

Part Name: Speed Gear 6 Cust. Part No.: 251.1.1230.50
 Shown on Drawing No.: 251.1.1230.50 Org. Part No.: 251.1.1230.50
 Engineering Change Level: 3 index "L" (C005149_MIP_1) Dated: 18/07/2016
 Additional Engineering Changes: na Dated: na
 Safety and/or Government Regulation: Yes No Purchase Order No.: _____ Weight (kg): 0.466
 Checking Aid No.: na Checking Aid Engineering Change Level: na Dated: na

ORGANIZATION MANUFACTURING INFORMATION

CUSTOMER SUBMITTAL INFORMATION

Getrag S.p.A.
 Organization Name & Supplier / Supplier Code
Via dei Ciclamini, 4
 Street Address
Modugno (Ba) Puglia 70026 Italy
 City Region Postal Code Country

Bari assembly line (GPS4)
 Customer Name / Division
na
 Buyer / Buyer Code
DCT300
 Application

MATERIALS REPORTING

Has customer-required Substances of Concern information been reported? Yes No n/a
 Submitted by IMDS or other customer format: _____
 (IMDS=International Material Data System)
 Are polymeric parts identified with appropriate ISO marking codes? Yes No n/a

REASON FOR SUBMISSION (Check at least one)

- Initial Submission
- Engineering Change(s)
- Tooling: Transfer, Replacement, Refurbishment, or additional
- Correction of Discrepancy
- Tooling Inactive > than 1 year
- Change to Optional Construction or Material
- Supplier or Material Source Change
- Change in Part Processing
- Parts Produced at Other or Additional Location
- Other - please specify below (e.g. additional specific customer requirement or e.g. change of EP parts)

REQUESTED SUBMISSION LEVEL (Check one)

- Level 1 - Warrant only (and for designated appearance items, an 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 na

DECLARATION

I hereby affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of 163 / 8 hours. I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from the declaration below.

EXPLANATION / COMMENTS: - First PPAP Submission (only differences from variant 251.1.1091.51).

- Identification grooves deleted in according with change C006077

Is each Customer Tool properly tagged and numbered? Yes No n/a
 Organization Authorized Signature: _____ Date: 10/01/2018
 Print Name: Tursi Dario Maria Phone No.: +39 0805858360 Fax No.: _____
 Title: 7DCT300 Launch Manager E-Mail: dario.tursi@magna.com

FOR CUSTOMER USE ONLY (If applicable))

Part Warrant Disposition: Approved Rejected Other _____
 Customer Signature: _____ Date: 10/01/2018
 Print Name: _____ Customer Tracking No.: _____

