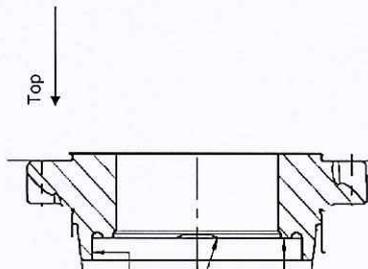
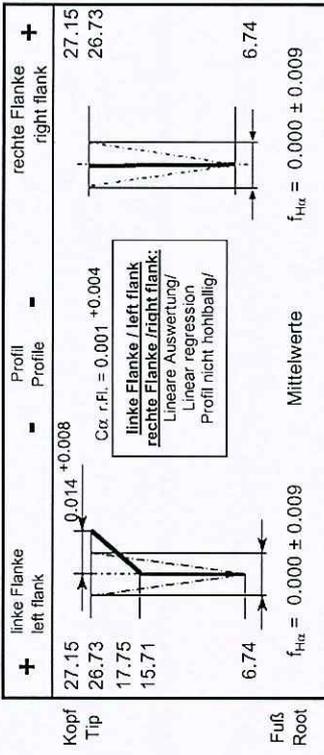


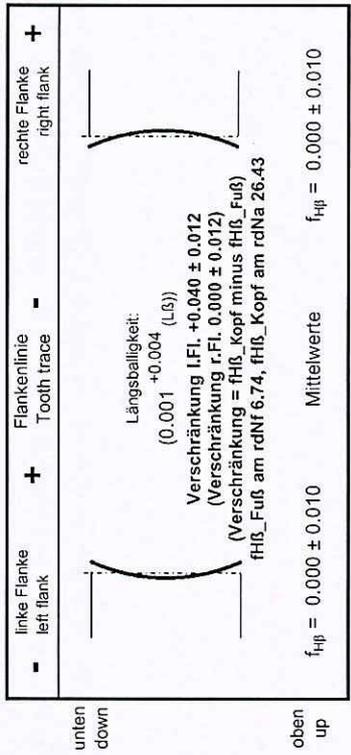
STIRNRAD		Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978)		(9)	
GEAR		gütig für Werte am Einzelzahn		Tolerances of gearing (DIN 3961 of Aug. 1978)	
valid for values at individual tooth		linke Fl. left flank	rechte Fl. right flank	linke Flanke left flank	rechte Flanke right flank
Zähnezahl Number of teeth	27			27.15	27.15
Modul Normal module	3.150000	0.016	0.016	26.73	26.73
Eingriffswinkel Normal pressure angle	17° 30' 0"			17.75	17.75
Schrägungswinkel Helix angle	20° 0' 0"	0.000 ± 0.018	0.000 ± 0.018	15.71	15.71
Steigungsrichtung Hand of helix	RECHTS	0.000 ± 0.025	0.000 ± 0.025	6.74	6.74
Profilverschiebungsfaktor Addendum modification coeff.	0.395				
Teilkreisdurchmesser Pitch diameter	90.508	0.014	0.014		
Kopfkreisdurchmesser Outside diameter	102.00 -0.20	0.071	0.071		
Kopfnutzkreis, theo. max. d _{Na} Tip diam. usable theo.	101.55				
Kopfnutzkreis, theo. min. d _{Na} Tip diam. usable theo.	101.10				
Fußkreisdurchmesser Root diameter	81.50 -0.35	9.90	9.90		
Fußnutzkreisdurchmesser Root diameter usable	86.86				
Grundkreisradius Base circle radius	42.903				
Grundkreisdurchmesser Base diameter	85.807				
Normalzahnstärke max. s _n Normal tooth thickness	5.733				
Normalzahnstärke min. s _n Normal tooth thickness	5.698				
Melzähnezahl Number of teeth spanned	4				
Zahnweite max. W _k Base tangent length	34.739				
Zahnweite min. W _k Base tangent length	34.706				
Melkugeldurchmesser Ball diameter	5.0000				
Diam. Zweikugelmaß max. M _{gk} Measurement o. balls	98.375				
Diam. Zweikugelmaß min. M _{gk} Measurement o. balls	98.286				
Verdrehtflankenspiel Circumferential backlash	0.065				
	0.175				



Profile-Messuremnet top by 7.92 mm
 Profil-Messuremnet bottom by 2.97 mm (a)
 Active flank Lβ = 4.95 mm
 L.Fl. = Zug



* Schreibbeginn Ø = 85.96 -0.30 ≈ 2.56
 * Start of checking



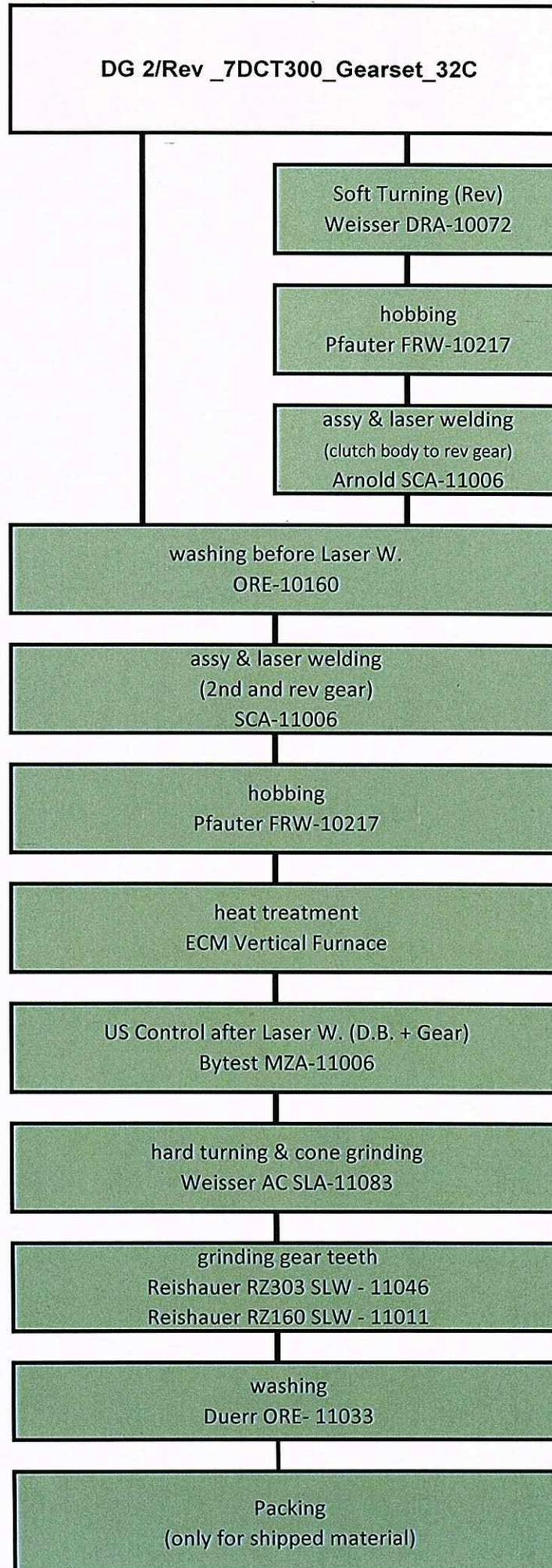
* f_{flc} (zwischen d_{Nf} und dem Schreibbeginn ds) max f_{flc2}, jedoch 0.003 zulässig
 * f_{flc} (between d_{Nf} and start of checking ds) max f_{flc2}, 0.003 allowable.
 Profil- und Flankenlinienmessung nach G_808006 und VDIN/VE 2612
 Flankenlinienprüfbereich Lβ = 0.5*b hochgerechnet auf 1.0*b (a)
 Begriffe für Stirnräder nach DIN 868, 3960, 3998

Profile and helix checking according to G_808006 and VDIN/VE 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

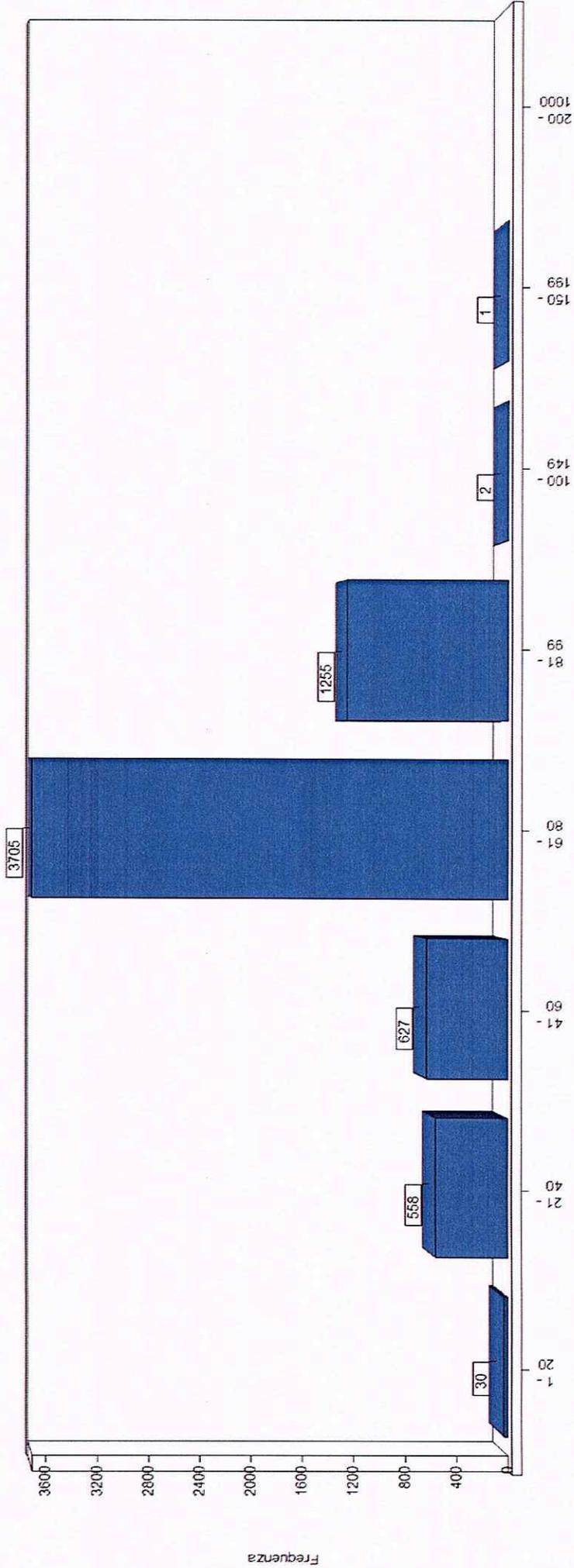
Verteller:	
	Schutzvermerk nach ISO 16016 beachten Protection per ISO 16016
	GETRAG GETRAG Getriebe- und Zahnradfabrik Hermann Hagenmeyer GmbH & Cie KG
	Remark:
	Ersatz für Erstverwendung bei Getriebe-type: 251/
Buch. Anz.	Änd.Nr.
Abbildungen sind unmaßstäblich. Diagrams not to scale.	
gez.	Datum Name
gepr.	07.12.2015 Cricenti, Fabrizio
Verzahnungsblatt Endkontrolle Final Check Gear Data	
Benennung: Naming: Zahnrad RWG	
Zeichnungsnummer: Drawing number: 251.1.1085.00	

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

Wkz-Profil siehe Werkzeugdatenblatt Nr. 251.1.1085.00
 For Tooth profile, see tool data sheet number



		FMEA Processo		Numero: Pagina: 1.2.1.1.1.1
Tipo/Modello/Produzione/Lotto: 7DCT300	Numero Disegno: Gearset 1A + 21A + 21H + 32C 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., Terlizze, Landriscina, Guerra, Sinibaldi, Capomio, Vicenti, Picerno, Pierro, Cacciapaglia, Sisto. Ditta:	Emesso: Modificato: 13/01/2017 14/05/2018	



Record Owner: Vicenti D.	Date Issued: 06.03.2017	GIS1 Item Number: 28.04	Page: 1 / 2
Dept.: WLP	Date Revised: 14.05.2018	GIS2 Classification: Confidential	Retention Start Date (Year): 2017

