Part Submission Warrant

MAGNA GETRAG

3M460

Part Name:	**Output Shaft 2**	Cust. Part No.:	251.6.1298.35
Shown on Drawing No.:	251.6.1298.35	Org. Part No.:	251.6.1298.35
Engineering Change Level:	3 Index "b" (C008074CP2)	Dated:	27/09/2017
Additional Engineering Changes:	na	Dated:	na
Safety and/or Government Regulation:	☐ Yes ☑ No Purchase Order No.:	Weight (kg):	1.602
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 251.6.1078.35)
- groove S and V design change (including EP part design)
- Identification grooves in according with change C006077

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

Organization Authorized Signature: [signature] Date: 23/03/2018

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: 23/03/18

Print Name: Customer Tracking No.:

New P/N introduction - 1298.35

Short description: Initial PPAP (only differences from 1078)

	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	LAB + Pulizia	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

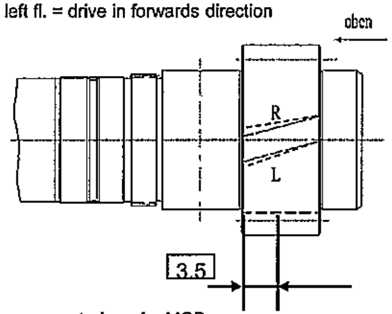
	Other requirements	Required	Note	PPAP Docs updated
1	PSW Raw part	NO		
2	PSW E.P. part	Yes		Yes
3	PSW Engagement Rings	NO		

23/03/2018

Released by Fabrizio.Cricenti on 2017-11-10
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	2.650000	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	24° 0' 0"	Profil-Winkelabweichung / Profile angle error $f_{H\alpha}$	-0.017 ± 0.012	0.000 ± 0.012	Teilungssprung / Diff. bet. adjacent pitches f_u	0.018
Steigungsrichtung / Hand of helix	LINKS	Flankenl.-Winkelabweich. / Tooth alignment error $f_{H\beta}$	0.040 ± 0.013	- 0.030 ± 0.013	Teilungs-Summenabweich. / Cumulative circ. pitch error F_{pk}	
Profilverschiebungsfaktor / Addendum modification coeff. x	0.917	Flankenl.-Gesamtabweich. / Total alignment error F_β			Rundlaufabweichung / Radial run-out F_r	0.032
Teilkreisdurchmesser / Pitch diameter d	49.313	Flankenl.-Formabweich. / Longitudinal alignment err. $f_{f\beta}$	0.004		Zahndickenschwankung / Range of tooth thickn. error R_S	
Kopfkreisdurchmesser / Outside diameter d_a	59.40 $_{-0.20}$	Teilungs-Gesamtabweich. / Cumulative pitch error F_p	0.040			
Kopfnutzkreisd. theo. max. / Tip diam. usable theo. d_{Na}	58.95	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}	58.57	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	44.15 $_{-0.30}$	Radbreite im Meßkreis d_M / Facewidth in meas. diam. b	33.98		Meßkreis Krümmungsradius ρ_{dM} / Radius of curvature meas. diam.	11.83
Fußnutzkreisdurchmesser / Root diameter usable d_{Nf}	47.02					
Grundkreisradius / Base circle radius r_b	22.906					
Grundkreisdurchmesser / Base diameter d_b	45.811					
Normalzahndicke max. / Normal tooth thickness s_n	5.932					
Normalzahndicke min. / Normal tooth thickness s_n	5.902					
Meßzähnezahl / Number of teeth spanned k	4					
Zahnweite max. / Base tangent length W_k	29.860					
Zahnweite min. / Base tangent length W_k	29.832					
Meßkugeldurchmesser / Ball diameter D_M	5.5000					
Diam. Zweikugelmaß max. / Measurement o. balls M_{dK}	61.718					
Diam. Zweikugelmaß min. / Measurement o. balls M_{dK}	61.666					
Verdrehflankenspiel theo. / Circumferential backlash	0.064 0.171					

left fl. = drive in forwards direction



Measurement plane for MOB

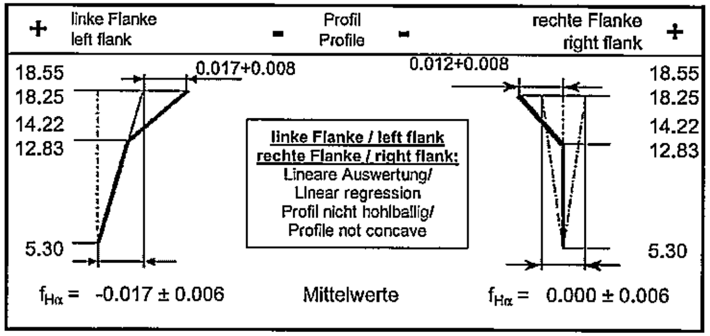
Hondurchmesser = 46.20 $_{-0.30}$ ≡ 2.99
honing diameter

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

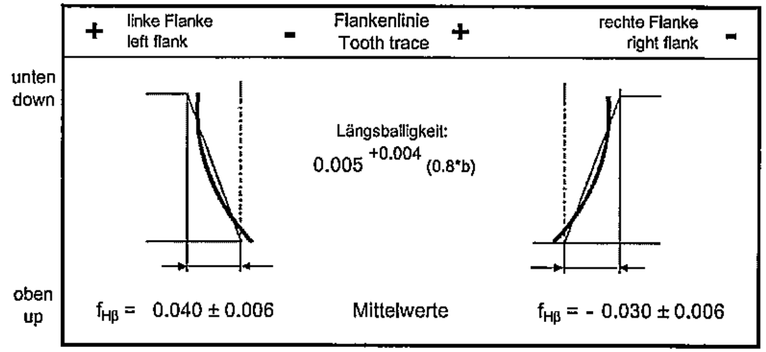
(a)

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 251.6.0782.35



* Schreibbeginn
* Start of checking
Ø = 46.20 $_{-0.30}$ ≡ 2.99



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

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

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

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

Verteiler:

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

Remark:

Abbildungen sind unmaßstablich.
Diagrams not to scale.

Ersatz für
Erstverwendung bei Getriebetype: 251

	Datum	Name
gez.	03.05.2017	Hartmann-G, Ch
gepr.		

Verzahnungsblatt Endkontrolle
Final Check Gear Data

Benennung:
Naming:
Abtriebswelle K2

Zeichnungsnummer:
Drawing number:
251.6.1298.35

OS2_7DCT300_Gearset_1A-21A_&_21H

hobbing
Pfauter FRW-10227
Pfauter FRW-10018

spline rolling
Excello WAW-10024

washing before heat treatment
ORE-10162

heat treatment
ECM Vertical Furnace

straightening
Galdabini RIA-10029

grinding dimensions
(grooves)
Schaudt SLA-11058

grinding dimensions
(grooves)
Schaudt SLA-16037

grinding dimensions
(diameter)
Schaudt SLA-10033
Schaudt SLA-10031

power honing
Prawema HNW-11007

Superfinishing
Nagel HNA-10057

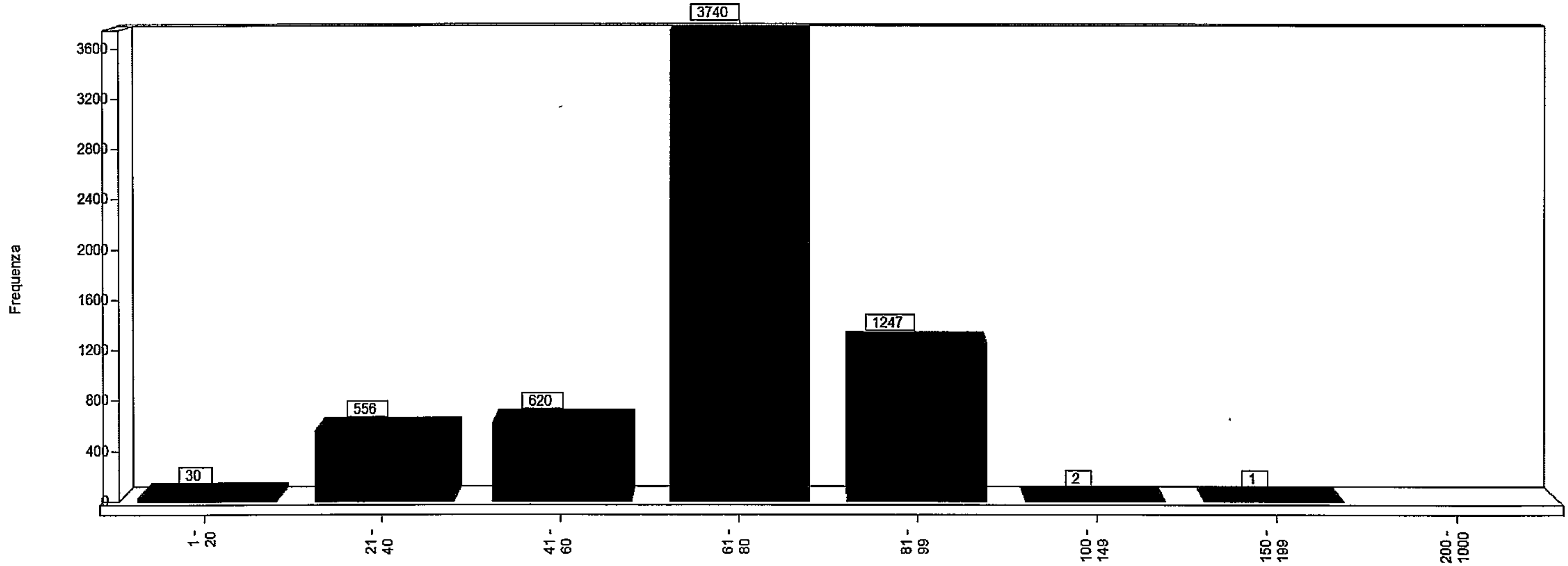
washing
Duerr ORE-10061

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 + 21H 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: 06/03/2018



Actions ongoing – RPN > 100:

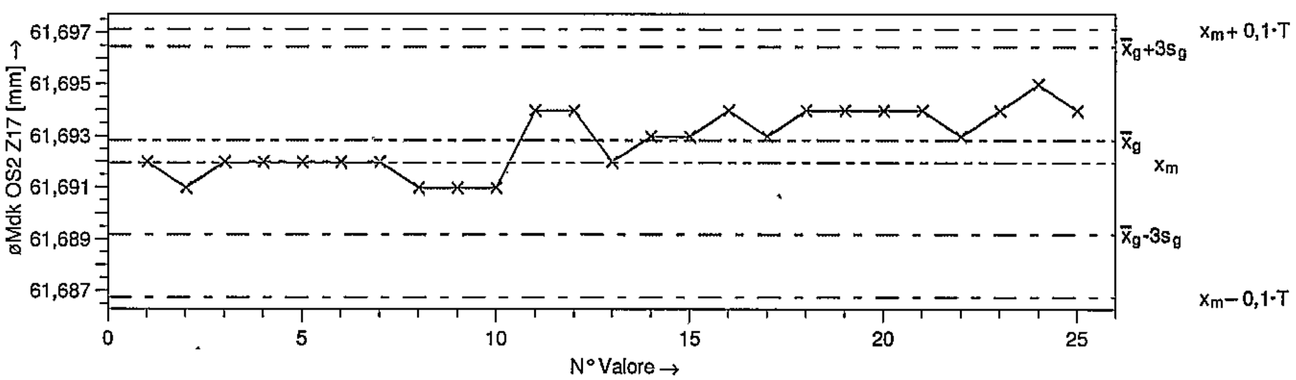
Chr. Classification	Project	Component	Operation	Chr. Description	Actual RPN				Action	Resp.	Due date	Min. RPN expected			
					S	O	D	RPN				S	O	D	RPN
<M>	DCT300	SG1	Hard Turning	Clutch body Height	7	4	4	112	Final drawing tolerance review + Dogbody height review on EP (100% Check --> Sampling check)	Pierro	02-Apr-18	7	3	5	(105)
<M>	DCT300	SGRv	Hard Turning	Clutch body Height	7	4	4	112	New part workstop implementation on internal surface instead of toothing surface (external) Final drawing tolerance review + Dogbody height review on EP (100% Check --> Sampling check)	Papagna Pierro	02-Apr-18	7	3	5	(105)
std	DCT300	IS2	Diam. Grinding	Spline Fr	8	6	4	192	New operation implementation in order to ground new clamping surface for Diam. grinding operation (100% Check --> Sampling check)	Cacciapaglia	20-Apr-18	8	3	5	(120)
									New machine Junker implementation for Diam. grinding operation		31-Aug-18	8	2	5	(80)

Capacità strumenti di misura

Data od. 05/12/2017	Nome oper. mario.bozza	Reparto/Area/Prod. NN	Posto di prova Levigatura OS2

Calibro		Master		Caratteristica	
Desc. calibro	Calibro a forcella	Desc. mast.	Serie KIT BPP	Desc. Car.	øMdk OS2 Z17
N° calibro	MAR 402090 050	N° master	MJU 416161 004	N° Caratt.	2516129835
Ris. calibro	0,001	Valore reale mast.	61,692	Val. Nom. 61,692	LSS 61,718 ≙ 0,026
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di m mm	LSI 61,666 ≙ -0,026

Nota



i	x_i	i	x_i	i	x_i	i	x_i	i	x_i
1	61,692	6	61,692	11	61,694	16	61,694	21	61,694
2	61,691	7	61,692	12	61,694	17	61,693	22	61,693
3	61,692	8	61,691	13	61,692	18	61,694	23	61,694
4	61,692	9	61,691	14	61,693	19	61,694	24	61,695
5	61,692	10	61,691	15	61,693	20	61,694	25	61,694

Valori a disegno			Valori Calcolati			Statistiche		
x_m	=	61,69200				$\bar{x}_g$	=	61,69284
LSI	=	61,666	$x_{min\,g}$	=	61,691	s_g	=	0,00121
LSS	=	61,718	$x_{max\,g}$	=	61,695	$\|Bi\| = \|\bar{x}_g - x_m\|$	=	0,00084000
T	=	0,052	R_g	=	0,004			
			n_{tot}	=	25	n_{eff}	=	25

Minimo riferimento per sistema di misura capace

$C_g = \frac{0{,}2 \cdot T}{4 \cdot s_g}$	=	2,14	0 1 1,33	$T_{min\,(C_g)}$	=	0,0323
$C_{gk} = \frac{0{,}1 \cdot T - \|\bar{x}_g - x_m\|}{2 \cdot s_g}$	=	1,80	0 1 1,33	$T_{min\,(C_{gk})}$	=	0,0407
%RE	=	1,92%	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

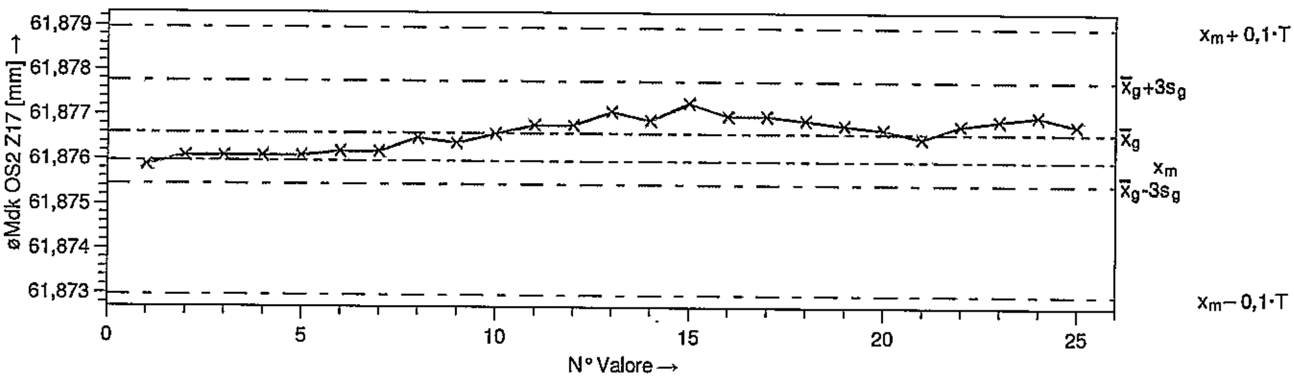
Q-DAS©

Pagina 1 / 1

Data/ora 16/03/2018	Nome oper. mario.bozza	Reparto/Area/Prod. WLQ	Posto di prova Dentatura OS2

Calibro		Master		Caratteristica	
Desc. calibro	Calibro a forcella	Desc. mast.	Serie KIT BPP	Desc. Car.	øMdk OS2 Z17
N° calibro	MAR 402090 047	N° master	MJU 416161 004	N° Caratt.	2516129835
Ris. calibro	0,0001	Valore reale mast.	61,876	Val. Nom. 61,8760	LSS 61,8910 $\hat{=}$ 0,0150
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di rr mm	LSI 61,8610 $\hat{=}$ -0,0150

Nota



i	x_i	i	x_i	i	x_i	i	x_i	i	x_i
1	61,8759	6	61,8762	11	61,8768	16	61,8770	21	61,8765
2	61,8761	7	61,8762	12	61,8768	17	61,8770	22	61,8768
3	61,8761	8	61,8765	13	61,8771	18	61,8769	23	61,8769
4	61,8761	9	61,8764	14	61,8769	19	61,8768	24	61,8770
5	61,8761	10	61,8766	15	61,8773	20	61,8767	25	61,8768

Valori a disegno			Valori Calcolati			Statistiche		
$x_m + 0{,}1 \cdot T$	=	61,879000	$x_{max\,g}$	=	61,8773	$\bar{x}_g + 3s_g$	=	61,877775
x_m	=	61,876000	$x_{min\,g}$	=	61,8759	$\bar{x}_g$	=	61,876620
$x_m - 0{,}1 \cdot T$	=	61,873000	R_g	=	0,0014	$\bar{x}_g - 3s_g$	=	61,875465
$0{,}2 \cdot T$	=	0,006000	n_{tot}	=	25	$6s_g$	=	0,002311
T	=	0,0300				s_g	=	0,000385
Unità di misura	=	mm				$\lvert Bi \rvert$	=	0,00062000
						n_{eff}	=	25

Test per Bias			Risultati del test : significativo ($\alpha \le 0{,}1\%$)
Bias	=	2,07%	

Minimo riferimento per sistema di misura capace

Risoluzione	%RE = 0,33%	0 … 5	$T_{min\,(\%RE)}$	= 0,00200
$C_g = \frac{0{,}2 \cdot T}{4 \cdot s_g}$	$= 2{,}80 \le \mathbf{3{,}89} \le 4{,}99$	0 … 1 1,33	$T_{min\,(C_g)}$	= 0,0103
$C_{gk} = \frac{0{,}1 \cdot T - \lvert \bar{x}_g - x_m \rvert}{2 \cdot s_g}$	$= 2{,}21 \le \mathbf{3{,}09} \le 3{,}97$	0 … 1 1,33	$T_{min\,(C_{gk})}$	= 0,0164

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

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

Data ____________ Firma ____________ Dipartimento ____________

GETRAG Production Part Approval

DIMENSIONAL TEST RESULTS

Organization:	GETRAG	Part Number:	251.6.1298.35
Supplier/Vendor Code:	GETRAG Modugno	Part Name:	Output Shaft 2
INSPECTION FACILITY:		Design Record Change Level:	3 Index "b"
NA		Engineering Change Documents:	C008074CP2 - 27/09/2017

Organization Measurement Results (Data)

Item	Dimension/Specification	Specification / Limits		Classif.	Qty. Tested	1	2	3	4	5	controllo distruttivo	Ok	Not Ok
1	Teeth Profile & Lead, Pitch, Fourier	OK	NOK		5	OK	OK	OK	OK	OK		OK	
2	MdK	61.718	61.666	<M>	5	61.698	61.690	61.695	61.700	61.692		OK	
3	df	44.150	43.850		5	44.048	44.036	44.033	44.035	44.038		OK	
4	da	59.400	59.200		5	59.343	59.344	59.341	59.342	59.344		OK	
5	Fr	32	0	<M>	5	16.0	15.6	15.7	15.8	15.9		OK	
6a	Max groove width - Detail V	-	1.6 min		5	1.609	1.618	1.604	1.616	1.611		OK	
6b	End groove radius (optional) - Detail V	-	-		5	0.474	0.302	0.409	0.433	0.410		OK	
6c	No material protrusion - Detail V	OK	NOK		5	OK	OK	OK	OK	OK		OK	
7	Id. groove position	2.500	3.5		5	3.174	3.167	3.122	3.127	3.111		OK	
8	Id. groove width	2.500	3.5		5	2.898	2.901	2.991	2.982	2.945		OK	
9	Id. groove depth	0.100	0.200		5	0.148	0.147	0.192	0.191	0.105		OK	
10	Max protrusion material - Detail S	16.550	-		5	16.451	16.445	16.450	16.453	16.467		OK	

SIGNATURE	TITLE	DATE
Vicenti D.	ME	20/03/2018

Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0416a04 0 P26 B7590	Controllore: turno c	Data: 05.01.2018 11:42	
Denominazione: Output Shaft 2	Numero denti z 17	Largh.fasc.dent. b 33.98mm	
Numero disegno.: D51.6.1298.35-IF	Modulo m 2.65mm	Tratto evolv. Lα 7.53mm	
Commessa/serie nr.: 1	Angolo pressione 20°	Tratto elica Lß 27.18mm	
Masch.Nr.: M001 Spindel: Formnest1	Angolo elica -24°	Inizio elab. Ml 5.3mm	
Untersuchungszweck: Laufende Messung	ø Base db 45.8113mm	Palpatore ø (#2)1mm	
Werkzeug: Charge:	Ang. Base -22.47°	Fat.scor.pr. x .917	

Testa

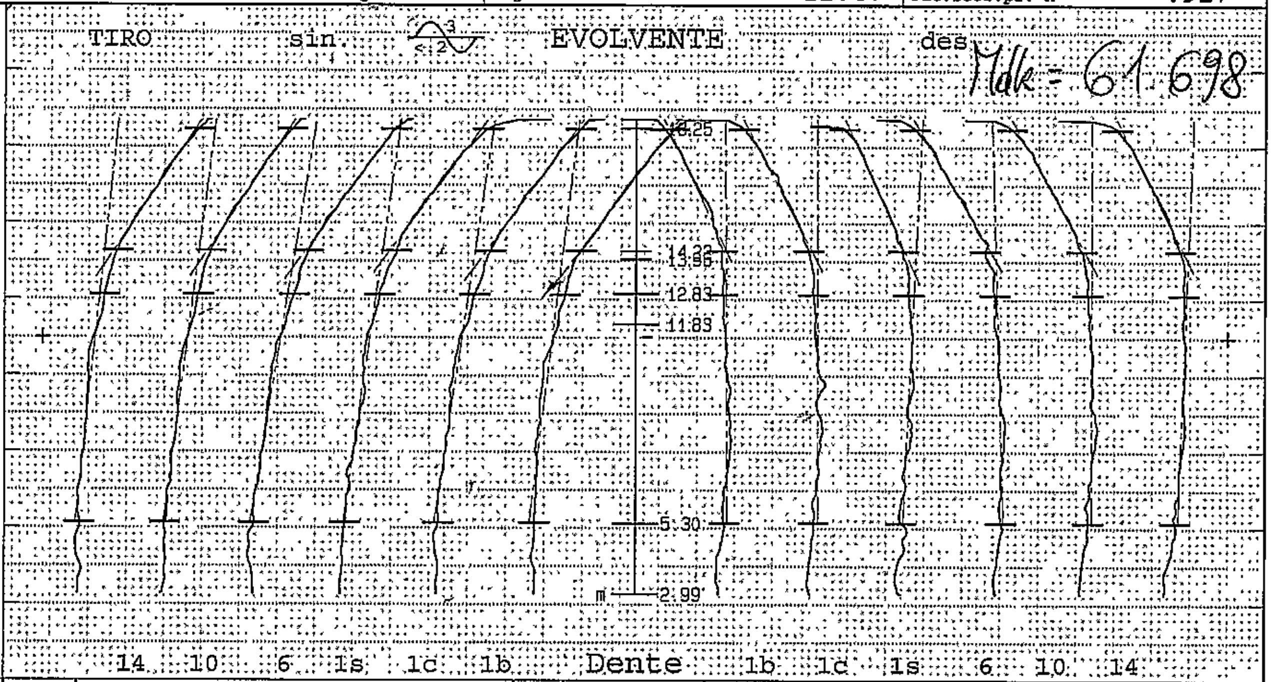
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance	Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm -17±6	-14.2	Var a 6.1							±6	Var a 6.9						0.1	
fHα -17±12	-14.2	-10.9	-13.5	-17.0	-14.7	-15.3	-12.5		±12	-0.7	-0.3	4.8	-3.0	-0.1	3.9	0.1	
Fα	3.4	4.9	3.0	2.7	2.5	2.9	4.6			2.3	3.4	3.8	2.8	3.1	3.2	3.1	
ffα 4	2.6	2.6	2.4	2.7	2.1	2.8	3.4		4	2.3	3.5	2.7	2.2	3.1	2.2	2.8	
Cα -25/-17	-20.9	-20.8	-19.8	-20.9	-21.3	-21.9	-24.6		-20/-12	-15.0	-18.3	-19.1	-19.2	-19.7	-19.1	-19.1	
ffαf 3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	1.2	0.0	0.0	0.0	0.0	
P/T-ø [mm]	44.048	[43.85/44.15]								59.343 [59.2/59.4]							