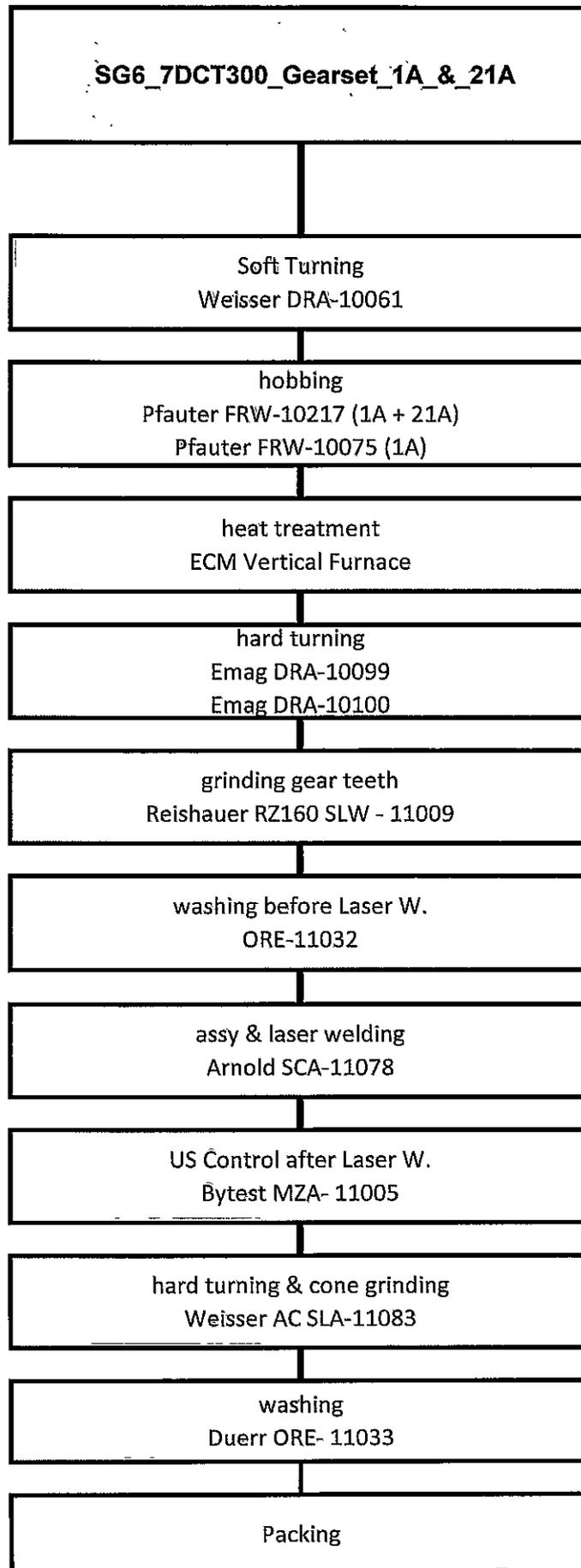
New P/N introduction - 1230.50

Short description: Initial PPAP (only differences from 1091)

PPAP Requirements	Required	Note	PPAP Docs updated
1 Design Records	Yes	Final Drawing + G.D. + VBZ	Yes
2 Authorized Engineering change documents	Yes	see dwg	Yes
3 Customer Engineering approval	n.a.		
4 DFMEA	NO		
5 Process flow diagram(s)	Yes		Yes
6 PFMEA	Yes		Yes
7 Control plan	Yes		Yes
8 Measurement system analysis studies	Yes	Studio Tipo 1 per MdK	Yes
9 Dimensional results	Yes		Yes
10 Records of Material / Performance test results	NO		
11 Initial process studies	Yes	Ppk for MdK and Fr	Yes
12 Qualified laboratory documentation	NO		
13 Appearance Approval Report (A.A.R.)	n.a.		
14 Sample Production Parts	Yes		Yes
15 Master sample	Yes		Yes
16 Checking aids	n.a.		
17 Customer-Specific Requirements	NO		
18 Part Submission Warrant (PSW)	Yes		Yes