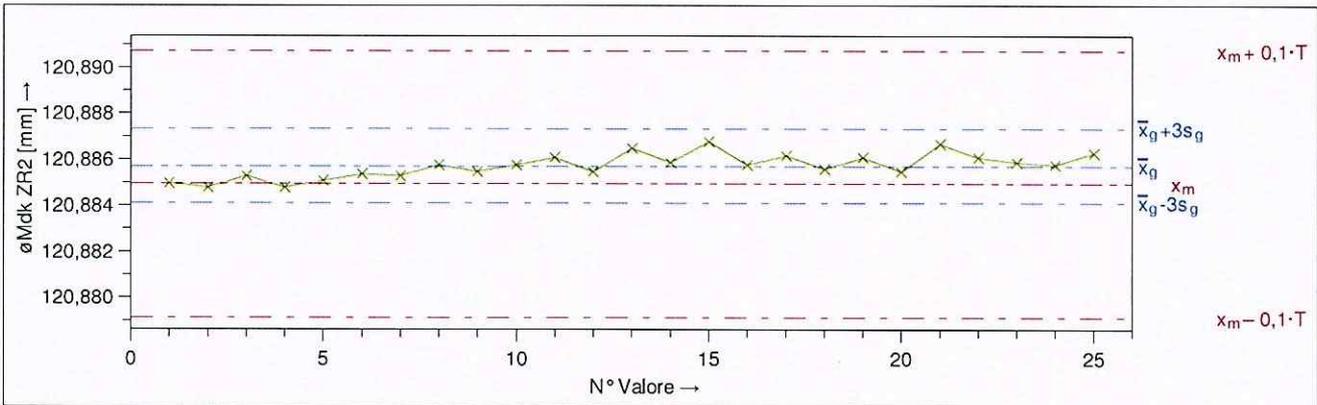
Actions ongoing for RPN > 100:

Chr. Classification	Project	Component	Operation	Chr. Description	Actual RPN			Action	Resp.	Due date	Min. RPN expected				
					S	O	D				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	Pierro	31-May-18	7	2	5	(70)
<M>	DCT300	SGRv	Hard Turning	Clutch body Height	7	3	5	105	Final drawing tolerance review + Dogbody height review on EP (100% Check --> Sampling check)	Pierro	30-Jun-18	7	2	5	(70)
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	31-Jul-18	8	3	5	(120)
									New machine Junker implementation for Diam. grinding operation		31-Aug-18	8	2	5	(80)

Record Owner: Vicenti D.	Date Issued: 06.03.2017	GIS1 Item Number: 28.04	Page: 2 / 2
Dept.: WLP	Date Revised: 14.05.2018	GIS2 Classification: Confidential	Retention Start Date (Year): 2017



Data/ora	26/04/2018	Nome oper.	mario.bozza	Reparto/Area/Prod.	WLQ	Posto di prova	Rettifica denti ZRO
Calibro		Master			Caratteristica		
Desc. calibro	Banchetto in acciaio	Desc. mast.	Master Mdk ZR2		Desc. Car.	øMdk ZR2	
N° calibro	MVZ 406001 006	N° master	MVZ 400659 002		N° Caratt.	2511124750_32C	
Ris. calibro	0,0001	Valore reale mast.	120,885		Val. Nom.	120,9090 LSS	120,938 $\hat{=}$ 0,0290
Caus. Pr.	Cg CgK	Unità di misura	mm		Unità di rr mm	LSI	120,880 $\hat{=}$ -0,0290
Nota							



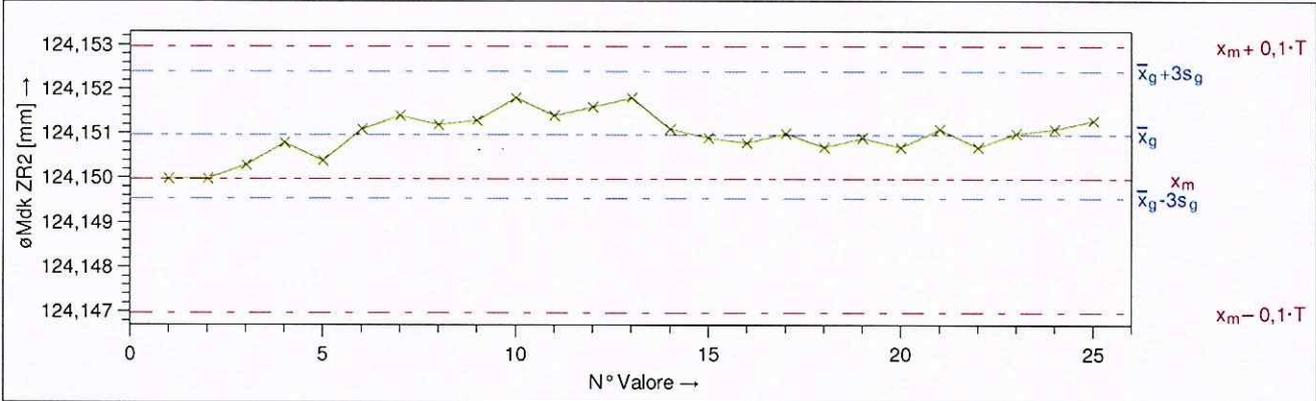
i	x _i	i	x _i	i	x _i	i	x _i	i	x _i
1	120,8850	6	120,8854	11	120,8861	16	120,8858	21	120,8867
2	120,8848	7	120,8853	12	120,8855	17	120,8862	22	120,8861
3	120,8853	8	120,8858	13	120,8865	18	120,8856	23	120,8859
4	120,8848	9	120,8855	14	120,8859	19	120,8861	24	120,8858
5	120,8851	10	120,8858	15	120,8868	20	120,8855	25	120,8863

Valori a disegno		Valori Calcolati		Statistiche	
x _m +0,1·T	= 120,890800	x _{maxg}	= 120,8868	\bar{x}_g+3s_g	= 120,887367
x _m	= 120,885000	x _{min g}	= 120,8848	\bar{x}_g	= 120,885744
x _m -0,1·T	= 120,879200	R _g	= 0,0020	\bar{x}_g-3s_g	= 120,884121
0,2·T	= 0,011600	n _{tot}	= 25	6s _g	= 0,003245
T	= 0,0580			s _g	= 0,000541
Unità di misura	= mm			B _i	= 0,00074400
				n _{eff}	= 25
Test per Bias				Risultati del test : significativo (α ≤ 0,1%)	
Bias		=	1,28%		
Minimo riferimento per sistema di misura capace					
Risoluzione	%RE =	0,17%		T _{min} (%RE)	= 0,00200
$C_g = \frac{0,2 \cdot T}{4 \cdot s_g}$	=	3,85 ≤ 5,36 ≤ 6,87		T _{min} (C _g)	= 0,0144
$C_{gk} = \frac{0,1 \cdot T - \bar{x}_g - x_m }{2 \cdot s_g}$	=	3,35 ≤ 4,67 ≤ 6,00		T _{min} (C _{gk})	= 0,0218
Sistema di misura capace (%RE,min,C _g ,C _{gk})					
<input type="checkbox"/> GETRAG MSA 2017: Capability of measuring system (Type-1 Study)					



Capacità strumenti di misura

Data/ora	12/06/2018	Nome oper.	mario.bozza	Reparto/Area/Prod.	WLQ	Posto di prova	Dentatura ZR2
Calibro		Master			Caratteristica		
Desc. calibro	Banchetto in acciaio	Desc. mast.	ZR2	Desc. Car.	øMdk ZR2		
N° calibro	MVZ 406001 029	N° master	MVZ 400659 001	N° Caratt.	2511124750_32C		
Ris. calibro	0,0001	Valore reale mast.	124,15	Val. Nom.	121,4300 LSS	121,445	$\hat{=} 0,0150$
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di r	mm LSI	121,415	$\hat{=} -0,0150$
Nota							



i	x _i	i	x _i	i	x _i	i	x _i	i	x _i
1	124,1500	6	124,1511	11	124,1514	16	124,1508	21	124,1511
2	124,1500	7	124,1514	12	124,1516	17	124,1510	22	124,1507
3	124,1503	8	124,1512	13	124,1518	18	124,1507	23	124,1510
4	124,1508	9	124,1513	14	124,1511	19	124,1509	24	124,1511
5	124,1504	10	124,1518	15	124,1509	20	124,1507	25	124,1513

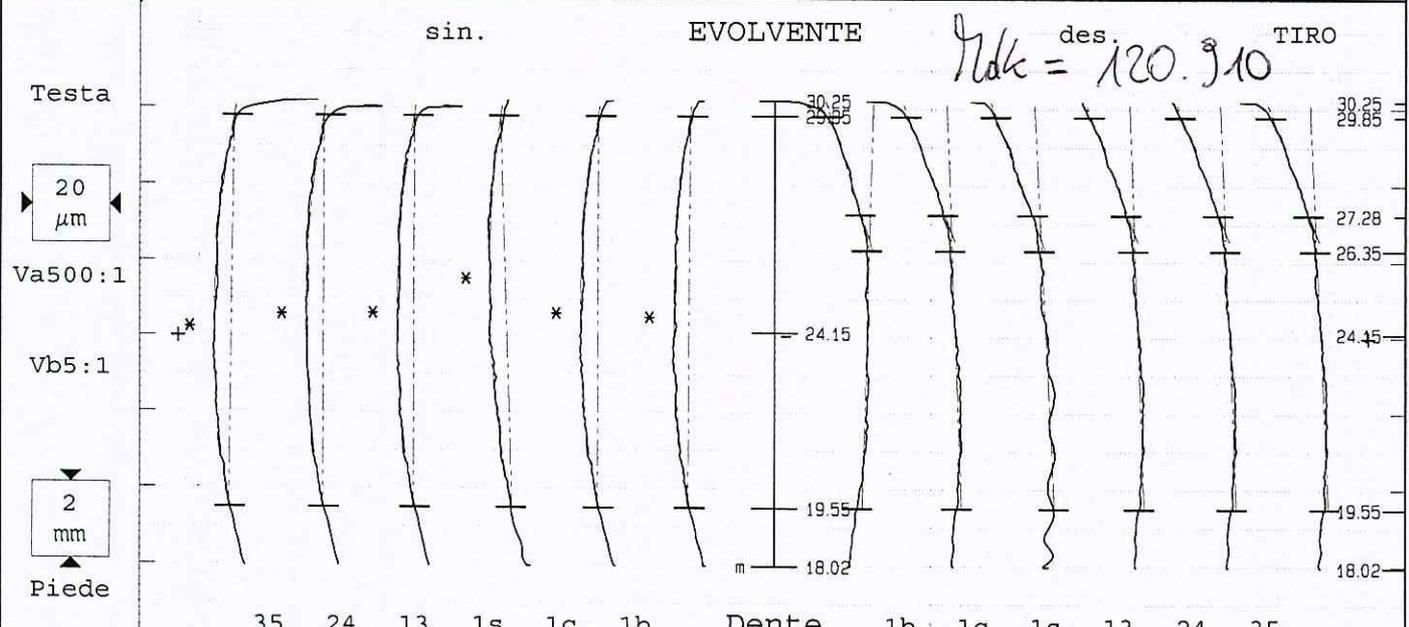
Valori a disegno		Valori Calcolati		Statistiche	
$x_m + 0,1 \cdot T$	= 124,153000	$x_{max\ g}$	= 124,1518	$\bar{x}_g + 3s_g$	= 124,152402
x_m	= 124,150000	$x_{min\ g}$	= 124,1500	\bar{x}_g	= 124,150976
$x_m - 0,1 \cdot T$	= 124,147000	R_g	= 0,0018	$\bar{x}_g - 3s_g$	= 124,149550
$0,2 \cdot T$	= 0,006000	n_{tot}	= 25	$6s_g$	= 0,002853
T	= 0,0300			s_g	= 0,000475
Unità di misura	= mm			$ Bi $	= 0,00097600
				n_{eff}	= 25
Test per Bias				Risultati del test : significativo ($\alpha \leq 0,1\%$)	
Bias		=	3,25%	Minimo riferimento per sistema di misura capace	
Risoluzione	%RE = 0,33%			$T_{min} (\%RE)$	= 0,00200
$C_g = \frac{0,2 \cdot T}{4 \cdot s_g}$	= 2,27 \leq 3,15 \leq 4,04			$T_{min} (C_g)$	= 0,0127
$C_{gk} = \frac{0,1 \cdot T - \bar{x}_g - x_m }{2 \cdot s_g}$	= 1,51 \leq 2,13 \leq 2,74			$T_{min} (C_{gk})$	= 0,0224
Sistema di misura capace (%RE,min,Cg,Cgk)					
<input type="checkbox"/> GETRAG MSA 2017: Capability of measuring system (Type-1 Study)					

