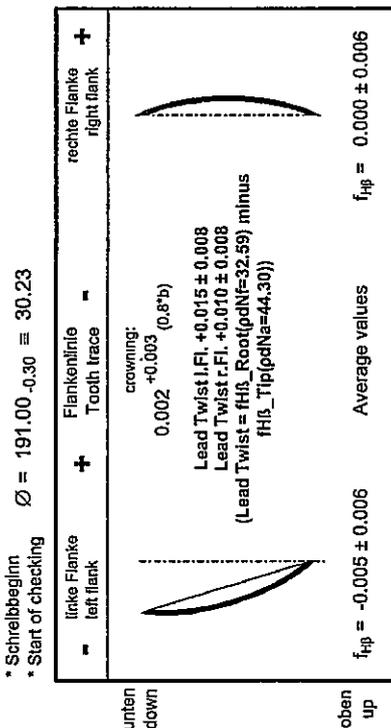
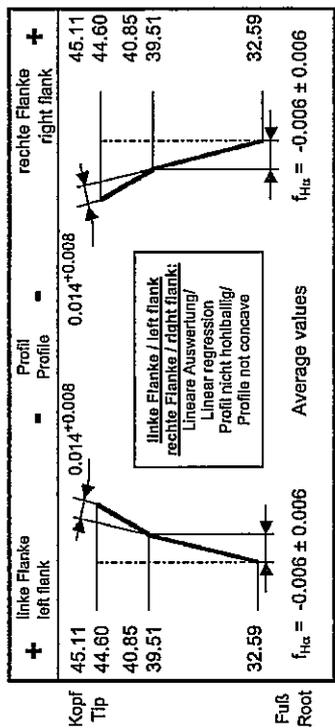
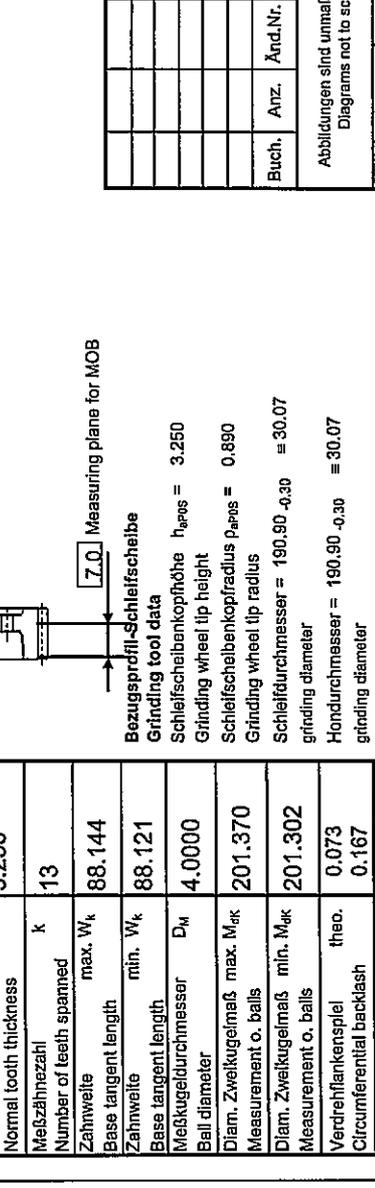


Part Name Ring Gear		Customer Part Number 250.1.6402.00	
Shown on Drawing No. 250.1.6402.00		Organization Part #.	
Engineering Change Level b 35624		Dated 11 Dec 2013	
Additional Engineering Changes		Dated	
Safety and/or Government Regulation <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Purchase Order No.	
		Weight (kg) 2,637	
Checking Aid No.		Checking Aid Engineering Change Level	
		Dated	
ORGANIZATION MANUFACTURING INFORMATION		CUSTOMER SUBMITTAL INFORMATION	
GETRAG MODUGNO		FORD	
Organization Name & Supplier/Vendor Code		Customer Name/Division	
VIA DEI CICLAMINI N°4			
Street Address		Buyer/Buyer Code	
MODUGNO BARI 70026 ITALY		TYP 250	
City	Region	Postal Code	Country
MATERIALS REPORTING			
Has customer-required Substances of Concern information been reported? Submitted by IMDS or other customer format:		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> n/a	
Are polymeric parts identified with appropriate ISO marking codes?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> n/a	
REASON FOR SUBMISSION (Check at least one)			
<input type="checkbox"/> Initial Submission		<input type="checkbox"/> Change to Optional Construction or Material	
<input checked="" type="checkbox"/> Engineering Change(s)		<input type="checkbox"/> Supplier or Material Source Change	
<input type="checkbox"/> Tooling: Transfer, Replacement, Refurbishment, or additional		<input type="checkbox"/> Change in Part Processing	
<input type="checkbox"/> Correction of Discrepancy		<input type="checkbox"/> Parts Produced at Additional Location	
<input type="checkbox"/> Tooling Inactive > than 1 year		<input checked="" type="checkbox"/> Other - please specify below	
REQUESTED SUBMISSION LEVEL (Check one)			
<input type="checkbox"/> Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.			
<input type="checkbox"/> Level 2 - Warrant with product samples and limited supporting data submitted to customer.			
<input checked="" type="checkbox"/> Level 3 - Warrant with product samples and complete supporting data submitted to customer.			
<input type="checkbox"/> Level 4 - Warrant and other requirements as defined by customer.			
<input type="checkbox"/> Level 5 - Warrant with product samples and complete supporting data reviewed at organization's manufacturing location.			
SUBMISSION RESULTS			
The results for <input checked="" type="checkbox"/> dimensional measurements <input checked="" type="checkbox"/> material and functional tests <input type="checkbox"/> appearance criteria <input checked="" type="checkbox"/> statistical process package			
These results meet all drawing and specification requirements: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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 _____ / _____ 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: New documentation for first PPAP lost			
Is each Customer Tool properly tagged and numbered? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> n/a			
Organization Authorized Signature			Date 13 Jan 2015
Print Name	Pennacchia Vincenzo	Phone No. tel 390805858580	Fax No.
Title	GPS 1 Leader	E-mail vincenzo.pennacchia@getrag.com	
FOR CUSTOMER USE ONLY (IF APPLICABLE)			
Part Warrant Disposition: <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Rejected <input type="checkbox"/> Other			
Customer Signature			Date 13.01.15
Print Name			Customer Tracking Number (optional)

22F

STIRNRAD GEAR		Toleranzen der Verzählung (DIN 3961 vom Aug. 1978) gültig für Werte am Einzelzahn Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth	
äußereverzählung external		linke Fl. left flank	rechte Fl. right flank
Zähnezahl z	74	# 0.005	# 0.005
Modul Normal module	2.300000		
Eingriffswinkel Normal pressure angle	20° 0' 0"		
Schrägungswinkel Helix angle	30° 0' 0"		
Steigungsrichtung Hand of helix	RIGHT		
Profilverstärkungsfaktor Addendum modification coeff.	-0.153		
Teilkreisdurchmesser Pitch diameter	196.530		
Außendurchmesser Outside diameter	202.90 -0.30		
Kopfnutkreisr. Tip diam. usable theo.	202.40		
Kopfnutkreisr. Tip diam. usable theo.	201.95		
Fußkreisr. Root diameter	189.10 -0.45		
Fußnutkreisr. Root diameter usable	192.55		
Grundkreisradius Base circle radius	90.590		
Grundkreisdurchmesser Base diameter	181.179		
Normalzahnstärke Normal tooth thickness	3.278		
Normalzahnstärke Normal tooth thickness	3.253		
Meßzähnezahl Number of teeth spanned	13		
Zahnweite max. W _k	88.144		
Zahnweite min. W _k	88.121		
Meßkugeldurchmesser Ball diameter	4.0000		
Diam. Zweikugelm. max. M _{2k}	201.370		
Meßkugelm. min. M _{2k}	201.302		
Verdrehflankenspiel theo.	0.073		
Circumferential backlash	0.167		

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



* f_{fl} (zwischen d_{N1} und dem Schreibeginn d_s) max f_{fl2}, jedoch 0.003 zulässig
* f_{fl} (between d_{N1} and start of checking d_s) max f_{fl2}, 0.003 allowable.
Profil- und Flankenliniendruck nach VDI/VDE 2612
Tabellenwerte für F_p und f_{pp} sind auf die gesamte Radbreite im Meßkreis d_m bezogen
Flankenliniendruckbereich L_p = 0.8°b hochgerechnet auf 1.0°b
Begriffe für Stirnräder nach DIN 868, 3960, 3998
Profil- und helix checking according to VDI/VDE 2612
Listed tolerance data for F_p and f_{pp} refers to the total face width in the meas. dia. d_m
Tooth trace testing area L_p = 0.8°b calculated to 1.0°b
Terms of the tooth system according to DIN (German Industrial Standards) No. 868, 3960, 3998

Verteiler:	
Erstverwendung bei Getriebebauteile:	250
Abbildungen sind unmaßstäblich. Diagrams not to scale.	
Buch, Anz.	Änd.Nr.
Name	
Datum	
Verzählungsblatt Endkontrolle	
Final Check: Gear Data	
Benennung:	
Name:	
Drawing number:	
250.1.3660.78	

Abbildungen sind unmaßstäblich.
Diagrams not to scale.

Verteiler:
Schutzvermerk nach ISO 16016 beachten
Protection per ISO 16016

■ ■ ■ GETRAG
GETRAG Getriebe- und Zahnradfabrik
Hermann Hagenmeyer GmbH & Co. KG

Remark:

250

250.1.3660.78

Ring Gear

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

Wkz-Profil siehe Werkzeugdatenblatt Nr. 250.1.3660.78
For Tooth profile, see tool data sheet number

