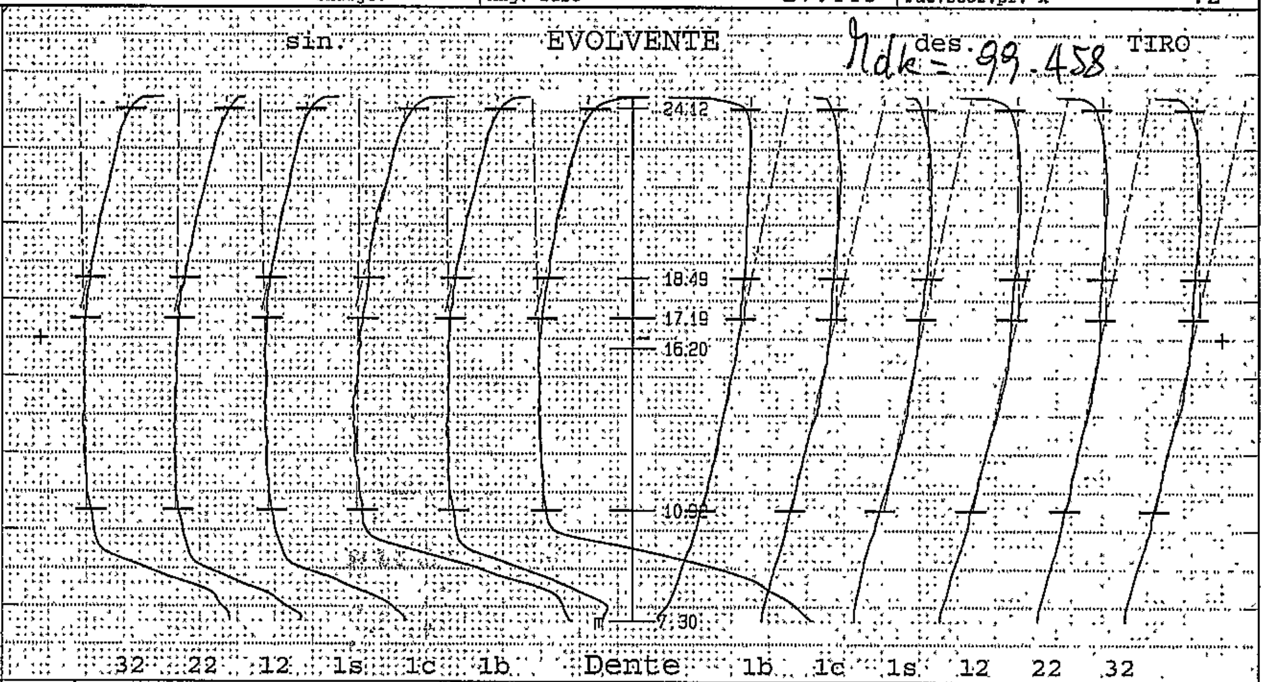
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm	±6	1.1	Var a 3.1							21±6	Var a 3.2						23.2	
fHα	±10	1.1	1.9	-0.8	2.3	-0.6	0.8	2.7		21±10	22.3	24.0	22.4	24.3	21.1	23.3	23.2	
Fα		1.8	2.0	1.3	2.0	2.6	1.9	2.1			1.5	2.2	2.2	2.4	2.0	2.0	2.2	
ffα	4	1.5	1.6	1.2	1.4	2.8	1.8	1.5		4	1.3	2.0	1.8	2.1	2.0	2.1	2.1	
Ca	-13/-5	-12.4	-12.3	-12.2	-12.3	-12.4	-12.7	-14.0		-13/-5	-9.7	-11.7	-11.0	-12.7	-11.7	-12.5	-12.2	
ffαf	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]		89.324	[89.15/89.5]								103.099	[102.94/103.2]						

Sotto

20 µm

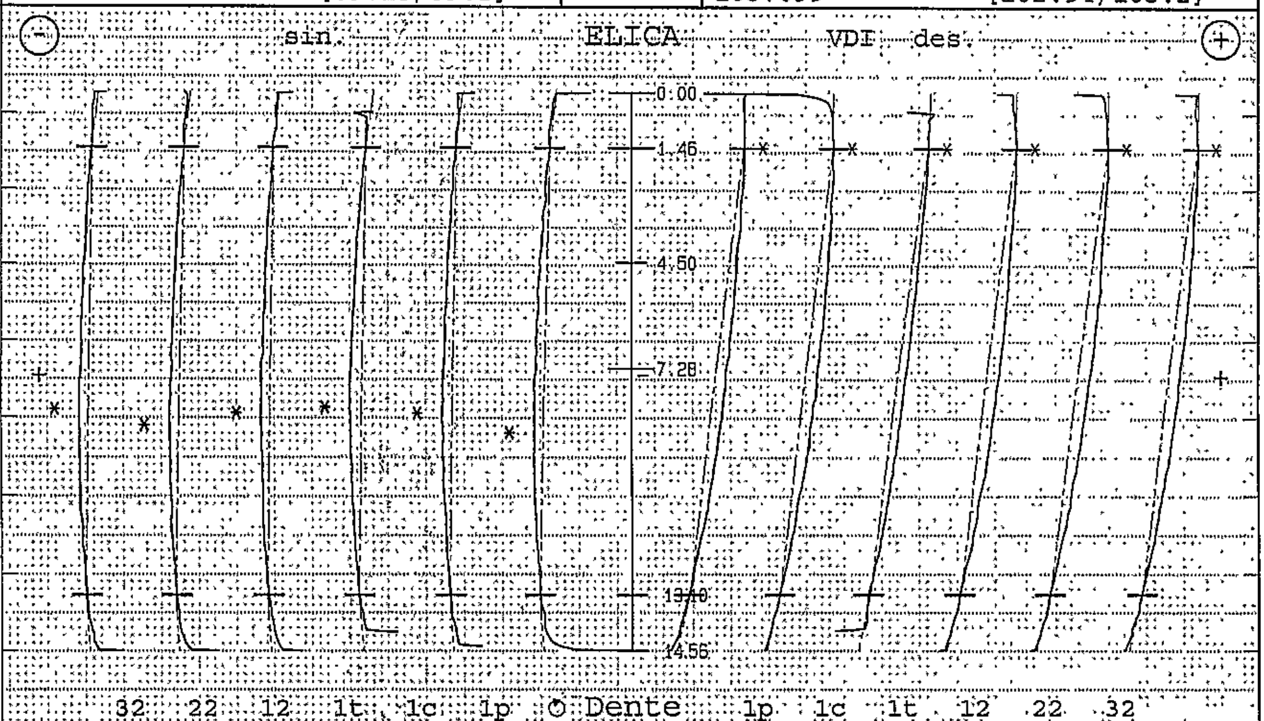
Va500:1

Vb5:1

2 mm

Sopra

N.: Z



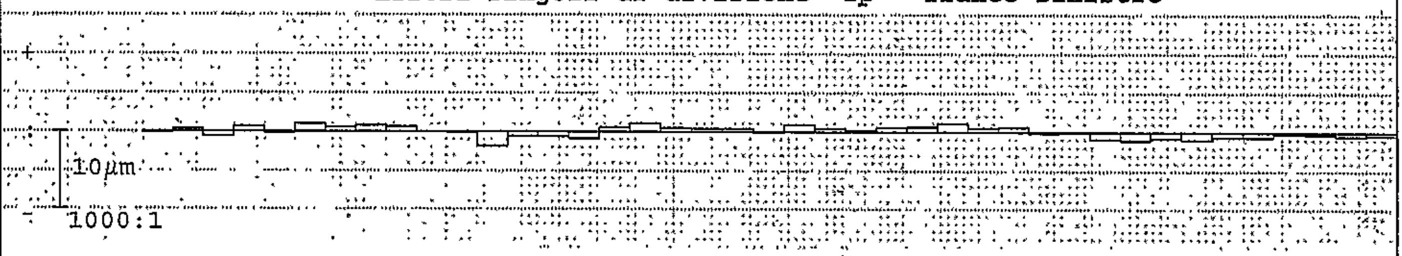
Tolerance		Medio								Tolerance							Medio	
fHßm	±6	2.5	Var ß 0.8							20±6	Var ß 1.3						18.6	
fHß	±13	2.5	2.2	3.0	2.3	2.6	2.4	3.5		20±13	18.1	17.9	19.4	18.5	19.2	18.6	18.6	
Fß		2.7	2.6	3.1	2.3	3.4	2.8	3.5			2.8	3.4	1.6	2.7	2.5	2.8	2.9	
ffß	4	0.8	0.9	0.9	0.6	0.7	0.8	0.9		4	0.9	0.8	0.8	0.7	0.8	0.7	0.8	
Cß	1/5	2.4	2.3	2.4	2.3	3.0	2.4	2.5		1/5	2.8	3.2	2.2	3.1	3.3	3.1	3.2	
Bd		-0.9															1.3	

GCG 808006

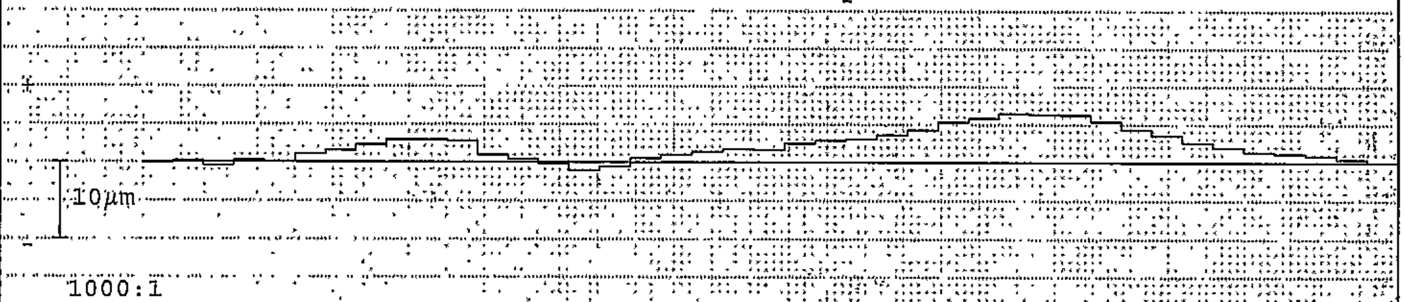
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	03.10.2017 23:07
Denominazione:	Input Outer Z41	Numero denti z	41	Angolo pressione	17.5°
Numero disegno.:	D51.6.1218.35-IF	Modulo m	2.05mm	Angolo elica	28.9°
Commessa/serie nr.:	4.D61-2	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formmeister	Werkzeug:	Charge:	

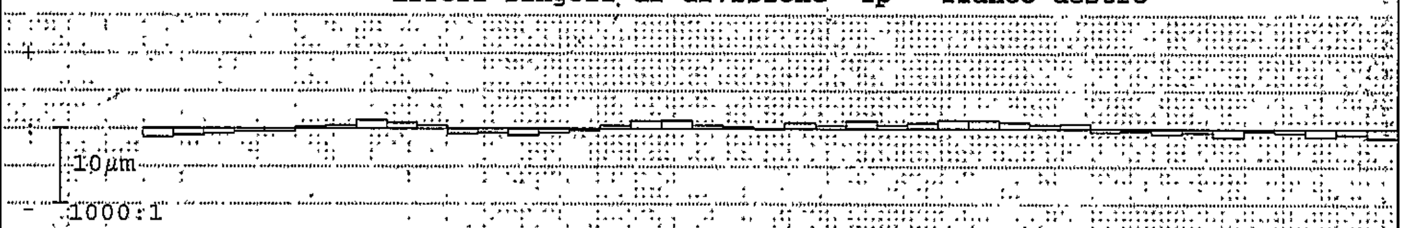
Errori singoli di divisione fp fianco sinistro



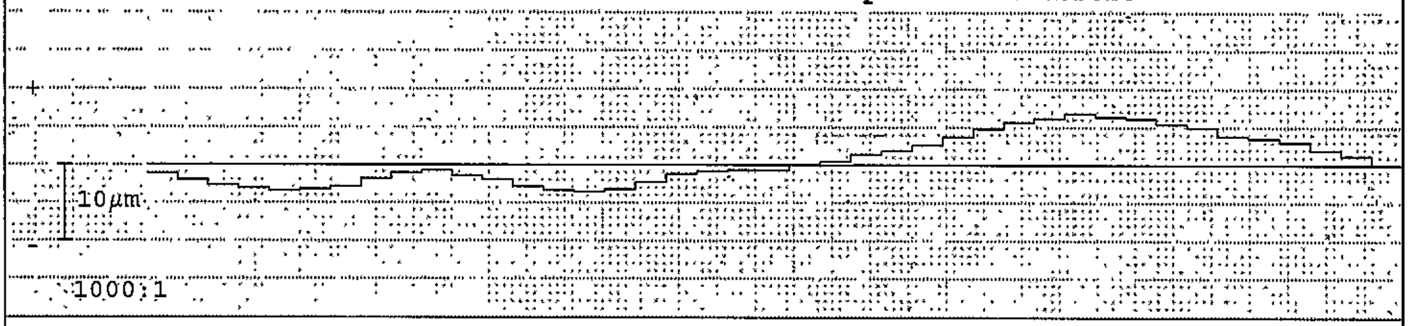
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



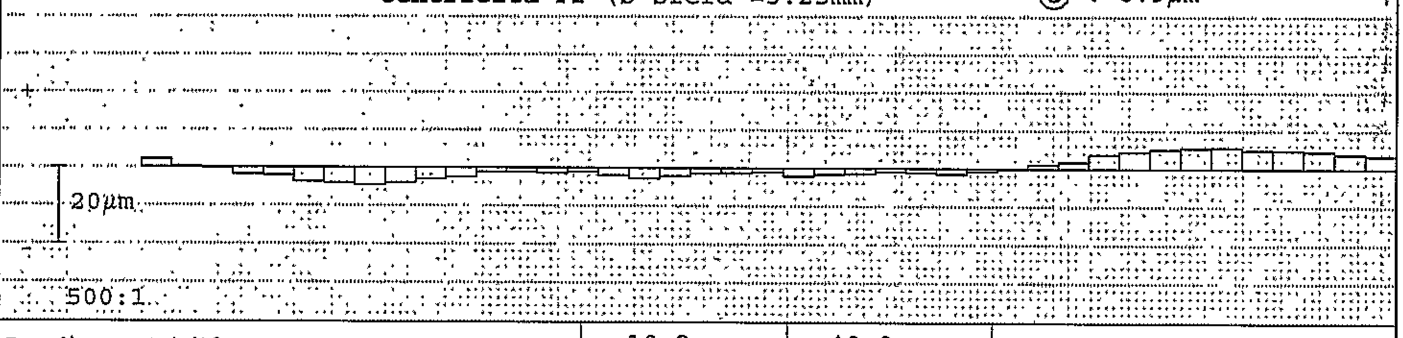
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:95.962 z=4.5mm

		fianco sinistro				fianco destro /	TIRO
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	1.8		14.0		1.2		14.0	
Gr. salto di passo	fu max	1.7		18.0		1.1		18.0	
Scarto di divisione	Rp	2.9				2.3			
Err. globale di divisione	Fp	7.5		50.0		10.4		50.0	
Err. cordale di divisione	Fpz/8	4.3				5.0			

Centricità Fr (Ø-sfera =3.25mm) ◎ : 6.9µm



Err. di concentricità	Fr	10.2	40.0	
Variaz. spessore dente	Rs			

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	02.10.2017 19:43
Denominazione:	Input Outer Z17	Numero denti z	17	Largh.fasc.dent. b	20.5mm
Numero disegno.:	D51.6.1218.35-IIF	Modulo m	2.35mm	Tratto evolv. La	6.84mm
Commessa/serie nr.:	4.D5C-2	Angolo pressione	20°	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formmess	Angolo elica	26°	Inizio elab. M1	4.82mm
Untersuchungszweck:	Laufende Messung	Ø Base db	41.1986mm	Palpatore Ø	(#2) 1mm
Werkzeug:	Charge:	Ang. Base	24.326°	Fat.scor.pr. x	.7

Testa

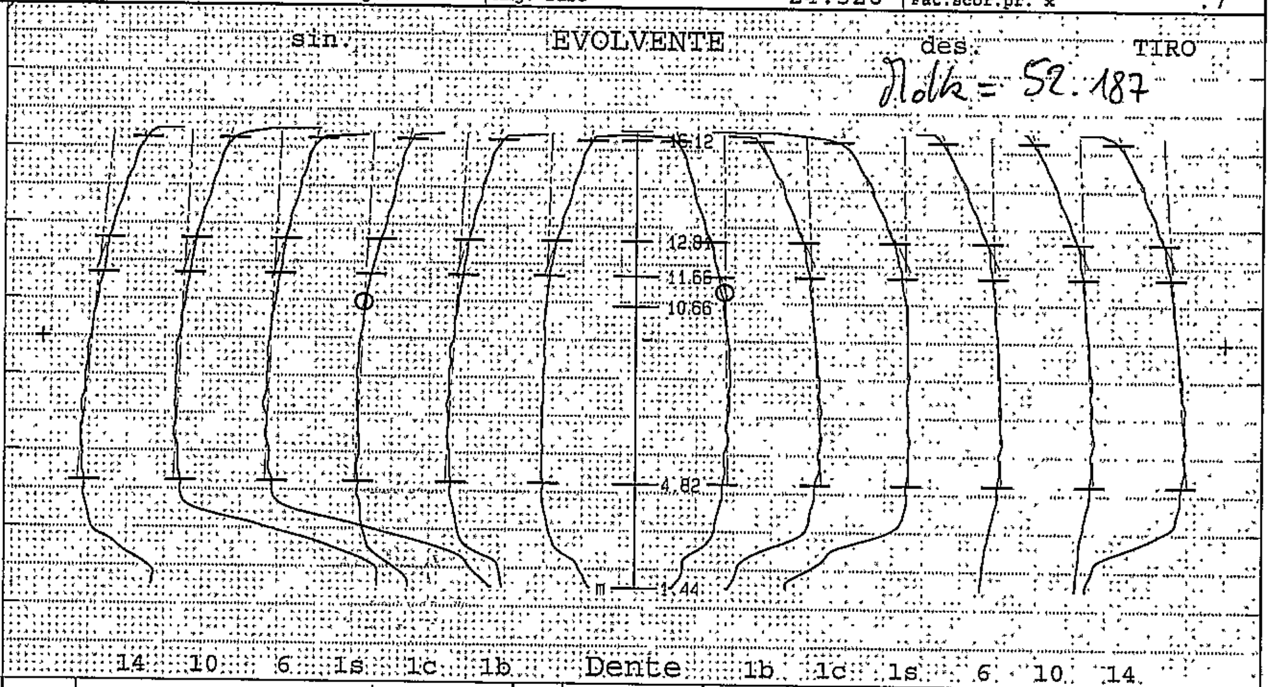
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm	±6	-5.8	Var a 5.0							±6	Var a 3.5						-4.6	
fHα	±10	-5.8	-9.1	-4.5	-4.1	-4.7	-5.4	-2.6		±10	-1.4	-4.5	-1.7	-3.1	-4.1	-6.6	-4.6	
Fα		4.8	6.0	4.2	4.5	3.8	4.3	2.0			3.1	3.3	2.3	2.6	3.0	4.2	3.3	
ffα	4	2.9	2.9	3.0	3.4	2.3	2.3	1.0		4	2.7	2.5	1.6	1.7	1.7	2.5	2.1	
Cα	-13/-5	-9.0	-8.2	-10.1	-9.3	-9.4	-8.3	-10.0		-13/-5	-11.9	-11.9	-15.2	-12.1	-11.5	-11.2	-11.7	
ffαf	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]		39.034					[38.9/39.2]				52.886					[52.74/53]		