Docum. archiviato elettronicamente. Archiviazione cartacea non necessaria

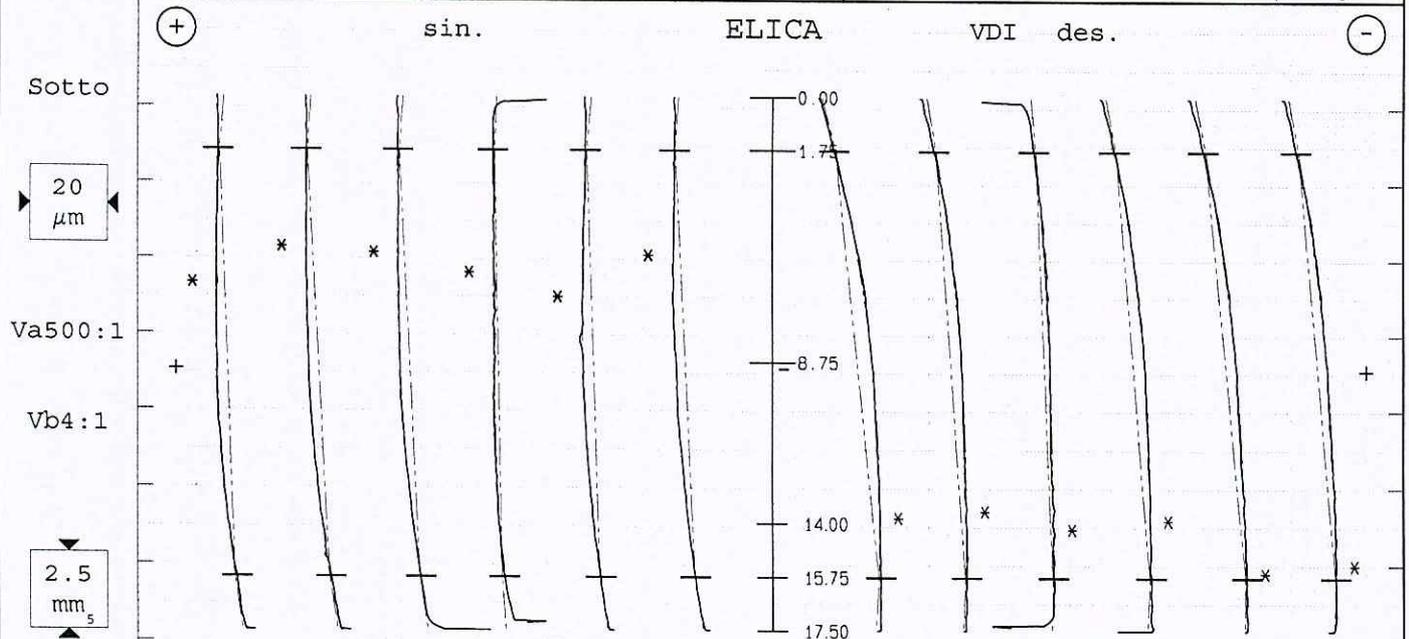
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0416b04 0	P26 601265	Controllore: Turno B	Data: 20.04.2018 12:12
Denominazione: ZR2		Numero denti z 45	Largh. fasc. dent. b 17.5mm
Numero disegno.: D51.1.1247.50-IF		Modulo m 2.3mm	Tratto evol. La 10.3/6.8mm
Comessa/serie nr.: 2 - A		Angolo pressione 20°00'00"	Tratto elica L _E 14mm
Masch. Nr.: M001	Spindel: Formner	Angolo elica -24°00'00"	Inizio elab. M1 19.55mm
Untersuchungszweck: Laufende Messung		Ø Base db 105.2491mm	Palpatore Ø (#2) 1mm
Werkzeug:	Charge:	Ang. Base -22°28'14"	Fat. scor. pr. x .546



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
fH _{am}	±6	-0.5	Var a 1.3								±6	Var a 1.0							-4.2	
fH _a	±8	-0.5	-1.4	-0.2	-0.1	3.0	-0.1	-0.5		±8	2.6	-3.9	-5.2	-3.8	-4.2	-4.8	-4.2			
F _a		2.3	2.7	2.8	2.0	3.1	1.5	1.4			3.0	3.1	4.2	3.1	3.2	3.4	3.2			
ff _a	5	1.7	1.4	2.5	1.7	1.4	1.3	1.2		5	2.3	2.2	3.1	2.3	2.1	1.9	2.1			
ca	4±2	4.5	4.5	4.6	4.4	4.4	4.5	4.0												
Ca										-14/-6	-11.1	-10.3	-10.3	-10.3	-10.2	-10.1	-10.2			
ff _{af}	3	0.0	0.0	0.0	0.0	0.4	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
P/T-Ø [mm]		109.293	[109.1/109.4]									121.841	[121.74/122]							



N:Z		35	24	13	1t	1c	1p	Ø Dente	1p	1c	1t	13	24	35				
fH _{βm}	5±4	5.7	Var β 2.9							10±4	Var β 3.3							11.4
fH _β	5±8	5.7	5.0	7.1	6.6	2.5	4.2	6.4	10±8	14.2	9.6	5.5	10.9	12.9	12.1	11.4		
F _β		2.7	2.6	3.1	2.7	1.9	2.3	2.4		5.2	2.5	3.4	3.0	3.6	3.2	3.1		
ff _β	5	1.0	1.0	0.9	0.9	1.1	1.0	0.5	5	1.0	1.0	1.0	0.9	1.1	1.1	1.0		
c _β	1/5	2.7	2.7	2.6	2.6	1.2	2.7	2.5	1/5	3.9	2.7	1.4	3.0	2.6	2.5	2.7		
FV	-8±8	-3.9							-8±8							-8.7		

GCG 808006

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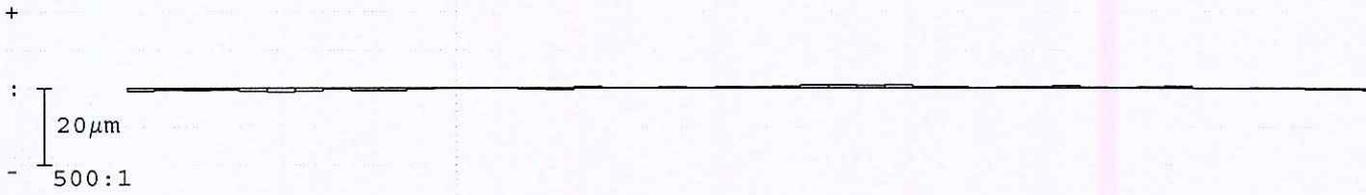


Ruota cilindrica Divisione

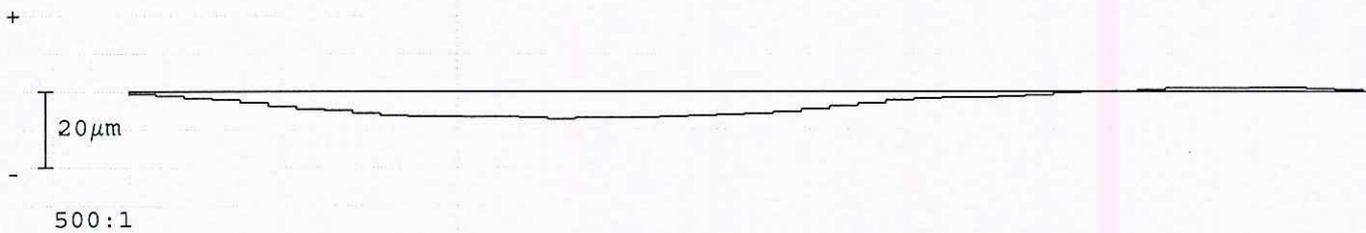


Nr. prog.: STI0416b04 0	P26 601265	Controllore: Turno B	Data: 20.04.2018 12:12
Denominazione: ZR2		Numero denti z 45	Angolo pressione 20°00'00"
Numero disegno: D51.1.1247.50-IF		Modulo m 2.3mm	Angolo elica -24°00'00"
Comessa/serie nr.: 2		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Formelwerkzeug	Charge:	

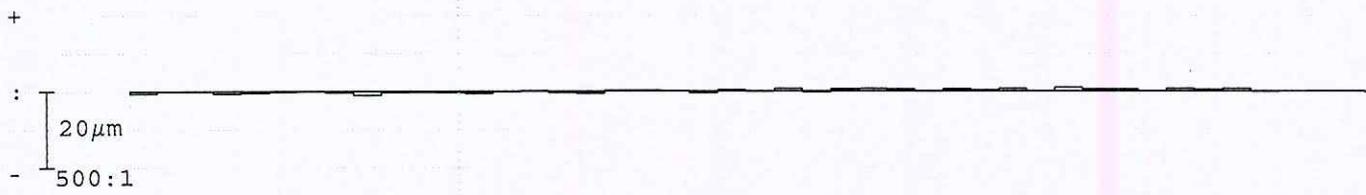
Errori singoli di divisione fp fianco sinistro



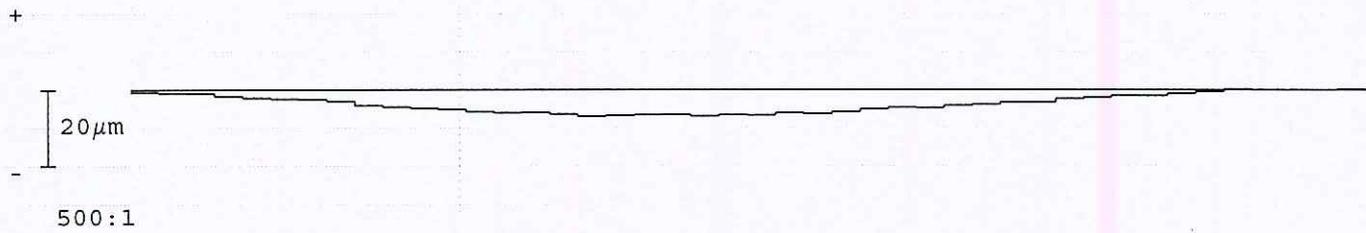
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

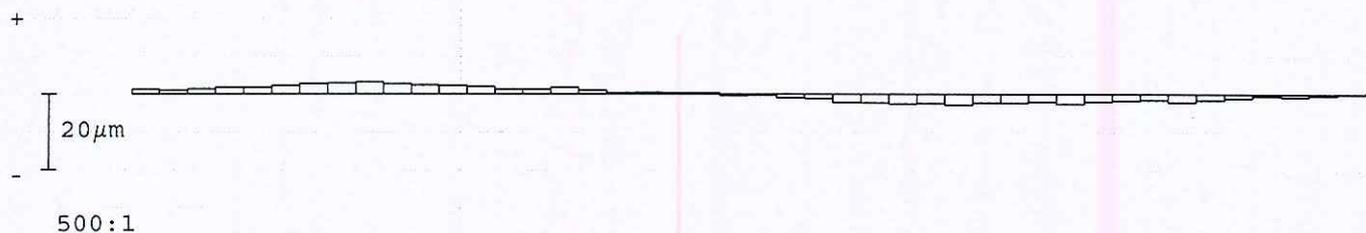


Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 115.803 z=14mm	fianco sinistro				fianco destro / TIRO			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	1.0		10.0		1.2		10.0	
Gr. salto di passo fu max	0.7		12.0		0.9		12.0	
Scarto di divisione Rp	1.9				2.1			
Err. globale di divisione Fp	8.4		36.0		7.2		36.0	
Err. cordale di divisione Fpz/8	4.1				3.3			

Centricità Fr (Ø-sfera =4mm) \odot : 4.9µm



Err. di concentricità Fr	6.0	28.0	
Variiaz. spessore dente Rs			

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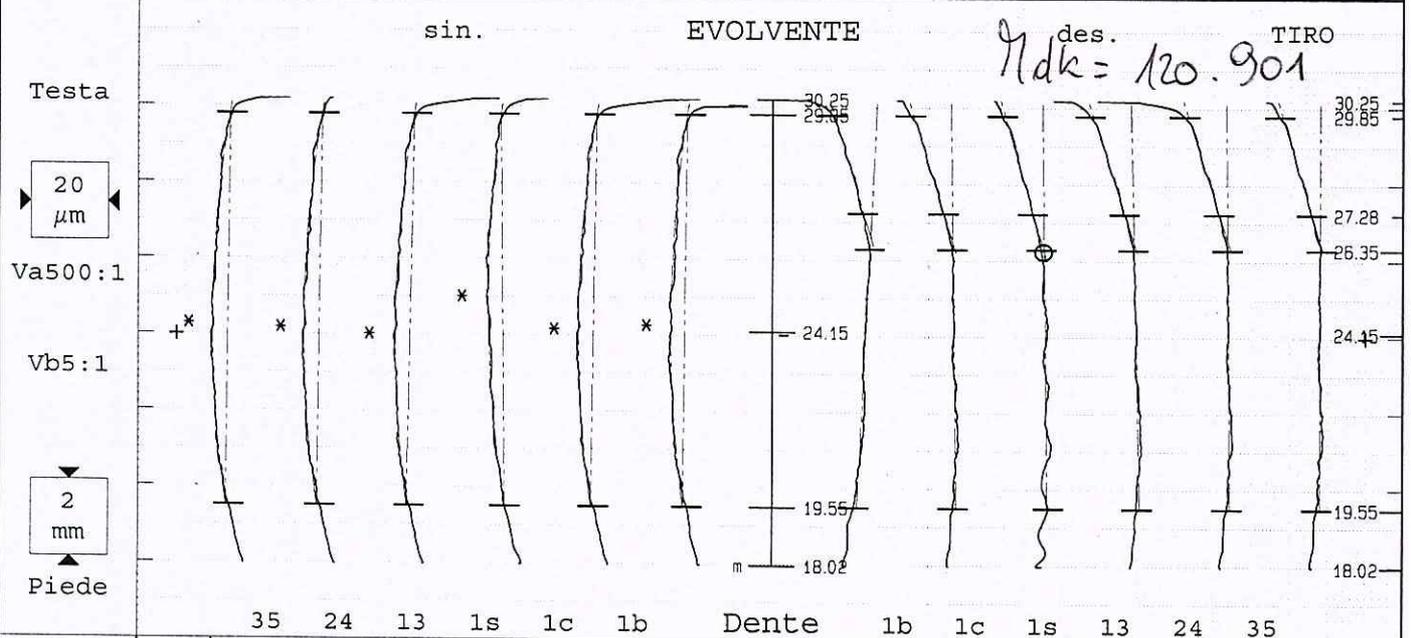
Docum.archiviato elettronicamente.Archiviazione cartacea non necessaria



