GETRAG 312639

Part Submission Warrant

Part Name: OUTPUT SHAFT 1 — Customer Part Number: 250.6.3975.35

Shown on Drawing No.: 250.6.3975.35 — Organization Part #:

Engineering Change Level: F Index (c) — Dated: 29-lug-14

Additional Engineering Changes: — Dated:

Safety and/or Government Regulation ☐ Yes ☑ No — Purchase Order No.: — Weight (kg): 2,076

Checking Aid No.: — Checking Aid Engineering Change Level: — Dated:

ORGANIZATION MANUFACTURING INFORMATION

GETRAG MODUGNO

Organization Name & Supplier/Vendor Code

VIA DEI CICLAMINI N°4

Street Address

City	Region	Postal Code	Country
MODUGNO	BARI	70026	ITALY

CUSTOMER SUBMITTAL INFORMATION

FORD

Customer Name/Division

FORD

Buyer/Buyer Code

TYP 250 FORD

Application

MATERIALS REPORTING

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

Submitted by IMDS or other customer format:

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

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 2000 / 24 hours. I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from this declaration below.

EXPLANATION / COMMENTS: ripetizione per smarrimento documentazione precedente

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

Organization Authorized Signature: [signature] — Date: 20/01/2015

Print Name: Dario Tursi — Phone No.: cell +39-393-9814554 — Fax No.:

Title: GPS 2 Leader — E-mail: dario.tursi@getrag.com

FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: ☑ Approved ☐ Rejected ☐ Other

Customer Signature: [signature] — Date: 20/01/2015

Print Name: — Customer Tracking Number (optional):

GETRAG Production Part Approval

DIMENSIONAL TEST RESULTS

Organization: GETRAG	Part Number: 250.6.3975.35
Supplier/Vendor Coc GETRAG Modugno	Part Name: Output Shaft 1
INSPECTION FACILITY: NA	Design Record Change Level: F Index (c) 29/07/2014
	Engineering Change Documents:

Item	Dimension/Specification	Specification / Limits		Test Date	Qty. Tested	1	2	3	4	5	Test distruttivo	Ok	Not Ok
						Organization Measurement Results (Data)							
1	MDK I	61,801	61,870		5	61,822	61,831	61,829	61,836	61,827		ok	
2	Root diameter I	49,350	49,800		5	49,657	49,709	49,710	49,671	49,655		ok	
3	Tip diameter I	64,140	64,400		5	64,188	64,210	64,229	64,227	64,228		ok	
4	Rz 4 dentatura Z19	0	4 μ		5	1,55	1,39	1,70	2,03	1,77		ok	
	Rmax 8 dentatura Z19	0	8 μ		5	2,15	1,63	2,09	2,44	2,11		ok	
5	↗ 0,040 A - B Z19	0	40 μ		5	17	13	9	8	15		ok	
6	Dettaglio "M"	-	-		5	OK	OK	OK	OK	OK		ok	
	Diametro Ø 63,95 -0,3	63,650	63,950		5	63,892	63,853	63,816	63,779	63,931		ok	

Toothing microgeometry validated by standard measurement report

SIGNATURE	TITLE	DATE
G. Cicirelli	QPE	12/01/2015

Item	Caractheristic	Tolerance	Part 1	Part 2	Part 3	Part 4	Part 5	Device
1	MDK I	61,801÷61,870	61,822	61,831	61,829	61,836	61,827	Calibro a sfere

Misurazioni Manuali

OS1 2506397535

12-gen-15

GETRAG Ruota cilindrica Evolvente/Elica

Nr. prog.:	STI0410o05 0 PNC35 B4784	Controllore:	TURNO c	Data:	09.01.2015 16:18
Denominazione:	Output Shaft 1	Numero denti z	20	Largh.fasc.dent. b	34.42mm
Numero disegno.:	250.6.3975.35-IF	Modulo m	2.45mm	Tratto evolv. La	7.34/11.86mm
Commessa/serie nr.:	ppap 1	Angolo pressione	20°	Tratto elica Lß	27.54mm
Masch.Nr.:	M001 Spindel: Formnest 1	Angolo elica	-29°	Inizio elab. M1	6.45mm
Untersuchungszweck:	Laufende Messung	ø Base db	51.7243mm	Palpatore ø	(#1)1mm
Werkzeug:	Charge:	Ang. Base	-27.102°	Fat.scor.pr. x	.6

Testa

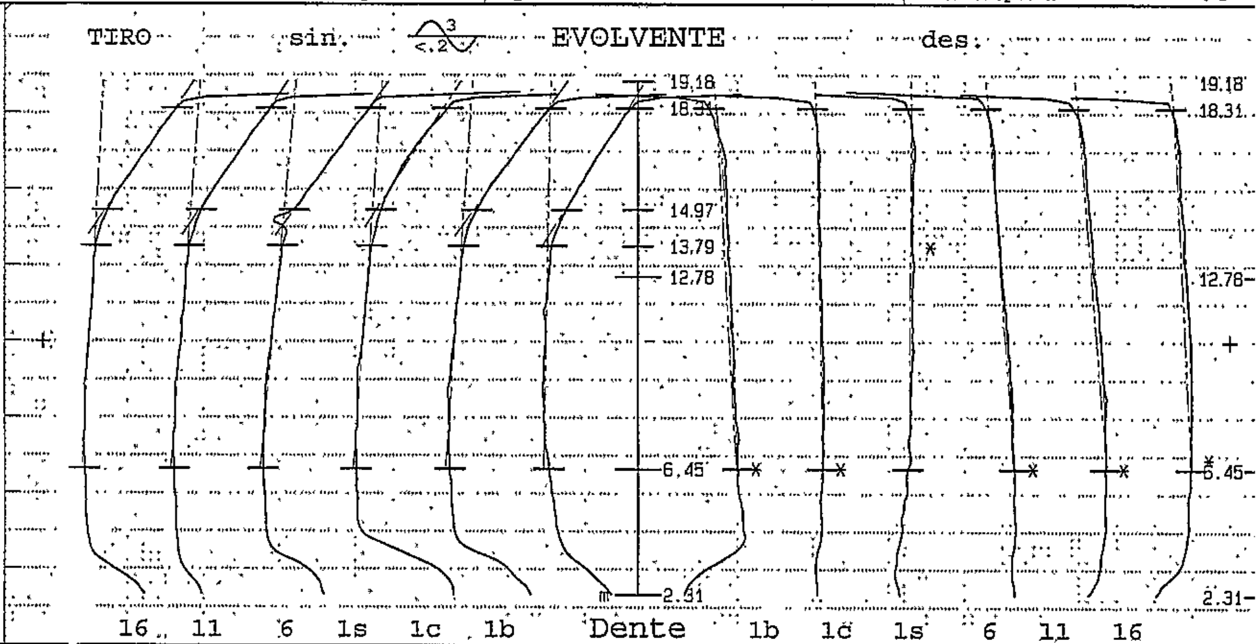
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qua
fHαm	±6	-4	Var 3							±6	Var 6						-6	
fHα	±10	-4	-3	-4	-6	-4	-4	-1		±10	-5	-2	1	-7	-8	-5	-6	
Fα		4	3	4	5	4	4	2			8	3	2	8	9	6	7	
ffα	4	2	1	1	4	2	2	2		4	3	2	2	1	2	1	2	
Cα										0/4	1	0	1	1	1	1	1	
fKo											0	0	0	0	0	0	0	
fKo	-22/-14	-20	-19	-19	-20	-17	-20	-20										
P/T-φ[mm]		49.657	[49.35/49.8]								64.188	[64.14/64.4]						

Sotto

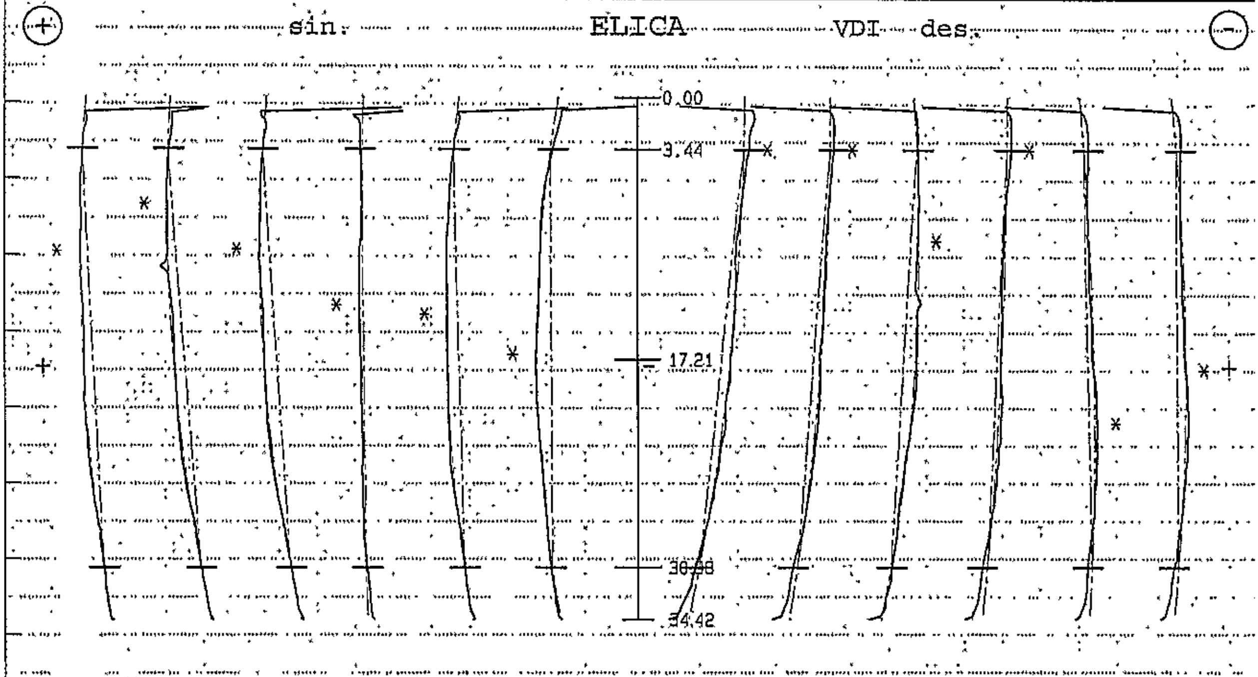
20 µm

Va500:1

Vb2:1

5 mm

Sopra



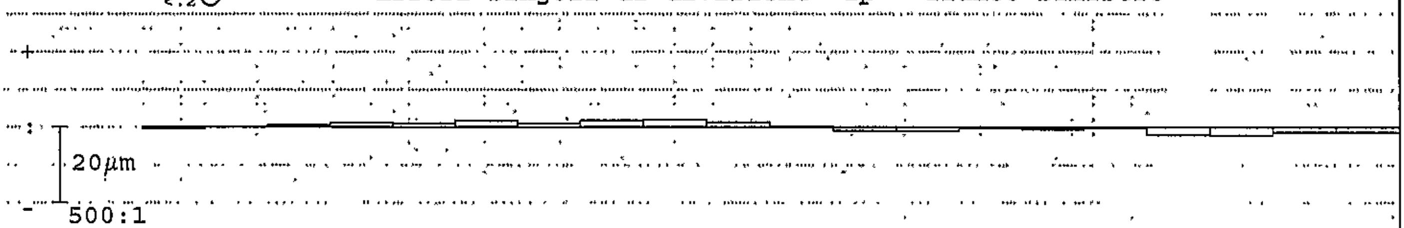
N:Z 16 11 6 1t 1c 1p Dente 1p 1c 1t 6 11 16

fHßm	8±6	8	Var 8							±6	Var 13						-4
fHß	8±13	8	7	11	9	1	3	0		±13	-15	-11	-9	-7	2	1	-4
Fß		3	2	5	2	7	4	7			18	12	12	11	4	3	8
ffß	4	2	1	3	1	1	1	1		4	2	2	2	2	2	2	2
Cß	2/6	3	3	3	3	1	3	4		2/6	2	2	3	1	2	2	2
Bd		-1															-6

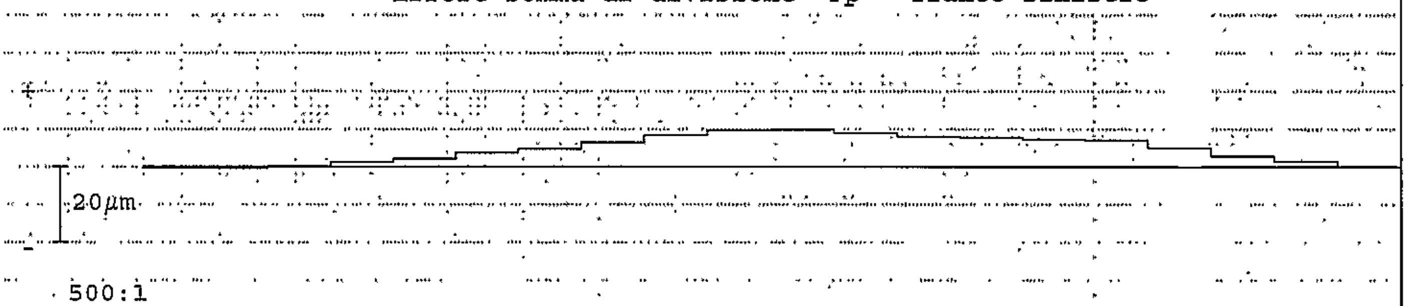
GETRAG	Ruota cilindrica Divisione

Nr. prog.: STI0410o05 0 PNC35 B4784	Controllore: TURNO C	Data: 09.01.2015 16:18	
Denominazione: Output Shaft 1	Numero denti z 20	Angolo pressione	20°
Numero disegno.: 250.6.3975.35-IF	Modulo m 2.45mm	Angolo elica	-29°
Commessa/serie nr.: ppap 1	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001 Spindel: Formmeßtz. 1	Werkzeug:	Charge:	

Errori singoli di divisione fp fianco sinistro

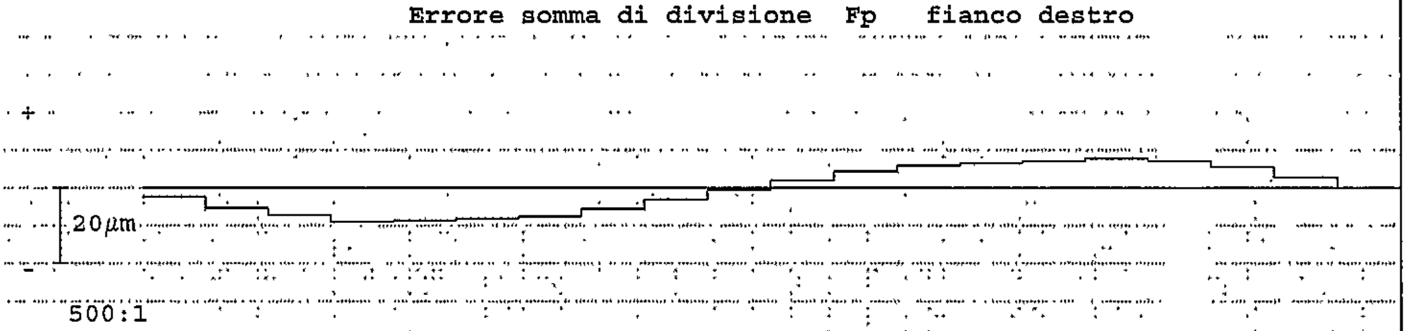


Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

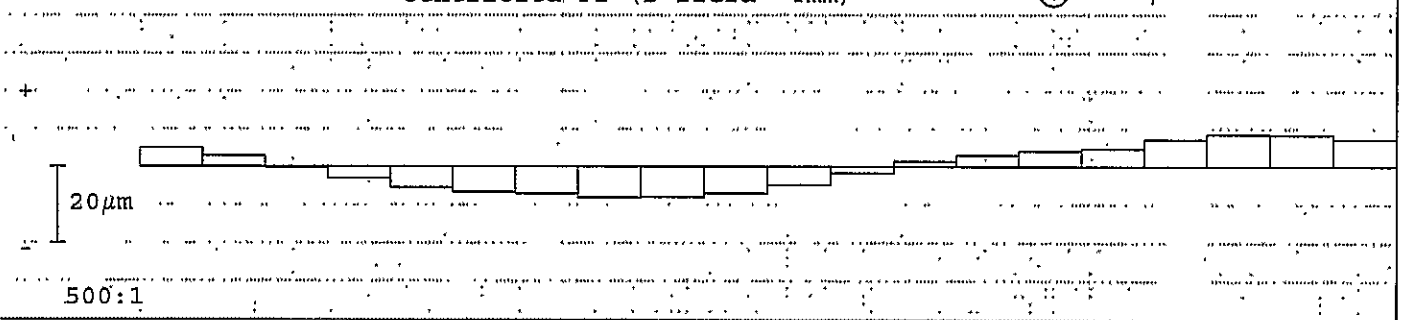
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:57.695 z=17.2mm

		fianco sinistro / TIRO				fianco destro			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2		14		3		14	
Gr. salto di passo	fu max	2		18		2		18	
Scarto di divisione	Rp	4				6			
Err. globale di divisione	Fp	10		50		17		50	
Err. cordale di divisione	Fpz/8	6				8			