Sotto

20 µm

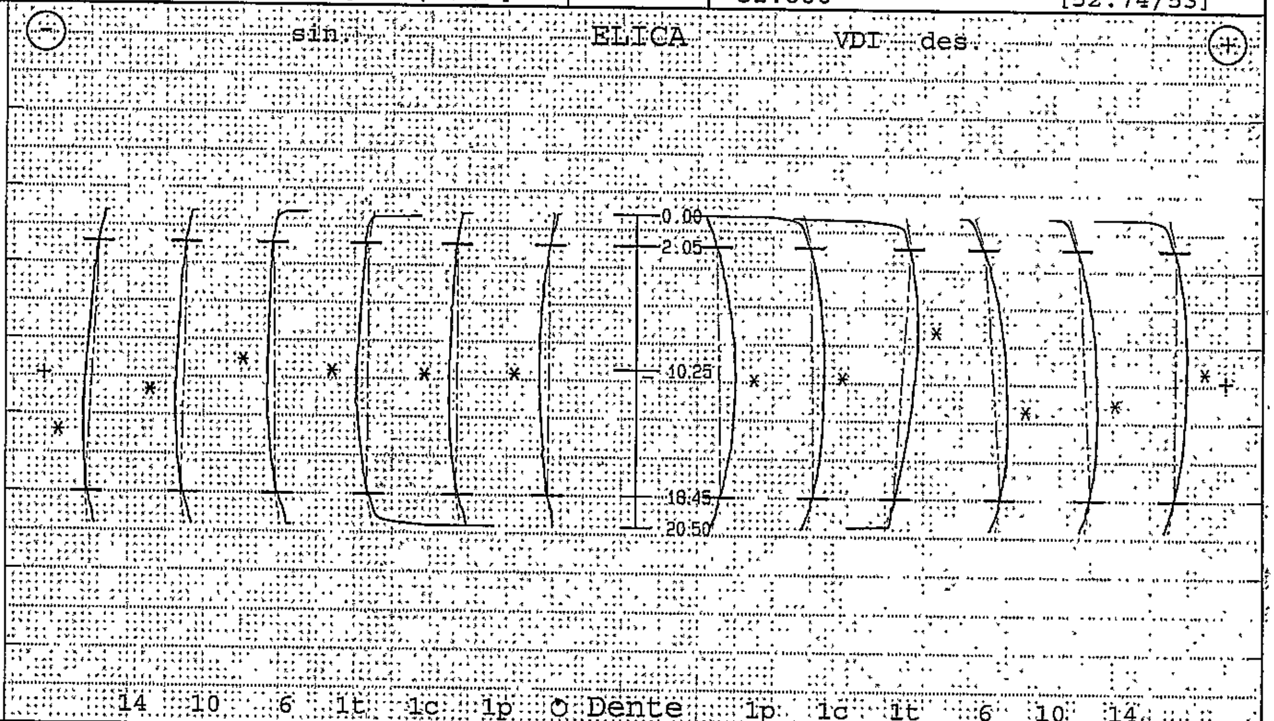
Va500:1

Vb2:1

5 mm

Sopra

N:Z



		Medio																
fHßm	±6	1.6	Var ß 5.1							±6	Var ß 5.7						-2.5	
fHß	±13	1.6	4.5	2.0	-0.6	0.3	0.5	0.5		±13	-1.5	-0.8	5.6	-5.5	-4.0	0.2	-2.5	
Fß		2.3	3.5	2.2	1.9	2.6	1.6	2.1			4.1	3.0	5.2	5.8	4.6	2.6	4.0	
ffß	4	0.9	0.8	0.9	0.9	1.1	0.9	0.6		4	0.6	0.7	0.9	0.9	0.7	0.6	0.7	
Cß	1/5	2.0	1.8	2.1	2.0	2.8	2.1	2.5		1/5	4.3	3.2	3.4	3.5	3.2	3.1	3.3	
Bd		-0.2																

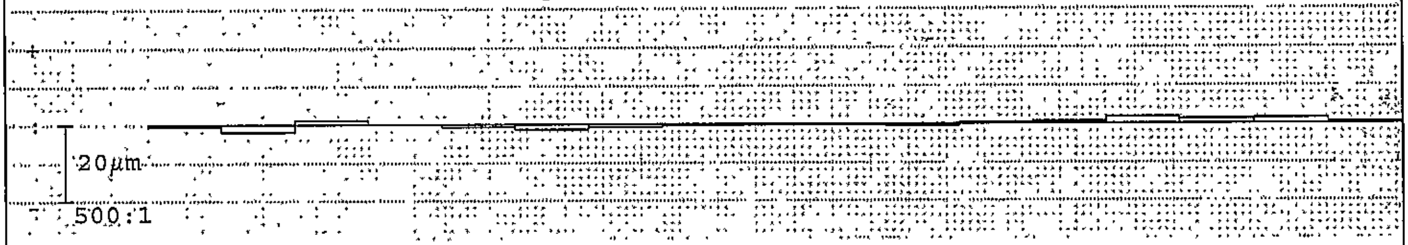
GCG 808006

KLINGELNBERG

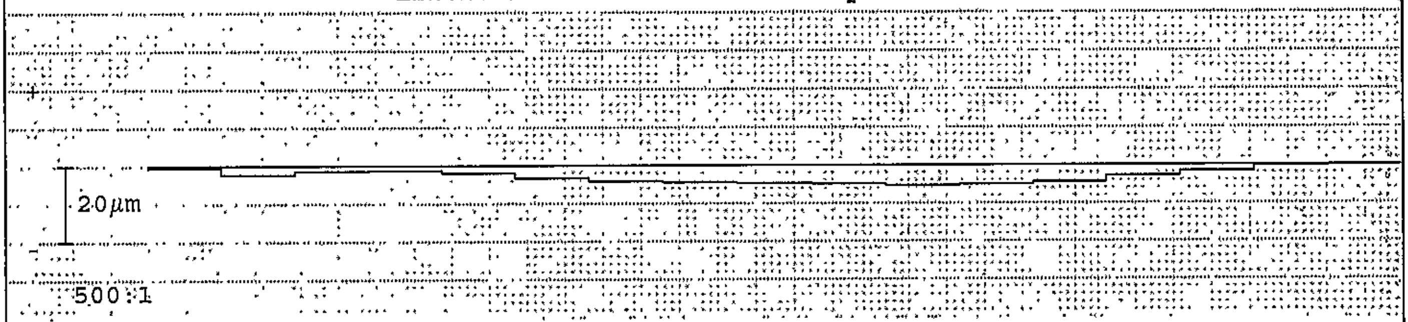
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	02.10.2017 19:43
Denominazione:	Input Outer Z17	Numero denti z	17	Angolo pressione	20°
Numero disegno.:	D51.6.1218.35-IIF	Modulo m	2.35mm	Angolo elica	26°
Commessa/serie nr.:	4.D5C-2	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formmeßzeug:	Formtest 1	Charge:	

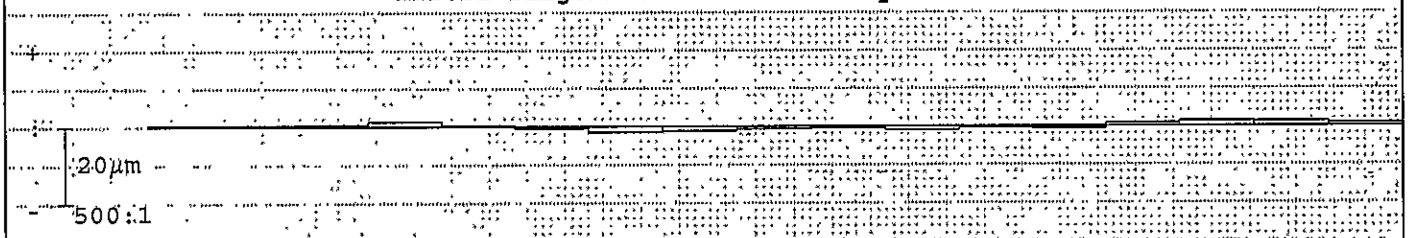
Errori singoli di divisione fp fianco sinistro



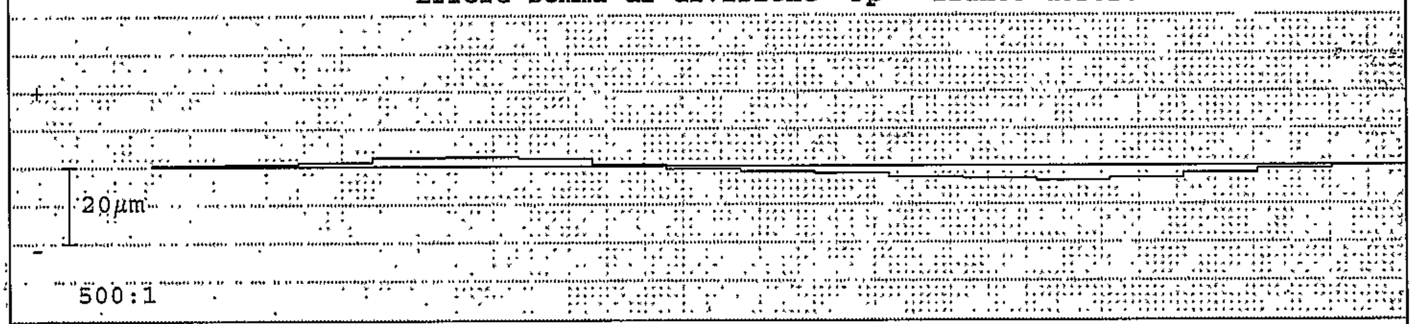
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



Errore somma di divisione Fp fianco destro

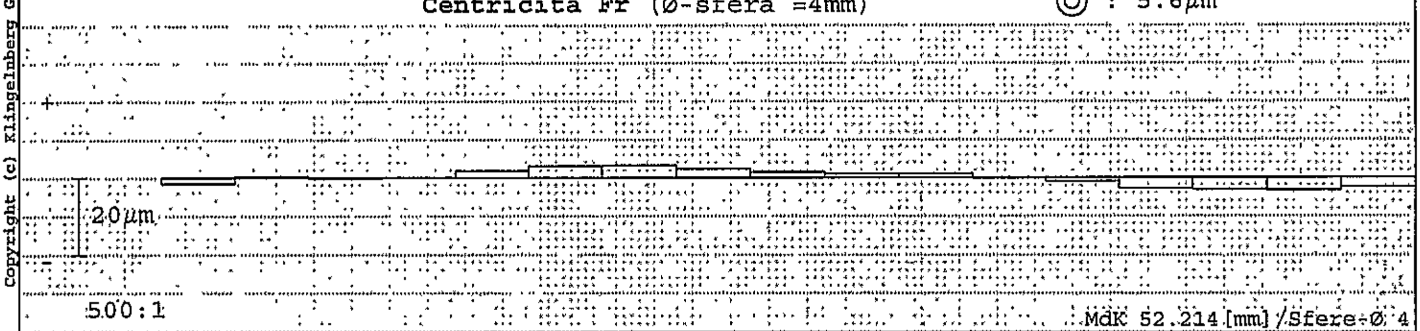


Corsa per misura divis.:46.388 z=10.3mm

		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	1.9		14.0		1.6		14.0	
Gr. salto di passo	fu max	3.0		18.0		1.3		18.0	
Scarto di divisione	Rp	3.6				2.9			
Err. globale di divisione	Fp	5.5		40.0		6.5		40.0	
Err. cordale di divisione	Fpz/8	2.9				2.8			

Centricità Fr (Ø-sfera =4mm)

◎ : 5.6µm



Err. di concentricitá	Fr	6.6	32.0	Val. amm	52.214	52.155
Variaz. spessore dente	Rs			Val.	52.181 52.183	52.18

KLINGELNBERG

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0 PNC35 B4784	Controllore: Turno C		Data: 03.10.2017 22:28
Denominazione: Input Outer Z41	Numero denti z	41	Largh.fasc.dent. b 14.56mm
Numero disegno.: D51.6.1218.35-IF	Modulo m	2.05mm	Tratto evolv. La 6.27mm
Commessa/serie nr.: 4.D61-103	Angolo pressione	17.5°	Tratto elica Lß 11.65mm
Masch.Nr.: M001 Spindel: Formmeast	Angolo elica	28.9°	Inizio elab. MI 10.92mm
Untersuchungszweck: Laufende Messung	Ø Base db	90.3267mm	Palpatore Ø (#2)1mm
Werkzeug: Charge:	Ang. Base	27.446°	Fat.scor.pr. x .2

Testa

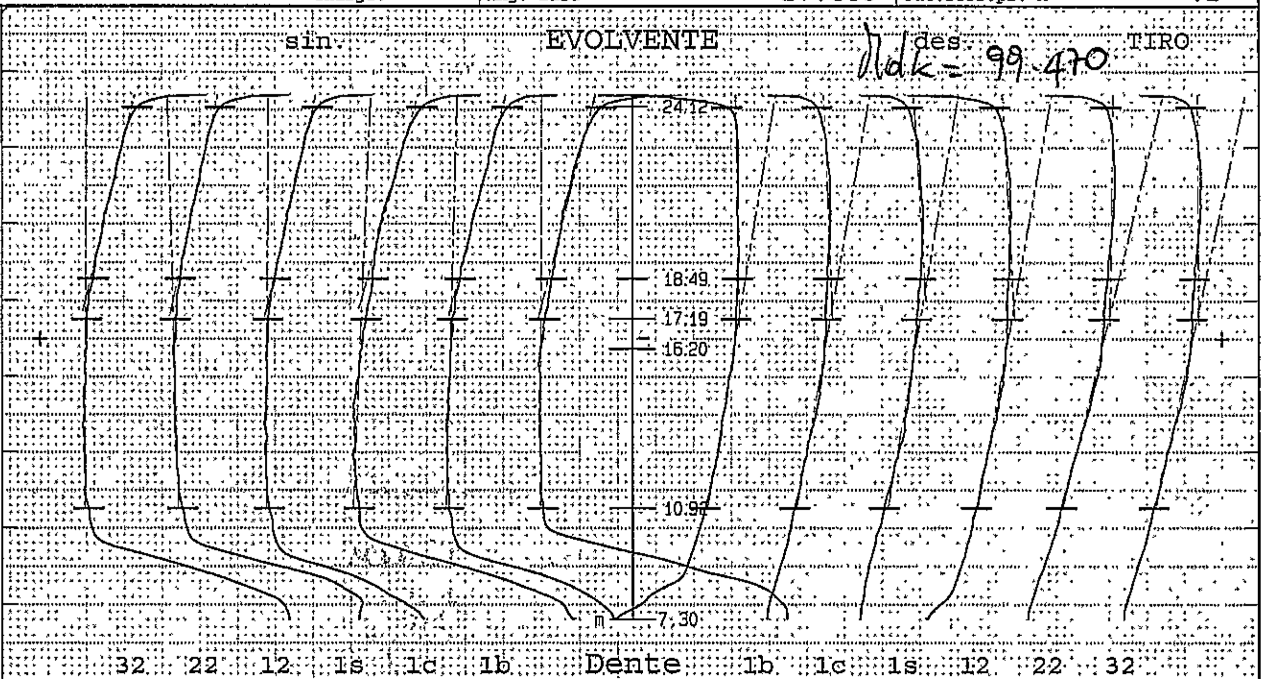
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance	Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm ±6	-0.3	Var a 5.6						.	21±6	Var a 6.9						21.7	
fHα ±10	-0.3	-0.5	2.8	-0.6	-4.5	-2.8	-0.5		21±10	17.5	18.9	18.2	18.9	25.8	23.2	21.7	
Fα	1.7	1.5	2.3	1.2	3.5	1.7	1.5			2.2	2.3	2.8	2.4	2.8	1.9	2.4	
ffα 4	1.4	1.6	1.5	1.3	2.6	1.2	1.5		4	1.1	1.9	2.0	2.0	2.0	2.1	2.0	
Cα -13/-5	-12.1	-12.0	-12.6	-11.9	-11.8	-12.0	-13.2		-13/-5	-10.0	-11.7	-11.3	-12.4	-12.5	-12.2	-12.2	
ffαf 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]	89.275				[89.15/89.5]					103.059				[102.94/103.2]			

Sotto

20 µm

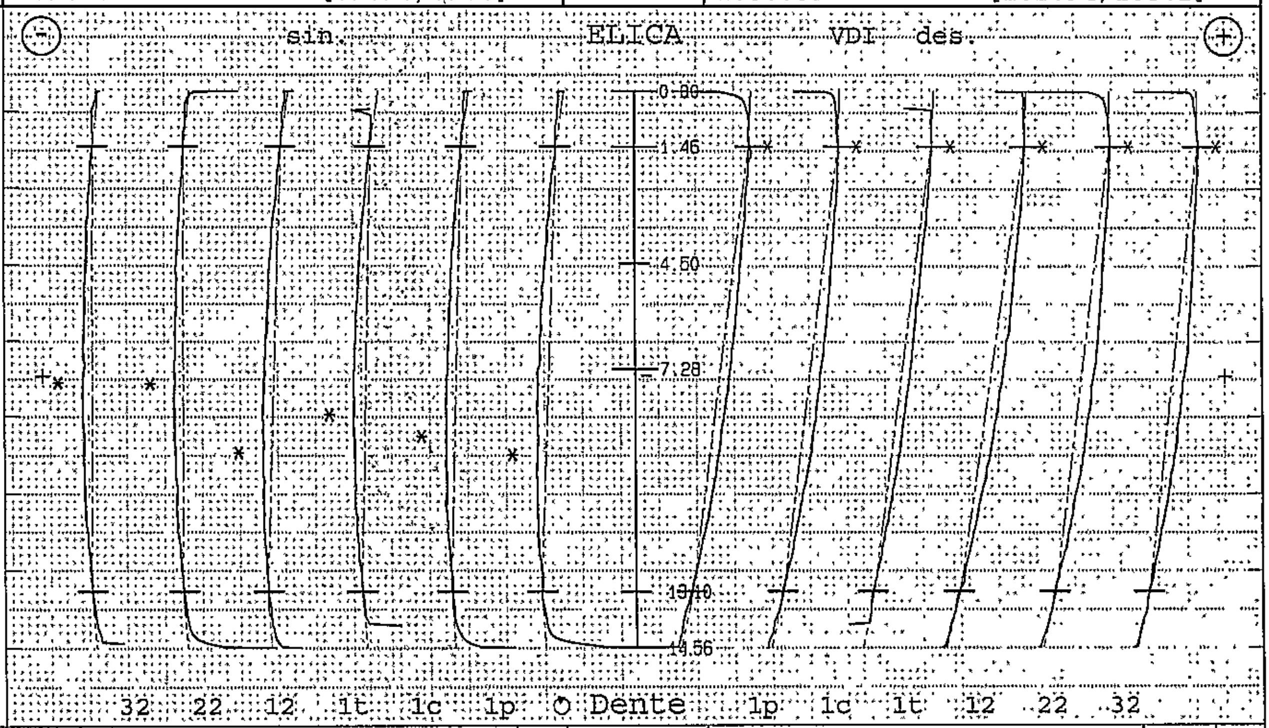
Va500:1

Vb5:1

2 mm

Sopra

N;Z



Tolerance	Medio							Qual	Tolerance							Medio	Qual
fHßm ±6	2.6	Var ß 4.1							20±6	Var ß 5.3						18.6	
fHß ±13	2.6	0.8	0.8	4.9	3.2	3.8	5.2		20±13	19.0	18.6	19.3	21.5	17.9	16.2	18.6	
Fß	2.9	1.9	1.8	4.2	5.2	3.7	4.6			1.9	2.6	1.6	3.4	3.0	4.0	3.3	
ffß 4	0.9	0.9	0.7	0.9	0.6	0.9	0.9		4	1.2	0.8	0.8	0.8	0.8	0.9	0.8	
Cß 1/5	2.5	2.4	2.4	2.6	3.1	2.5	2.7		1/5	2.5	2.9	2.1	3.0	3.2	3.1	3.1	
Bd	-2.0															0.3	