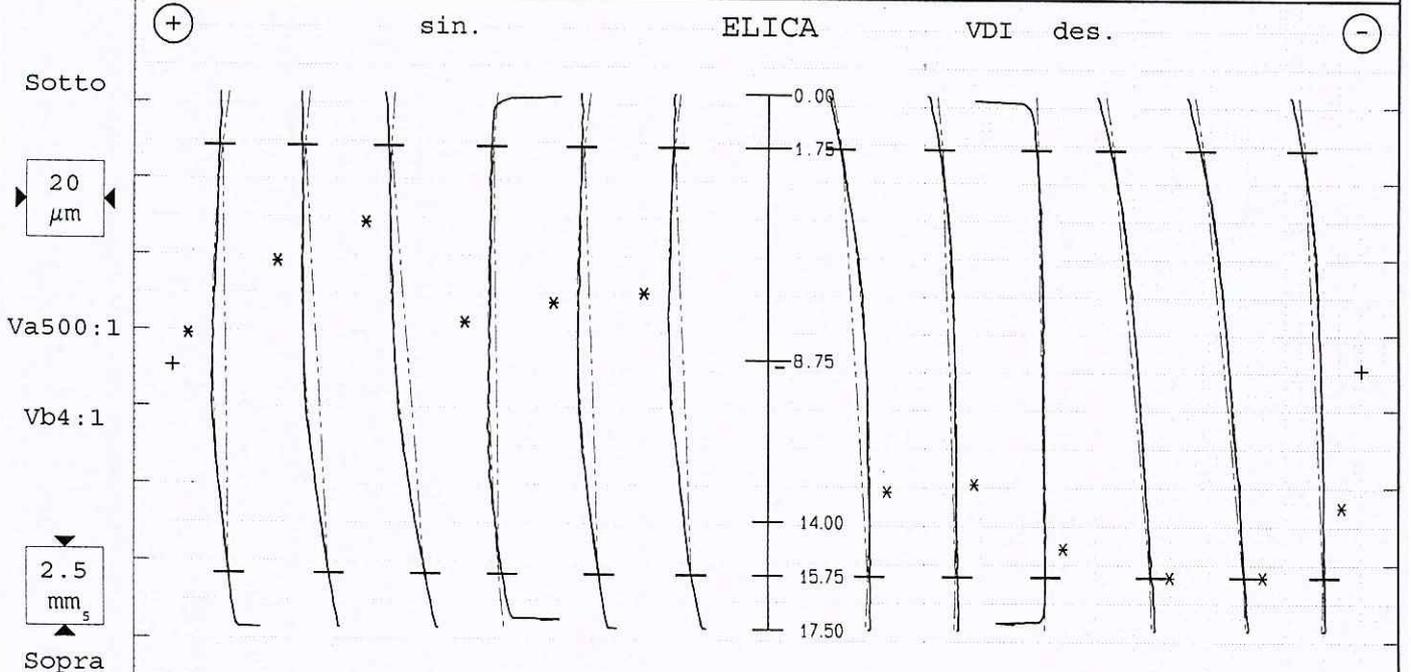
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0416b04 0		P26 601265		Controllore: Turno A		Data: 20.04.2018 11:57					
Denominazione: ZR2		Numero denti z		45		Largh. fasc. dent. b		17.5mm			
Numero disegno.: D51.1.1247.50-IF		Modulo m		2.3mm		Tratto evolv. La		10.3/6.8mm			
Comessa/serie nr.: 4 - 2		Angolo pressione		20°00'00"		Tratto elica L&		14mm			
Masch. Nr.: M001		Spindel: Formelettrolitica		-24°00'00"		Inizio elab. M1		19.55mm			
Untersuchungszweck: Laufende Messung		Ø Base db		105.2491mm		Palpatore Ø		(#2) 1mm			
Werkzeug:		Charge:		Ang. Base		-22°28'14"		Fat. scor. pr. x		.546	



	Tolerance	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
		Medio	Var a								Medio	Var a								
fH _{om}	±6	-1.5	0.8								±6	2.5							-1.2	
fH _a	±8	-1.5	-1.1	-1.4	-1.9	1.1	-1.5	-1.0		±8	5.0	-1.5	-1.3	-2.4	-1.0	0.1	-1.2			
F _a		2.4	1.9	2.2	2.9	1.7	2.4	2.0			4.3	1.8	2.7	2.2	1.6	1.7	1.8			
ff _a	5	1.5	1.6	1.7	1.4	1.4	1.4	2.1		5	1.7	1.7	2.6	1.6	1.7	1.6	1.7			
ca	4±2	4.0	4.0	4.0	3.9	3.8	3.9	3.7												
Ca										-14/-6	-11.1	-9.9	-9.8	-9.9	-10.0	-9.9	-9.9			
ffa _f	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.3	0.0	0.0	0.0	0.0			
P/T-Ø [mm]		109.297 [109.1/109.4]									121.845 [121.74/122]									



	Tolerance	Var β							Qual	Tolerance	Var β							Medio	Qual	
		Medio	Var β								Medio	Var β								
fH _{βm}	5±4	6.3	9.0								10±4	8.7							8.9	
fH _β	5±8	6.3	1.9	7.7	10.9	1.7	4.5	5.4		10±8	8.6	4.5	2.2	11.9	13.2	6.0	8.9			
F _β		4.3	3.6	3.9	6.9	3.0	2.9	2.9			2.5	3.8	5.7	3.3	4.2	3.1	3.6			
ff _β	5	1.4	1.4	1.3	1.4	1.7	1.4	0.9		5	1.1	1.4	1.0	1.4	1.3	1.4	1.4			
c _β	1/5	3.4	3.4	3.4	3.4	2.1	3.4	3.5		1/5	2.8	1.5	0.5	1.4	1.5	1.8	1.6			
FV	-8±8	-3.7								-8±8										

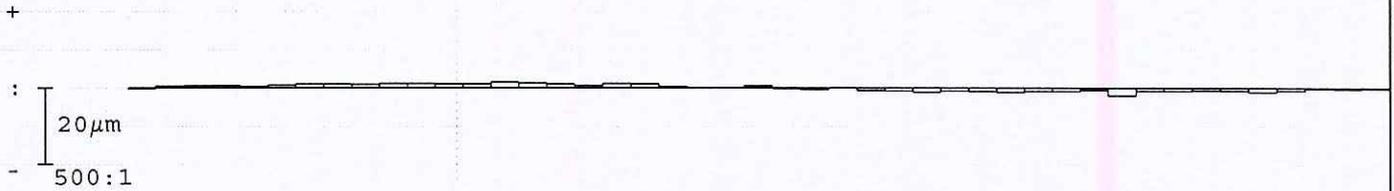


Ruota cilindrica Divisione

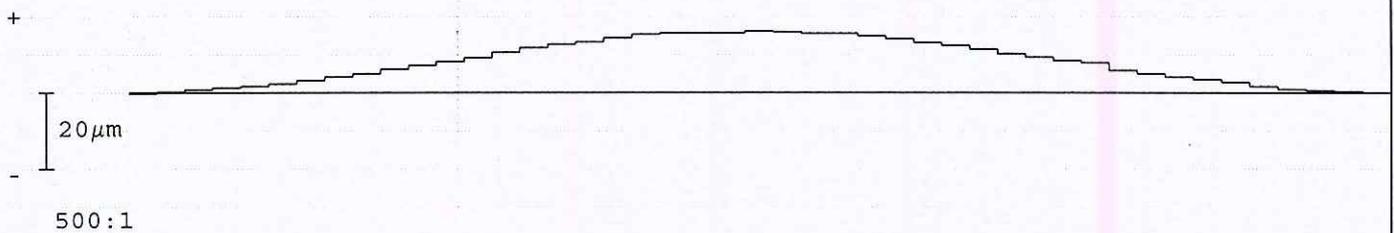


Nr. prog.: STI0416b04 0	P26 601265	Controllore: Turno A	Data: 20.04.2018 11:57
Denominazione: ZR2		Numero denti z 45	Angolo pressione 20°00'00"
Numero disegno.: D51.1.1247.50-IF		Modulo m 2.3mm	Angolo elica -24°00'00"
Commessa/serie nr.: 4		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Formwerkzeug	Charge:	

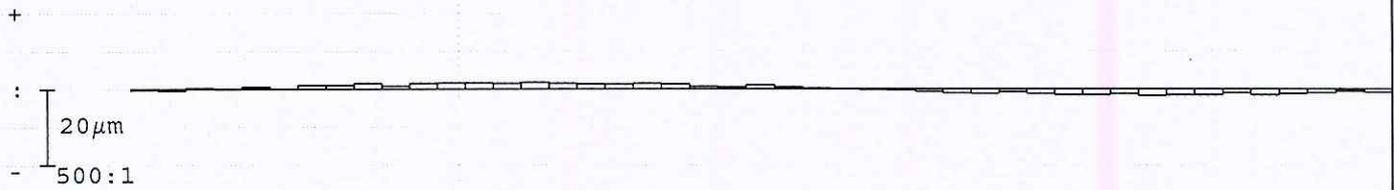
Errori singoli di divisione fp fianco sinistro



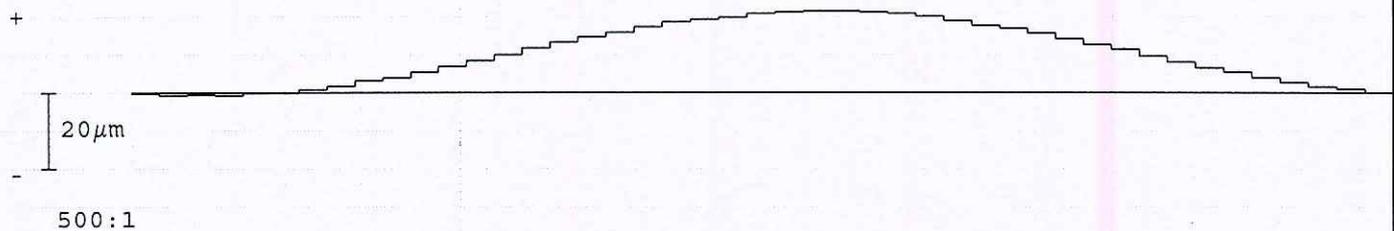
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



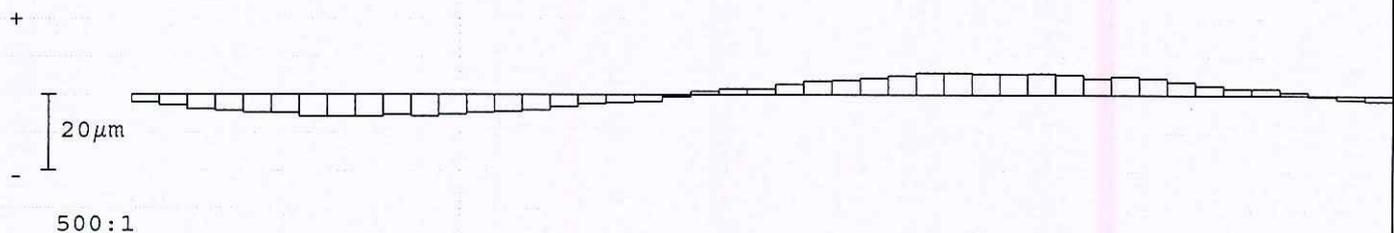
Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 115.803 z=14mm	fianco sinistro				fianco destro / TIRO			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	2.0		10.0		1.8		10.0	
Gr. salto di passo fu max	1.4		12.0		1.0		12.0	
Scarto di divisione Rp	3.4				3.6			
Err. globale di divisione Fp	16.4		36.0		22.2		36.0	
Err. cordale di divisione Fpz/8	6.8				9.4			

Centricità Fr (Ø-sfera =4mm)