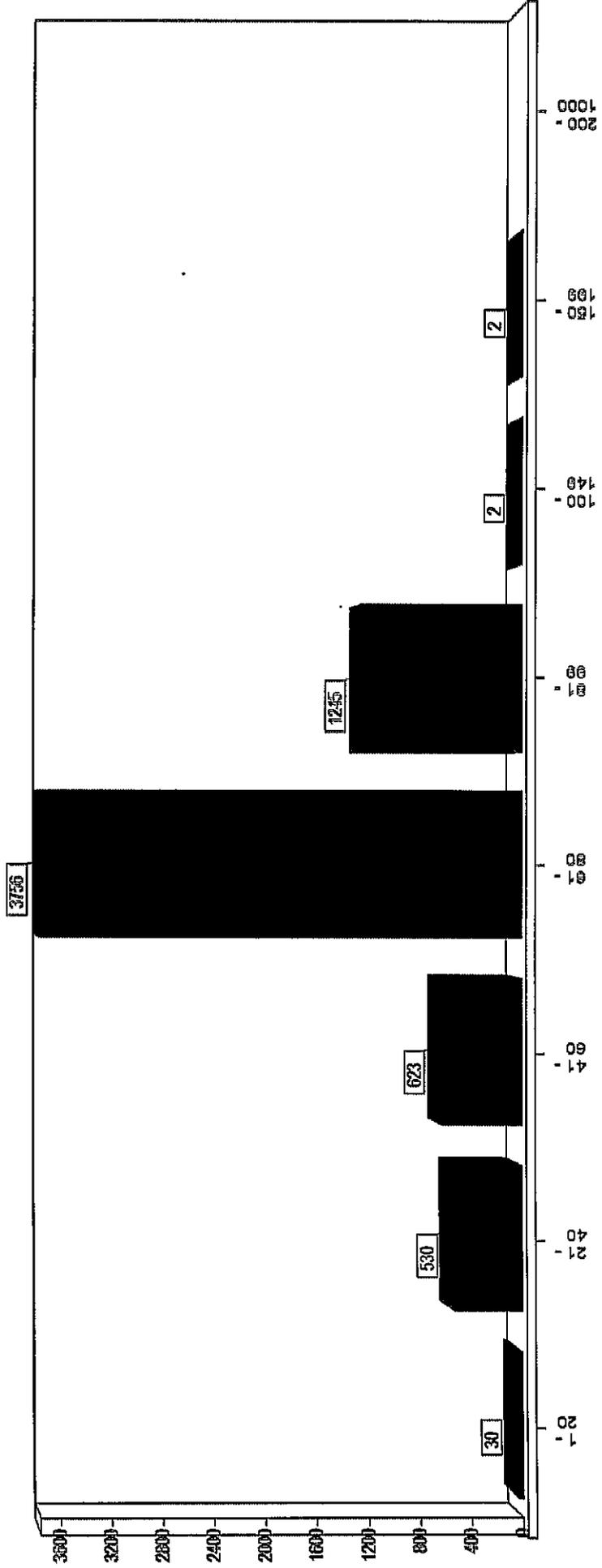
Other requirements			
1 PSW Raw part	NO		
2 PSW E.P. part	NO		
3 PSW Engagement Rings	NO		

10/01/2018



DCT300 – GEARSSET: PFMEA RPN Status

		FMEA Processo		Numero: Pagina: 1.2.1.1.1
Tipo/Modello/Produzione/Lotto: 7DCT300	Numero Disegno: Gearsset 1A + 21A Stato modificat.: -	Responsabile: Getrag Dltac: Getrag	Emesso: 31/08/2015	
FMEA/Elemento: GEARSSET 7DCT300	Codice dell'operazione: Tutta Stato modificat.: -	Responsabile: Papagna, Oscurio, Mili, Cichelli, Tanzi T., Tanizese, Landisciana, Guarna, Santobadi, Capomio, Vicenti, Pisanno, Pieno Dltac:	Emesso: Modificato: 13/01/2017 20/11/2017	