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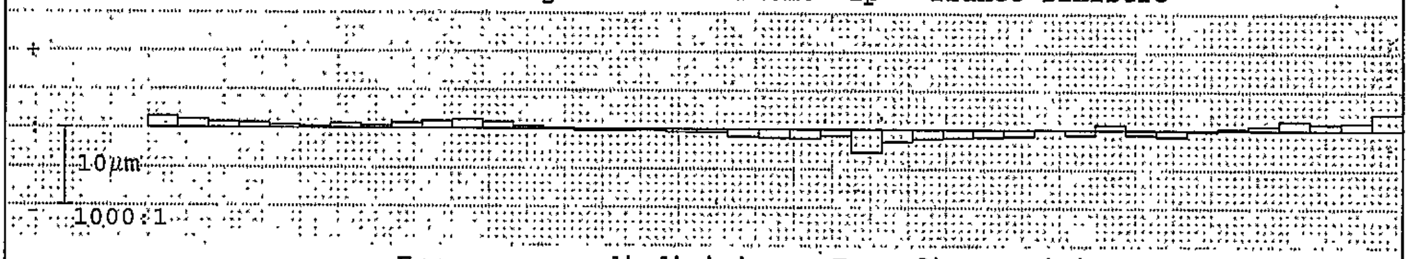
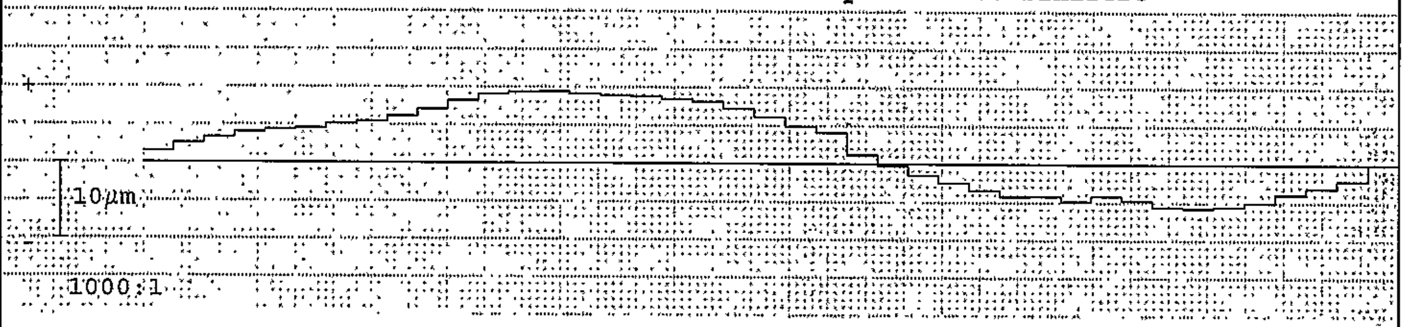
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0 PNC35 B4784		Controllore:	Turno C	Data:	03.10.2017 22:28
Denominazione:	Input Outer Z41	Numero denti z	41	Angolo pressione	17.5°
Numero disegno.:	D51.6.1218.35-IF	Modulo m	2.05mm	Angolo elica	28.9°
Commessa/serie nr.:	4.D61-11	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001 Spindel: Formmeßt 1	Satzzeug:		Charge:	

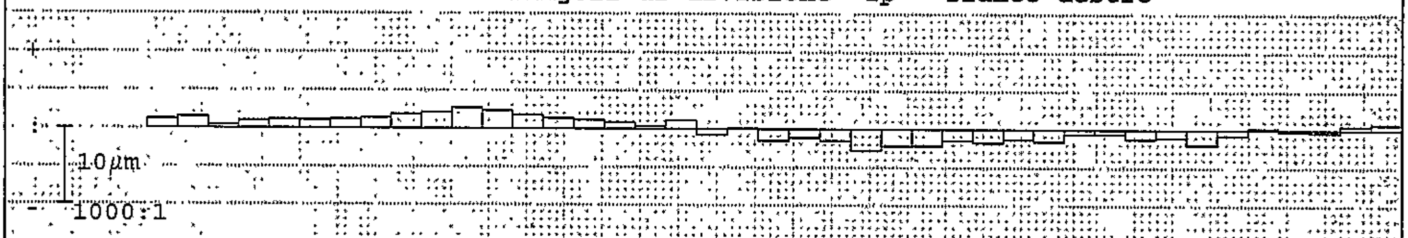
Errori singoli di divisione fp fianco sinistro



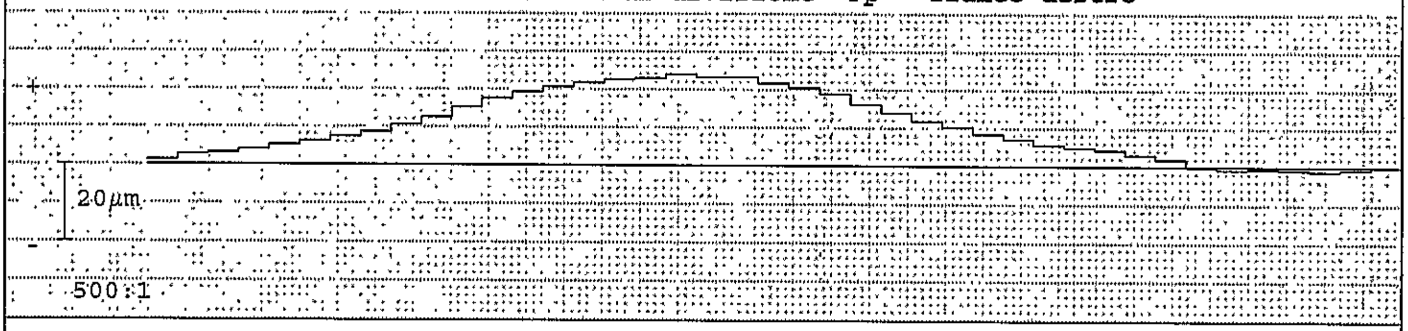
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



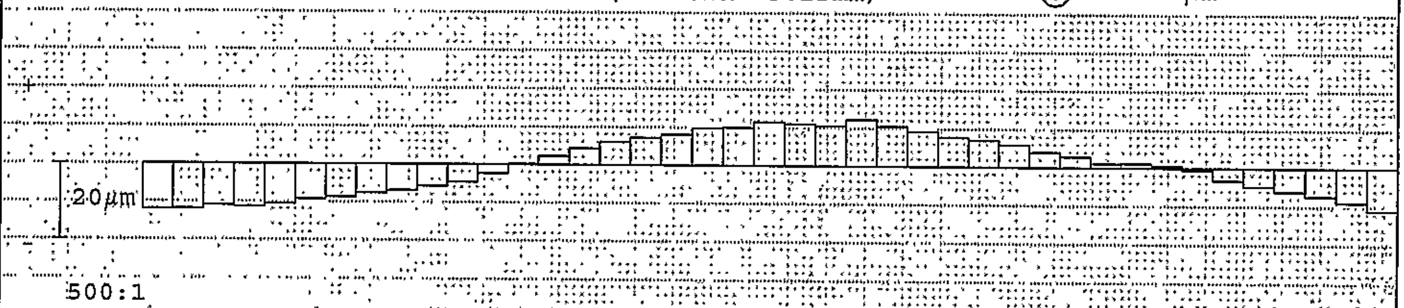
Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 95.962 z=4.5mm

		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2.9		14.0		2.8		14.0	
Gr. salto di passo	fu max	2.1		18.0		1.9		18.0	
Scarto di divisione	Rp	5.0				5.4			
Err. globale di divisione	Fp	15.1		50.0		25.1		50.0	
Err. cordale di divisione	Fpz/8	7.5				10.6			

Centricità Fr (Ø-sfera =3.25mm) ◎ : 22.2µm



Err. di concentricitá	Fr	24.2	40.0	
Variaz. spessore dente	Rs			

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	02.10.2017 20:59
Denominazione:	Input Outer Z17	Numero denti z	17	Largh.fasc.dent. b	20.5mm
Numero disegno.:	D51.6.1218.35-IIF	Modulo m	2.35mm	Tratto evolv. La	6.84mm
Commessa/serie nr.:	34.D5C-[illegible]	Angolo pressione	20°	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formmess	Angolo elica	26°	Inizio elab. M1	4.82mm
Untersuchungszweck:	Laufende Messung	Ø Base db	41.1986mm	Palpatore Ø	(#2)1mm
Werkzeug:	Charge:	Ang. Base	24.326°	Fat.scor.pr. x	.7

Testa

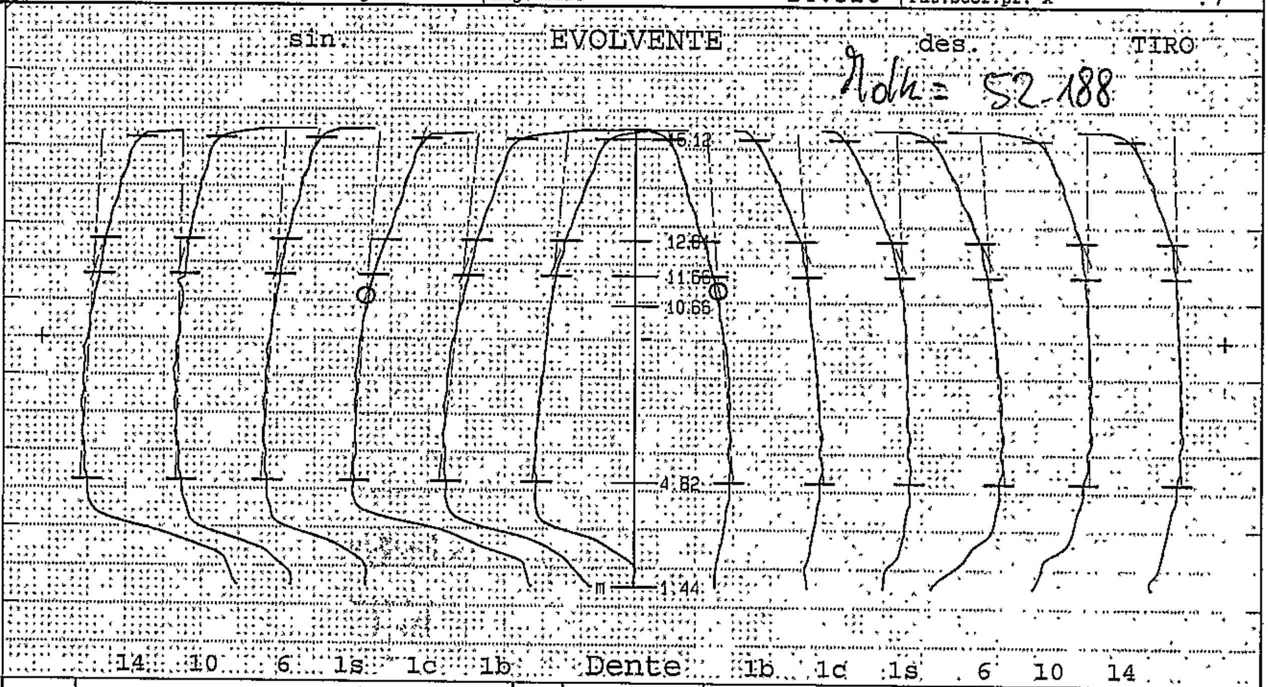
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm	±6	-5.8	Var a 8.4						.	±6	Var a 5.9						-4.3	
fHα	±10	-5.8	-5.5	-1.6	-6.2	-7.3	-10.0	-8.9	.	±10	-7.2	-7.1	-3.9	-6.7	-1.2	-2.2	-4.3	
Fα		4.7	4.7	3.0	4.5	5.3	6.7	5.5			4.9	4.3	3.2	4.4	2.2	2.1	3.3	
ffα	4	2.8	3.1	2.7	2.5	2.6	2.8	1.6		4	2.3	1.7	1.2	2.4	2.5	1.9	2.1	
Cα	-13/-5	-9.0	-9.2	-8.6	-8.5	-11.3	-9.5	-10.0		-13/-5	-9.7	-10.8	-13.1	-12.2	-11.4	-10.9	-11.3	
ffαf	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]		39.036					[38.9/39.2]				52.889					[52.74/53]		

Sotto

20 µm

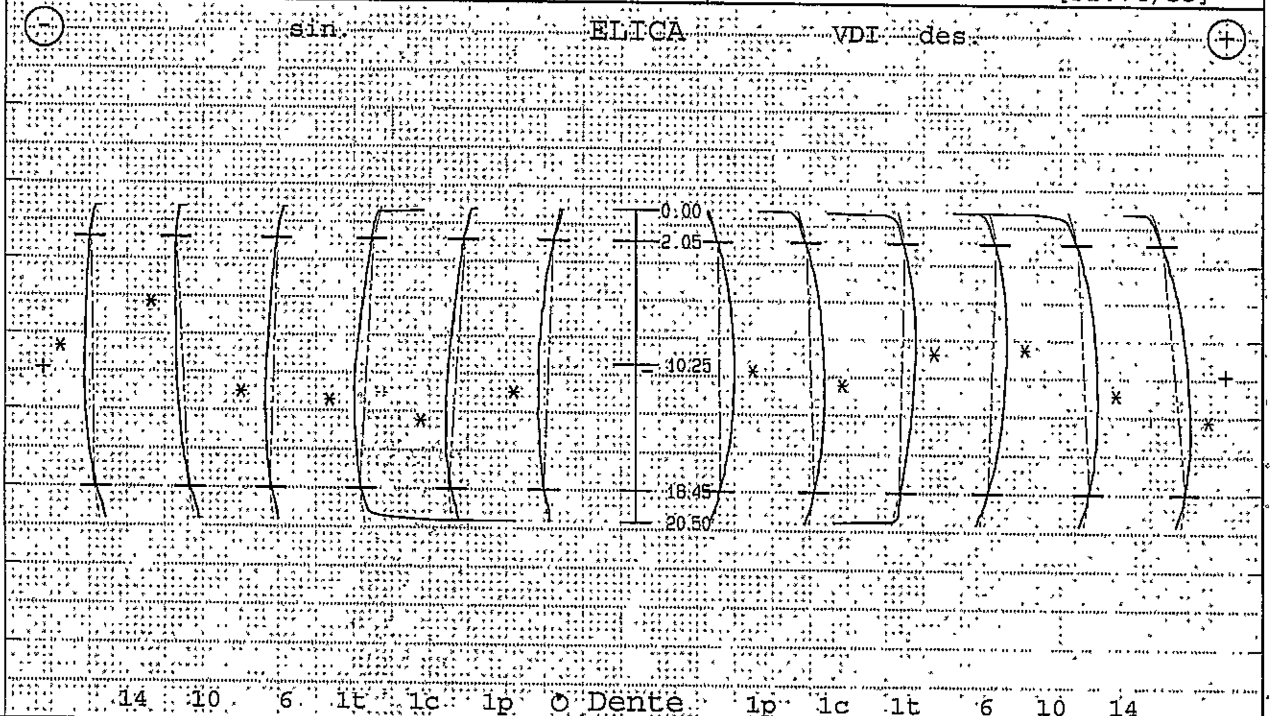
Va500:1

Vb2:1

5 mm

Sopra

N:Z



fHßm	±6	0.6	Var ß 9.4							±6	Var ß 10.3						-3.0	
fHß	±13	0.6	-1.2	-4.2	2.4	4.4	5.2	3.0		±13	-0.9	-2.8	1.8	2.6	-4.0	-7.7	-3.0	
Fß		3.2	2.2	4.0	2.4	3.8	4.1	3.7			3.6	4.1	3.0	4.2	4.8	7.2	5.1	
ffß	4	0.9	0.9	0,8	0.8	0.9	1.1	0.7		4	0.5	0.6	0.9	0.6	0.7	0.7	0.7	
Cß	1/5	2.1	2.3	1.8	2.0	2.9	2.2	2.6		1/5	4.0	3.6	3.4	3.7	3.5	3.6	3.6	
Bd		1.4															[illegible]	

GCG 808006

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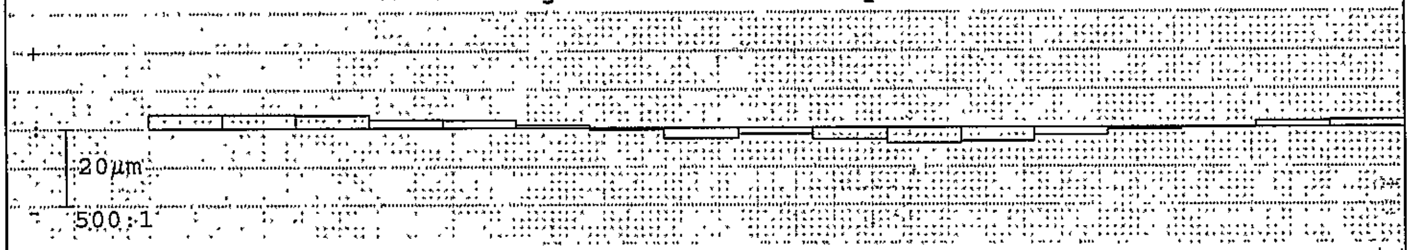
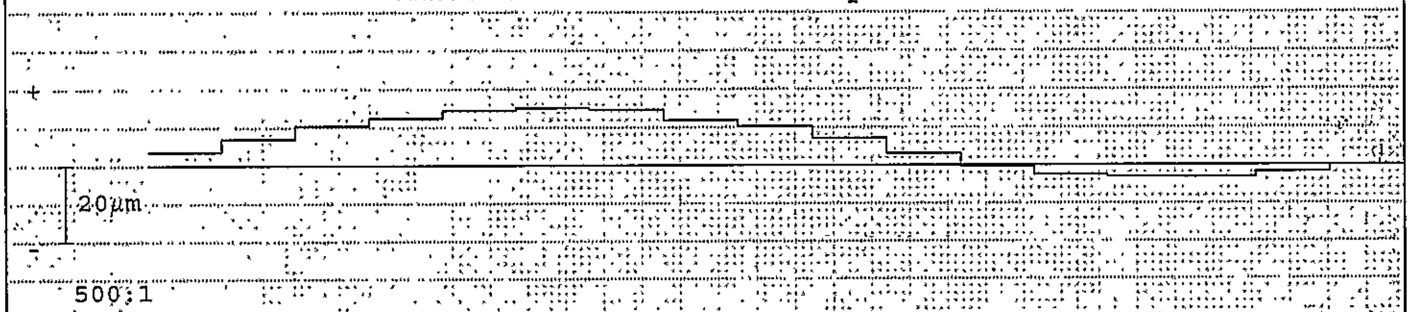
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	02.10.2017 20:59
Denominazione:	Input Outer Z17	Numero denti z	17	Angolo pressione	20°
Numero disegno.:	D51.6.1218.35-IIF	Modulo m	2.35mm	Angolo elica	26°
Commessa/serie nr.:	34.D5C-11	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formmeßkeil	Satzzeig:	Charge:	