⊙ : 11.3µm

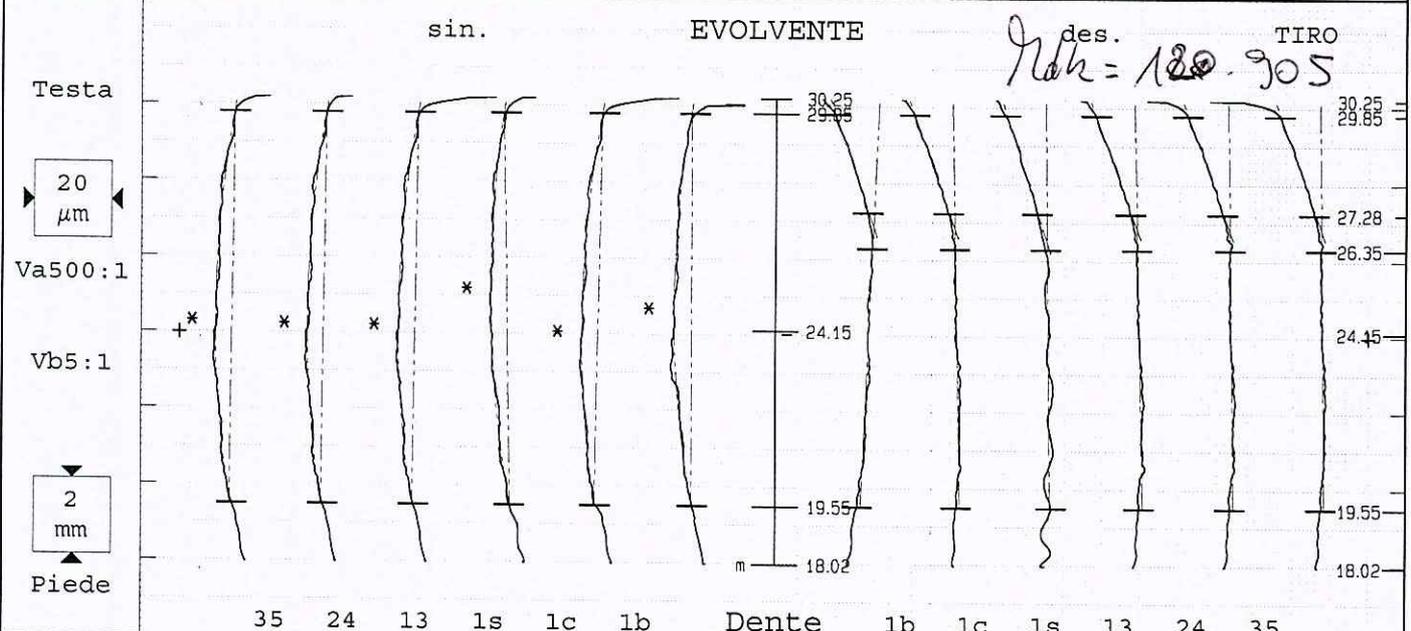


Err. di concentricità Fr	11.6	28.0	
Variab. spessore dente Rs			

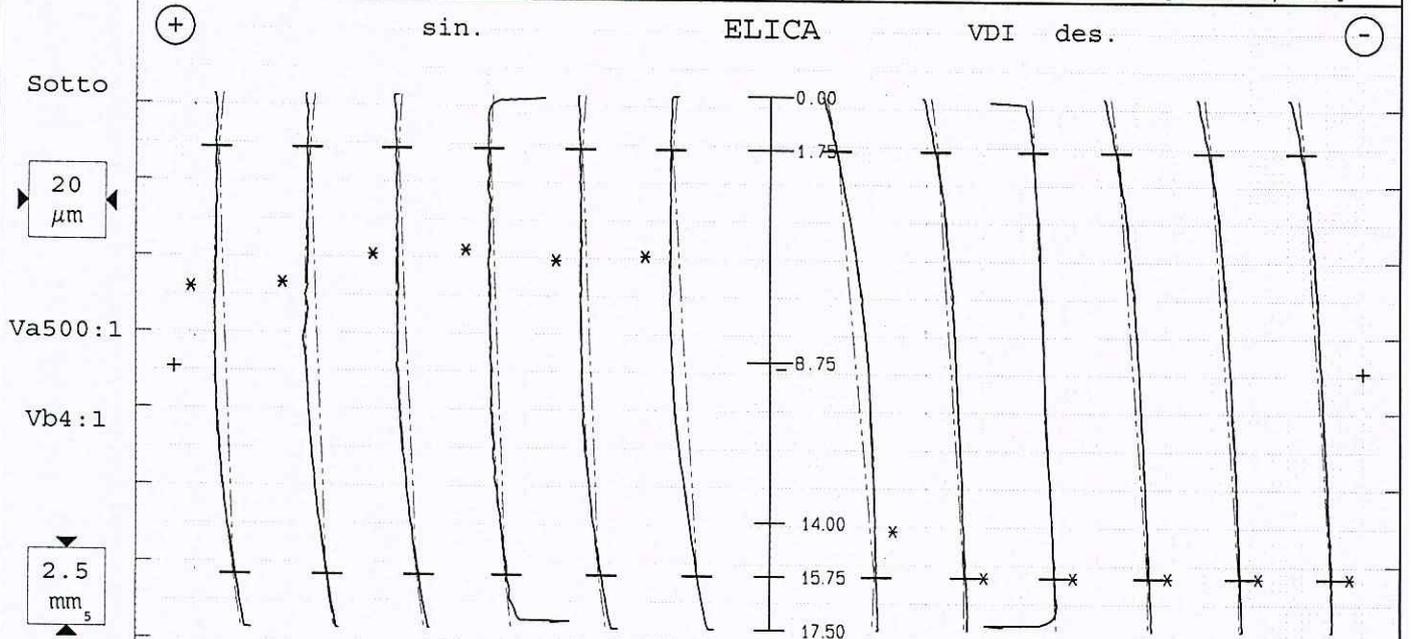
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0416b04 0	P26 601265	Controllore: Turno A	Data: 20.04.2018 11:46
Denominazione: ZR2		Numero denti z 45	Largh.fasc.dent. b 17.5mm
Numero disegno.: D51.1.1247.50-IF		Modulo m 2.3mm	Tratto evol. La 10.3/6.8mm
Commissa/serie nr.: 6-3		Angolo pressione 20°00'00"	Tratto elica Ls 14mm
Masch.Nr.: M001	Spindel: Formelettrolitica	Angolo elica -24°00'00"	Inizio elab. M1 19.55mm
Untersuchungszweck: Laufende Messung	Ø Base db 105.2491mm		Palpatore Ø (#2) 1mm
Werkzeug:	Charge:	Ang. Base -22°28'14"	Fat.scor.pr. x .546



	Tolerance	Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
			Var a 0.8								Var a 1.1							
fHm	±6	-1.4								±6							-1.8	
fHa	±8	-1.4	-1.1	-1.3	-1.4	1.8	-1.9	0.2		±8	4.5	-2.1	-1.2	-2.3	-1.5	-1.2	-1.8	
Fa		2.5	2.3	2.3	2.5	2.6	2.7	2.6			3.9	2.0	2.4	2.5	1.8	1.6	2.0	
ffa	5	1.6	1.6	1.7	1.7	1.6	1.4	2.2		5	2.0	1.8	2.5	2.2	2.0	1.7	1.9	
ca	4±2	4.3	4.3	4.2	4.4	4.2	4.2	4.6										
Ca										-14/-6	-11.3	-10.1	-10.3	-10.3	-10.5	-10.5	-10.4	
ffaf	3	0.0	0.0	0.0	0.0	0.1	0.0	0.0		3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	
P/T-Ø [mm]		109.284	[109.1/109.4]								121.838	[121.74/122]						



	Tolerance	Medio	Val.misur [µm]						Qual	Tolerance	Val.misur [µm]						Medio	Qual
			Var β 1.2								Var β 1.1							
fHβm	5±4	5.5								10±4							9.3	
fHβ	5±8	5.5	4.9	5.4	6.1	5.0	5.5	8.1		10±8	12.3	8.8	6.6	9.9	9.3	9.0	9.3	
Fβ		2.9	2.6	3.4	2.9	2.0	2.5	3.7			3.4	1.4	2.7	1.4	1.2	1.1	1.3	
ffβ	5	1.4	1.2	1.5	1.3	1.4	1.4	1.0		5	0.9	1.1	0.9	1.0	1.0	1.3	1.1	
cβ	1/5	2.7	2.8	3.0	2.5	1.9	2.3	3.3		1/5	3.1	1.5	0.1	1.6	1.4	1.0	1.4	
FV	-8±8	-3.1								-8±8							-5.7	

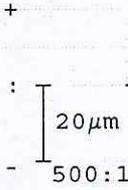


Ruota cilindrica Divisione

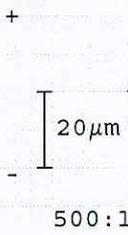


Nr. prog.: STI0416b04 0	P26 601265	Controllore: Turno A	Data: 20.04.2018 11:46
Denominazione: ZR2		Numero denti z 45	Angolo pressione 20°00'00"
Numero disegno.: D51.1.1247.50-IF		Modulo m 2.3mm	Angolo elica -24°00'00"
Comessa/serie nr.: 6		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Formel	Gezdg:	Charge:

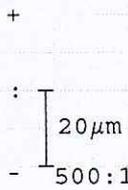
Errori singoli di divisione fp fianco sinistro



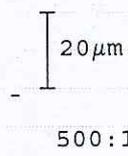
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

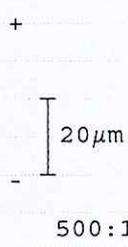


Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 115.803 z=14mm	fianco sinistro				fianco destro / TIRO			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	0.4		10.0		0.5		10.0	
Gr. salto di passo fu max	0.8		12.0		0.7		12.0	
Scarto di divisione Rp	0.8				0.9			
Err. globale di divisione Fp	2.0		36.0		2.8		36.0	
Err. cordale di divisione Fpz/8	1.2				1.3			

Centricità Fr (Ø-sfera =4mm) \odot : 1.1µm



Err. di concentricità Fr	1.5	28.0	
Variab. spessore dente Rs			

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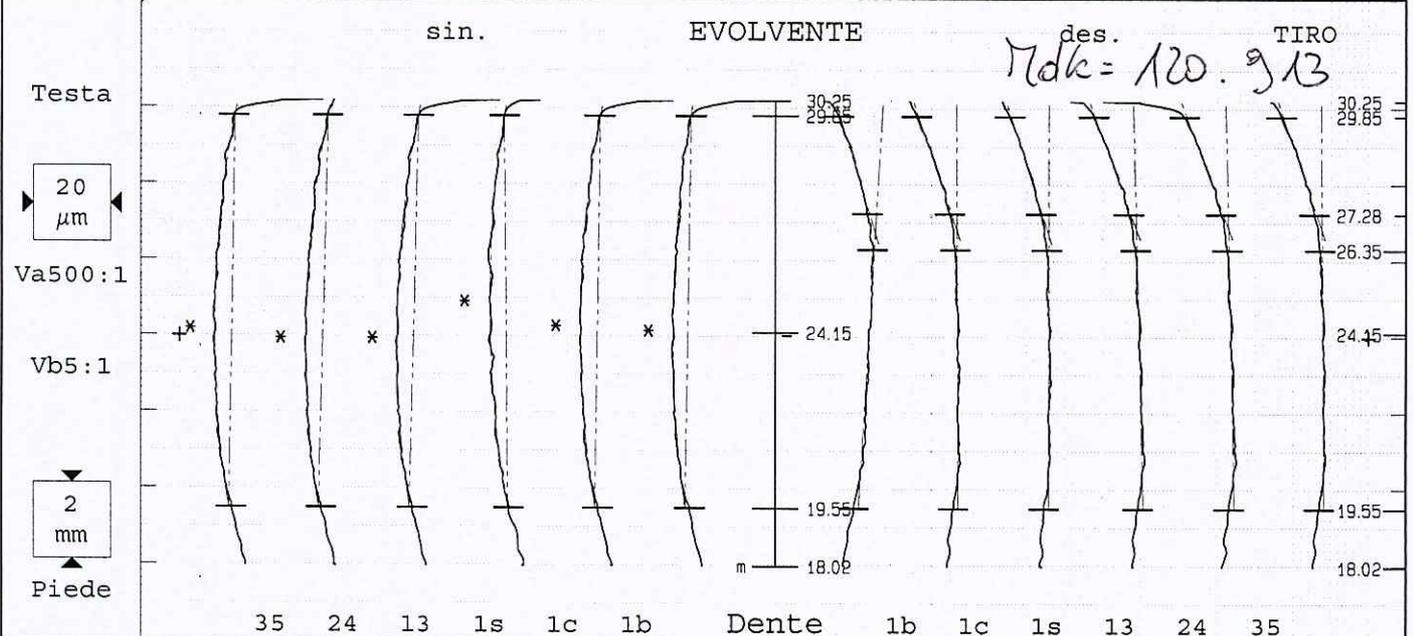
Docum.archiviato elettronicamente.Archiviazione cartacea non necessaria