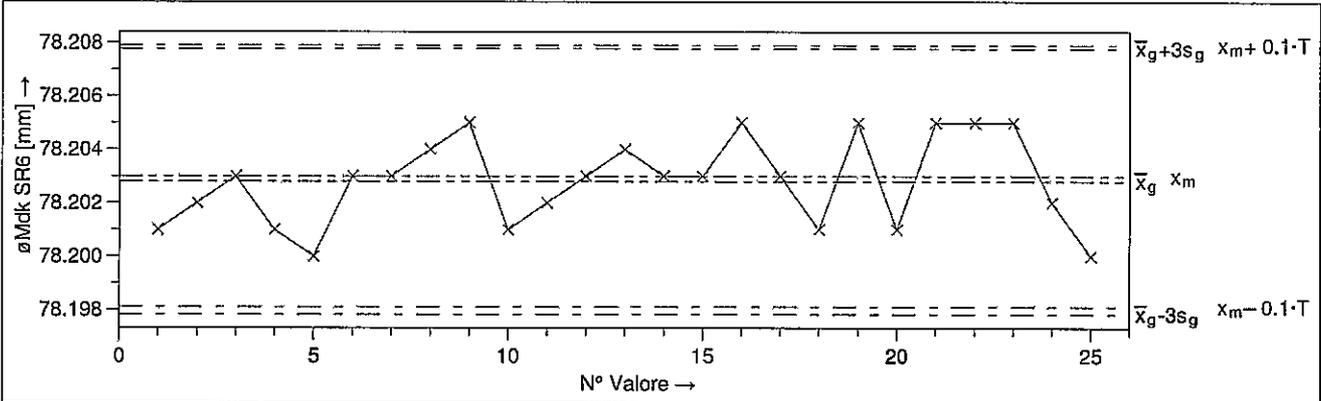
sequenza



Capacità strumenti di misura

Pagina
1 / 1

Data/ora	11/11/2017	Nome oper.	G.Sette	Reparto/Area/Prod.	NN	Posto di prova	Dentatura SR6
Calibro		Master			Caratteristica		
Desc. calibro	Banchetto in acciaio	Desc. mast.	SR6	Desc. Car.	øMdk SR6		
N° calibro	MVZ 406001 020	N° master	MVZ 400567 002	N° Caratt.	2511123150		
Ris. calibro	0.001	Valore reale mast	78.203	Val. Nom	78.203	LSS	78.228 $\hat{=} 0.025$
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di n mm	LSI	78.179	$\hat{=} -0.024$
Nota	Banchetto øMdk MVZ 406001 020 per ruote dentate DCT 300 hard						



i	x _i	i	x _i	i	x _i	i	x _i	i	x _i
1	78.201	6	78.203	11	78.202	16	78.205	21	78.205
2	78.202	7	78.203	12	78.203	17	78.203	22	78.205
3	78.203	8	78.204	13	78.204	18	78.201	23	78.205
4	78.201	9	78.205	14	78.203	19	78.205	24	78.202
5	78.200	10	78.201	15	78.203	20	78.201	25	78.200

Valori a disegno		Valori Calcolati		Statistiche	
$x_{m+0.1\cdot T}$	= 78.20790	$x_{max\ g}$	= 78.205	$\bar{x}_g + 3s_g$	= 78.20777
x_m	= 78.20300	$x_{min\ g}$	= 78.200	\bar{x}_g	= 78.20280
$x_{m-0.1\cdot T}$	= 78.19810	R_g	= 0.005	$\bar{x}_g - 3s_g$	= 78.19783
$0.2\cdot T$	= 0.00980	n_{tot}	= 25	$6s_g$	= 0.00995
T	= 0.049			s_g	= 0.00166
Unità di misura	= mm			$ B_i $	= 0.00020000
				n_{eff}	= 25

Test per Bias			Risultati del test : non significativo
Bias	=	0.41%	

Minimo riferimento per sistema di misura capace						
Risoluzione	%RE =	2.04%		$T_{min} (\%RE)$	=	0.0200
$\%EV = \frac{EV}{T}$	=	20.31%		$T_{min} (\%EV)$	=	0.199
$C_g = \frac{0.2\cdot T}{4\cdot s_g}$	=	$1.06 \leq 1.48 \leq 1.89$		$T_{min} (C_g)$	=	0.0440
$C_{gk} = \frac{0.1\cdot T - \bar{x}_g - x_m }{2\cdot s_g}$	=	$1.00 \leq 1.42 \leq 1.84$		$T_{min} (C_{gk})$	=	0.0461

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



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

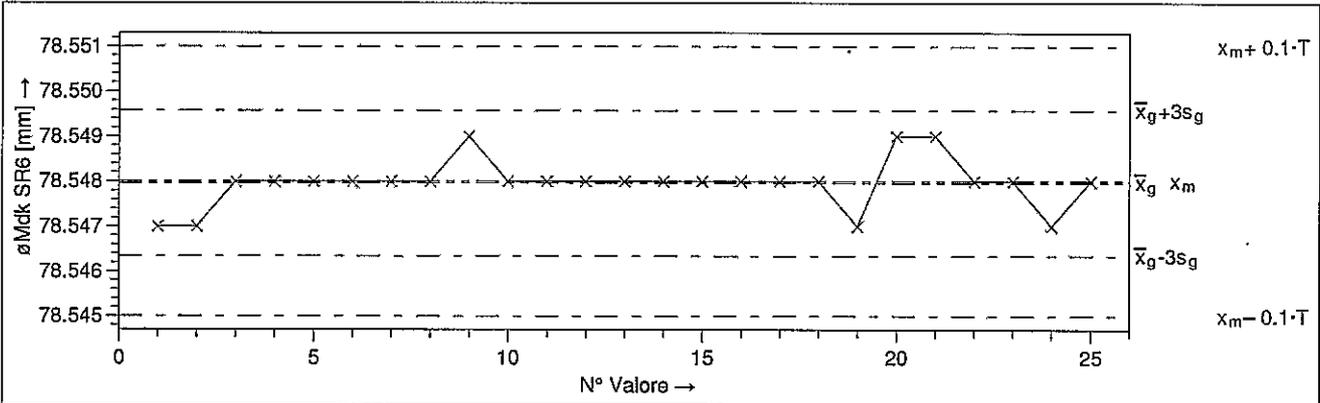
Data _____ Firma _____ Dipartimento _____