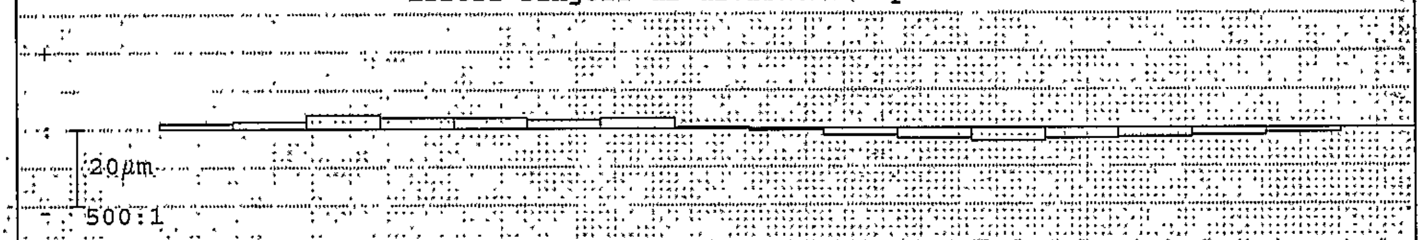
Errori singoli di divisione fp fianco sinistro



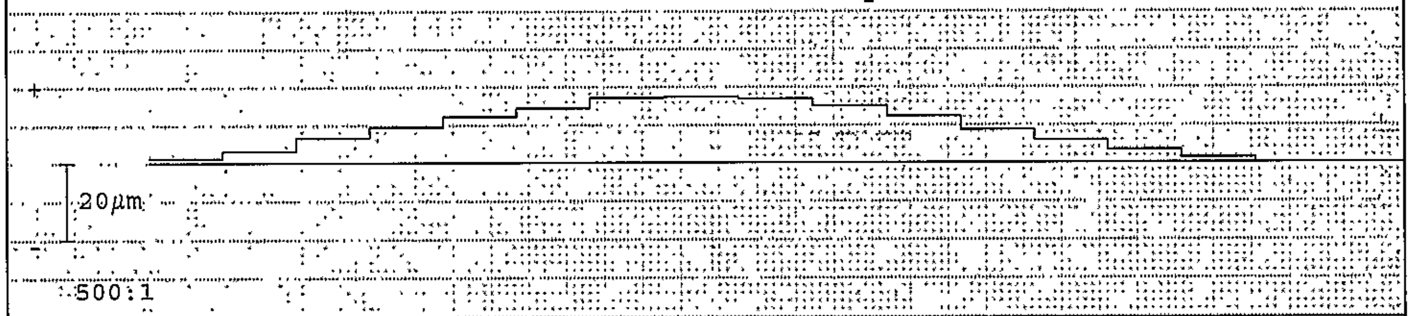
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



Errore somma di divisione Fp fianco destro

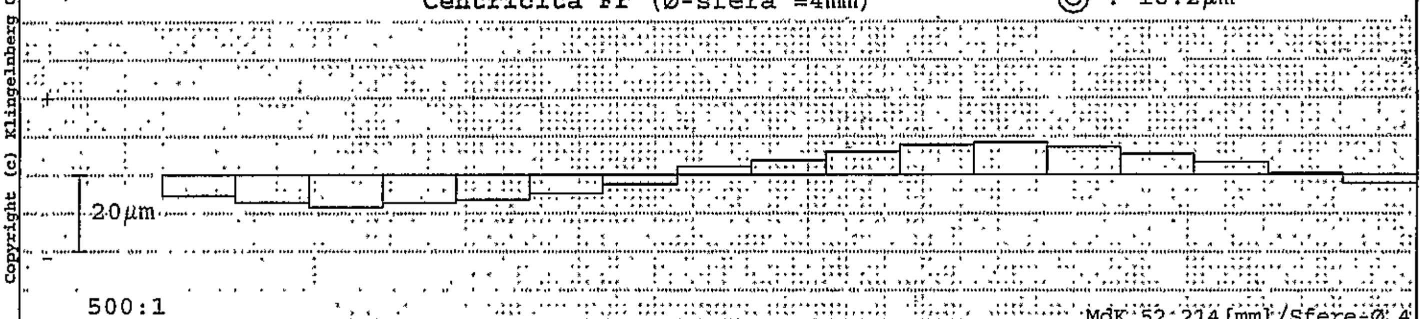


Corsa per misura divis.:46.388 z=10.3mm

		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	4.1		14.0		3.5		14.0	
Gr. salto di passo	fu max	2.2		18.0		2.3		18.0	
Scarto di divisione	Rp	7.6				7.0			
Err. globale di divisione	Fp	18.3		40.0		17.4		40.0	
Err. cordale di divisione	Fpz/8	7.6				6.4			

Centricità Fr (Ø-sfera =4mm)

◎ : 16.2µm

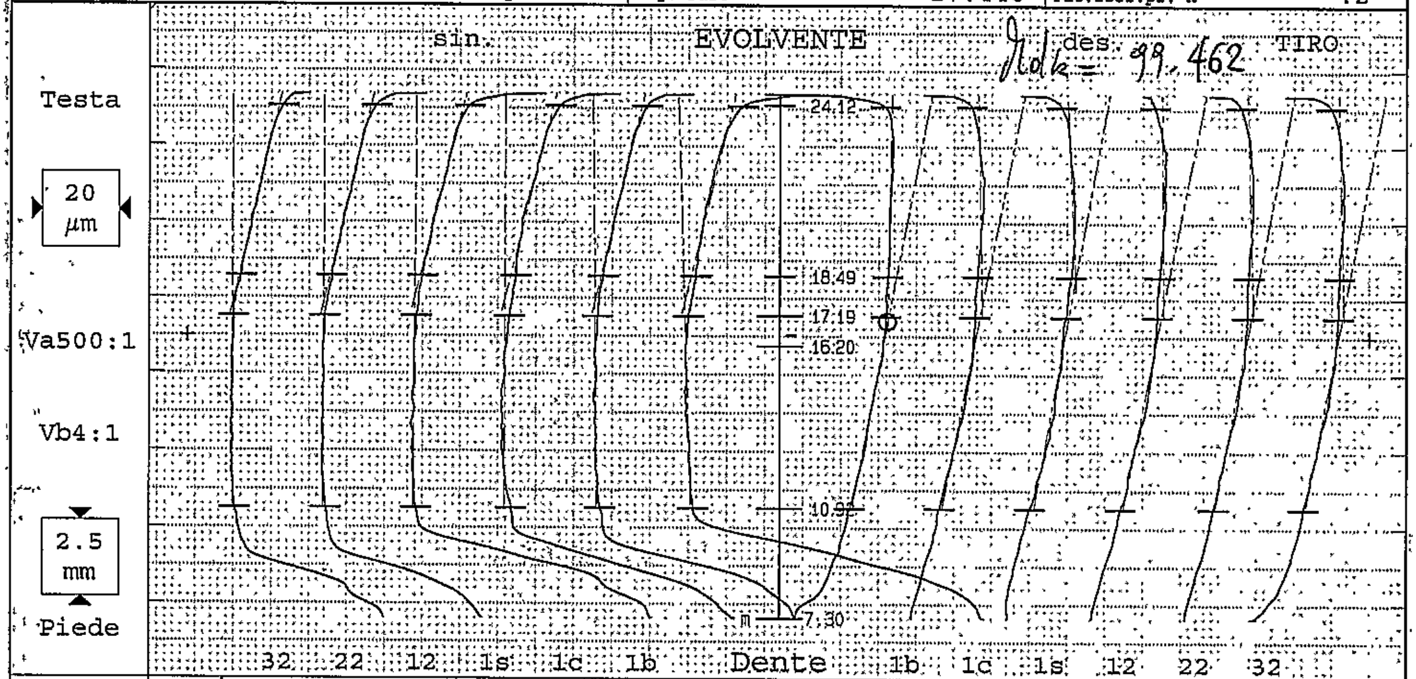


MdK 52.214 [mm] / Sfere-Ø 4

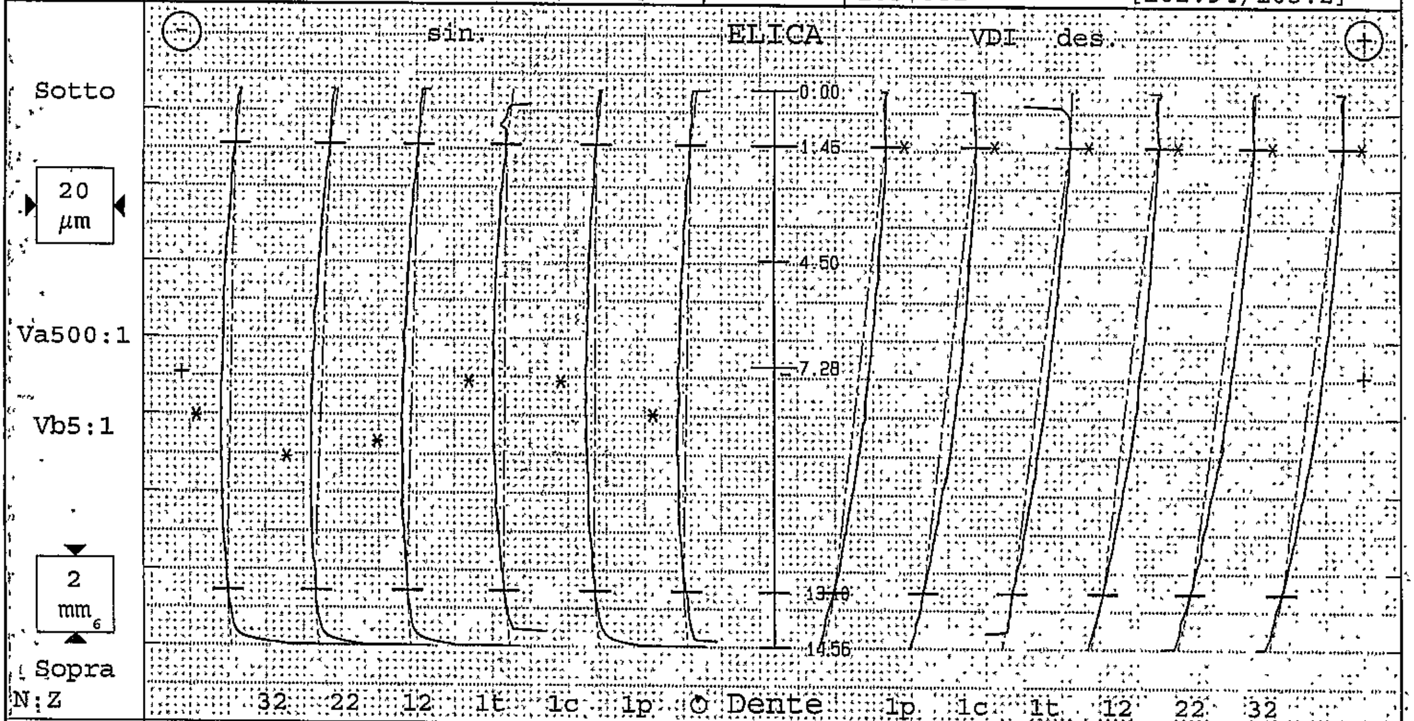
Err. di concentricità	Fr	16.9	32.0	Val. amm	52.214	52.155
Variaz. spessore dente	Rs			Val. 52.179	52.18	52.178

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	03.10.2017 21:45
Denominazione:	Input Outer Z41	Numero denti z	41	Largh.fasc.dent. b	14.56mm
Numero disegno.:	D51.6.1218.35-IF	Modulo m	2.05mm	Tratto evolv. La	6.27mm
Commessa/serie nr.:	4.D61-1~~5~~4	Angolo pressione	17.5°	Tratto elica Lß	11.65mm
Masch.Nr.:	M001 Spindel: Formnest	Angolo elica	28.9°	Inizio elab. M1	10.92mm
Untersuchungszweck:	Laufende Messung	Ø Base db	90.3267mm	Palpatore Ø	(#2) 1mm
Werkzeug:	Charge:	Ang. Base	27.446°	Fat.scor.pr. x	.2



Tolerance	Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm ±6	-0.1	Var a 1.9							21±6	Var a 1.1						20.8	
fHα ±10	-0.1	-0.2	-0.3	-0.9	-0.3	1.0	3.1		21±10	20.5	21.2	19.3	21.1	20.1	20.6	20.8	
Fα	1.3	1.0	1.0	1.5	2.5	1.7	2.0			1.4	2.0	2.1	1.8	2.0	2.0	2.0	
ffα 4	1.3	1.0	1.1	1.6	2.6	1.4	1.4		4	1.2	2.1	2.0	1.8	1.8	1.9	1.9	
Cα -13/-5	-12.6	-12.2	-12.6	-12.5	-12.7	-12.9	-14.1		-13/-5	-10.0	-11.7	-10.5	-11.0	-11.6	-11.9	-11.6	
ffαf 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]	89.288	[89.15/89.5]								103.081	[102.94/103.2]						

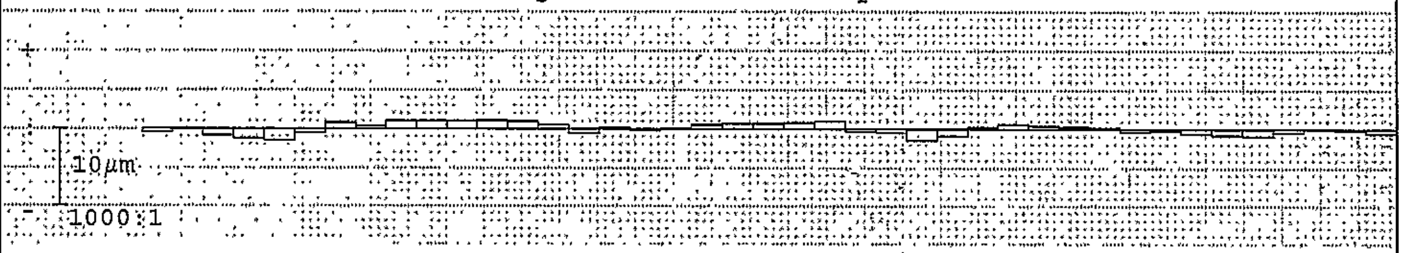


Tolerance	Medio							Qual	Tolerance							Medio	Qual
fHßm ±6	3.2	Var ß 4.4							20±6	Var ß 3.5						19.0	
fHß ±13	3.2	2.8	5.2	4.1	1.1	0.8	2.5		20±13	16.9	17.2	18.7	18.0	20.7	20.1	19.0	
Fß	3.3	3.0	4.5	3.9	2.6	1.8	2.7			3.4	3.4	1.8	2.8	2.7	2.6	2.9	
ffß 4	0.7	0.6	0.8	0.8	0.6	0.7	1.1		4	1.0	0.9	0.8	0.9	0.9	0.7	0.9	
Cß 1/5	2.5	2.4	2.6	2.4	3.0	2.4	2.3		1/5	2.6	3.0	2.2	2.9	2.9	3.0	3.0	
Bd	-1.4															1.8	

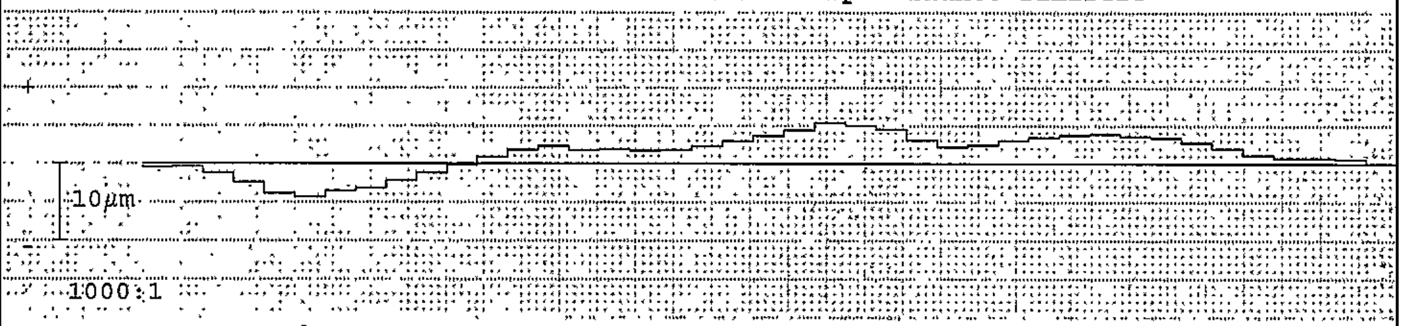
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	03.10.2017 21:45
Denominazione:	Input Outer Z41	Numero denti z	41	Angolo pressione	17.5°
Numero disegno.:	D51.6.1218.35-IF	Modulo m	2.05mm	Angolo elica	28.9°
Commessa/serie nr.:	4.D61-16	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001 Spindel: Formneat	Zeitzeug: 1		Charge:	

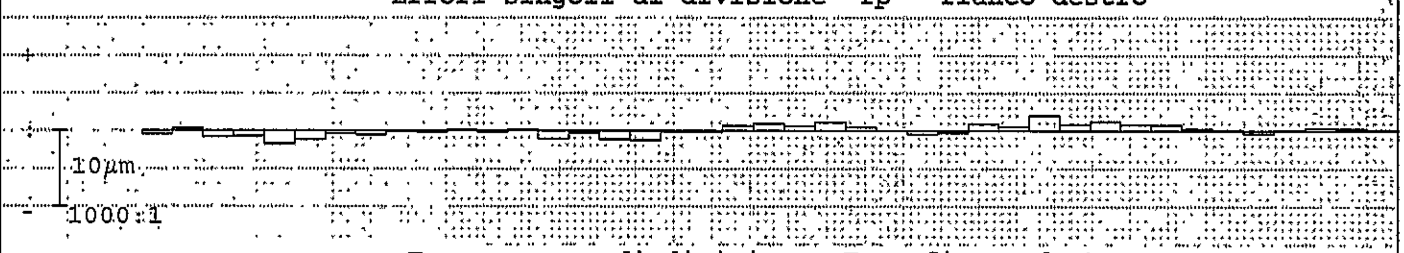
Errori singoli di divisione fp fianco sinistro



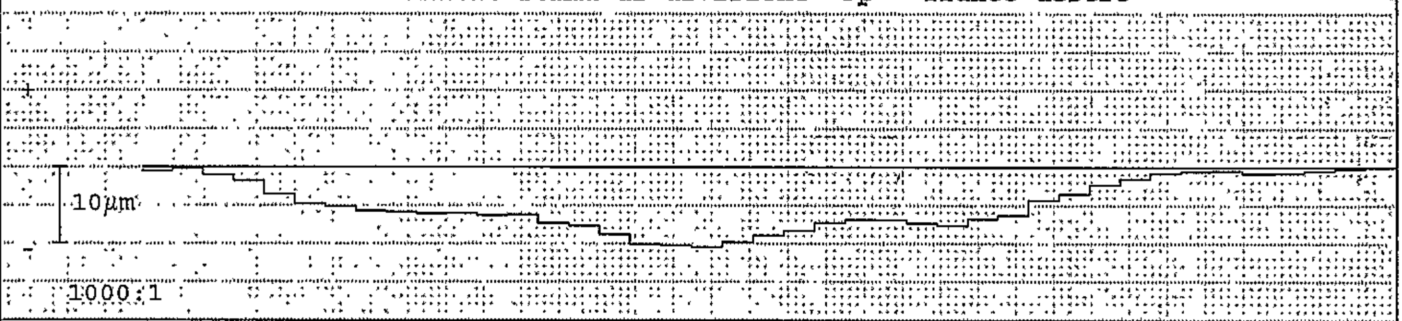
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