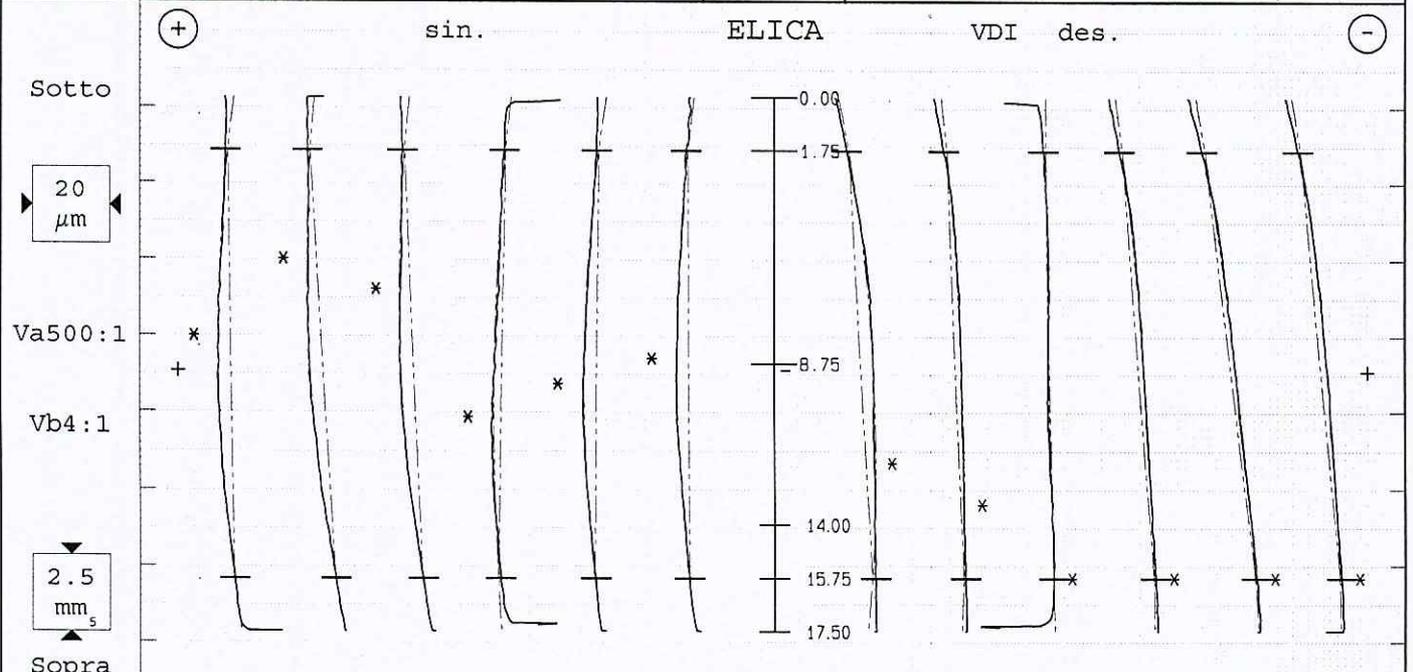
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0416b04 0	P26 601265	Controllore: Turno A	Data: 20.04.2018 11:22
Denominazione: ZR2		Numero denti z 45	Largh.fasc.dent. b 17.5mm
Numero disegno.: D51.1.1247.50-IF		Modulo m 2.3mm	Tratto evolv. La 10.3/6.8mm
Comnessa/serie nr.: 10 - 4		Angolo pressione 20°00'00"	Tratto elica L&S 14mm
Masch.Nr.: M001	Spindel: Formata	Angolo elica -24°00'00"	Inizio elab. M1 19.55mm
Untersuchungszweck: Laufende Messung		Ø Base db 105.2491mm	Palpatore Ø (#2) 1mm
Werkzeug:	Charge:	Ang. Base -22°28'14"	Fat.scor.pr. x .546



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
fH _{am}	±6	-2.0	Var a 1.2								±6	Var a 2.0							-1.5	
fH _a	±8	-2.0	-1.6	-2.5	-2.4	0.9	-1.3	-1.5		±8	6.2	-0.5	0.0	-2.5	-2.2	-0.7	-1.5			
F _a		2.4	2.2	2.9	2.8	1.9	1.8	1.9			5.1	1.9	2.0	2.5	2.5	1.8	2.2			
ff _a	5	1.4	1.6	1.3	1.5	1.5	1.3	1.7		5	2.1	2.0	2.0	2.2	2.3	1.9	2.1			
ca	4±2	4.5	4.5	4.5	4.4	4.3	4.5	3.9												
Ca										-14/-6	-11.2	-10.0	-9.9	-10.1	-10.3	-10.0	-10.1			
ffa _f	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
P/T-Ø [mm]		109.298 [109.1/109.4]									121.848 [121.74/122]									



N:Z		35	24	13	1t	1c	1p	Ø Dente	1p	1c	1t	13	24	35				
fH _{βm}	5±4	3.7	Var β 9.8							10±4	Var β 11.0							11.2
fH _β	5±8	3.7	2.1	8.3	5.8	-2.5	-1.5	0.4	10±8	7.6	5.4	2.4	10.2	16.4	12.9	11.2		
F _β		3.9	3.2	4.0	3.2	5.5	5.2	4.0		3.1	3.2	5.6	1.6	6.9	3.6	3.8		
ff _β	5	1.1	1.1	1.2	1.2	1.4	1.0	0.8	5	1.4	1.4	1.2	1.3	1.2	1.1	1.3		
c _β	1/5	3.3	3.3	3.4	3.3	2.0	3.2	3.0	1/5	3.3	1.6	-0.3	1.4	1.2	1.7	1.5		
FV	-8±8	-2.9							-8±8							-5.2		

GCG 808006

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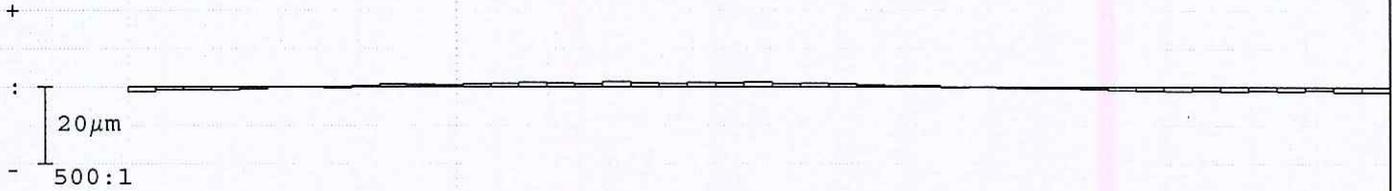


Ruota cilindrica Divisione

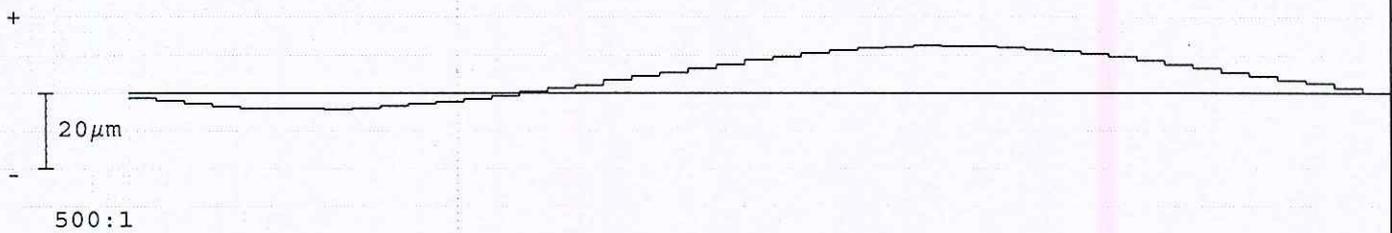


Nr. prog.: STI0416b04 0	P26 601265	Controllore: Turno A	Data: 20.04.2018 11:22
Denominazione: ZR2		Numero denti z 45	Angolo pressione 20°00'00"
Numero disegno.: D51.1.1247.50-IF		Modulo m 2.3mm	Angolo elica -24°00'00"
Comessa/serie nr.: 10		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Formelwerkzeug	Charge:	

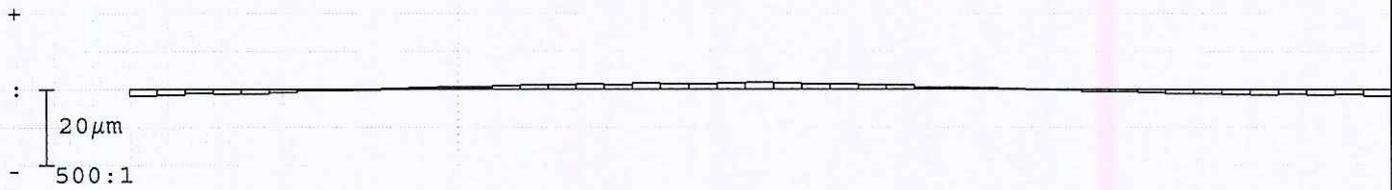
Errori singoli di divisione fp fianco sinistro



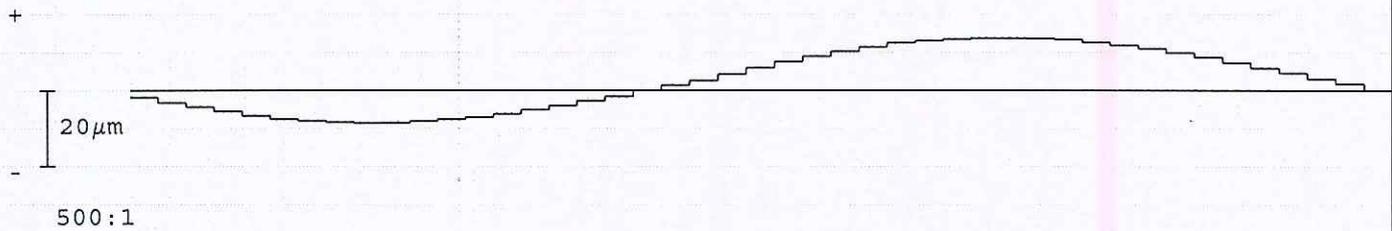
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro



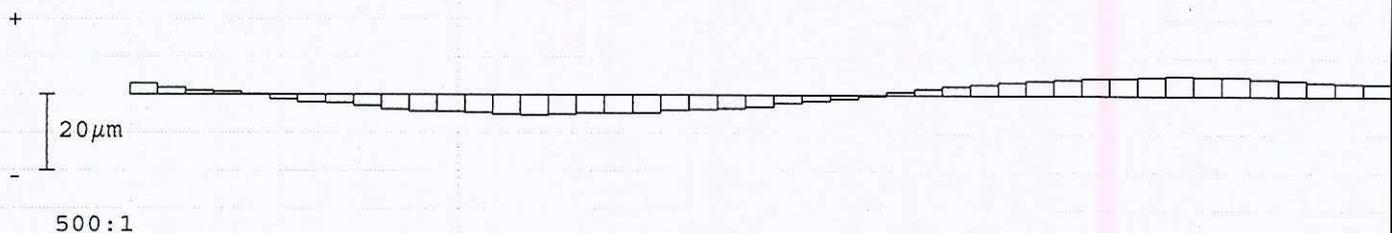
Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 115.803 z=14mm	fianco sinistro				fianco destro / TIRO			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	1.4		10.0		1.8		10.0	
Gr. salto di passo fu max	0.6		12.0		0.6		12.0	
Scarto di divisione Rp	2.7				3.5			
Err. globale di divisione Fp	16.8		36.0		22.4		36.0	
Err. cordale di divisione Fpz/8	6.7				9.1			

Centricità Fr (Ø-sfera =4mm)

⊙ : 10.3µm



Err. di concentricità Fr	10.6	28.0	
Variab. spessore dente Rs			

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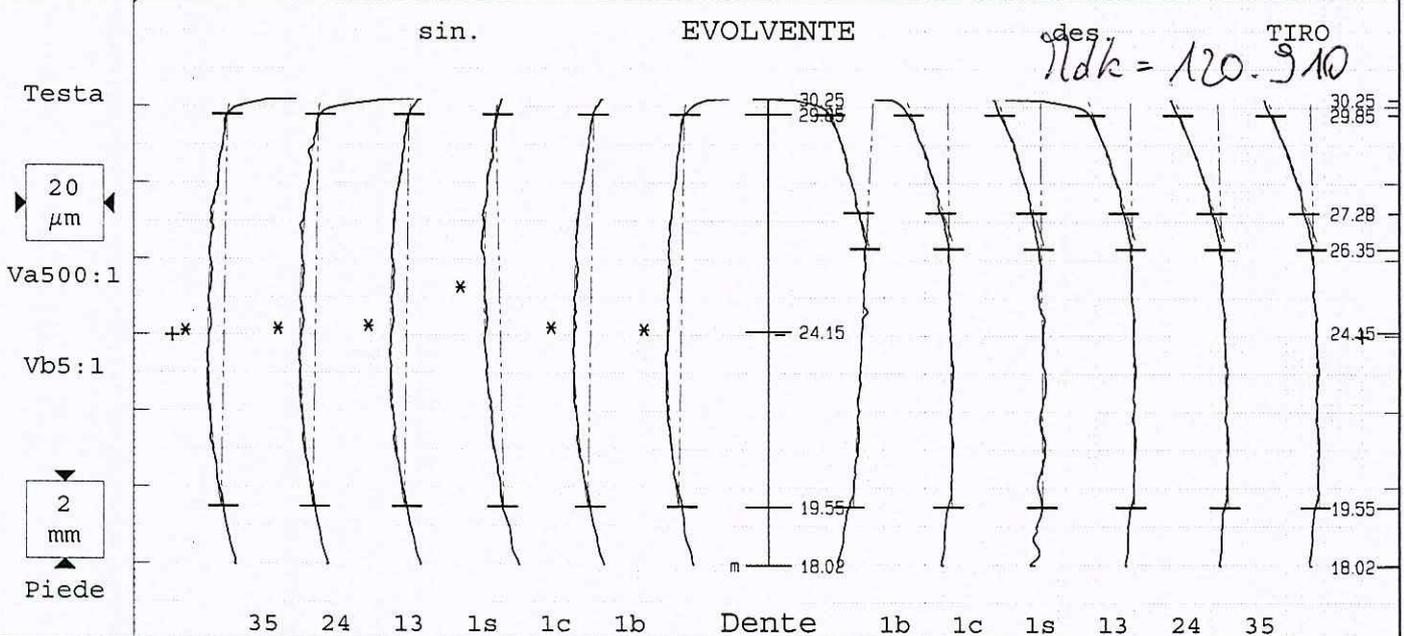
Docum.archiviato elettronicamente.Archiviazione cartacea non necessaria