3

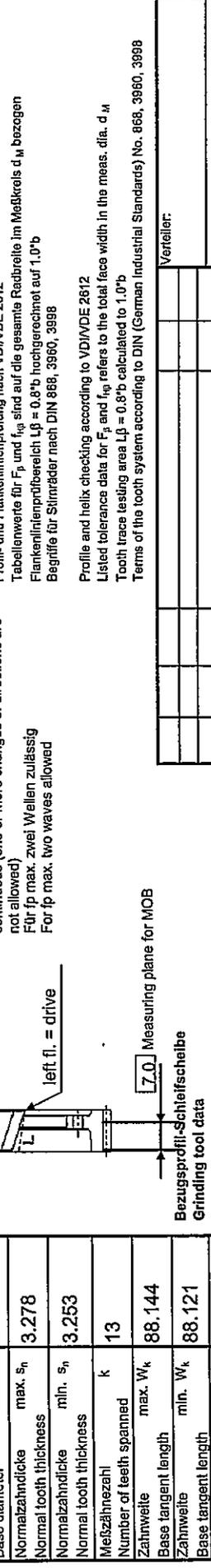
2

4

STIRNRAD external
GEAR external

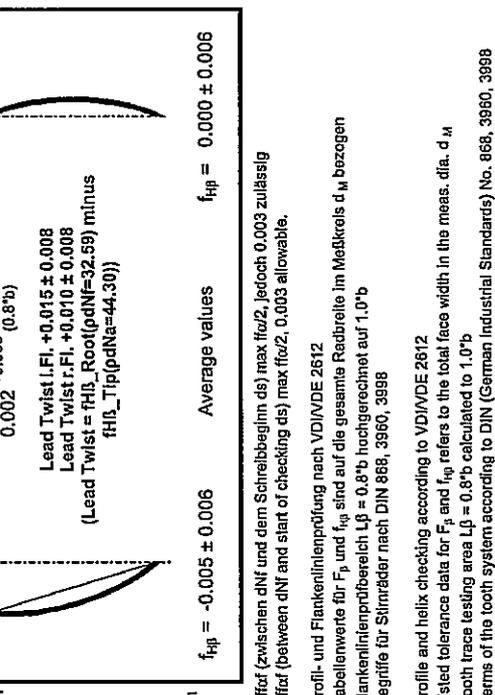
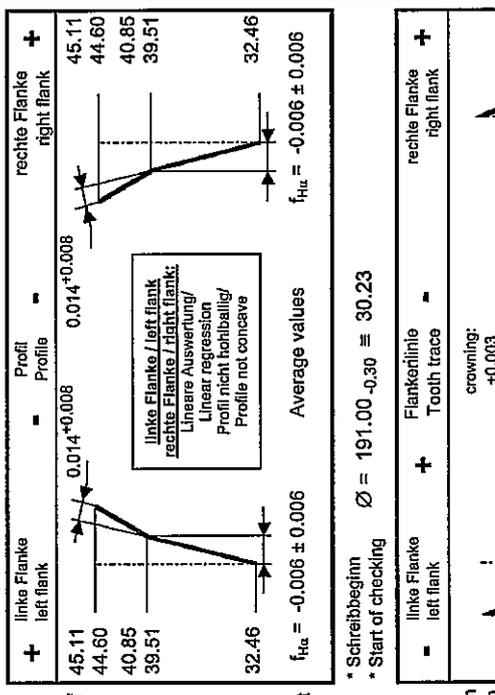
Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth		Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth	
außenverzähnt external	innenverzähnt internal	außenverzähnt external	innenverzähnt internal
Zähnezahl Number of teeth	74	Zähnezahl Number of teeth	74
Modul Normal module	2.30000	Modul Normal module	2.30000
Eingriffswinkel Normal pressure angle	20° 0' 0"	Eingriffswinkel Normal pressure angle	20° 0' 0"
Schraubungswinkel Helix angle	30° 0' 0"	Schraubungswinkel Helix angle	30° 0' 0"
Hand of helix	RIGHT	Hand of helix	RIGHT
Profilverstärkungsfaktor Addendum modification coeff.	-0.153	Profilverstärkungsfaktor Addendum modification coeff.	-0.153
Teilkreisdurchmesser Pitch diameter	196.530	Teilkreisdurchmesser Pitch diameter	196.530
Kopfkreisdurchmesser Outside diameter	202.90 -0.30	Kopfkreisdurchmesser Outside diameter	202.90 -0.30
Kopfnutkreis, theo. max. d_{ha} Tip diam. usable theo.	202.40	Kopfnutkreis, theo. max. d_{ha} Tip diam. usable theo.	202.40
Kopfnutkreis, theo. min. d_{ha} Tip diam. usable theo.	201.95	Kopfnutkreis, theo. min. d_{ha} Tip diam. usable theo.	201.95
Fußkreisdurchmesser Root diameter	189.10 -0.45	Fußkreisdurchmesser Root diameter	189.10 -0.45
Fußnutkreisdurchmesser Root diameter usable	192.46	Fußnutkreisdurchmesser Root diameter usable	192.46
Grundkreisradius Base circle radius	90.590	Grundkreisradius Base circle radius	90.590
Grundkreisdurchmesser Base diameter	181.179	Grundkreisdurchmesser Base diameter	181.179
Normalzähndicke max. s_n Normal tooth thickness	3.278	Normalzähndicke max. s_n Normal tooth thickness	3.278
Normalzähndicke min. s_n Normal tooth thickness	3.253	Normalzähndicke min. s_n Normal tooth thickness	3.253
Meßzähnezahl Number of teeth spanned	13	Meßzähnezahl Number of teeth spanned	13
Zahnweite max. W_k Base tangent length	88.144	Zahnweite max. W_k Base tangent length	88.144
Zahnweite min. W_k Base tangent length	88.121	Zahnweite min. W_k Base tangent length	88.121
Meßkugeldurchmesser Ball diameter	4.0000	Meßkugeldurchmesser Ball diameter	4.0000
Diam. Zweikugelmäß max. M_{sk} Measurement o. balls	201.370	Diam. Zweikugelmäß max. M_{sk} Measurement o. balls	201.370
Diam. Zweikugelmäß min. M_{sk} Measurement o. balls	201.302	Diam. Zweikugelmäß min. M_{sk} Measurement o. balls	201.302
Vordrehflankenspiel Circumferential backlash	0.073 0.167	Vordrehflankenspiel Circumferential backlash	0.073 0.167

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 f_p max. zwei Wellen zulässig
 For f_p max. two waves allowed



Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth		Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth	
außenverzähnt external	innenverzähnt internal	außenverzähnt external	innenverzähnt internal
Zähnezahl Number of teeth	74	Zähnezahl Number of teeth	74
Modul Normal module	2.30000	Modul Normal module	2.30000
Eingriffswinkel Normal pressure angle	20° 0' 0"	Eingriffswinkel Normal pressure angle	20° 0' 0"
Schraubungswinkel Helix angle	30° 0' 0"	Schraubungswinkel Helix angle	30° 0' 0"
Hand of helix	RIGHT	Hand of helix	RIGHT
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Kopfkreisdurchmesser Outside diameter	202.90 -0.30	Kopfkreisdurchmesser Outside diameter	202.90 -0.30
Kopfnutkreis, theo. max. d_{ha} Tip diam. usable theo.	202.40	Kopfnutkreis, theo. max. d_{ha} Tip diam. usable theo.	202.40
Kopfnutkreis, theo. min. d_{ha} Tip diam. usable theo.	201.95	Kopfnutkreis, theo. min. d_{ha} Tip diam. usable theo.	201.95
Fußkreisdurchmesser Root diameter	189.10 -0.45	Fußkreisdurchmesser Root diameter	189.10 -0.45
Fußnutkreisdurchmesser Root diameter usable	192.46	Fußnutkreisdurchmesser Root diameter usable	192.46
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Vordrehflankenspiel Circumferential backlash	0.073 0.167	Vordrehflankenspiel Circumferential backlash	0.073 0.167

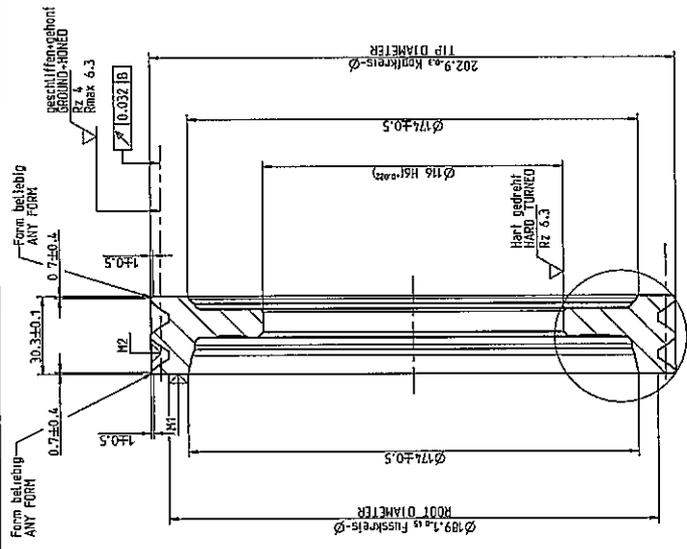
Vorbereitungsdaten siehe Verzahnungsblatt Vorbearbeitung gleicher Nr.
 For pre-machining dimensions, see gear data sheet same number



Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth		Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth	
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Meßkugeldurchmesser Ball diameter	4.0000	Meßkugeldurchmesser Ball diameter	4.0000
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Diam. Zweikugelmäß min. M_{sk} Measurement o. balls	201.302	Diam. Zweikugelmäß min. M_{sk} Measurement o. balls	201.302
Vordrehflankenspiel Circumferential backlash	0.073 0.167	Vordrehflankenspiel Circumferential backlash	0.073 0.167

Verteiler:
 Schutzvermerk nach ISO 16016 beachten
 Protection per ISO 16016
GETRAG
 GETRAG Getriebe- und Zahnradfabrik
 Hermann Hagenmeyer GmbH & Co. KG
 Remark:
 Ersatz für
 Erstverwendung
 bei Getriebeartyp: 250
 Verzeichnungsblatt Endkontrolle: 250
 Final Check Gear Data
 Datum Name
 17.06.2013 Cricenti, Fabrizio
 Buch. Anz. Anz.Nr.
 Abbildungen sind unmaßstäblich.
 Diagrams not to scale.
 Zeichnungsnummer:
 Drawing number:
250.1.3660.51
 Ring Gear