Centricità Fr (Ø-sfera =4mm) ◎ : 16µm



Err. di concentricità	Fr	17	40	
Variaz. spessore dente	Rs			

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GETRAG	Ruota cilindrica Evolvente/Elica	

Nr. prog.:	STI0410o05 0 PNC35 B4784	Controllore:	TURNO c	Data:	09.01.2015 16:2
Denominazione:	Output Shaft 1	Numero denti z	20	Largh.fasc.dent. b	34.42mm
Numero disegno.:	250.6.3975.35-IF	Modulo m	2.45mm	Tratto evolv. La	7.34/11.86mm
Commessa/serie nr.:	ppap 2	Angolo pressione	20°	Tratto elica Lß	27.54mm
Masch.Nr.:	M001 Spindel: Formnext	Angolo elica	-29°	Inizio elab. M1	6.45mm
Untersuchungszweck:	Laufende Messung	Ø Base db	51.7243mm	Palpatore Ø	(#1)1mm
Werkzeug:	Charge:	Ang. Base	-27.102°	Fat.scor.pr. x	.6

Testa

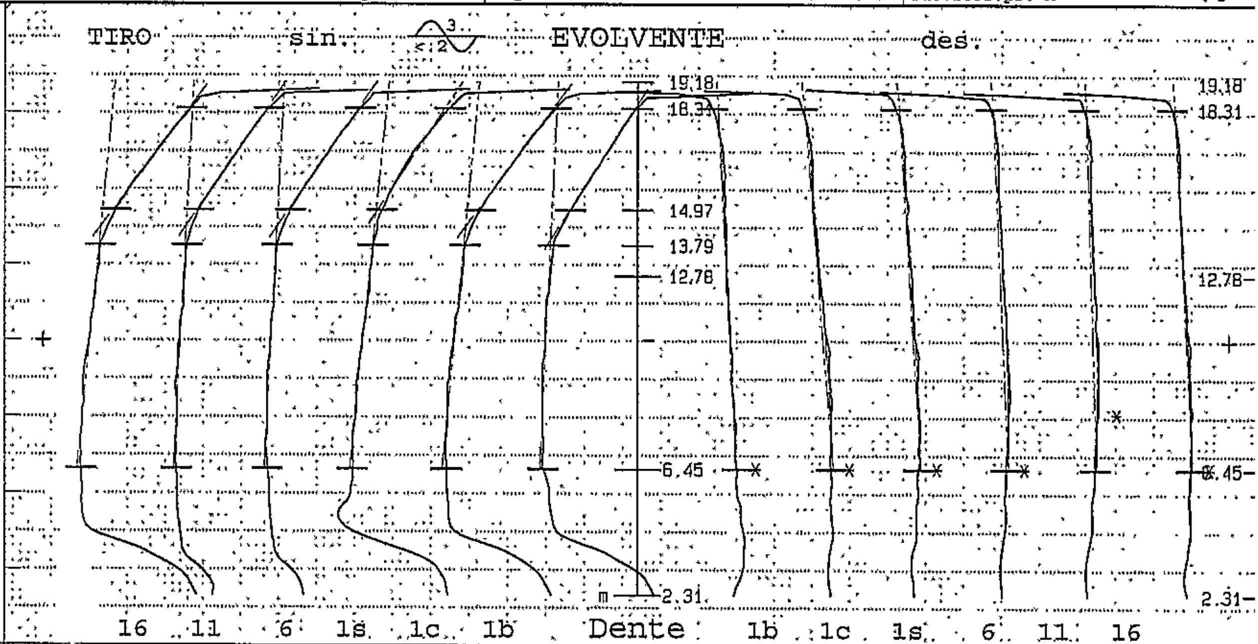
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qua
fHαm	±6	-5	Var 3							±6	Var 5						-5	
fHα	±10	-5	-6	-3	-3	-6	-6	-3		±10	-5	-8	-6	-4	-3	-5	-5	
Fα		4	5	3	3	5	5	3			7	8	7	5	4	5	6	
ffα	4	2	2	1	1	1	2	2		4	2	2	2	1	1	2	2	
Cα										0/4	0	1	1	1	1	0	1	
fKo											0	0	0	0	0	0	0	
fKo	-22/-14	-20	-20	-20	-20	-15	-20	-20										
P/T-φ[mm]		49.709	[49.35/49.8]								64.210	[64.14/64.4]						

Sotto

20 µm

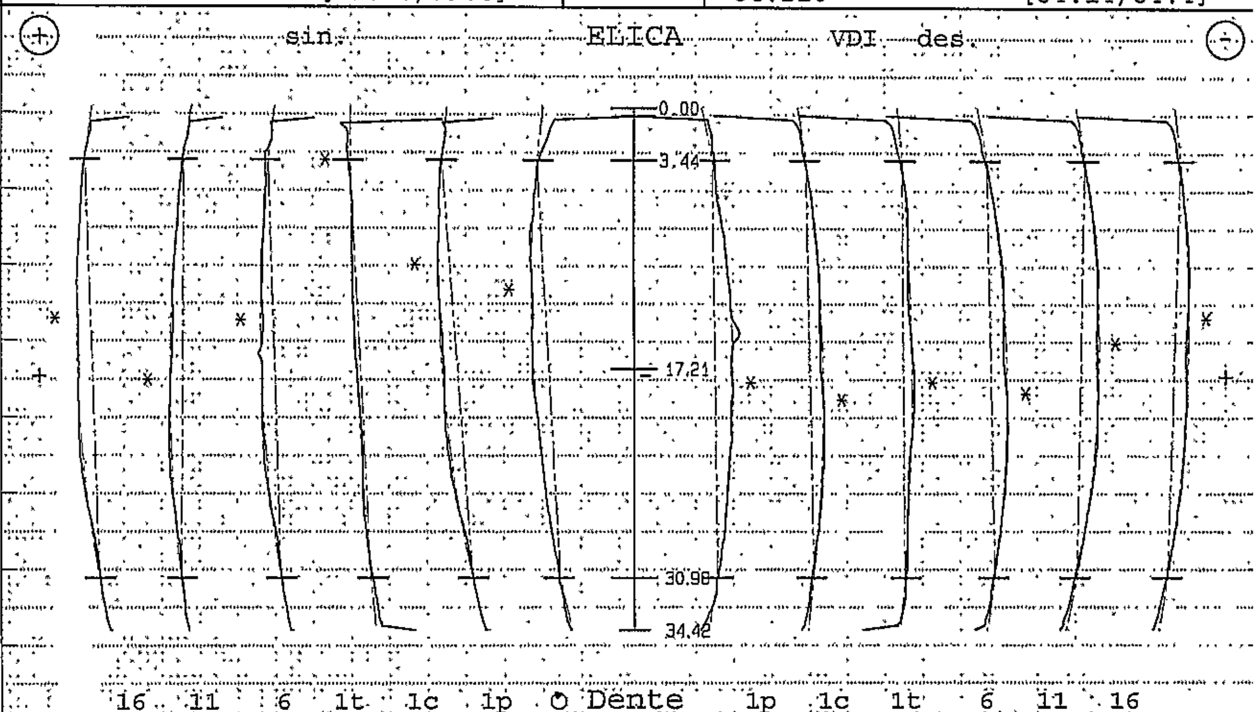
Va500:1

Vb2:1

5 mm

Sopra

N:Z

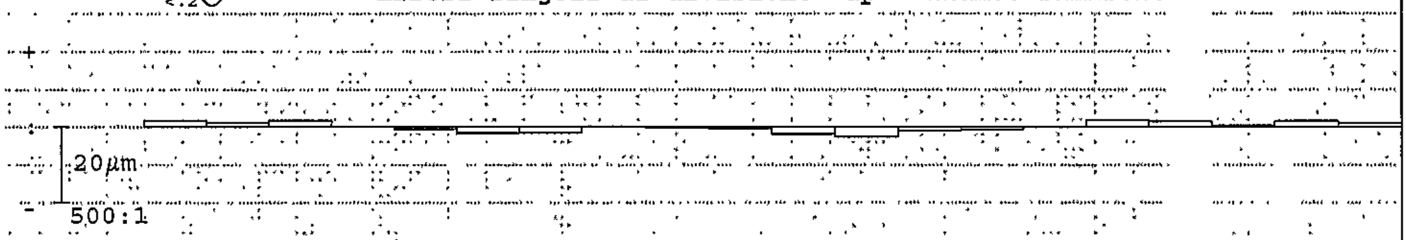


Tolerance		Medio							Qual	Tolerance							Medio	Qua
fHßm	8±6	5	Var 11							±6	Var 7						-1	
fHß	8±13	5	5	-1	4	7	10	8		±13	2	3	1	2	-3	-4	-1	
Fß		5	4	7	4	4	3	3			5	3	3	4	5	5	4	
ffß	4	1	1	1	2	1	1	1		4	3	1	1	1	1	1	1	
Cß	2/6	4	4	3	4	1	4	4		2/6	5	3	2	4	5	4	4	
Bd		1															1	

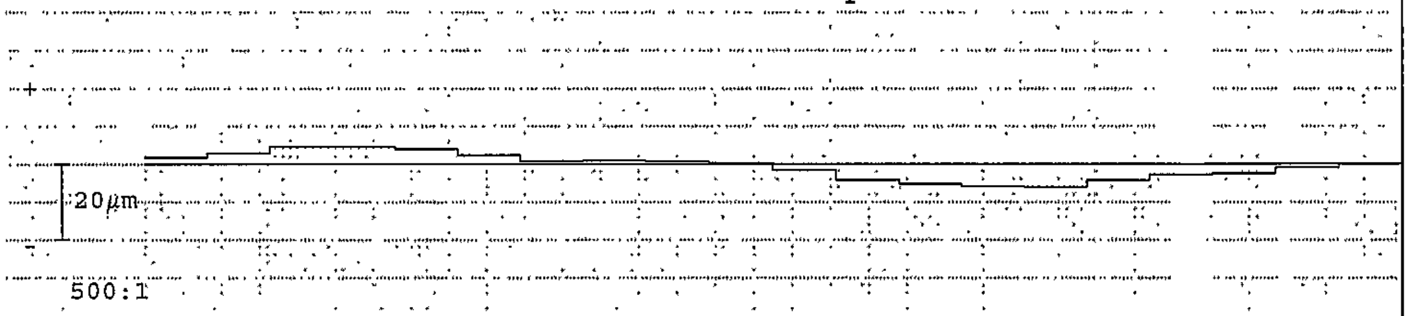
GETRAG	Ruota cilindrica Divisione

Nr. prog.:	STI0410o005 0 PNC35 B4784	Controllore:	TURNO C	Data:	09.01.2015 16:26
Denominazione:	Output Shaft 1	Numero denti z	20	Angolo pressione	20°
Numero disegno.:	250.6.3975.35-IF	Modulo m	2.45mm	Angolo elica	-29°
Commessa/serie nr.:	ppap 2	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001 Spindel: Formmeatzeug:			Charge:	

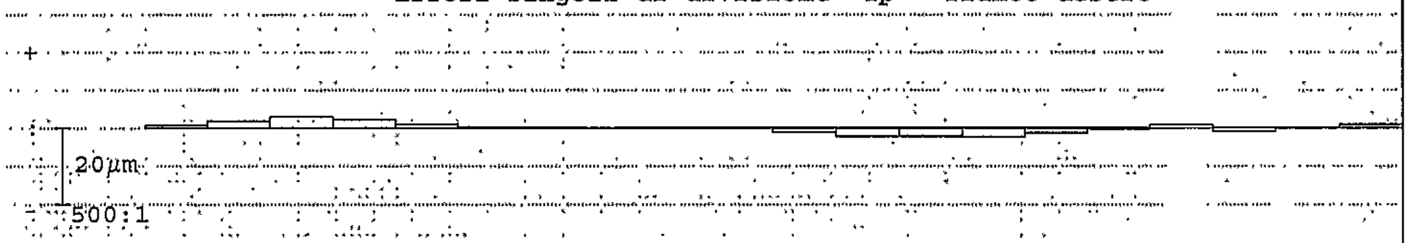
Errori singoli di divisione fp fianco sinistro



Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

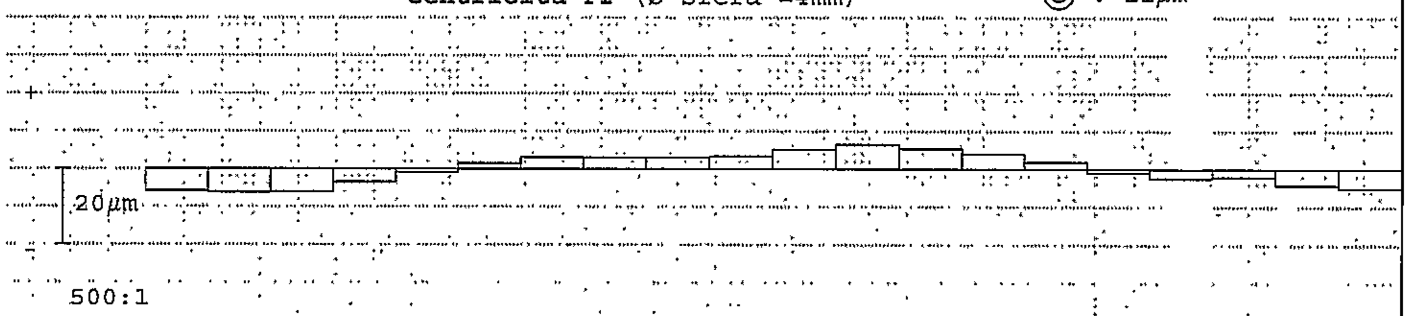


Errore somma di divisione Fp fianco destro

Corsa per misura divis.:57.695 z=17.2mm

		fianco sinistro / TIRO				fianco destro			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	3		14		3		14	
Gr. salto di passo	fu max	2		18		2		18	
Scarto di divisione	Rp	5				5			
Err. globale di divisione	Fp	11		50		10		50	
Err. cordale di divisione	Fpz/8	6				7			

Centricità Fr (Ø-sfera =4mm) ◎ : 11µm



Err. di concentricitá	Fr	13	40	
Variaz. spessore dente	Rs			

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GETRAG Ruota cilindrica Evolvente/Elica

Nr. prog.:	STI0410o05 0 PNC35 B4784	Controllore:	TURNO C	Data:	09.01.2015 16:32
Denominazione:	Output Shaft 1	Numero denti z	20	Largh.fasc.dent. b	34.42mm
Numero disegno.:	250.6.3975.35-IF	Modulo m	2.45mm	Tratto evolv. La	7.34/11.86mm
Commessa/serie nr.:	ppap 3	Angolo pressione	20°	Tratto elica Lß	27.54mm
Masch.Nr.:	M001 Spindel: Formnest 1	Angolo elica	-29°	Inizio elab. M1	6.45mm
Untersuchungszweck:	Laufende Messung	Ø Base db	51.7243mm	Palpatore Ø	(#1)1mm
Werkzeug:	Charge:	Ang. Base	-27.102°	Fat.scor.pr. x	.6