Sotto

20 µm

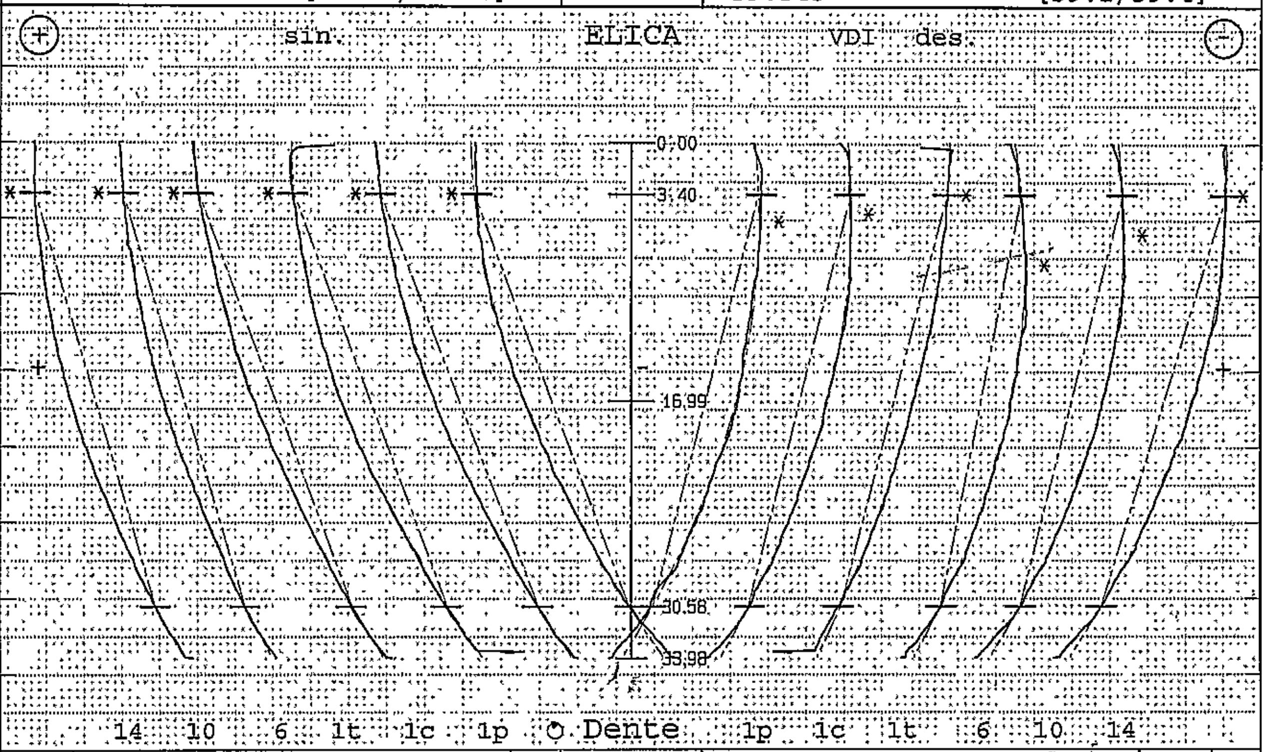
Va500:1

Vb2:1

5 mm

Sopra

N:Z



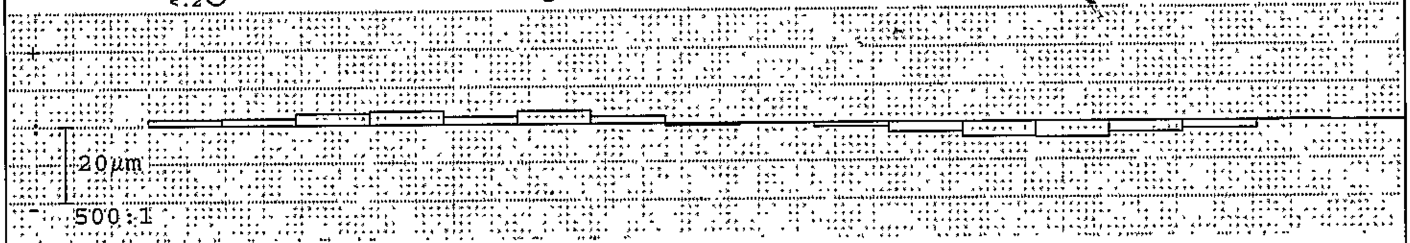
fHßm 40±6	45.8	Bd 0.Var ß 11.9						-30±6	Bd -0.Var ß 14.9						-33.9
fHß 40±13	45.8	39.8	40.7	51.0	50.6	51.7	50.6	-30±13	-34.8	-33.8	-35.1	-26.6	-33.7	-41.5	-33.9
Fß	5.5	1.7	1.3	9.2	8.6	9.7	9.1		6.4	4.7	5.7	5.2	5.4	9.6	6.2
ffß 4	0.9	0.8	1.0	0.8	1.0	0.9	1.1	4	2.3	1.1	1.2	1.4	1.1	1.3	1.2
Cß 5/9	6.1	6.6	5.5	5.7	7.6	6.6	7.3	5/9	8.1	7.5	5.3	8.1	8.4	7.8	8.0

GCG 808006

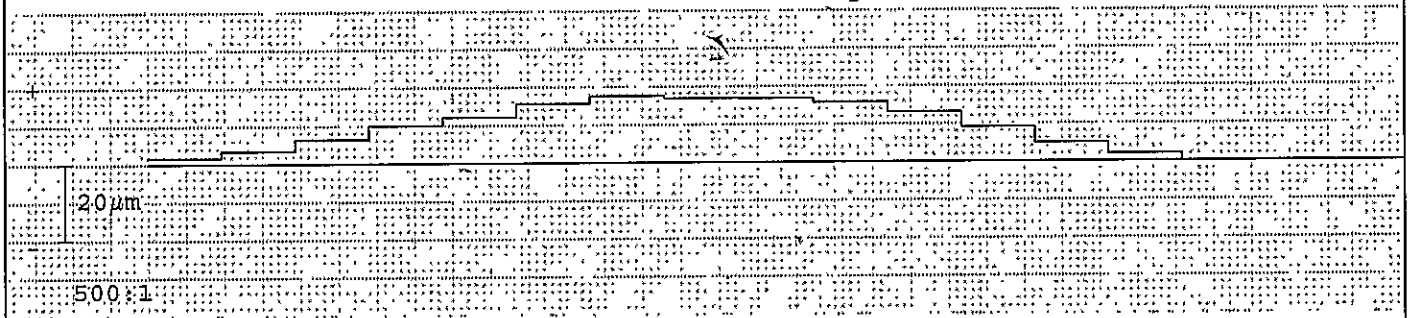
Ruota cilindrica Divisione

Nr. prog.: STI0416a04 0	P26 B7590	Controllore: turno c	Data: 05.01.2018 11:42
Denominazione:	Output Shaft 2	Numero denti z: 17	Angolo pressione: 20°
Numero disegno.:	D51.6.1298.35-IF	Modulo m: 2.65mm	Angolo elica: -24°
Commessa/serie nr.:	1	Untersuchungszweck: Laufende Messung	
Masch.Nr.:	M001	Spindel: Formneat 1 Werkzeug:	Charge:

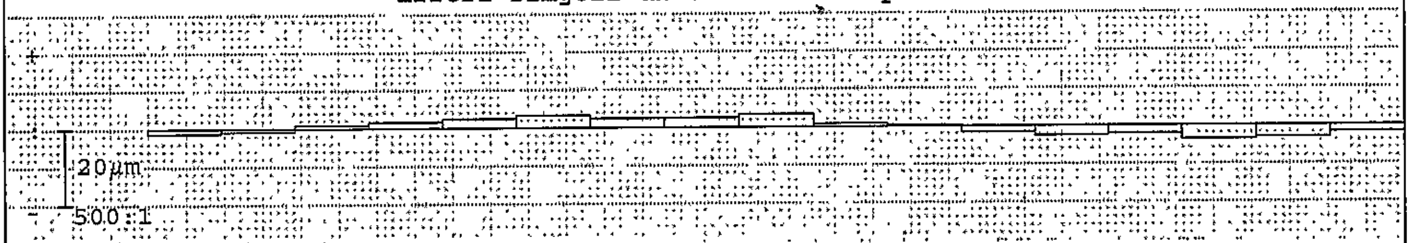
Errori singoli di divisione fp fianco sinistro



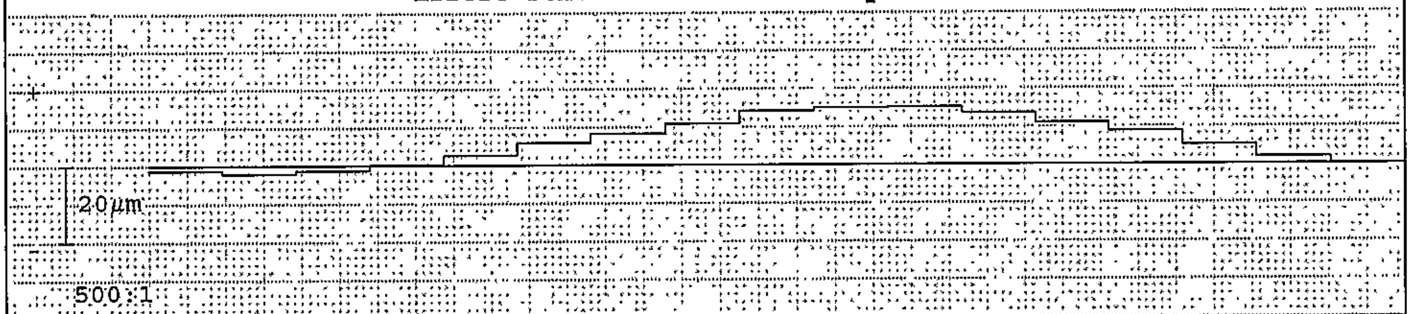
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



Errore somma di divisione Fp fianco destro

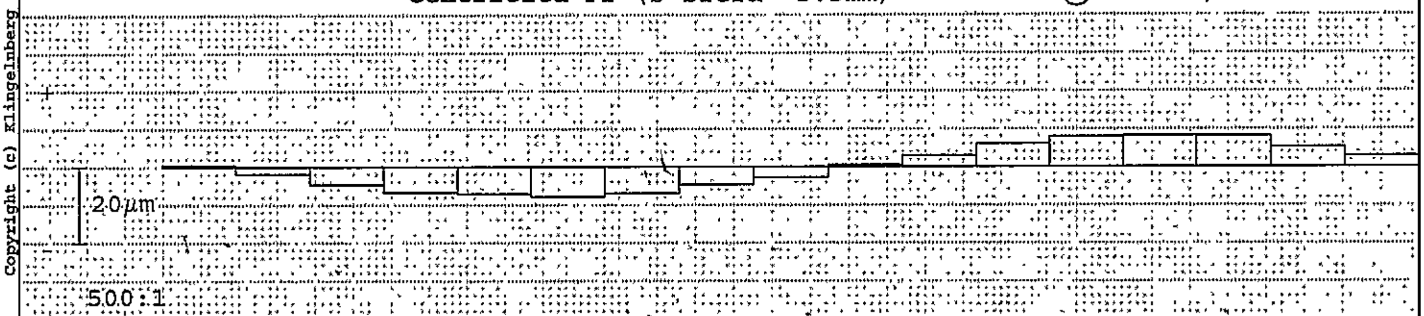


Corsa per misura divis.:53.645 z=17mm

		fianco sinistro / TIRO				fianco destro			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	4.2		14.0		3.7		14.0	
Gr. salto di passo	fu max	2.5		18.0		2.6		18.0	
Scarto di divisione	Rp	7.7				7.1			
Err. globale di divisione	Fp	17.6		40.0		17.2		40.0	
Err. cordale di divisione	Fpz/8	8.2				6.9			

Centricità Fr (Ø-sfera =5.5mm)

◎ : 15.8µm



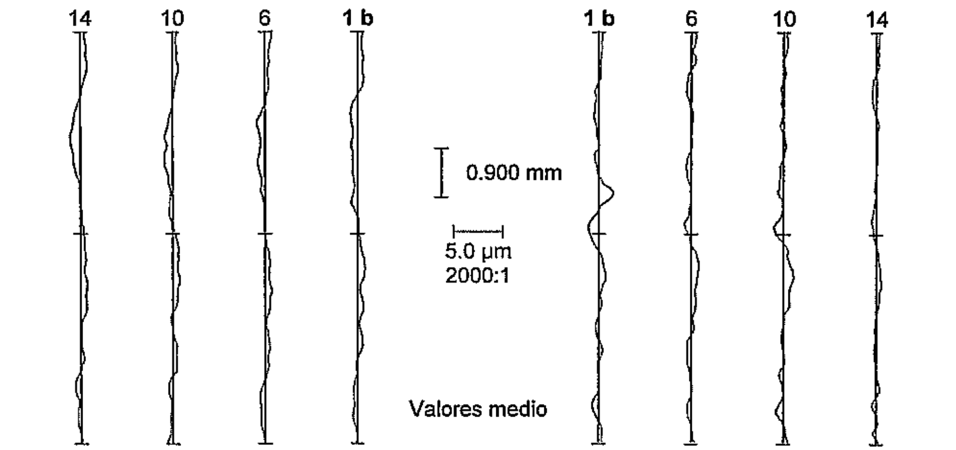
Err. di concentricitá	Fr	16.0	32.0	
Variaz. spessore dente	Rs			

KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF Denominazione: Output Shaft 205.01.18
Serie nr: 1 Scopo: Laufende Messung42 / 11:48
Macchina: M001 Mandrino: Formnest 1 z= 17

Evolvente senza modifiche effettive

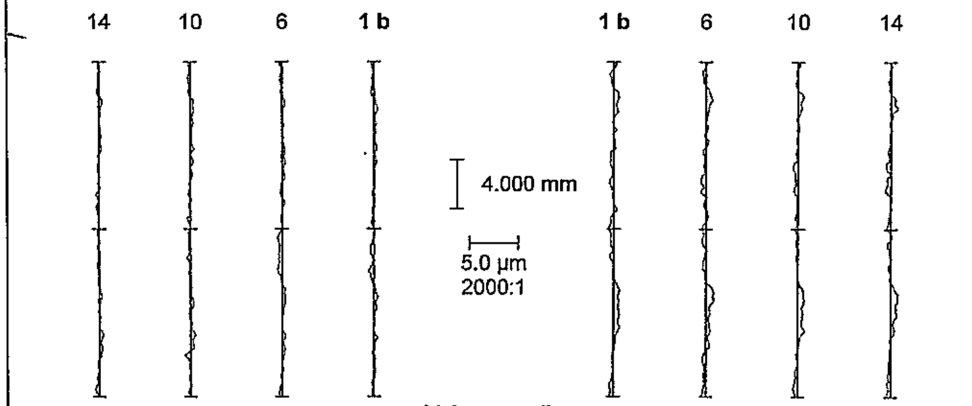
+/- sinistro destro -/+



	14	10	6	1 b	Valores medio		1 b	6	10	14
fhα	-6.4	-7.9	-9.9	-8.9	-8.3	0.1	-0.2	-1.8	0.0	2.3
Fα	10.4	8.2	7.3	8.2	8.5	3.1	3.4	2.8	3.1	3.2
ffα	2.6	2.4	2.7	2.8	2.6	2.8	3.5	2.2	3.1	2.2

Elica senza modifiche effettive

+/- sinistro destro -/+



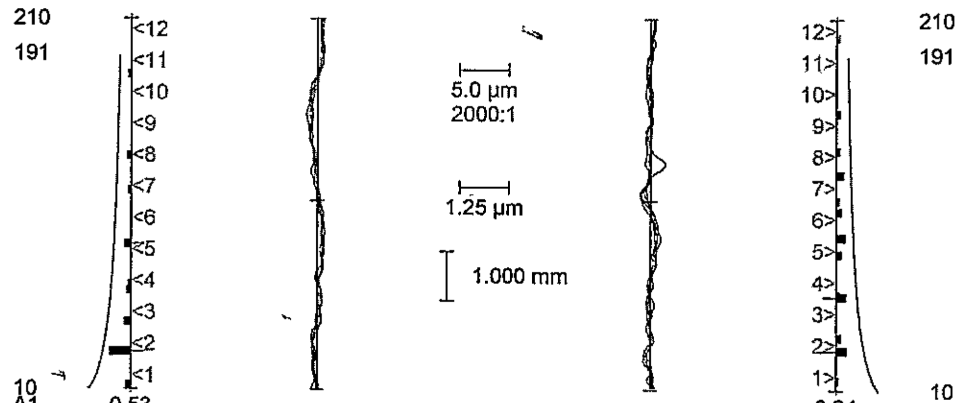
	14	10	6	1 b	Valores medio		1 b	6	10	14
fhβ	-39.8	-40.7	-51.0	-51.7	-45.8	33.9	33.8	26.6	33.7	41.5
Fβ	63.9	64.4	72.6	73.1	68.5	50.6	50.4	44.6	50.6	56.8
ffβ	0.8	1.0	0.8	0.9	0.9	1.2	1.1	1.4	1.1	1.3
Cβ	10.1	8.5	8.8	10.1	9.4	12.4	11.7	12.6	13.1	12.1

KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF Denominazione: Output Shaft 205.01.18
Serie nr: 1 Scopo: Laufende Messung42 / 11:48
Macchina: M001 Mandrino: Formnest 1 z= 17

Evolvente senza modifiche effettive

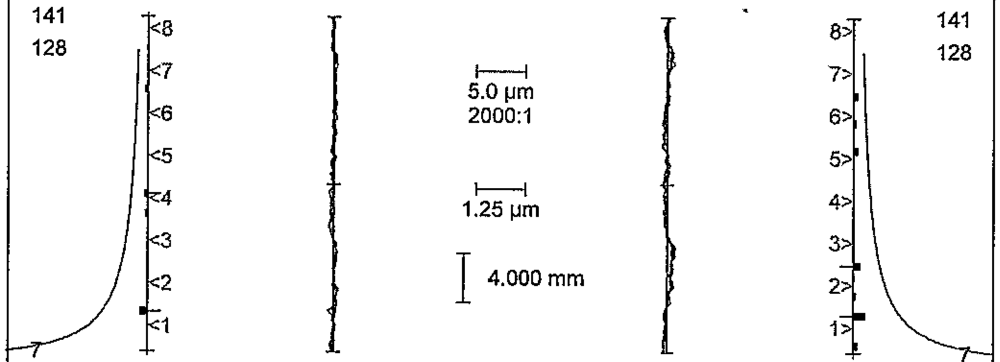
+/- sinistro Spettro medio



	sinistro	destro
A1	0.53	0.24
A2	0.15	0.25
O(1)	30	60
O(2)	88	31

Elica senza modifiche effettive

+/- sinistro destro -/+



	sinistro	destro
A1	0.18	0.29
A2	0.06	0.16
O(1)	23	22
O(2)	70	42

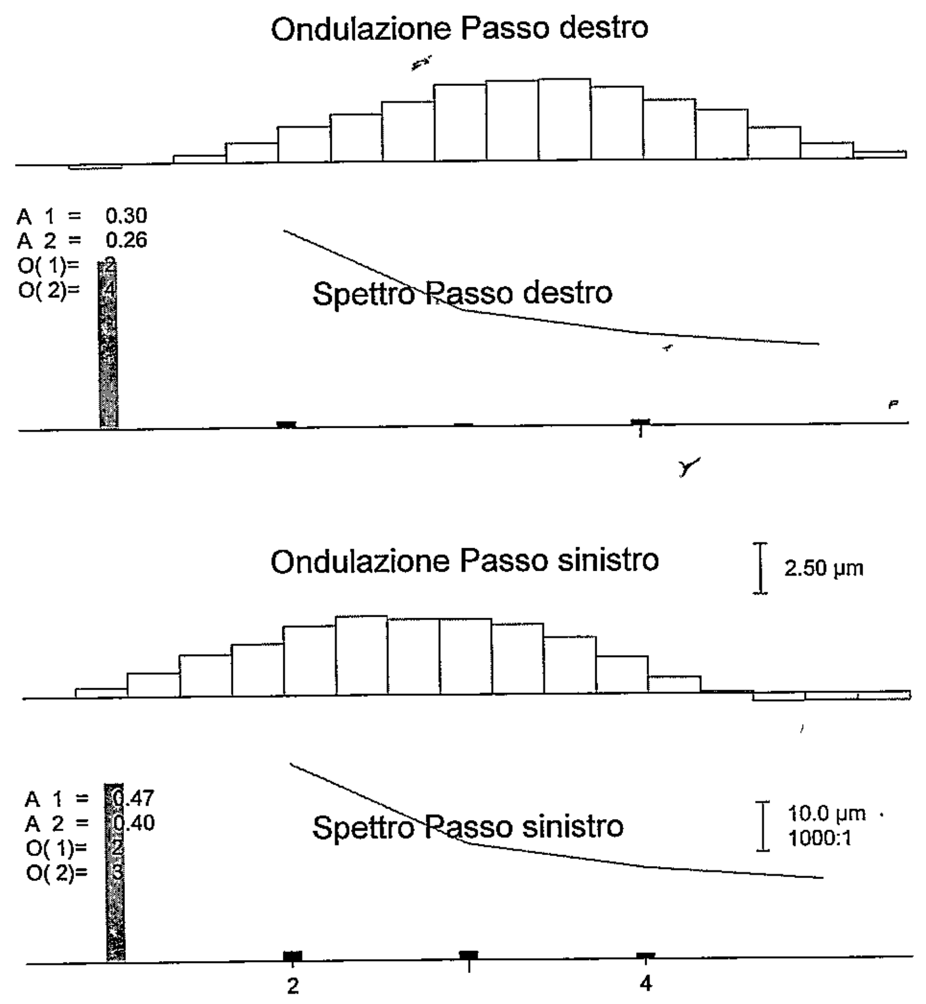
■ Spettro

tmpana_dat

KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF
Serie nr: 1
Macchina: M001

Denominazione: Output Shaft 205.01.18
Scopo: Laufende Messung 42 / 11:48
Mandrino: Formnest 1 z= 17



Ruota cilindrica Evolvente/Elica

Nr. prog.:	STI0416a04 0 P26 B7590	Controllore:	turno c	Data:	05.01.2018 11:48
Denominazione:	Output Shaft 2	Numero denti z	17	Largh.fasc.dent. b	33.98mm
Numero disegno.:	D51.6.1298.35-IF	Modulo m	2.65mm	Tratto evolv. La	7.53mm
Commessa/serie nr.:	2	Angolo pressione	20°	Tratto elica Lß	27.18mm
Masch.Nr.:	M001 Spindel: Formm[illegible]	Angolo elica	-24°	Inizio elab. M1	5.3mm
Untersuchungszweck:	Laufende Messung	Ø Base db	45.8113mm	Palpatore Ø	(#2) 1mm
Werkzeug:	Charge:	Ang. Base	-22.47°	Fat.scor.pr. x	.917

Testa

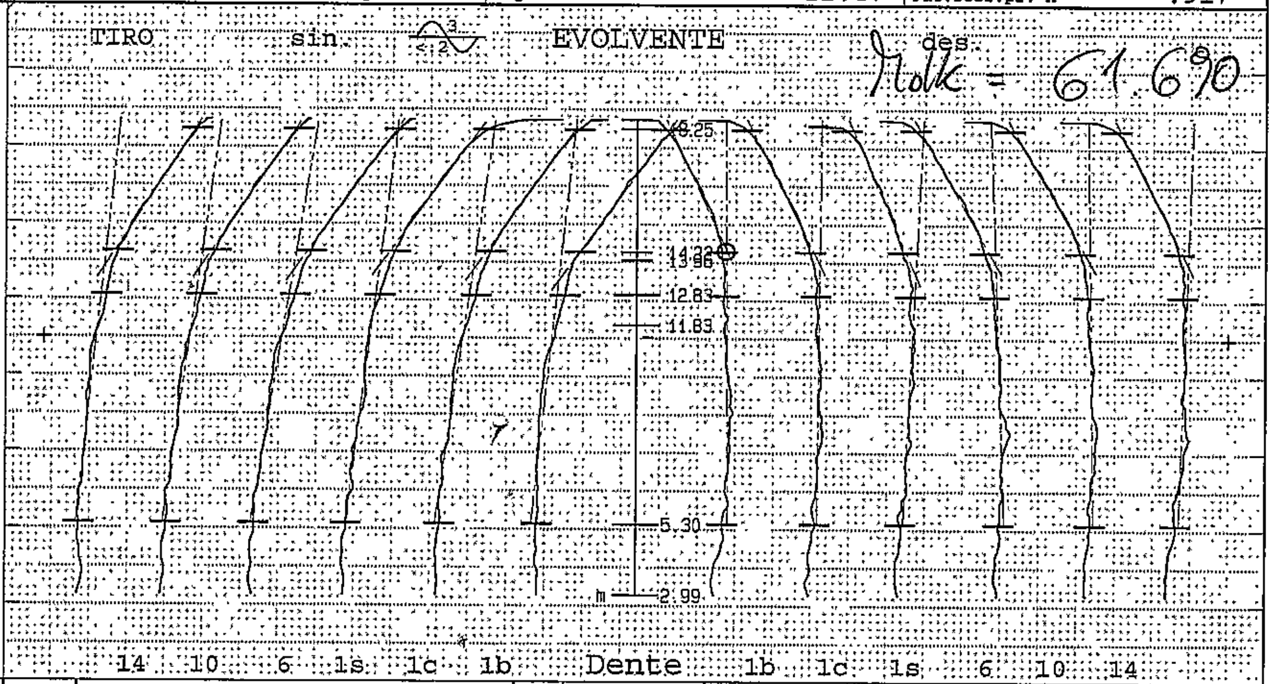
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance	Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm -17±6	-14.6	Var a 6.2							±6	Var a 7.3						-0.2	
fHα -17±12	-14.6	-11.1	-14.9	-17.3	-13.5	-15.1	-11.2		±12	-0.8	1.0	5.0	-3.7	-1.6	3.6	-0.2	
Fα	3.2	4.3	2.6	2.8	2.9	3.0	4.9			2.7	2.8	4.3	4.4	2.7	4.1	3.5	
ffα 4	2.6	2.4	2.3	2.8	1.8	3.0	3.4		4	2.9	2.6	2.5	3.8	2.8	3.5	3.2	
Cα -25/-17	-20.8	-20.3	-20.2	-21.2	-21.6	-21.3	-24.7		-20/-12	-14.6	-18.4	-18.6	-18.7	-19.6	-19.3	-19.0	
ffαf 3	0.0	0.0	0.0	0.0	0.3	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø[mm]	44.036				[43.85/44.15]					59.344				[59.2/59.4]			