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



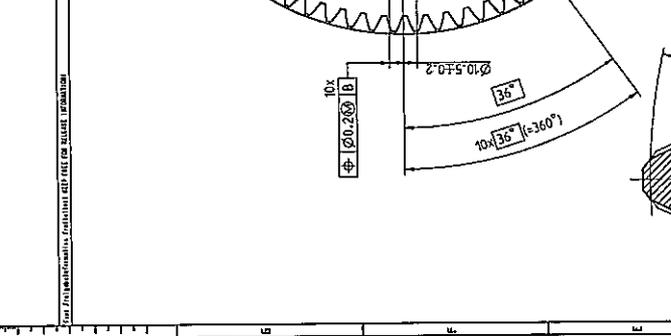
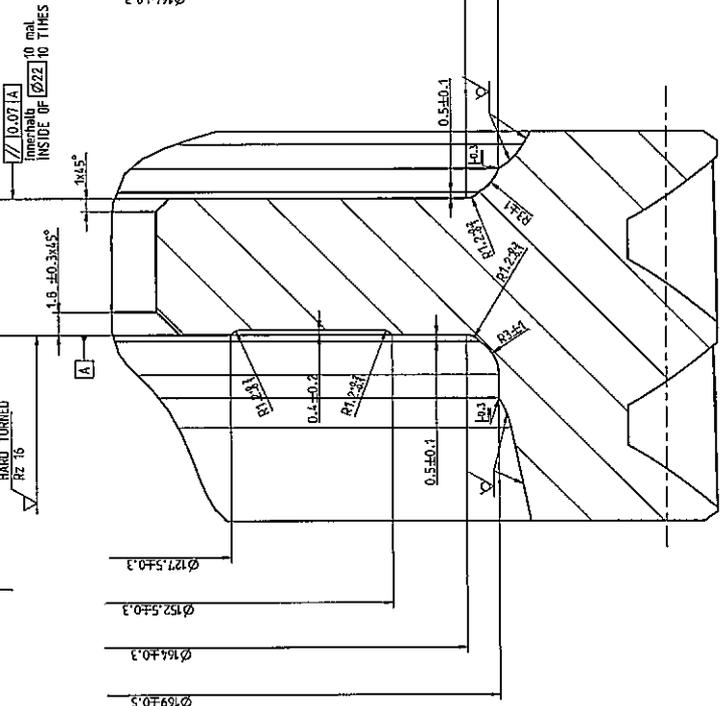
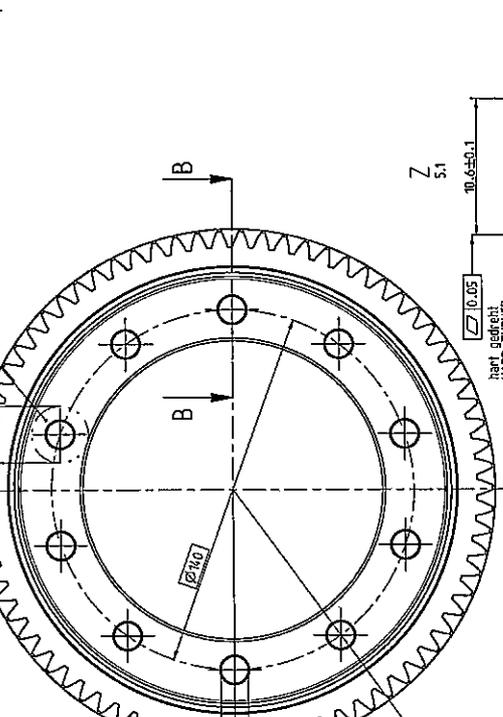
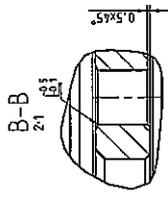
Das Getriebe ist ein Produkt der Erpenen Nummer 250.14402.00
 Lieferant: Maschinenbau Getriebe- und Antriebstechnik GmbH
 Die Zeichnung ist Eigentum der Erpenen. Die Weitergabe an Dritte ist ohne schriftliche Genehmigung der Erpenen untersagt.
 THIS COMPONENT IS PART OF GROUP NUMBER 250.14402.00
 SUPPLIER: MASCHINENBAU GETRIEBE- UND ANTRIEBSTECHNIK GMBH
 For the fitting and inspection in the Hirth Code (Hirth Code) use the Hirth Code (Hirth Code) version of the drawing.
 FOR FITTING AND INSPECTION IN THE HIRTH CODE (HIRTH CODE) USE THE DATA MATRIX CODE (COMPONENT AND/OR PACKAGE)
 THE GROUP NUMBER 250.14402.00 HAS TO BE USED.
 P/PP made / ACCORDING TO 250.14360.70

Technische Sauberkeit / TECHNICAL CLEANLINESS:
 Es gelten die Sauberkeitsanforderungen nach GN 4340-1
 CLEANLINESS REQUIREMENTS OF THE GN 4340-1 HAVE TO BE ABIDED

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



0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99



einzelgehäutet und angeblasen
 H1 (Innenflanken) : 80,5-2,5 HRA
 H2 (Zahnflanken) : CHD (H) 550- 0,5-0,4
 H3 (Kernteile) : min. 300 HV10
 CASE HARDENED AND TEMPERED
 H1 (INTERNAL FLANKS) : 80,5-2,5 HRA
 H2 (TOOTH FLANKS) : CHD (H) 550- 0,5-0,4
 H3 (INSIDE BASE OF TOOTH) : min. 300 HV10

Außenverzahnung / EXTERNAL GEAR	
Zahnwelle / SPLINE DATA EXTERNAL	
Benennung / PART NUMBER	2.300
Modul / MODULE	3
Zahl der Zähne / NUMBER OF TEETH	20
Profil / PROFILE	20.0
Wälzflanken / ROLLING SURFACES	30.0
Wälzflanken / ROLLING SURFACES	RIGHT, LEFTS
Wälzflanken / ROLLING SURFACES	-0.353
Wälzflanken / ROLLING SURFACES	7
Wälzflanken / ROLLING SURFACES	3.278
Wälzflanken / ROLLING SURFACES	3.253
Wälzflanken / ROLLING SURFACES	201.370
Wälzflanken / ROLLING SURFACES	201.302

Istruzioni di controllo



PP Produzione GPS

Materiale: 2501640200

Descrizione: Chart corona

Operazione: 0230 Rettifica dentatura con RZ303C

Centro di lavoro: SLW14850 RETTIFICA DENTI RG

Indice del disegno finito: B

Data emissione: 25.11.2014 / Vito Fiore

Data aggiornamento: 13.03.2014 / Vito Fiore

0000	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 secondo Gear data 250.1.3660.50				MVZ-400249 EVOLVENTIMETRO						1° pz 2.3.1.1-R 2		CR1: controllo primo pezzo
0010	M	Diametro Mdk (RZ303C e RZF)	201,336 mm	201,302	201,370	MOA-416121 RUGOSIMETRO TIPO PRK MZA-450311 Calcolatore di misura E9066 Marposs						1° pz 2.3.1.1-R 2		
0020		Evolvente ed elica sec.G.D. con svergolamento (RZ303C)				MVZ-400249 EVOLVENTIMETRO	3	pz ogni 100 per macchina				1	1	Misu: diagramma di dentatura
0022		Evolvente ed elica sec.G.D. con svergolamento (RZF)				MVZ-400249 EVOLVENTIMETRO						ogni 50 pz prodotti /macchina		Misu: diagramma di dentatura
0030		SOMMA DI PASSO Fp (RZ303C)	mm		0,045	MVZ-400249 EVOLVENTIMETRO						1	1	Misu: diagramma di dentatura
0032		SOMMA DI PASSO Fp (RZF)	mm		0,045	MVZ-400249 EVOLVENTIMETRO						ogni 50 pz prodotti /macchina		Misu: diagramma di dentatura
0040	M	OSCILLAZIONE RADIALE Fr (RZ303C)	mm		0,032	MVZ-400249 EVOLVENTIMETRO						1	1	Misu: diagramma di dentatura
0042	M	OSCILLAZIONE RADIALE Fr (RZF)	mm		0,032	MVZ-400249 EVOLVENTIMETRO						ogni 50 pz prodotti /macchina		Misu: diagramma di dentatura
0044		Controllo ammassature del materiale da rettificare con ingranometro automatico (RZ303C)	mm		0,300	MRA-450155 Ingranometro automatico Relishauer RZ303C	1	100% di pezzi						CR1: calcolatore di misura
0050		RUGOSITA' Rz	0,0 µm	0,0	4,0	MOA-416121 RUGOSIMETRO TIPO PRK						1° pz 2.3.1.1-R 2		Misu: controllo primo pezzo

Istruzioni di controllo



PP Produzione GPS

Materiale: 2501640200 **Indice del disegno finito:** B
Descrizione: Chart corona **Data emissione:** 25.11.2014 / Vito Fiore
Operazione: 0230 Rettifica dentatura con RZ303C **Data aggiornamento:** 13.03.2014 / Vito Fiore
Centro di lavoro: SLW14850 RETTIFICA DENTI RG

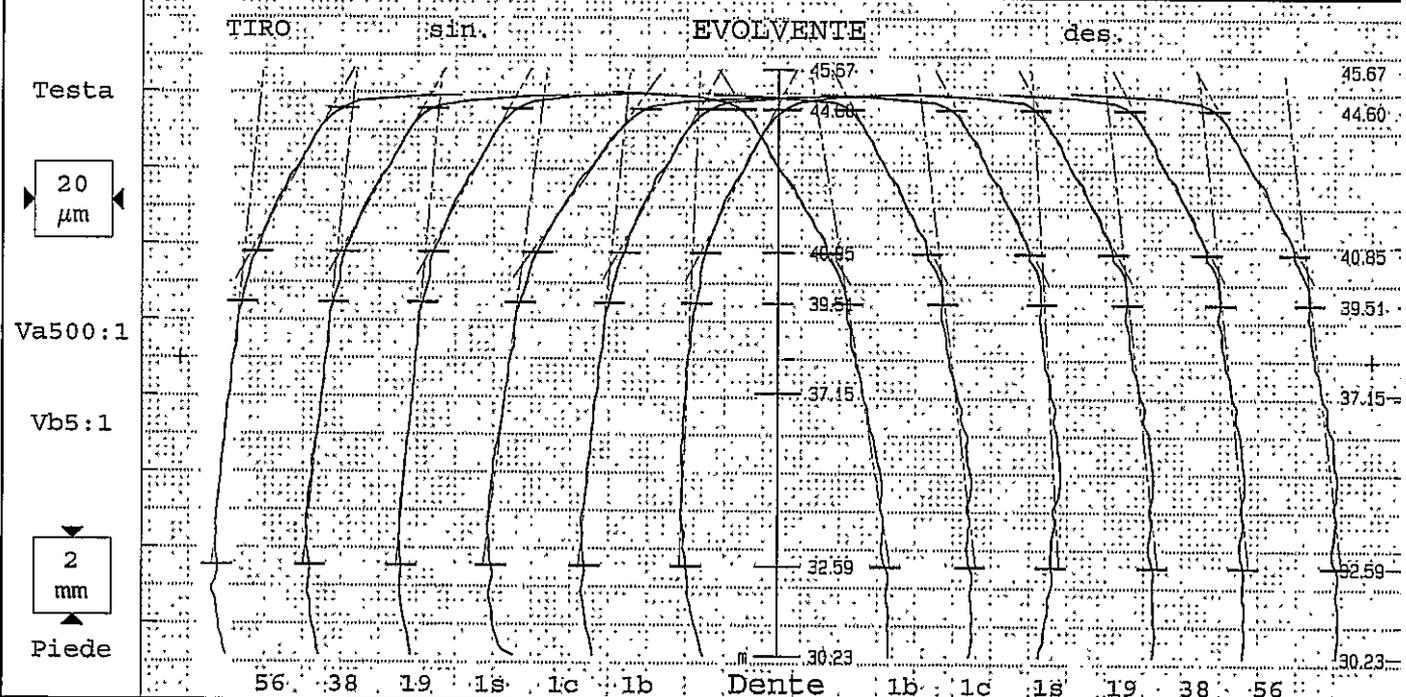
Id. lavoro	Caratteristica	Misura nomin.	L.TI	L.TS	Strumento di controllo	Quantità	Frequenza RK1:	Quantità	Frequenza RK2:	Quantità	Frequenza Sala di misura	Cambio ut.	Metodi di gestione / Documentazione
0060	RUGOSITA' Rmax	0,0 µm	0,0	6,3	MOA-416121 RUGOSIMETRO TIPO PRK						1° pz 2.3.1.1-R 2		Misur. controllo primo pezzo
0070	Controllo chimico bruciature secondo procedura WTL 3.4.10.01					1	pz cambio mola rettifica						CR1: controllo primo pezzo
0080	Contr. vis. assenza rettifica incompleta					3	pz ogni 100 per macchina						CR1: no documentazione