Testa

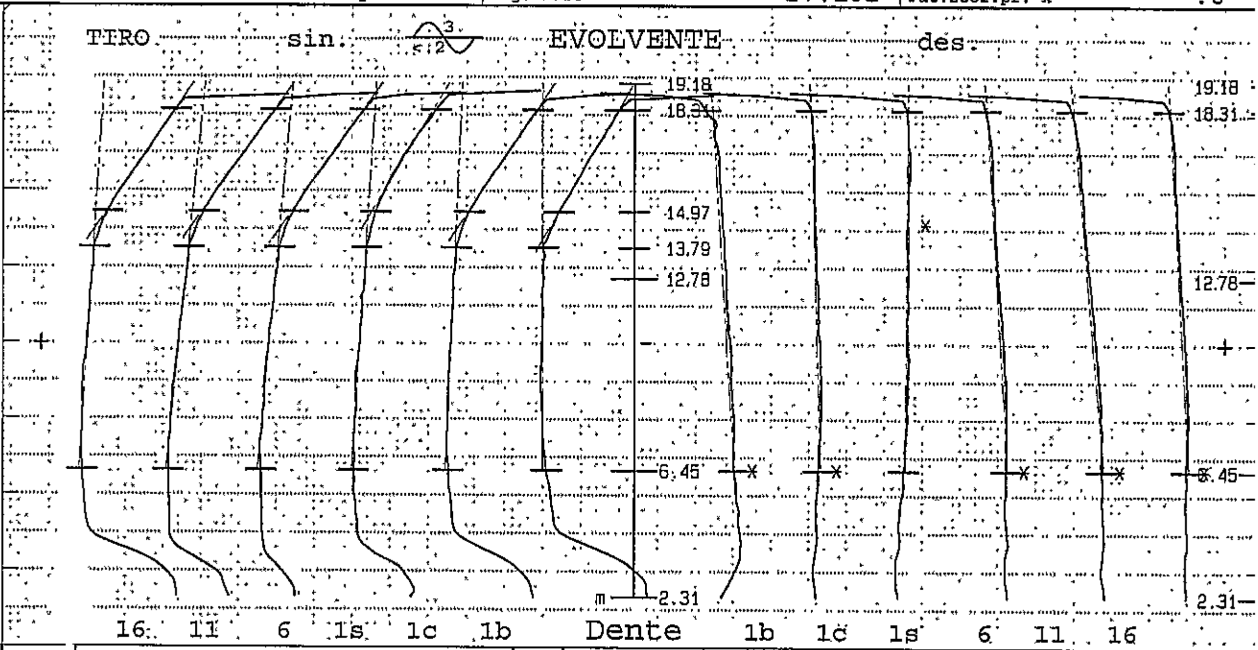
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qual
fHαm	±6	-5			Var	3				±6			Var	5			-6	
fHα	±10	-5	-4	-6	-5	-4	-3	0		±10	-6	-3	1	-6	-8	-5	-6	
Fα		4	4	5	5	3	3	2			8	3	2	6	8	5	6	
ffα	4	1	1	1	1	1	1	2		4	3	1	1	1	1	1	1	
Cα										0/4	1	1	0	1	1	1	1	
fKo											0	0	0	0	0	0	0	
fKo	-22/-14	-19	-19	-19	-19	-15	-20	-20										
P/T-φ[mm]		49.710			[49.35/49.8]						64.229			[64.14/64.4]				

Sotto

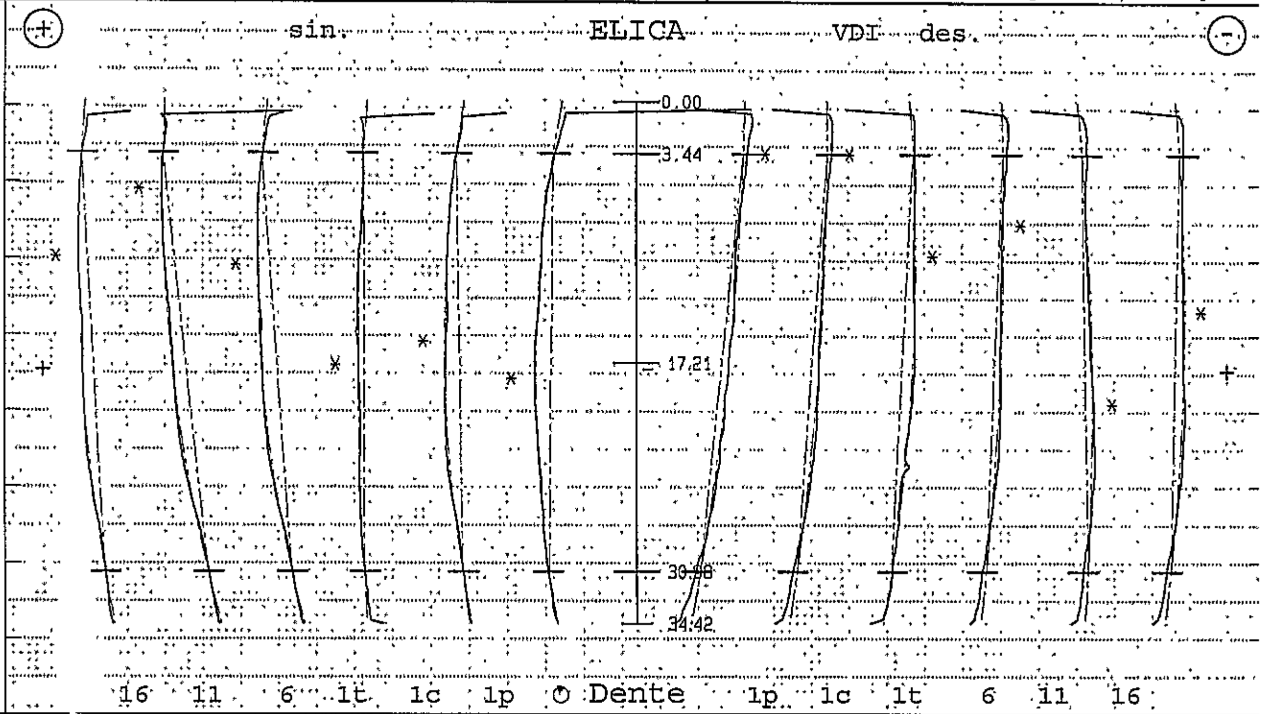
20 µm

Va500:1

Vb2:1

5 mm

Sopra



N:Z

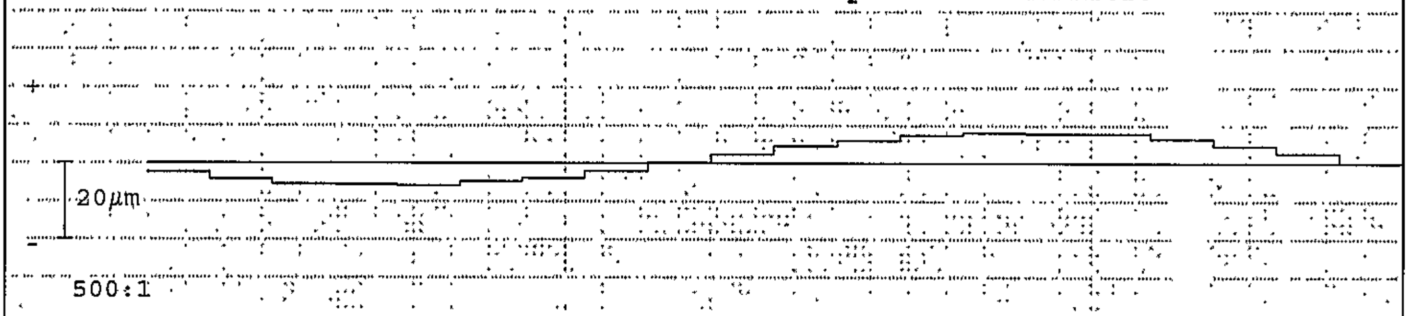
fHßm	8±6	9			Var	13				±6			Var	12			-4	
fHß	8±13	9	8	15	10	0	2	-1		±13	-14	-10	-7	-6	2	-3	-4	
Fß		6	2	8	6	7	6	8			16	11	7	8	2	5	7	
ffß	4	1	1	1	1	1	1	1		4	2	2	2	2	3	2	2	
Cß	2/6	4	3	4	4	2	4	4		2/6	2	2	3	2	2	2	2	
Bd		-1															-7	

GETRAG	Ruota cilindrica Divisione

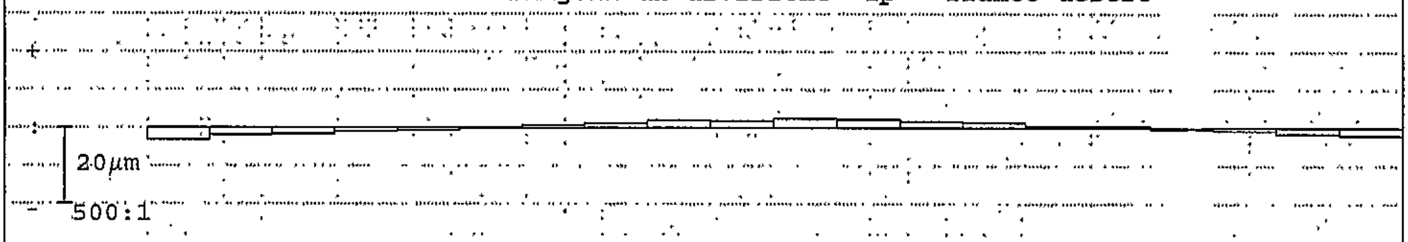
Nr. prog.: STI0410o05 0 PNC35 B4784	Controllore: TURNO C	Data: 09.01.2015 16:32	
Denominazione: Output Shaft 1	Numero denti z 20	Angolo pressione 20°	
Numero disegno.: 250.6.3975.35-IF	Modulo m 2.45mm	Angolo elica -29°	
Commessa/serie nr.: ppap 3	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001	Spindel: Formmeßt. 1 Werkzeug:	Charge:	

Errori singoli di divisione fp fianco sinistro

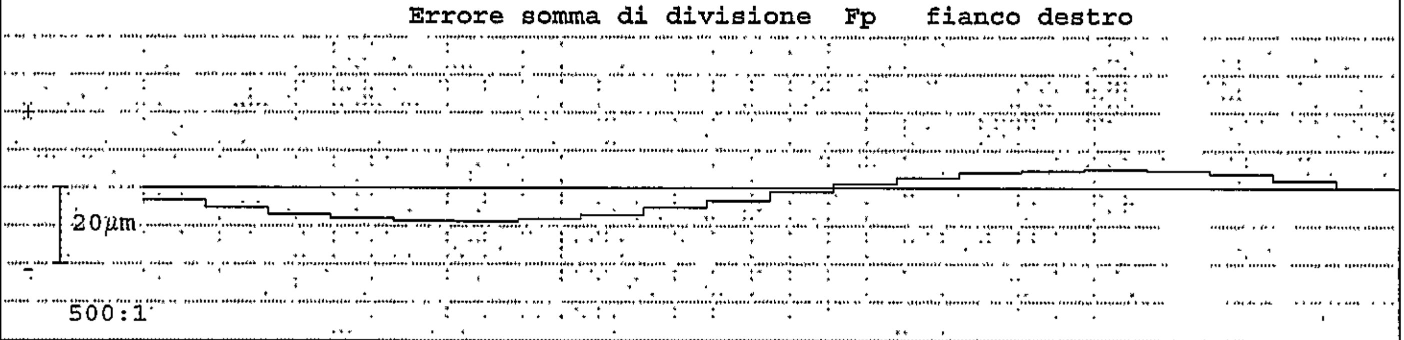
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



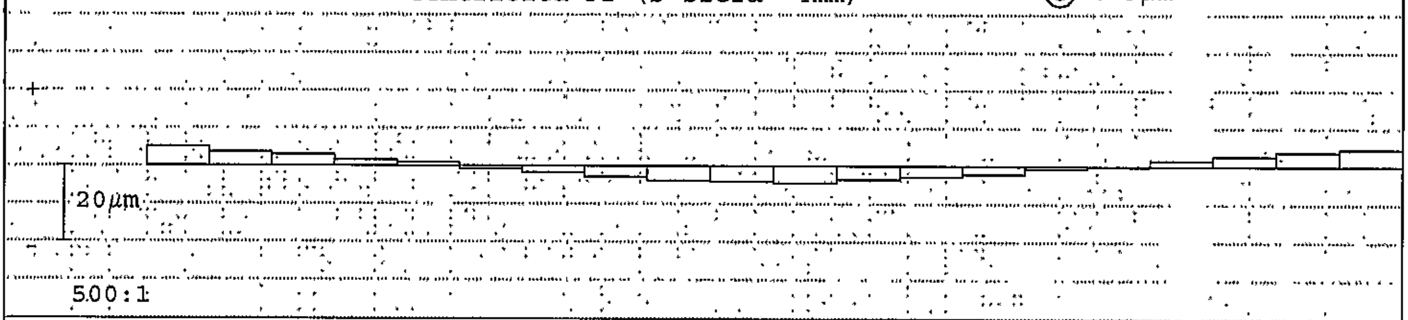
Errore somma di divisione Fp fianco destro



Corsa per misura divis.:57.695 z=17.2mm

		fianco sinistro / TIRO				fianco destro			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	3		14		3		14	
Gr. salto di passo	fu max	1		18		1		18	
Scarto di divisione	Rp	5				5			
Err. globale di divisione	Fp	14		50		14		50	
Err. cordale di divisione	Fpz/8	7				7			