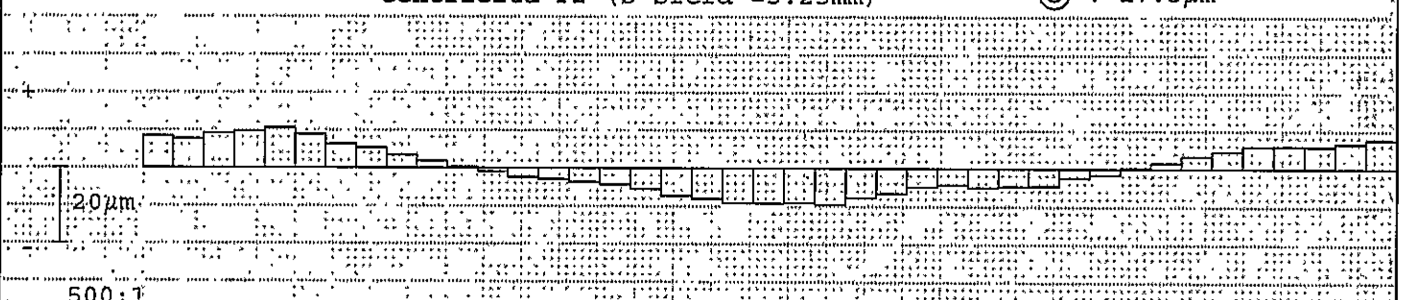
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:95.962 z=4.5mm

		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	1.5		14.0		2.0		14.0	
Gr. salto di passo	fu max	1.3		18.0		1.5		18.0	
Scarto di divisione	Rp	2.6				3.8			
Err. globale di divisione	Fp	9.7		50.0		10.4		50.0	
Err. cordale di divisione	Fpz/8	5.0				5.5			

Centricità Fr (Ø-sfera =3.25mm) ◎ : 17.3µm



Err. di concentricitá	Fr	20.0	40.0	
Variaz. spessore dente	Rs			

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Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore: Turno C	Data: 02.10.2017 21:30
Denominazione:	Input Outer Z17	Numero denti z: 17	Largh.fasc.dent. b: 20.5mm
Numero disegno.:	D51.6.1218.35-IIF	Modulo m: 2.35mm	Tratto evolv. Lα: 6.84mm
Commessa/serie nr.:	34.D5C-~~B~~4	Angolo pressione: 20°	Tratto elica Lß: 16.4mm
Masch.Nr.:	M001 Spindel: Formnest	Angolo elica: 26°	Inizio elab. M1: 4.82mm
Untersuchungszweck:	Laufende Messung	Ø Base db: 41.1986mm	Palpatore Ø: (#2)1mm
Werkzeug:	Charge:	Ang. Base: 24.326°	Fat.scor.pr. x: .7

Testa

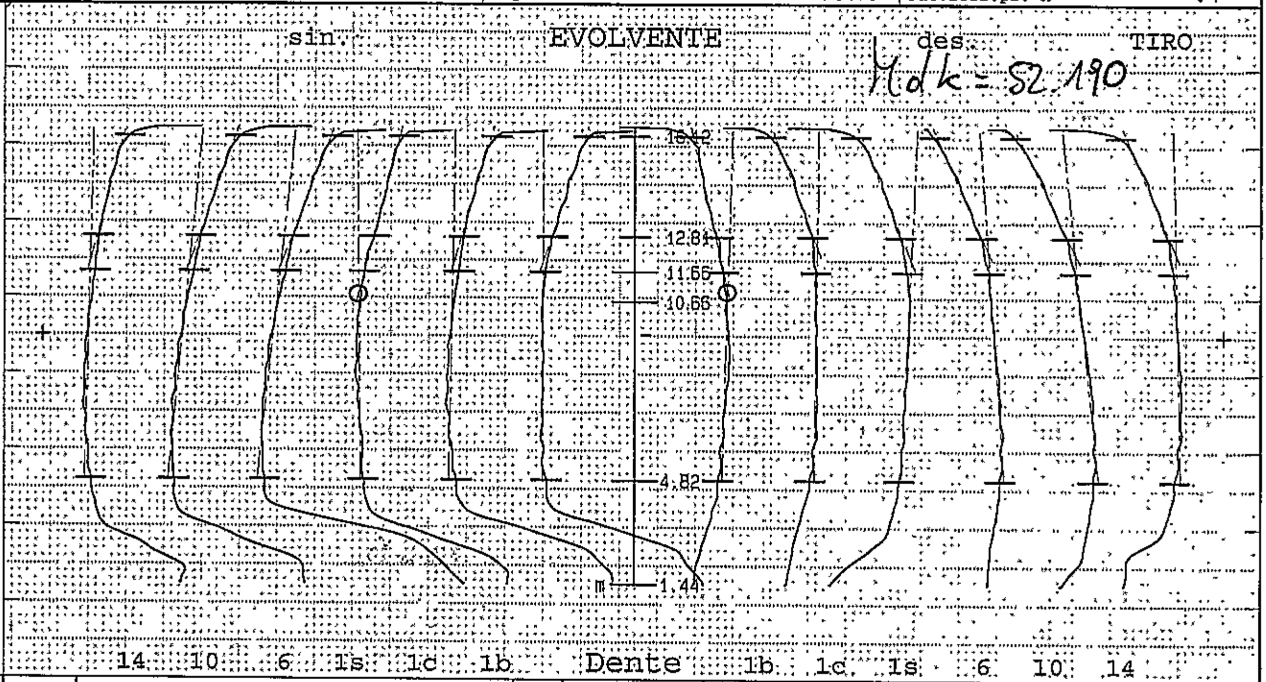
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm	±6	-5.7	Var a 8.2							±6	Var a 10.7						-4.2	
fHα	±10	-5.7	-2.3	-9.0	-9.8	0.8	-1.6	-0.1		±10	2.7	1.2	4.1	-6.5	-9.5	-2.0	-4.2	
Fα		4.8	3.1	6.1	6.5	2.3	3.3	1.6			3.1	2.1	3.0	3.9	5.5	2.3	3.5	
ffα	4	2.8	2.6	2.6	2.9	2.6	3.0	1.6		4	2.3	1.8	1.5	1.8	2.3	2.5	2.1	
Cα	-13/-5	-9.0	-8.0	-8.9	-9.6	-11.2	-9.4	-11.1		-13/-5	-10.5	-11.7	-14.8	-11.4	-11.7	-12.5	-11.8	
ffαf	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]		39.046				[38.9/39.2]					52.900				[52.74/53]			

Sotto

20 µm

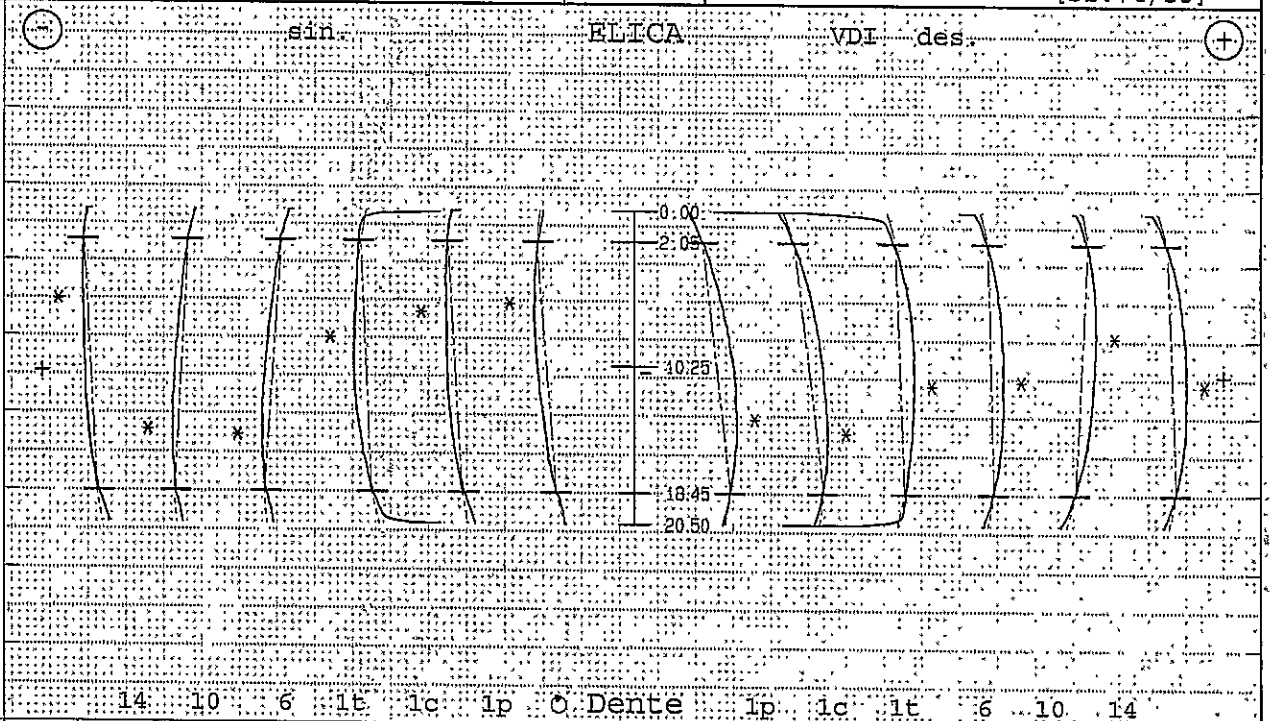
Va500:1

Vb2:1

5 mm

Sopra

N:Z



Tolerance		Medio								Tolerance							Medio
fHßm	±6	0.5	Var ß 10.4							±6	Var ß 13.9						-2.6
fHß	±13	0.5	-4.2	4.7	5.9	-3.4	-4.5	-6.2		±13	-9.2	-9.7	-2.8	-1.9	4.2	-2.8	-2.6
Fß		4.1	4.2	3.5	4.4	4.0	4.4	5.2			8.3	8.5	4.5	3.4	4.9	4.5	5.3
ffß	4	0.8	0.9	0.6	0.9	1.0	0.8	0.8		4	0.6	0.8	1.1	0.6	0.7	0.7	0.7
Cß	1/5	1.9	1.6	1.8	2.1	3.1	2.1	2.5		1/5	4.4	3.7	3.7	3.3	3.5	3.9	3.6
Bd		2.8															

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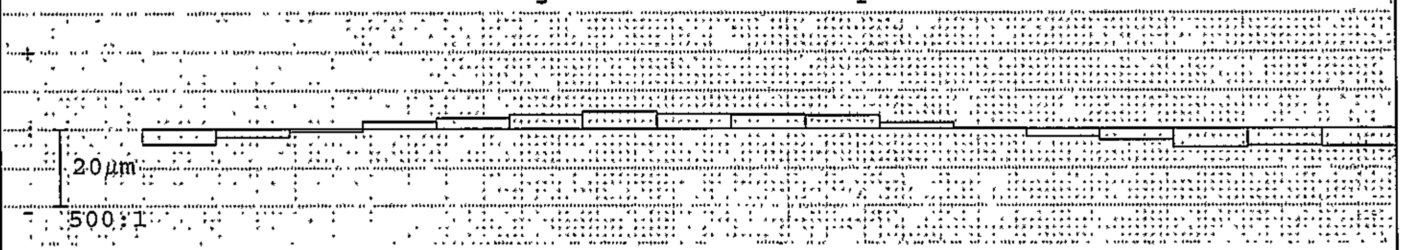
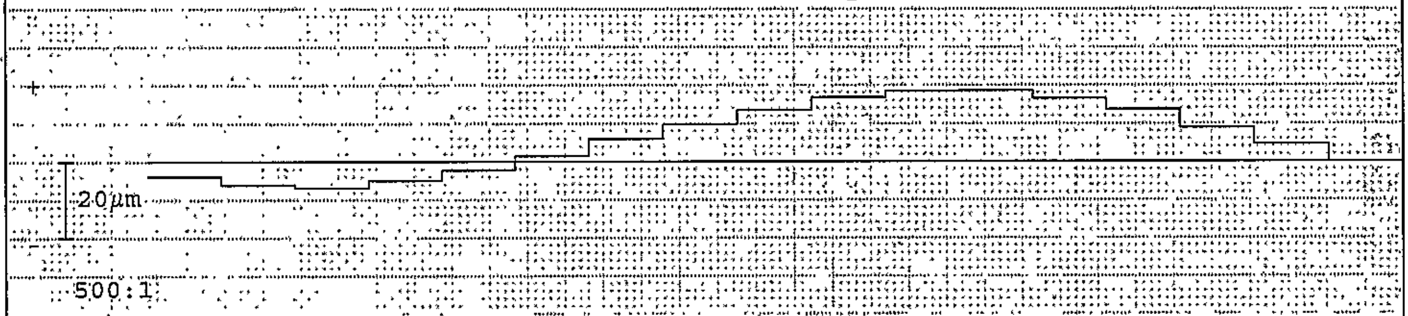
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore: Turno C	Data: 02.10.2017 21:30
Denominazione:	Input Outer Z17	Numero denti z 17	Angolo pressione 20°
Numero disegno.:	D51.6.1218.35-IIF	Modulo m 2.35mm	Angolo elica 26°
Commessa/serie nr.:	34.D5C-16	Untersuchungszweck: Laufende Messung	
Masch.Nr.:	M001	Spindel: Form[illegible] Werkzeug:	Charge:

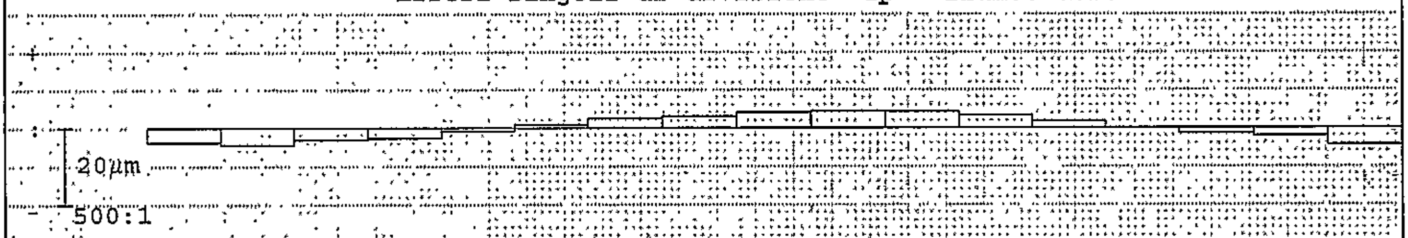
Errori singoli di divisione fp fianco sinistro



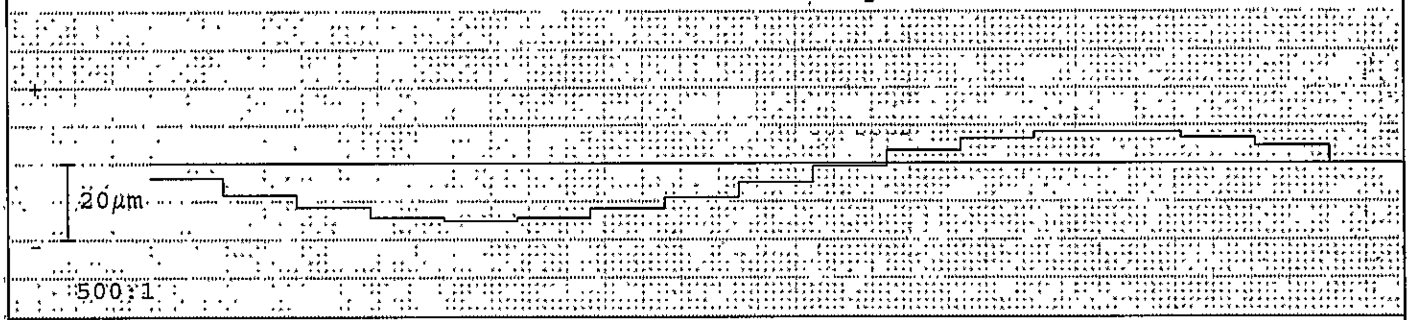
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



Errore somma di divisione Fp fianco destro

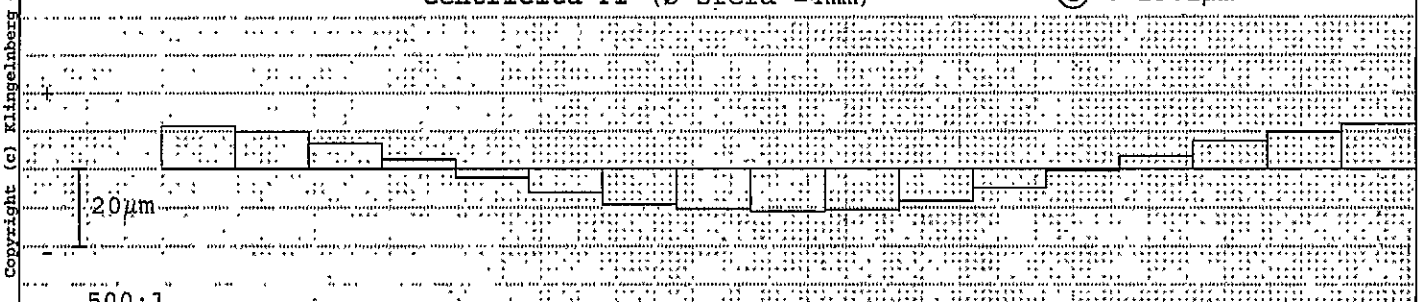


Corsa per misura divis.:46.388 z=10.3mm — fianco sinistro — fianco destro / TIRO

		Val.misur (sinistro)	Qual.	Val. amm	Qual.	Val.misur (destro)	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	4.7		14.0		4.6		14.0	
Gr. salto di passo	fu max	2.6		18.0		2.4		18.0	
Scarto di divisione	Rp	9.2				8.8			
Err. globale di divisione	Fp	25.4		40.0		23.4		40.0	
Err. cordale di divisione	Fpz/8	9.0				8.5			

Centricità Fr (Ø-sfera =4mm)

◎ : 23.1µm



MdK 52.214 [mm] / Sfere-Ø 4

Err. di concentricità	Fr	22.8	32.0	Val. amm 52.214 52.155
Variaz. spessore dente	Rs			Val. 52.178 52.179 52.177

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Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412 06 0	PNC35 B4784	Controllore:	Turno C	Data:	03.10.2017 21:03
Denominazione:	Input Outer Z41	Numero denti z	41	Largh.fasc.dent. b	14.56mm
Numero disegno.:	D51.6.1218.35-IF	Modulo m	2.05mm	Tratto evolv. La	6.27mm
Commessa/serie nr.:	4.D61-~~0~~5	Angolo pressione	17.5°	Tratto elica Lß	11.65mm
Masch.Nr.:	M001 Spindel: Formmeß	Angolo elica	28.9°	Inizio elab. M1	10.92mm
Untersuchungszweck:	Laufende Messung	ø Base db	90.3267mm	Palpatore ø	(#2)1mm
Werkzeug:	Charge:	Ang. Base	27.446°	Fat.scor.pr. x	.2