GETRAG

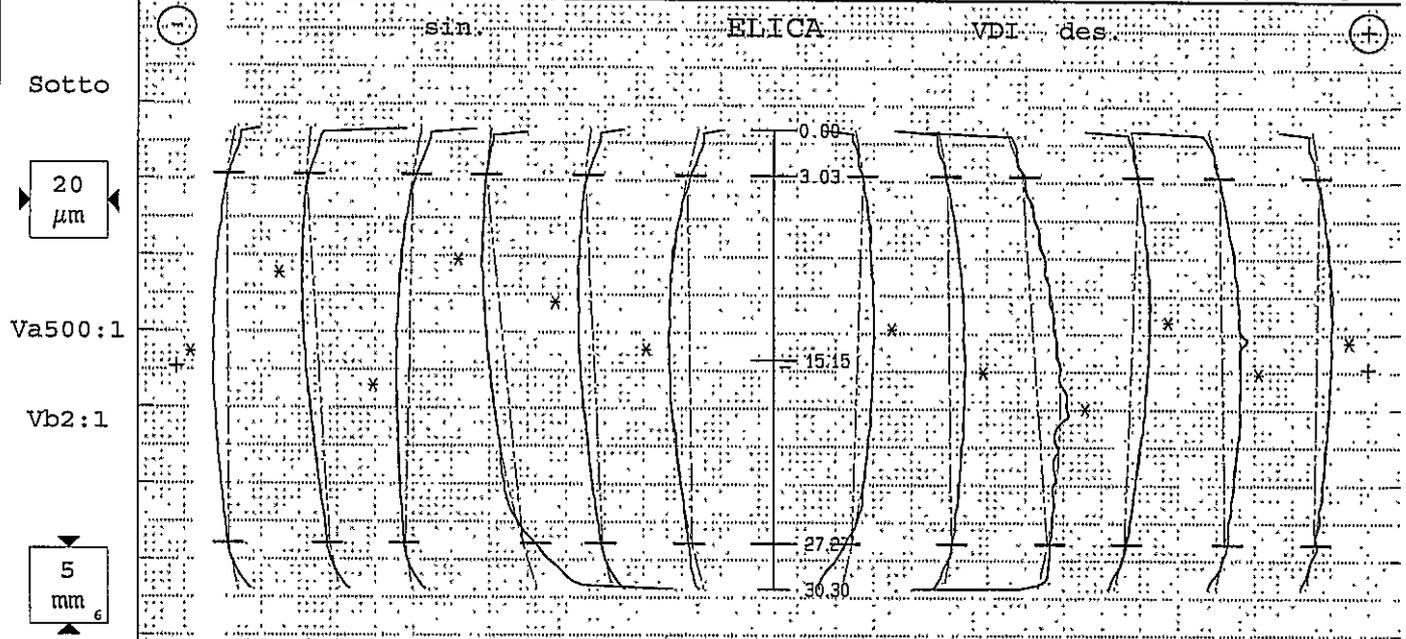
Ruota cilindrica Evolvente/Elica



Nr. prog.:	STI0410c05 0	PNC35 B4784	Controllore:	turno A	Data:	22.12.2014 14:59
Denominazione:	ring gear		Numero denti z	74	Largh.fasc.dent. b	30.3mm
Numero disegno.:	250.1.3660.51-IF		Modulo m	2.3mm	Tratto evolv. La	6.92mm
Comessa/serie nr.:	PAPP N.1		Angolo pressione	20°	Tratto elica L _S	24.24mm
Masch.Nr.:	M001	Spindel: Forme	Angolo elica	30°	Inizio elab. M1	32.59mm
Untersuchungszweck:	Laufende Messung		Ø Base db	181.1793mm	Palpatore Ø	(#1) 1mm
Werkzeug:	Charge:		Ang. Base	28.024°	Fat.scor.pr. x	- .153



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual
		Var 1									Var 1								
fH _{am}	-6±6	-7								-6±6								-8	
fH _a	-5±5	-7	-7	-6	-9	-7	-3		-6±5	-11	-8	-4	-8	-7	-8		-8		
F _a	2	2	2	2	3	2	4			6	5	5	4	4	4		4		
ffa	5	2	2	2	3	2	2		5	3	4	4	4	3	4		4		
fX _o	-22/-14	-19	-19	-18	-18	-24	-19	-20		-22/-14	-19	-18	-20	-18	-18	-18		-18	
P/T-φ [mm]	188.837	[188.65/189.1]								202.602	[202.6/202.9]								



N:Z		Var 10									Var 7								
fH _{Sm}	-5±6	-3								+6								1	
fH _B	-5±8	-3	-1	-8	2	-12	-6	-2		+8	4	-1	-8	5	-2	2		1	
F _S	11	4	4	2	7	10	2	6		11	6	3	10	5	6	3		4	
ffa	5	1	1	1	1	4	1	2		5	3	1	4	1	3	2		2	
CR	2/5	4	4	3	3	4	4	5		2/5	4	4	6	4	5	4		4	
Bd	15±8	10								10±8								12	





Nr. prog.:	STI0410005 0	PNC35 B4784	Controllore:	turno A	Data:	22.12.2014 14:59
Denominazione:	ring gear		Numero denti z	74	Angolo pressione	20°
Numero disegno.:	250.1.3660.51-IF		Modulo m	2.3mm	Angolo elica	30°
Comessa/serie nr.:	PAPP N.1		Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Formtestzdg:	Charge:			

Errori singoli di divisione fp fianco sinistro

20µm
500:1

Errore somma di divisione Fp fianco sinistro

20µm
500:1

Errori singoli di divisione fp fianco destro

20µm
500:1

Errore somma di divisione Fp fianco destro

20µm
500:1

	fianco sinistro / TIRO				fianco destro			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	1		11		2		11	
Gr. salto di passo fu max	2		14		2		14	
Scarto di divisione Rp	2				3			
Err. globale di divisione Fp	8		45		14		45	
Err. cordale di divisione Fpz/B	5				9			

Centricità Fr (Ø-sfera =4mm) ☉ : 10µm

20µm
500:1

Err. di concentricità Fr	12	32	
Variaz. spessore denta Rs			

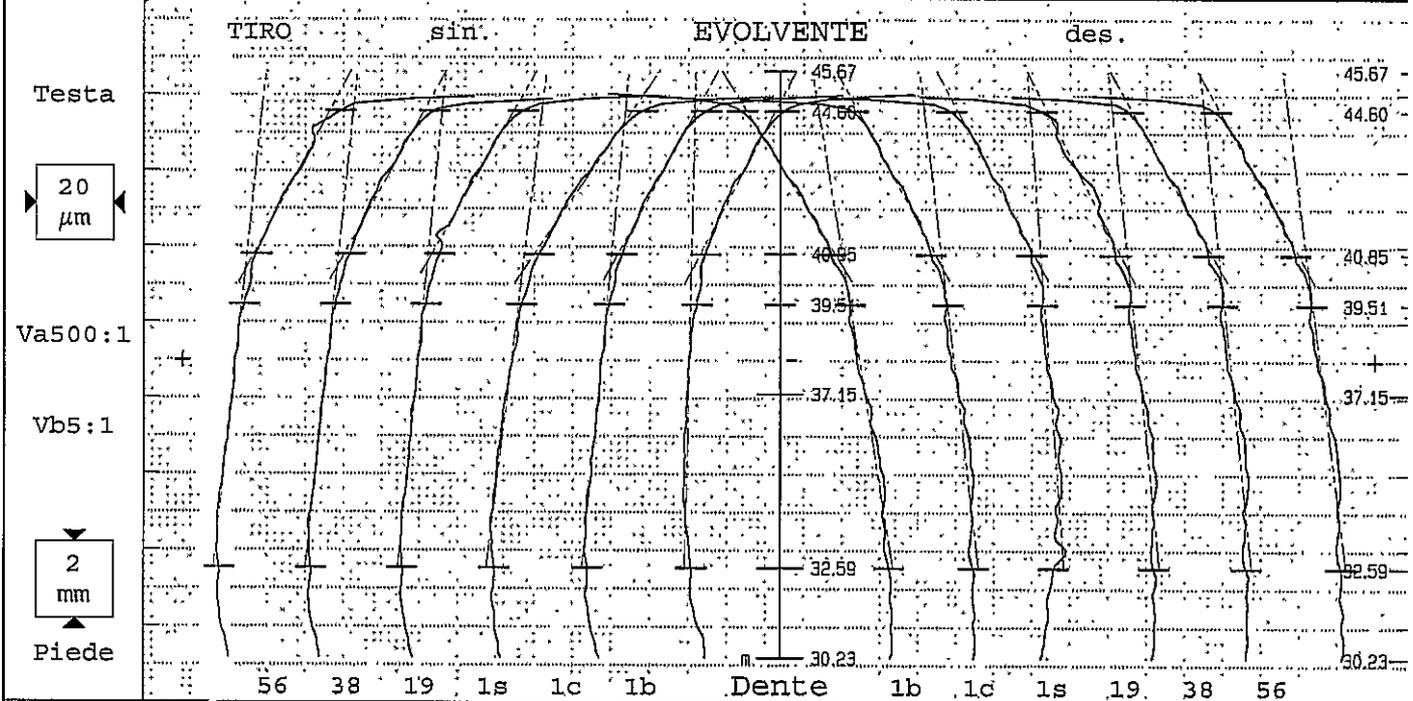


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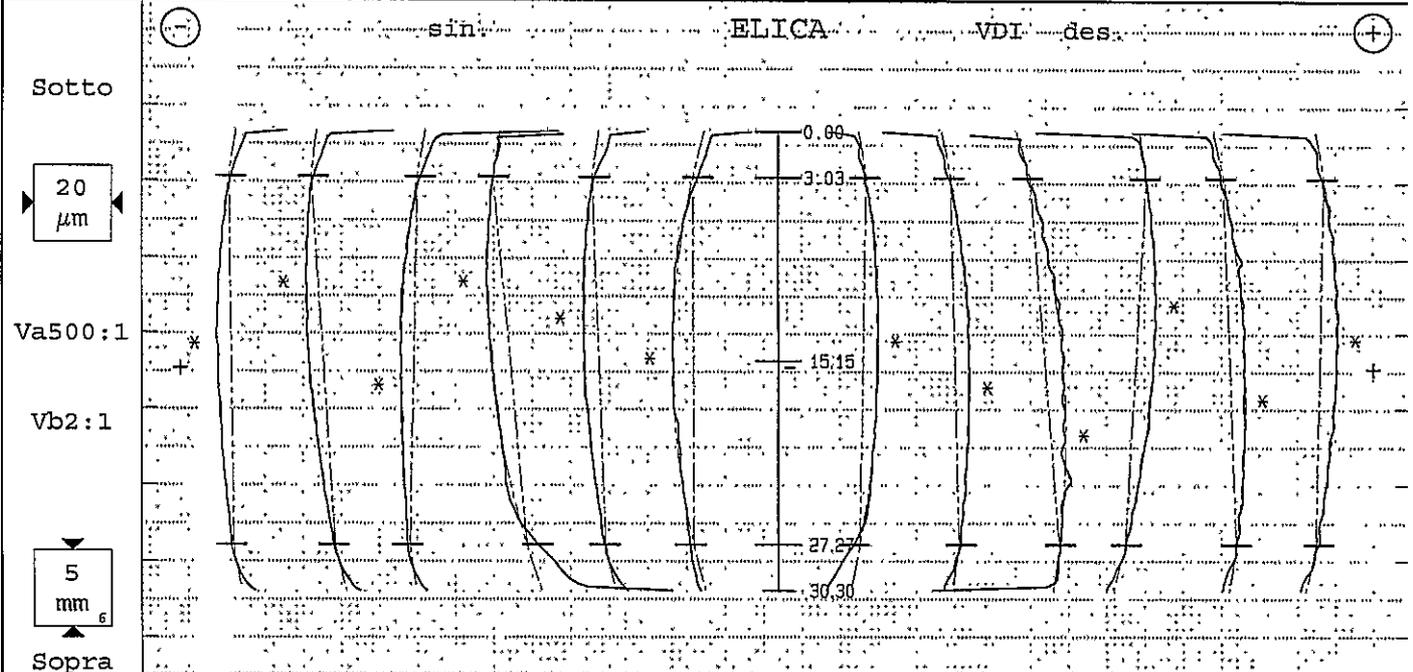
Ruota cilindrica Evolvente/Elica