Sotto

20 µm

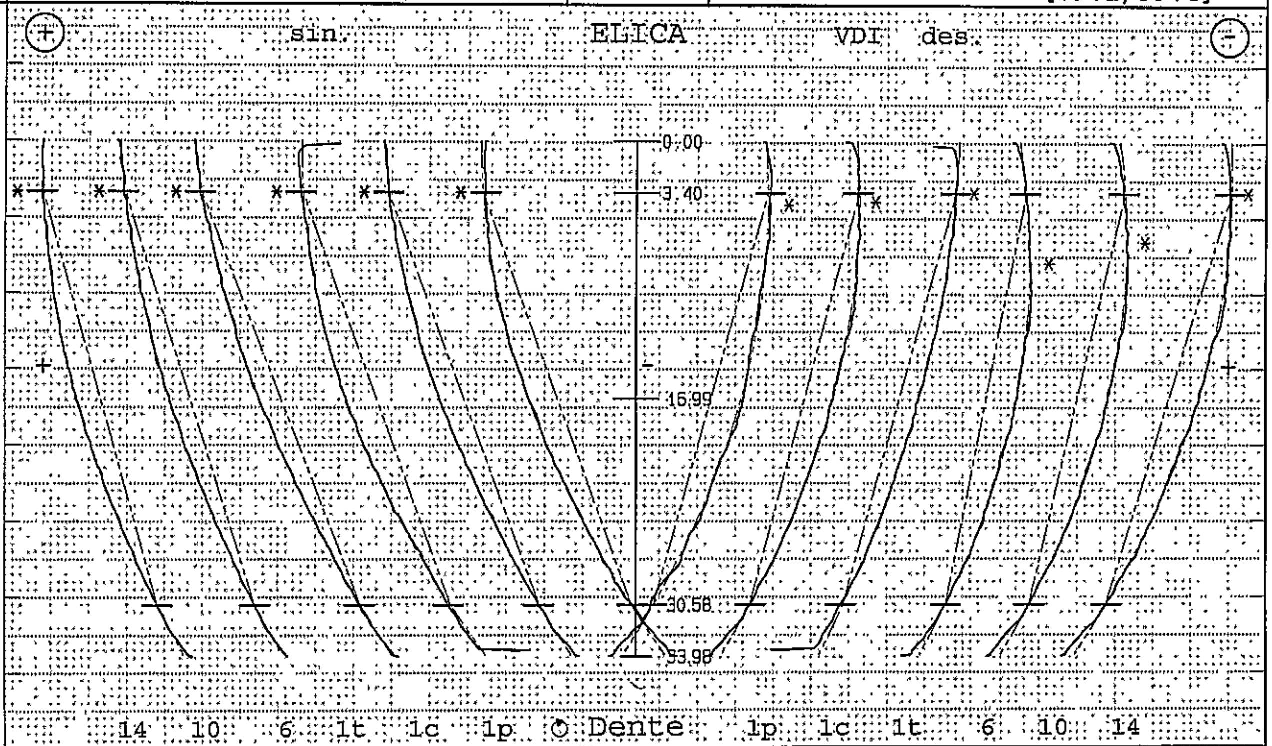
Va500:1

Vb2:1

5 mm

Sopra

N:Z

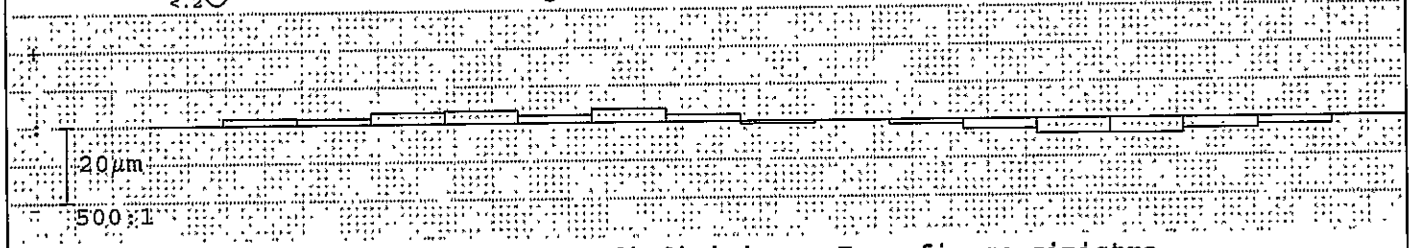


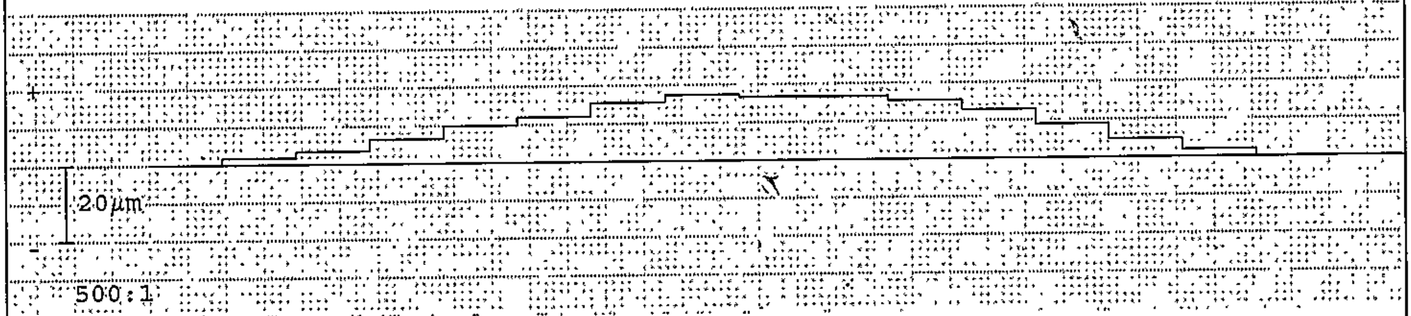
fHßm 40±6	45.8	Bd 0.Var ß 15.0							-30±6	Bd 0.Var ß 15.1						-33.9
fHß 40±13	45.8	37.8	43.3	52.8	48.8	49.4	48.5		-30±13	-37.7	-36.1	-37.1	-26.4	-31.5	-41.5	-33.9
Fß	6.0	2.3	3.3	10.7	7.0	7.6	7.8			8.0	6.3	6.6	5.3	4.3	9.9	6.5
ffß 4	0.9	0.8	0.9	0.9	1.3	0.8	1.1		4	2.2	1.4	1.2	1.2	1.3	1.6	1.4
Cß 5/9	6.1	6.4	5.6	5.8	8.1	6.4	7.6		5/9	8.0	7.6	5.3	8.1	8.3	8.0	8.0

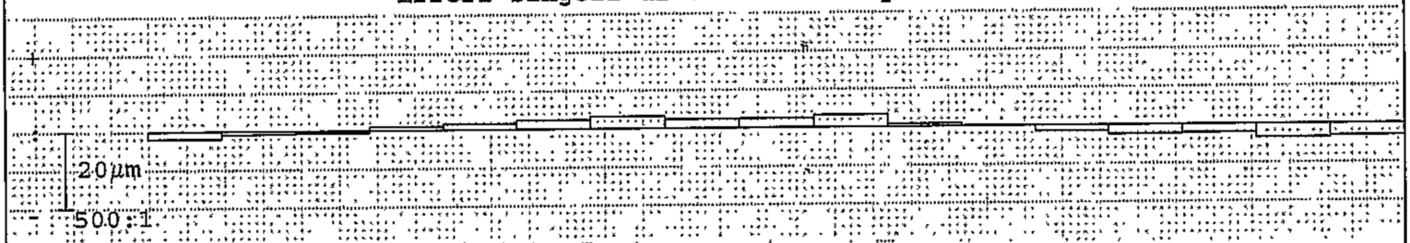
GCG 808006

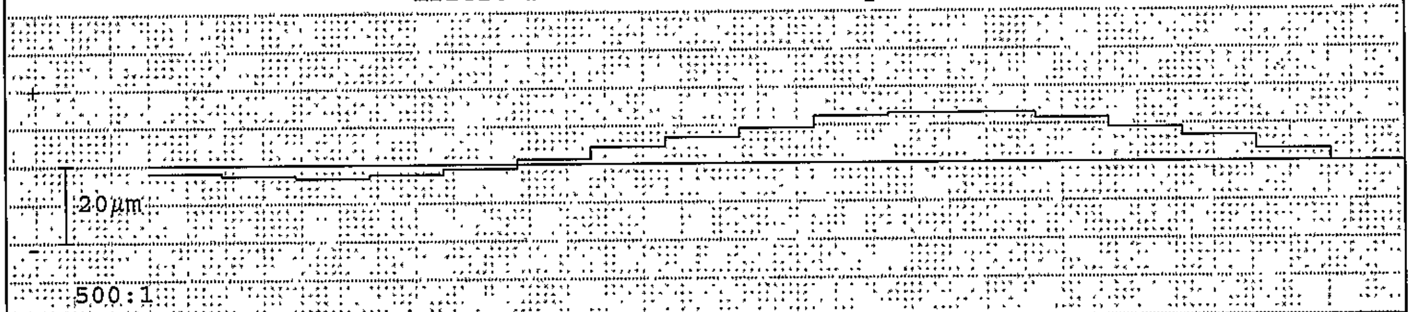
Ruota cilindrica Divisione

Nr. prog.: STI0416a04 0	P26 B7590	Controllore:	turno c	Data:	05.01.2018 11:48
Denominazione:	Output Shaft 2	Numero denti z	17	Angolo pressione	20°
Numero disegno.:	D51.6.1298.35-IF.	Modulo m	2.65mm	Angolo elica	-24°
Commessa/serie nr.:	2	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formmeßt. 1	Werkzeug:	Charge:	





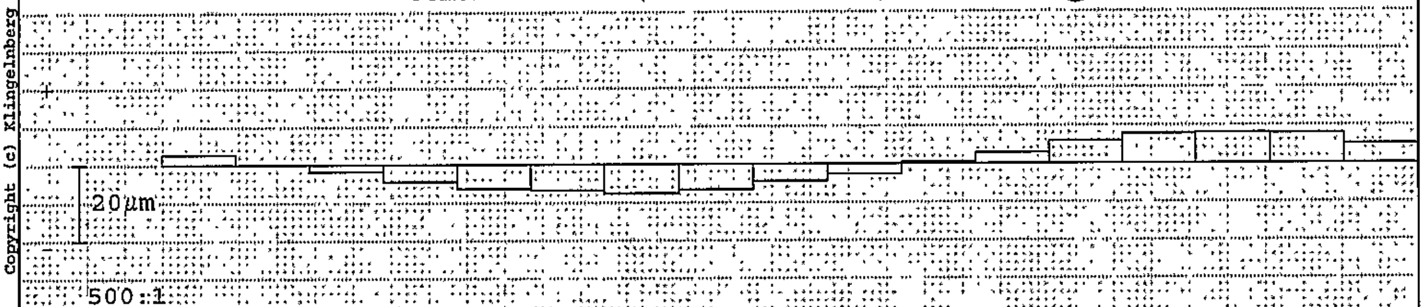




Corsa per misura divis.:53.645 z=17mm

		fianco sinistro / TIRO				fianco destro			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	4.1		14.0		3.6		14.0	
Gr. salto di passo	fu max	2.6		18.0		2.5		18.0	
Scarto di divisione	Rp	7.7				6.8			
Err. globale di divisione	Fp	17.4		40.0		16.5		40.0	
Err. cordale di divisione	Fpz/8	8.0				6.7			

Centricità Fr (Ø-sfera =5.5mm) ◎ : 15.2µm



Err. di concentricità	Fr	15.6	32.0	
Variaz. spessore dente	Rs			

KLINGELNBERG

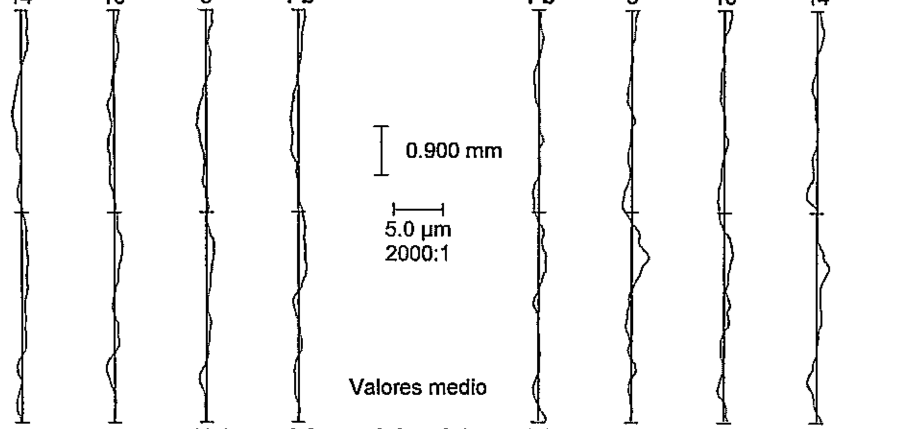
KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF
Serie nr: 2
Macchina: M001

Denominazione: Output Shaft 2 05.01.18
Scopo: Laufende Messung 11:48 / 11:54
Mandrino: Formnest 1
z= 17

Evolvente senza modifiche effettive

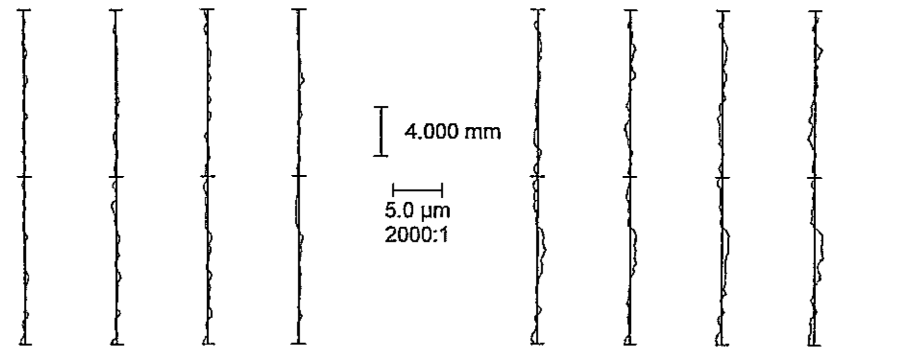
+/- sinistro — destro -/+



	14	10	6	1 b	Valores medio		1 b	6	10	14
fhα	-6.5	-8.7	-10.1	-8.8	-8.5	-0.1	0.6	-2.2	-0.9	2.1
Fα	9.8	7.9	7.0	8.2	8.2	3.5	2.8	4.4	2.7	4.0
ffα	2.5	2.4	2.8	3.0	2.6	3.2	2.6	3.8	2.8	3.5

Elica senza modifiche effettive

+/- sinistro — destro -/+



	14	10	6	1 b	Valores medio		1 b	6	10	14
fhβ	-37.8	-43.3	-52.8	-49.4	-45.8	33.9	36.1	26.4	31.5	41.5
Fβ	62.5	66.9	74.3	71.3	68.8	50.6	52.4	44.7	48.7	56.5
ffβ	0.8	0.9	0.9	0.8	0.9	1.4	1.4	1.2	1.3	1.6
Cβ	9.8	8.6	8.9	9.8	9.3	12.4	11.8	12.5	12.9	12.4

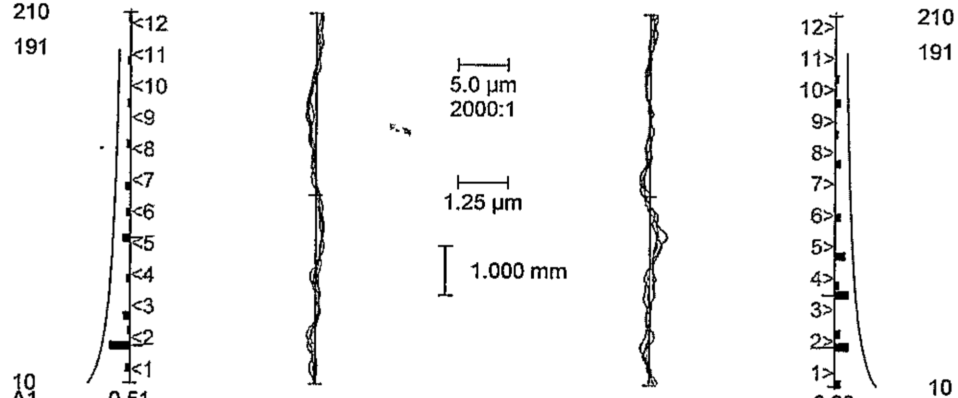
KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF
Serie nr: 2
Macchina: M001

Denominazione: Output Shaft 2 05.01.18
Scopo: Laufende Messung 11:48 / 11:54
Mandrino: Formnest 1
z= 17

Evolvente senza modifiche effettive

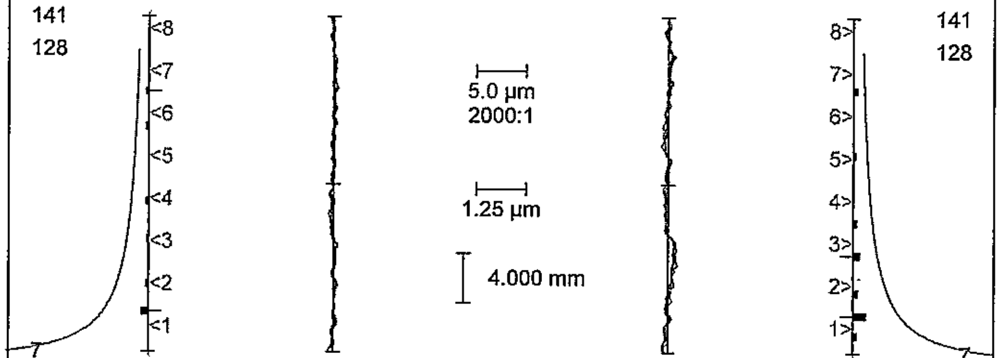
+/- sinistro — Spettro medio



	sinistro	destro
A1	0.51	0.33
A2	0.18	0.34
O(1)	30	31
O(2)	88	59

Elica senza modifiche effettive

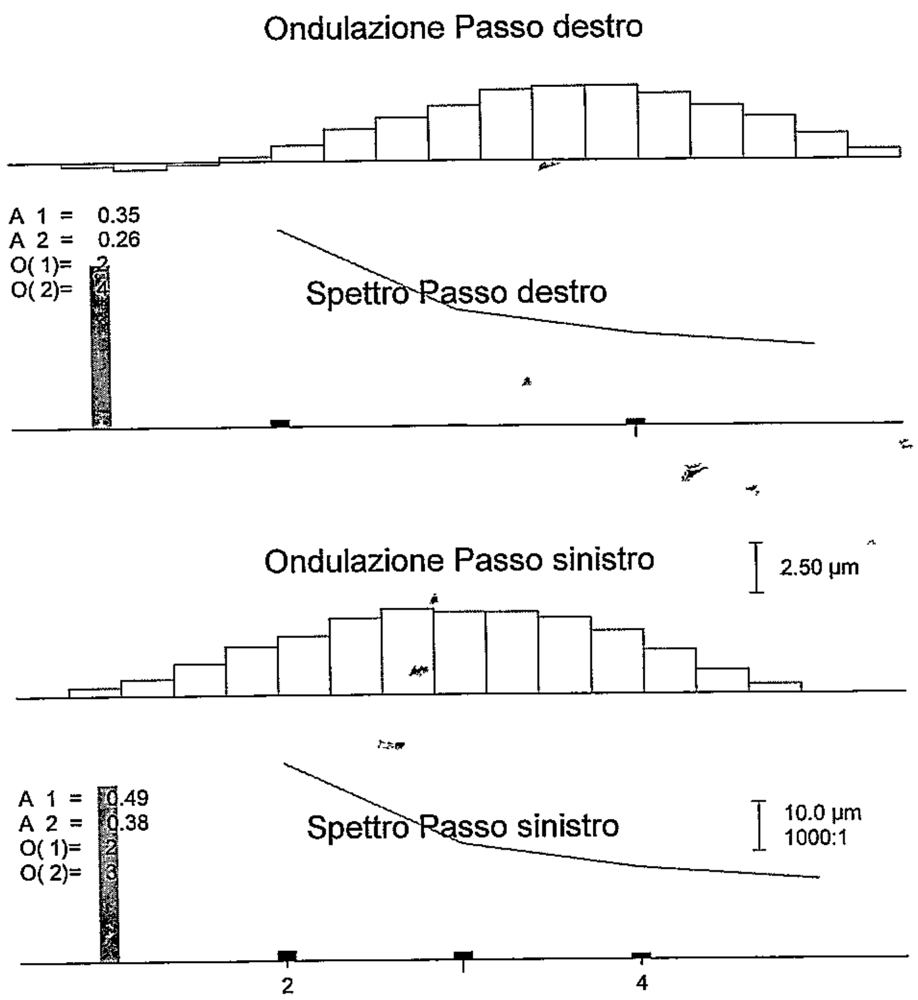
+/- sinistro — destro -/+



	sinistro	destro
A1	0.17	0.31
A2	0.06	0.16
O(1)	23	22
O(2)	111	46

■ Spettro ■ tmpana_dat

Numero di disegno: D51.6.1298.35-IF	Denominazione: Output Shaft 2 05.01.18
Serie nr: 2	Scopo: Laufende Messung 11:48 / 11:54
Macchina: M001	Mandrino: Formnest 1 z= 17



Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0416a04 0	P26 601265	Controllore:	turno B	Data:	08.01.2018 10:54
Denominazione:	Output Shaft 2	Numero denti z	17	Largh.fasc.dent. b	33.98mm
Numero disegno.:	D51.6.1298.35-IF	Modulo m	2.65mm	Tratto evolv. La	7.53mm
Commessa/serie nr.:	3	Angolo pressione	20°00'00"	Tratto elica Lß	27.18mm
Masch.Nr.:	M001 Spindel: Formmeßt	Angolo elica	-24°00'00"	Inizio elab. M1	5.3mm
Untersuchungszweck:	Laufende Messung	Ø Base db	45.8113mm	Palpatore Ø	(#2)1mm
Werkzeug:	Charge:	Ang. Base	-22°28'14"	Fat.scor.pr. x	.917

Testa

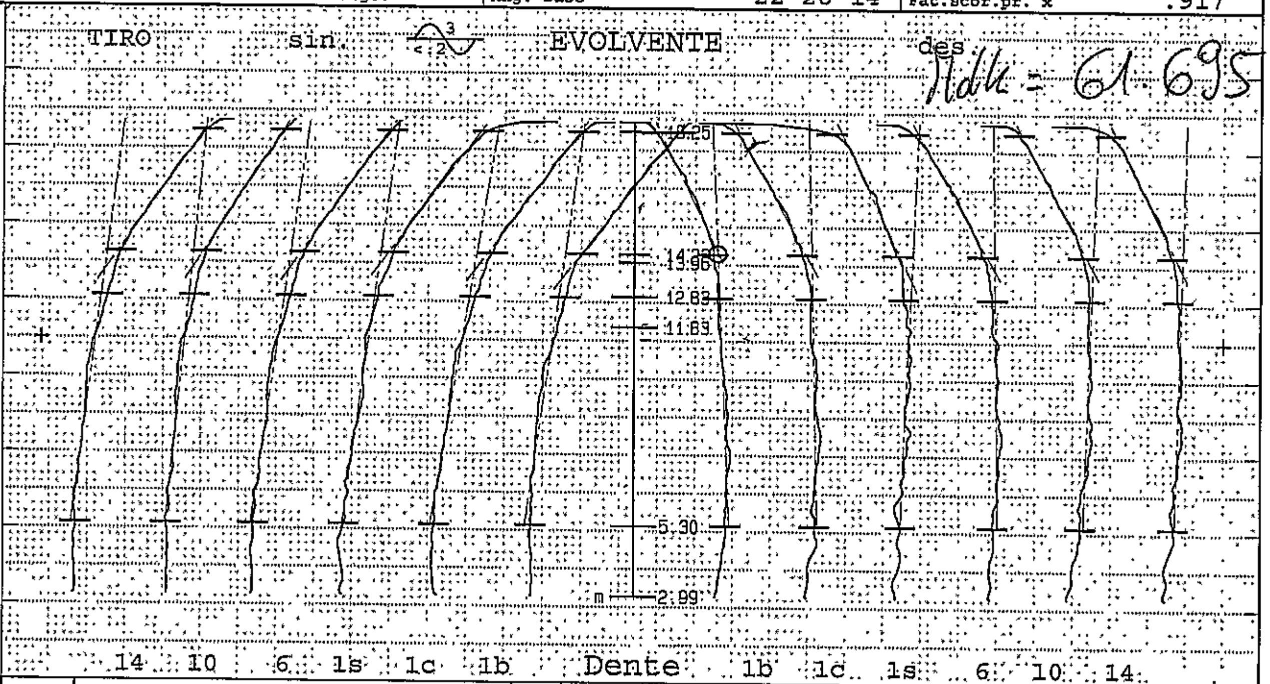
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm	-17±6	-14.2	Var a 6.8							±6	Var a 6.0						0.7	
fHα	-17±12	-14.2	-13.5	-10.6	-15.1	-14.5	-17.4	-14.9		±12	-4.6	-2.4	4.6	-1.5	3.6	3.0	0.7	
Fα		3.2	3.6	4.3	2.4	2.7	2.6	3.5			3.6	3.0	4.4	2.8	3.7	3.2	3.2	
ffα	4	2.6	2.8	2.5	2.7	1.9	2.5	2.9		4	2.4	2.9	3.7	2.9	3.1	2.5	2.9	
Cα	-25/-17	-21.3	-21.6	-20.6	-21.3	-21.8	-21.5	-24.8		-20/-12	-14.0	-18.7	-20.4	-19.9	*-20.3*	-19.1	-19.5	
ffαf	3	0.0	0.0	0.0	0.0	0.5	0.0	0.0		3	0.0	0.0	0.4	0.0	0.0	0.0	0.0	
P/T-ø [mm]		44.033				[43.85/44.15]					59.341				[59.2/59.4]			

Sotto

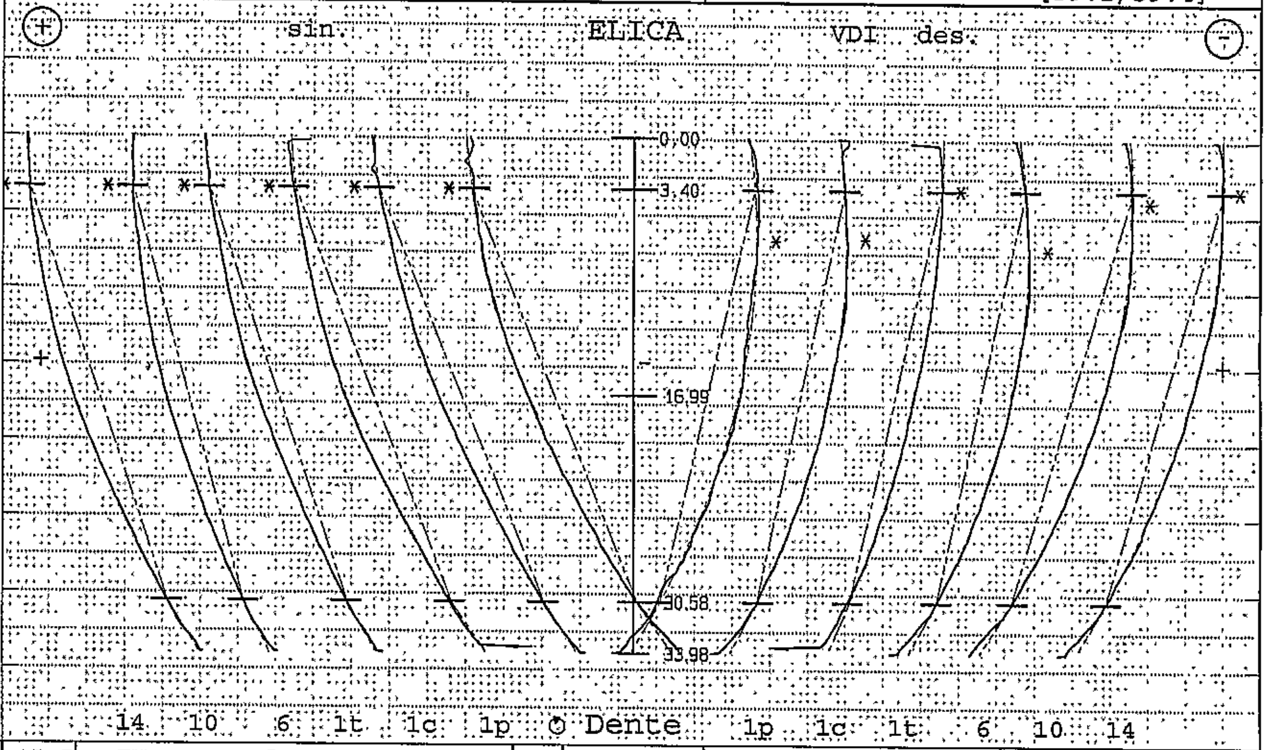
20 µm

Va500:1

Vb2:1

5 mm

Sopra



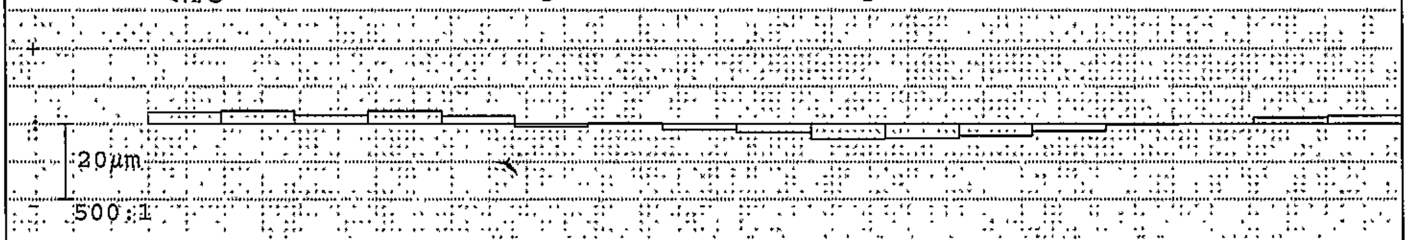
N:Z 14 10 6 1t 1c 1p Dente 1p 1c 1t 6 10 14

fHßm	40±6	45.5	FV -2.Var ß 17.3							-30±6	FV 0.Var ß 10.5						-34.4	
fHß	40±13	45.5	45.6	36.7	45.6	51.5	*54.0*	54.2		-30±13	-31.3	-29.3	-30.6	-29.4	-39.8	-39.0	-34.4	
Fß		6.1	4.6	2.7	4.6	9.7	12.6	12.5			5.4	3.2	1.2	3.8	8.9	7.8	5.9	
ffß	4	0.7	0.6	0.7	0.8	0.9	0.7	1.0		4	2.1	1.0	1.0	1.0	1.1	1.1	1.1	
cß	5/9	6.1	6.7	5.9	5.5	7.4	6.1	7.2		5/9	8.3	7.7	5.1	8.3	8.5	7.5	8.0	