Centricità Fr (Ø-sfera =4mm) ◎ : 9μm

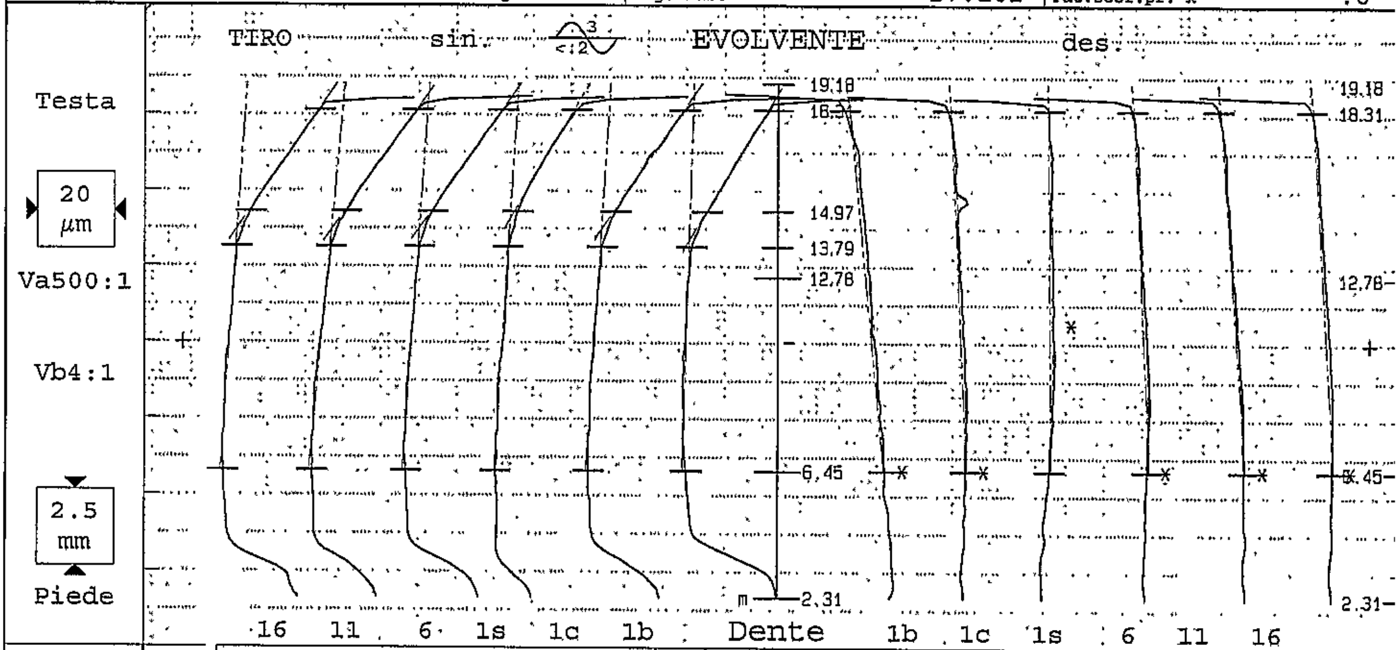


Err. di concentricitá	Fr	9	40	
Variaz. spessore dente	Rs			

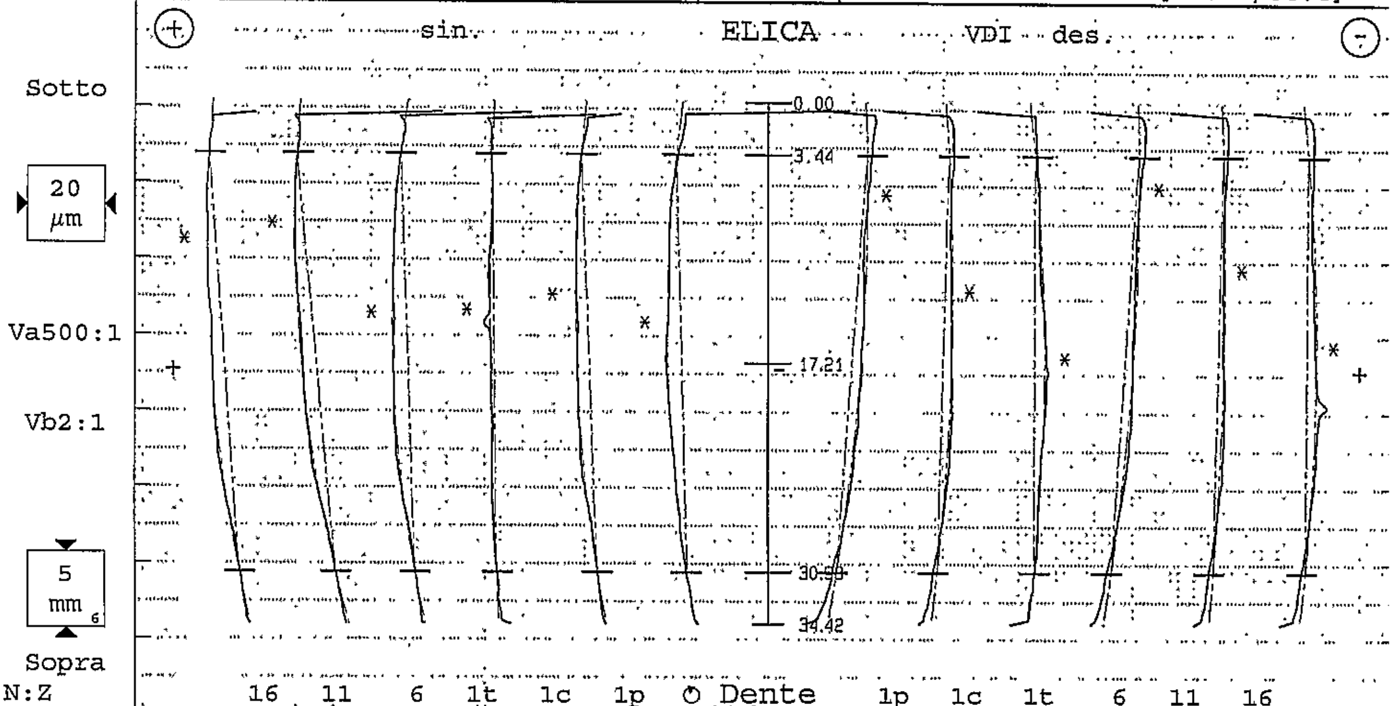
KLINGELNBERG

GETRAG Ruota cilindrica Evolvente/Elica

Nr. prog.:	STI0410o005 0 PNC35 B4784	Controllore:	TURNO c	Data:	09.01.2015 16:4(
Denominazione:	Output Shaft 1	Numero denti z	20	Largh.fasc.dent. b	34.42mr
Numero disegno.:	250.6.3975.35-IF	Modulo m	2.45mm	Tratto evolv. Lα	7.34/11.86mı
Commessa/serie nr.:	ppap 4	Angolo pressione	20°	Tratto elica Lß	27.54mr
Masch.Nr.:	M001 Spindel: Formnest	Angolo elica	-29°	Inizio elab. M1	6.45mr
Untersuchungszweck:	Laufende Messung	Ø Base db	51.7243mm	Palpatore Ø	(#1) 1mr
Werkzeug: Charge:		Ang. Base	-27.102°	Fat.scor.pr. x	.6



Tolerance	Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qua
fHαm ±6	-4	Var 1							±6	Var 3						-5	
fHα ±10	-4	-4	-5	-4	-4	-4	-2		±10	-9	-4	-1	-4	-7	-6	-5	
Fα	4	4	5	4	3	4	2			11	5	2	5	7	6	6	
ffα 4	1	1	1	1	1	1	2		4	2	3	1	1	1	1	2	
Cα									0/4	1	1	1	1	1	1	1	
fKo										0	0	0	0	0	0	0	
fKo -22/-14	-20	-20	-20	-20	-15	-19	-20										
P/T-φ[mm]	49.671	[49.35/49.8]								64.227	[64.14/64.4]						

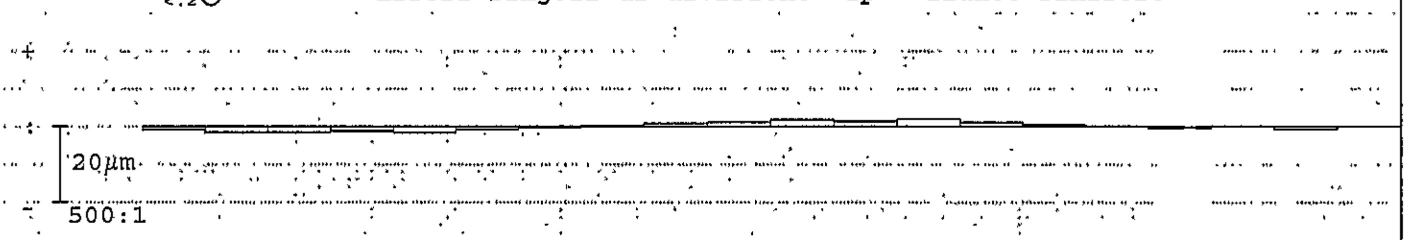


Tolerance	Medio							Qual	Tolerance							Medio	Qua
fHßm 8±6	8	Var 8							±6	Var 8						-4	
fHß 8±13	8	10	13	5	1	5	4		±13	-10	-4	0	-9	-3	-1	-4	
Fß	4	4	5	4	6	3	4			12	6	2	11	6	5	7	
ffß 4	1	1	1	1	2	1	1		4	2	2	2	3	2	4	3	
Cß 2/6	4	3	4	4	1	3	4		2/6	3	2	3	2	2	3	2	
Bd	3															-10	

GETRAG	Ruota cilindrica Divisione	

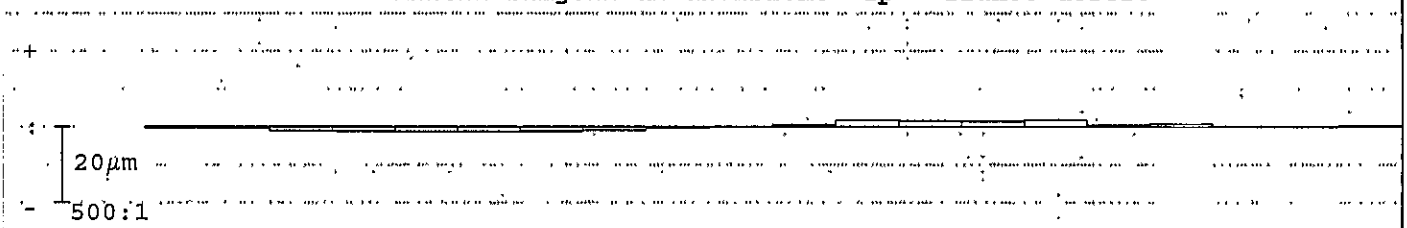
Nr. prog.:	STI0410o005 0 PNC35 B4784	Controllore:	TURNO C	Data:	09.01.2015 16:40
Denominazione:	Output Shaft 1	Numero denti z	20	Angolo pressione	20°
Numero disegno.:	250.6.3975.35-IF	Modulo m	2.45mm	Angolo elica	-29°
Commessa/serie nr.:	ppap 4	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001 Spindel: Formnest 1	Werkzeug:		Charge:	

Errori singoli di divisione fp fianco sinistro

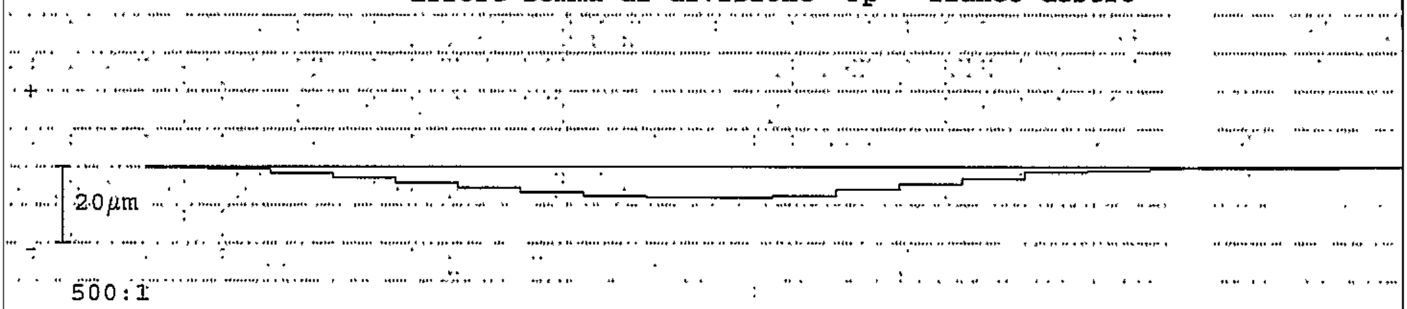


Errore somma di divisione Fp fianco sinistro

Errori singoli di divisione fp fianco destro

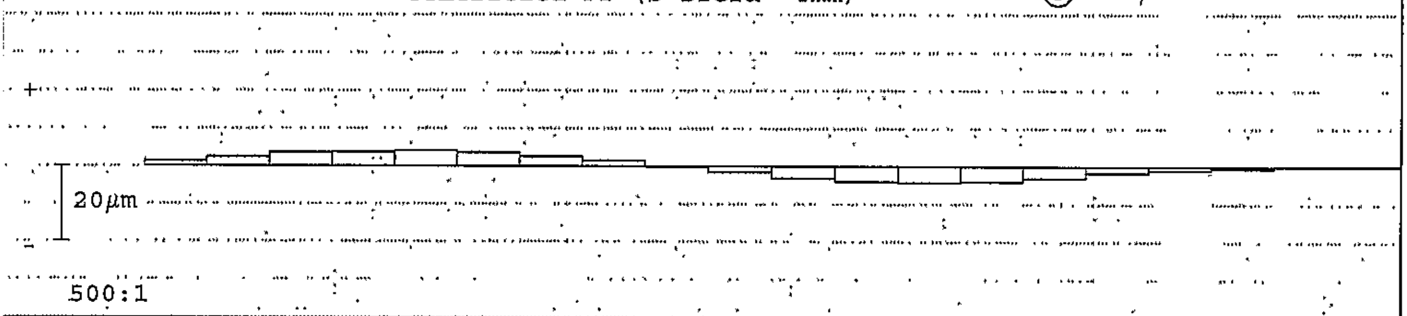


Errore somma di divisione Fp fianco destro



Corsa per misura divis.:57.695 z=17.2mm		fianco sinistro / TIRO				fianco destro			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2		14		2		14	
Gr. salto di passo	fu max	1		18		1		18	
Scarto di divisione	Rp	4				3			
Err. globale di divisione	Fp	9		50		8		50	
Err. cordale di divisione	Fpz/ß	5				5			

Centricità Fr (Ø-sfera =4mm) ◎ : 7µm



Err. di concentricità	Fr	8	40		
Variaz. spessore dente	Rs				

KLINGELNBERG

GETRAG Ruota cilindrica Evolvente/Elica

Nr. prog.:	STI0410o005 0 PNC35 B4784	Controllore:	TURNO C	Data:	09.01.2015 16:48
Denominazione:	Output Shaft 1	Numero denti z	20	Largh.fasc.dent. b	34.42mm
Numero disegno.:	250.6.3975.35-IF	Modulo m	2.45mm	Tratto evolv. Lα	7.34/11.86mm
Commessa/serie nr.:	ppap 5	Angolo pressione	20°	Tratto elica Lß	27.54mm
Masch.Nr.:	M001 Spindel: Formnest	Angolo elica	-29°	Inizio elab. Ml	6.45mm
Untersuchungszweck:	Laufende Messung	Ø Base db	51.7243mm	Palpatore Ø	(#1) 1mm
Werkzeug:	Charge:	Ang. Base	-27.102°	Fat.scor.pr. x	.6

Testa

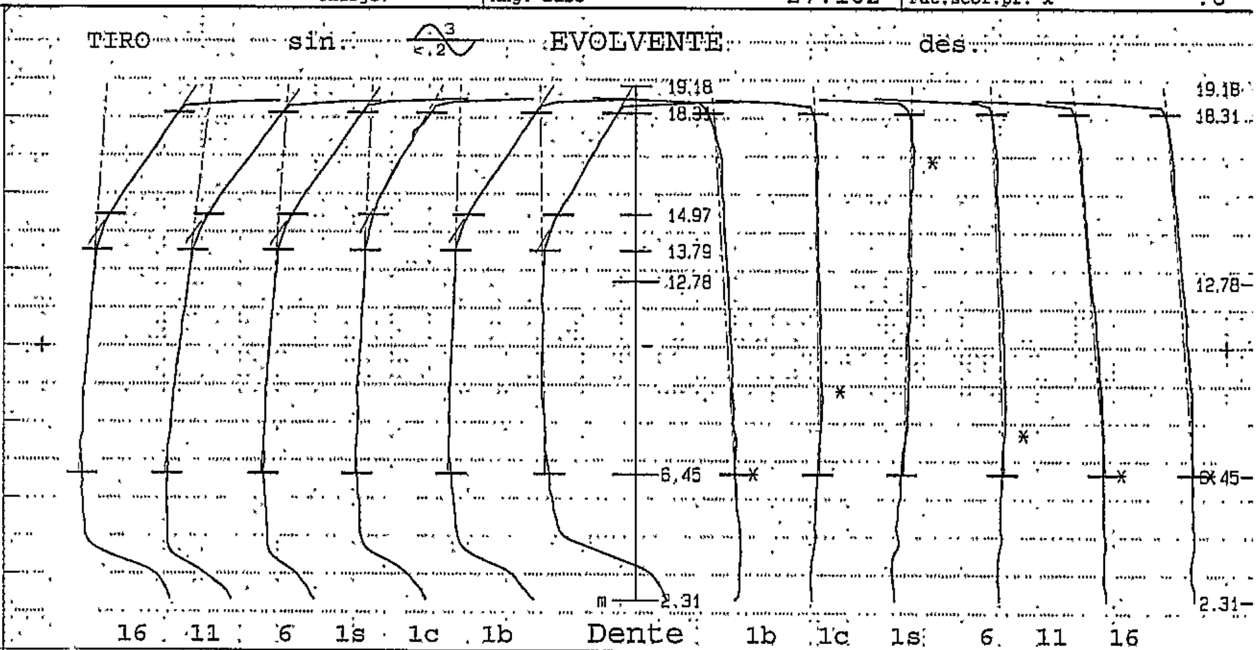
20 µm

Va500:1

Vb4:1

2.5 mm

Piede



Tolerance		Medio	Val.misur[µm]						Qual	Tolerance	Val.misur[µm]						Medio	Qua
fHαm	±6	-4			Var	5				±6			Var	7			-5	
fHα	±10	-4	-4	-7	-4	-3	-2	1		±10	-6	-1	2	-3	-8	-7	-5	
Fα		4	4	7	4	2	2	2			8	3	3	4	8	8	6	
ffα	4	1	1	1	1	1	1	2		4	2	1	1	1	1	1	1	
Cα										0/4	1	1	1	1	1	1	1	
fKo											0	0	0	0	0	0	0	
fKo	-22/-14	-20	-19	-20	-20	-15	-20	-20										
P/T-φ[mm]		49.655				[49.35/49.8]					64.228				[64.14/64.4]			