Nr. prog.:	STI0410005 0	PNC35 B4784	Controllore:	turno A	Data:	22.12.2014 14:50
Denominazione:	ring gear		Numero denti z	74	Largh. fasc. dent. b	30.3mm
Numero disegno.:	250.1.3660.51-IF		Modulo m	2.3mm	Tratto evolv. La	6.92mm
Commessa/serie nr.:	P2PPAP N.2		Angolo pressione	20°	Tratto elica Ls	24.24mm
Masch.Nr.:	M001	Spindel: Formata	Angolo elica	30°	Inizio elab. M1	32.59mm
Untersuchungszweck:	Laufende Messung		Ø Base db	181.1793mm	Palpatore Ø	(#1) 1mm
Werkzeug:	Charge:		Ang. Base	28.024°	Fat. scor. pr. x	- .153



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
fHm	-6±6	-7	Var 1								-6±6	Var 2							-8	
fHa	-6±5	-7	-7	-7	-8	-6	-2		-6±5	-11	-8	-5	-7	-7	-9	-8				
Fa	2	2	2	2	3	2	5		5	6	4	5	4	4	5	4				
ffa	5	2	2	2	3	2	3		5	3	4	5	4	4	4	4				
fKo	-22/-14	-19	-18	-19	-19	-23	-18	-21		-22/-14	-19	-17	-19	-17	-19	-18	-18			
P/T-α [mm]	188.844	[188.65/189.1]								202.606	[202.6/202.9]									



N:Z	Var 10								Var 11										
fHm	-5±6	-3																1	
fHb	-5±8	-3	-2	-8	2	-11	-4	0		±6	±8	2	-3	-10	7	-4	3	1	
Fs	11	4	4	3	7	9	3	7		11	5	4	10	6	5	4	5		
ffs	5	1	1	1	2	4	1	2		5	2	1	3	1	3	1	2		
Cs	2/5	4	4	4	3	5	4	5		2/5	4	4	5	5	4	4	4		
Bd	15±8	11									10±8								12

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Nr. prog.:	STI0410005 0	PNC35 B4784	Controllore:	turno A	Data:	22.12.2014 14:50
Denominazione:	ring gear		Numero denti z	74	Angolo pressione	20°
Numero disegno.:	250.1.3660.51-IF		Modulo m	2.3mm	Angolo elica	30°
Comessa/serie nr.:	P2PPAP N.2		Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: FORMER	Zeichn.:		Charge:	

Errori singoli di divisione fp fianco sinistro

20µm

500:1

Errore somma di divisione Fp fianco sinistro

20µm

500:1

Errori singoli di divisione fp fianco destro

20µm

500:1

Errore somma di divisione Fp fianco destro

20µm

500:1

Corsa per misura divis.:195.822 z=15.2mm	fianco sinistro / TIRO				fianco destro			
	Val.misur	Qual.	Val. amm	Qual.	Val.misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	2		11		7		11	
Gr. salto di passo fu max	1		14		13		14	
Scarto di divisione Rp	3				13			
Err. globale di divisione Fp	9		45		13		45	
Err. cordale di divisione Fpz/8	6				9			

Centricità Fr (Ø-sfera =4mm)

⊙ : 11µm

20µm

500:1

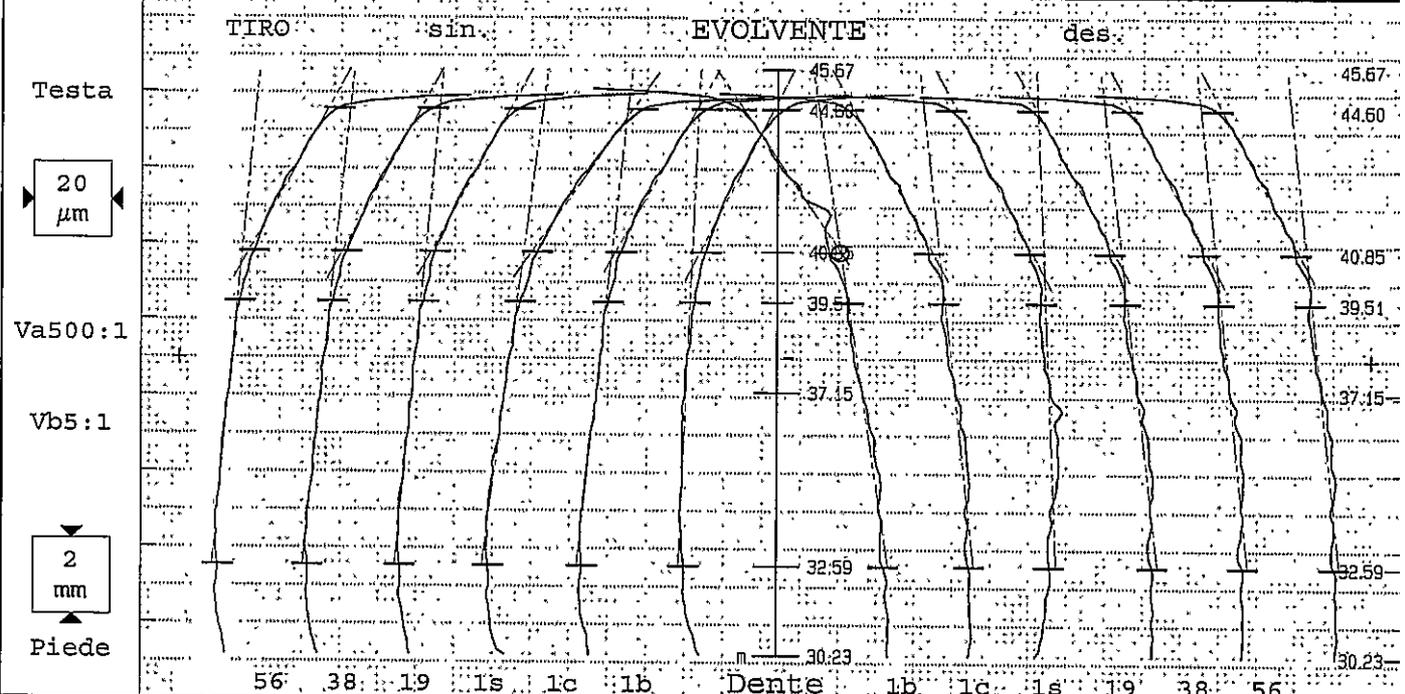
Err. di concentricità Fr	12	32		
Variaz. spessore dente Rs				

GETRAG

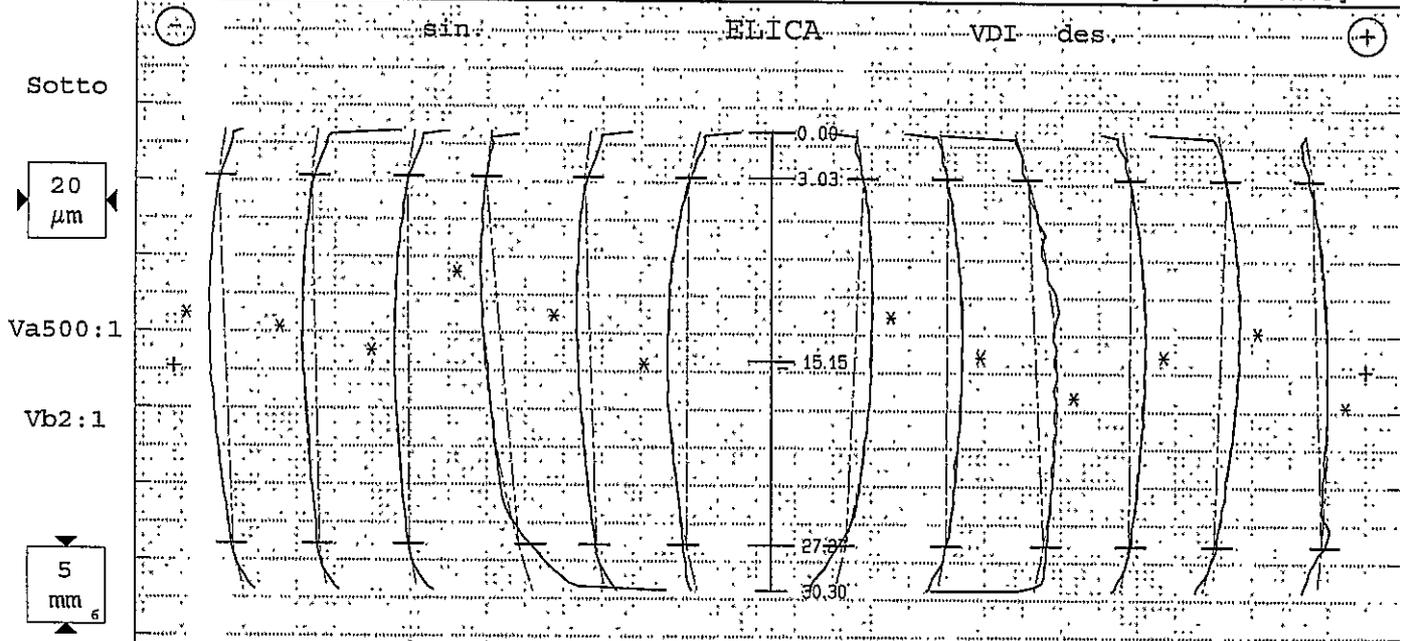
Ruota cilindrica Evolvente/Elica



Nr. prog.:	STI0410o05 0 PNC35 B4784	Controllore:	turno A	Data:	22.12.2014 15:07
Denominazione:	ring gear	Numero denti z	74	Largh.fasc.dent. b	30.3mm
Numero disegno.:	250.1.3660.51-IF	Modulo m	2.3mm	Tratto evolv. La	6.92mm
Commissa/serie nr.:	PAPP N.3	Angolo pressione	20°	Tratto elica Ls	24.24mm
Masch.Nr.:	M001 Spindel: Forming	Angolo elica	30°	Inizio elab. M1	32.59mm
Untersuchungszweck:	Laufende Messung	Ø Base db	181.1793mm	Palpatore Ø	(#1) 1mm
Werkzeug:	Charge:	Ang. Base	28.024°	Pat.scor.pr. x	- .153