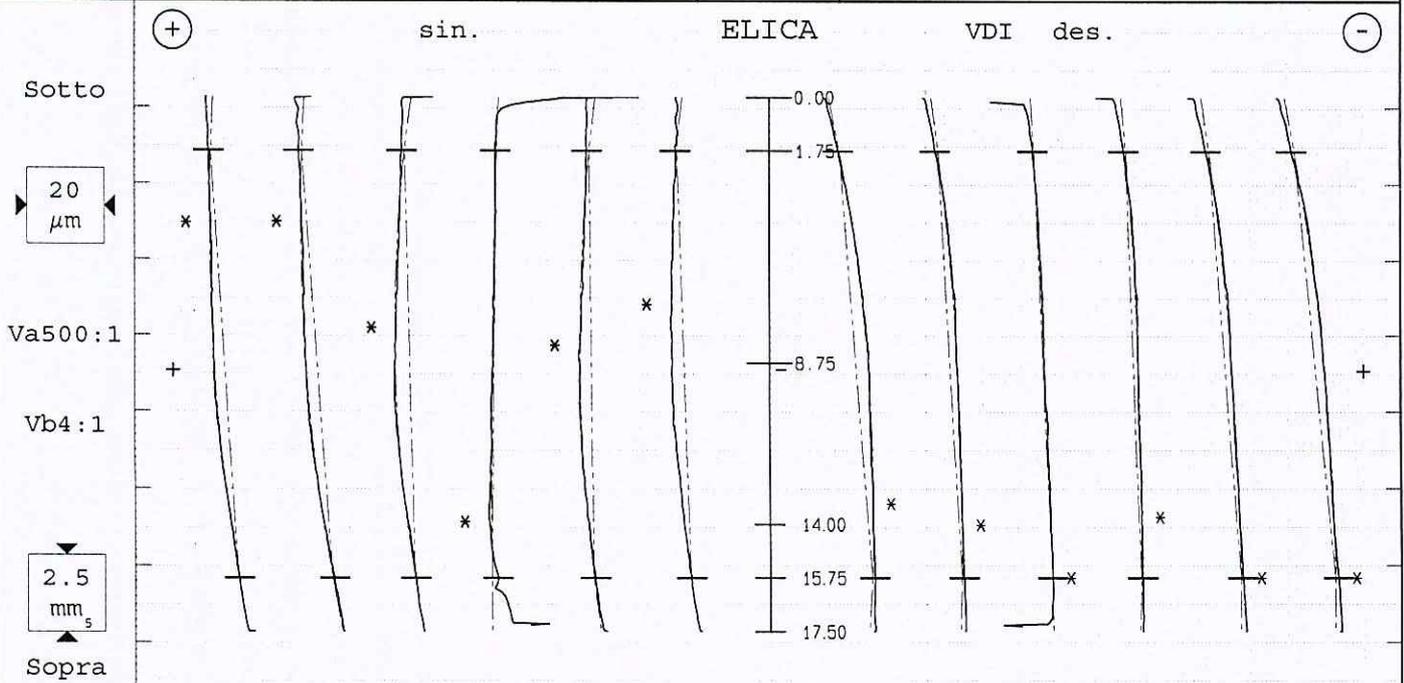
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0416b04 0	P26 601265	Controllore: Turno A	Data: 20.04.2018 10:47
Denominazione: ZR2		Numero denti z 45	Largh. fasc. dent. b 17.5mm
Numero disegno.: D51.1.1247.50-IF		Modulo m 2.3mm	Tratto evolv. La 10.3/6.8mm
Comessa/serie nr.: 16 -5		Angolo pressione 20°00'00"	Tratto elica Ls 14mm
Masch. Nr.: M001	Spindel: Formn. cat. elica	-24°00'00"	Inizio elab. M1 19.55mm
Untersuchungszweck: Laufende Messung	Ø Base db	105.2491mm	Palpatore Ø (#2) 1mm
Werkzeug:	Charge:	Ang. Base -22°28'14"	Fat. scor. pr. x .546



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
fH _{am}	±6	-1.5	Var a 0.4								±6	Var a 1.7							-1.8	
fH _a	±8	-1.5	-1.7	-1.5	-1.3	2.0	-1.6	-1.5		±8	5.2	-1.1	-0.5	-1.1	-2.8	-2.2	-1.8			
F _a		2.2	2.3	2.5	1.9	2.5	2.1	1.9			4.8	1.4	2.2	1.4	2.4	2.0	1.8			
ff _a	5	1.6	1.6	2.0	1.5	1.6	1.4	1.5		5	2.2	1.7	2.3	1.6	1.7	1.7	1.7			
ca	4±2	4.3	4.2	4.1	4.2	4.1	4.5	3.8												
Ca										-14/-6	-10.6	-9.6	-9.9	-9.9	-9.9	-10.0	-9.9			
ffa _f	3	0.0	0.0	0.0	0.0	0.4	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
P/T-Ø [mm]		109.304 [109.1/109.4]									121.855 [121.74/122]									



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
fH _{βm}	5±4	5.8	Var β 8.6								10±4	Var β 8.3							8.9	
fH _β	5±8	5.8	8.9	9.8	3.1	-2.0	1.2	4.2		10±8	10.4	7.5	5.8	4.8	10.1	13.1	8.9			
F _β		4.4	4.7	6.2	3.3	4.9	3.5	2.4			3.1	2.3	3.1	3.9	2.1	4.6	3.2			
ff _β	5	1.3	1.0	1.4	1.4	2.4	1.3	0.8		5	1.1	1.4	0.7	1.0	1.4	1.7	1.4			
c _β	1/5	3.1	2.7	3.0	3.8	0.5	3.0	3.1		1/5	3.2	2.0	0.5	1.3	1.8	2.3	1.9			
FV	-8±8	-6.2								-8±8										

GCG 808006

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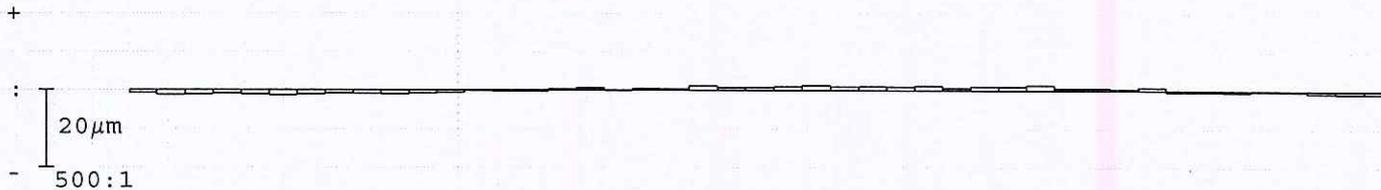


Ruota cilindrica Divisione

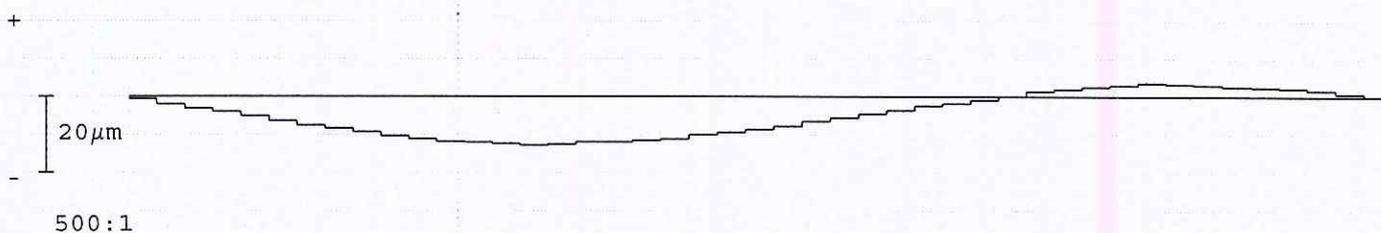


Nr. prog.: STI0416b04 0	P26 601265	Controllore: Turno A	Data: 20.04.2018 10:47
Denominazione: ZR2		Numero denti z 45	Angolo pressione 20°00'00"
Numero disegno.: D51.1.1247.50-IF		Modulo m 2.3mm	Angolo elica -24°00'00"
Comessa/serie nr.: 16		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Formelwerkzeug	Charge:	

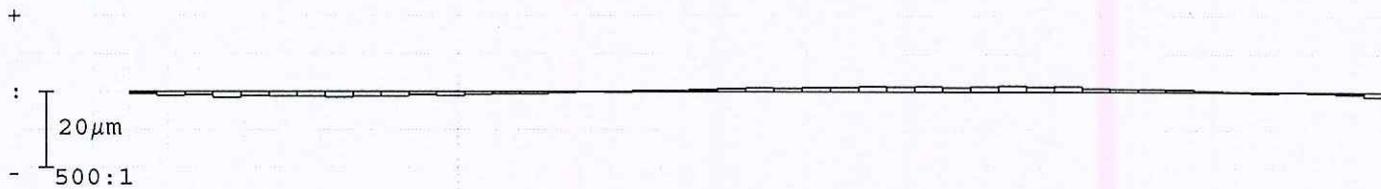
Errori singoli di divisione fp fianco sinistro



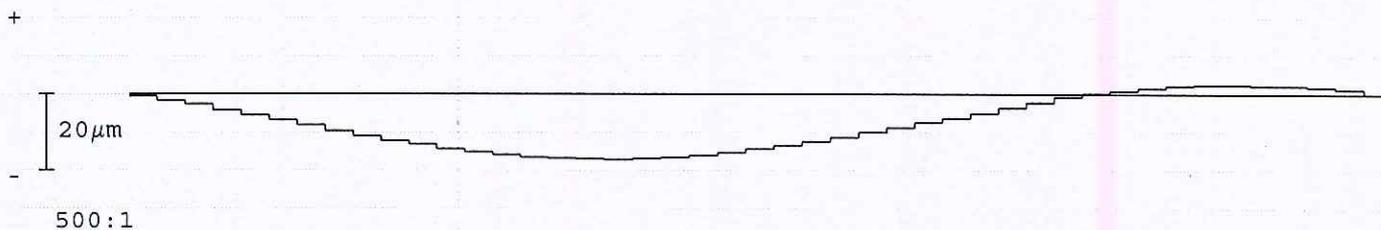
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

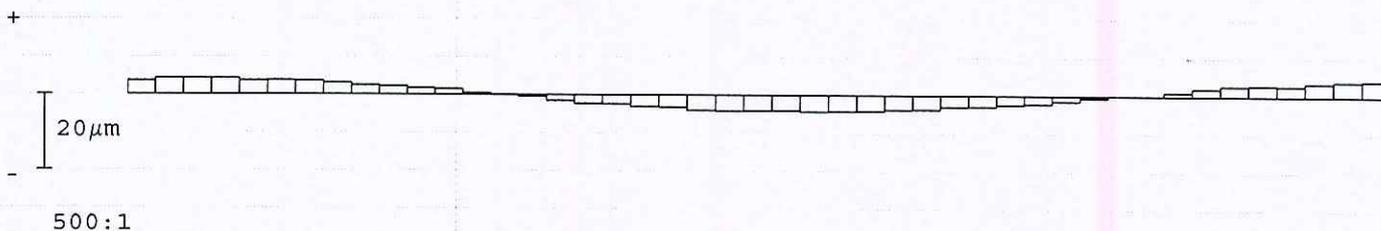


Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 115.803 z=14mm	fianco sinistro				fianco destro / TIRO			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	1.4		10.0		1.7		10.0	
Gr. salto di passo fu max	1.0		12.0		0.8		12.0	
Scarto di divisione Rp	2.7				3.3			
Err. globale di divisione Fp	16.3		36.0		19.7		36.0	
Err. cordale di divisione Fpz/8	6.8				8.4			

Centricità Fr (Ø-sfera =4mm) \odot : 8.6µm



Err. di concentricità Fr	8.7	28.0	
Variab. spessore dente Rs			

Docum.archiviato elettronicamente.Archiviazione cartacea non necessaria

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REPORT 18/083

Date: 18/05/2018
 Author: F. Abbaticchio

Reason for analysis: PPAP
Motivo dell'indagine:

