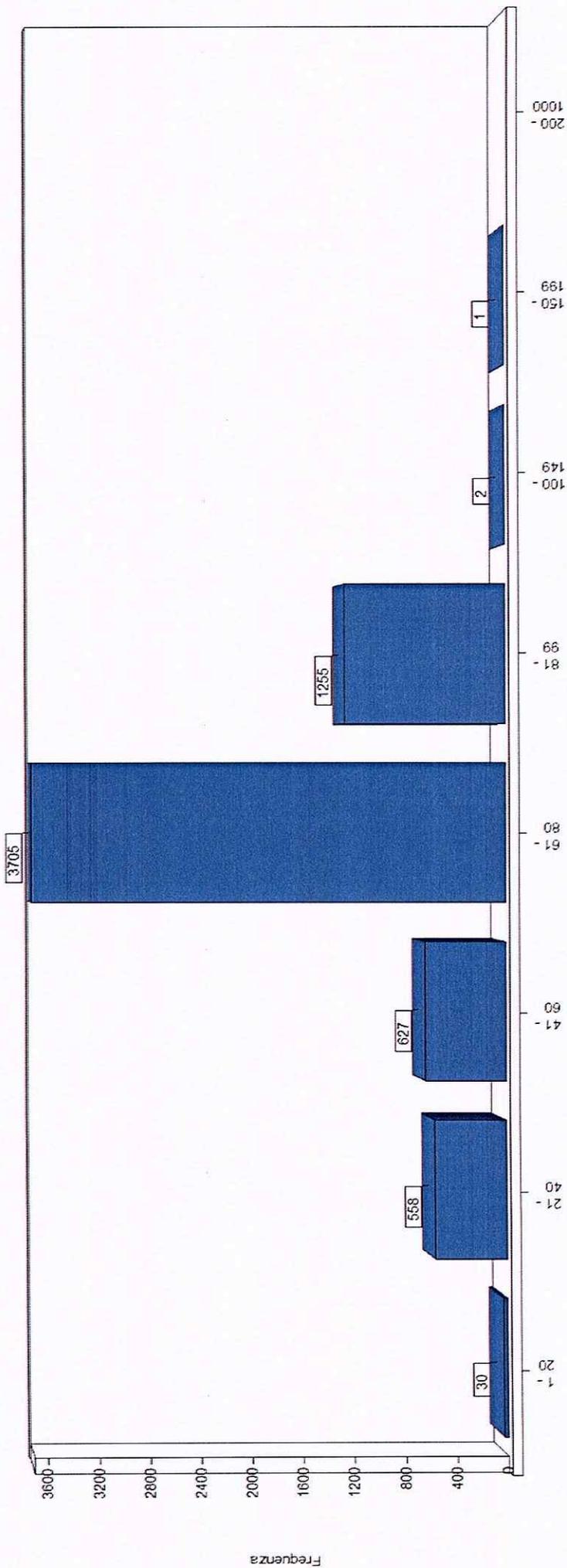


GETRAG		FMEA Processo		Numero: Pagina:	1.2.1.1.1.1
Tipo/Modello/Produzione/Lotto: 7DCT300		Numero Disegno: Gearset 1A + 21A + 21H + 32C Stato modifica		Responsabile: Getrag Ditta: Getrag	31/08/2015
FMEA/Elemento: GEARSET 7DCT300		Codice dell'operazione: Tutte Stato modifica		Responsabile: Papagna, Oscuro, Nitti, Cicirelli, Tanzi T., Terizzese, Landriscina, Guerra, Sinibaldi, Caponio, Vicenti, Picerno, Plerro, Cacciapaglia, Sisto. Ditta:	13/01/2017 14/05/2018



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

Actions ongoing for RPN > 100:

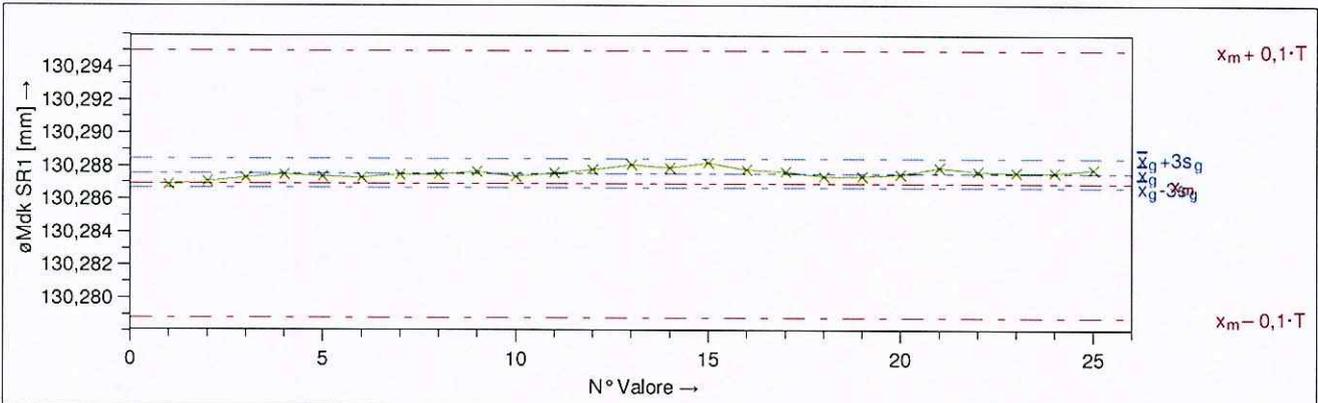
Chr. Classification	Project	Component	Operation	Chr. Description	Actual RPN			Action	Resp.	Due date	Min. RPN expected				
					S	O	D				S	O	D	RPN	
<M>	DCT300	SG1	Hard Turning	Clutch body Height	7	4	4	112	Final drawing tolerance review + Dogbody height review on EP	Pierro	31-May-18	7	2	5	(70)
<M>	DCT300	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



Capacità strumenti di misura

Data/ora	24/04/2018	Nome oper.	mario.bozza	Reparto/Area/Prod.	WLQ	Posto di prova	Rettifica denti SR1
Calibro		Master			Caratteristica		
Desc. calibro	Banchetto in acciaio	Desc. mast.	Master Mdk SR1		Desc. Car.	øMdk SR1	
N° calibro	MVZ 406001 020	N° master	MVZ 400653 002		N° Caratt.	2511124550_32C	
Ris. calibro	0,0001	Valore reale mast.	130,287		Val. Nom.	130,2645 LSS	130,305 $\hat{A} = 0,0405$
Caus. Pr.	Cg CgK	Unità di misura	mm		Unità di rr mm	LSI	130,224 $\hat{A} = -0,0405$
Nota							



i	x _i	i	x _i	i	x _i	i	x _i	i	x _i
1	130,2869	6	130,2873	11	130,2876	16	130,2878	21	130,2879
2	130,2871	7	130,2875	12	130,2878	17	130,2877	22	130,2877
3	130,2873	8	130,2875	13	130,2881	18	130,2874	23	130,2876
4	130,2875	9	130,2877	14	130,2879	19	130,2874	24	130,2876
5	130,2874	10	130,2874	15	130,2882	20	130,2875	25	130,2878

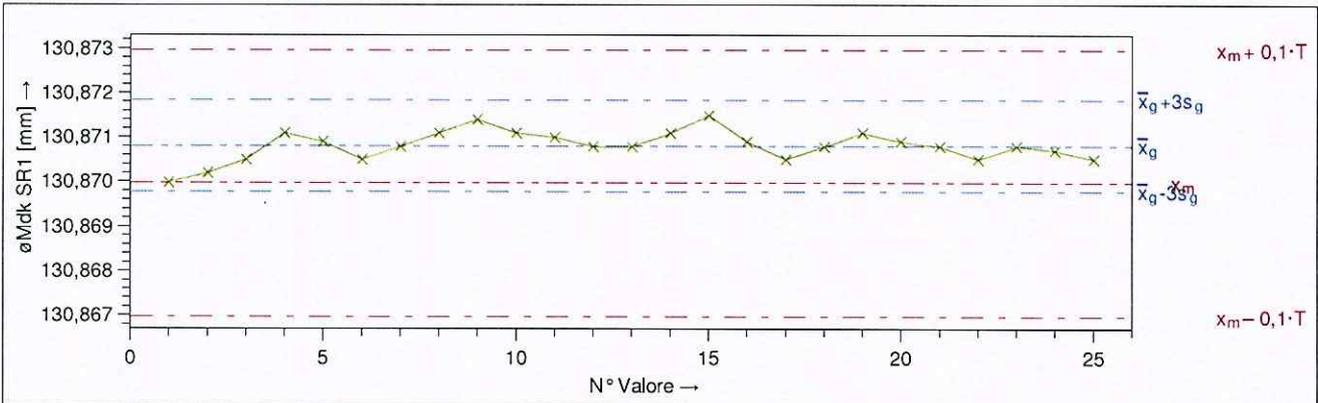
Valori a disegno		Valori Calcolati		Statistiche	
$x_m + 0,1 \cdot T$	= 130,295100	x_{maxg}	= 130,2882	$\bar{x}_g + 3s_g$	= 130,288462
x_m	= 130,287000	x_{ming}	= 130,2869	\bar{x}_g	= 130,287584
$x_m - 0,1 \cdot T$	= 130,278900	R_g	= 0,0013	$\bar{x}_g - 3s_g$	= 130,286706
$0,2 \cdot T$	= 0,016200	n_{tot}	= 25	$6s_g$	= 0,001755
T	= 0,0810			s_g	= 0,000293
Unità di misura	= mm			$ Bi $	= 0,00058400
				n_{eff}	= 25
Test per Bias				Risultati del test : significativo ($\alpha \leq 0,1\%$)	
Bias		= 0,72%		Minimo riferimento per sistema di misura capace	
Risoluzione	%RE = 0,12%			$T_{min}(\%RE)$	= 0,00200
$C_g = \frac{0,2 \cdot T}{4 \cdot s_g}$	= 9,95 ≤ 13,85 ≤ 17,73			$T_{min}(C_g)$	= 0,00778
$C_{gk} = \frac{0,1 \cdot T - \bar{x}_g - x_m }{2 \cdot s_g}$	= 9,21 ≤ 12,85 ≤ 16,48			$T_{min}(C_{gk})$	= 0,0136
Sistema di misura capace (%RE, min, C _g , C _{gk})					
<input type="checkbox"/> GETRAG MSA 2017: Capability of measuring system (Type-1 Study)					

Data _____ Firma _____ Dipartimento _____



Capacità strumenti di misura

Data/ora	11/06/2018	Nome oper.	mario.bozza	Reparto/Area/Prod.	WLQ	Posto di prova	Dentatura SR1
Calibro		Master			Caratteristica		
Desc. calibro	Banchetto in acciaio	Desc. mast.	SR1	Desc. Car.	øMdk SR1		
N° calibro	MVZ 406001 037	N° master	MVZ 400653 001	N° Caratt.	2511124550_32C		
Ris. calibro	0,0001	Valore reale mast.	130,87	Val. Nom.	130,8700 LSS	130,885	$\hat{\Delta} = 0,0150$
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di rr mm	LSI	130,855	$\hat{\Delta} = -0,0150$
Nota							



i	x _i	i	x _i	i	x _i	i	x _i	i	x _i
1	130,8700	6	130,8705	11	130,8710	16	130,8709	21	130,8708
2	130,8702	7	130,8708	12	130,8708	17	130,8705	22	130,8705
3	130,8705	8	130,8711	13	130,8708	18	130,8708	23	130,8708
4	130,8711	9	130,8714	14	130,8711	19	130,8711	24	130,8707
5	130,8709	10	130,8711	15	130,8715	20	130,8709	25	130,8705