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
		Var							1			Var							1	
fHcm	-6±6	-7								-6±6								-8		
fHa	-6±5	-7	-6	-7	-7	-9	-7	-3		-6±5	-11	-8	-3	-8	-7	-7	-8			
Fa	2	2	2	2	2	4	2	4			5	4	7	4	4	4	4			
ffa	5	2	2	2	2	3	2	2		5	3	3	5	4	4	4	4			
fKo	-22/-14	-19	-19	-19	-18	-23	-18	-20		-22/-14	-20	-18	-21	-18	-18	-18	-18			
P/T-φ [mm]	188.839		[188.65/189.1]								202.601		[202.6/202.9]							



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
		Var							4			Var							7	
fHsm	-5±6	-3								±6								1		
fHB	-5±8	-3	-5	-3	-1	-11	-4	0		±8	6	1	-5	1	4	-3	1			
fB	11	3	3	3	4	10	3	6		11	7	3	7	3	5	5	4			
ffb	5	1	1	1	1	4	1	1		5	2	1	3	1	1	3	2			
CB	2/5	4	4	3	4	5	3	5		2/5	5	4	5	4	5	3	4			
Bd	15±8	11								10±8							11			





Nr. prog.:	STI041005 0	PNC35 B4784	Controllore:	turno A	Data:	22.12.2014	15:07
Denominazione:	ring gear		Numero denti z	74	Angolo pressione	20°	
Numero disegno.:	250.1.3660.51-IF		Modulo m	2.3mm	Angolo elica	30°	
Commessa/serie nr.:	PAPP N.3		Untersuchungszweck:	Laufende Messung			
Masch.Nr.:	M001	Spindel: Form	Zeit:		Charge:		

Errori singoli di divisione fp fianco sinistro

20µm

500:1

Errore somma di divisione Fp fianco sinistro

20µm

500:1

Errori singoli di divisione fp fianco destro

20µm

500:1

Errore somma di divisione Fp fianco destro

20µm

500:1

	fianco sinistro / TIRO				fianco destro			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	2		11		2		11	
Gr. salto di passo fu max	2		14		2		14	
Scarto di divisione Rp	3				3			
Err. globale di divisione Fp	8		45		14		45	
Err. cordale di divisione Fpz/B	6				9			

Centricità Fr (Ø-sfera =4mm)

⊙ : 11µm

20µm

500:1

Err. di concentricità Fr	12	32	
Variaz. spessore dente Rs			

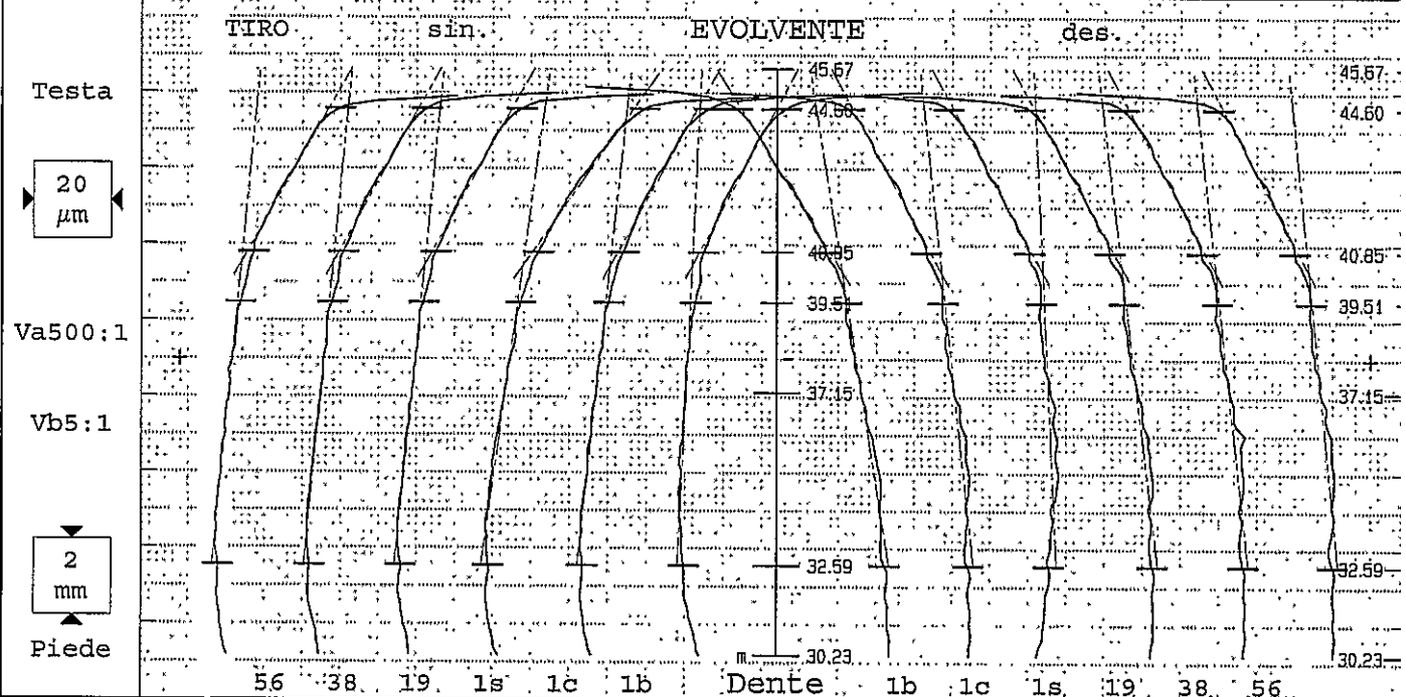


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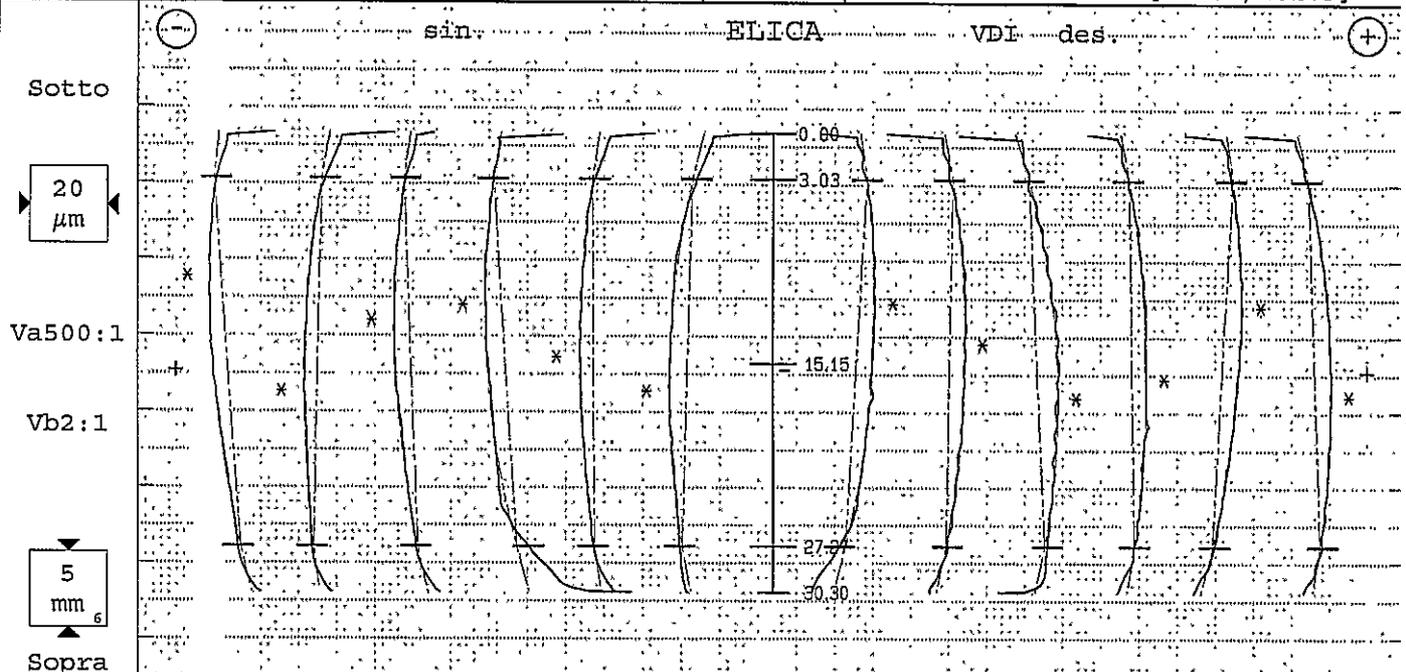
Ruota cilindrica Evolvente/Elica



Nr. prog.:	STI0410o05 0	PNC35 B4784	Controllora:	turno A	Data:	22.12.2014 15:22
Denominazione:	ring gear		Numero denti z	74	Largh.fasc.dent. b	30.3mm
Numero disegno.:	250.1.3660.51-IF		Modulo m	2.3mm	Tratto evolv. La	6.92mm
Comessa/serie nr.:	PAPP N.4		Angolo pressione	20°	Tratto elica Lβ	24.24mm
Masch.Nr.:	M001	Spindel: Formulas	Angolo elica	30°	Inizio elab. M1	32.59mm
Untersuchungszweck:	Laufende Messung		Ø Base db	181.1793mm	Palpatore Ø	(#1) 1mm
Werkzeug:	Charge:		Ang. Base	28.024°	Fat.scor.pr. x	- .153



Tolerance	Medio	Val. misur [μm]							Qual	Tolerance	Val. misur [μm]							Medio	Qual	
fHm	-6±6	-7	Var 0								-6±6	Var 1							-8	
fHa	-6±5	-7	-7	-7	-7	-9	-7	-3		-6±5	-11	-8	-3	-8	-8	-7	-8			
Fa	2	2	2	2	4	2	4		5	6	4	6	4	5	3	4				
ffa	5	2	2	2	2	3	2	2	5	3	4	4	3	5	4	4				
fKo	-22/-14	-19	-19	-19	-19	-23	-18	-20	-22/-14	-20	-19	-21	-18	-18	-18	-18				
P/T-φ [mm]	188.841	[188.65/189.1]								202.604	[202.6/202.9]									