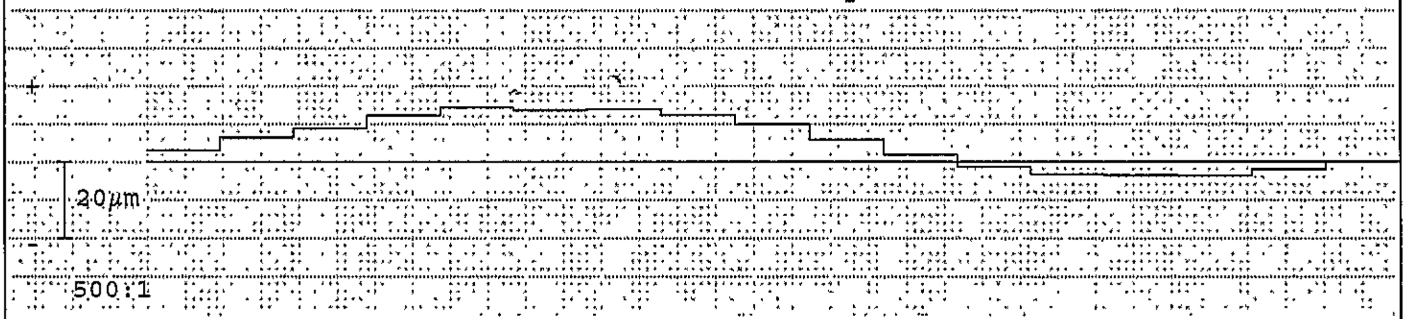
Ruota cilindrica Divisione

Nr. prog.: STI0416a04 0	P26 601265	Controllore:	turno B	Data:	08.01.2018 10:54
Denominazione:	Output Shaft 2	Numero denti z	17	Angolo pressione	20°00'00"
Numero disegno.:	D51.6.1298.35-IF	Modulo m	2.65mm	Angolo elica	-24°00'00"
Commessa/serie nr.:	3	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001 Spindel: Formmeat 1	Werkzeug:		Charge:	

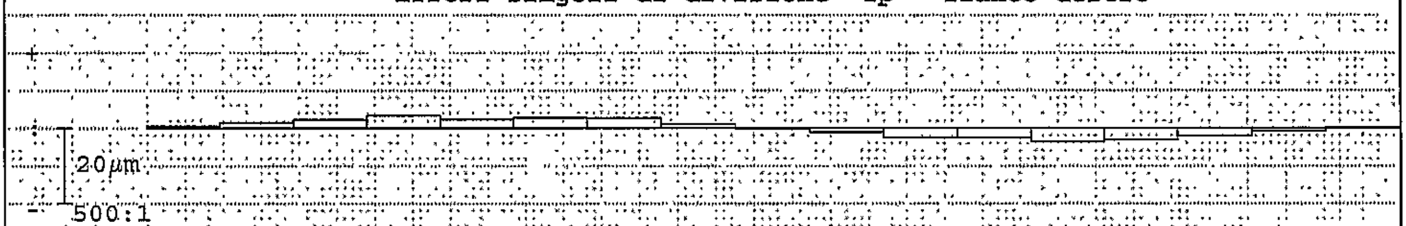
Errori singoli di divisione fp fianco sinistro



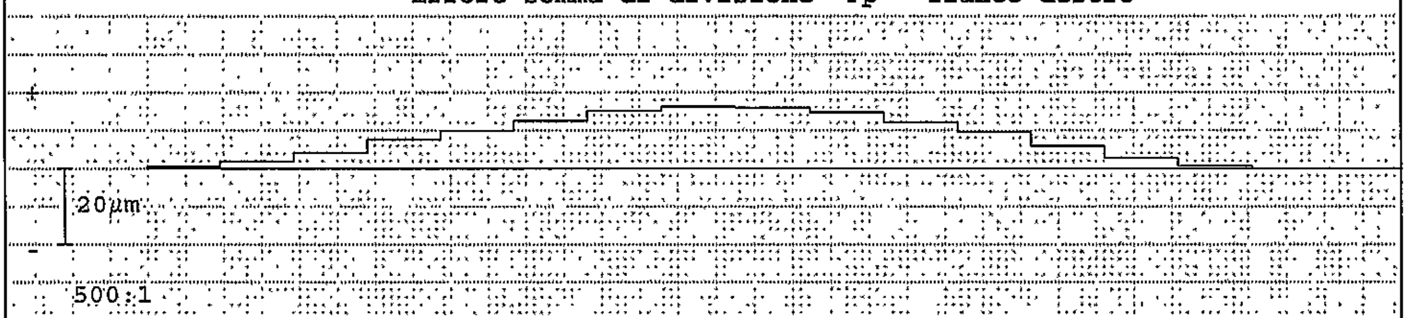
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



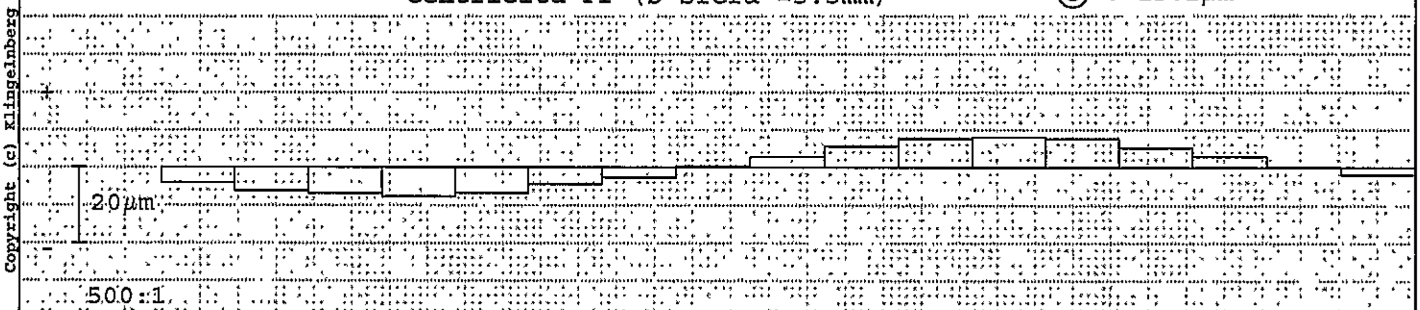
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:53.645 z=17mm

		fianco sinistro / TIRO				fianco destro			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	4.1		14.0		3.6		14.0	
Gr. salto di passo	fu max	2.9		18.0		1.6		18.0	
Scarto di divisione	Rp	7.5				7.0			
Err. globale di divisione	Fp	18.0		40.0		16.4		40.0	
Err. cordale di divisione	Fpz/8	8.0				6.8			

Centricità Fr (Ø-sfera =5.5mm) ◎ : 15.2µm



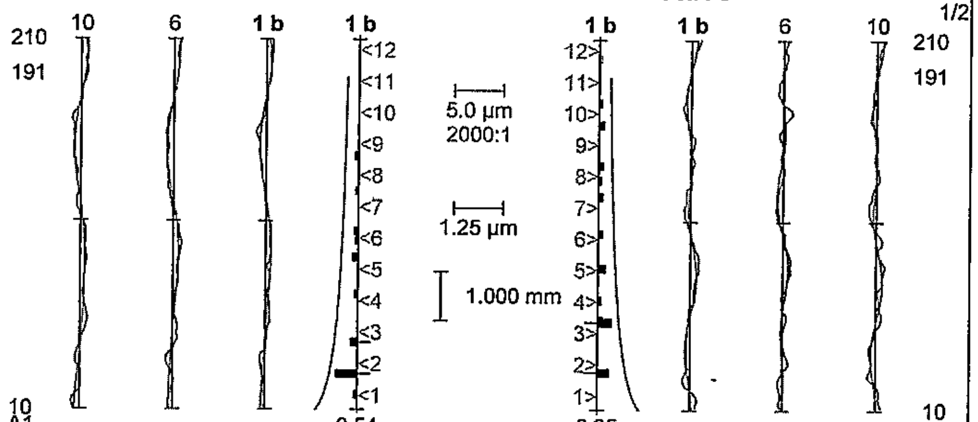
Err. di concentricitá	Fr	15.7	32.0	
Variaz. spessore dente	Rs			

KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF | Denominazione: Output Shaft 2 08.01.18
Serie nr: 3 | Scopo: Laufende Messung 10:54 / 10:58
Macchina: M001 | Mandrino: Formnest 1 | z= 17

Evolvente senza modifiche effettive

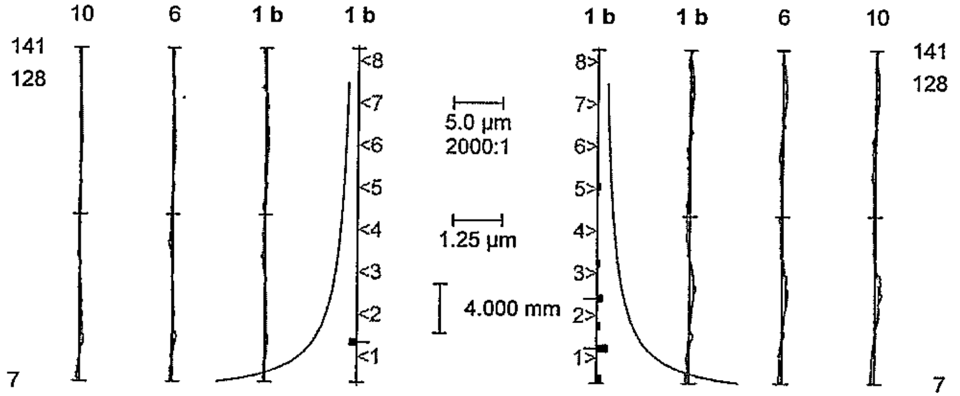
+/- sinistro | Spettro medio 1/2



	sinistro	destro
A1	0.54	0.35
A2	0.17	0.29
O(1)	29	57
O(2)	46	30

Elica senza modifiche effettive

+/- sinistro | destro -/+



	sinistro	destro
A1	0.17	0.26
A2	–	0.13
O(1)	23	21
O(2)	–	41

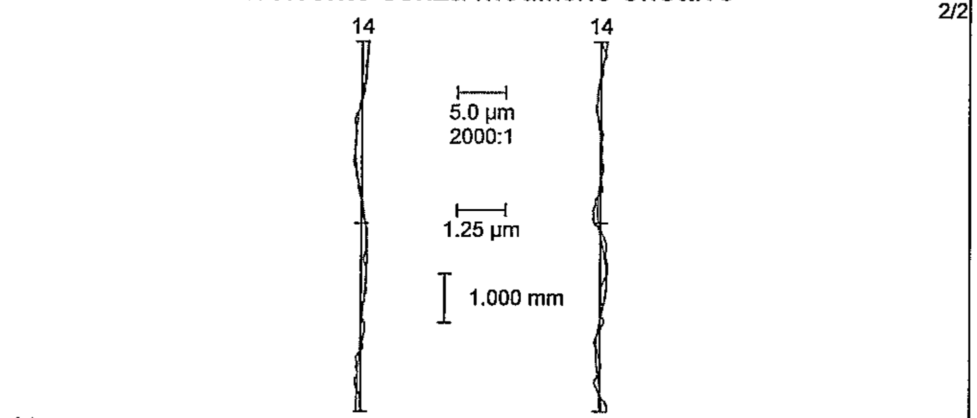
■ Spettro ■ 3_20180108105413

KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF | Denominazione: Output Shaft 2 08.01.18
Serie nr: 3 | Scopo: Laufende Messung 10:54 / 10:58
Macchina: M001 | Mandrino: Formnest 1 | z= 17

Evolvente senza modifiche effettive

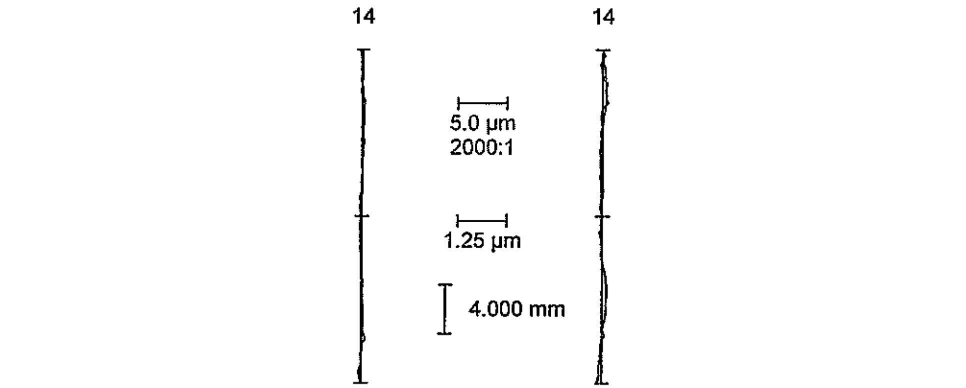
+/- sinistro | Spettro medio 2/2



A1
A2
O(1)
O(2)

Elica senza modifiche effettive

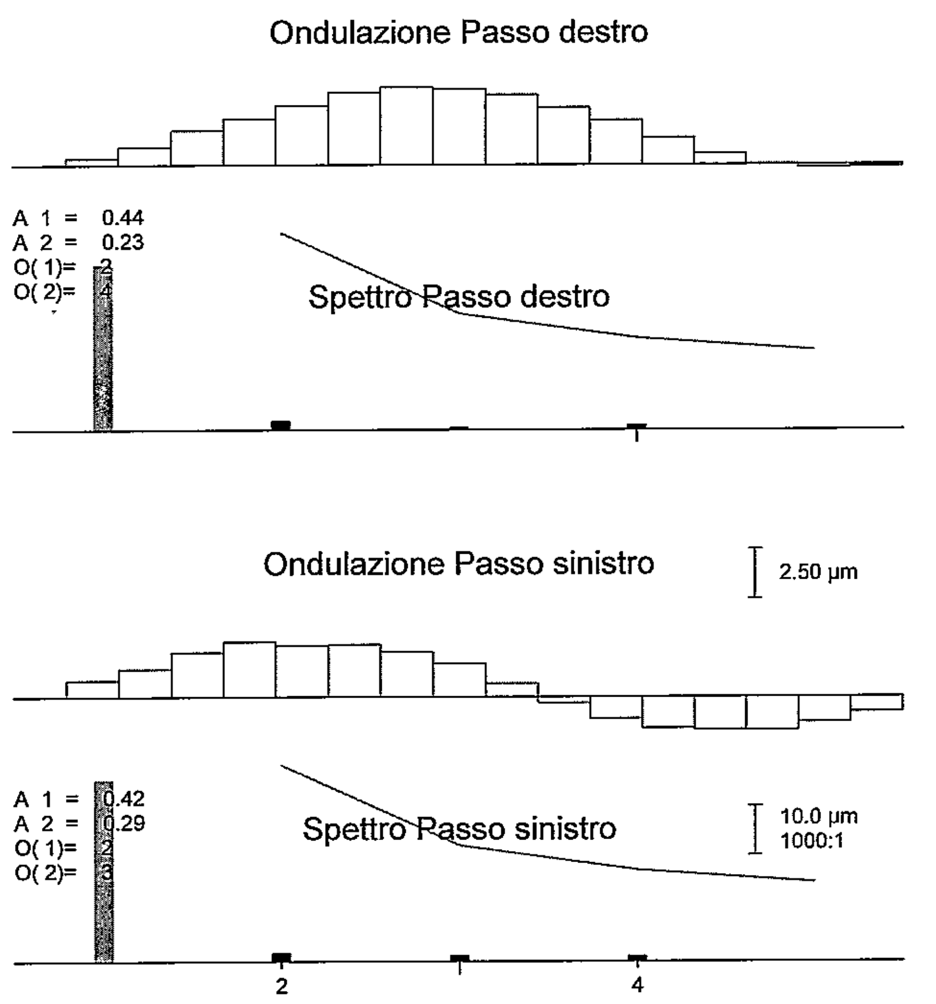
+/- sinistro | destro -/+



A1
A2
O(1)
O(2)

■ Spettro ■ 3_20180108105413

KLINGELNBERG	Numero di disegno: D51.6.1298.35-IF	Denominazione: Output Shaft 28.01.18
	Serie nr: 3	Scopo: Laufende Messung 10:54 / 10:58
	Macchina: M001	Mandrino: Formnest 1 z= 17



Ruota cilindrica Evolvente/Elica

Nr. prog.:	STI0416a04 0 P26 601265	Controllore:	turno B	Data:	08.01.2018 11:06
Denominazione:	Output Shaft 2	Numero denti z	17	Largh.fasc.dent. b	33.98mm
Numero disegno.:	D51.6.1298.35-IF	Modulo m	2.65mm	Tratto evolv. Lα	7.53mm
Commessa/serie nr.:	4	Angolo pressione	20°00'00"	Tratto elica Lß	27.18mm
Masch.Nr.:	M001 Spindel: Formneat1	Angolo elica	-24°00'00"	Inizio elab. M1	5.3mm
Untersuchungszweck:	Laufende Messung	Ø Base db	45.8113mm	Palpatore Ø	(#2)1mm
Werkzeug:	Charge:	Ang. Base	-22°28'14"	Fat.scor.pr. x	.917

Testa

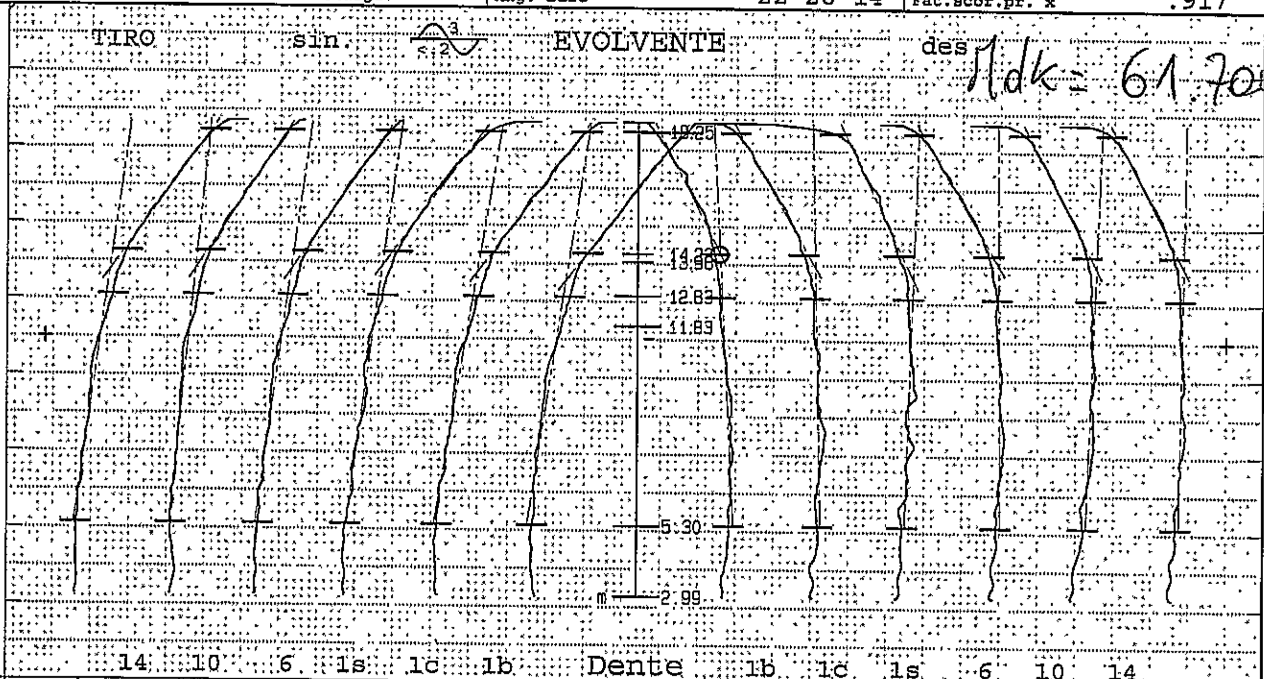
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance	Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm -17±6	-14.2	Var a 6.7							±6	Var a 6.3						0.6	
fHα -17±12	-14.2	-14.5	-10.6	-14.5	-14.3	-17.3	-15.8		±12	-5.3	-2.3	3.4	-0.9	4.0	1.7	0.6	
Fα	3.2	2.8	4.4	2.8	2.7	2.7	3.2			3.7	3.3	4.7	2.5	3.9	2.9	3.2	
ffα 4	2.6	2.9	2.5	2.4	2.2	2.6	3.1		4	2.4	3.0	3.7	2.6	2.9	2.6	2.8	
Cα -25/-17	-21.2	-21.7	-20.9	-20.6	-21.7	-21.6	-24.6		-20/-12	-14.5	-19.6	-19.6	-20.0	-19.5	-18.8	-19.5	
ffαf 3	0.0	0.0	0.0	0.0	0.3	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
P/T-ø [mm]	44.035	[43.85/44.15]								59.342	[59.2/59.4]						

Sotto

20 µm

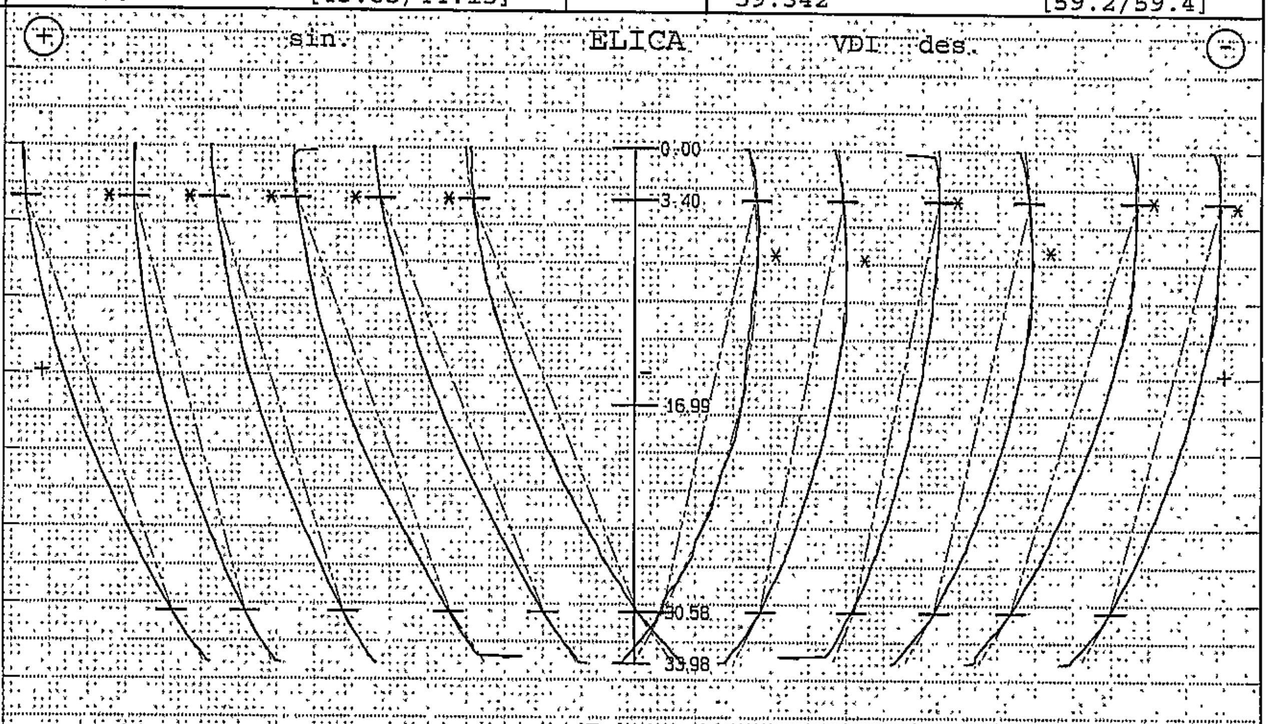
Va500:1

Vb2:1

5 mm

Sopra

N:Z



fHßm 40±6	45.5	FV -4. Var ß 16.5							-30±6	FV 2. Var ß 14.2						-34.6
fHß 40±13	45.5	48.4	37.1	42.8	50.6	53.6	54.6		-30±13	-30.4	-27.7	-28.1	-31.7	-41.9	-36.9	-34.6
Fß	5.8	6.7	2.7	2.5	8.6	11.3	11.3			5.0	4.3	2.0	4.3	10.0	6.8	6.4
ffß 4	0.6	0.5	0.6	0.7	1.0	0.7	1.1		4	2.0	1.1	1.2	1.0	1.4	1.2	1.2
cß 5/9	6.1	6.6	6.3	5.6	7.3	6.0	7.0		5/9	8.4	7.8	5.3	8.5	8.1	7.6	8.0

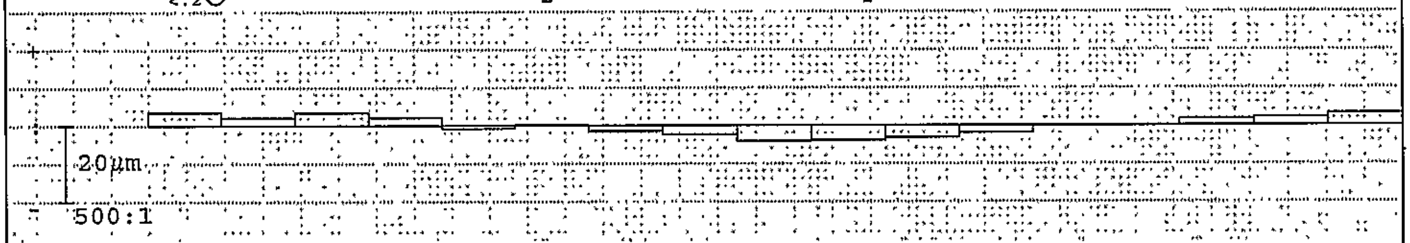
GCG 808006

KLINGELNBERG

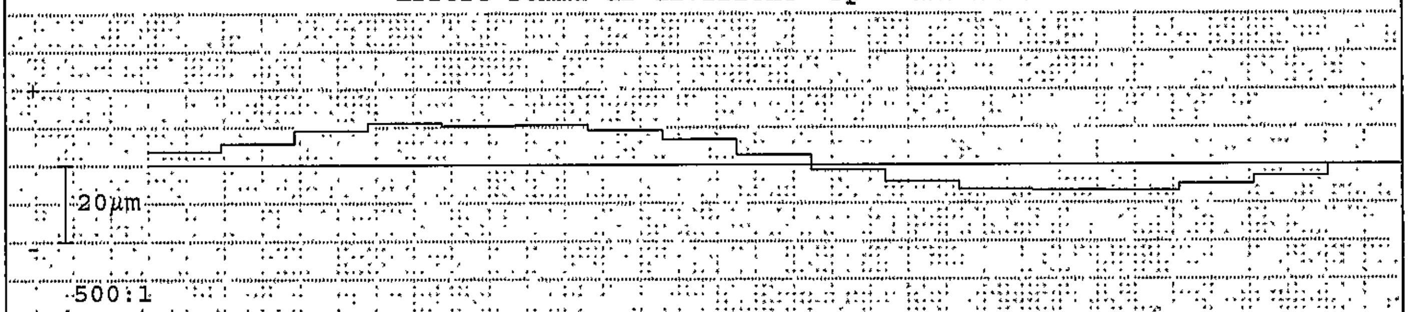
Ruota cilindrica Divisione

Nr. prog.: STI0416a04 0	P26 601265	Controllore:	turno B	Data:	08.01.2018 11:06
Denominazione:	Output Shaft 2	Numero denti z	17	Angolo pressione	20°00'00"
Numero disegno.:	D51.6.1298.35-IF	Modulo m	2.65mm	Angolo elica	-24°00'00"
Commessa/serie nr.:	4	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formmeßzeug:		Charge:	