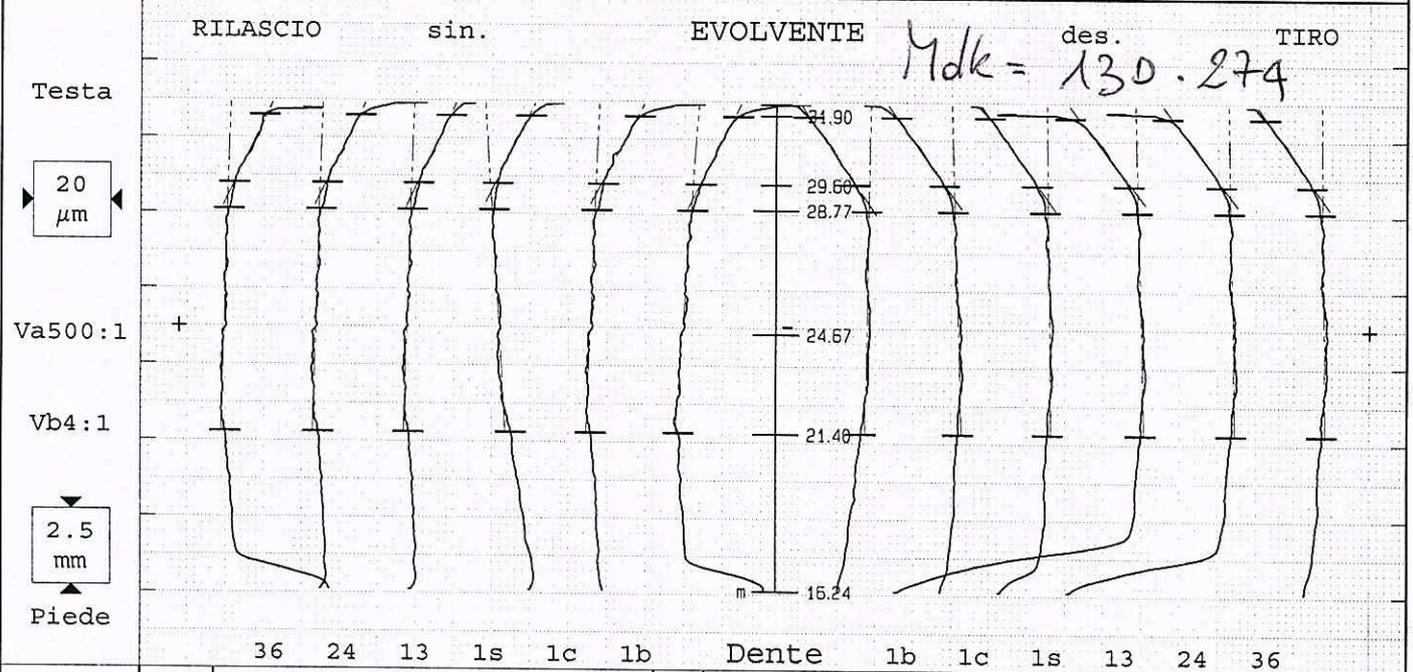
Valori a disegno		Valori Calcolati		Statistiche	
$x_m + 0,1 \cdot T$	= 130,873000	x_{maxg}	= 130,8715	$\bar{x}_g + 3s_g$	= 130,871842
x_m	= 130,870000	x_{ming}	= 130,8700	\bar{x}_g	= 130,870812
$x_m - 0,1 \cdot T$	= 130,867000	R_g	= 0,0015	$\bar{x}_g - 3s_g$	= 130,869782
$0,2 \cdot T$	= 0,006000	n_{tot}	= 25	$6s_g$	= 0,002059
T	= 0,0300			s_g	= 0,000343
Unità di misura	= mm			$ Bi $	= 0,00081200
				n_{eff}	= 25
Test per Bias				Risultati del test : significativo ($\alpha \leq 0,1\%$)	
Bias		=	2,71%		
Minimo riferimento per sistema di misura capace					
Risoluzione	%RE =	0,33%		$T_{min} (\%RE)$	= 0,00200
$C_g = \frac{0,2 \cdot T}{4 \cdot s_g}$	=	$3,14 \leq 4,37 \leq 5,60$		$T_{min} (C_g)$	= 0,00913
$C_{gk} = \frac{0,1 \cdot T - \bar{x}_g - x_m }{2 \cdot s_g}$	=	$2,28 \leq 3,19 \leq 4,10$		$T_{min} (C_{gk})$	= 0,0172
Sistema di misura capace (%RE,min,C _g ,C _{gk})					
<input type="checkbox"/> GETRAG MSA 2017: Capability of measuring system (Type-1 Study)					

Docum. archiviato elettronicamente. Archiviazione cartacea non necessaria

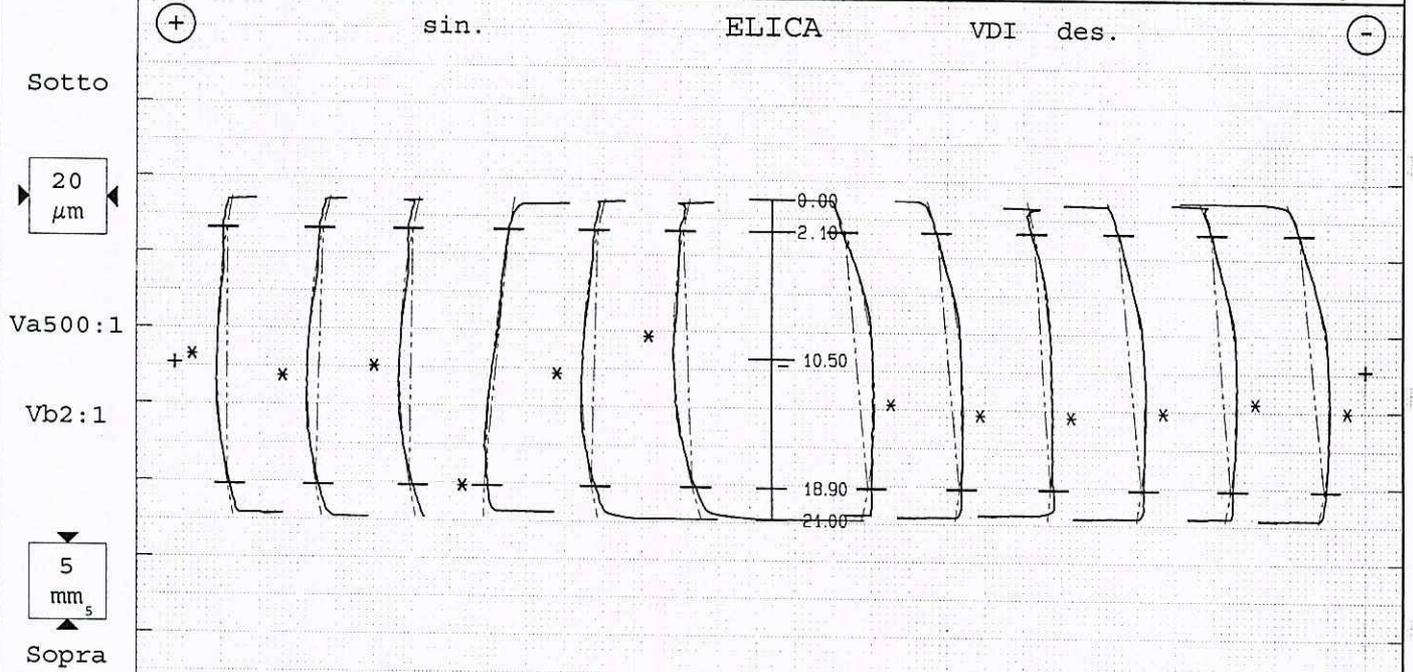
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0416a04 0		PNC35 B4784		Controllore: Turno C		Data: 14.04.2018 00:41					
Denominazione: SR1		Numero denti z		47		Largh. fasc. dent. b		21mm			
Numero disegno.: D51.1.1245.50-IF		Modulo m		2.45mm		Tratto evolv. La		7.37mm			
Commessa/serie nr.: 1 - 1		Angolo pressione		20°		Tratto elica L8		16.8mm			
Masch.Nr.: M001		Spindel: Formest		Angolo elica		-24.5°		Inizio elab. M1		21.4mm	
Untersuchungszweck: Laufende Messung		Ø Base db		117.4936mm		Palpatore Ø		#2) 1mm			
Werkzeug:		Charge:		Ang. Base		-22.935°		Fat. scor. pr. x		.182	



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
fHsm	±5	-2.5	Var a 0.9								±5	Var a 1.6							-1.9	
fHa	±8	-2.5	-2.2	-2.4	-2.4	5.2	-3.1	-5.7		±8	1.3	-2.6	-1.2	-2.3	-1.8	-1.0	-1.9			
Fa		2.5	2.1	2.5	2.5	5.0	2.7	4.7			2.5	2.6	2.1	2.3	2.1	2.0	2.3			
ffa	5	2.0	1.6	2.3	2.1	2.4	1.9	1.4		5	2.1	1.9	1.7	1.8	1.8	2.0	1.9			
Ca	-13/-5	-9.9	-9.7	-9.9	-9.8	-11.3	-10.2	-9.6		-19/-11	-16.2	-14.7	-15.1	-15.1	-14.9	-14.8	-14.9			
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]		119.950 [119.83/120.15]									134.309 [134.3/134.5]									



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
fHsm	±4	-1.4	Var β 2.6								5±4	Var β 1.9							7.5	
fHs	±8	-1.4	0.1	-2.5	-1.1	-8.2	-2.0	2.9		5±8	7.6	7.4	5.3	7.6	6.5	8.4	7.5			
Fβ		2.7	2.5	2.7	2.9	5.9	2.8	5.2			5.2	3.8	3.1	3.9	3.7	4.8	4.1			
ffβ	5	1.8	1.6	1.6	2.1	1.4	1.9	1.8		5	1.6	1.1	1.6	1.0	1.0	0.9	1.0			
Cβ	1/5	2.9	2.6	3.0	3.0	0.9	3.1	3.5		1/5	4.3	3.5	2.4	3.8	4.0	4.4	3.9			
Bd		-11.1																	-2.3	