Sotto

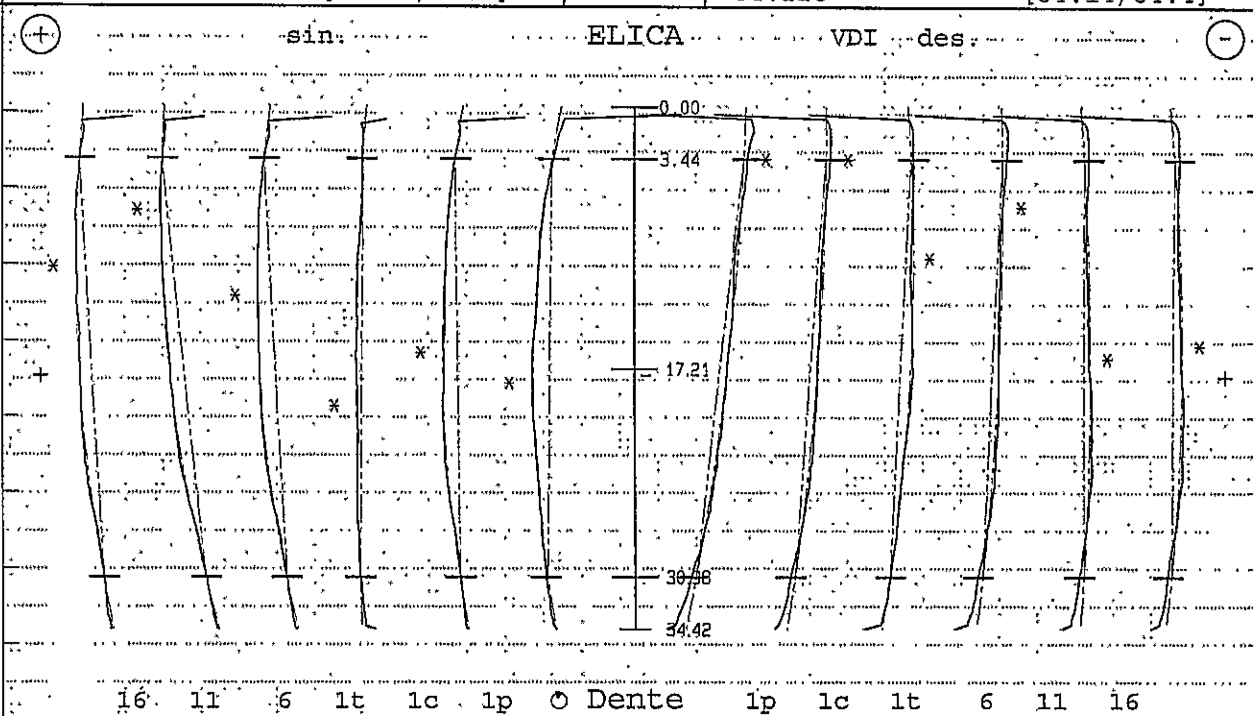
20 µm

Va500:1

Vb2:1

5 mm

Sopra

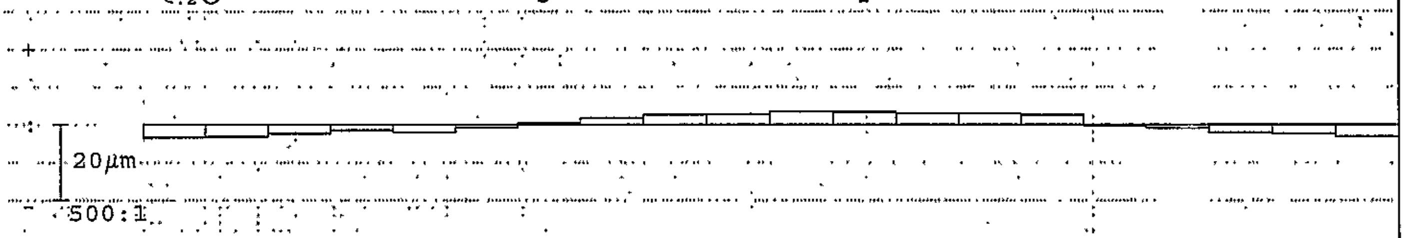


N:Z

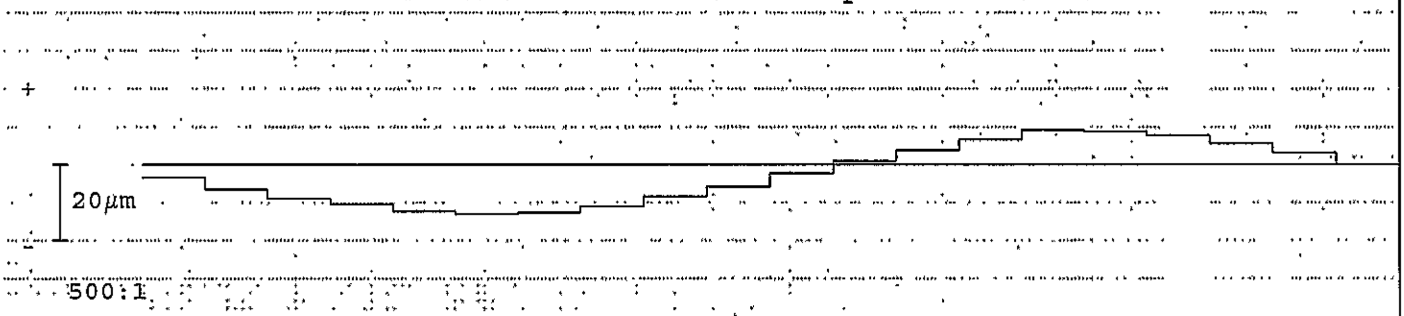
fHßm	8±6	8			Var	13				±6			Var	11			-5	
fHß	8±13	8	8	14	7	-1	1	-2		±13	-16	-11	-7	-7	0	-1	-5	
Fß		4	2	6	3	7	6	9			17	11	10	11	6	4	8	
ffß	4	1	1	1	1	1	1	1		4	2	2	1	2	2	2	2	
Cß	2/6	4	3	4	4	1	4	4		2/6	2	2	3	2	2	2	2	
Bd		-1															-9	

GETRAG	Ruota cilindrica Divisione				
Nr. prog.:	STI0410o05 0 PNC35 B4784	Controllore:	TURNO C	Data:	09.01.2015 16:48
Denominazione:	Output Shaft 1	Numero denti z	20	Angolo pressione	20°
Numero disegno.:	250.6.3975.35-IF	Modulo m	2.45mm	Angolo elica	-29°
Commessa/serie nr.:	ppap 5	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001 Spindel: Formmeat 1	Werkzeug:		Charge:	

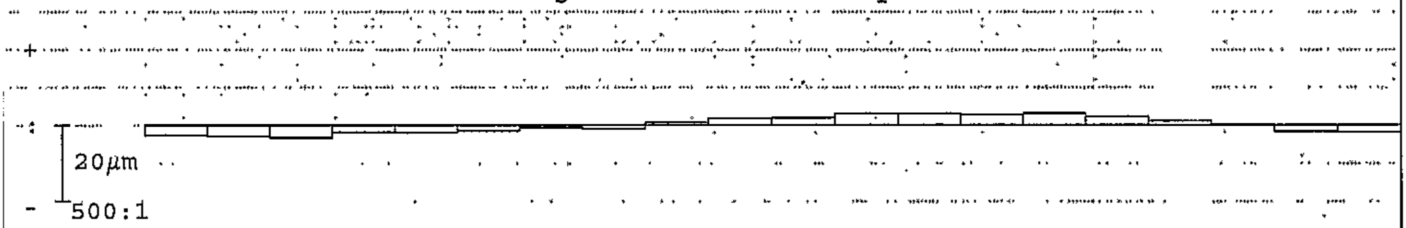
Errori singoli di divisione fp fianco sinistro



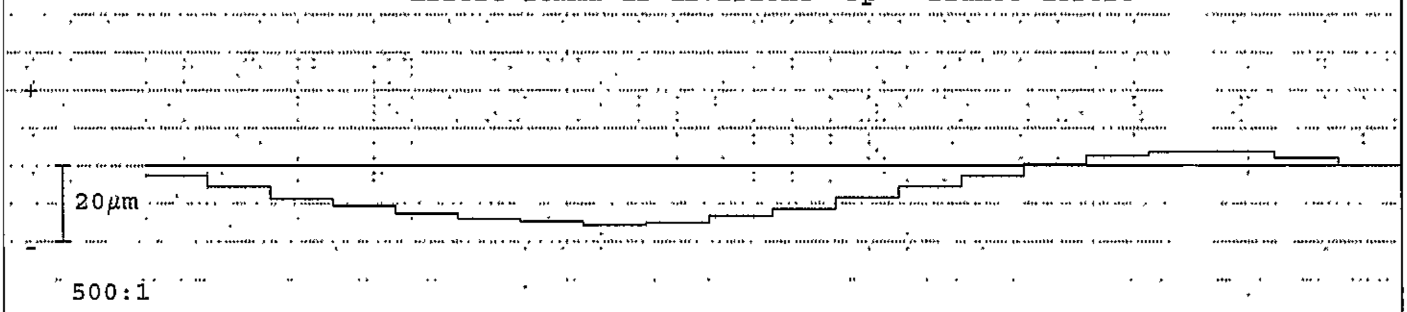
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

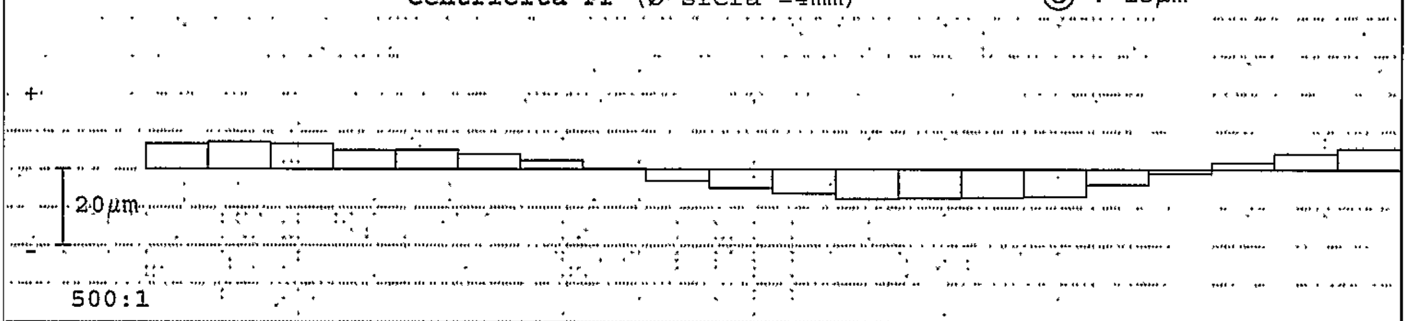


Errore somma di divisione Fp fianco destro



Corsa per misura divis.:57.695 z=17.2mm		fianco sinistro / TIRO				fianco destro			
		Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	3		14		3		14	
Gr. salto di passo	fu max	3		18		2		18	
Scarto di divisione	Rp	6				6			
Err. globale di divisione	Fp	22		50		20		50	
Err. cordale di divisione	Fpz/8	10				9			

Centricità Fr (Ø-sfera =4mm) ◎ : 15µm



Err. di concentricitá	Fr	15	40	
Variaz. spessore dente	Rs			

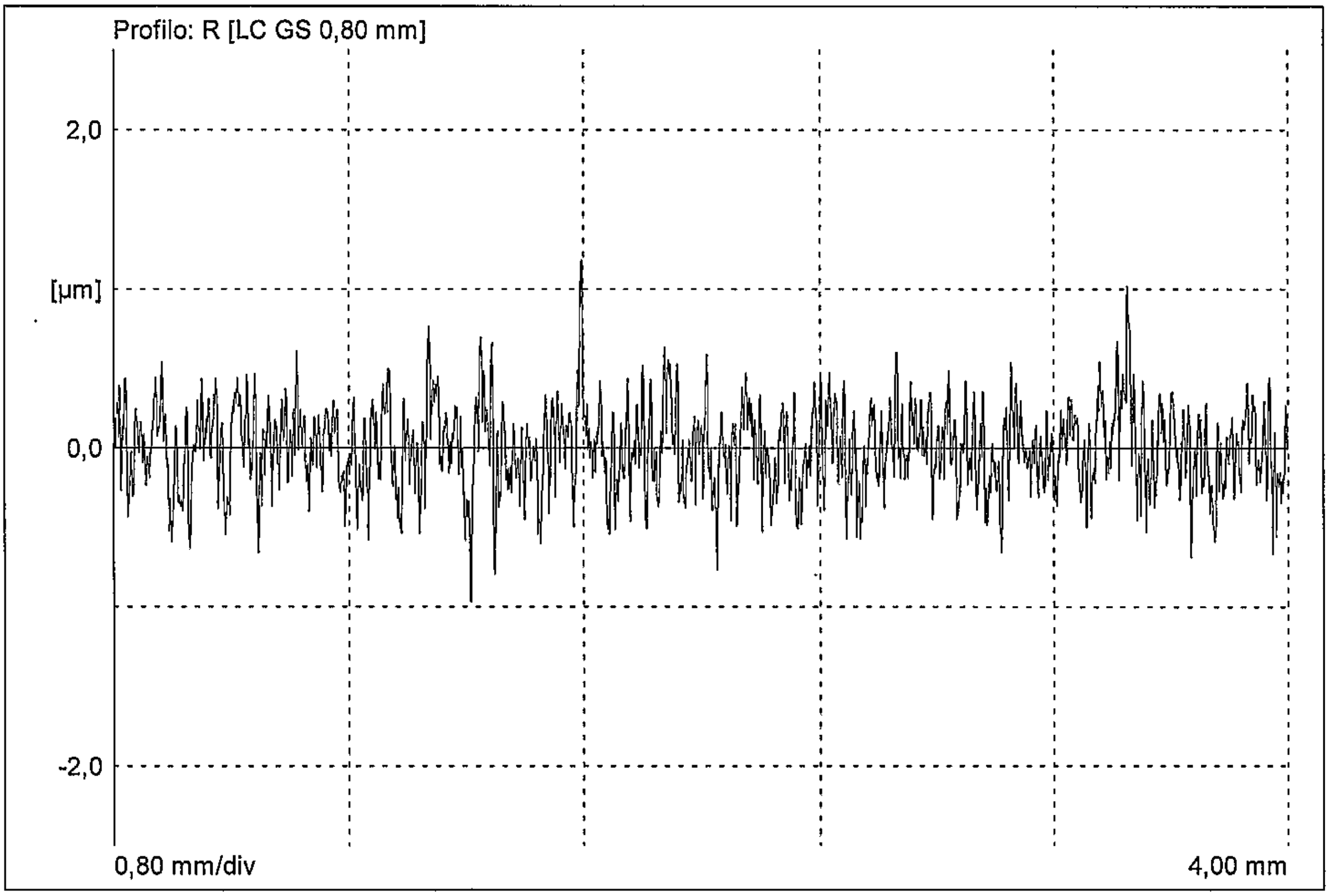
KLINGELNBERG

GETRAG

Via dei Ciclamini,4 Modugno (BA)

Sala Metrologica GPS5

Oggetto:	OS1
Numero:	3975 Pz.1
Operatore:	TURNO C
Data, ora:	12/01/2015, 08:55
Nota:	DENTE
Tastatore:	MFW-250 -40
MACCHINA:	MOA 416121 001