Capacità strumenti di misura

Pagina
1 / 1

Data/ora	13/11/2017	Nome oper.	G.Sette	Reparto/Area/Prod.	NN	Posto di prova	Dentatura SR6
Calibro		Master			Caratteristica		
Desc. calibro	Banchetto in acciaio	Desc. mast.	SR6	Desc. Car.	øMdk SR6		
N° calibro	MVZ 406001 004	N° master	MVZ 400567 001	N° Caratt.	2511123150		
Ris. calibro	0.001	Valore reale mast	78.548	Val. Nom 78.548	LSS	78.563	$\hat{=} 0.015$
Caus. Pr.	Cg CgK	Unità di misura	mm	Unità di n mm	LSI	78.533	$\hat{=} -0.015$
Nota	Banchetto øMdk MVZ 406001 004 per ruote dentate DCT 300 soft						



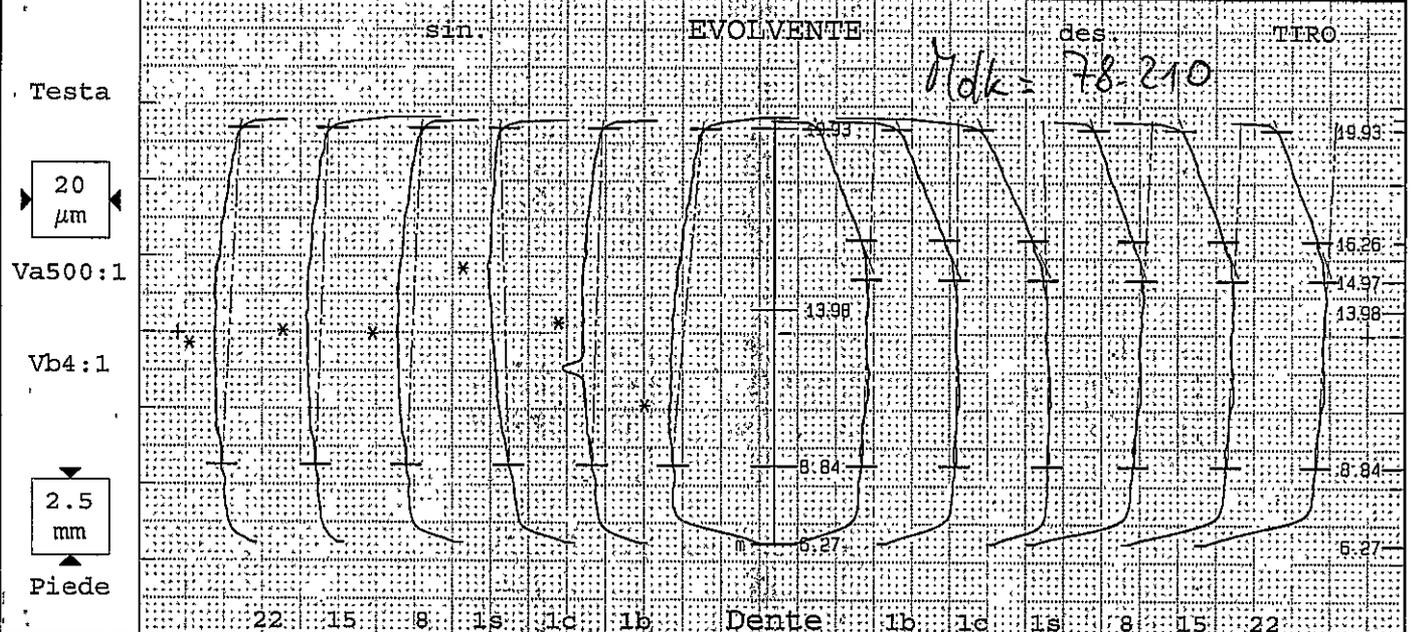
i	x _i	i	x _i	i	x _i	i	x _i	i	x _i
1	78.547	6	78.548	11	78.548	16	78.548	21	78.549
2	78.547	7	78.548	12	78.548	17	78.548	22	78.548
3	78.548	8	78.548	13	78.548	18	78.548	23	78.548
4	78.548	9	78.549	14	78.548	19	78.547	24	78.547
5	78.548	10	78.548	15	78.548	20	78.549	25	78.548