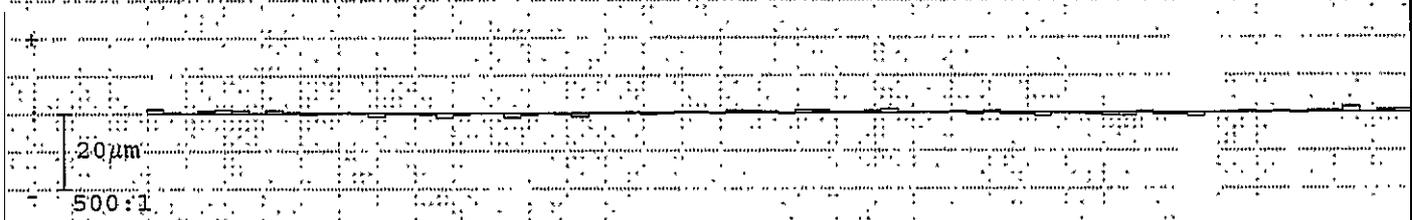
N: Z		Var 12								Var 11								
fHm	-5±6	-3	-9 3 -5 -7 -1 3							±6	7 2 -5 -2 7 -4							1
fHβ	-5±8	-3	3 7 3 7 4 9							±8	8 3 7 4 6 5							5
Fβ	11	4	1 1 1 5 1 2							11	2 2 2 1 1 1							1
ffβ	5	1	4 3 4 5 3 5							5	4 4 5 4 4 4							4
Cβ	2/5	4								2/5								4
Bd	15±8	10								10±8								12



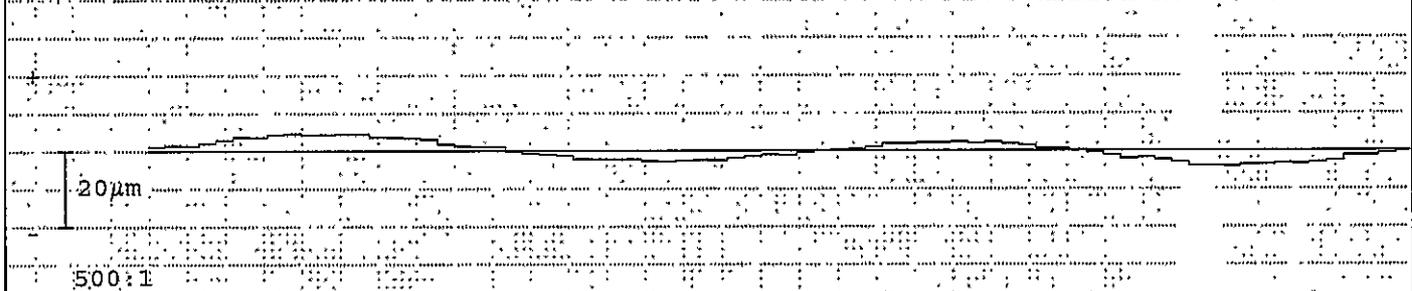


Nr. prog.:	STI0410005 0	PNC35 B4784	Controllore:	turno A	Data:	22.12.2014 15:22
Denominazione:	ring gear		Numero denti z	74	Angolo pressione	20°
Numero disegno:	250.1.3660.51-IF		Modulo m	2.3mm	Angolo elica	30°
Commessa/serie nr.:	PAPP N.4		Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: FORMER	Erzeuger:		Charge:	

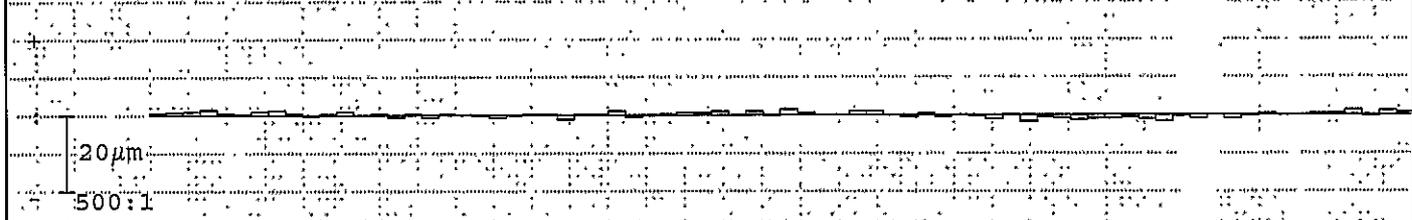
Errori singoli di divisione fp fianco sinistro



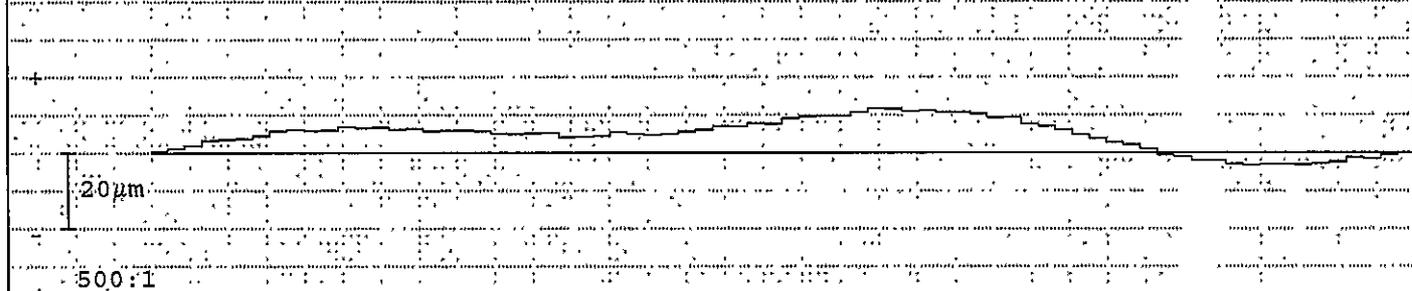
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

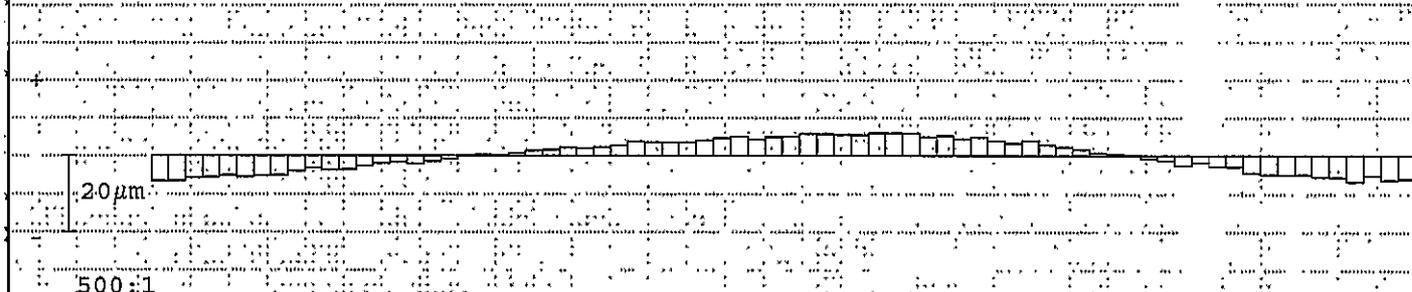


Errore somma di divisione Fp fianco destro



	fianco sinistro / TIRO				fianco destro			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	1		11		2		11	
Gr. salto di passo fu max	1		14		2		14	
Scarto di divisione Rp	2				3			
Err. globale di divisione Fp	9		45		15		45	
Err. cordale di divisione Fpz/8	6				10			