GCG 808006

Copyright (c) Klingelberg GmbH

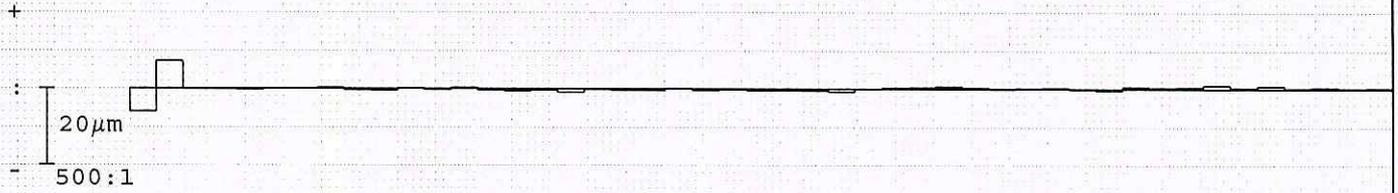


Ruota cilindrica Divisione

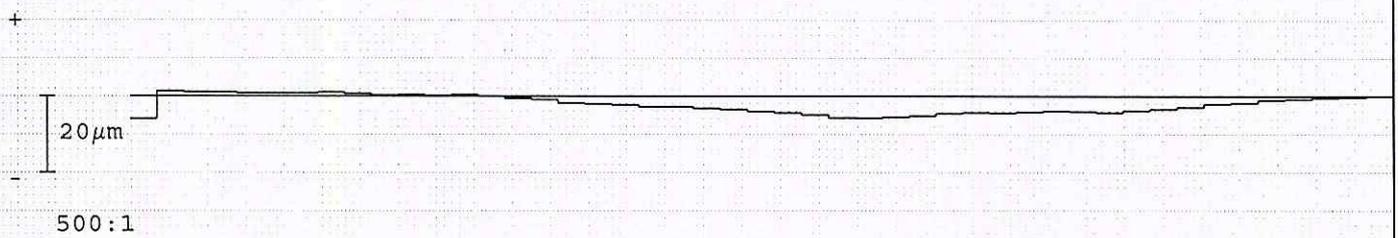


Nr. prog.: STI0416a04 0	PNC35 B4784	Controllore: Turno C	Data: 14.04.2018 00:41
Denominazione: SR1		Numero denti z 47	Angolo pressione 20°
Numero disegno.: D51.1.1245.50-IF		Modulo m 2.45mm	Angolo elica -24.5°
Comessa/serie nr.: 1		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Formelwerkzeug	Charge:	

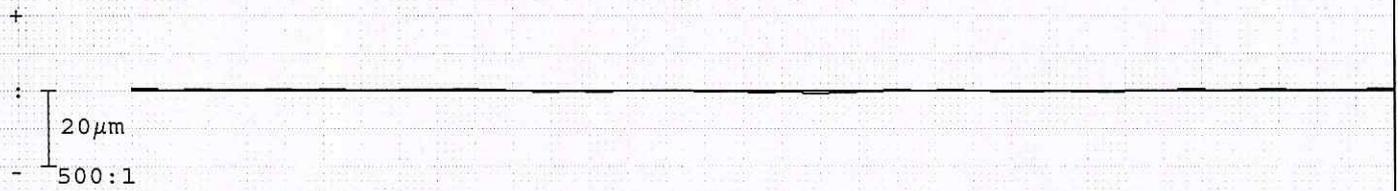
Errori singoli di divisione fp fianco sinistro



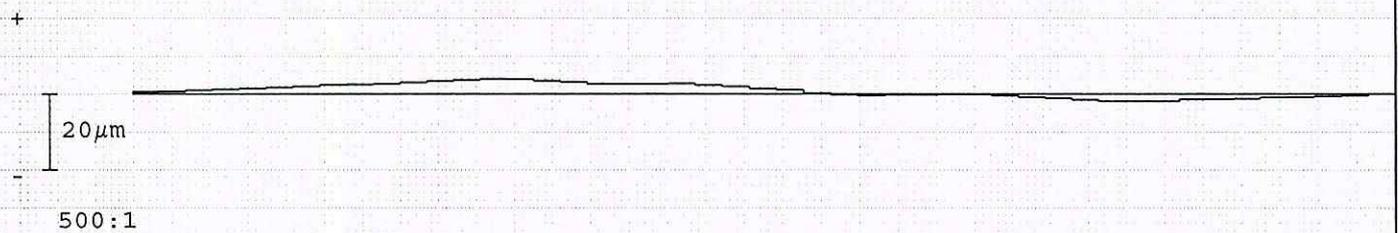
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

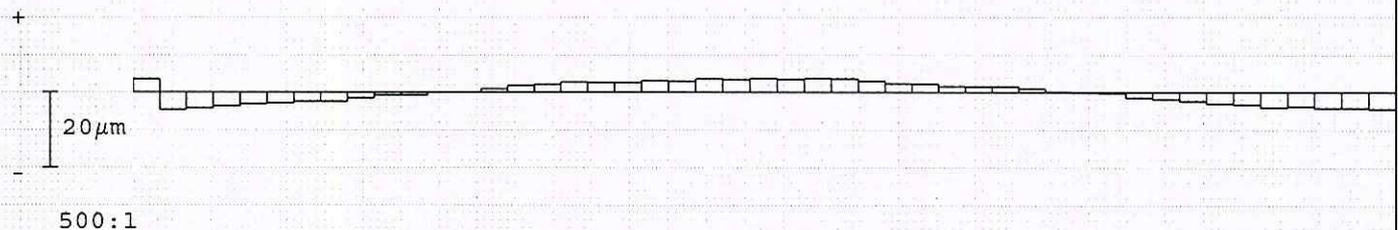


Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 127.435 z=10.5mm	fianco sinistro / RILASCIO				fianco destro / TIRO			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	7.2		11.0		0.8		11.0	
Gr. salto di passo fu max	13.1		14.0		0.5		14.0	
Scarto di divisione Rp	13.1				1.4			
Err. globale di divisione Fp	7.2		45.0		6.0		45.0	
Err. cordale di divisione Fpz/8	6.7				3.0			

Centricità Fr (Ø-sfera =3.5mm) © : 7.3µm



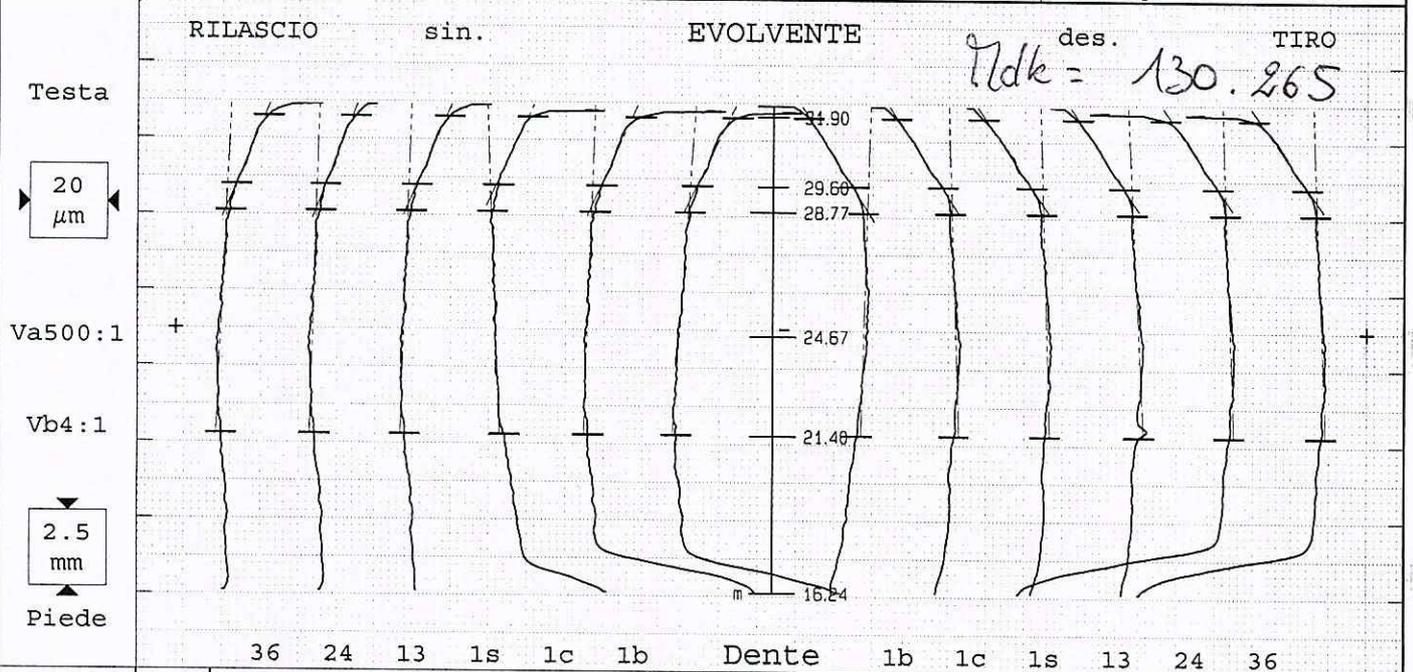
Err. di concentricità Fr	8.3	32.0	
Variaz. spessore dente Rs			

Docum.archiviato elettronicamente.Archiviazione cartacea non necessaria

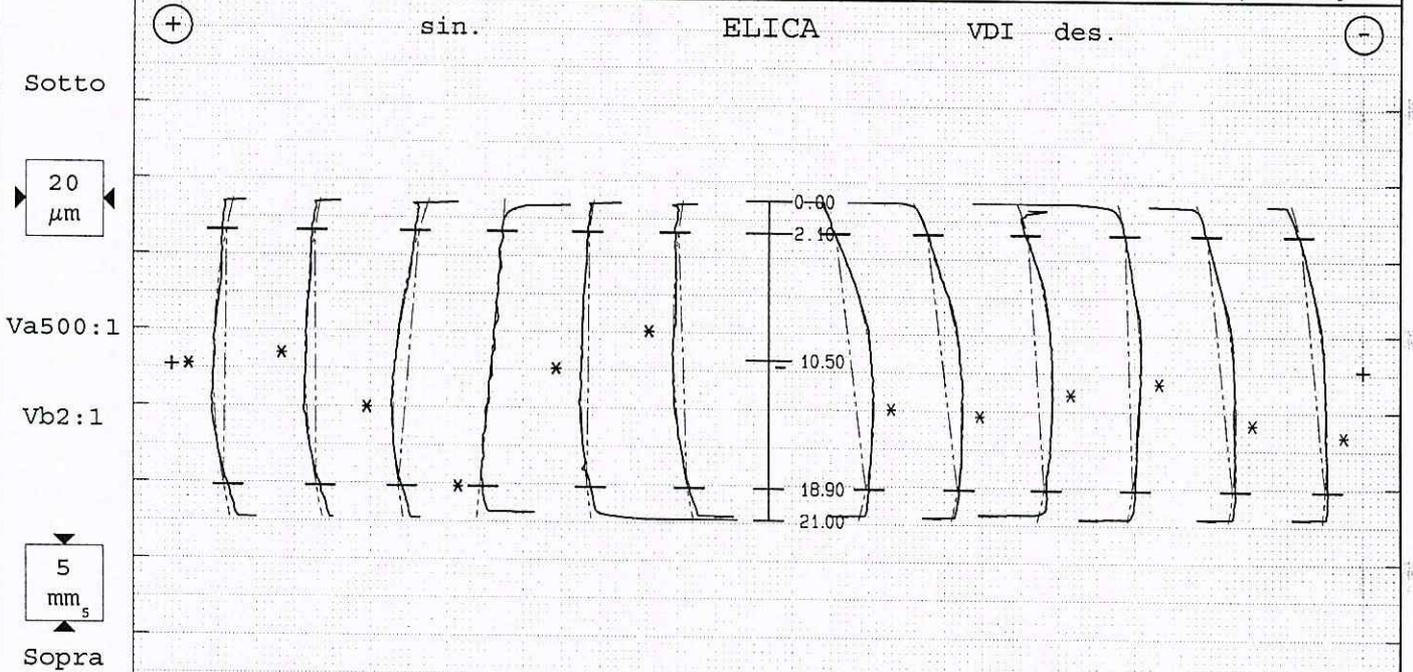
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0416a04 0	PNC35 B4784	Controllore: Turno C	Data: 14.04.2018 01:02
Denominazione: SR1	Numero denti z: 47	Largh.fasc.dent. b: 21mm	
Numero disegno.: D51.1.1245.50-IF	Modulo m: 2.45mm	Tratto evolv. La: 7.37mm	
Commessa/serie nr.: 3 - 2	Angolo pressione: 20°	Tratto elica Ls: 16.8mm	
Masch.Nr.: M001	Spindel: Formest. Angolo elica: -24.5°	Inizio elab. M1: 21.4mm	
Untersuchungszweck: Laufende Messung	Ø Base db: 117.4936mm	Palpatore Ø (#2): 1mm	
Werkzeug:	Charge:	Ang. Base: -22.935°	Fat.scor.pr. x: .182