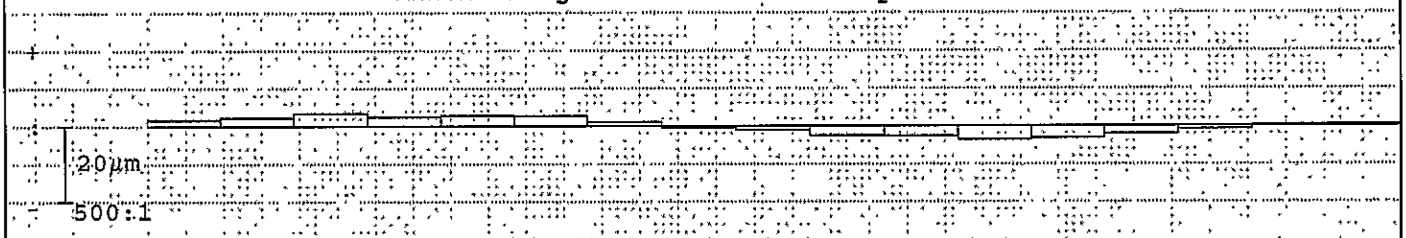
Errori singoli di divisione fp fianco sinistro



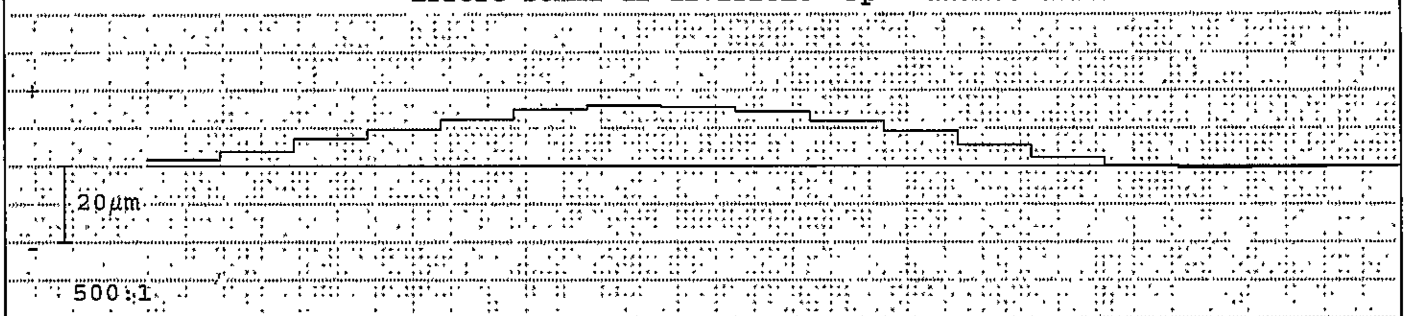
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



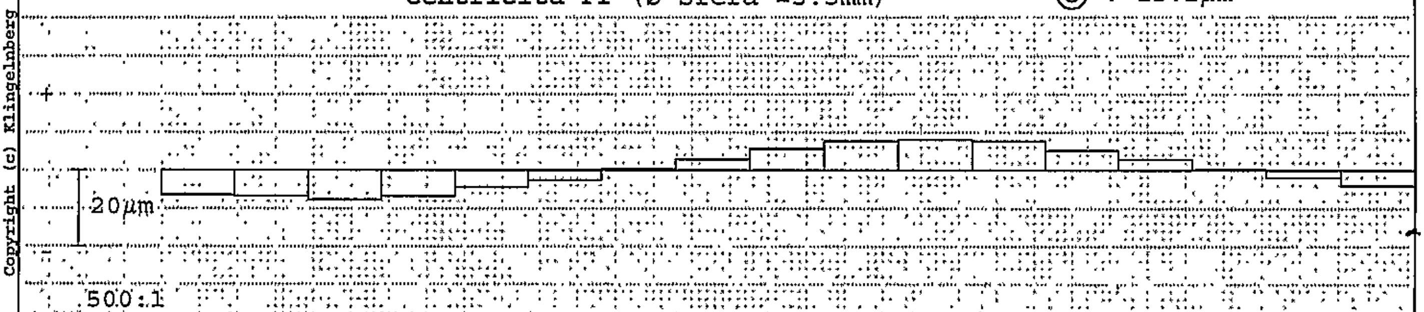
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:53.645 z=17mm — fianco sinistro / TIRO — fianco destro

		fianco sinistro Val.misur	Qual.	Val. amm	Qual.	fianco destro Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	4.1		14.0		3.6		14.0	
Gr. salto di passo	fu max	2.8		18.0		1.6		18.0	
Scarto di divisione	Rp	7.6				7.0			
Err. globale di divisione	Fp	17.9		40.0		16.4		40.0	
Err. cordale di divisione	Fpz/8	8.1				6.8			

Centricità Fr (Ø-sfera =5.5mm) ◎ : 15.2μm

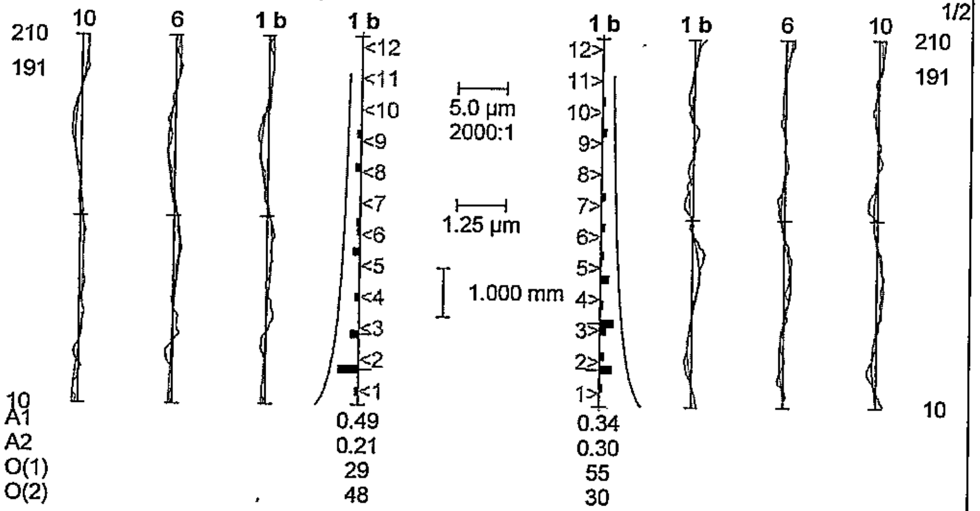


Err. di concentricità	Fr	15.8	32.0
Variaz. spessore dente	Rs		

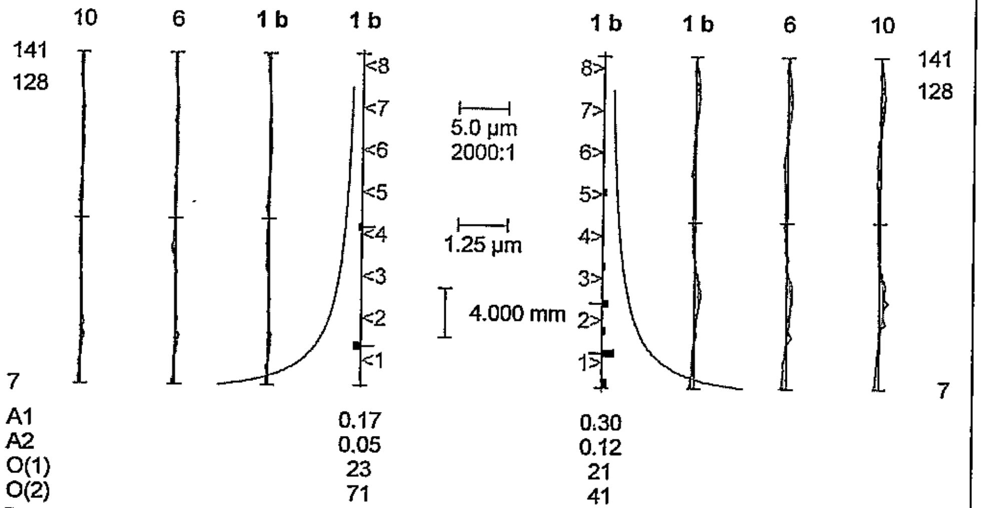
KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF Denominazione: Output Shaft 2 08.01.18
Serie nr: 4 Scopo: Laufende Messung06 / 11:11
Macchina: M001 Mandrino: Formnest 1 z= 17

+/- sinistro **Evolvente senza modifiche effettive** Spettro medio 1/2



+/- sinistro **Elica senza modifiche effettive** destro -/+

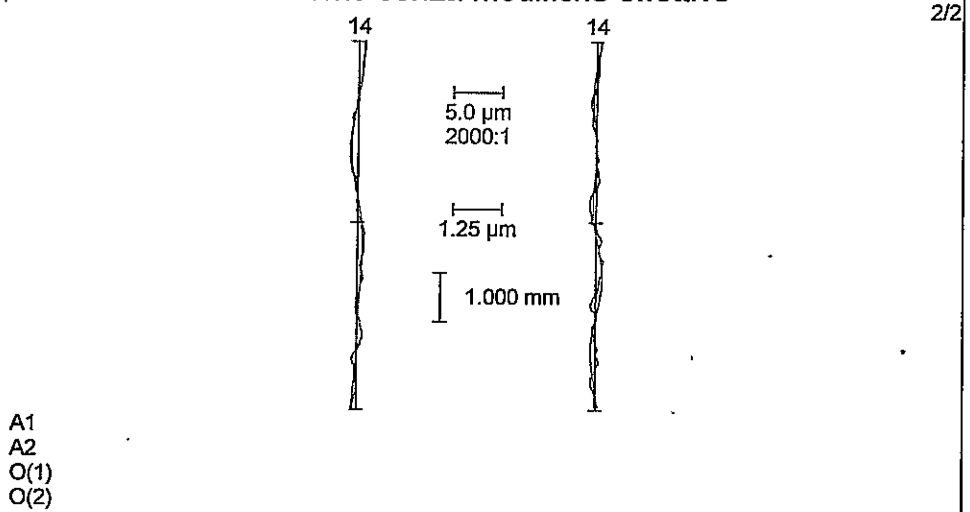


■ Spettro ■ 4_20180108110640

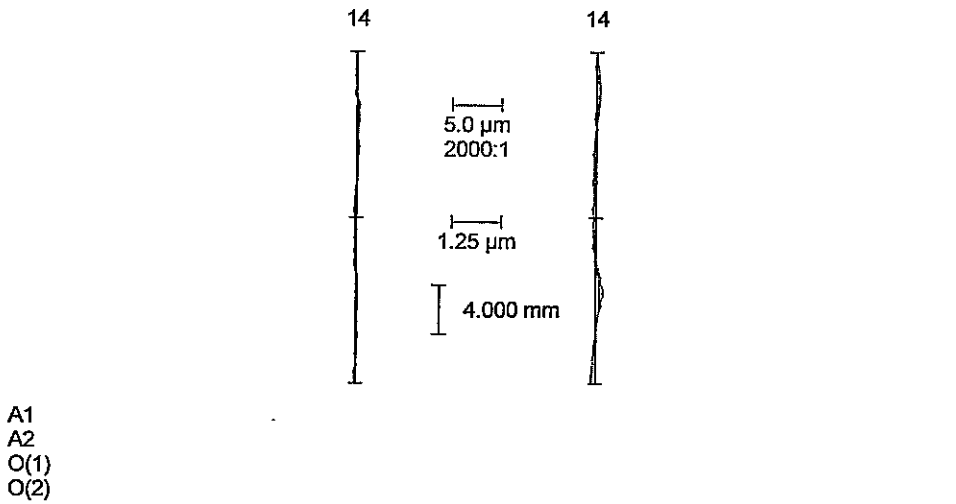
KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF Denominazione: Output Shaft 2 08.01.18
Serie nr: 4 Scopo: Laufende Messung06 / 11:11
Macchina: M001 Mandrino: Formnest 1 z= 17

+/- sinistro **Evolvente senza modifiche effettive** Spettro medio 2/2



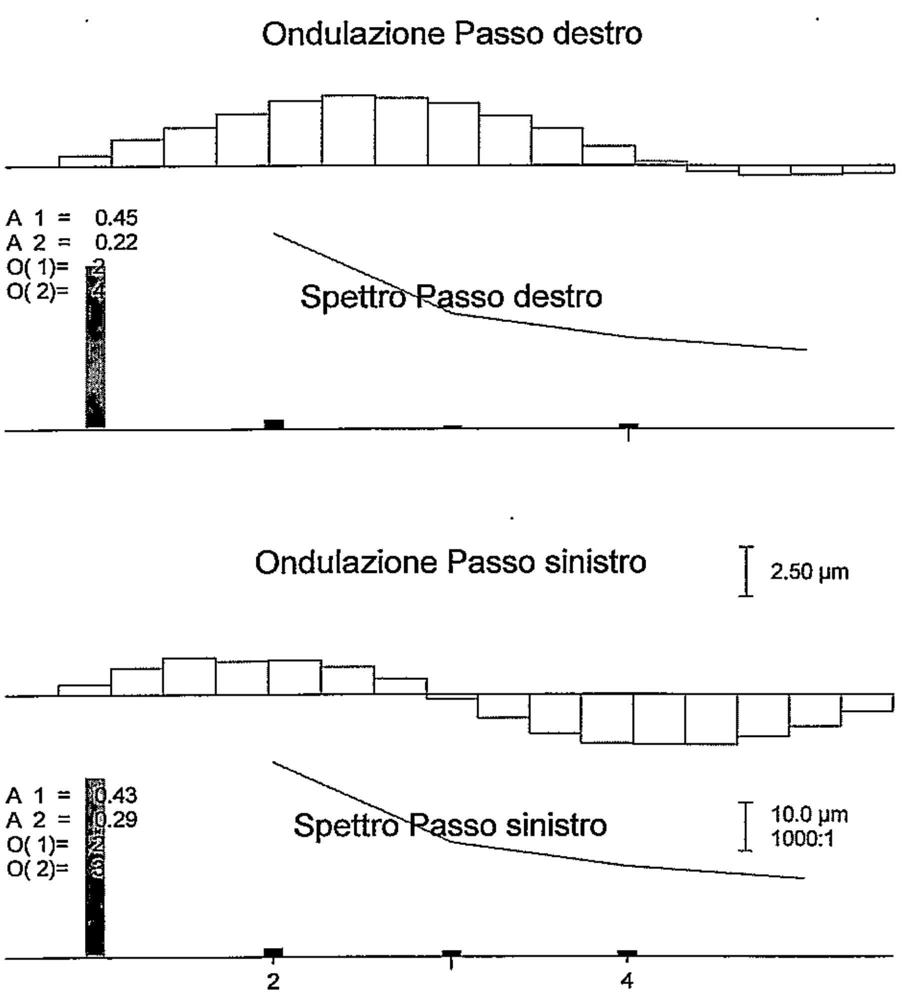
+/- sinistro **Elica senza modifiche effettive** destro -/+



■ Spettro ■ 4_20180108110640

KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF Denominazione: Output Shaft 208.01.18
Serie nr: 4 Scopo: Laufende Messung06 / 11:11
Macchina: M001 Mandrino: Formnest 1 z= 17



Ruota cilindrica Evolvente/Elica

Nr. prog.: STI0416a04 0	P26 601265	Controllore:	turno B	Data:	08.01.2018 11:40
Denominazione:	Output Shaft 2	Numero denti z	17	Largh.fasc.dent. b	33.98mm
Numero disegno.:	D51.6.1298.35-IF	Modulo m	2.65mm	Tratto evolv. Lα	7.53mm
Commessa/serie nr.:	5	Angolo pressione	20°00'00"	Tratto elica Lß	27.18mm
Masch.Nr.:	M001 Spindel: Formmeßt.1	Angolo elica	-24°00'00"	Inizio elab. M1	5.3mm
Untersuchungszweck:	Laufende Messung	Ø Base db	45.8113mm	Palpatore Ø	(#2)1mm
Werkzeug:	Charge:	Ang. Base	-22°28'14"	Fat.scor.pr. x	.917

Testa

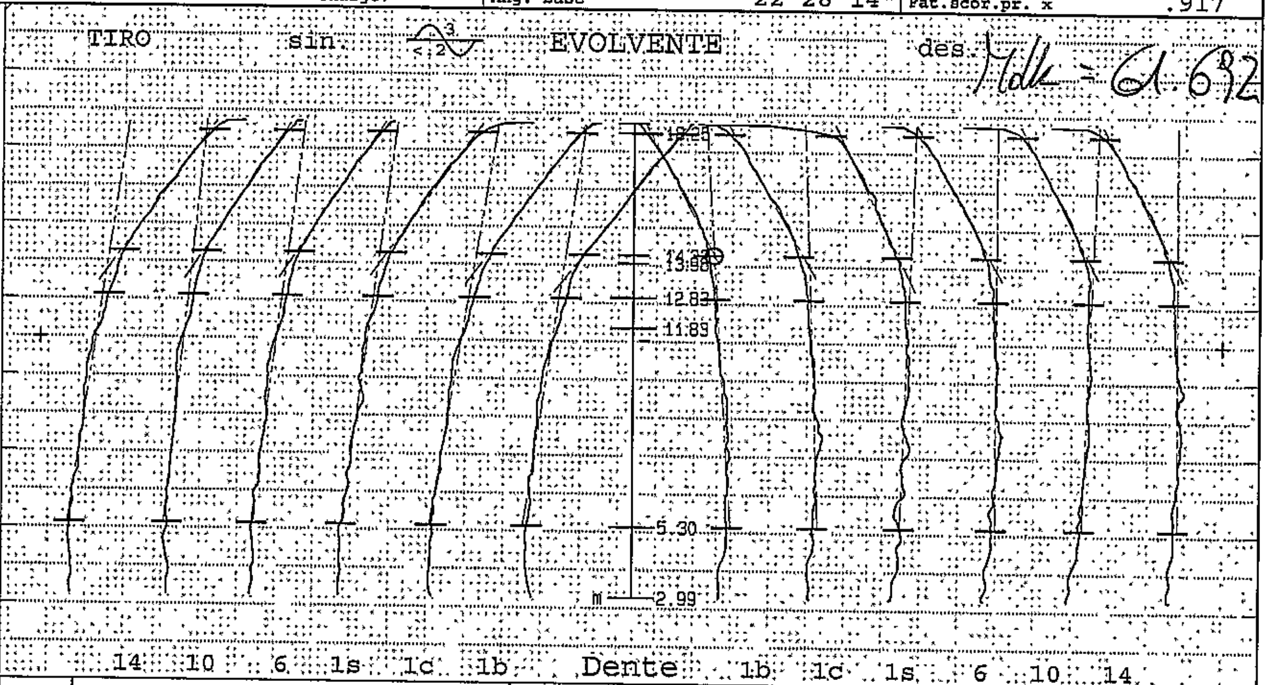
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
fHαm	-17±6	-14.3	Var a 6.5							±6	Var a 7.8						0.1	
fHα	-17±12	-14.3	-15.6	-10.8	-13.6	-14.0	-17.3	-15.7		±12	-6.5	-3.7	3.8	0.3	4.1	-0.2	0.1	
Fα		3.3	2.5	4.9	3.1	2.4	2.8	3.0			4.1	4.1	4.1	3.3	3.6	3.1	3.5	
ffα	4	2.7	2.7	2.7	2.6	2.0	2.8	3.3		4	2.3	3.5	3.5	3.3	2.2	3.1	3.0	
Cα	-25/-17	-21.1	-21.8	-21.2	-19.9	-21.0	-21.5	-25.2		-20/-12	-15.0	-19.0	-20.2	-19.9	-19.3	-18.5	-19.2	
ffαf	3	0.0	0.0	0.0	0.0	0.6	0.0	0.0		3	0.0	0.0	0.5	0.0	0.0	0.0	0.0	
P/T-ø [mm]		44.038	[43.85/44.15]								59.344				[59.2/59.4]			

Sotto

20 µm

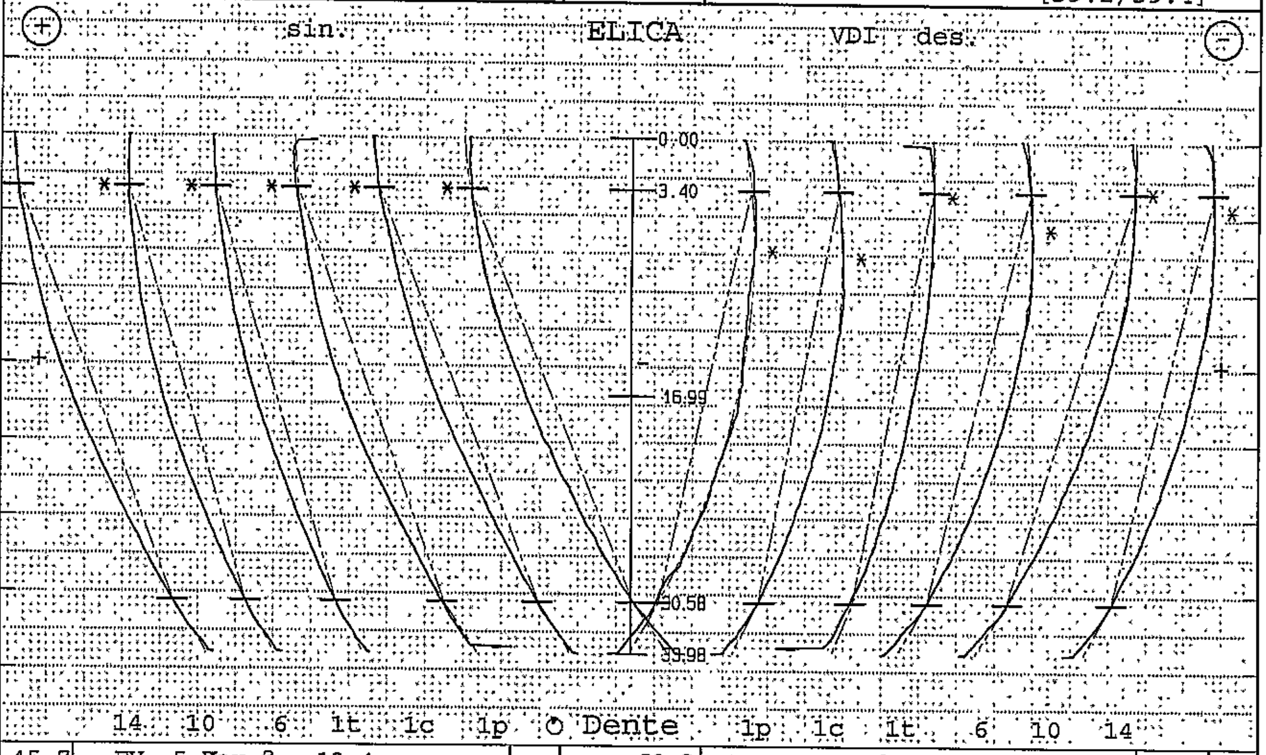
Va500:1

Vb2:1

5 mm

Sopra

N:Z



fHßm	40±6	45.7	FV -5. Var ß 13.4							-30±6	FV 3. Var ß 15.6						-34.3
fHß	40±13	45.7	51.3	39.0	40.2	48.5	52.4	53.8		-30±13	-30.3	-26.7	-26.6	-34.2	-42.3	-34.1	-34.3
Fß		5.6	9.3	2.0	0.8	6.9	10.1	10.7			5.4	5.0	3.1	5.7	10.0	4.7	6.4
ffß	4	0.6	0.6	0.6	0.6	1.0	0.6	0.9		4	2.1	1.3	1.3	1.0	1.1	1.0	1.1
cß	5/9	6.1	6.5	6.6	5.5	7.2	5.7	6.9		5/9	8.7	8.0	5.5	8.4	8.0	7.5	8.0

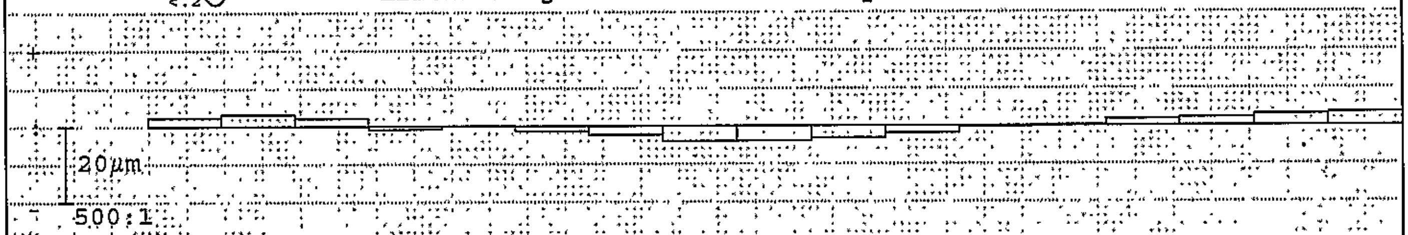
GCG 808006

KLINGELNBERG

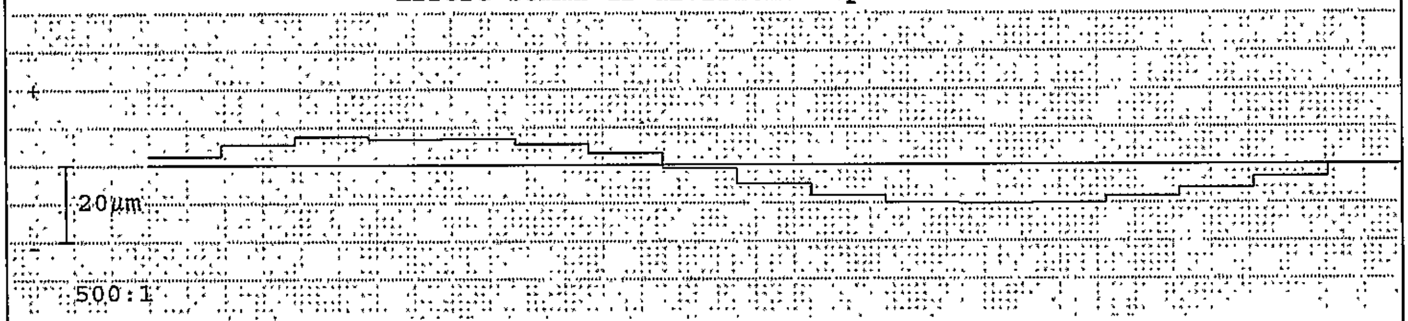
Ruota cilindrica Divisione

Nr. prog.: STI0416a04 0 P26 601265	Controllore: turno B	Data:	08.01.2018 11:40
Denominazione: Output Shaft 2	Numero denti z 17	Angolo pressione	20°00'00"
Numero disegno.: D51.6.1298.35-IF	Modulo m 2.65mm	Angolo elica	-24°00'00"
Commessa/serie nr.: 5	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001 Spindel: Formmeat 1	Werkzeug:	Charge:	