Centricità Fr (Ø-sfera =4mm) Ⓞ : 11µm



Err. di concentricità Fr	13	32	
Variab. spessore dente Rs			

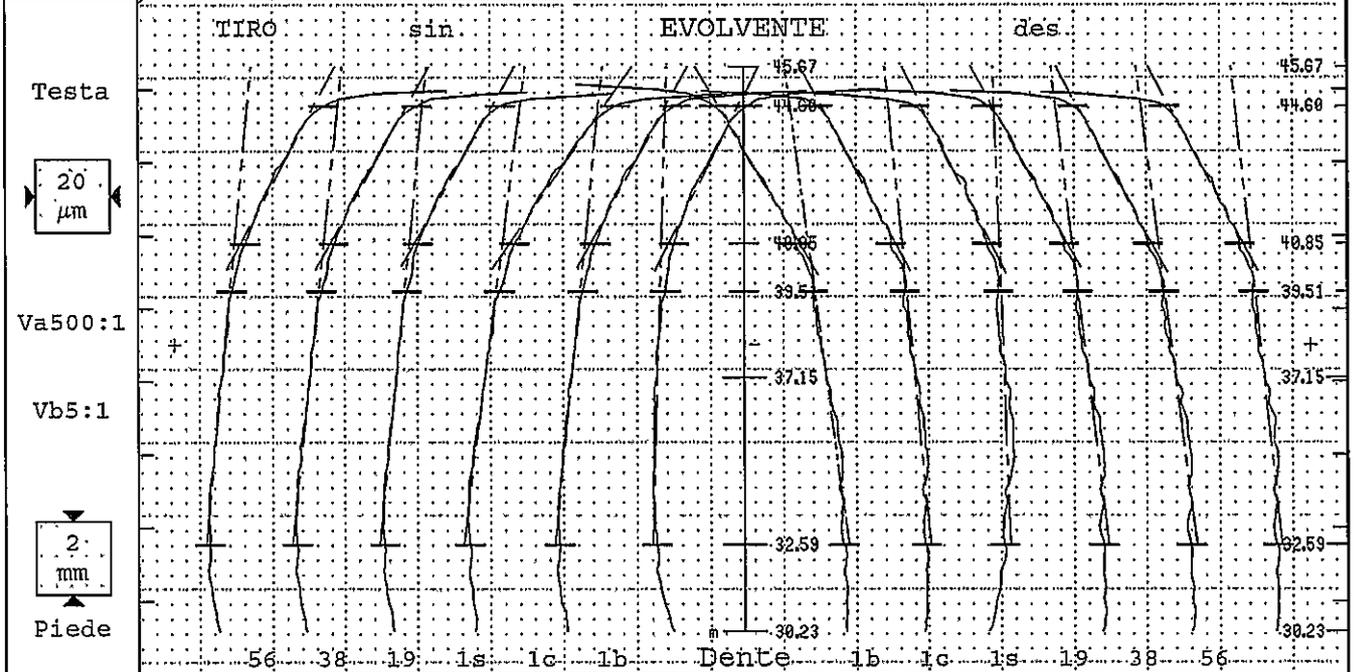


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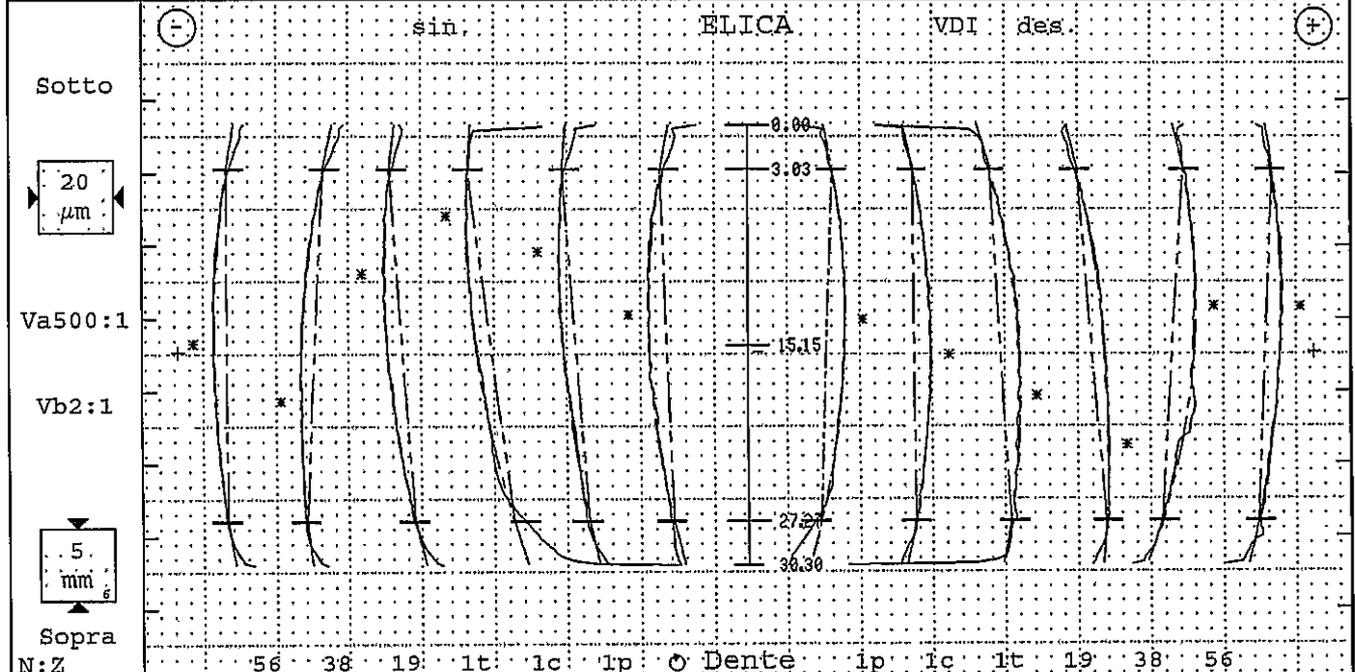
Ruota cilindrica Evolvente/Elica



Nr. prog.:	STI041005 0	PNC35 B4784	Controllore:	turno A	Data:	22.12.2014 15:37
Denominazione:	ring gear		Numero denti z	74	Largh.fasc.dent. b	30.3mm
Numero disegno.:	250.1.3660.51-IF		Modulo m	2.3mm	Tratto evolv. La	6.92mm
Commessa/serie nr.:	PAPP N.5		Angolo pressione	20°	Tratto elica Lb	24.24mm
Masch.Nr.:	M001	Spindel: Form	Angolo elica	30°	Inizio elab. M1	32.59mm
Untersuchungszweck:	Laufende Messung		Ø Base db	181.1793mm	Palpatore Ø	(#1)1mm
Werkzeug:	Charge:		Ang. Base	28.024°	Fat.scor.pr. x	-.153



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
fHm	-6±6	-7	Var 0								-6±6	Var 2							-8	
fHv	-6±5	-7	-7	-7	-7	-9	-7	-2		-6±5	-9	-7	-2	-8	-9	-7	-8			
Fσ		2	1	2	2	4	2	5			4	3	6	4	4	4	4			
ffα	5	2	2	2	2	2	2	2		5	3	3	4	4	4	4	4			
fKo	-22/-14	-19	-18	-19	-19	-23	-18	-20		-22/-14	-20	-18	-20	-17	-18	-18	-18			
P/T-φ[mm]	188.838	[188.65/189.1]								202.601	[202.6/202.9]									



fHm	-5±6	-3	Var 15								±6	Var 17							0
fHs	-5±8	-3	0	3	-9	-16	-9	-4		±8	4	-1	-7	-8	7	5	0		
Fβ	11	6	5	10	4	12	3	4		11	7	4	7	9	7	6			
ffβ	5	1	1	1	1	4	1	2		5	2	1	2	1	3	2			
CB	2/5	4	4	4	4	4	3	5		2/5	5	5	5	4	5	5			
Bd	15±8	12									10±8								11

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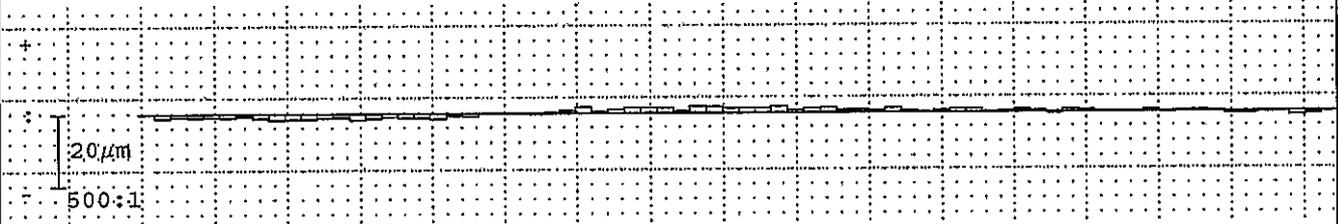
GETRAG

Ruota cilindrica Divisione

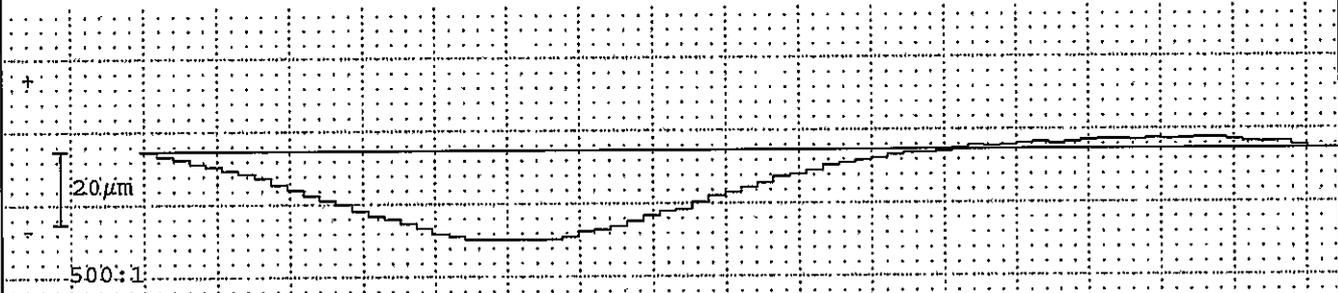


Nr. prog.:	STI0410005 0 PNC35 B4784	Controllore:	turno A	Data:	22.12.2014 15:37
Denominazione:	ring gear	Numero denti z	74	Angolo pressione	20°
Numero disegno.:	250.1.3660.51-IF	Modulo m	2.3mm	Angolo alica	30°
Commessa/serie nr.:	PAPP N.5	Untersuchungszweck:	Laufende Messung		
Masch.Nr.:	M001	Spindel: Form	entziedg:	Charge:	

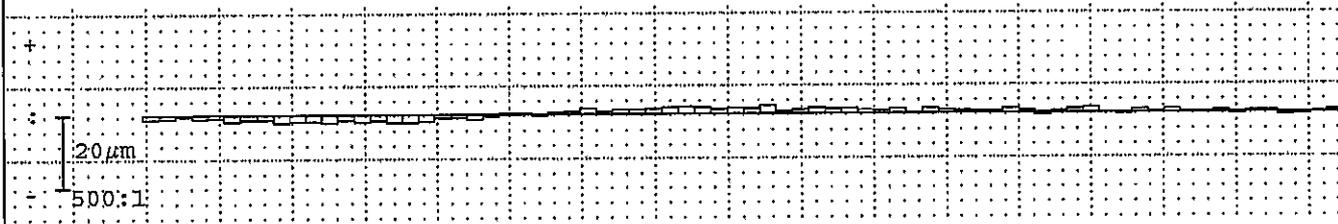
Errori singoli di divisione fp fianco sinistro



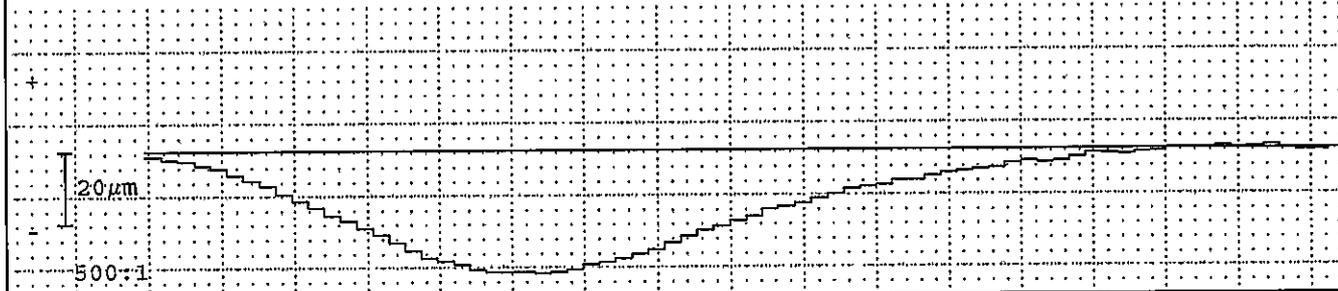
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

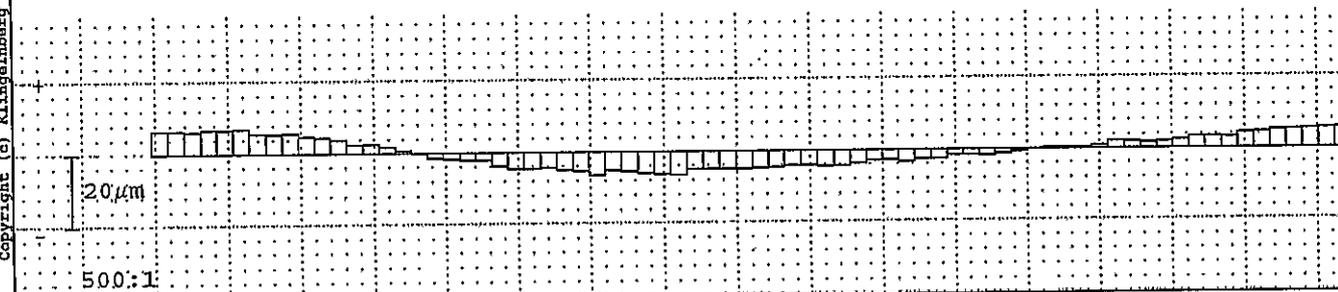


Errore somma di divisione Fp fianco destro



Corse per misura divis.: 195.822 z=15.2mm	fianco sinistro / TIRO				fianco destro			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	2		11		2		11	
Gr. salto di passo fu max	1		14		2		14	
Scarto di divisione Rp	4				4			
Err. globale di divisione Fp	27		45		35		45	
Err. cordale di divisione Fpz/8	13				18			

Centricità Fr (Ø-sfera = 4mm) © : 12µm



Err. di concentricità Fr	14	32		
Variaz. spessore dente Rs				

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Point	Caracteristic	Tolerance	Part 1	Part 2	Part 3	Part 4	Part 5
4	MDK	201,370/201,302	201,326	201,345	201,329	201,345	201,346

Manual measures by Marposs

RG 250 1 6402 00

09,Jan 2015