		36 24 13 1s 1c 1b							Dente 1b 1c 1s 13 24 36											
Tolerance	Medio	Val.misur [µm]							Qual	Tolerance	Val.misur [µm]							Medio	Qual	
fH _{am}	±5	-2.8	Var a 1.4								±5	Var a 1.3							-3.3	
fH _a	±8	-2.8	-3.7	-2.3	-2.6	3.3	-2.6	-5.7		±8	2.3	-2.8	-2.6	-4.1	-3.1	-3.3	-3.3			
F _a		3.1	3.6	3.1	2.8	3.7	2.8	4.4			3.1	3.0	2.9	4.1	2.9	2.8	3.2			
ffa	5	2.0	2.2	2.2	1.9	1.7	1.8	1.5		5	2.2	2.7	2.5	2.4	2.4	2.2	2.4			
Ca	-13/-5	-9.3	-9.1	-8.9	-9.4	-10.7	-9.8	-9.2		-19/-11	-16.1	-13.7	-14.6	-13.2	-13.6	-14.3	-13.7			
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]		119.953 [119.83/120.15]									134.315 [134.3/134.5]									



		36 24 13 1t 1c 1p							Dente 1p 1c 1t 13 24 36											
Tolerance	Medio	Var β							Qual	Tolerance	Var β							Medio	Qual	
fH _{βm}	±4	-2.0	7.2								5±4	7.5							7.3	
fH _β	±8	-2.0	-0.9	0.4	-6.8	-7.4	-0.7	2.7		5±8	10.0	10.0	5.3	2.5	8.4	8.2	7.3			
F _β		3.8	3.5	3.7	5.6	5.8	2.2	5.0			7.0	5.9	6.4	3.0	4.2	3.8	4.2			
ff _β	5	2.0	2.3	2.1	2.0	1.3	1.7	1.7		5	1.2	0.9	1.2	1.2	1.3	1.1	1.1			
C _β	1/5	2.8	3.1	2.8	3.5	-0.3	1.9	2.4		1/5	5.4	4.7	4.2	3.0	3.5	2.9	3.5			
B _d		-10.1																		

GCC 808006

Copyright (c) Klingelberg GmbH

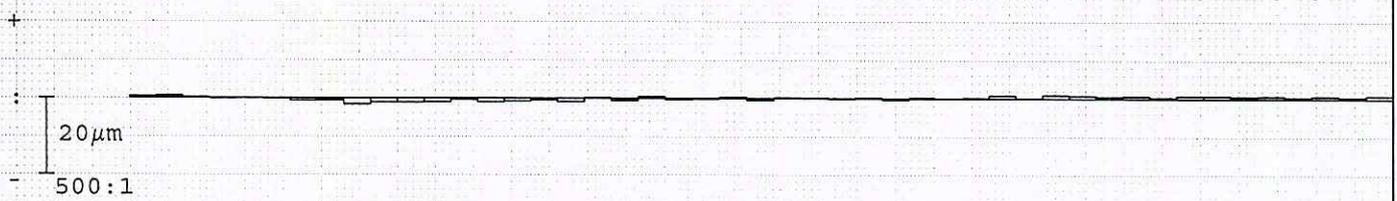


Ruota cilindrica Divisione

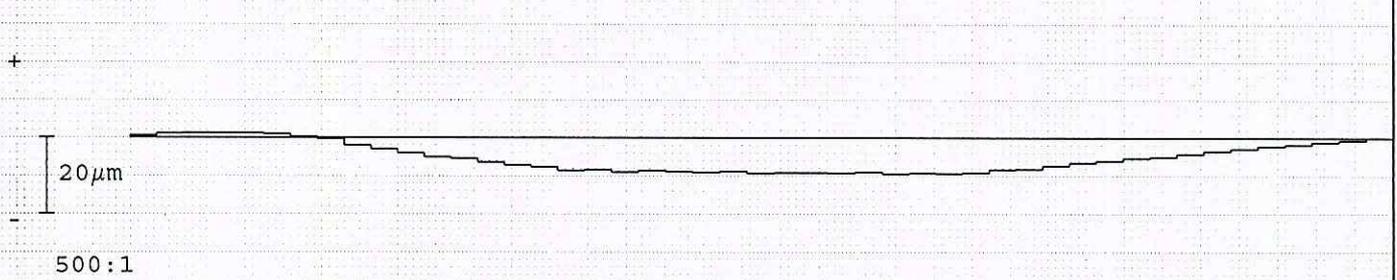


Nr. prog.: STI0416a04 0	PNC35 B4784	Controllore: Turno C	Data: 14.04.2018 01:02
Denominazione: SR1		Numero denti z 47	Angolo pressione 20°
Numero disegno.: D51.1.1245.50-IF		Modulo m 2.45mm	Angolo elica -24.5°
Comessa/serie nr.: 3		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Form	Art.Nr.: 10000000000000000000	Charge:

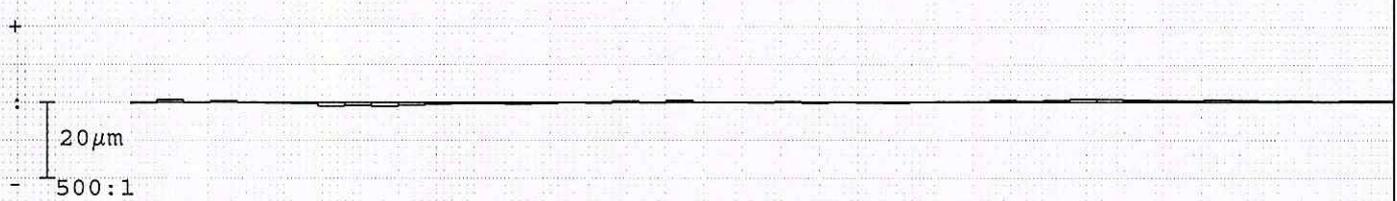
Errori singoli di divisione fp fianco sinistro



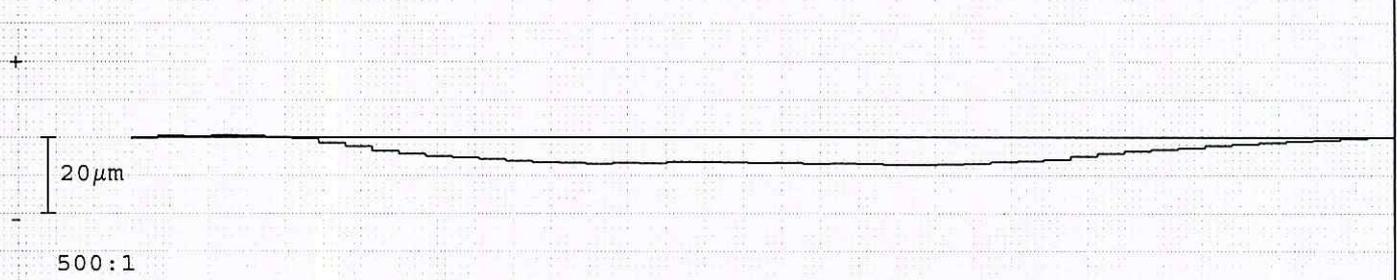
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

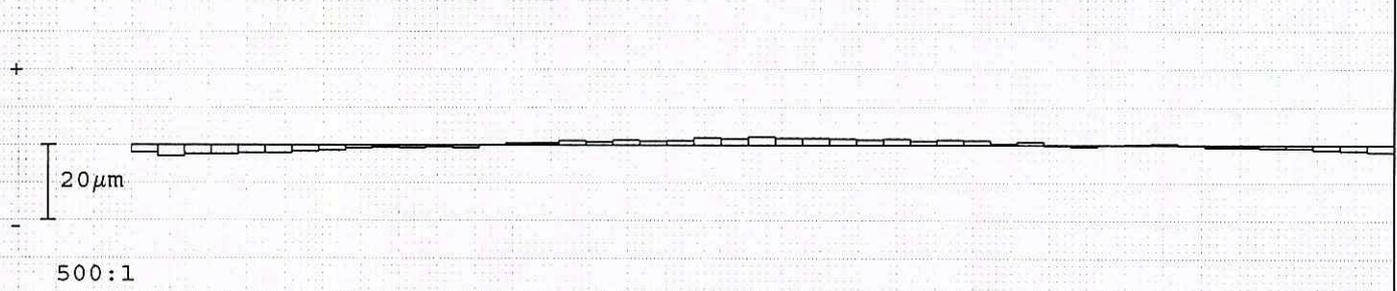


Errore somma di divisione Fp fianco destro



	Corsa per misura divis.: 127.435 z=10.5mm	fianco sinistro / RILASCIO				fianco destro / TIRO			
		Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	1.6		11.0		1.2		11.0	
Gr. salto di passo	fu max	1.1		14.0		0.9		14.0	
Scarto di divisione	Rp	2.6				2.0			
Err. globale di divisione	Fp	10.7		45.0		7.9		45.0	
Err. cordale di divisione	Fpz/8	6.1				5.0			