LT	5,60	mm
LM	4,00	mm
Z	5	
VB	±250,0	μm
Ra	0,20	μm
Rmax	2,15	μm
Rz	1,55	μm

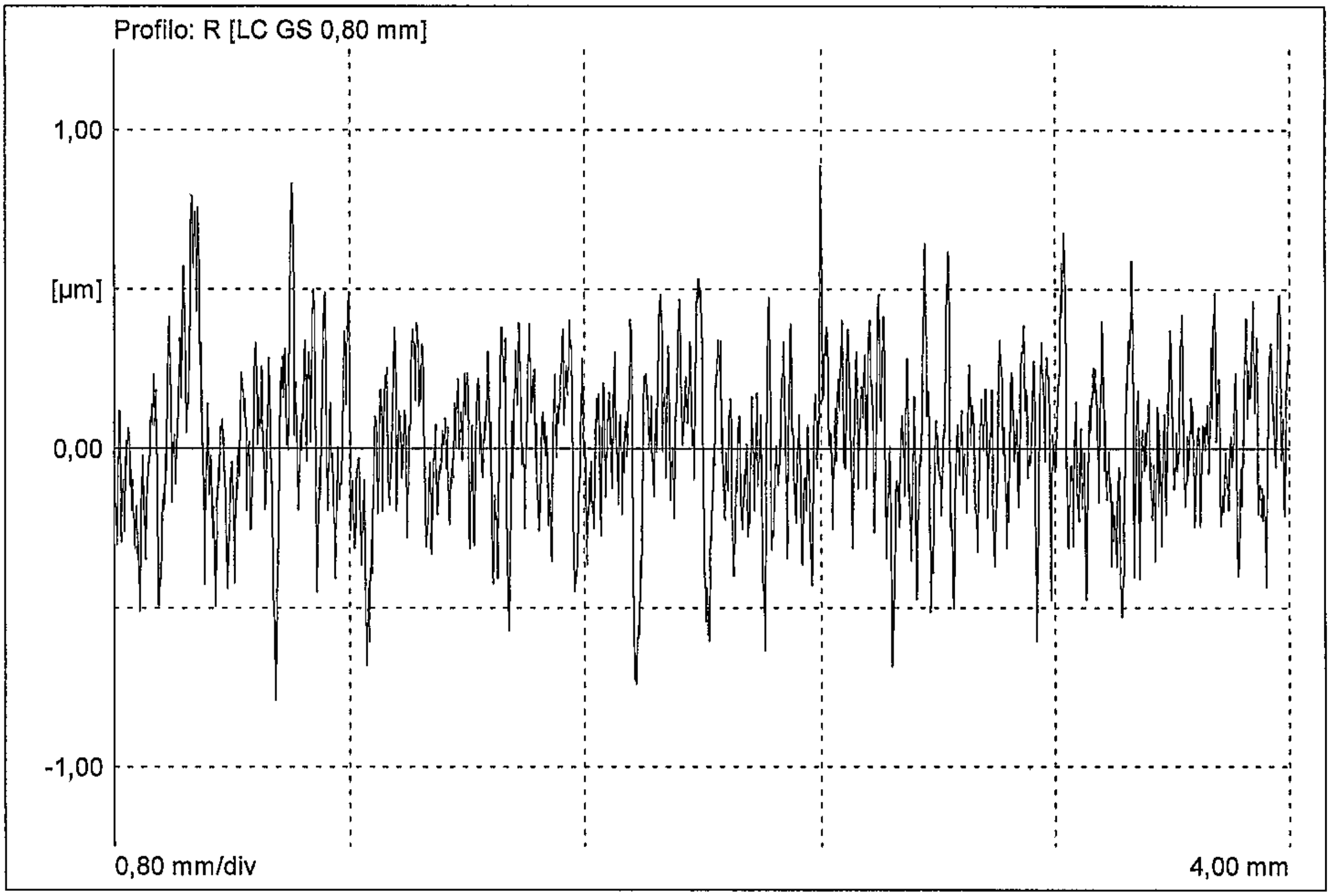
PERTHOMETER CONCEPT

GETRAG

Via dei Ciclamini,4 Modugno (BA)

Sala Metrologica GPS5

Oggetto:	OS1
Numero:	3975 Pz.2
Operatore:	TURNO C
Data, ora:	12/01/2015, 08:56
Nota:	DENTE
Tastatore:	MFW-250 -40
MACCHINA:	MOA 416121 001



LT	5,60	mm
LM	4,00	mm
Z	5	
VB	±250,0	µm
Ra	0,18	µm
Rmax	1,63	µm
Rz	1,39	µm

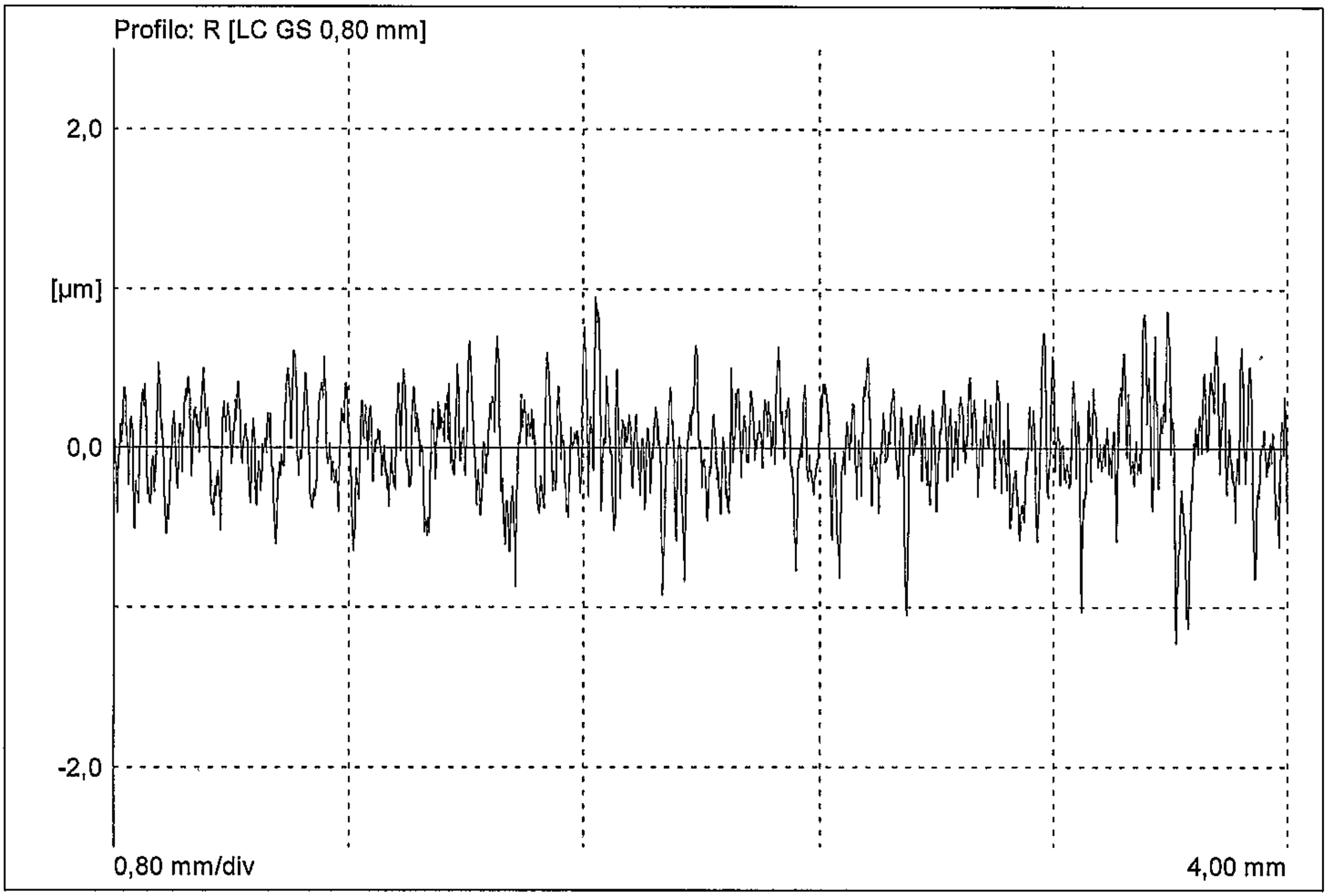
PERTHOMETER CONCEPT

GETRAG

Via dei Ciclamini,4 Modugno (BA)

Sala Metrologica GPS5

Oggetto:	OS1
Numero:	3975 Pz.3
Operatore:	TURNO C
Data, ora:	12/01/2015, 08:57
Nota:	DENTE
Tastatore:	MFW-250 -40
MACCHINA:	MOA 416121 001



LT	5,60	mm
LM	4,00	mm
Z	5	
VB	±250,0	µm
Ra	0,22	µm
Rmax	2,09	µm
Rz	1,70	µm

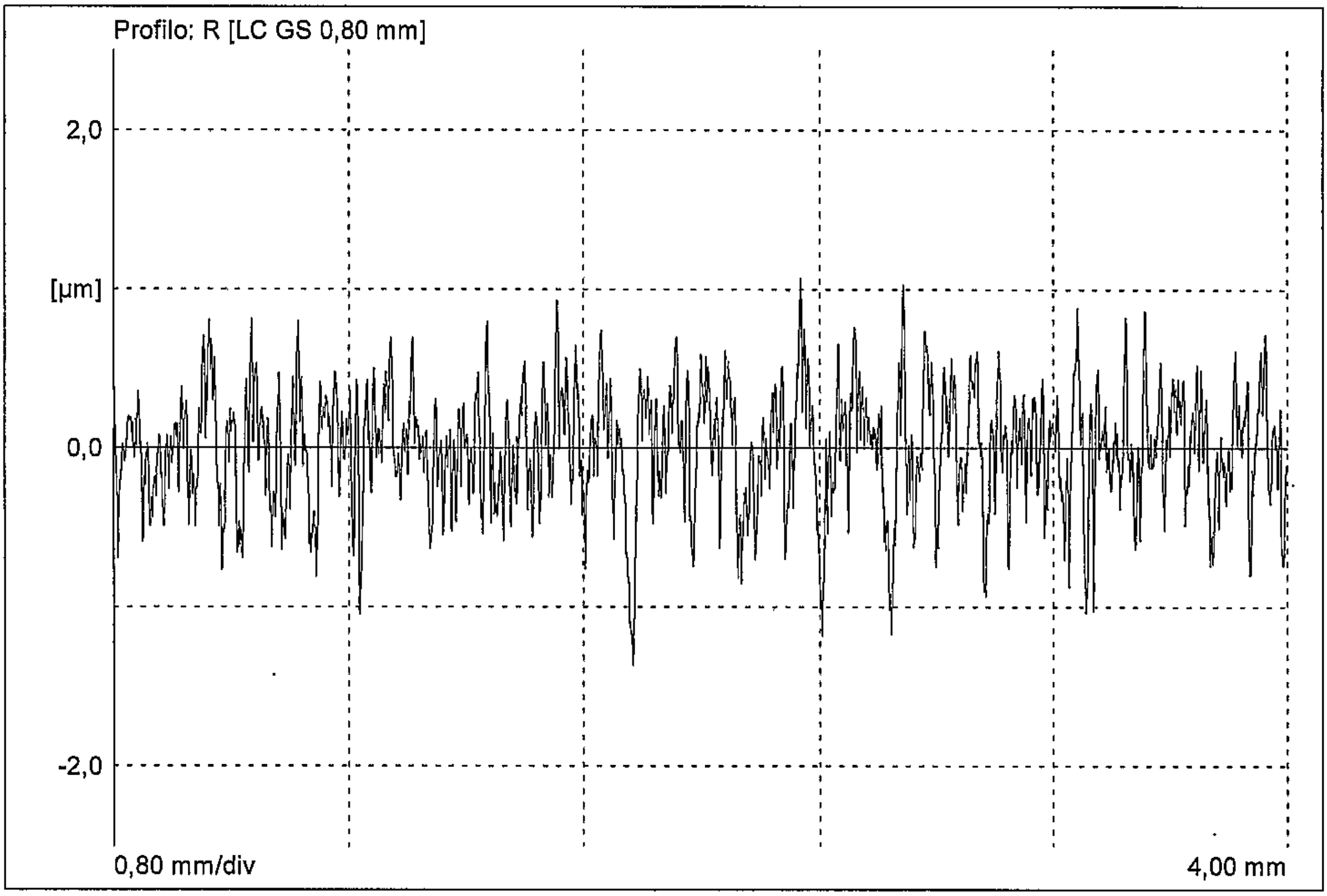
PERTHOMETER CONCEPT

GETRAG

Via dei Ciclamini,4 Modugno (BA)

Sala Metrologica GPS5

Oggetto:	OS1
Numero:	3975 Pz.4
Operatore:	TURNO C
Data, ora:	12/01/2015, 08:58
Nota:	DENTE
Tastatore:	MFW-250 -40
MACCHINA:	MOA 416121 001



LT	5,60	mm
LM	4,00	mm
Z	5	
VB	±250,0	µm
Ra	0,28	µm
Rmax	2,44	µm
Rz	2,03	µm

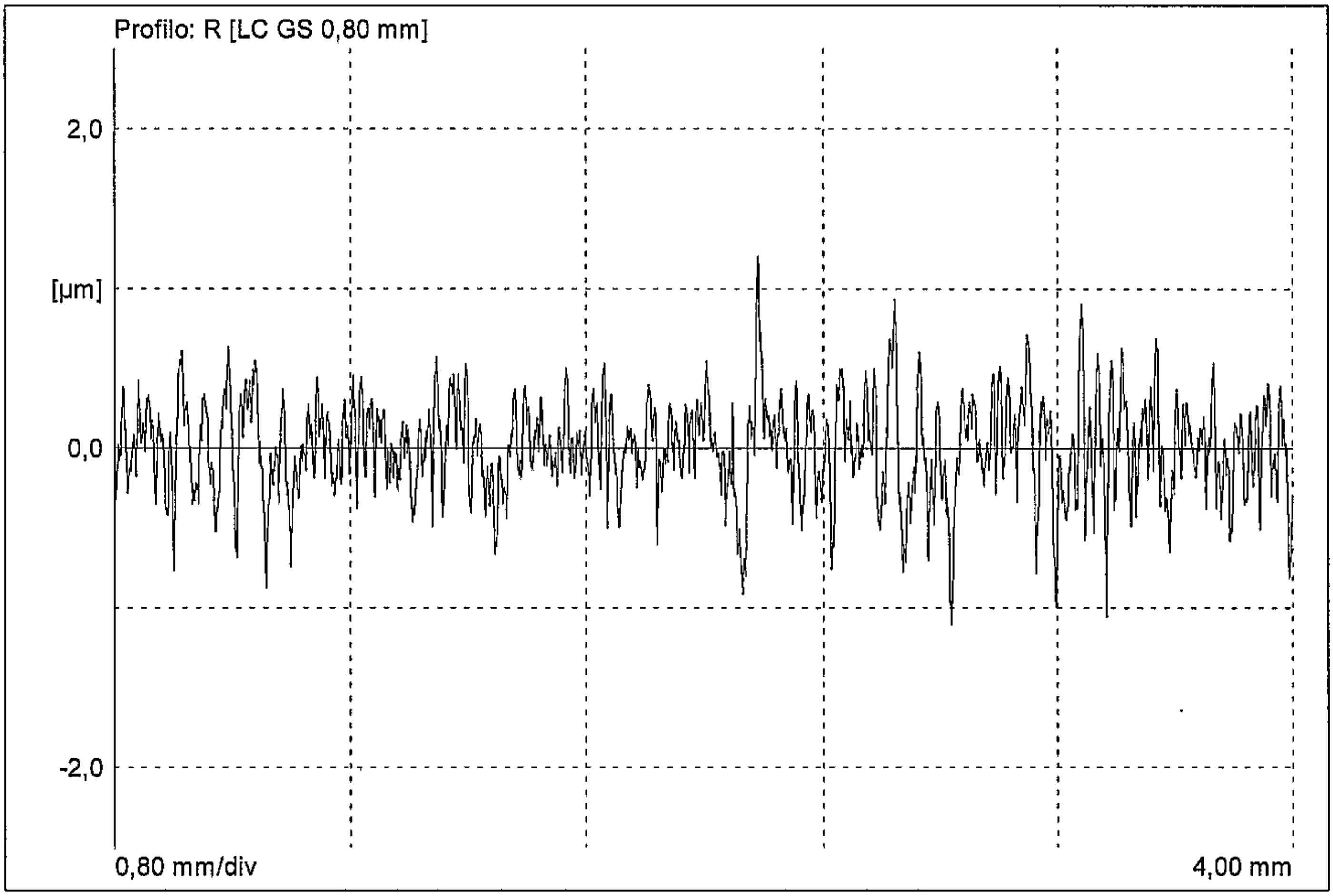
PERTHOMETER CONCEPT

GETRAG

Via dei Ciclamini,4 Modugno (BA)

Sala Metrologica GPS5

Oggetto:	OS1
Numero:	3975 Pz.5
Operatore:	TURNO C
Data, ora:	12/01/2015, 08:59
Nota:	DENTE
Tastatore:	MFW-250 -40
MACCHINA:	MOA 416121 001



LT	5,60	mm
LM	4,00	mm
Z	5	
VB	±250,0	µm
Ra	0,23	µm
Rmax	2,11	µm
Rz	1,77	µm

PERTHOMETER CONCEPT

VICIVISION

GETRAG SPA - MTL Measure report

Operatore:	Data:	Numero seriale di lotto: Nr: 0	Config. file. C:\Start\Archive\Z_PPAP\OS1_3975_EDISON\2506397535_Part M.mtl
Amministratore: super	12-01-2015 09:31	Pz_1	Tipo Z_PPAP\OS1_3975_EDISON
		Unità di misura: [mm , °]	Modello: 2506397535_Part M

Nota di programm

Nota.