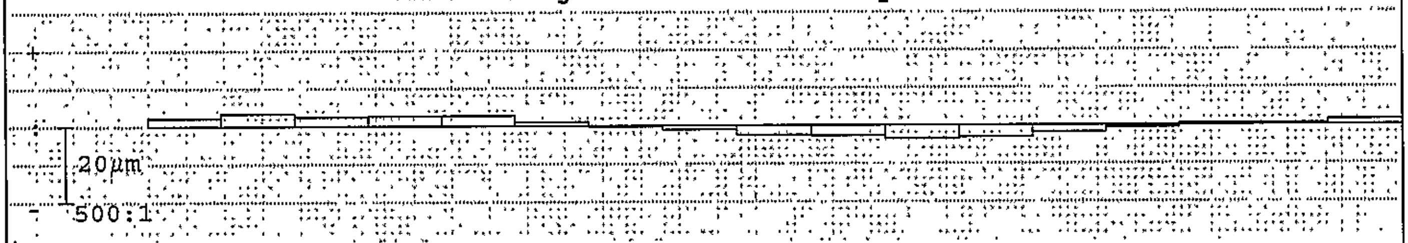
Errori singoli di divisione fp fianco sinistro



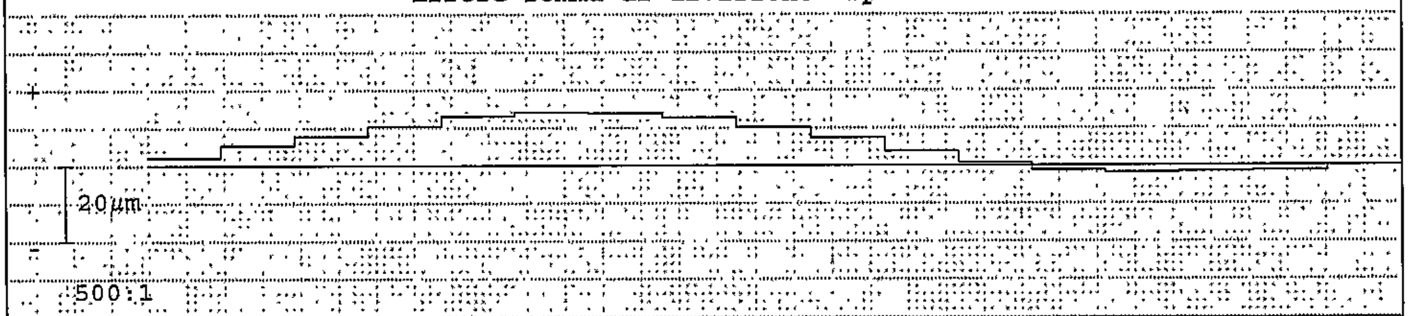
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



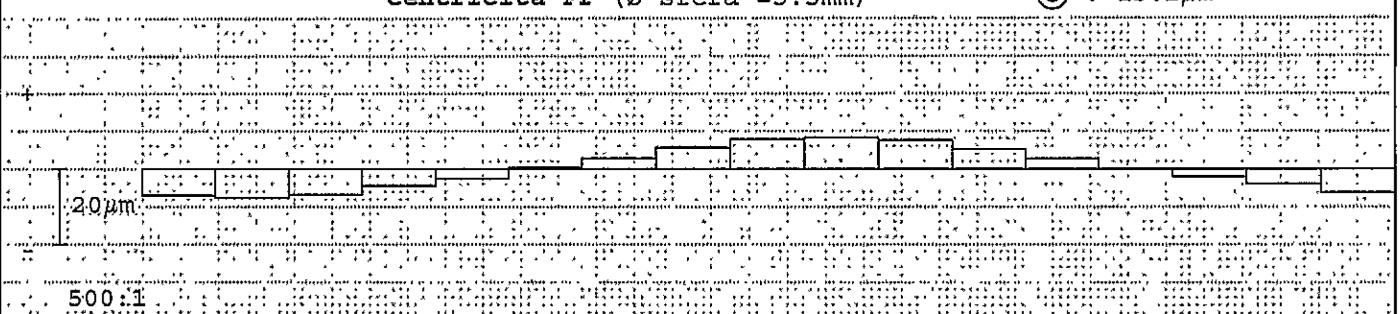
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:53.645 z=17mm

		fianco sinistro / TIRO				fianco destro			
		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	2.9		18.0		1.7		18.0	
Scarto di divisione	Rp	7.5				6.8			
Err. globale di divisione	Fp	17.8		40.0		16.0		40.0	
Err. cordale di divisione	Fpz/8	8.1				6.7			

Centricità Fr (Ø-sfera =5.5mm) ◎ : 15.2µm



Err. di concentricità	Fr	15.9	32.0	
Variaz. spessore dente	Rs			

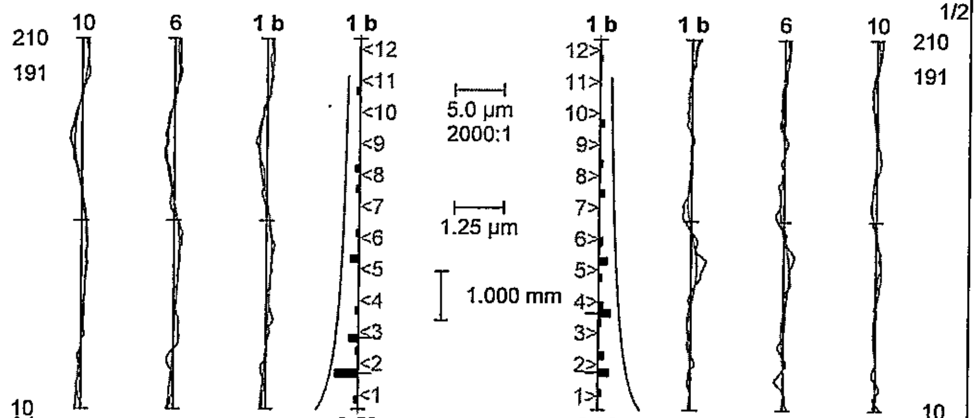
KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF Denominazione: Output Shaft 2 08.01.18
Serie nr: 5 Scopo: Laufende Messung 40 / 11:44
Macchina: M001 Mandrino: Formnest 1 z= 17

+/- sinistro

Evolvente senza modifiche effettive

Spettro medio 1/2

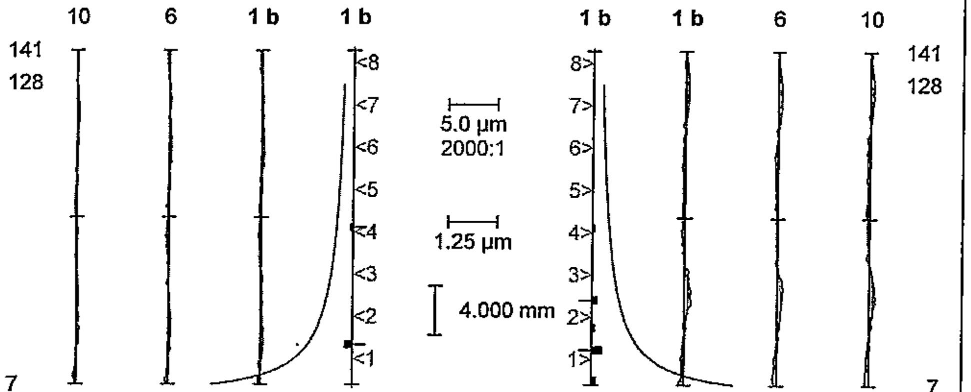


A1	0.59	0.30
A2	0.22	0.26
O(1)	29	62
O(2)	48	30

+/- sinistro

Elica senza modifiche effettive

destro -/+



A1	0.18	0.26
A2	0.05	0.12
O(1)	23	21
O(2)	70	41

■ Spettro ■ 5_20180108114017

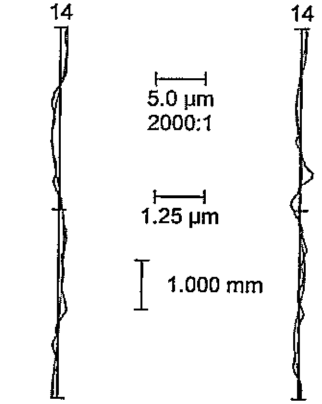
KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF Denominazione: Output Shaft 2 08.01.18
Serie nr: 5 Scopo: Laufende Messung 40 / 11:44
Macchina: M001 Mandrino: Formnest 1 z= 17

+/- sinistro

Evolvente senza modifiche effettive

Spettro medio 2/2

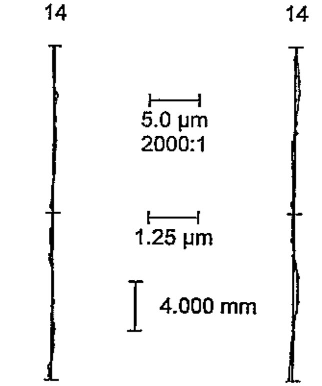


A1
A2
O(1)
O(2)

+/- sinistro

Elica senza modifiche effettive

destro -/+



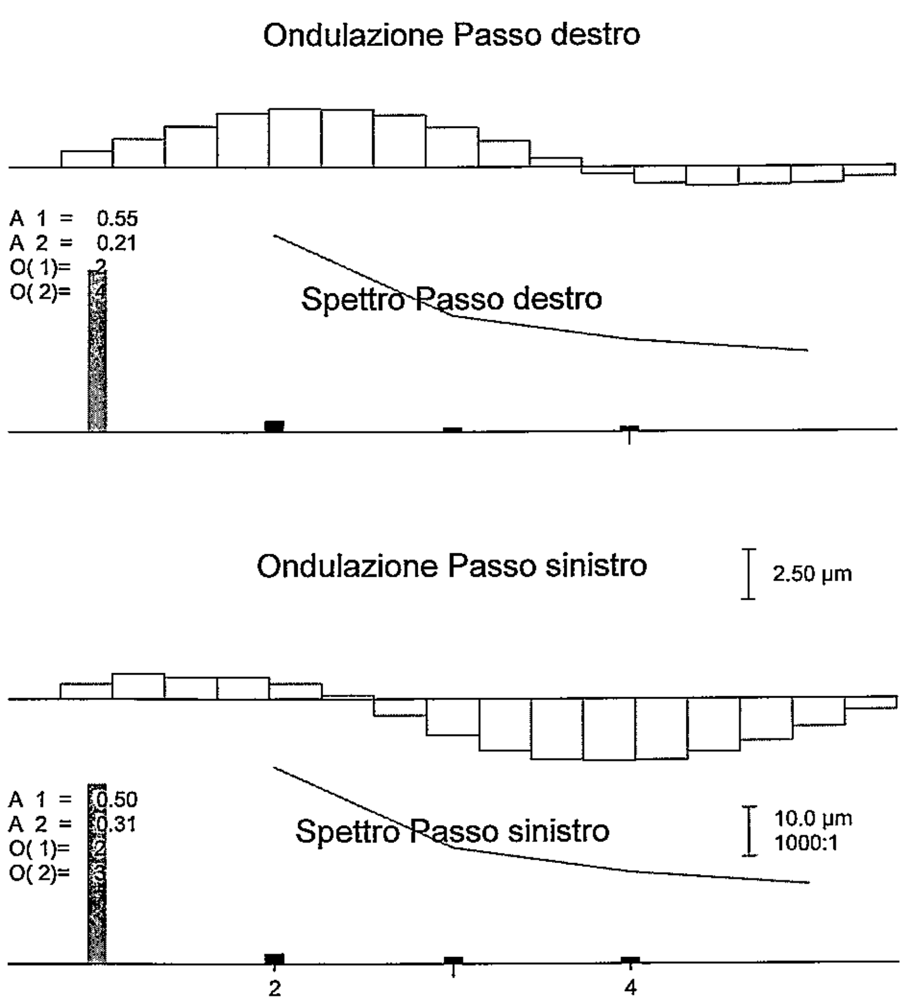
A1
A2
O(1)
O(2)

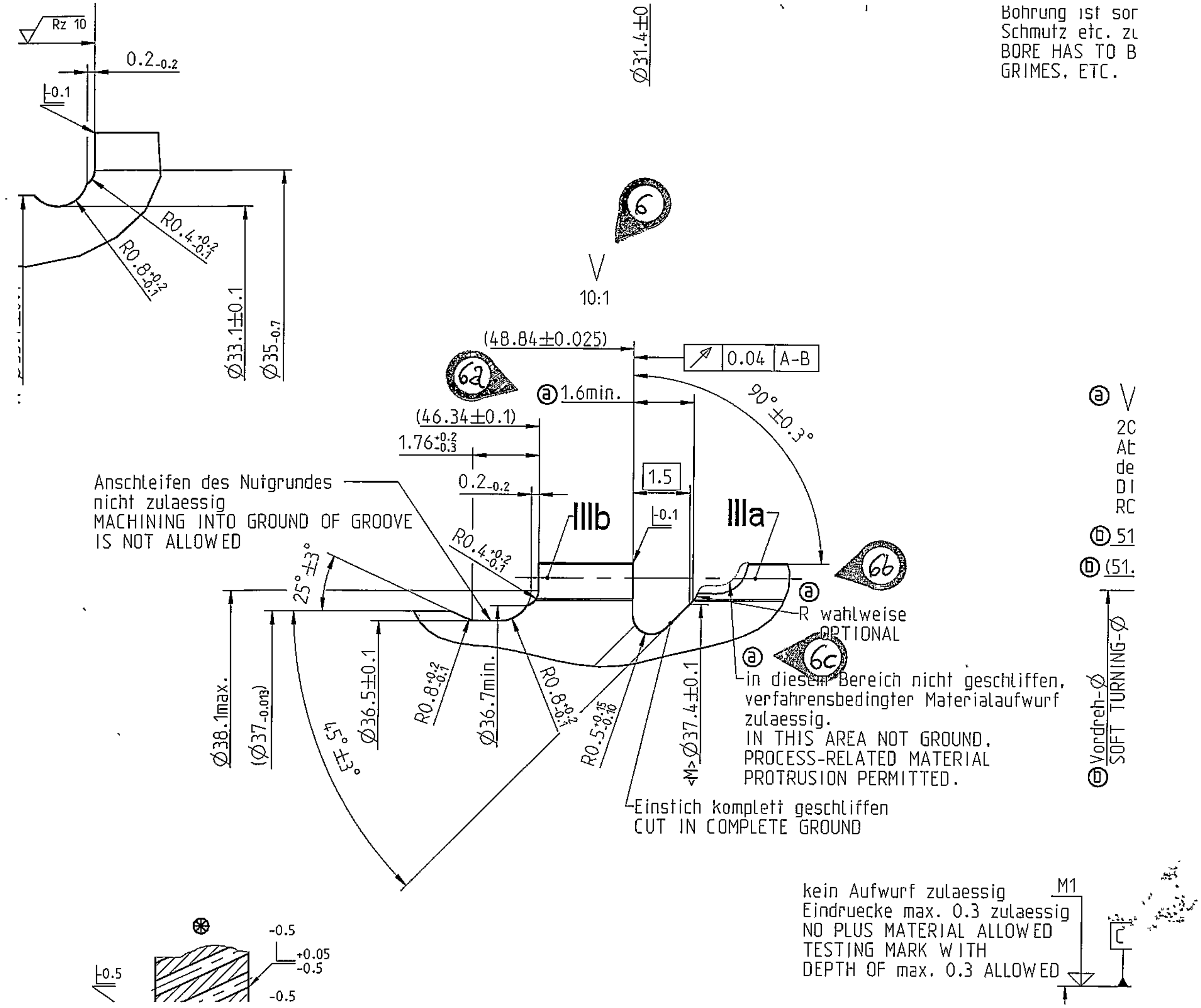
■ Spettro ■ 5_20180108114017

KLINGELNBERG

Numero di disegno: D51.6.1298.35-IF
Serie nr: 5
Macchina: M001

Denominazione: Output Shaft 2 08.01.18
Scopo: Laufende Messung 11:40 / 11:44
Mandrino: Formnest 1 z= 17



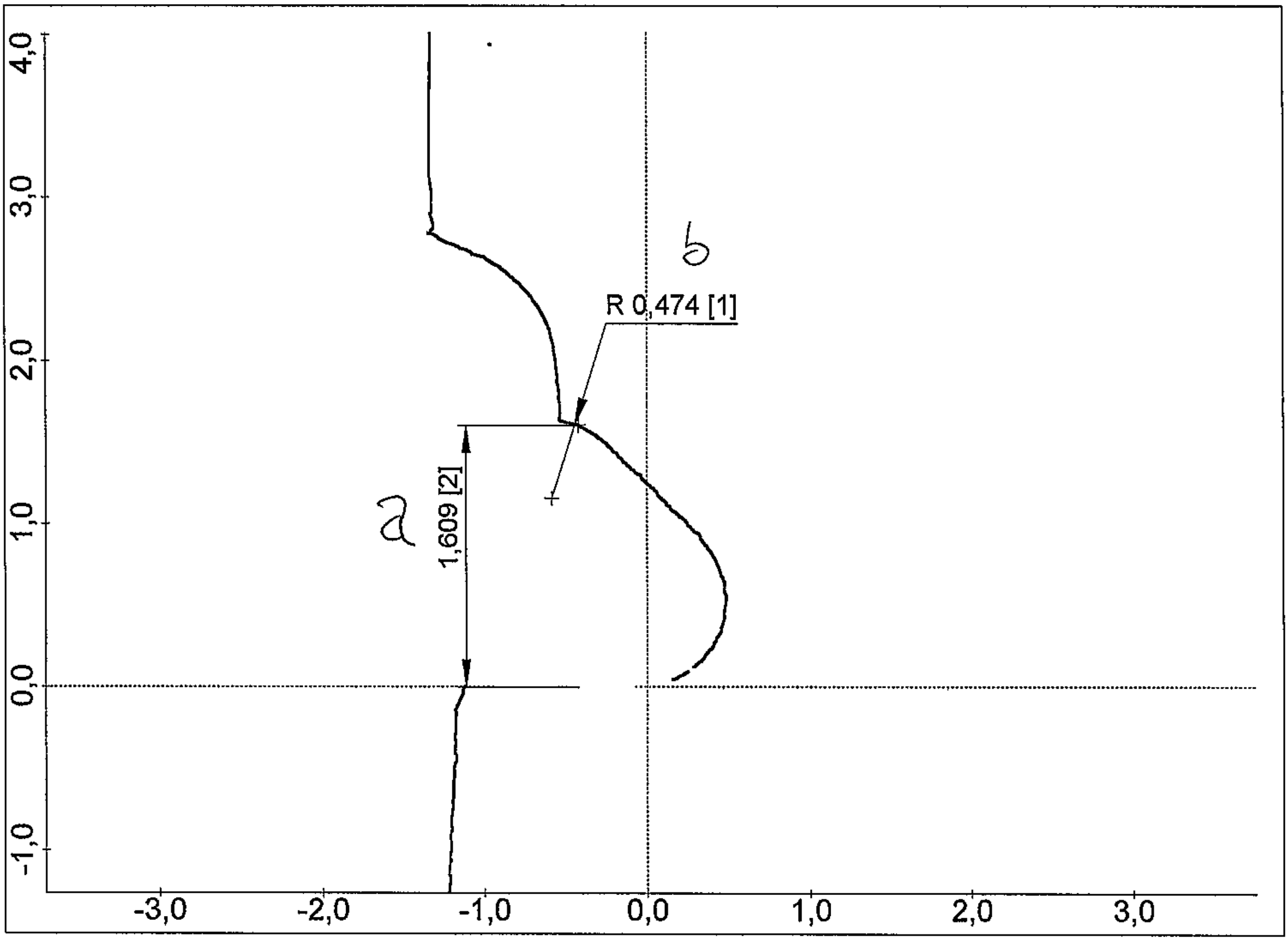


Bohrung ist sor
Schmutz etc. zu
BORE HAS TO B
GRIMES, ETC.
Rz 10
0.2-0.2
0.1
R0.4+0.2-0.1
R0.8+0.2-0.1
Ø33.1±0.1
Ø35-0.7
Ø31.4±0
6
10:1
(48.84±0.025)
0.04 A-B
6a
ⓐ 1.6min.
(46.34±0.1)
1.76+0.2-0.3
90° ±0.3°
1.5
0.2-0.2
Anschleifen des Nutgrundes
nicht zulaessig
MACHINING INTO GROUND OF GROOVE
IS NOT ALLOWED
IIIb
IIIa
0.1
R0.4+0.2-0.1
25° ±3°
6b
ⓐ
R wahlweise
OPTIONAL
ⓐ
6c
in diesem Bereich nicht geschliffen,
verfahrensbedingter Materialaufwurf
zulaessig.
IN THIS AREA NOT GROUND,
PROCESS-RELATED MATERIAL
PROTRUSION PERMITTED.
Ø38.1max.
(Ø37-0.013)
Ø36.5±0.1
R0.8+0.2-0.1
Ø36.7min.
R0.8+0.2-0.1
R0.5+0.15-0.10
<M>Ø37.4±0.1
45° ±3°
Einstich komplett geschliffen
CUT IN COMPLETE GROUND
ⓐ
2C
At
de
DI
RC
ⓑ 51
ⓑ (51.
ⓑ Vordreh-Ø
SOFT TURNING-Ø
kein Aufwurf zulaessig
Eindruecke max. 0.3 zulaessig
NO PLUS MATERIAL ALLOWED
TESTING MARK WITH
DEPTH OF max. 0.3 ALLOWED
M1
C
-0.5
+0.05
-0.5
-0.5
0.5

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS 2
Numero:	1298 PZ N.1
Operatore:	TURNO C
Data, ora:	13.12.2017, 09:33
Nota:	PART V
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



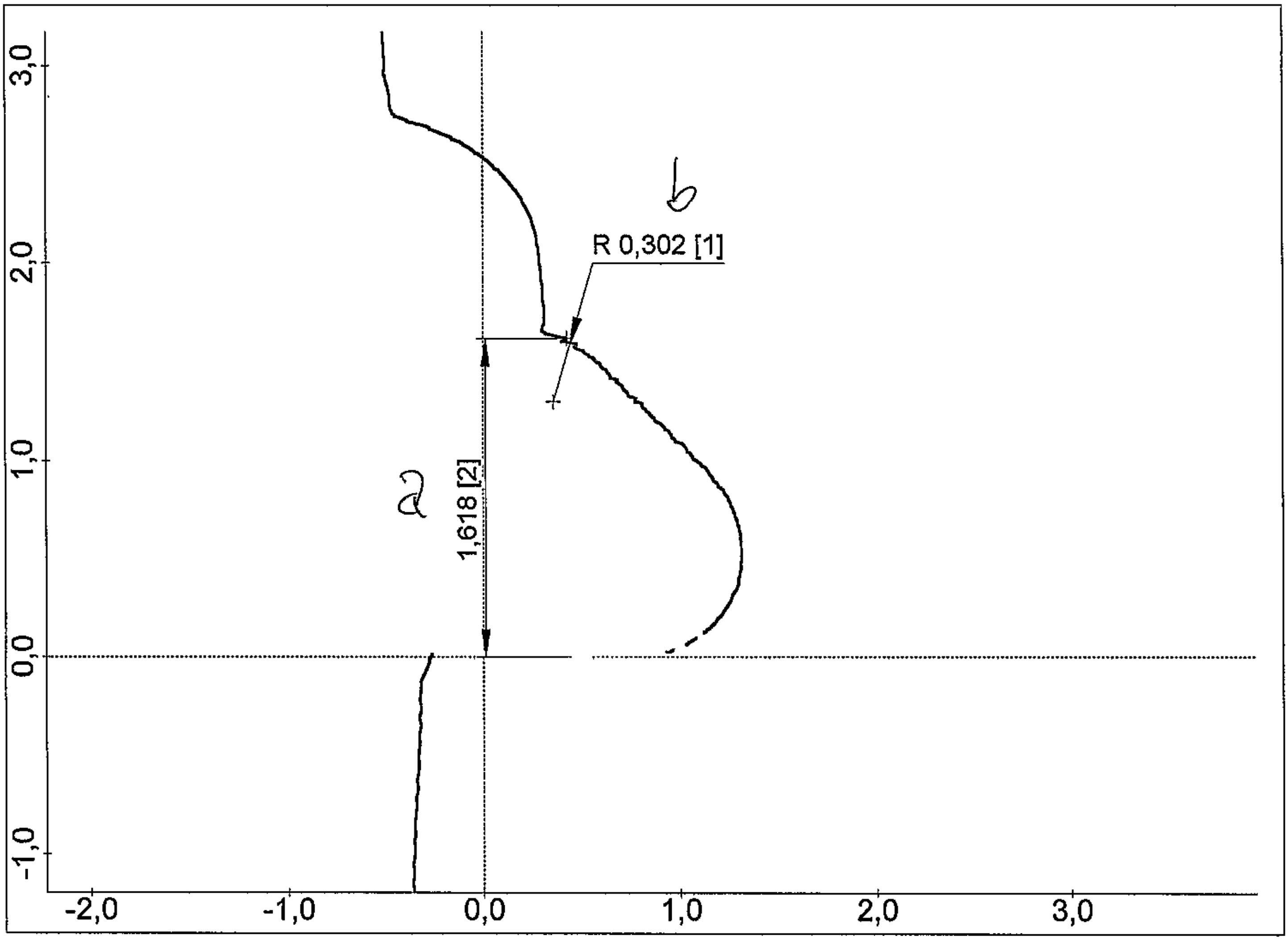
PERTHOMETER CONCEPT

Area Riservata alla Produzione	
Valutazione Profilo	
OK	☐
NOK	☐
N°BADGE ODP RICEVENTE	

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS 2
Numero:	1298 PZ N.2
Operatore:	TURNO C
Data, ora:	13.12.2017, 09:48
Nota:	PART V
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