Centricità Fr (Ø-sfera =3.5mm) \odot : 3.6µm

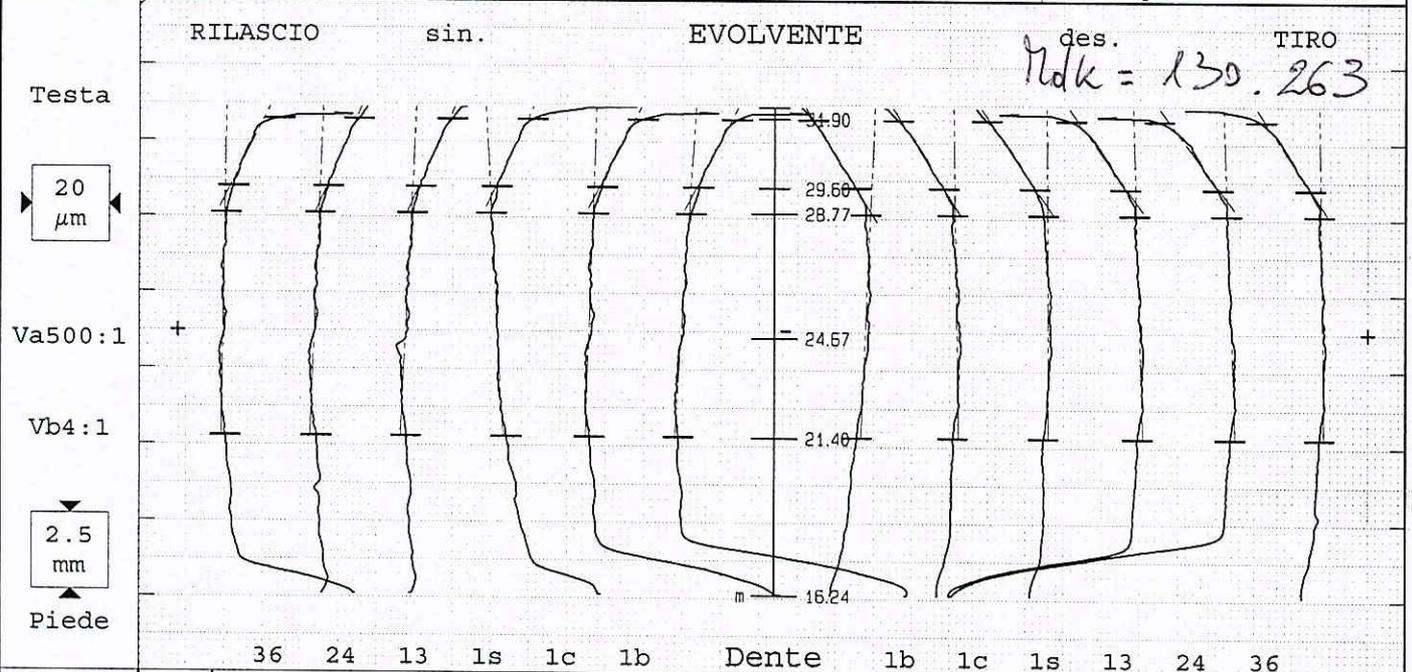


Err. di concentricità	Fr	5.1	32.0	
Variaz. spessore dente	Rs			

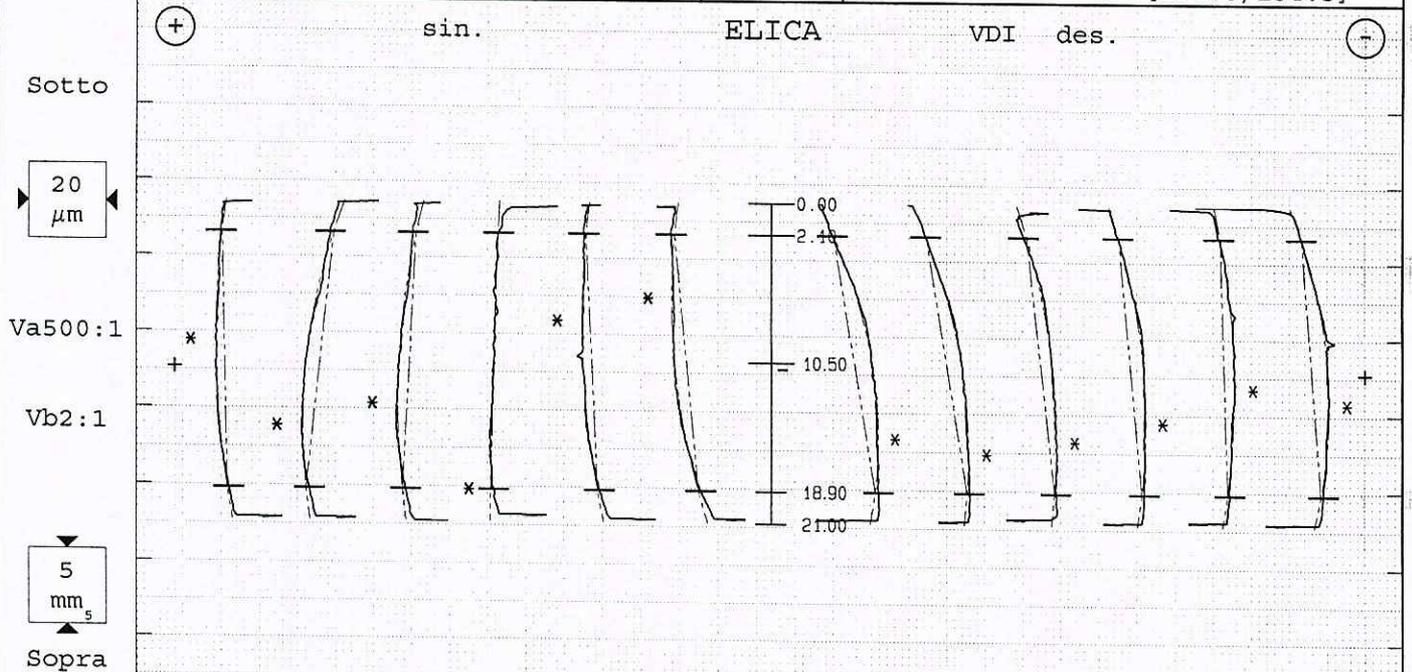
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0416a04 0	PNC35 B4784	Controllore: Turno C	Data: 14.04.2018 02:19
Denominazione: SR1	Numero denti z: 47	Largh.fasc.dent. b: 21mm	
Numero disegno.: D51.1.1245.50-IF	Modulo m: 2.45mm	Tratto evolv. La: 7.37mm	
Commessa/serie nr.: 10-3	Angolo pressione: 20°	Tratto elica Ls: 16.8mm	
Masch.Nr.: M001	Spindel: Formata a elica	-24.5°	Inizio elab. M1: 21.4mm
Untersuchungszweck: Laufende Messung	Ø Base db: 117.4936mm	Palpatore Ø: (#2) 1mm	
Werkzeug:	Charge:	Ang. Base: -22.935°	Fat.scor.pr. x: .182



Tolerance	Medio	Val.misur [µm]							Qual	Tolerance	Val.misur [µm]							Medio	Qual		
		Var a 2.7									Var a 1.7										
fH _{om}	±5	-2.8								±5								-2.0			
fH _a	±8	-2.8	-1.3	-3.3	-4.0	4.3	-2.7	-5.4		±8	3.5	-1.3	-0.5	-2.5	-3.0	-1.3	-2.0				
F _a		2.9	1.9	3.0	4.2	4.1	2.4	4.2			3.7	2.5	2.3	2.4	2.4	1.9	2.3				
ff _a	5	2.6	2.0	2.8	3.6	1.5	2.0	1.5		5	2.4	2.6	2.3	2.2	2.2	2.0	2.3				
Ca	-13/-5	-9.6	-10.0	-9.0	-9.0	-10.9	-10.2	-9.7		-19/-11	-16.1	-14.1	-15.3	-14.6	-14.5	-14.4	-14.4				
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]		119.949	[119.83/120.15]									134.309	[134.3/134.5]								



Tolerance	Medio	Val.β							Qual	Tolerance	Val.β							Medio	Qual
		Var β 12.8									Var β 11.2								
fH _{βm}	±4	-2.1								5±4								7.5	
fH _β	±8	-2.1	1.6	-9.1	-4.6	-2.5	3.7	7.7		5±8	13.7	13.6	9.2	7.6	2.4	6.5	7.5		
F _β		4.6	2.6	6.9	3.8	2.5	5.1	12.0			8.4	7.8	7.4	3.8	3.4	6.4	5.4		
ff _β	5	1.5	0.7	1.8	1.7	1.4	1.9	1.6		5	1.4	1.0	1.4	1.1	1.6	3.1	1.7		
C _β	1/5	2.7	2.2	3.5	2.7	0.2	2.3	3.1		1/5	4.7	3.9	3.1	3.4	2.7	4.4	3.6		
B _d		-10.2																	

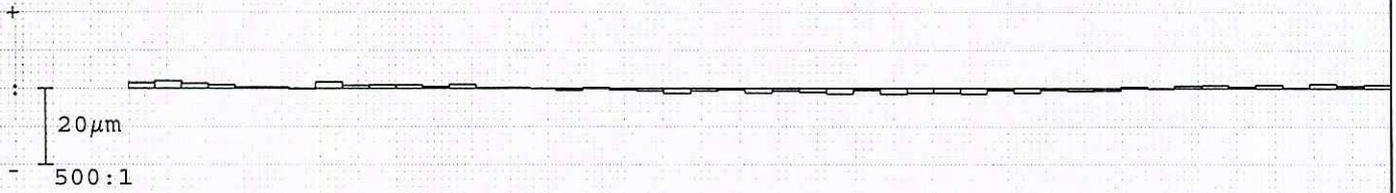


Ruota cilindrica Divisione

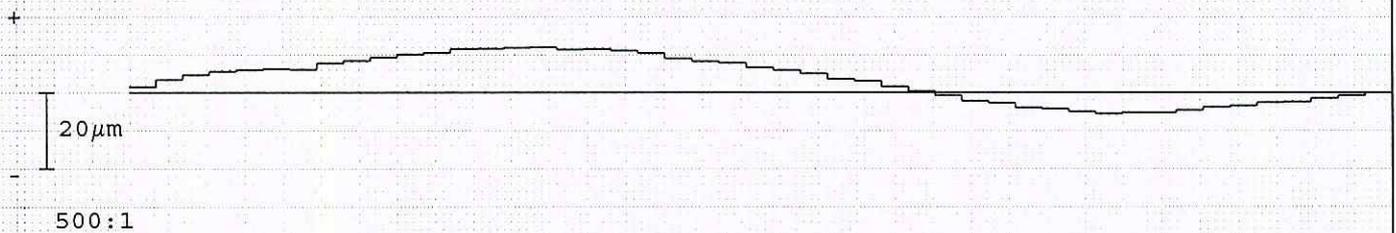


Nr. prog.: STI0416a04 0	PNC35 B4784	Controllore: Turno C	Data: 14.04.2018 02:19
Denominazione: SR1		Numero denti z 47	Angolo pressione 20°
Numero disegno.: D51.1.1245.50-IF		Modulo m 2.45mm	Angolo elica -24.5°
Commessa/serie nr.: 10		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Formel	Best.Nr.: 01	Charge:

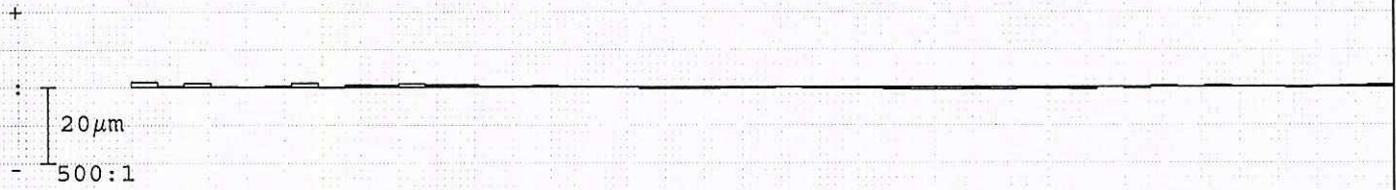
Errori singoli di divisione fp fianco sinistro



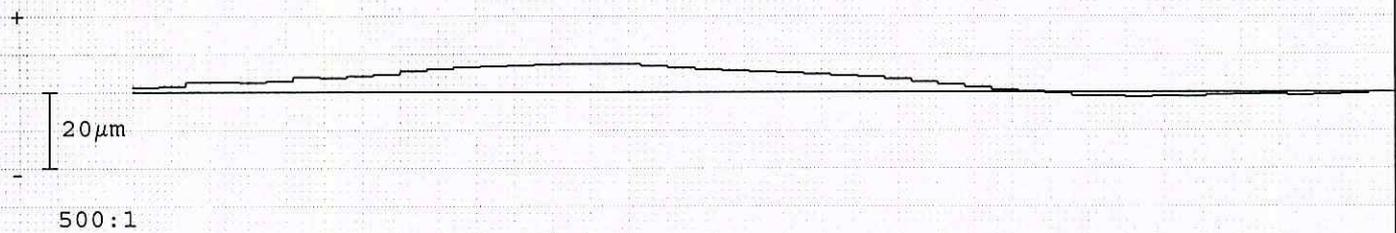
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