GRAP.	Descrizione	Nominale	Misura	Scostamento	FUORI TOL.	TOL. INF.	TOL. SUP.
	Part_M_D63.95	63.950	63.892	-0.058		-0.300	0.000

GETRAG SPA - MTL Measure report

Operatore:	Data:	Numero seriale di lotto: Nr: 0	Config. file: C:\Start\Archive\Z_PPAP\OS1_3975_EDISON\2506397535_Part M.mtl
Amministratore: super	12-01-2015 09:32	Pz_2	Tipo: Z_PPAP\OS1_3975_EDISON
		Unità di misura: [mm , °]	Modello: 2506397535_Part M

Nota di programm	Nota:

GRAP.	Descrizione	Nominale	Misura	Scostamento	FUORI TOL.	TOL. INF.	TOL. SUP.
	Part_M_D63.95	63.950	63.853	-0.097		-0.300	0.000

VICI VISION

GETRAG SPA - MTL Measure report

Operatore:	Data:	Numero seriale di lotto Nr: 0	Config. file: C:\Start\Archive\Z_PPAP\OS1_3975_EDISON\2506397535_Part M mtl
Amministratore: super	12-01-2015 09:32	Pz_3	Tipo: Z_PPAP\OS1_3975_EDISON
		Unità di misura: [mm , °]	Modello: 2506397535_Part M

Nota di programm	Nota:

GRAP.	Descrizione	Nominale	Misura	Scostamento	FUORI TOL.	TOL. INF.	TOL. SUP.
| |	Part_M_D63.95	63.950	63.816	-0.134		-0.300	0.000

GETRAG SPA - MTL Measure report

VICI VISION

Operatore:	Data:	Numero seriale di lotto: Nr: 0	Config. file: C:\Start\Archive\Z_PPAP\OS1_3975_EDISON\2506397535_Part M.mtl
Amministratore: super	12-01-2015 09:32	Pz_4	Tipo: Z_PPAP\OS1_3975_EDISON
		Unità di misura: [mm , °]	Modello: 2506397535_Part M

Nota di programm

Nota:

GRAP.	Descrizione	Nominale	Misura	Scostamento	FUORI TOL.	TOL. INF.	TOL. SUP.
	Part_M_D63.95	63.950	63.779	-0.171		-0.300	0.000

VICI VISION GETRAG SPA - MTL Measure report

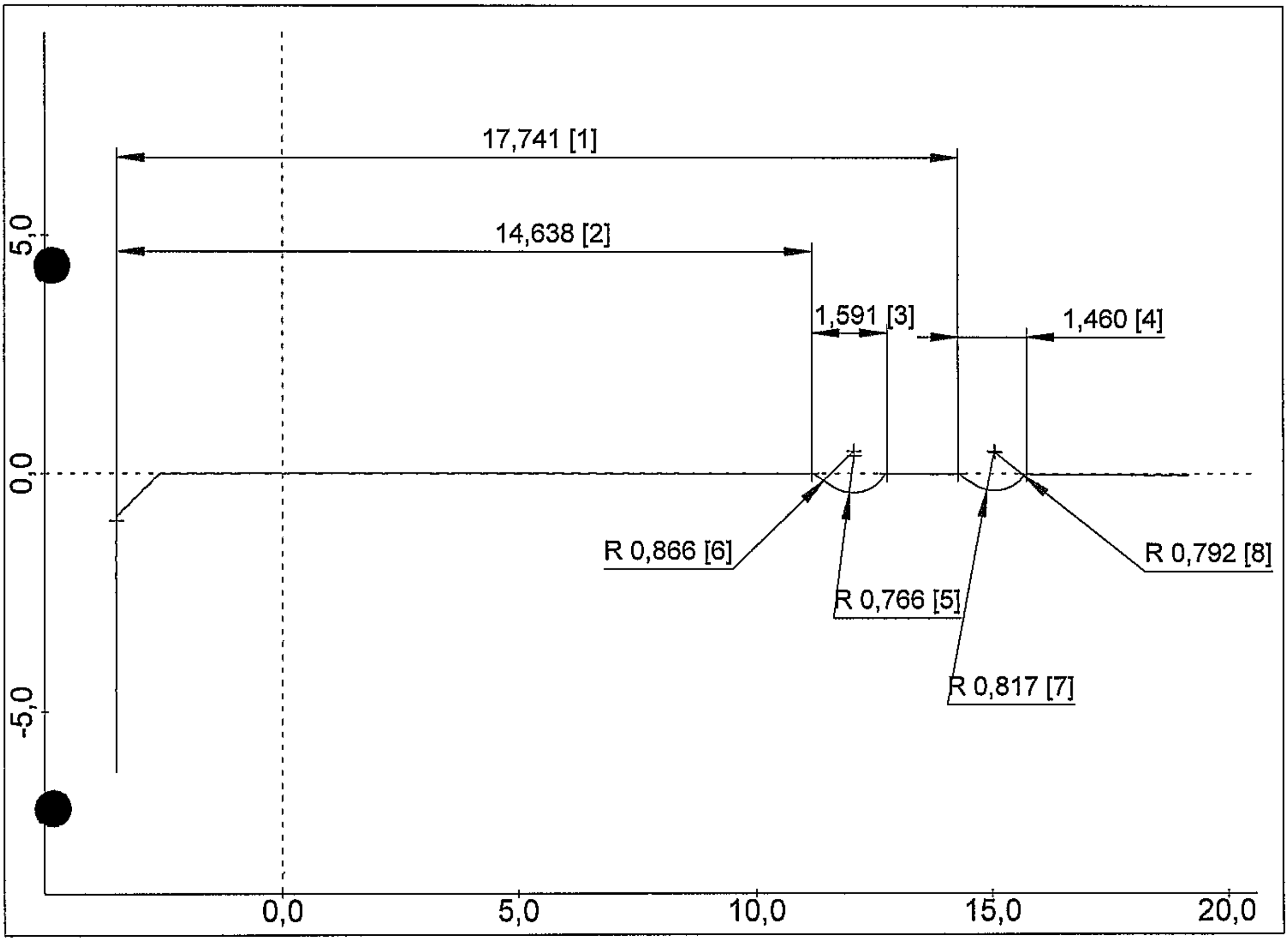
Operatore: Amministratore: super	Data: 12-01-2015 09:33	Numero seriale di lotto: Nr: 0 Pz_5 Unità di misura: [mm , °]	Config. file: C:\Start\Archive\Z_PPAP\OS1_3975_EDISON\2506397535_Part M.mtl Tipo: Z_PPAP\OS1_3975_EDISON Modello: 2506397535_Part M
Nota di programm		Nota:	

GRAP.	Descrizione	Nominale	Misura	Scostamento	FUORI TOL.	TOL. INF.	TOL. SUP.
	Part_M_D63.95	63.950	63.931	-0.019		-0.300	0.000

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS1
Numero:	3975 PPAP 1
Operatore:	TURNO C
Data, ora:	09.01.2015, 17:21
Nota:	PROF. M
Tastatore:	PCV 350 / 21 mm
Macchina:	MOA 416120 001

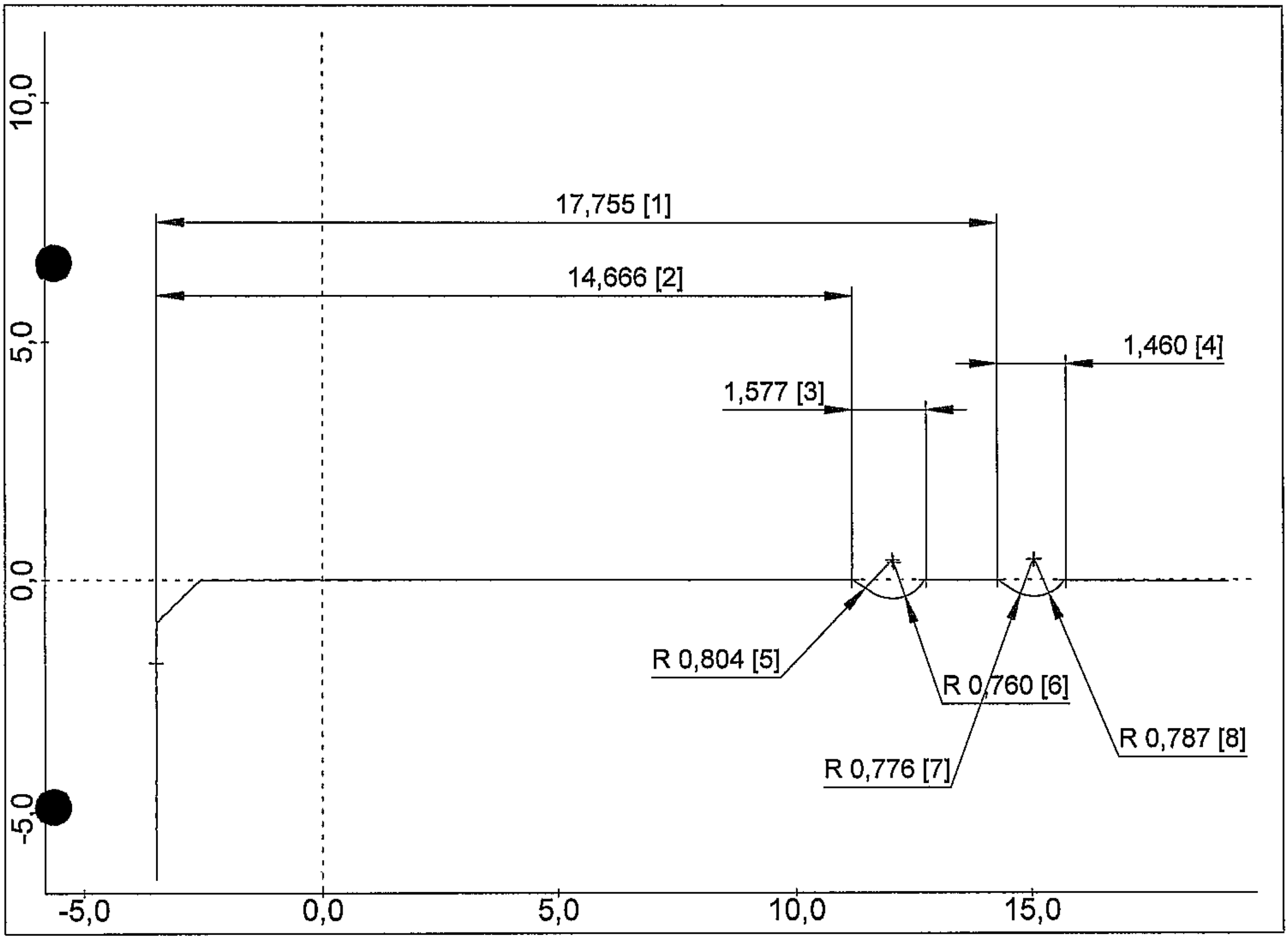


PERTHOMETER CONCEPT

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS1
Numero:	3975 PPAP 2
Operatore:	TURNO C
Data, ora:	09.01.2015, 17:21
Nota:	PROF. M
Tastatore:	PCV 350 / 21 mm
Macchina:	MOA 416120 001

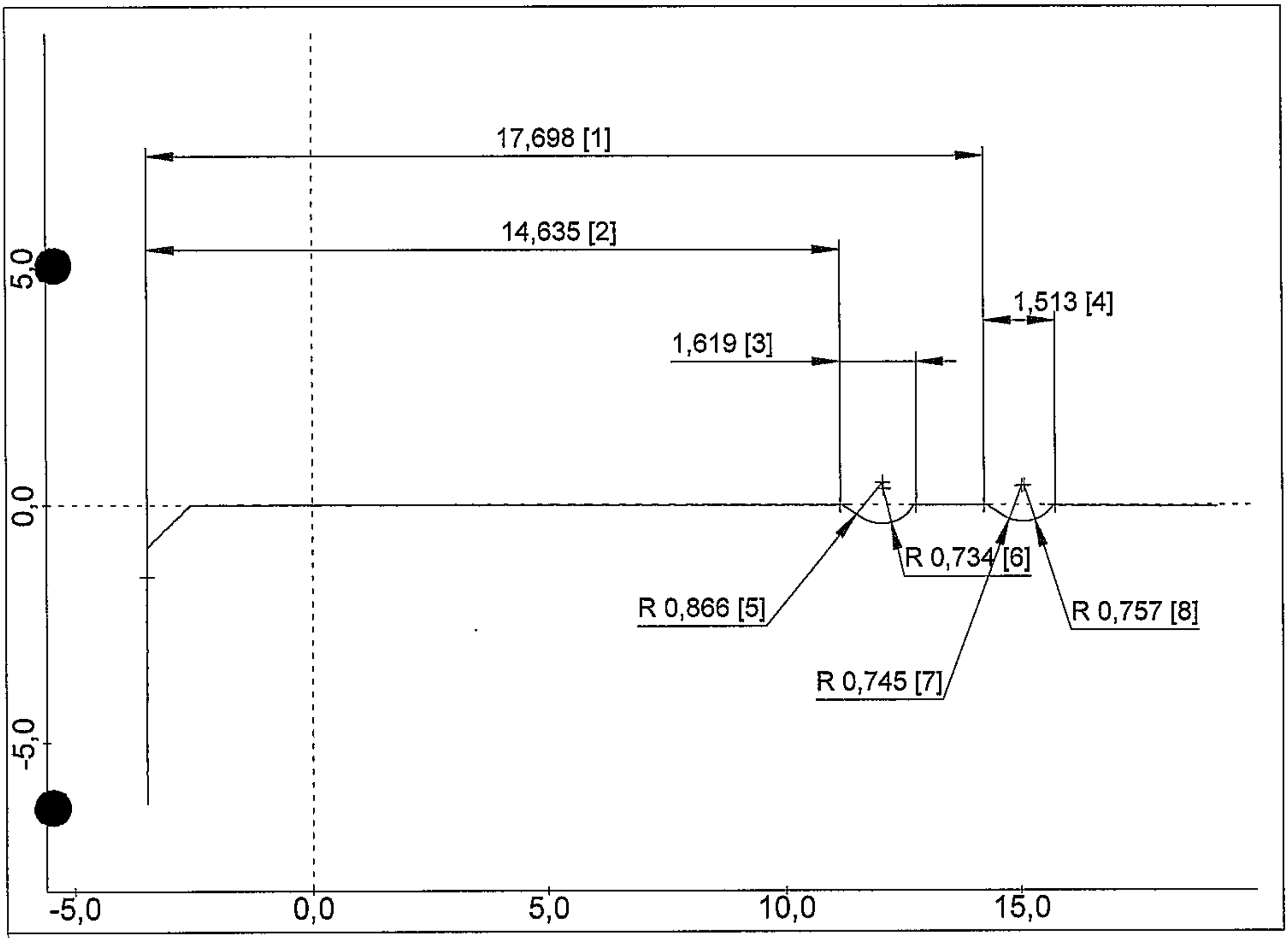


PERTHOMETER CONCEPT

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS1
Numero:	3975 PPAP 3
Operatore:	TURNO C
Data, ora:	09.01.2015, 17:21
Nota:	PROF. M
Tastatore:	PCV 350 / 21 mm
Macchina:	MOA 416120 001