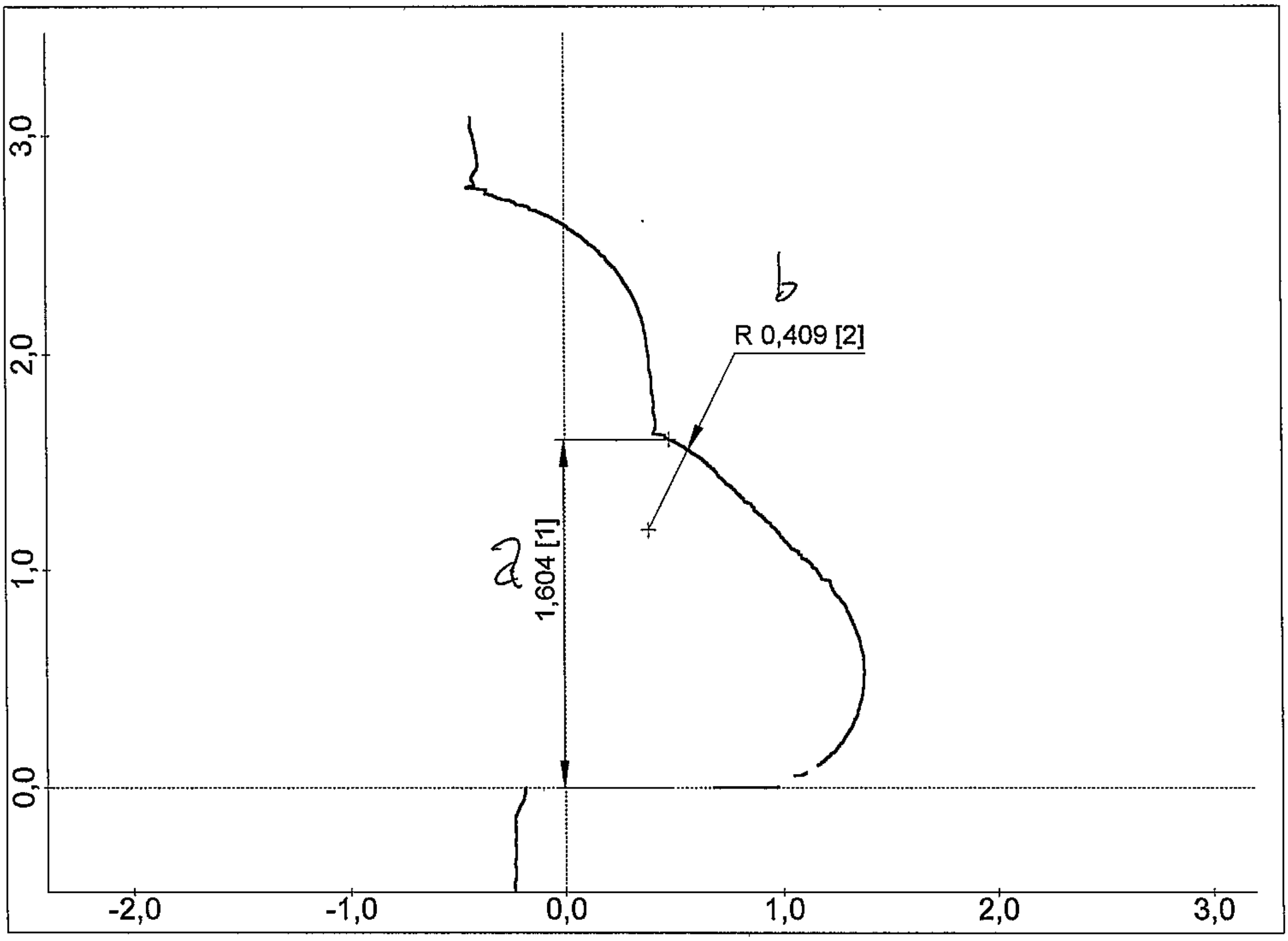
PERTHOMETER CONCEPT

Area Riservata alla Produzione	
Valutazione Profilo	
OK	☐
NOK	☐
N°BADGE ODP RICEVENTE	

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS 2
Numero:	1298 PZ N.3
Operatore:	TURNO C
Data, ora:	13.12.2017, 09:51
Nota:	PART V
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



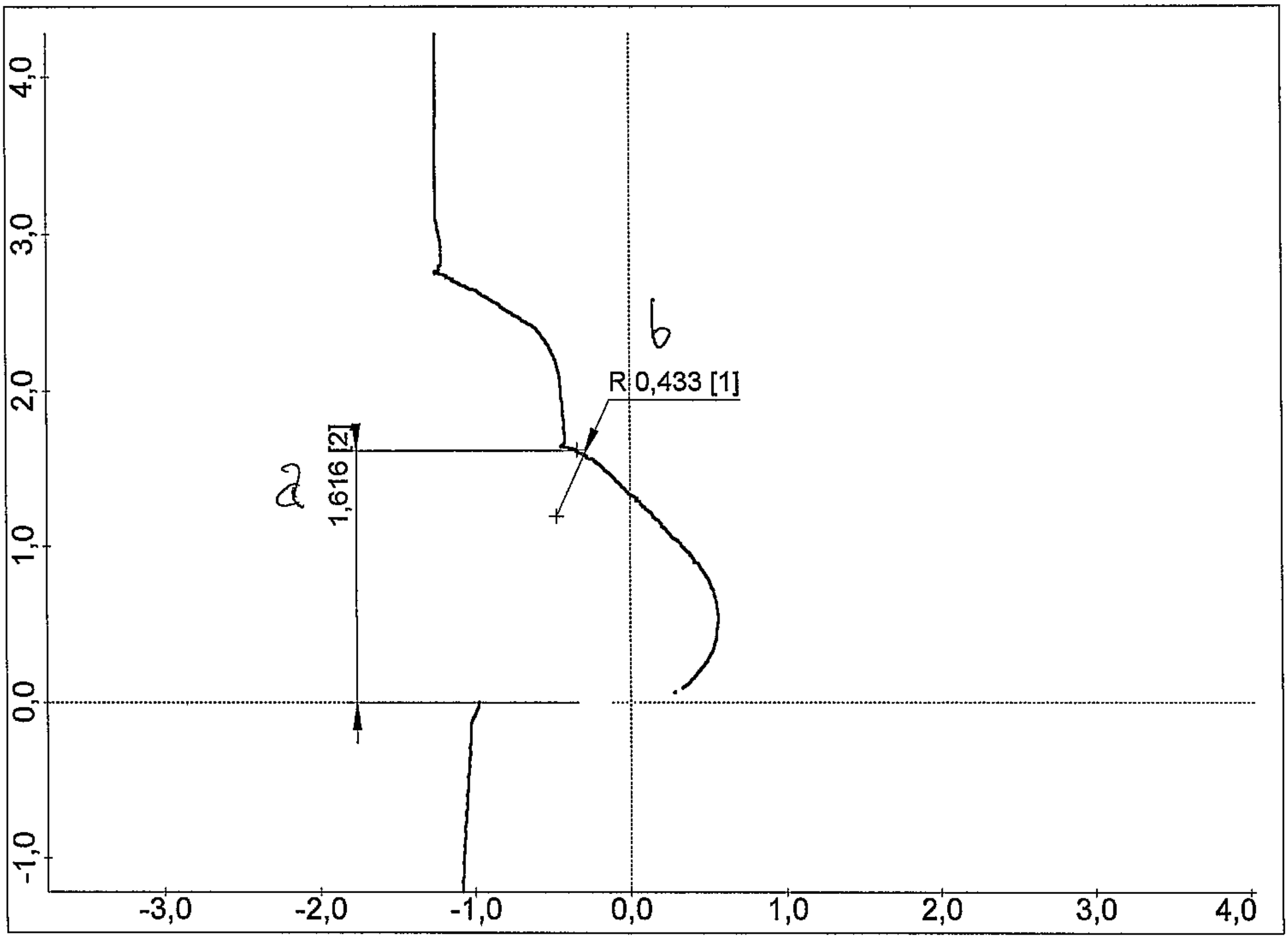
PERTHOMETER CONCEPT

Area Riservata alla Produzione	
Valutazione Profilo	
OK	☐
NOK	☐
N°BADGE ODP RICEVENTE	

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS 2
Numero:	1298 PZ N.4
Operatore:	TURNO C
Data, ora:	13.12.2017, 09:54
Nota:	PART V
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



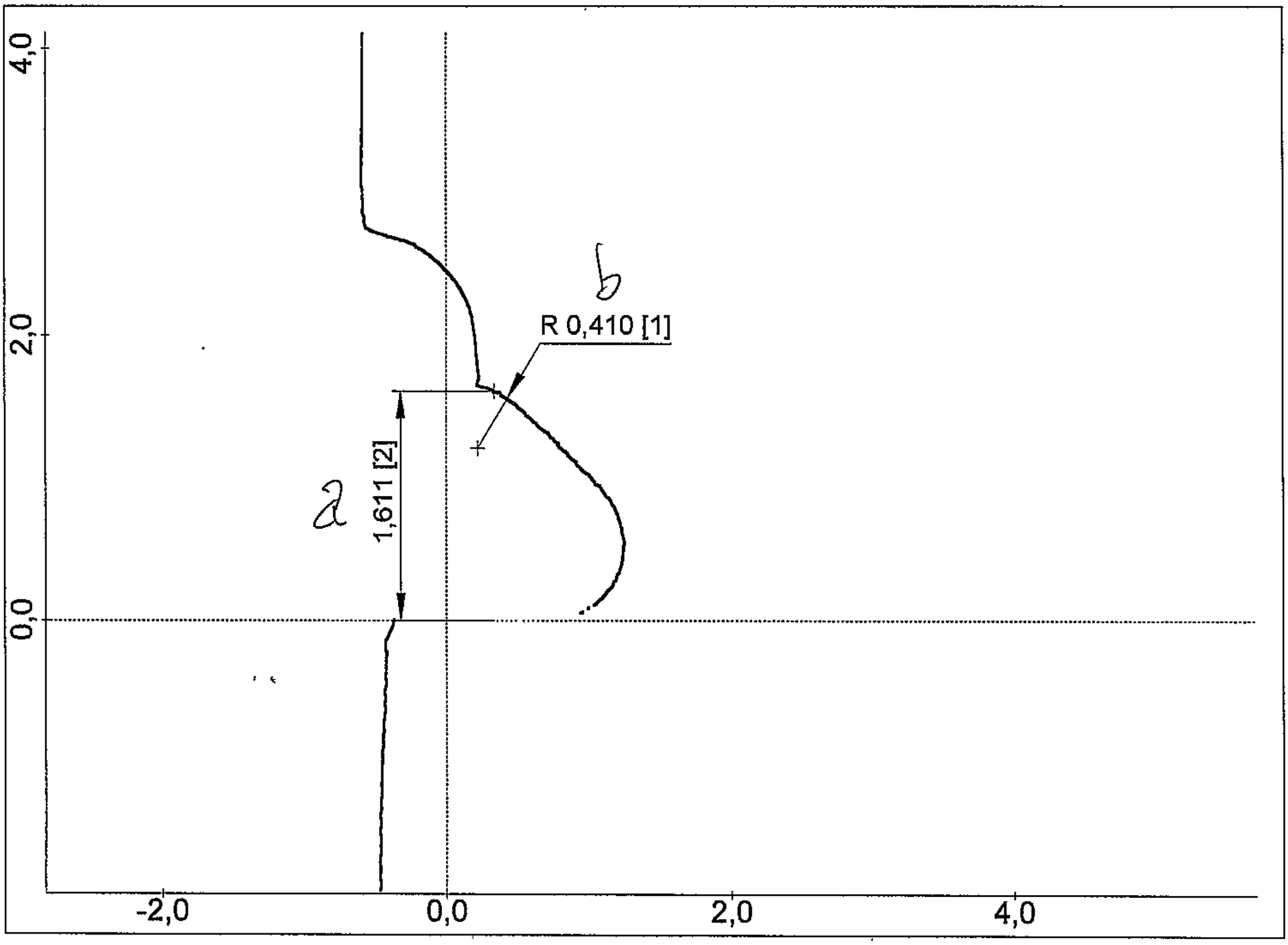
PERTHOMETER CONCEPT

Area Riservata alla Produzione	
Valutazione Profilo	
OK	☐
NOK	☐
N°BADGE ODP RICEVENTE	

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS 2
Numero:	1298 PZ N.5
Operatore:	TURNO C
Data, ora:	13.12.2017, 10:01
Nota;	PART V
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



PERTHOMETER CONCEPT

Area Riservata alla Produzione	
Valutazione Profilo	
OK	☐
NOK	☐
N°BADGE ODP RICEVENTE	

VICIVISION

Docum.archiviato elettronicamente.
Archiviazione cartacea non necessaria

Operatore:	data:	Numero di Lotto: Nr: 0	La configurazione.
Amministratore: admin	19-03-18 9-9-55	PZ_01 Unità di misura: [mm , °]	.\Archive\Z_Z_SERVIZIO\ modello: OS2_GOLE_1298_FINITO

Nota di programma:

Nota:

BARCODE:

GRAP.	tipo	Descrizione	Nominale	Misura	Scostamento	FUORI TOL.	TOL. INF.	TOL. SUP.
	├─┤	DIS	3.000	3.174	0.174		-0.500	0.500
	├─┤	DIS_AMPIEZZA	3.000	2.898	-0.102		-0.500	0.500
	├─┤	PROFONDITA'	0.200	0.148	-0.052		-0.100	0.000

VICIVISION

Docum.archiviato elettronicamente
Archiviazione cartacea non necessaria

Operatore:	data:	Numero di Lotto: Nr: 0	La configurazione:
Amministratore: admin	19-03-18 9-11-26	PZ_02	.\Archive\Z_Z_SERVIZIO\
		Unità di misura: [mm , °]	modello: OS2_GOLE_1298_FINITO

Nota di programma:

Nota:

BARCODE:

GRAP.	tipo	Descrizione	Nominale	Misura	Scostamento	FUORI TOL.	TOL. INF.	TOL. SUP.
	⊢⊣	DIS	3.000	3.167	0.167		-0.500	0.500
	⊢⊣	DIS AMPIEZZA	3.000	2.901	-0.099		-0.500	0.500
	⊢⊣	PROFONDITA'	0.200	0.147	-0.053		-0.100	0.000

VICIVISION

Docum.archiviato elettronicamente
Archiviazione cartacea non necessaria

Operatore:	data:	Numero di Lotto: Nr: 0	La configurazione:
Amministratore: admin	19-03-18 9-12-37	PZ_03 Unità di misura: [mm , °]	.\Archive\Z_Z_SERVIZIO\ modello: OS2_GOLE_1298_FINITO

Nota di programma:

Nota:

BARCODE:

GRAP.	tipo	Descrizione	Nominale	Misura	Scostamento	FUORI TOL.	TOL. INF.	TOL. SUP.
	⊢⊣	DIS	3.000	3.122	0.122		-0.500	0.500
	⊢⊣	DIS_AMPIEZZA	3.000	2.991	-0.009		-0.500	0.500
	⊢⊣	PROFONDITA'	0.200	0.192	-0.008		-0.100	0.000

VICIVISION

Docum.archiviato elettronicamente
Archiviazione cartacea non necessaria

Operatore:	data	Numero di Lotto: Nr: 0	La configurazione:
Amministratore: admin	19-03-18 9-13-57	PZ_04 Unità di misura: [mm , °]	.\Archive\Z_Z_SERVIZIO\ modello: OS2_GOLE_1298_FINITO

Nota di programma:

Nota:

BARCODE:

GRAP.	tipo	Descrizione	Nominale	Misura	Scostamento	FUORI TOL.	TOL. INF.	TOL. SUP.
	⊢⊣	DIS	3.000	3.127	0.127		-0.500	0.500
	⊢⊣	DIS_AMPIEZZA	3.000	2.982	-0.018		-0.500	0.500
	⊢⊣	PROFONDITA'	0.200	0.191	-0.009		-0.100	0.000

VICIVISION

Docum.archiviato elettronicamente.
Archiviazione cartacea non necessaria

Operatore:	data:	Numero di Lotto: Nr 0	La configurazione:
Amministratore: admin	19-03-18 9-17-24	PZ_05 Unità di misura: [mm , °]	.\Archive\Z_Z_SERVIZIO modello: OS2_GOLE_1298_FINITO

Nota di programma:

Nota:

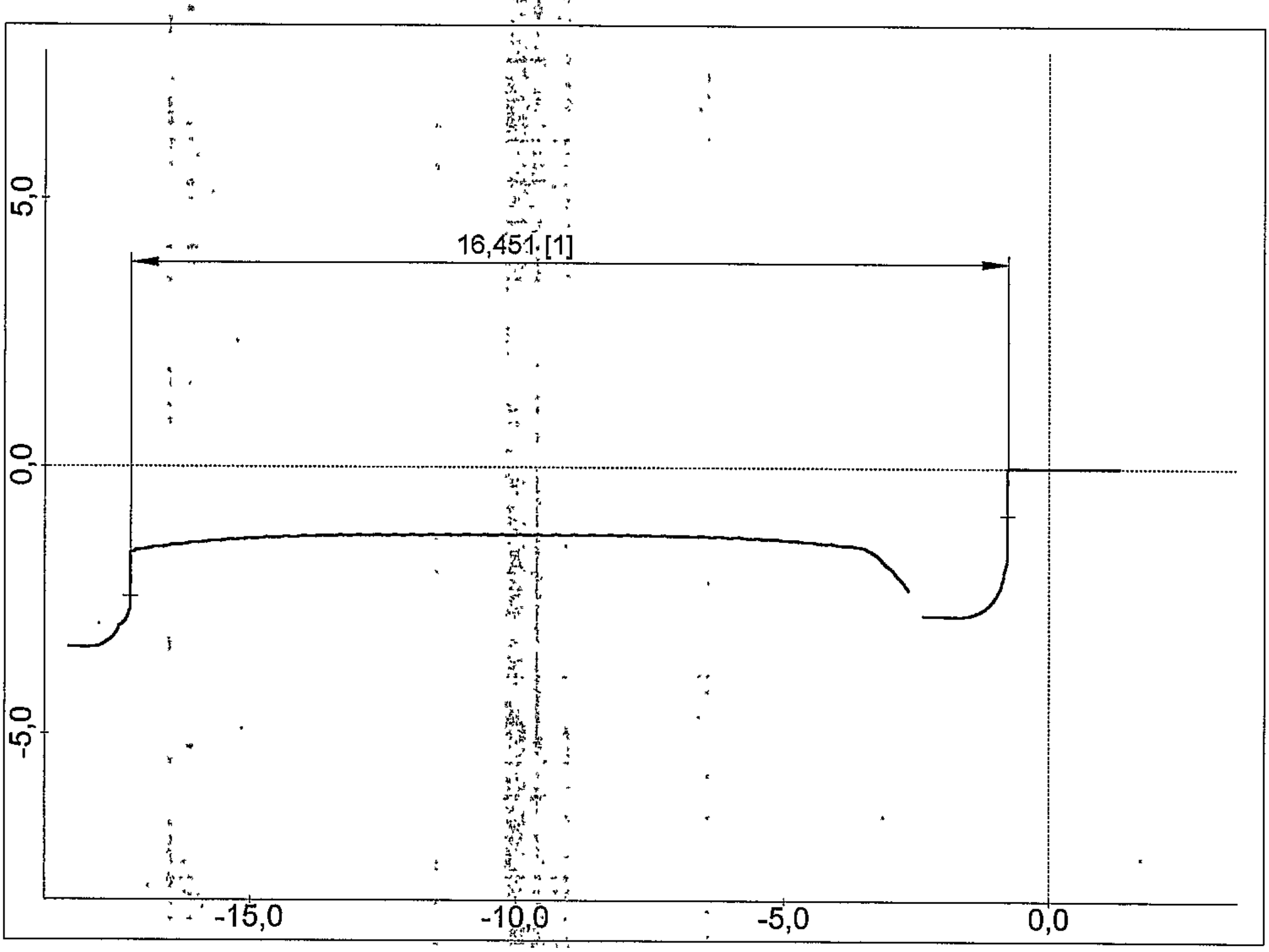
BARCODE:

GRAP.	tipo	Descrizione	Nominale	Misura	Scostamento	FUORI TOL.	TOL. INF.	TOL. SUP.
	├─┤	DIS	3.000	3.111	0.111		-0.500	0.500
	├─┤	DIS_AMPIEZZA	3.000	2.945	-0.055		-0.500	0.500
	├─┤	PROFONDITA'	0.200	0.105	-0.095		-0.100	0.000

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS2
Numero:	1298
Operatore:	TURNO B
Data, ora:	20.03.2018, 14:05
Nota:	PROFILO PZ.1
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



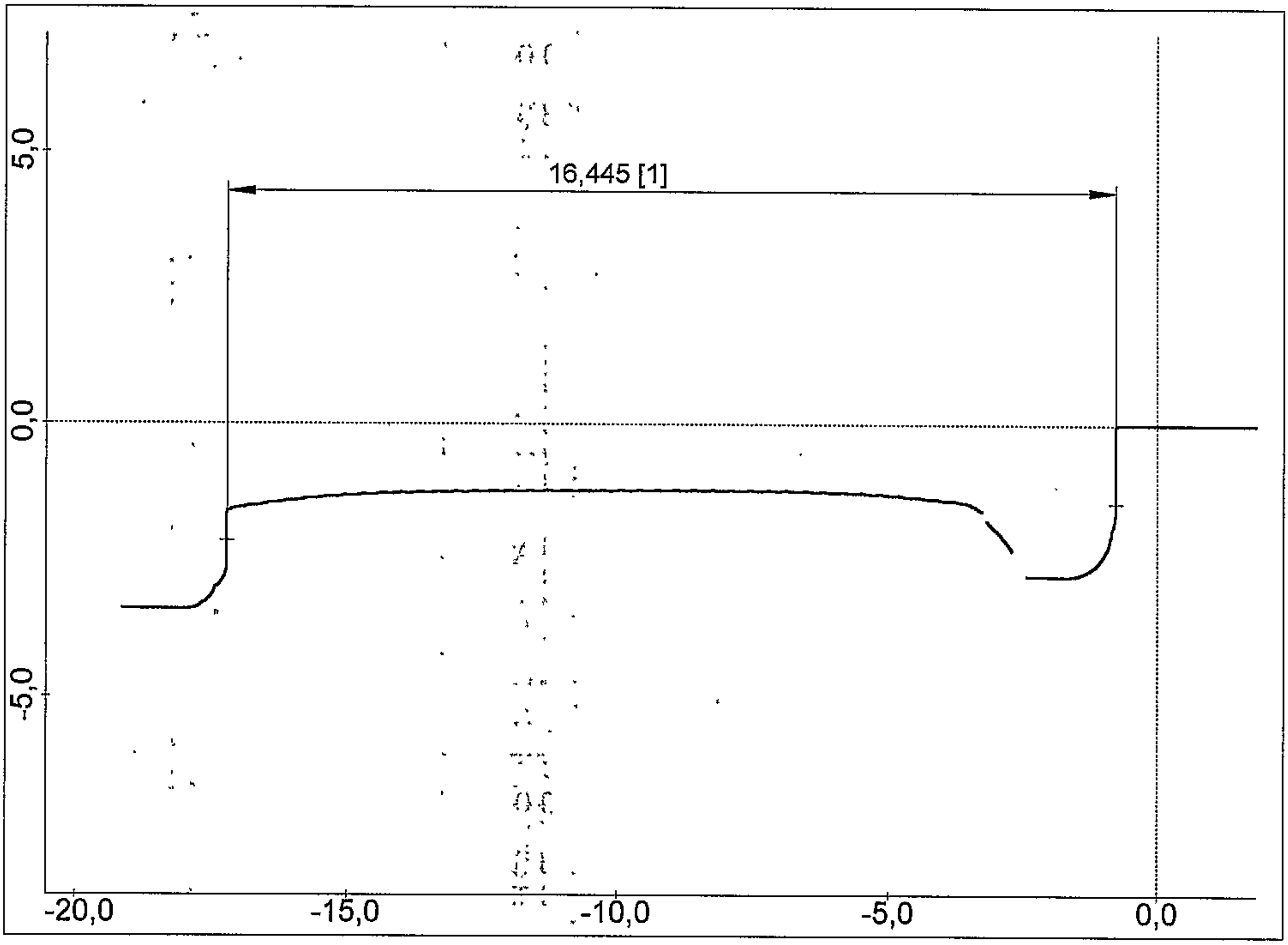
PERTHOMETER CONCEPT

Area Riservata alla Produzione	
Valutazione Profilo	
OK	☐
NOK	☐
N°BADGE ODP RICEVENTE	

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS2
Numero:	1298
Operatore:	TURNO B
Data, ora:	20.03.2018, 14:07
Nota:	PROFILO PZ.2
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



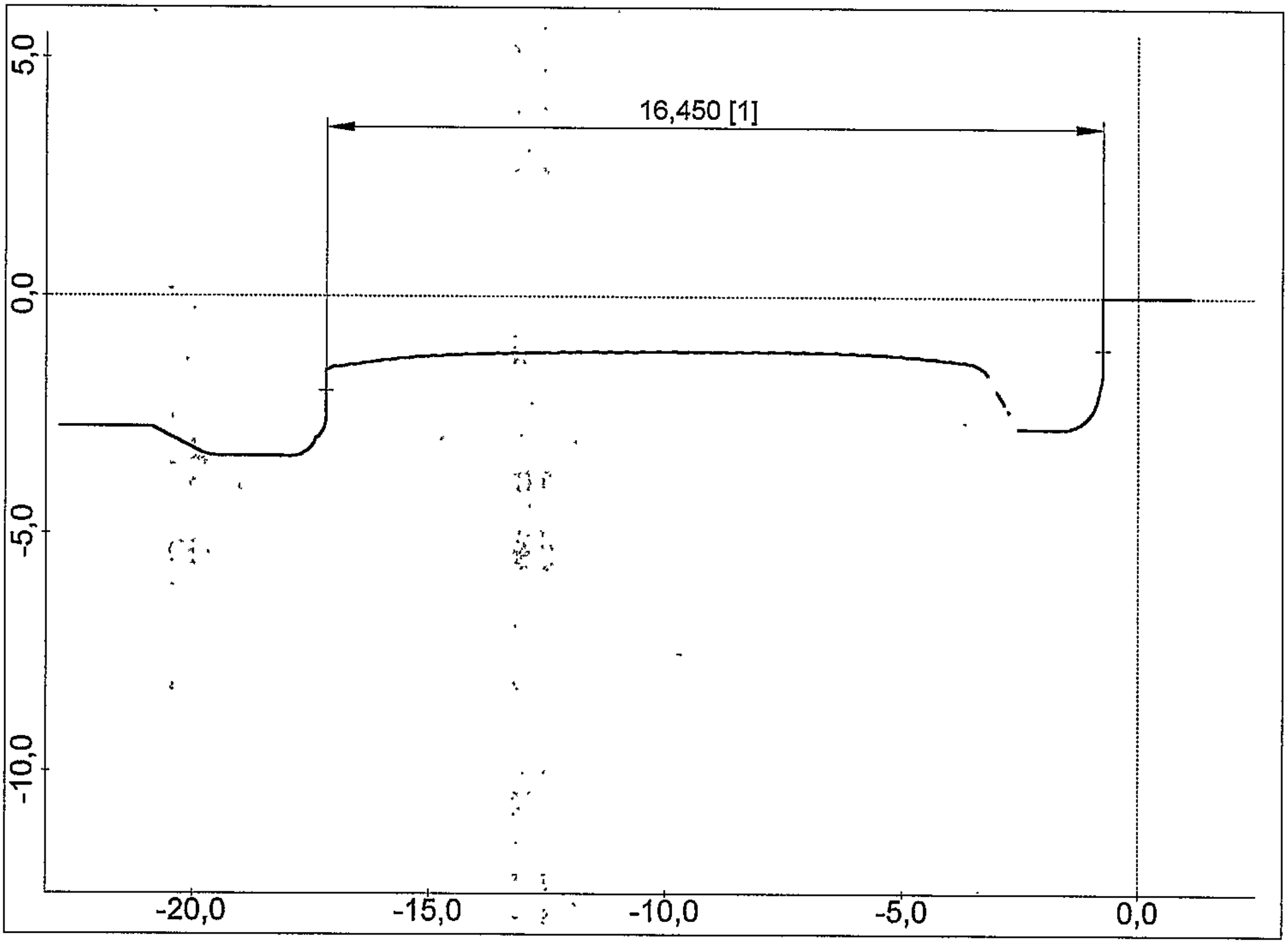
PERTHOMETER CONCEPT

Area Riservata alla Produzione	
Valutazione Profilo	
OK	☐
NOK	☐
N°BADGE ODP RICEVENTE	