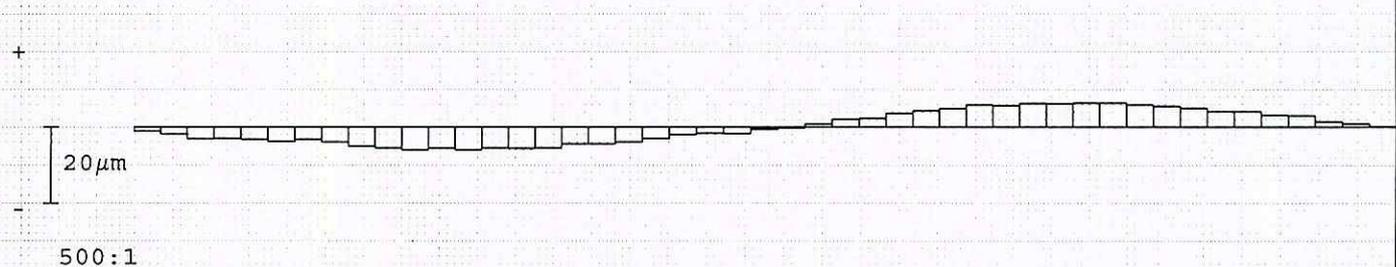


Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 127.435 z=10.5mm	fianco sinistro / RILASCIO				fianco destro / TIRO			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	1.9		11.0		1.3		11.0	
Gr. salto di passo fu max	1.8		14.0		1.3		14.0	
Scarto di divisione Rp	3.4				2.0			
Err. globale di divisione Fp	17.5		45.0		8.8		45.0	
Err. cordale di divisione Fpz/8	7.3				3.9			

Centricità Fr (Ø-sfera =3.5mm) © : 11.8µm



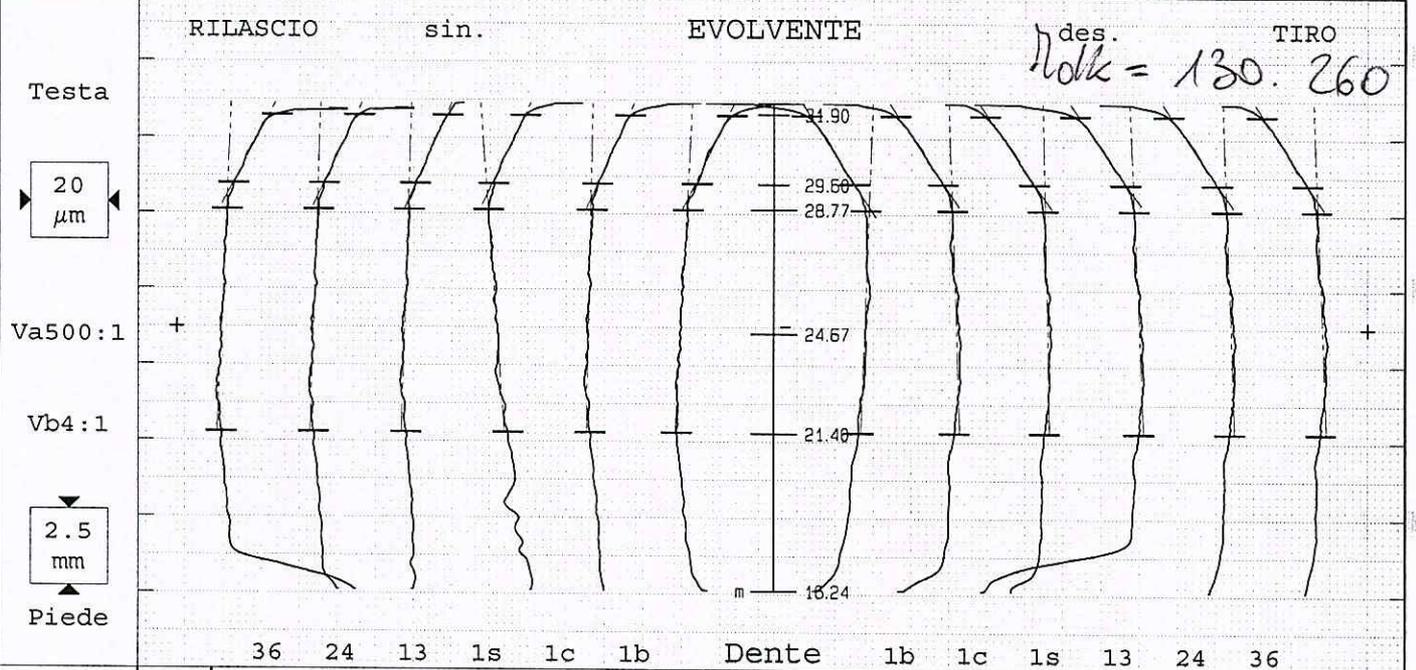
Err. di concentricità Fr	12.3	32.0	
Variab. spessore dente Rs			

Docum.archiviato elettronicamente.Archiviazione cartacea non necessaria

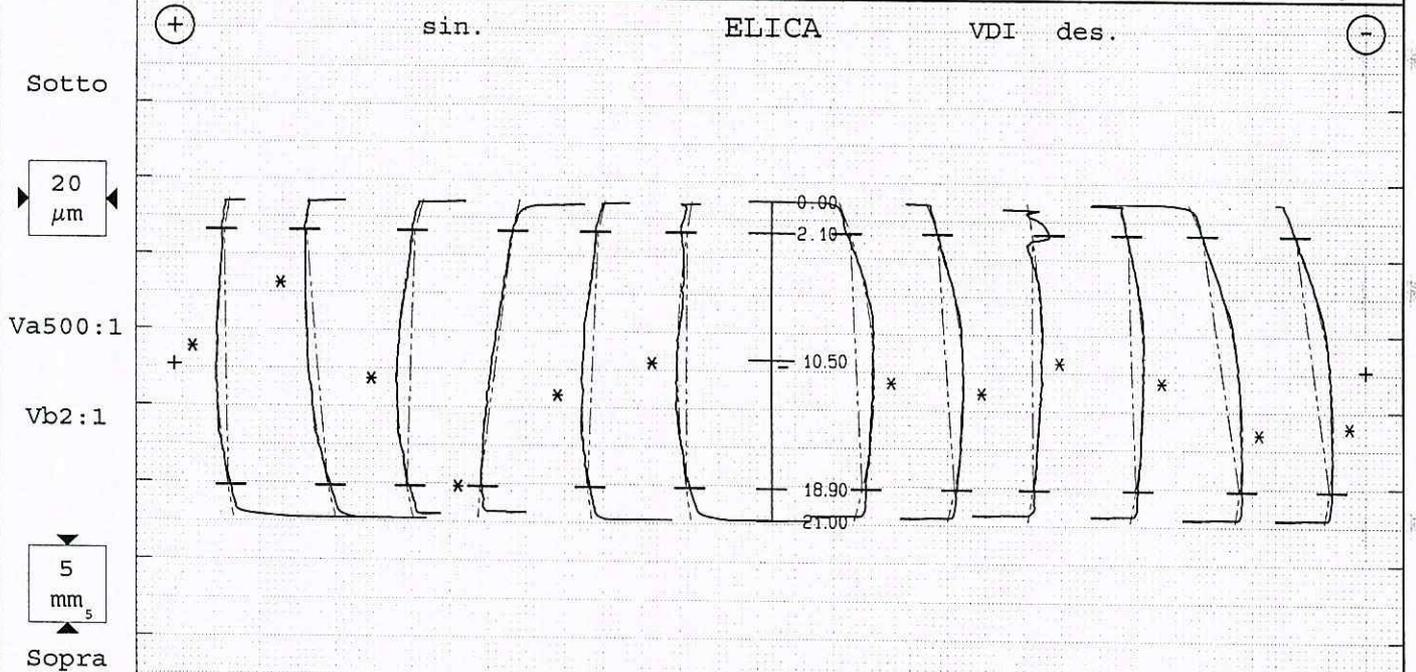
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0416a04 0	PNC35 B4784	Controllore: Turno d	Data: 14.04.2018 08:37
Denominazione: SR1		Numero denti z 47	Largh.fasc.dent. b 21mm
Numero disegno.: D51.1.1245.50-IF		Modulo m 2.45mm	Tratto evolv. La 7.37mm
Commessa/serie nr.: 17 -4		Angolo pressione 20°	Tratto elica L& 16.8mm
Masch.Nr.: M001	Spindel: Form. evolv. elica	-24.5°	Inizio elab. M1 21.4mm
Untersuchungszweck: Laufende Messung		∅ Base db 117.4936mm	Palpatore ∅ (#2) 1mm
Werkzeug:	Charge:	Ang. Base -22.935°	Fat.scor.pr. x .182



Tolerance	Medio	Val.misur [μm]							Qual	Tolerance	Val.misur [μm]							Medio	Qual
fH _{am} ±5	-2.5	Var a 1.8								±5	Var a 0.8							-3.2	
fH _a ±8	-2.5	-3.4	-2.6	-2.4	6.0	-1.6	-4.2		±8	3.0	-2.8	-1.8	-3.6	-3.1	-3.3	-3.2			
F _a	2.4	2.9	2.4	2.3	5.2	2.0	3.2			3.2	2.9	2.3	2.9	2.8	3.1	2.9			
f _{fa} 5	1.8	1.8	1.5	1.9	2.1	1.8	1.0		5	2.1	2.6	2.3	2.2	2.4	2.8	2.5			
Ca -13/-5	-9.7	-10.2	-9.6	-9.4	-11.5	-9.5	-9.6		-19/-11	-16.4	-13.6	-14.7	-13.6	-13.7	-13.5	-13.6			
f _{faf} 3	0.0	0.0	0.0	0.0	1.3	0.0	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
P/T-∅ [mm]	119.947	[119.83/120.15]									134.303	[134.3/134.5]							



N:Z	36	24	13	1t	1c	1p	∅ Dente	1p	1c	1t	13	24	36				
fH _{Bm} ±4	0.4	Var β 10.7							5±4	Var β 9.6							7.8
fH _B ±8	0.4	1.0	7.0	-2.8	-10.9	-3.7	-0.3	5±8	3.9	5.5	0.1	2.5	12.1	11.0	7.8		
F _B	4.1	2.9	6.9	3.3	8.3	3.2	2.6		4.8	4.0	8.1	3.2	6.6	6.3	5.0		
f _{fβ} 5	1.5	1.5	1.3	1.6	1.2	1.4	2.5	5	1.9	1.1	6.3	1.1	1.1	1.2	1.1		
CS 1/5	2.8	2.5	2.4	3.5	1.0	2.6	2.3	1/5	4.7	4.4	2.5	3.1	4.3	4.3	4.0		
Bd	-10.6														-3.8		