Valori a disegno		Valori Calcolati		Statistiche	
$x_{m+0.1 \cdot T}$	= 78.55100	$x_{max\ g}$	= 78.549	$\bar{x}_g + 3s_g$	= 78.54958
x_m	= 78.54800	$x_{min\ g}$	= 78.547	\bar{x}_g	= 78.54796
$x_{m-0.1 \cdot T}$	= 78.54500	R_g	= 0.002	$\bar{x}_g - 3s_g$	= 78.54634
$0.2 \cdot T$	= 0.00600	n_{tot}	= 25	$6s_g$	= 0.00323
T	= 0.030			s_g	= 0.000539
Unità di misura	= mm			$ Bi $	= 0.000040000
				n_{eff}	= 25
Test per Bias				Risultati del test : non significativo	
Bias		= 0.13%			
Minimo riferimento per sistema di misura capace					
Risoluzione	%RE = 3.33%			$T_{min} (\%RE)$	= 0.0200
$\%EV = \frac{EV}{T}$	= 10.77%			$T_{min} (\%EV)$	= 0.0646
$C_g = \frac{0.2 \cdot T}{4 \cdot s_g}$	= 2.00 ≤ 2.79 ≤ 3.57		11.33	$T_{min} (C_g)$	= 0.0143
$C_{gk} = \frac{0.1 \cdot T - \bar{x}_g - x_m }{2 \cdot s_g}$	= 1.96 ≤ 2.75 ≤ 3.54		11.33	$T_{min} (C_{gk})$	= 0.0147
Sistema di misura capace (%RE,min,C _g ,C _{gk})					
□ GETRAG MSA 2017: Capability of measuring system (Type-1 Study)					