Testa

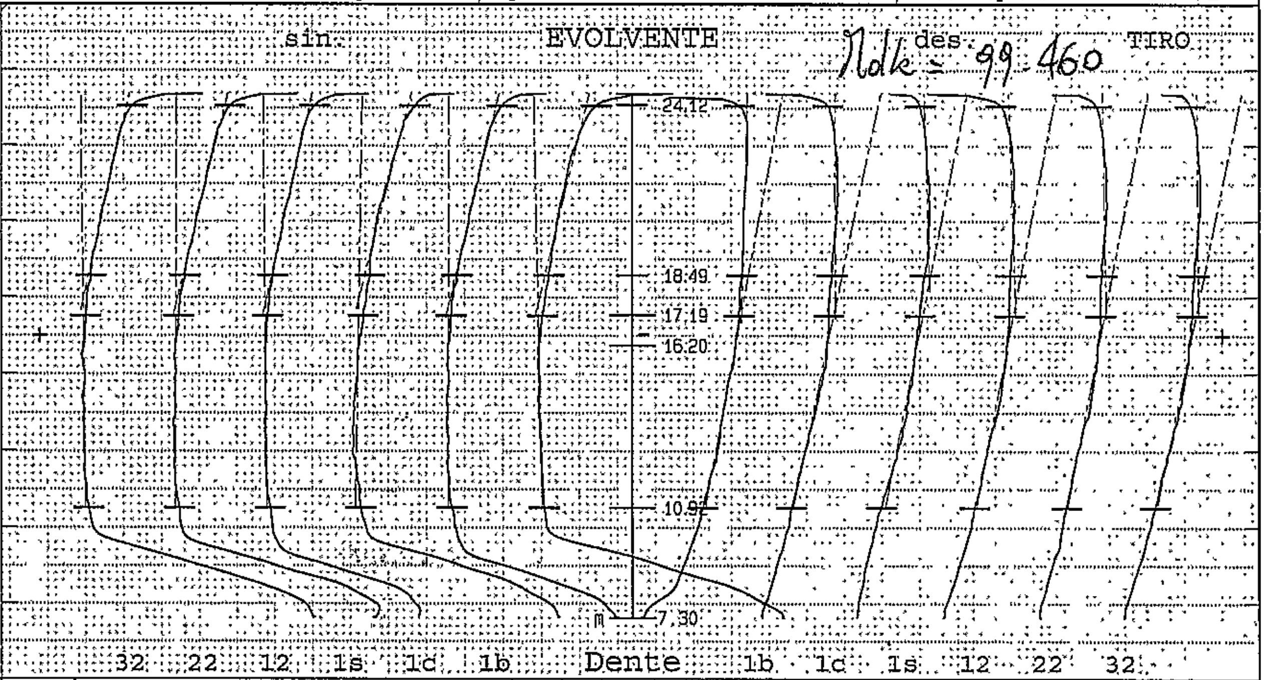
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm	±6	0.4	Var a 1.6							21±6	Var a 2.3						21.3	
fHα	±10	0.4	1.2	-0.4	0.9	-1.8	-0.1	2.2	.	21±10	20.0	22.5	20.9	20.2	20.5	21.8	21.3	
Fα		1.6	1.9	1.6	1.4	2.9	1.4	1.7			1.5	1.9	1.9	1.9	2.1	1.7	1.9	
ffα	4	1.4	1.4	1.7	1.2	2.6	1.4	1.5		4	1.2	2.1	1.9	1.8	2.0	1.9	2.0	
Cα	-13/-5	-12.5	-12.1	-12.9	-12.3	-12.2	-12.5	-13.8		-13/-5	-9.0	-11.6	-10.6	-11.9	-11.4	-11.4	-11.6	
ffαf	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]		89.300				[89.15/89.5]					103.071				[102.94/103.2]			

Sotto

20 µm

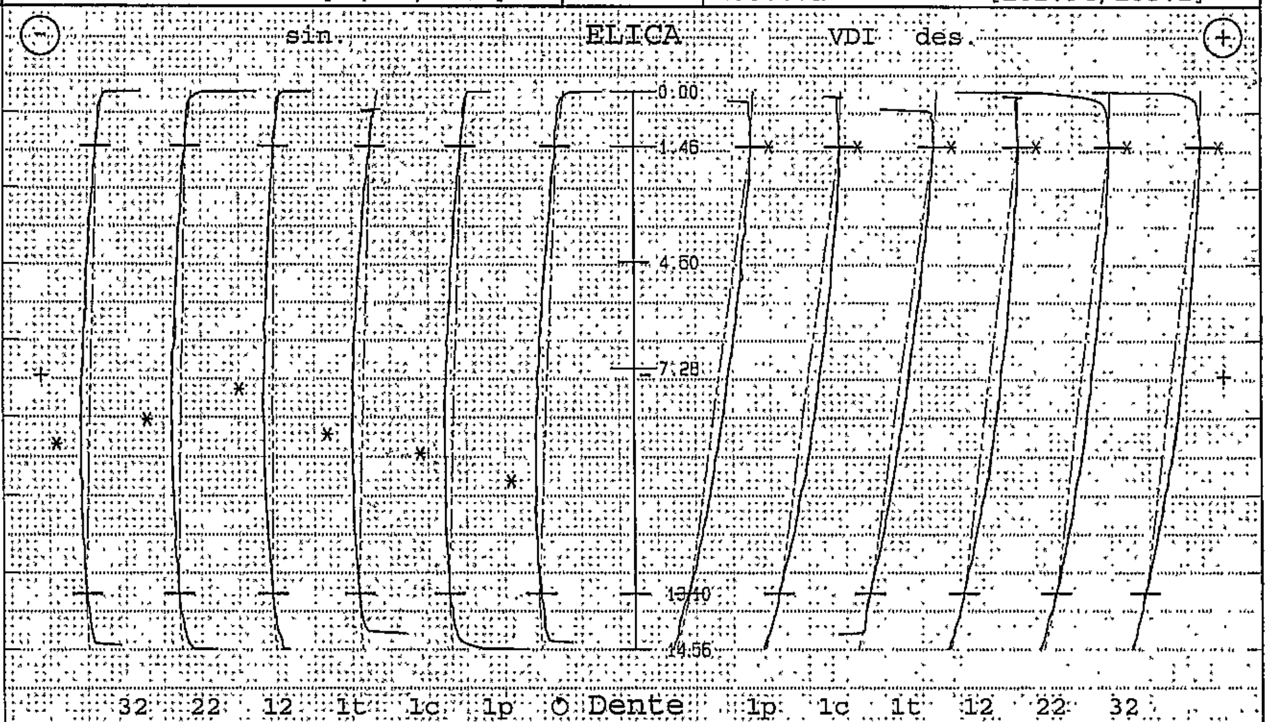
Va500:1

Vb5:1

2 mm

Sopra

N: Z



fHßm	±6	3.0	Var ß 3.1							20±6	Var ß 2.6						18.6	
fHß	±13	3.0	3.8	2.7	1.2	4.1	4.3	6.1		20±13	20.6	20.3	21.2	18.0	17.7	18.3	18.6	
Fß		3.0	3.5	2.9	1.9	4.1	3.7	5.0			2.6	2.6	2.0	3.1	3.0	2.8	2.9	
ffß	4	0.7	0.8	1.0	0.6	0.6	0.5	1.0		4	1.1	0.8	0.6	0.8	0.7	0.8	0.8	
Cß	1/5	2.3	2.3	2.3	2.4	2.8	2.3	2.4		1/5	2.5	3.1	2.2	3.2	2.8	2.9	3.0	
Bd		-2.0															0.6	

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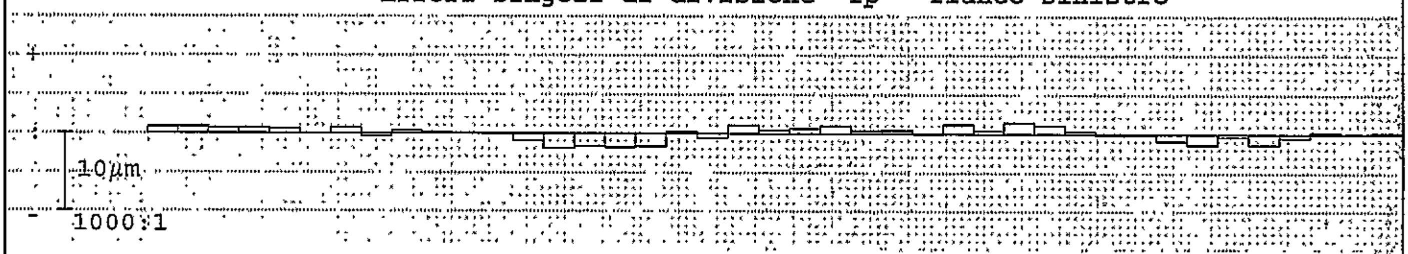
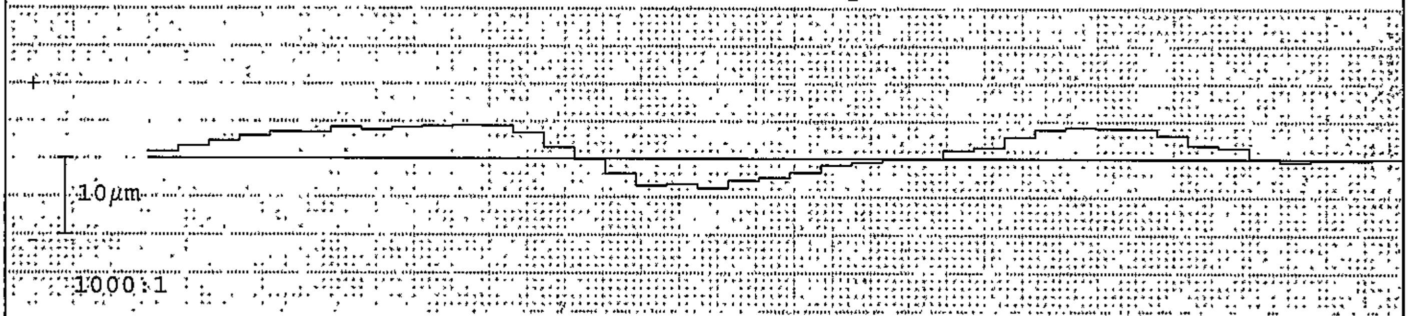
Ruota cilindrica Divisione

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	03.10.2017 21:03
Denominazione:	Input Outer Z41	Numero denti z	41	Angolo pressione	17.5°
Numero disegno.:	D51.6.1218.35-IF	Modulo m	2.05mm	Angolo elica	28.9°
Commessa/serie nr.:	4.D61-22	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formneat 1	Werkzeug:	Charge:	

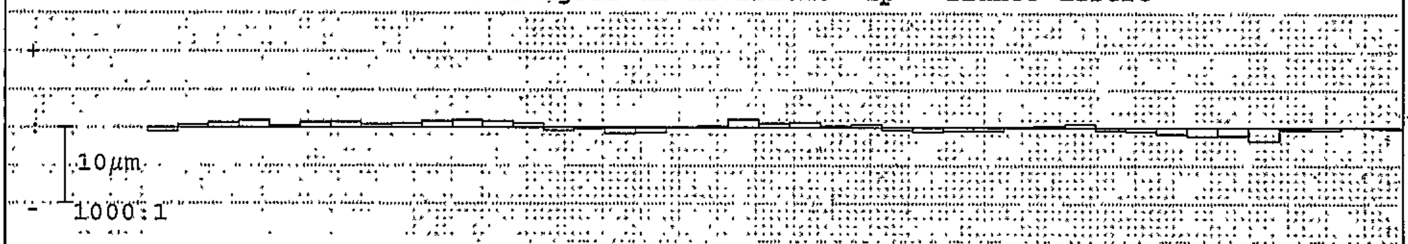
Errori singoli di divisione fp fianco sinistro



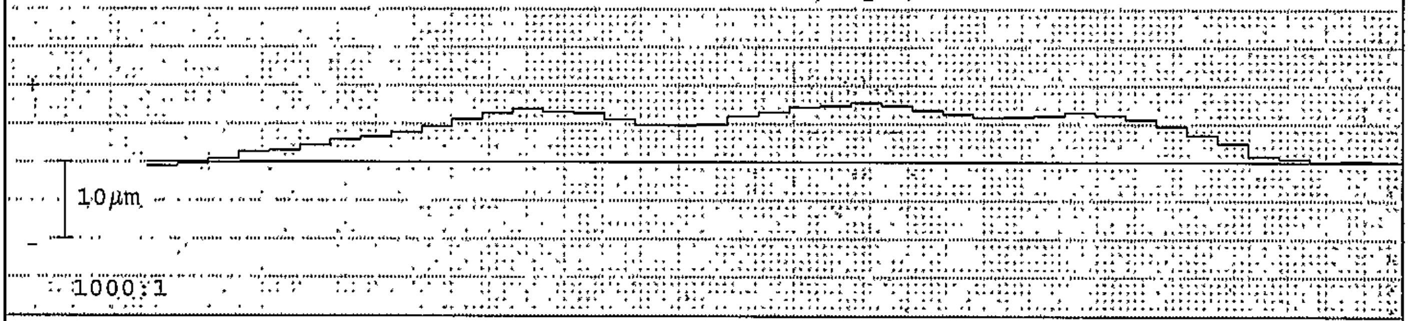
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

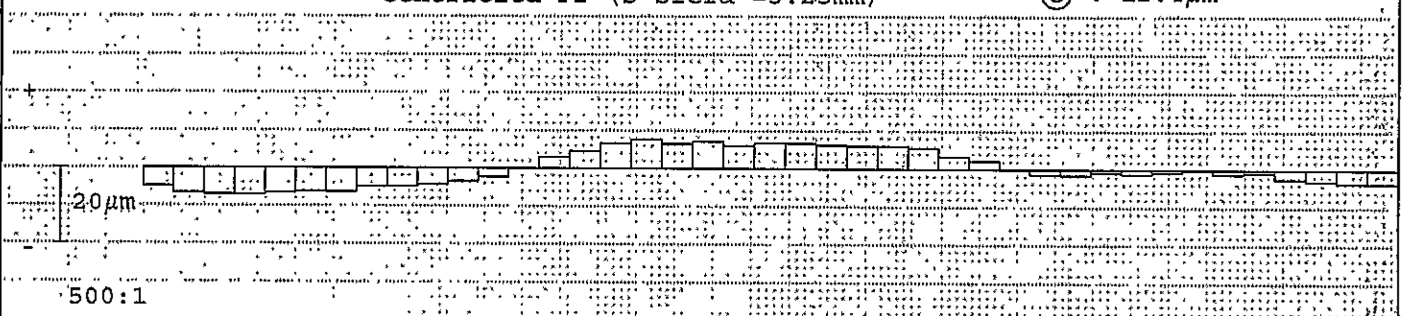


Errore somma di divisione Fp fianco destro



Corsa per misura divis.:95.962 z=4.5mm		fianco sinistro				fianco destro / TIRO			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	1.9		14.0		1.7		14.0	
Gr. salto di passo	fu max	1.9		18.0		1.4		18.0	
Scarto di divisione	Rp	3.3				2.7			
Err. globale di divisione	Fp	8.3		50.0		8.3		50.0	
Err. cordale di divisione	Fpz/8	7.9				5.4			

Centricità Fr (Ø-sfera =3.25mm) ◎ : 12.4µm



Err. di concentricità	Fr	14.8	40.0	
Variaz. spessore dente	Rs			

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0412_06 0	PNC35 B4784	Controllore:	Turno C	Data:	02.10.2017 22:40
Denominazione:	Input Outer Z17	Numero denti z	17	Largh.fasc.dent. b	20.5mm
Numero disegno.:	D51.6.1218.35-IIF	Modulo m	2.35mm	Tratto evolv. La	6.84mm
Commessa/serie nr.:	4.D5C-~~225~~ 25	Angolo pressione	20°	Tratto elica Lß	16.4mm
Masch.Nr.:	M001 Spindel: Formmest	Angolo elica	26°	Inizio elab. M1	4.82mm
Untersuchungszweck:	Laufende Messung	Ø Base db	41.1986mm	Palpatore Ø	(#2) 1mm
Werkzeug:	Charge:	Ang. Base	24.326°	Fat.scor.pr. x	.7

Testa

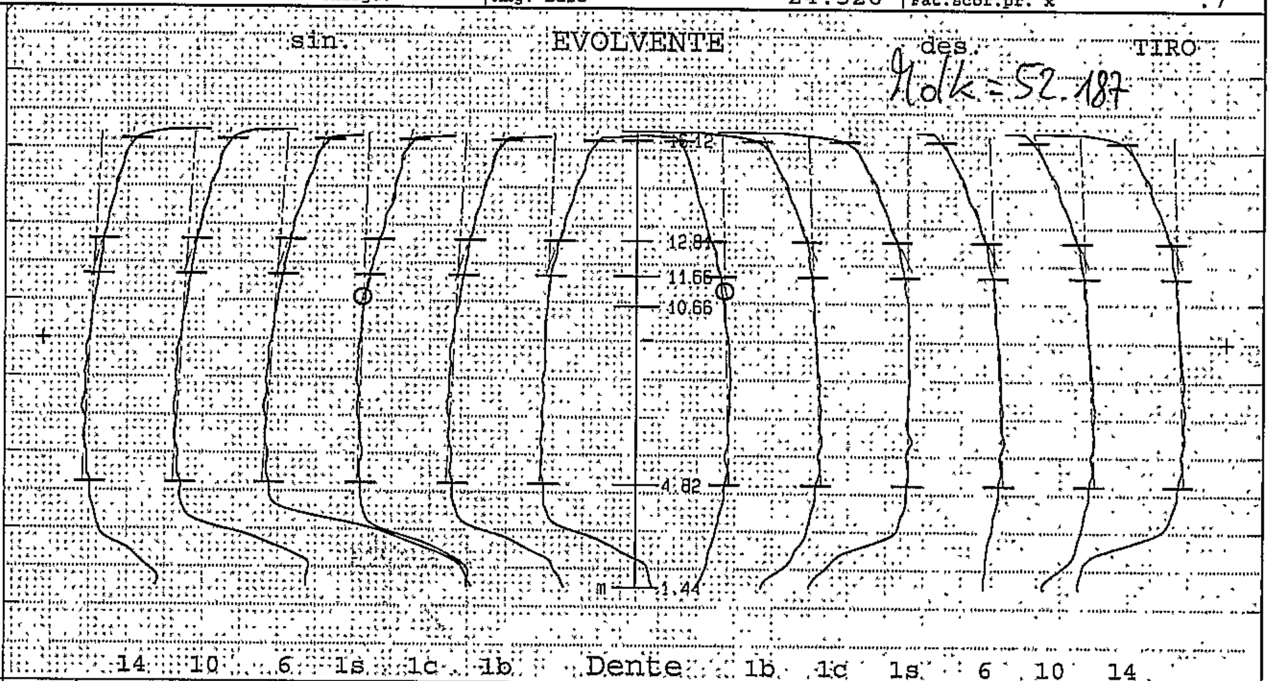
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
fHαm	±6	-5.5	Var a 1.7							±6	Var a 1.1						-3.6	
fHα	±10	-5.5	-4.8	-5.7	-6.5	-2.8	-4.8	-3.5		±10	-2.0	-3.6	-0.4	-3.9	-4.0	-2.9	-3.6	
Fα		4.7	4.5	4.6	5.2	3.4	4.4	2.6			2.6	2.8	2.1	3.1	2.8	2.5	2.8	
ffα	4	3.0	3.3	3.1	3.0	2.6	2.7	1.4		4	2.2	2.1	1.9	2.1	2.3	2.5	2.3	
Cα	-13/-5	-8.9	-7.8	-8.8	-9.8	-10.8	-9.3	-10.5		-13/-5	-10.7	-11.5	-14.4	-11.8	-11.5	-12.1	-11.7	
ffαf	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]		39.027				[38.9/39.2]					52.897				[52.74/53]			