GCG 808006

Copyright (c) Klingelberg GmbH

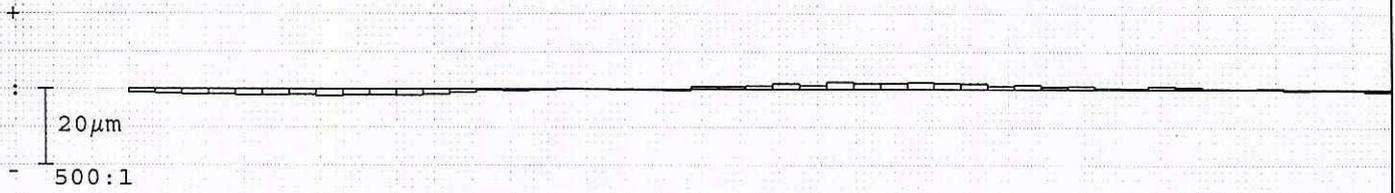


Ruota cilindrica Divisione

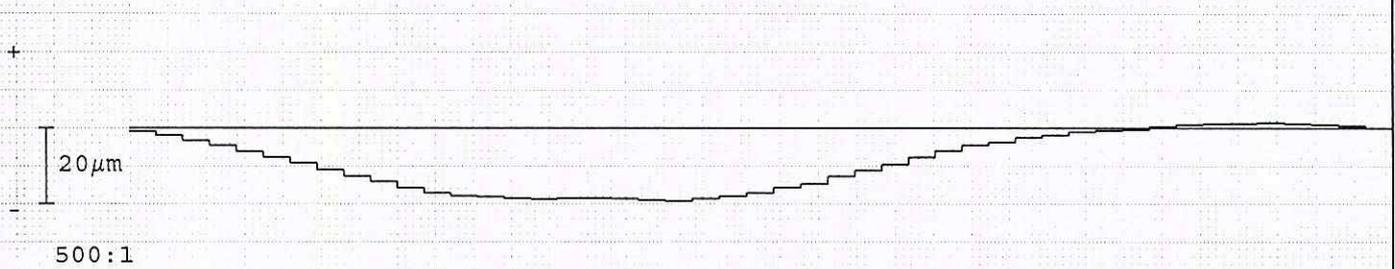


Nr. prog.: STI0416a04 0	PNC35 B4784	Controllore: Turno d	Data: 14.04.2018 08:37
Denominazione: SR1		Numero denti z 47	Angolo pressione 20°
Numero disegno.: D51.1.1245.50-IF		Modulo m 2.45mm	Angolo elica -24.5°
Comessa/serie nr.: 17		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Formelwerk	Erzeuger:	Charge:

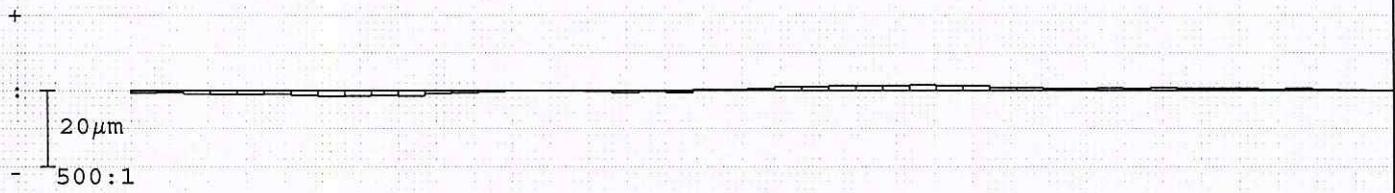
Errori singoli di divisione fp fianco sinistro



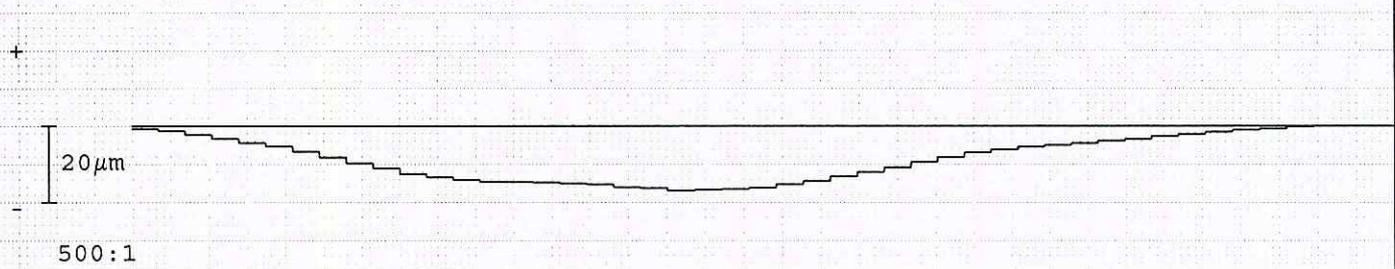
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

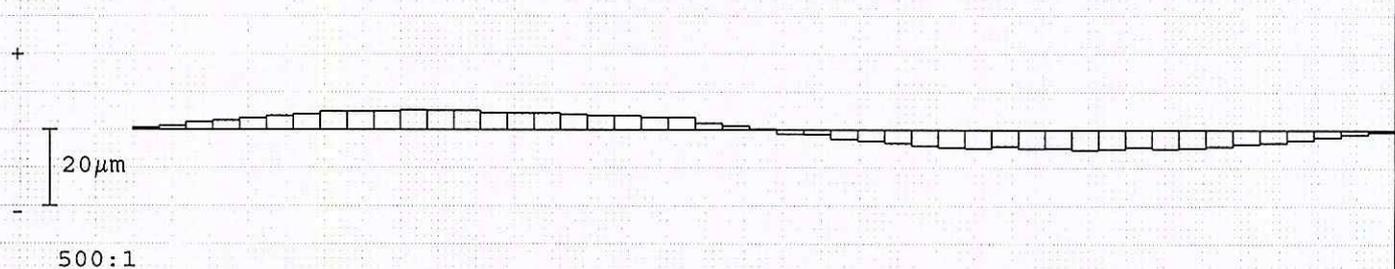


Errore somma di divisione Fp fianco destro



		fianco sinistro / RILASCIO				fianco destro / TIRO			
		Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2.0		11.0		1.5		11.0	
Gr. salto di passo	fu max	1.1		14.0		0.8		14.0	
Scarto di divisione	Rp	3.9				2.9			
Err. globale di divisione	Fp	20.7		45.0		16.9		45.0	
Err. cordale di divisione	Fpz/8	10.2				8.1			

Centricità Fr (Ø-sfera =3.5mm) ☉ : 10.6µm



Err. di concentricità	Fr	10.6	32.0	
Variac. spessore dente	Rs			

Docum. archiviato elettronicamente. Archiviazione cartacea non necessaria.

Copyright (c) Klingelberg GmbH

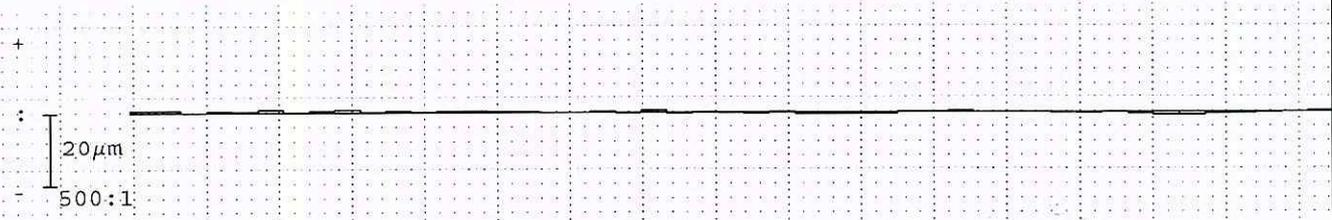


Ruota cilindrica Divisione

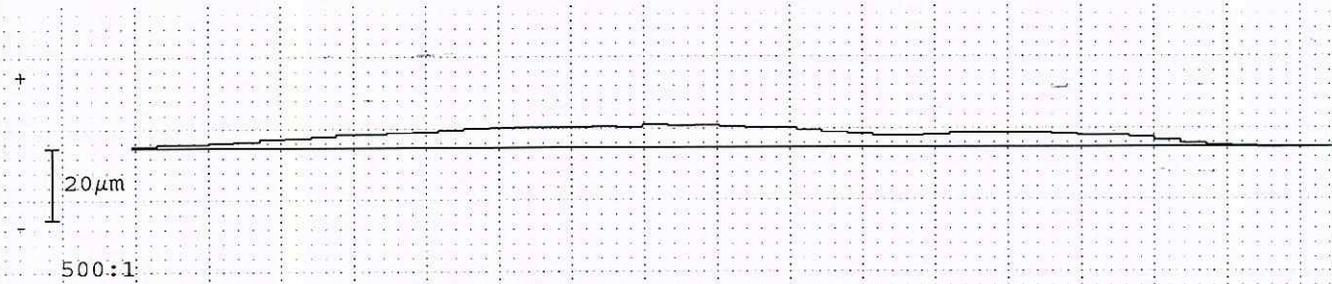


Nr. prog.: STI0416a04 0	PNC35 B4784	Controllore: Turno d	Data: 14.04.2018 09:20
Denominazione: SR1	Numero denti z: 47	Angolo pressione: 20°	
Numero disegno.: D51.1.1245.50-IF	Modulo m: 2.45mm	Angolo elica: -24.5°	
Comessa/serie nr.: 21	Untersuchungszweck: -- Laufende Messung		
Masch.Nr.: M001	Spindel: Form	Werkzeug:	Charge:

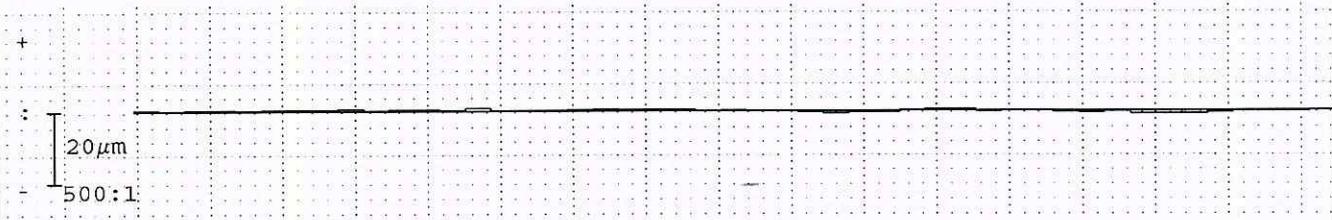
Errori singoli di divisione fp fianco sinistro



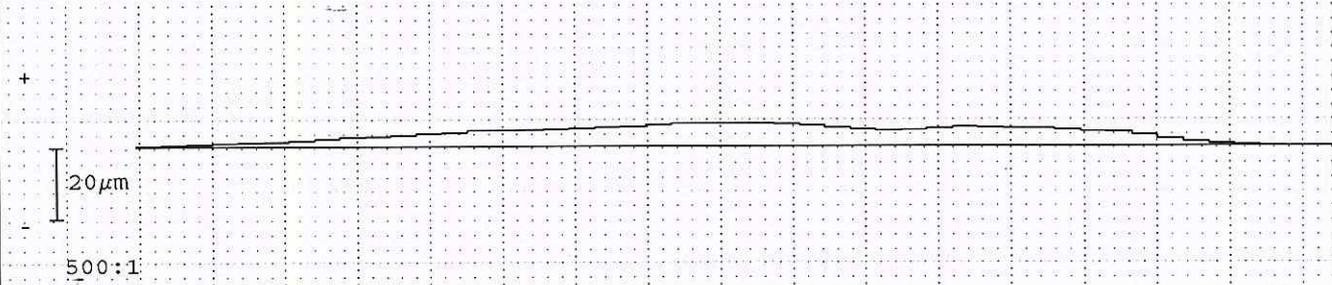
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