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS2
Numero:	1298
Operatore:	TURNO B
Data, ora:	20.03.2018, 14:13
Nota:	PROFILO PZ. 3
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



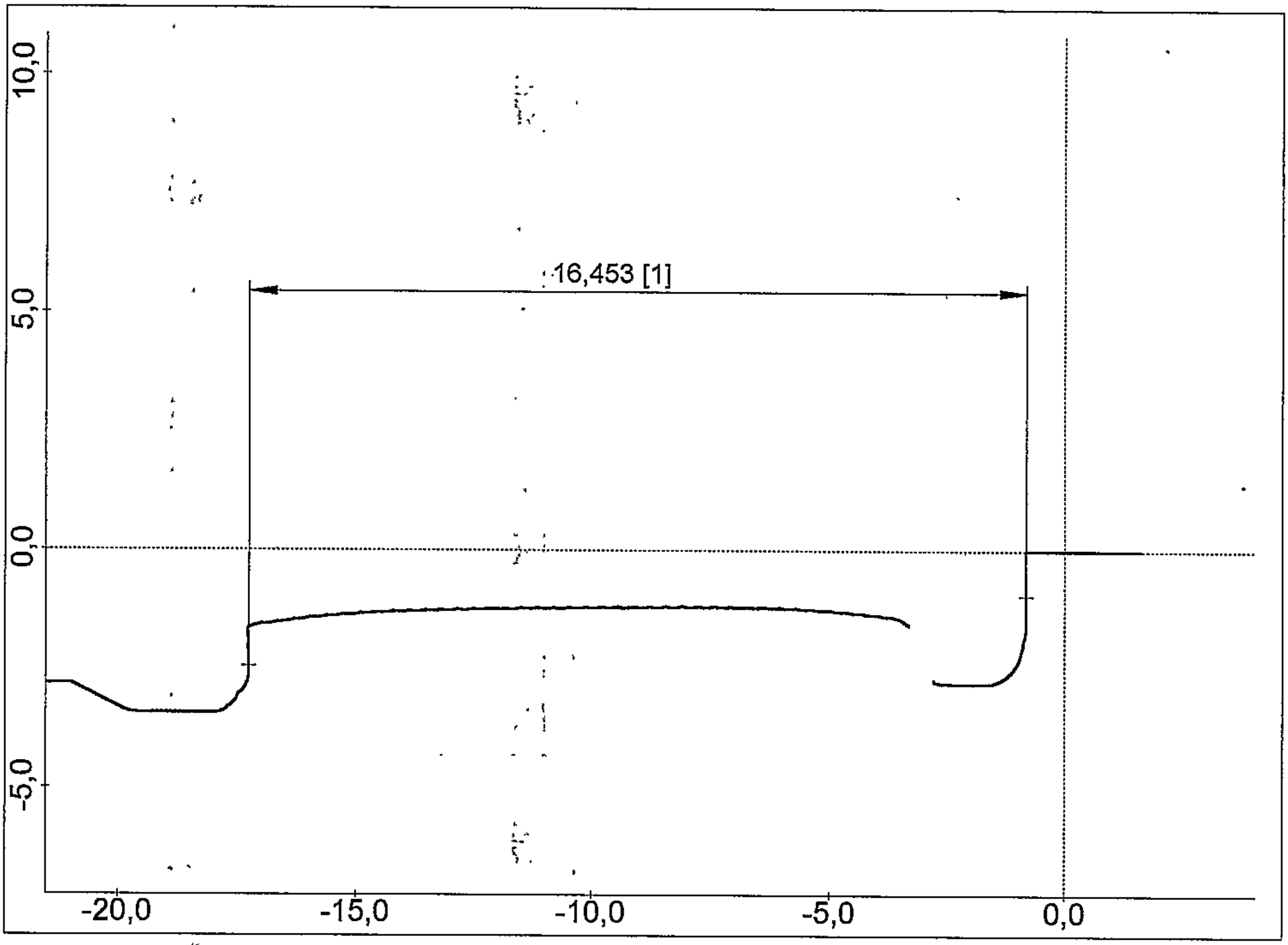
PERTHOMETER CONCEPT

Area Riservata alla Produzione	
Valutazione Profilo	
OK	☐
NOK	☐
N°BADGE ODP RICEVENTE	

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS2
Numero:	1298
Operatore:	TURNO B
Data, ora:	20.03.2018, 14:14
Nota:	PROFILO PZ. 4
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



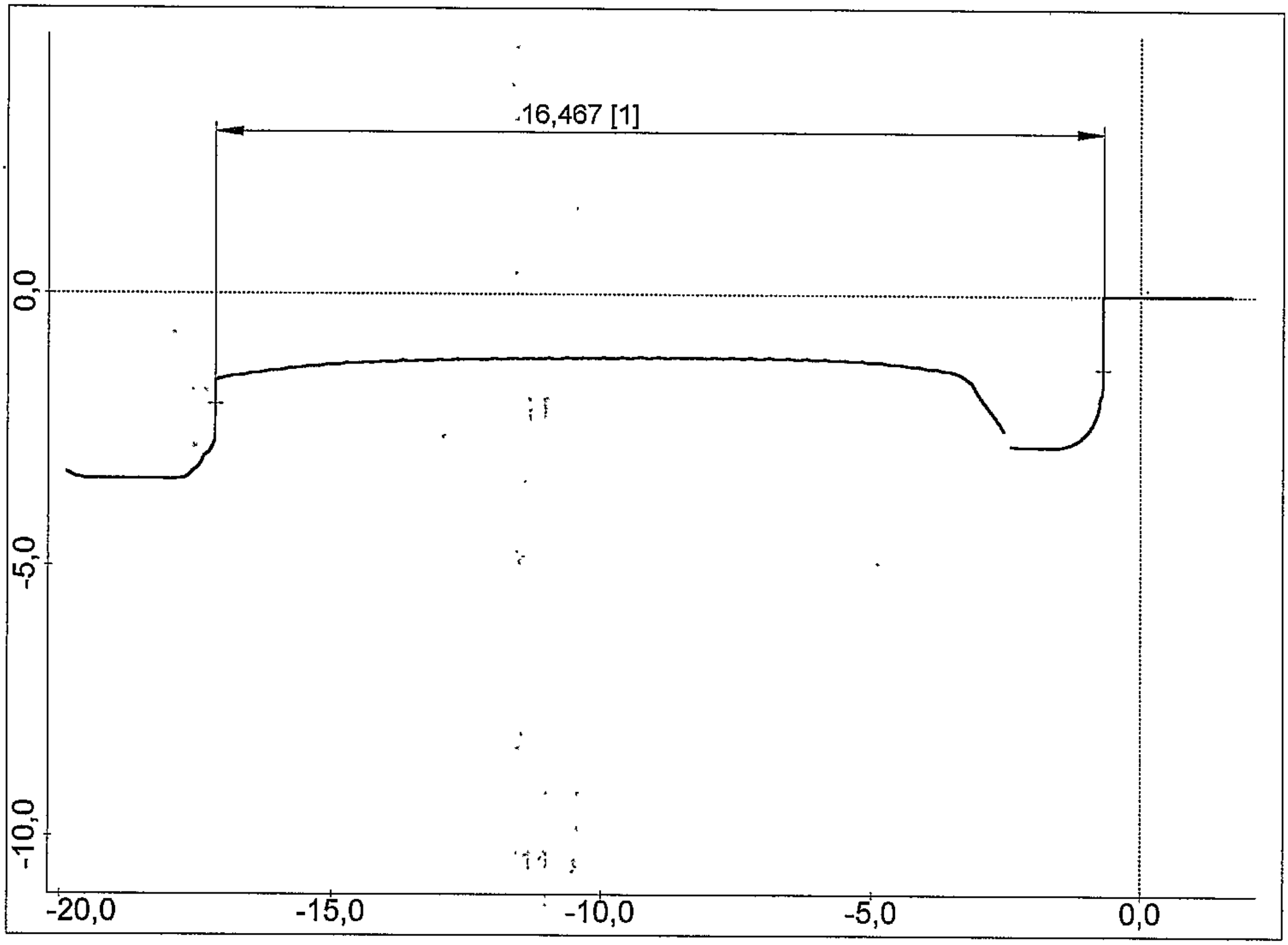
PERTHOMETER CONCEPT

Area Riservata alla Produzione	
Valutazione Profilo	
OK	☐
NOK	☐
N°BADGE ODP RICEVENTE	

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS2
Numero:	1298
Operatore:	TURNO B
Data, ora:	20.03.2018, 14:16
Nota:	PROFILO PZ. 5
Tastatore:	PCV 350 / 33 mm
Macchina:	MOA 416120 002



PERTHOMETER CONCEPT

Area Riservata alla Produzione	
Valutazione Profilo	
OK	☐
NOK	☐
N°BADGE ODP RICEVENTE	

REPORT 18/038

Date: 21/03/2018
Author: M. de Dato

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

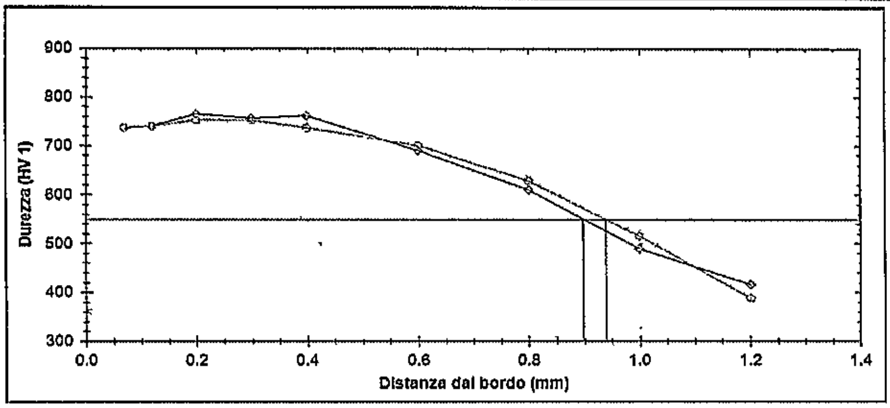
Part Name: *Nome particolare:*	OS2
Material: *Materiale:*	GCG_805000 Part 2
State of part: *Stato del particolare:*	Finito
P/N:	251.6.1298.35
S/N:	-
Customer: *Cliente:*	Daimler
Result: *Risultato:*	**OK**
Notes: *Note:*	Gearset 21H
Distribution list: *Lista di distribuzione:*	WLQ - M. Vicenti

Surface hardness verification *(verifica durezza superficiale)*

Component	Scale	Position	Measured Value	Range
Shaft	HRC	M1	61,6	-
Shaft	HRA	M1	82,0	80.5 + 2.5

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

Component	Scale	Sample #	Position	Measured Value	Range
Shaft	CHD 550 HV1	1327/18	M2 (tooth flank)	0,94	0.70+0.50 mm
Shaft	CHD 550 HV1	1327/18	M3	0,90	0.50 mm min.
Shaft	Core hardness HV10	1327/18	M4 (tooth core)	365	≥ 300



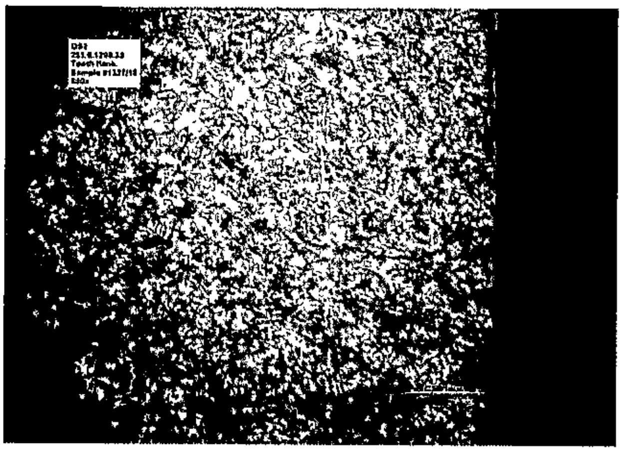
Picture 1: profili di durezza.

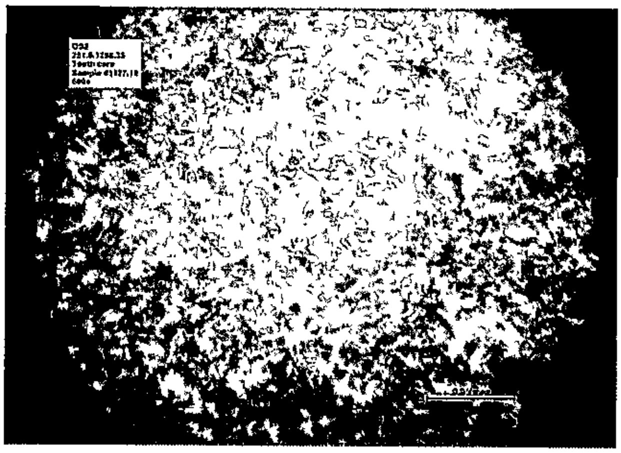
REPORT 18/038

Date: 21/03/2018
Author: M. de Dato

Microstructure analysis *(analisi della microstruttura)*

Sample #	**1327/18**
Shaft - Tooth flank surface structure:	Martensite e austenite residua (10%)
Shaft -,Tooth base core structure:	Martensite, bainite





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

Component	Operation	Machine	Part Number	Transferability	Items	Spec.	hrs	ORI	Target	Cm	Cmk	CM Last Update	N	Pa th	Pp	Ppk	PP Last Update
OUTPUT1	Power Honing	HNW11006	251.6.1296.35	21H	Fr	32	x	PPAP	1.67	-	3.15	20/03/2018			-	2.76	22/03/2018
OUTPUT1	Power Honing	HNW11006	251.6.1296 35	21H	MEDIO M1-M3	Max. 58,044Min. 57,984	x	PPAP	1.67	4.08	SIM	20/03/2018			3.73	SIM	22/03/2018
OUTPUT2	Power Honing	HNW11007	251.6.1298.35	21H	Fr	32	x	PPAP	1.67	-	3.03	20/03/2018			-	3.45	22/03/2018
OUTPUT2	Power Honing	HNW11007	251.6.1298.35	21H	MEDIO M1-M3	Min. 56,728Max. 56,778	x	PPAP	1.67	2.14	SIM	20/03/2018			2.45	SIM	22/03/2018
R.GEAR	Grind Gear Teeth	SLW11046	251.1.1300.50	21H	Fr	32	x	PPAP	1.67	-	1.69	20/03/2018			-	3.35	22/03/2018
R.GEAR	Grind Gear Teeth	SLW11046	251.1.1300.50	21H	MEDIO M1-M3	min 211,162max.211,233	x	PPAP	1.67	2.23	SIM	20/03/2018			2.23	SIM	22/03/2018

Analisi di similitudine GN4402
GETRAG SpA

GETRAG

Analisi di similitudine Ppk	Formular Nr Datum: Status: Entwurf Formular Eigner / Fachbereich Prozess-/VA-verweis:

Macchina da confrontare: HNW11007
Capability da confrontare Nr.: 02/03/2017

Data: 22/03/2018
Owner: G.Sette
Abt.: WLQ1

Codice Pezzo di riferimento: 251.6.1078.35

Partnumber in esame: 251.6.1298.35

Esito Correlazione: Il processo è paragonabile capacità di processo confermata

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

Deviazione Std. Ammessa: ± 25 %

Componente di riferimento					Componente in esame					
DIMENSIONI					DIMENSIONI					
Caratteristiche	**Unità**	**Nominale**		**Deviazione ammessa in %**	**Nominale**		**Deviazione %**	**i.O./n.i.O.**		
numero denti Z	---	15		35	17		13.33	i.O.		
diam.primitivo - Ø	mm	40.879		35	45.811		12.06	i.O.		
Altezza dentatura	mm	14.780		50	15.250		3.18	i.O.		
diam.testa - Ø (da)	mm	54.700		40	59.400		8.59	i.O.		

Studio delle specifiche						Studio delle specifiche					
Caratteristiche	**Unità**	**Nominale**	**Tolleranza T_1**	**P_p**	**P_{Pk} (solo per caratteristiche unilaterali)**	**Nominale**	**Tolleranza T_2**	**Target (1,00/1,33/1,67)**	**i.O./n.i.O.**	**Min. P_p**	**Min. P_{pk}**
Mdk - Ø	mm	56.753	0.050	2.36		61.692	0.052	1.67	i.O	2.45	
Fr (Eccentricità)	µm	0	32	3.45		0	32	1.67	i.O	3.45	
	µm								---		
	µm								---		
	µm								---		
	µm								---		
	µm								---		
...									---		

Part Submission Warrant

087/17

Part Name OUTPUT SHAFT 2 PRE TURNED Cust. Part Number 2516129880
Shown on Drawing No. 2516129880 Org. Part Number
Engineering Change Level b Dated 10.10.17
Additional Engineering Changes Dated
Safety and/or Government Regulation ☐ Yes ☑ No Purchase Order No. 5500039785 Weight (kg) 1,652
Checking Aid No. 2516129880_b_KP Checking Aid Engineering Change Level b Dated 30.10.17

ORGANIZATION MANUFACTURING INFORMATION

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

Vápenická 30
Street Address

Prievidza Slovakia 971 01 Slovakia
City Region Postal Code Country

CUSTOMER SUBMITTAL INFORMATION

Getrag
Customer Name/Division

1/1001
Buyer/Buyer Code

Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? ☐ Yes ☐ No ☑ n/a
Submitted by IMDS or other customer format: 698086761 / 0.01

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

REASON FOR SUBMISSION (Check at least one)

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

REQUESTED SUBMISSION LEVEL (Check one)

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

SUBMISSION RESULTS

The results for ☑ dimensional measurements ☑ material and functional tests ☐ appearance criteria ☑ statistical process package
These results meet all drawing and specification requirements: ☑ Yes ☐ No (If "NO" - Explanation Required)
Mold / Cavity / Production Process 2516129880_b_PFD

DECLARATION

I hereby affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of 74 / 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: Neue Linie
DC-249, DC-247

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

Organization Authorized Signature Date 7.11.17

Print Name Jaroslav Osvald Phone No. 00421/905651768 Fax No. -310

Title QS E-mail abalaz@gewis.eu

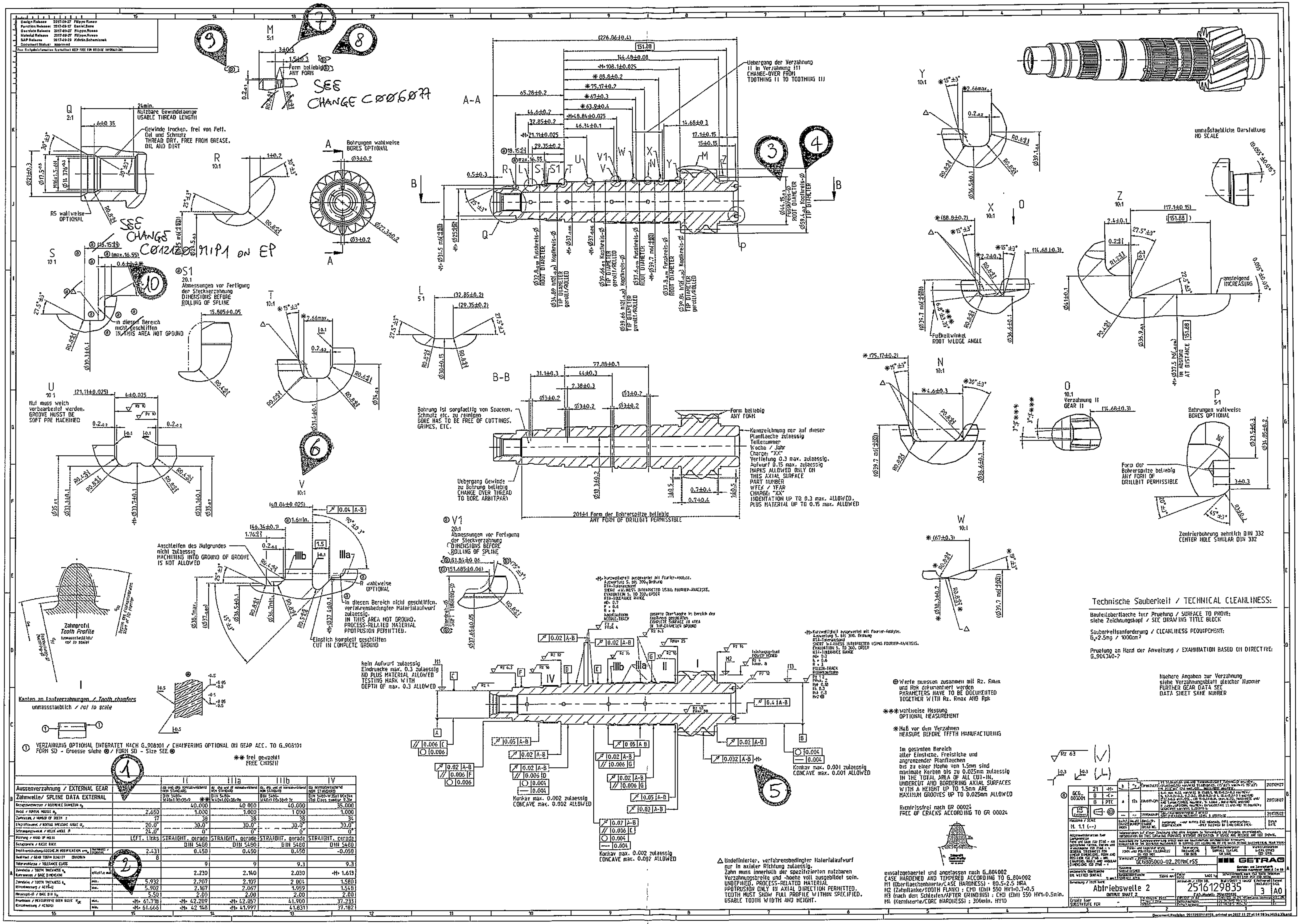
FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: ☒ Approved ☐ Rejected ☐ Other

Customer Signature Date 08.12.17

Print Name A. Hettinger Customer Tracking Number (optional) 17-01323

MAGNA GETRAG



① VERZAHNUNG OPTIONAL ENTGRATET NACH G_908101 / CHAMFERING OPTIONAL ON GEAR ACC. TO G_908101
FORM SD - Groesse siehe ⑧ / FORM SD - Size SEE ⑧

** frei gewaehlt
FREE CHOSEN

Aussenverzahnung / EXTERNAL GEAR		I	II	IIIa	IIIb	IV
Zahnwelle/ SPLINE DATA EXTERNAL			DIN 5480-W40x1.00x38x9 **	DIN 5480-W40x1.00x38x9n	DIN 5480-W40x1.00x38x9.3c	DIN 5480-W35x1.00x34x (Tol Class similar 9,3)
Bezugsdurchmesser / REFERENCE DIAMETER			40.000	40.000	40.000	35.000
Modul / NORMAL MODULE		2.650	1.000	1.000	1.000	1.000
Zaehnezahl / NUMBER OF TEETH z		17	38	38	38	34
Eingriffswinkel / NORMAL PRESSURE ANGLE		20.0°	30.0°	30.0°	30.0°	30.0°
Schraegungswinkel / HELIX ANGLE β		24.0°	0°	0°	0°	0°
Richtung / HAND OF HELIX		LEFT, links	STRAIGHT, gerade	STRAIGHT, gerade	STRAIGHT, gerade	STRAIGHT, gerade
Bezugsprofil / BASIC RACK			DIN 5480	DIN 5480	DIN 5480	DIN 5480
Profilverschiebung / ADDENDUM MODIFICATION	Nennmass / NOMINAL	2.431	0.450	0.450	0.450	-0.050
Qualitaet / GEAR TOOTH QUALITY		8				
Toleranzklasse / TOLERANCE CLASS			9	9	9.3	9.3
Zahndicke / TOOTH THICKNESS, Kontrollmass / GAGE DIMENSION	effective max.		2.230	2.140	2.030	<M> 1.613
Zahndicke / TOOTH THICKNESS, Einstellmessung / ACTUAL	max.	5.932	2.207	2.107	2.004	1.580
	min.	5.902	2.167	2.067	1.959	1.548
Messkugel-Ø / BALL DIA		5.50	2.00	2.00	2.00	2.00
Pruefmass / MEASUREMENT OVER BALLS, Einstellmessung / ACTUAL	max.	<M> 61.718	<M> 42.209	<M> 42.057	41.900	37.233
	min.	<M> 61.666	<M> 42.148	<M> 41.997	41.831	37.182

△ Undefinierter, verfahrensbedingter Materialaufwurf nur in axialer Richtung zulaessig. Zahn muss innerhalb der spezifizierten nutzbaren Verzahnungsbreite und -hoehe voll ausgebildet sein.
UNDEFINED, PROCESS-RELATED MATERIAL PROTRUSION ONLY IN AXIAL DIRECTION PERMITTED. TOOTH MUST SHOW FULL PROFILE WITHIN SPECIFIED. USABLE TOOTH WIDTH AND HEIGHT.

⊕ Werte muessen zusammen mit Rz, Rmax und Rpk dokumentiert werden
PARAMETERS HAVE TO BE DOCUMENTED TOGETHER WITH Rz, Rmax AND Rpk

*** wahlweise Messung
OPTIONAL MEASUREMENT

* Maß vor dem Verzahnen
MEASURE BEFORE TEETH MANUFACTURING

Im gesamten Bereich aller Einstiche, Freistiche und angrenzender Planflaechen bis zu einer Hoehe von 1.5mm sind maximale Kerben bis zu 0.025mm zulaessig
IN THE TOTAL AREA OF ALL CUT-IN, UNDERCUT AND BORDERING AXIAL SURFACES WITH A HEIGHT UP TO 1.5mm ARE MAXIMUM GROOVES UP TO 0.025mm ALLOWED

Richtrissfrei nach GR 00024
FREE OF CRACKS ACCORDING TO GR 00024

einsatzgehaertet und angelassen nach G_804002
CASE HARDENED AND TEMPERED ACCORDING TO G_804002
H1 (Oberflaechenhaerte/CASE HARDNESS) : 80.5+2.5 HRA
H2 (Zahnflanke/TOOTH FLANK) : CHD (Eht) 550 HV1=0.7+0.5
H3 (nach dem Schleifen/AFTER GRINDING) : CHD (Eht) 550 HV1=0.5min.
H4 (Kernhaerte/CORE HARDNESS) : 300min. HV10

Technische Sauberkeit / TECHNICAL CLEANLINESS:

Bauteiloberflaeche fuer Pruefung / SURFACE TO PROVE:
siehe Zeichnungskopf / SEE DRAWING TITLE BLOCK

Sauberkeitsanforderung / CLEANLINESS REQUIREMENT:
G_A=2.5mg / 1000cm²

Pruefung an Hand der Anweisung / EXAMINATION BASED ON DIRECTIVE:
G_904340-7

Naehere Angaben zur Verzahnung siehe Verzahnungsblatt gleicher Nummer
FURTHER GEAR DATA SEE DATA SHEET SAME NUMBER

Rz 63 (✓)

Massstab / SCALE: M. 1.1 (--)

Werkstoff / MATERIAL: GCG805000-02_20MnCrS5

GETRAG

Benennung / ITEM NAME: Abtriebswelle 2
OUTPUT SHAFT 2

Artikel-Nr. / ITEM NO.: 2516129835 — 3 — A0

Ersatz fuer / SUBSTITUTE FOR: -