Sotto

20 µm

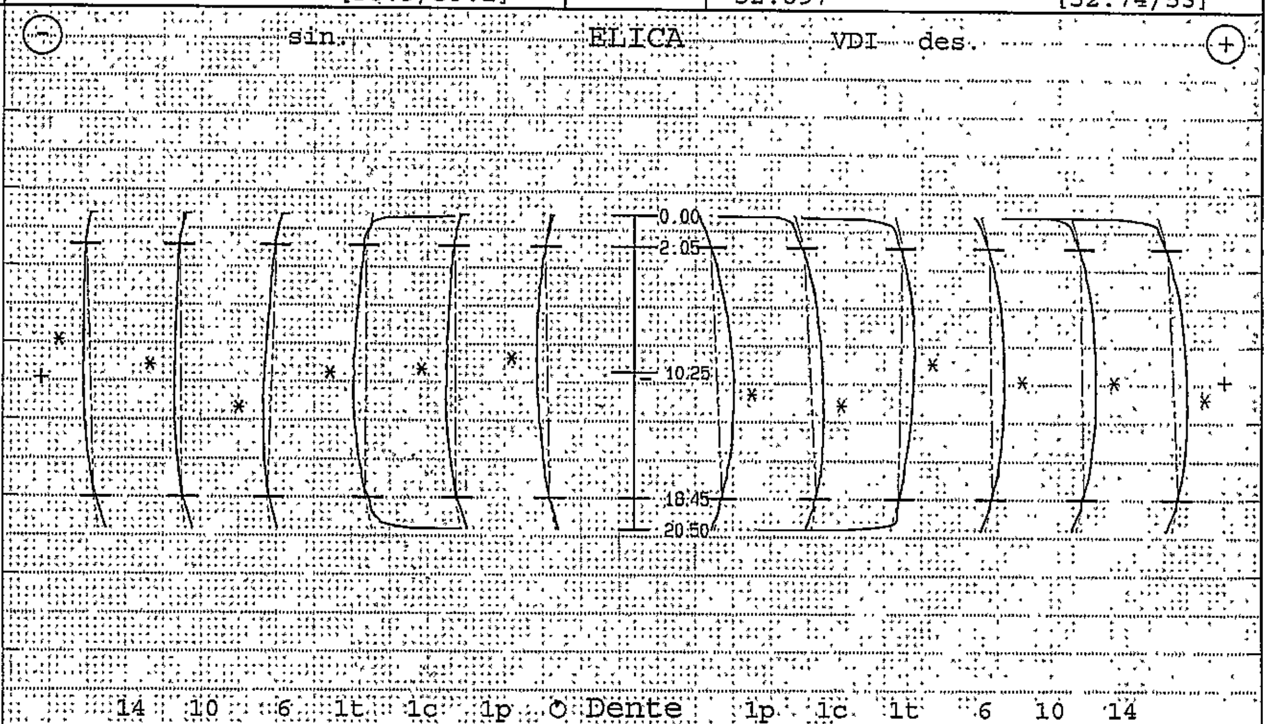
Va500:1

Vb2:1

5 mm

Sopra

N:Z



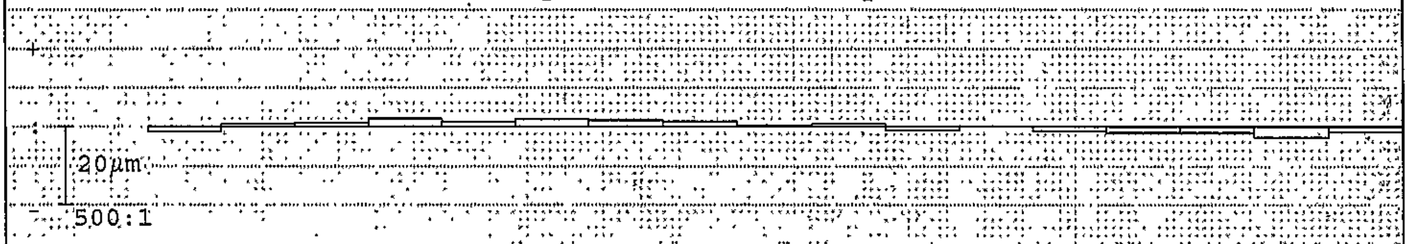
fHßm	±6	0.0	Var ß 5.2							±6	Var ß 3.3						-2.7	
fHß	±13	0.0	-2.3	-0.4	2.9	0.2	-0.2	-1.4		±13	-3.9	-4.4	1.3	-1.1	-1.3	-3.8	-2.7	
Fß		2.3	2.8	1.7	2.6	3.1	2.2	2.5			5.1	5.0	3.1	3.4	3.6	4.8	4.2	
ffß	4	0.9	0.9	1.0	0.7	1.3	0.9	0.7		4	0.6	1.0	1.1	0.8	0.8	0.7	0.8	
Cß	1/5	2.0	1.9	1.8	2.0	3.2	2.4	2.8		1/5	4.4	3.3	3.5	3.6	3.7	3.7	3.6	
Bd		1.6															5.2	

GCG 808006

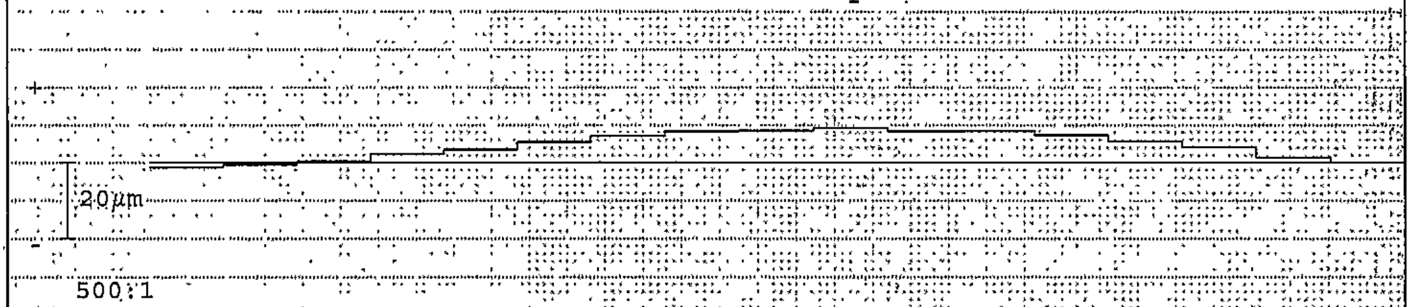
Ruota cilindrica Divisione

Nr. prog.: STI0412 06 0	PNC35 B4784	Controllore:	Turno C	Data:	02.10.2017 22:40
Denominazione:	Input Outer Z17	Numero denti z	17	Angolo pressione	20°
Numero disegno.:	D51.6.1218.35-IIF	Modulo m	2.35mm	Angolo elica	26°
Commessa/serie nr.:	4.D5C-22	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001 Spindel: Formneat 1	Werkzeug:		Charge:	

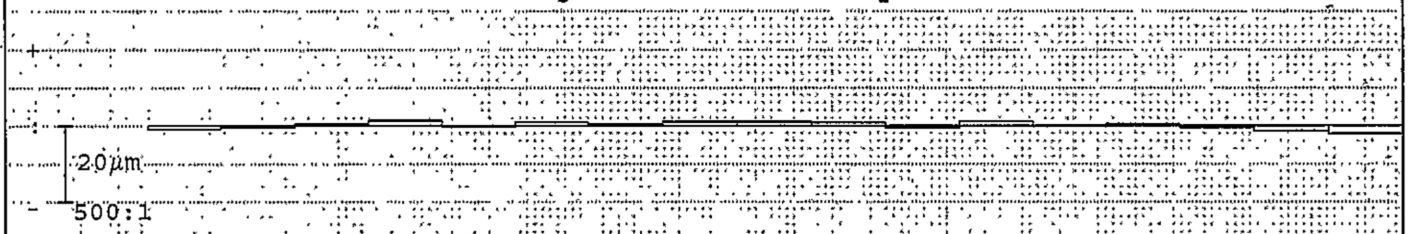
Errori singoli di divisione fp fianco sinistro



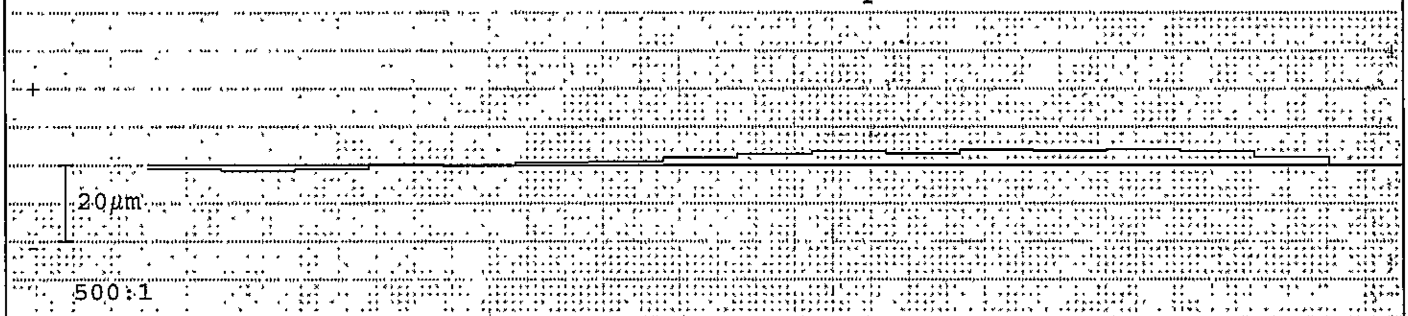
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



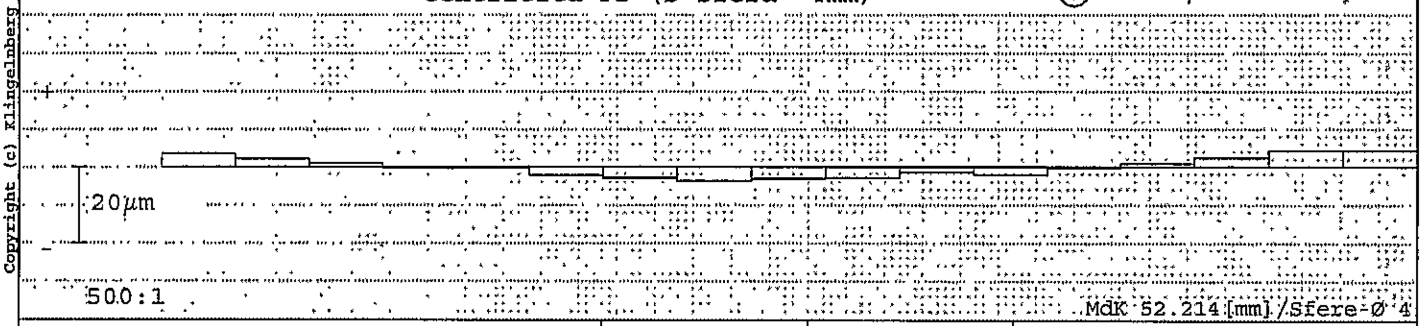
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:46.388 z=10.3mm — fianco sinistro — fianco destro / TIRO

		fianco sinistro Val.misur	Qual.	Val. amm	Qual.	fianco destro Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2.7		14.0		2.2		14.0	
Gr. salto di passo	fu max	2.0		18.0		1.7		18.0	
Scarto di divisione	Rp	4.7				3.5			
Err. globale di divisione	Fp	10.5		40.0		5.6		40.0	
Err. cordale di divisione	Fpz/8	4.3				3.5			

Centricità Fr (Ø-sfera =4mm) ◎ : 7.1µm



MdK 52.214 [mm] / Sfere-Ø 4

Err. di concentricità	Fr	8.0	32.0	Val. amm	52.214	52.155
Variaz. spessore dente	Rs			Val. 52.179	52.181	52.177

KLINGELNBERG

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

MAGNA GETRAG

REPORT 17/185

Date: 20/10/2017
Author: Abbaticchio Francesco

Reason for analysis: *Motivo dell'indagine:*	PPAP

Requester: *Richiedente:*	WLQ - S.Picerno

Part Name: *Nome particolare:*	IS2
Material: *Materiale:*	GCG_805000_Part 2
State of part: *Stato del particolare:*	Finished

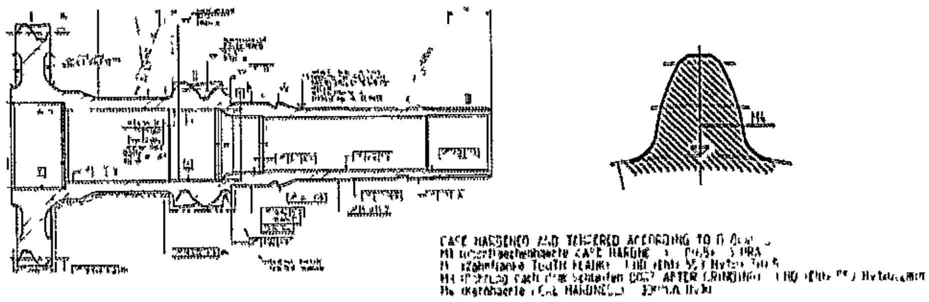
P/N:	251.6.1218.35
S/N:	GCG_805000_Part 2
Customer: *Cliente:*	-

Result: *Risultato:*	OK

Distribution list: *Lista di distribuzione:*	WLQ1 - S.Picerno

Notes: *Note:*	New variant 21A

Drawing (Disegno)



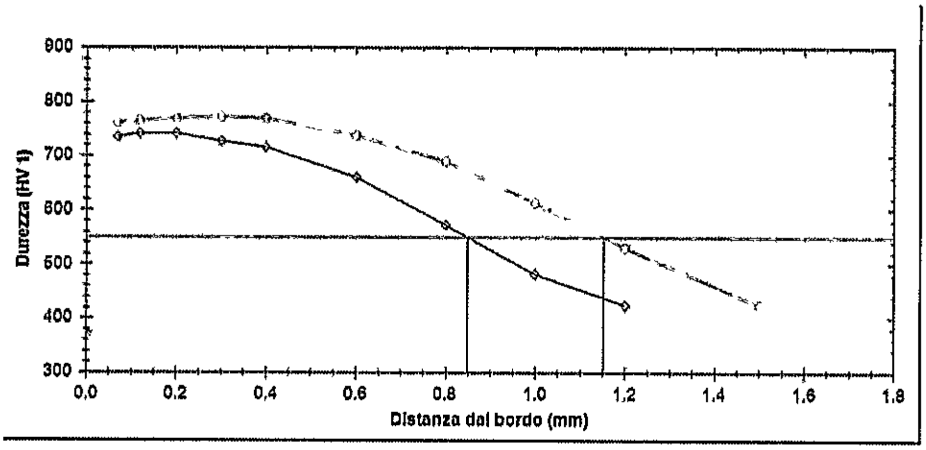
Picture 1: drawing of the part

Surface Hardness Verification

Scale	Position	Values [mm]	Range	Component
HRC	M1	61.8	-	Shaft
HRA	M1	81.8	80.5 ÷ 2.5	Shaft

CHD Verification (Verifica CHD)

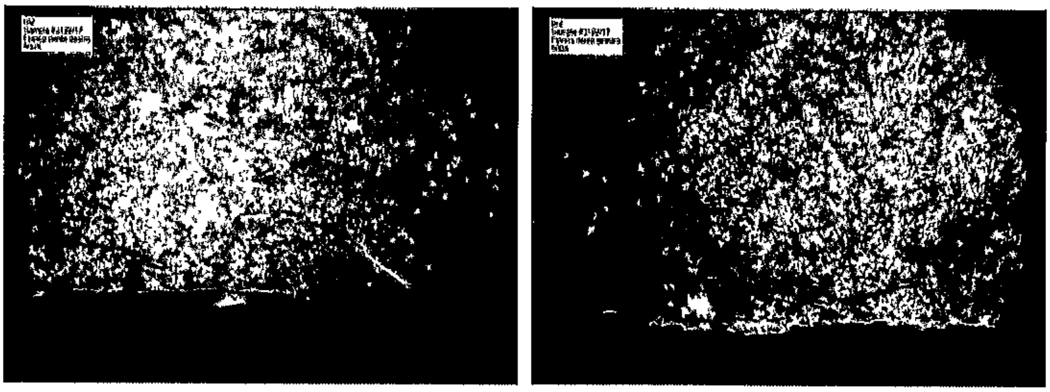
	Sample	Position	Measured Value	Range
CHD 550 HV1	3122/17	M2	1.15	0.7 ÷ 0.5mm
CHD 550 HV1	3122/17	M3	0.85	min. 0.2mm
Core hardness HV10	3122/17	M4	372	≥ 300



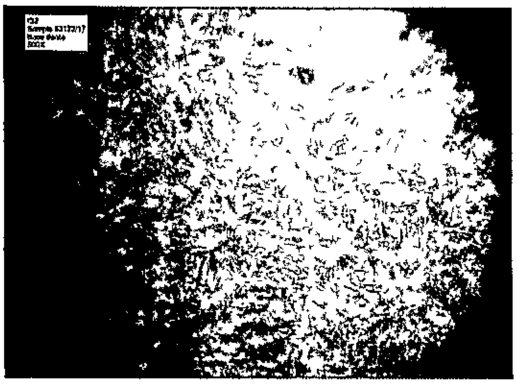
Picture 2: hardness profiles

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

Sample #	3122/17
Tooth flank surface structure:	Martensite <5% retained austenite (OK)
Tooth base core structure:	Martensite + bainite (OK)



Picture 3: Gear - Surface microstructure at tooth flank (right) and at tooth root (left)



Picture 4: Core microstructure at tooth base (X500)

U N I KASSEL
V E R S I T Ä T
Institute of Materials Engineering
Metallic Materials
Prof. Dr.-Ing. Berthold Scholtes
Prof. Dr.-Ing. Thomas Niendorf

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-19045-03-00

ZERTECH
Zentrum für
Randschichtanalytik
und -Technik

ZerTech – division of Institute of Materials Engineering, D-34125 Kassel

F.T.M. SRL
Attn. to Mr. Blasotta
Forniture Tecniche Meridionali
Via di San Giuliano 47
71121 Foggia
Italy

delivery address: Sophie-Henschel-Haus
Mönchebergstraße 3
D-34125 Kassel

phone: 0049-561/804-3657

telefax: 0049-561/804-3662

our reference	person in charge	phone: 0049561/804-3657	date:
MPT-I2_rep	Dipl.-Ing. Django Baunack		17 November 2017

Order-No. 4500495530

Test Report

Object of examination:

One specimen of each part number has been examined. Residual stress measurements have been performed in according to the test standard of G_804010. Position A has measuring area of approximately 0.5 mm to 1.5 mm above the root form diameter d_{Ff} in a zone of ± 3 mm from the centre of the tooth width (means in active profile of the tooth flank). Position B has a measuring area of approximately 0.5 mm to 1.5 mm below the root form diameter d_{Ff} and in a zone of ± 3 mm from the gear centre means in tooth root area of the gear). The tilt of Ψ-angle occurs in the height of the tooth. The residual stress state is carried out in the distances to the surface shown in table 1.