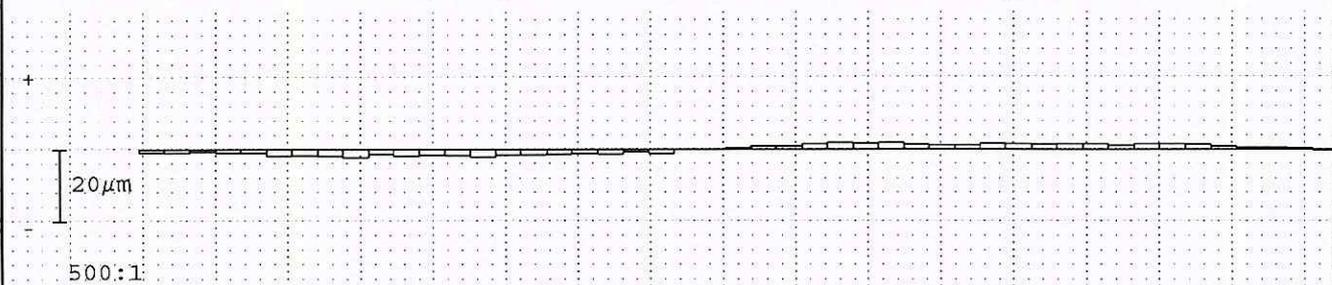


Errore somma di divisione Fp fianco destro



	fianco sinistro / RILASCIO				fianco destro / TIRO			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	0.9		11.0		0.9		11.0	
Gr. salto di passo fu max	1.0		14.0		0.6		14.0	
Scarto di divisione Rp	1.7				1.6			
Err. globale di divisione Fp	6.6		45.0		6.4		45.0	
Err. cordale di divisione Fpz/8	3.4				4.0			

Centricità Fr (Ø-sfera =3.5mm) ⊙ : 3.7µm



Err. di concentricità Fr	4.1	32.0	
Variaz. spessore dente Rs			

REPORT 18/081

Date: 17/05/2018
 Author: M. de Dato

Reason for analysis: PPAP
Motivo dell'indagine:

Requester: WLQ - M. Vicenti
Richiedente:

Part Name: SG1
Nome particolare:
Material: GCG_805000 Part 2
Materiale:
State of part: Finito
Stato del particolare:

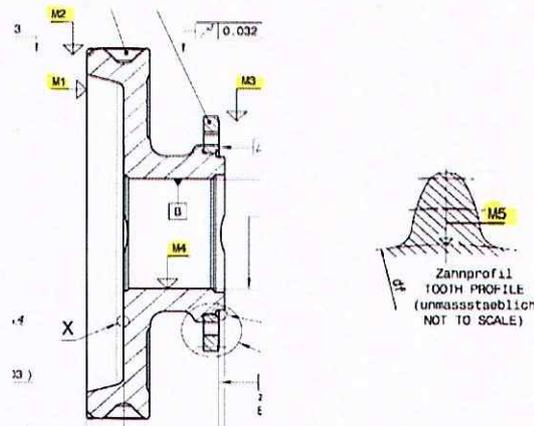
P/N: 251.1.1244.50
S/N: -
Customer:
Cliente:

Result: OK
Risultato:

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

Notes: Gearset 32C
Note:

Drawing (disegno)



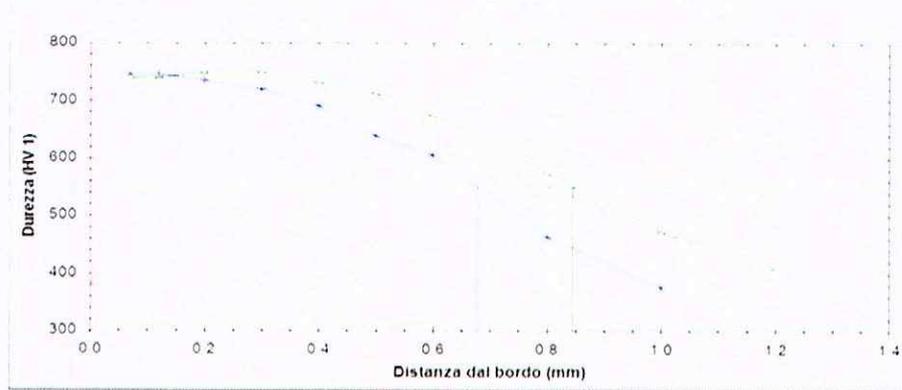
Picture 1: posizioni di misura a disegno.

Surface hardness verification (verifica durezza superficiale)

Component	Scale	Position	Measured Value	Range
Gear	HRC	M1	61.2	-
Gear	HRA	M1	81.4	80.5 + 2.5

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

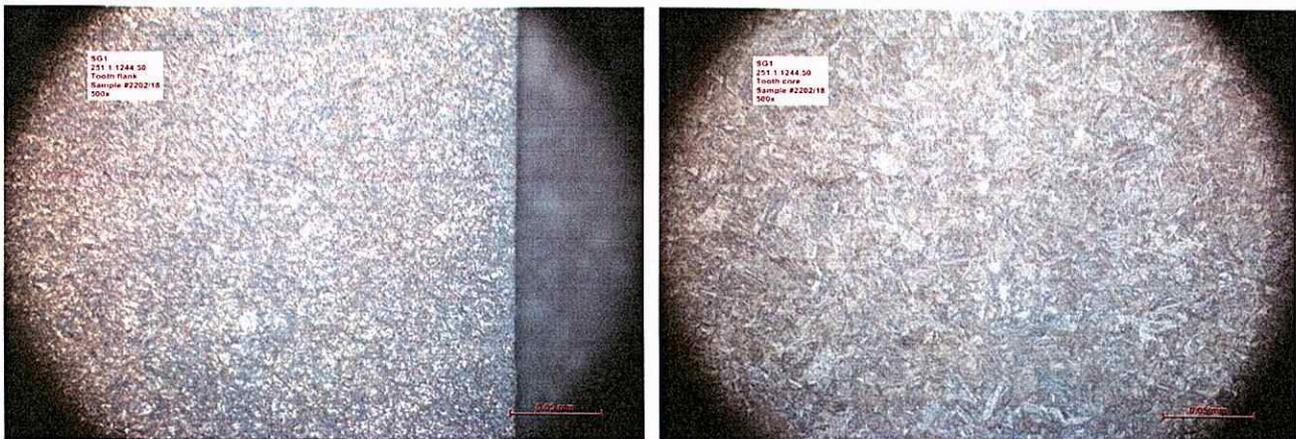
Component	Scale	Sample #	Position	Measured Value	Range
Gear	CHD 550 HV1	2202/18	M2 (tooth flank)	0.81	0.50+0.40 mm
Gear	CHD 550 HV1	2202/18	M3 (KK)	0.84	0.50 mm min.
Gear	CHD 550 HV1	2202/18	M4 (Bore)	0.68	0.30 mm min.
Gear	Core hardness HV10	2202/18	M5 (tooth core)	384	≥ 300



Picture 1: profili di durezza.

Microstructure analysis (analisi della microstruttura)

Sample #	2202/18
Gear - Tooth flank surface structure:	Martensite e austenite residua (15%)
Gear - Tooth base core structure:	Martensite, bainite



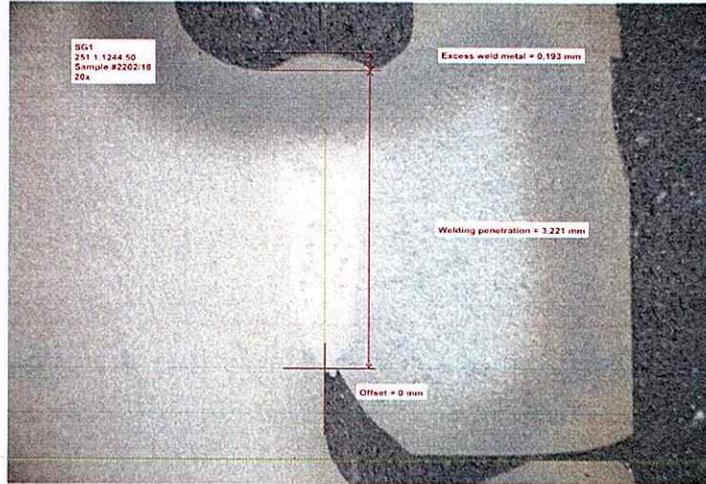
Picture 2: Microstruttura sul fianco dente (a sinistra) ed a cuore sulla base dente (a destra).

REPORT 18/081

Date: 17/05/2018
 Author: M. de Dato

Weld bead analysis (analisi della saldatura)

Feature	Unit	Sample #	Measured Value	Range
Radial offset	mm	2203/18	0.00	max 0.1
Penetration	mm	2203/18	3.22	min 2.8
Excess weld metal	mm	2203/18	0.19	max 0.5



Picture 3: macro sezione saldatura OK.

Analisi di similitudine Ppk

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

Macchina da confrontare: SLW11009
Capability da confrontare Nr.: 22/02/2017

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

Codice Pezzo di riferimento: 251.1.1082.50

Partnumber in esame: 251.1.1245.50

	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	---	58			47			i.O.			
diam.primitivo - Ø	mm	123.247			117.494			i.O.			
Altezza dentatura	mm	21			21			i.O.			
diam.testa - Ø (da)	mm	139.00			134.50			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	137.5455	0.077	6.36		130.265	0.081	1.67	i.O	6.69	
Fr (Eccentricità)	µm	0	32	3.22		0	32	1.67	i.O	3.22	
	µm								---		
	µm								---		
	µm								---		
	µm								---		
	µm								---		
...									---		

Part Submission Warrant

PSW Nr.: 006/18



Part Name Speed Gear 1st Cust. Part Number 251.1.1245.80
 Shown on Drawing No. 251.1.1245.80 Org. Part Number 25.5.00650.00
 Engineering Change Level -/16.10.2017 Dated 16.10.2017
 Additional Engineering Changes n/a Dated n/a
 Safety and/or Government Regulation Yes No Purchase Order No. 5500040221 Weight (kg) 1,6220
 Checking Aid No. Höhenreißer Checking Aid Engineering Change Level n/a Dated 01.05.2016
Std. Messmittel 01.05.2017
Contour measuring 20.03.2017
Sirio 688 09.03.2017

ORGANIZATION MANUFACTURING INFORMATION

CUSTOMER SUBMITTAL INFORMATION

Cotarko GmbH DCZSA
 Organization Name & Supplier/Vendor Code
Henry-Ford-Str. 1
 Street Address
Köln NRW 50725 Germany
 City Region Postal Code Country

Getrag Ford Transmission GmbH
 Customer Name/Division
Petra Braun
 Buyer/Buyer Code
DCT300
 Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? Yes No n/a
 Submitted by IMDS or other customer format: IMDS-Nr. : 727193118 / 1

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 External Machining

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 200 / 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: Full PSW Neuteil - externe Zerspanung

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

Organization Authorized Signature Gerd Nöthen Date 06. Mrz 18
 Print Name Gerd Nöthen Phone No. +49 221 90 10337 Fax No. +49-221-76803205
 Title QS Manager E-mail gnoethe1@cotarko.com

FOR CUSTOMER USE ONLY (IF APPLICABLE)

Part Warrant Disposition: Approved Rejected Other
 Customer Signature W. Tetke Date 13.3.18
 Print Name Wolfram Tetke 00220