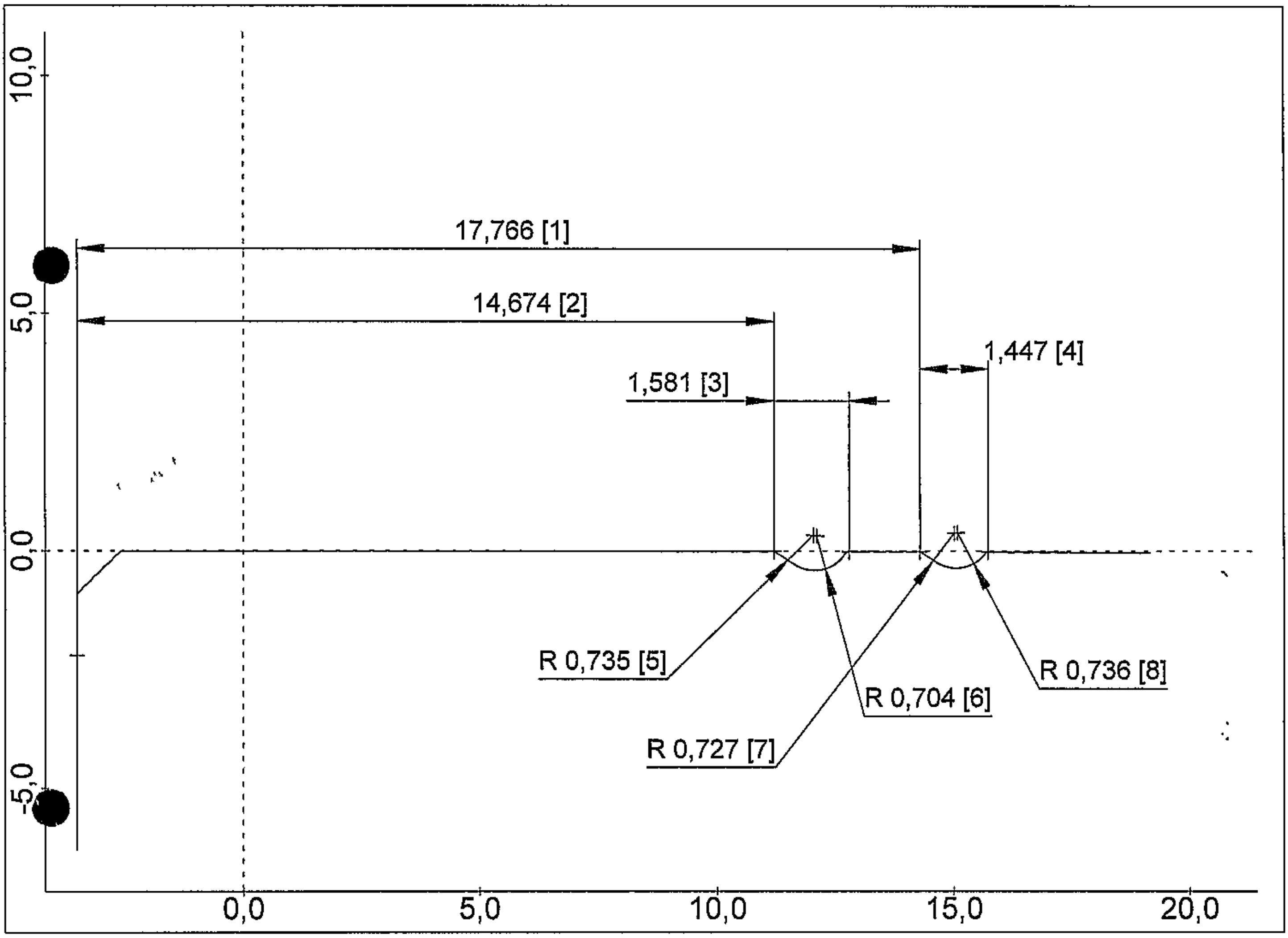


PERTHOMETER CONCEPT

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS1
Numero:	3975 PPAP 4
Operatore:	TURNO C
Data, ora:	09.01.2015, 17:21
Nota:	PROF. M
Tastatore:	PCV 350 / 21 mm
Macchina:	MOA 416120 001

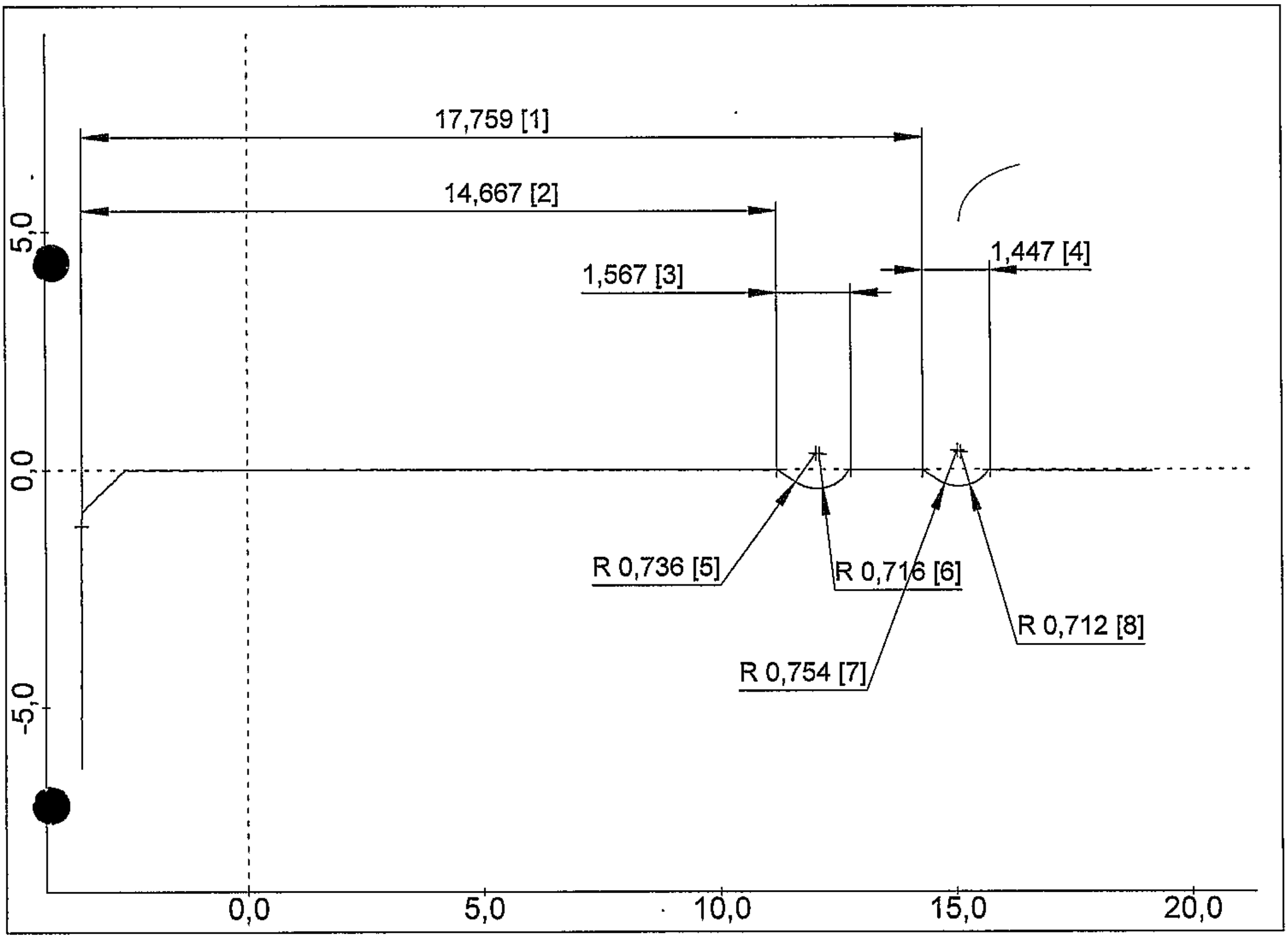


PERTHOMETER CONCEPT

GETRAG

Via dei Ciclamini 4, Modugno (BA)

Oggetto:	OS1
Numero:	3975 PPAP 5
Operatore:	TURNO C
Data, ora:	09.01.2015, 17:21
Nota:	PROF. M
Tastatore:	PCV 350 / 21 mm
Macchina:	MOA 416120 001



PERTHOMETER CONCEPT

Istruzioni di controllo

GETRAG

PP Produzione GPS

Materiale: 2506397535
Indice del disegno finito: -

Descrizione: Albero di uscita 1 Stato:Rilasciato Produzione + Calcolo costi
Data emissione: 24.11.2014 / Vito Fiore

Operazione: 0200 Levigatura di potenza 3769z= 20
Data aggiornamento: 24.11.2014 / Vito Fiore

Centro di lavoro: HNW15245 LEVIGATURA OS1

n.SAP Ordinamento	GN 3010	Caratteristica	Misura nomin.	LTI	LTS	Strumento di controllo	Quantità	Frequenza RK1:	Quantità	Frequenza RK2:	Quantità	Frequenza Sala di misura	Cambio ut.	Metodi di gestione / Documentazione
0002		Controllo 1° pz sec. VBZ 450_804098				MVZ-400249 EVOLVENTIMETRO					1	1° pz 2.3.1.1-R 2		Misu: controllo primo pezzo
						MOA-416121 RUGOSIMETRO TIPO PRK					1	1° pz 2.3.1.1-R 2		
0004		aspetto, privo di bava, senza danno					3	pz per rack						CR1: no documentazione
0012	M	Diametro MdK da G. T. sfere 3.5 mm	61,836 mm	61,801	61,870	MZA-401071 CALCOLATORE DI MISURA E9066 MARPOSS	3	pz ogni 100 per macchina						CR1: calcolatore di misura
0014		DIAGRAMMA COMPLETO CON SVERGOLAMENTO	mm			MVZ-400249 EVOLVENTIMETRO					1	Ultimo PZ. prima ravvivatu ra		Misu: diagramma di dentatura
0020	M	DIAGRAMMA COMPLETO CON SVERGOLAMENTO	mm			MVZ-400249 EVOLVENTIMETRO					1	1 pezzo ogni cambio parametri macchina		Misu: diagramma di dentatura
0030	M	Oscillazione Fr	0,000 mm		0,032	MVZ-400249 EVOLVENTIMETRO					1	pz a turno/mac .		Misu: diagramma di dentatura
0032		Somma Passo Fp	0,000 mm		0,040	MVZ-400249 EVOLVENTIMETRO					1	pz a turno/mac .		Misu: diagramma di dentatura
0060		Sup. dente completamente levigata controllo visivo					8	pz per rack						CR1: no documentazione

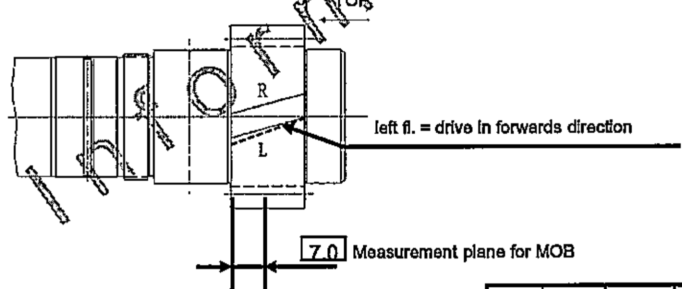
Trattare i prodotti non conformi secondo procedura 2.3.5 del Manuale dei Processi

Gli audit di prodotto sono stati eseguiti secondo il piano annuale

STIRNRAD / GEAR	außenverzahnt / external
Zähnezahl / Number of teeth z	20
Modul / Normal module m_n	2.450000
Eingriffswinkel / Normal pressure angle α_n	20° 0' 0"
Schrägungswinkel / Helix angle β	29° 0' 0"
Steigungsrichtung / Hand of helix	LEFT
Profilverschiebungsfaktor / Addendum modification coeff. x	0.600
Teilkreisdurchmesser / Pitch diameter d	56.024
Kopfkreisdurchmesser / Outside diameter d_a	$64.40_{-0.26}$
Kopfnutzkreisd. theo. max. / Tip diam. usable theo. d_{Na}	63.85
Kopfnutzkreisd. theo. min. / Tip diam. usable theo. d_{Na}	63.38
Fußkreisdurchmesser / Root diameter d_f	$49.80_{-0.45}$
Fußnutzkreisdurchmesser / Root diameter usable d_{Nf}	53.31
Grundkreisradius / Base circle radius r_b	25.862
Grundkreisdurchmesser / Base diameter d_b	51.724
Normalzahndicke max. / Normal tooth thickness s_n	4.919
Normalzahndicke min. / Normal tooth thickness s_n	4.889
Meßzähnezahl / Number of teeth spanned k	
Zahnweite max. / Base tangent length W_k	
Zahnweite min. / Base tangent length W_k	
Meßkugeldurchmesser / Ball diameter D_M	3.5000
Diam. Zweikugelmaß max. / Measurement o. balls M_{dK}	61.870
Diam. Zweikugelmaß min. / Measurement o. balls M_{dK}	61.801
Verdrehflankenspiel theo. / Circumferential backlash	0.072 0.171

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

	linke Fl. / left flank	rechte Fl. / right flank		
Profil-Formabweichung / Profile form error $f_{f\alpha}$	0.004		Eingriffstellungs-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	0.000 ± 0.010	Teilungssprung / Diff. bet. adjacent pitches f_u	0.018
Flankenl.-Winkelabweich. / Tooth alignment error $f_{H\beta}$	+ 0.008 ± 0.013	0.000 ± 0.013	Teilungs-Summenabweich. / Cumulative circ. pitch error F_{pk}	
Flankenl.-Gesamtabweich. / Total alignment error F_β			Rundlaufabweichung / Radial run-out F_r	0.040
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	34.42		Meßkreis-Krümmungsradius / Radius of curvature meas. diam. ρ_{dM}	12.78

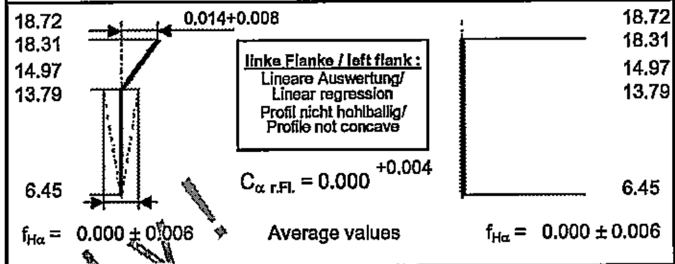


Hondurchmesser = $51.93_{-0.30}$ = 2.31
honing diameter

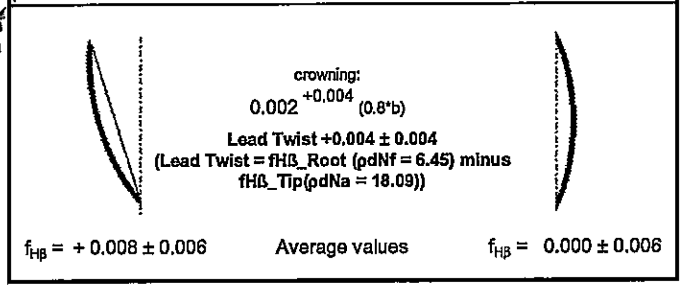
\# Der Verlauf der Profil- und Flankenlinie muss über den Messbereich stetig sein (ein- oder mehrfache Richtungsänderungen sind nicht zulässig)
\# The form of the profile and helix has to be continuous (one or more changes of directions are not allowed)
Für fp max. zwei Wellen zulässig
For fp max. two waves allowed

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: 250.6.3975.35



* Schreibbeginn
* Start of checking
Ø = $51.93_{-0.30}$ ≡ 2.31



* 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 Flankenlinienprüfung nach VDI/VDE 2612
Tabellenwerte für F_β und $f_{H\beta}$ sind auf die gesamte Radbreite im Meßkreis d_M bezogen
Flankenlinienprüfbereich Lβ = 0.8*b hochgerechnet auf 1.0*b
Begriffe für Stirnräder nach DIN 868, 3960, 3998

Profile and helix checking according to VDI/VDE 2612
Listed tolerance data for F_β and $f_{H\beta}$ refers to the total face width in the meas. dia. d_M
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:

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

Abbildungen sind unmaßstäblich. / Diagrams not to scale.

Ersatz für:
Erstverwendung bei Getriebetype: 250
Remark:

	Datum	Name
gez.	25.02.2014	Cricenti, Fabrizio
gepr.		

Verzahnungsblatt Endkontrolle
Final Check Gear Data
Benennung: / Naming: **Output Shaft K1**

Zeichnungsnummer: / Drawing number: **250.6.3975.35**