Pos.	Part name	Part number	Gear teeth to be checked	Measuring Pos. A	Measuring Pos. B	Measuring Pos. C	Depth Profile in µm
1	Input shaft outer	2516121835	I		X		5, 20, 40, 60, 80
2	Input shaft outer	2516121835	I		X		5, 20, 40, 60, 80
3	Double Gear	25111122350	II	X			5, 20, 40, 60, 80

Table I: Part list of samples

The residual stress measurements were carried out on a stationary X-ray diffractometer (Manufacturer: Siemens; Type F2). The following list contains the most important measuring parameters.

<u>Measurement details:</u>

<u>Diffractometer:</u>	F2
Radiation:	Cr kα
Crystal lattice:	{211}
Crystal orientation (ψ-angle):	0°; ± 18°; ± 27°; ± 33°; ± 39°; ± 45°
Diffraction angle range (2Θ):	148° - 164°
Step-feeding:	0.1°
Primary aperture:	Ø1.0 mm for measuring point A and F 0.5 x·4.0 mm^2 for measuring point B
Detector aperture:	symmetrizing slit

<u>Evaluation parameter:</u>

Determination of peak position:	gravitational line method
Calculation of residual stresses:	$\sin^2\Psi$-method
Diffraction angle of stress free crystal lattice:	$\Theta_0 = 78.035°$
X-ray elastic constant:	$½S_2 = 6.09 \cdot 10^{-6}$ mm^2/N

<u>Results:</u>

The residual stress values in the tables are rounded by 5 MPa. Standard deviation assigned to the residual stress values is a measure of the reliability of the measurement procedure. The integral width of the interference lines indicates hardening or softening effects, respectively.

Distance from the surface in mm	**Residual stresses σ^{ES} in MPa**	**Integral width IW in degree**
0.005	-740 +-38	5,88
0.020	-950 +-48	5,36
0.040	-1135 +-56	6,10
0,060	-1110 +-57	5,99
0,080	-1055 +-52	6,15

Table 1: Residual stresses and integral width; **Input shaft outer; 2516121835; Position B**

Distance from the surface in mm	Residual stresses σ^{ES} in MPa	Integral width IW in degree
0,004	-695 +-30	5,96
0,021	-705 +-35	5,86
0,041	-930 +-45	5,93
0,060	-1055 +-50	5,93
0,080	-865 +-45	5,92

Table 2: Residual stresses and integral width; **Input shaft outer; 2516121835; Position B**

Distance from the surface in mm	Residual stresses σ^{ES} in MPa	Integral width IW in degree
0,004	-805 +-45	5,77
0,022	-1030 +-55	5,92
0,040	-1070 +-50	5,86
0,062	-1145 +-50	5,96
0,080	-960 +-45	6,09

Table 3: Residual stresses and integral width; **Double Gear; 25111122350; Position A**

As agreed with the customer the residual values are marked with (*), if the shear stress indicator is higher than 80 MPa.

Yours sincerely

Django Baunack

Django Baunack
Person in charge

ZERTECH

Zentrum für Randschichtanalytik und -Technik

Annotations:

ZerTech is accredited to *DIN EN ISO/IEC 17025* referring to procedures of residual stress analysis by X-ray diffraction (XRD) as well as the Hole Drilling Method (HDM). The X-ray diffraction method is descripted in *DIN EN 15305 Non-destructive testing - Test Method for Residual Stress Analysis by X-ray Diffraction*. The proceedings of the Hole Drilling Method are ruled in *ASTM-Designation E837-13a Standard Test Method for Determining Residual Stress by the Hole-drilling Strain Gage Method.*

The experimental data are only valid for the investigated specimen. The work pieces and specimen of disposition will be stored for persistence of 6 month. After that time they will supply to material recycling, if there is no explicit desire by client. A send back is possible. Therefore the client has to take over the postage costs. This procedure is necessary because of our limited stock keeping capacity.

GETRAG

Part Submission Warrant

Hivo - Internal	Rev.: 00
Material-Nr.:	111283-00
Partgroup:	1102
Report-Nr.:	1520170470

Part Name: Input shaft outer — Cust. Part Number: 251.6.0693.90
Shown on Drawing No.: 1-111283-0000-90 — Org. Part Number: 111283-00
Engineering Change Level: T72383 — Dated: 10. Feb 16
Additional Engineering Changes: 10071362 — Dated: 02. Dez 14
Safety and/or Government Regulation: ☐ Yes ☑ No — Purchase Order No.: 550003916401 — Weight (kg): 3,1150
Checking Aid No.: general inspection equip. — Checking Aid Engineering Change Level — Dated

ORGANIZATION MANUFACTURING INFORMATION

Hirschvogel Umformtechnik GmbH 6589
Organization Name & Supplier/Vendor Code

Dr.-Manfred-Hirschvogel-Strasse 6
Street Address

City	Region	Postal Code	Country
Denklingen	Bayern	86920	Germany

CUSTOMER SUBMITTAL INFORMATION

Getrag - Bari
Customer Name/Division

Mr. Straub
Buyer/Buyer Code

Application

MATERIALS REPORTING

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

Submitted by IMDS or other customer format: Module ID: 680669298 Version: 0.01
Date: 2017-08-24

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: hot forging

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 / 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: Initial sample inspection / Report-No.: 1520170470

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

Organization Authorized Signature: i. A. [signature] — Date: 24. Aug 17

Print Name: Hr.Simon Brugger — Phone No.: +49-8243-291-6157 — Fax No.: +49-8243-991-0

Title: QMP — E-mail: Simon.Brugger@Hirschvogel.com

FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: ☒ Approved ☐ Rejected ☐ Other

Customer Signature: A. Hett — Date: 24.08.17

Print Name: A. Hettinger — Customer Tracking Number (optional): 17-00833

March 2006 CFG-1001

MAGNA GETRAG

GETRAG B.V. & Co. KG,
Hermann-Hagenmeyer-Straße
74199 Untergruppenbach

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

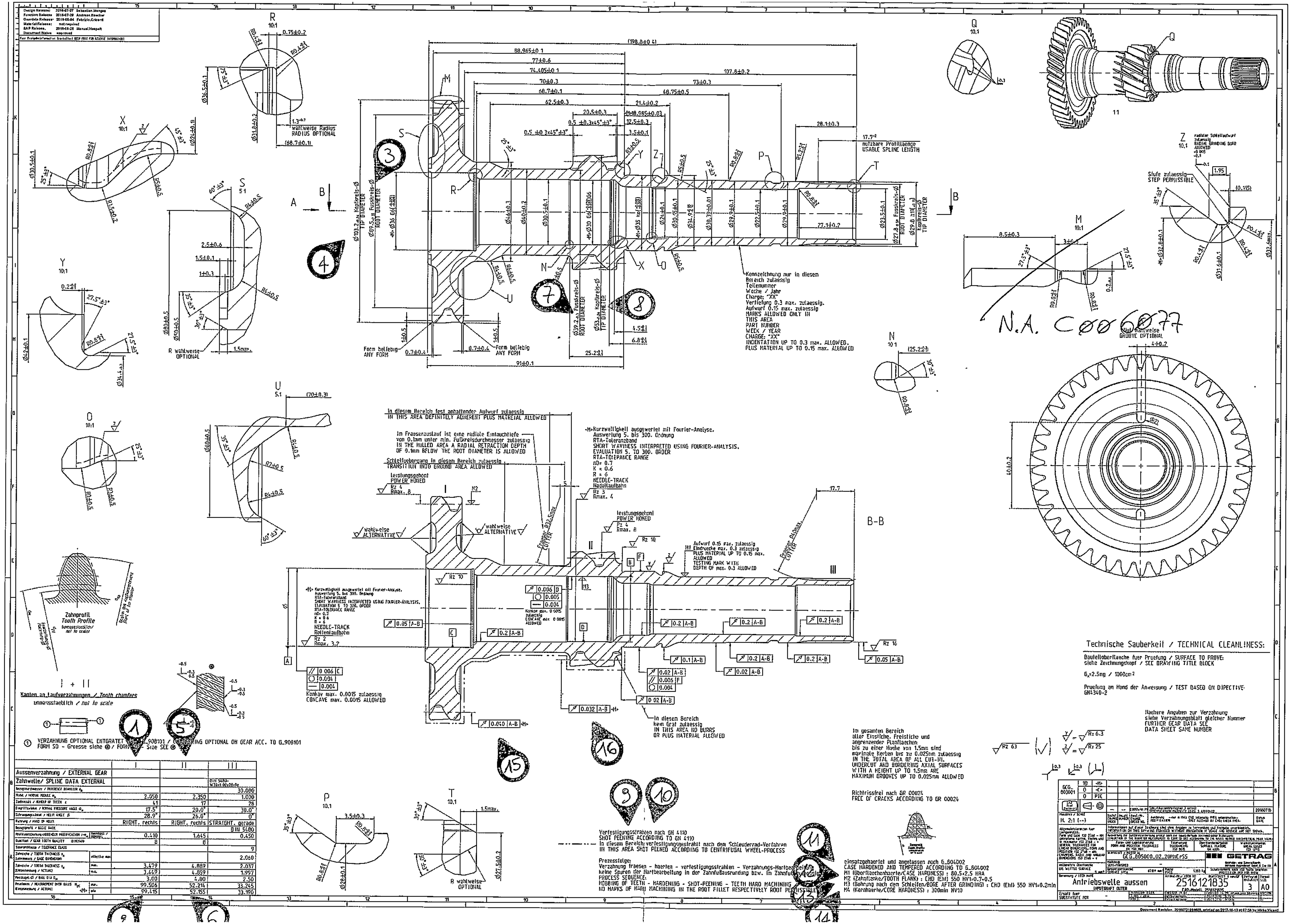
Cleanliness Analysis *(Analisi della Pulizia)*

Part	P/N	Washing Machine	Detergent	Sampling date	Wetted surface [cm2]	Gravimetric evaluation [mg/1000cm^2]	Max Allowable [mg/1000cm^2]
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	1.78	17/02/2017		1.05	1.81	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		8.03	6.49	08/03/2017				
DG-FIX	Power Honing (3rd Gear)	HNW11013	251.1.1074.35	1A - 21A	Fr	32	x	PPAP	1.67	-	1.68	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		-	2.16	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	5.68	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		2.3	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	2.39	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	2.76	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		-	6	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	1.89	08/03/2017				
DR2-Rw	Hard Turning & Cone Grinding	SLA11083	251.1.1083.50	1A - 21A	Rz Foro	Rz 4	x	PPAP	1.67	-	2.09	10/10/2016		-	2.33	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		2.06	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	1.57	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 Rw	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	2.81	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	1.67	25/10/2017		2.08	1.78	08/03/2017				
INPUT1	Grinding Grooves	SLA16037	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	SLA16037	251.6.1073.35	1A - 21A	38 05+0,1	38 05+0 1	x	PPAP	1.67	2.76	2.75	25/10/2017		2.32	2.27	08/03/2017				
INPUT1	Grinding Grooves	SLA16037	251.6.1073.35	1A - 21A	Ø 15,2-0,11	Ø 15,2-0 11	x	PPAP	1.67	1.80	1.06	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	251.5.1071.35	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	0.81	24/02/2017		1.01	0.87	08/03/2017	100% checked on PP Marposs	n/a		
INPUT2	Hard Turning	DRA11022	251.5.1071.35	1A - 21A	Diameter	Ø 32,8+0,1-0,1	x	PPAP	1.67	8.86	5.97	18/05/2017		8.58	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	3.18	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	1.75	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	1.57	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 cleaness 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	2.93	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	3.82	08/03/2017				
INPUT2	Power Honing (4th Gear Z35)	HNW11016	251.6.1218.35	21A	Fr	40	x	capacity increase	1.67	SIM	SIM	26/02/2018		-	2.94	28/02/2018				
INPUT2	Power Honing (4th Gear Z35)	HNW11016	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	SLA10036	251.6.1076.35	1A - 21A	DIA_055_1	36 +36 -35,987	x	PPAP	1.67	2.73	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	3.18	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	2.15	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	2.83	2.62	28/11/2017		1.98	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	1.57	3.07	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	1.57	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	251.5.1076.35	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	3.83	1.42	08/09/2017		3.41	1.88	08/03/2017	Reinforced Control Plan	Process centering	Sinibaldi	W08
OUTPUT1	Grinding Grooves	SLA11055	251.5.1076.35	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	3.35	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	165,43+0 05-0,05	x	PPAP	1.67	5.67	3.07	08/09/2017		13.12	8.44	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	0.09	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	12.70	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	1.67	08/03/2017				
OUTPUT1	Grinding Grooves	SLA11055	251.6.1076.35	1A - 21A	Length	17,46+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	6.06	2.80	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	15/02/2017		-	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	15/02/2017		3.55	2.05	08/03/2017				
OUTPUT1	Splines Rolling	WAW10023	251.6.1076.35	1A - 21A	MEDIO M1-M3	46.231 - 46.157	x	PPAP	1.57	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 - 42,068	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		2.62	2.91	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	2.55	2.64	25/01/2018		1.62	1.69	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	4.35	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	3.62	13/10/2017		2.88	2.28	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	2.58	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	4.9	02/03/2017				
OUTPUT2	Power Honing	HNW11007	251.6.1078.35	1A-21A	Fr	32	x	PPAP	1.67	-	2.03	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	8.60	7.90	03/03/2017		7.24	6.54	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	6.19	02/03/2017				
OUTPUT2	Superfinishing	HNA10057	251.6.1078.35	1A-21A	DIA_050	Ø 37 (D & E)-0,013	x	PPAP	1.67	1.75	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 211,162max 211,233	x	capacity increase	1.67	3.89	2.08	12/12/2017		2.59	2.60	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 211,162max 211,233	x	capacity increase	1.67	4.05	2.68	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	-	1.69	17/05/2017		-	3.35	02/03/2017				
R.GEAR	Grind Gear Teeth	SLW11046	251.1.1080.50	1A-21A	MEDIO M1-M3	min 211,162max 211,233	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		2.60	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	4.63	2.76	17/03/2017		6.38	3.67	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		-	2.48	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	3.06	2.36	21/11/2017		2.10	1.84	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		1.85	1.84	02/03/2017				
SG1	Hard Turning	DRA10110	251.1.1081.50	1A-21A	DIS_075	33,64 +0,03 -0,03	x	PPAP	1.67	6.27	6.43	12/10/2016		5.02	5.56	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	0.58	12/10/2016		1.23	0.55	02/03/2017	100% checked by using a specific measurement device (as for Control Plan)	Review specifiche / mod.prodotto	Pierro	wk18
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	-	2.48	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 65	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	1.28	06/03/2017	100% checked on PP Marposs	n/a		
SG3	Hard Turning & Cone Grinding	SLA11083	251.1.1086.50	1A-21A	DIA_082	Ø 70,5+0 01-0,01	x	PPAP	1.67	2.01	T.C.	12/10/2017		2.68	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_087	28 86+0,03-0,03	x	PPAP	1.67	6.56	T.C	12/10/2017		7 98	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	2.83	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	2.16	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	2.26	07/03/2018				
SG3	Hard Turning & Cone Grinding	SLA11084	251 1.1086.50	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	251.1.1086.50	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		2.18	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	3.95	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	fHbm dex	4,5°+0,75°-0 75°	x	PPAP	1.67	1.81	1.77	24/09/2016		1 86	1.73	07/03/2017				
SG3	Shaping & Pointing	STW12177	251 1.1086.50	1A-21A	fHbm sin	4,5°+0,75°-0,75°	x	PPAP	1.67	2.07	2.00	24/09/2016		2.05	1.83	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	24/09/2016		1.8	1.60	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		7.65	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 57	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	2.64	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	5.80	11/01/2018		2.92	2.59	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		-	2.29	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		-	3.16	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_076	7.5 ±0.050	x	PPAP	1.67	4.67	4 16	22/02/2017		3 88	3.81	03/03/2017				

Component	Operation	Machine	Part Number	Transferability	Items	Spec.	hrs	DRI	Target	Cm	Cmk	CM Last Update	N	Pp	Ppk	PP Last Update	Containment 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	2.45	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	1.96	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	2.28	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	1.66	1.73	22/02/2017		1.69	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	4.92	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	2.06	08/03/2018				
SG5	Hard Turning & Cone Grinding	SLA11088	251.1.1089.50	1A - 21A	DIA_077	70.5 ±0 010	x	capacity increase	1.67	2.69	2.66	12/01/2018		2.38	2.00	08/03/2018				
SG5	Hard Turning & Cone Grinding	SLA11088	251.1.1089.50	1A - 21A	DIS_038	20.96 ±0.030	x	capacity increase	1.67	5.99	3.68	12/01/2018		2.12	2.11	08/03/2018				
SG5	Hard Turning & Cone Grinding	SLA11088	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	SLA11088	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.82,985	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	8.27	6.95	28/02/2017		8.27	6.94	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	1.2	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	1.86	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 90	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	1.06	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	0.87	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	1.09	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	7.33	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	4.06	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	1.76	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 66	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	2.87	1.88	27/10/2017		2.28	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	1.80	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 68	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. 67,048min. 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		-	2.38	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		3.58	1.86	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	2.83	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	1.45	1.06	19/10/2017		2.16	2.13	26/02/2018	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	26/02/2018				
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	26/02/2018	100% checked by using a specific measurement device (as for Control Plan)	Review specifiche / mod.prodotto	Pierro	wk18



	I	II	III
Aussenverzahnung / EXTERNAL GEAR			
Zahnwelle/ SPLINE DATA EXTERNAL			DIN 5480-W30x1.00x28x9e
Bezugsdurchmesser / REFERENCE DIAMETER d_B			30.000
Modul / NORMAL MODULE m_n	2.050	2.350	1.000
Zaehnezahl / NUMBER OF TEETH z	41	17	28
Eingriffswinkel / NORMAL PRESSURE ANGLE α_n	17.5°	20.0°	30.0°
Schraegungswinkel / HELIX ANGLE β	28.9°	26.0°	0°
Richtung / HAND OF HELIX	RIGHT, rechts	RIGHT, rechts	STRAIGHT, gerade
Bezugsprofil / BASIC RACK			DIN 5480
Profilverschiebung/ADDENDUM MODIFICATION $x \cdot m_n$ Nennmass / NOMINAL	0.410	1.645	0.450
Qualitaet / GEAR TOOTH QUALITY	8	8	
Toleranzklasse / TOLERANCE CLASS			9
Zahndicke / TOOTH THICKNESS s_n Lehrenmass / GAGE DIMENSION effective max			2.060
Zahndicke / TOOTH THICKNESS s_n (Einzelmessung / ACTUAL) max.	3.479	4.889	2.037
Zahndicke / TOOTH THICKNESS s_n (Einzelmessung / ACTUAL) min.	3.449	4.859	1.997
Messkugel-Ø / BALL DIA D_M	3.00	4.00	2.50
Pruefmass / MEASUREMENT OVER BALLS M_{dK} (Einzelmessung / ACTUAL) max.	99.506	52.214	33.245
Pruefmass / MEASUREMENT OVER BALLS M_{dK} (Einzelmessung / ACTUAL) min.	99.415	52.155	33.190