Requester: WLQ - M. Vicenti
Richiedente:

Part Name: DG2/Rv cpl
Nome particolare:
Material: GCG_805000 Part 2
Materiale:
State of part: Finito
Stato del particolare:

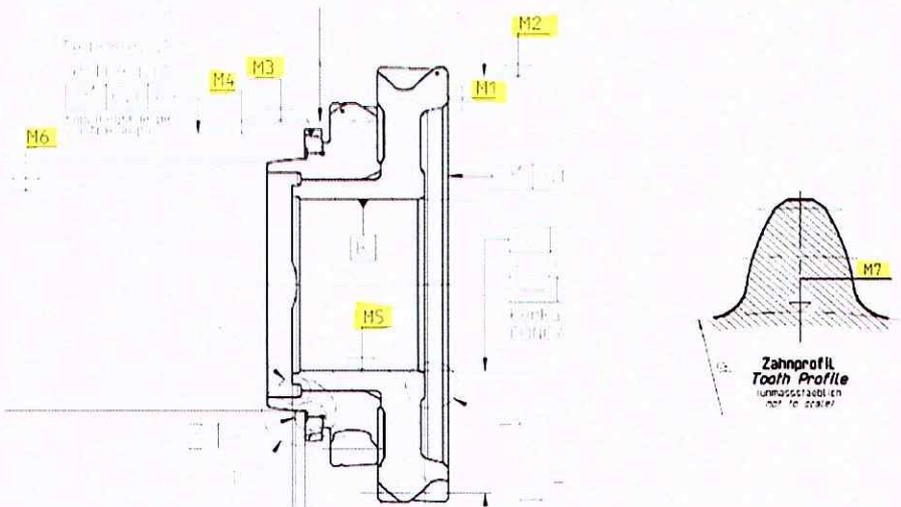
P/N: 251.1.1246.50
S/N: -
Customer: -
Cliente:

Result: OK
Risultato:

Distribution list: WLQ - M. Vicenti
Lista di distribuzione:

Notes: Gearset 32C
Note:

Drawing (disegno)



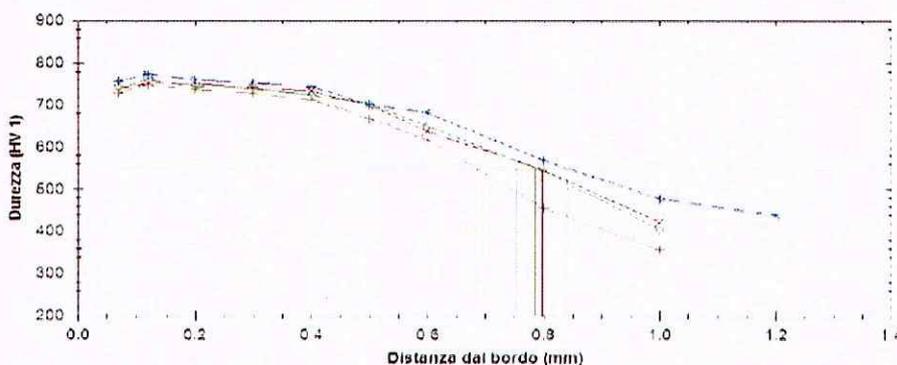
Picture 1: posizioni di misura a disegno.

Surface hardness verification (verifica durezza superficiale)

Component	Scale	Position	Measured Value	Range
Gear	HRC	M1	61.4	-
Gear	HRA	M1	81.6	80.5 + 2.5

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

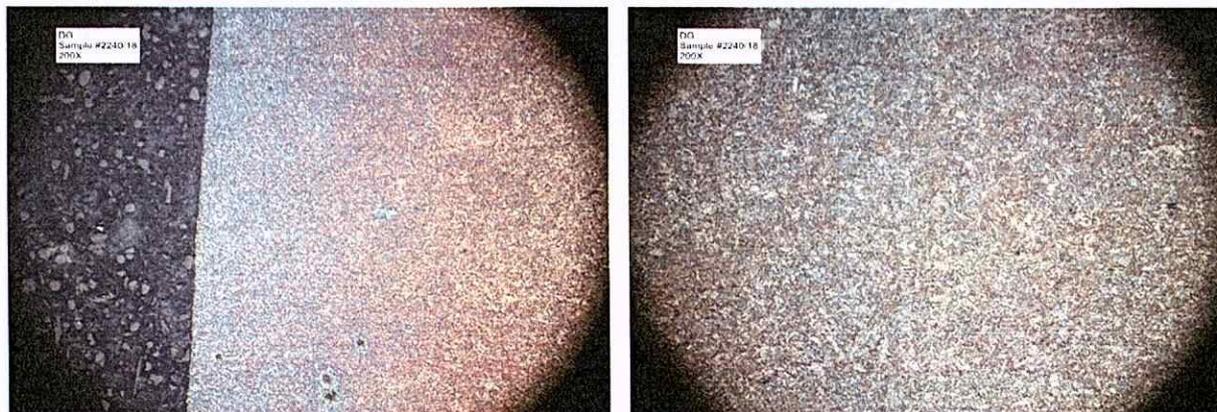
Component	Scale	Sample #	Position	Measured Value	Range
Gear	CHD 550 HV1	2239/18	M2 (tooth flank)	0.75	0.50+0.40 mm
Gear	CHD 550 HV1	2239/18	M3 (tooth flank)	0.79	0.50+0.40 mm
Gear	CHD 550 HV1	2239/18	M4 (kk)	0.74	0.50 mm min.
Gear	Core hardness HV10	2239/18	M5(Bore)	0.80	0.30 mm min.
Gear	Core hardness HV11	2239/18	M6 (Cone)	0.69	0.40 mm min.
Gear	Core hardness HV12	2239/18	M7	351	≥ 300
Gear	Core hardness HV13	2239/18	M7 (kk)	370	≥ 300



Picture 2: profili di durezza.

Microstructure analysis (analisi della microstruttura)

Sample #	2239/18
Gear - Tooth flank surface structure:	Martensite e austenite residua (15%)
Gear - Tooth base core structure:	Martensite, bainite



Picture 3: Microstruttura sul fianco dente (a sinistra) ed a cuore sulla base dente (a destra).

REPORT 18/083

Date: 18/05/2018
 Author: F. Abbaticchio

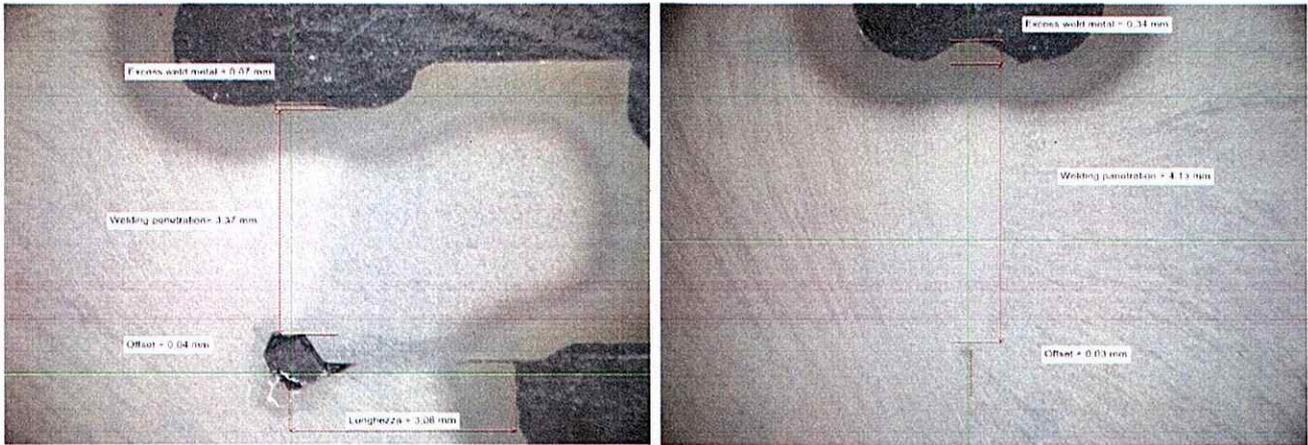
Weld bead analysis (analisi della saldatura)

Giunto Rev - Gear 2nd

Feature	Unit	Sample #	Measured Value	Range
Radial offset	mm	2240/18	0.03	max 0.1
Penetration	mm	2240/18	4.13	3.5 + 0.5
Excess weld metal	mm	2240/18	0.34	max 0.5

Giunto Rev - clutch ring

Feature	Unit	Sample #	Measured Value	Range
Radial offset	mm	2240/18	0.04	max 0.1
Penetration	mm	2240/18	3.37	min 2.5
Excess weld metal	mm	2240/18 </td <td>0.07</td> <td>max 0.5</td>	0.07	max 0.5



Picture 3: macro sezione saldatura OK (saldatura corpo d'aggancio a sinistra, saldatura ruota-ruota a destra).

Analisi di similitudine Ppk

Formular Nr:
Datum:
Status: Entwurf
Formular Eigner / Fachbereich:
Prozess-/VA-verweis:

Macchina da confrontare: SLW11046
Capability da confrontare Nr.: 02/03/2017

Data: 18/05/2018
Owner: G.Sette
Abt.: WLQ1

Codice Pezzo di riferimento: 251.1.1083.50

Partnumber in esame: 251.1.1246.50

	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

Esito Correlazione: **Il processo è paragonabile
capacità di processo confermata**

Deviazione Std. Ammessa: ± 25 %

Componente di riferimento					Componente in esame						
DIMENSIONEN					DIMENSIONEN						
Merkmal	Einheit	Nominale		Deviazione ammessa in %	Nominale		Deviazione %	i.O./n.i.O.			
numero denti Z	---	48			45			i.O.			
diam.primitivo - Ø	mm	111.179			105.249			i.O.			
Altezza dentatura	mm	6.55			6.3			i.O.			
diam.testa - Ø (da)	mm	127.40			122.00			i.O.			

Studio delle specifiche					Studio delle specifiche						
Merkmal	Einheit	Nominale	Toleranz T ₁	P _p	P _{pk} (solo per caratteristiche unilaterali)	Nominale	Toleranz T ₂	Taregt (1,00/1,33/1,67)	i.O./n.i.O.	Min. P _p	Min. P _{pk}
Mdk - Ø	mm	126.127	0.06	1.73		120.880	0.058	1.67	i.O.	1.67	
Fr (Eccentricità)	µm	0	28	1.67		0	28	1.67	i.O.	1.67	
	µm								---		
	µm								---		
	µm								---		
	µm								---		
	µm								---		
	µm								---		

Part Submission Warrant



Part Name <u>Zahnrad 2.Gang</u>		Cust. Part Number <u>251.1.1247.80</u>	
Shown on Drawing No. <u>251.1.1247.80</u>		Org. Part Number _____	
Engineering Change Level <u>0</u>		Dated <u>16. Okt 17</u>	
Additional Engineering Changes <u>SEI No. 0 72511B Index: -</u>		Dated <u>29. Jul 15</u>	
Safety and/or Government Regulation <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Purchase Order No. <u>5500040240 / 04.12.17</u>	
Checking Aid No. _____		Weight (kg) <u>1.150</u>	
Checking Aid Engineering Change Level _____		Dated _____	

ORGANIZATION MANUFACTURING INFORMATION		CUSTOMER SUBMITTAL INFORMATION	
<u>SEISSENSCHMIDT GmbH</u>		<u>Getrag B.V & Co.KG</u>	
Organization Name & Supplier/Vendor Code		Customer Name/Division	
<u>DAIMLERSTRASSE 11</u>		<u>Frau Petra Braun</u>	
Street Address		Buyer/Buyer Code	
<u>PLETTENBENRW</u>	<u>58840</u>	<u>GERMANY</u>	<u>251er Getriebe</u>
City	Region	Postal Code	Country
		Application	

MATERIALS REPORTING

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

Submitted by IMDS or other customer format: IMDS

719854890

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

REASON FOR SUBMISSION (Check at least one)

<input checked="" type="checkbox"/> Initial Submission	<input type="checkbox"/> Change to Optional Construction or Material
<input 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 type="checkbox"/> 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 Smeral 1600

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 390 / 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: _____

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

Organization Authorized Signature i.A. A. Suliani Date 08. Feb 18

Print Name Suliani / Schmidt-Lotz Phone No. 0049 2391 915-2103 Fax No. 0049 2391 915-197

Title Quality Management E-mail a.suliani@seissenschmidt.com

FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: Approved Rejected Other

Customer Signature W. Tefke Date 27.2.18

Print Name Wadim Tefke Customer Tracking Number (optional) 18-00265

based on CFG-1001 PPAP Version 4



GETRAG B.V. & Co. KG

GCG_F11_2213_00 2007-05
VBoerkewitz/Q E Management

Date Issued: DD.MM.YYYY Hermann-Hagenmeyer-StraÙe
Date Revised: DD.MM.YYYY 74199 Unterguppenbach

Retention: GIS 28.01/15
Security Class: Confidential