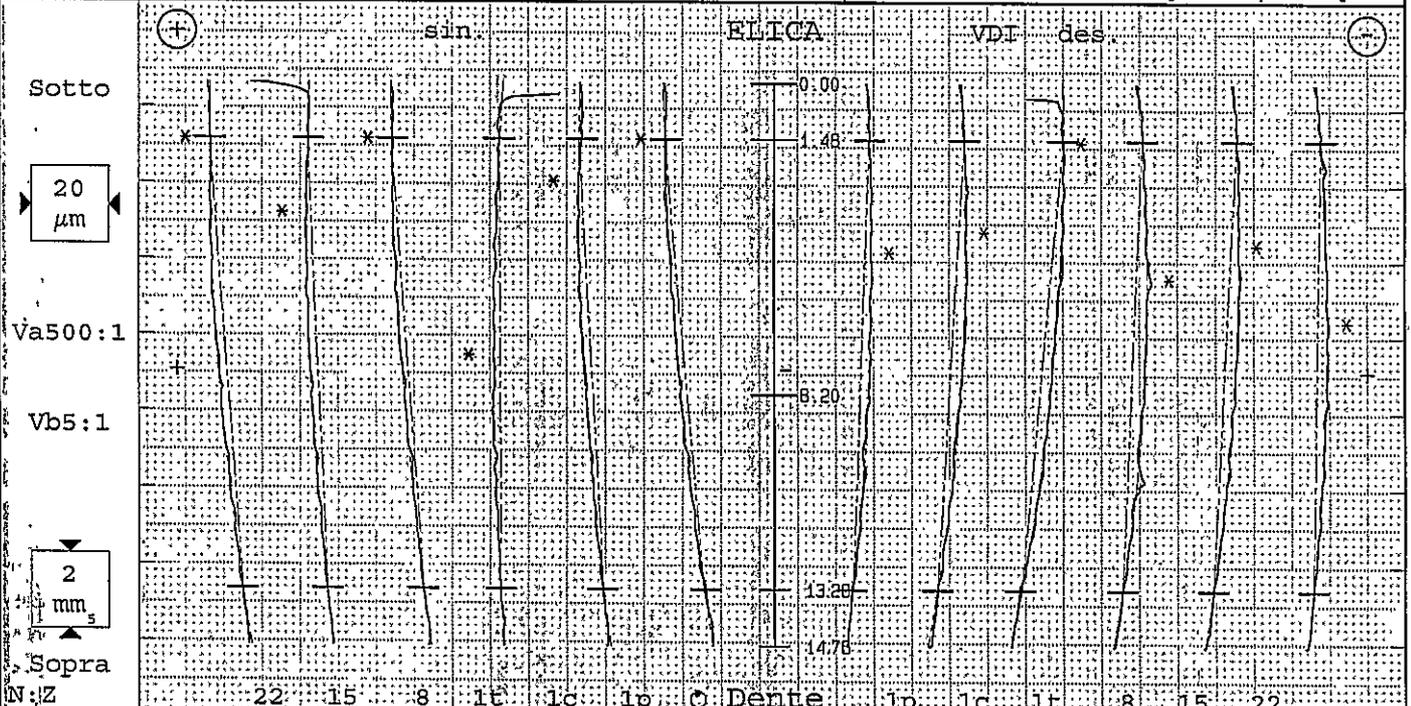
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0412 06 0	P26 B7590	Controllore: turno B	Data: 03.11.2017 15:54
Denominazione: SR6		Numero denti z: 28	Largh. fasc. dent. b: 14.76mm
Numero disegno: D51.1.1231.50-ICA		Modulo m: 2.05mm	Tratto evolv. La: 11.09/6.13mm
Commessa/serie nr.: 1		Angolo pressione: 17.5°	Tratto elica LK: 11.81mm
Masch. Nr.: M001	Spindel: Forme elicoidale	Angolo elicoidale: -28.9°	Inizio elab. MI: 8.84mm
Untersuchungszweck: Laufende Messung	Ø Base ab: 61.6865mm		Palpatore Ø: (#2C) 1mm
Werkzeug: Charge:	Ang. Base: -27.446°		Fat. scor. pr. x: .985



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
FHdm ±6	-3.5	Var a 1.9								±6								3.2		
FHd ±10	-3.5	-4.5	-3.1	-3.7	2.4	-2.6	-7.8		±10	3.0	0.3	-1.6	4.5	3.3	4.8	3.2				
Fd	7.2	6.7	6.0	6.2	4.5	9.9	9.1			2.4	1.6	2.1	3.0	2.3	3.0	2.5				
ffa	5	2.6	1.4	1.7	1.3	1.7	5.8	1.3	5	1.7	1.7	1.5	1.5	1.7	1.8	1.7				
Ca	1/5	4.0	4.1	3.7	4.1	3.7	4.0	3.0												
Ca																				
ffaaf	3	0.0	0.9	1.0	1.2	0.6	0.8	0.4												
P/T-Ø [mm]	61.353	[61.25/61.6]									74.099	[74.04/74.3]								



FHSm	10±6	9.1	Var β 4.3								12±5	Var β 6.5							-6.4
FHS	10±10	9.1	11.0	6.7	10.8	0.3	7.9	12.8		-12±10	-5.4	-9.0	-13.8	-6.5	-7.7	-2.5	-6.4		
FB		5.3	1.9	14.6	1.5	8.6	3.2	3.3			5.6	3.7	3.6	7.0	4.5	8.1	5.8		
ffb	5	1.1	1.1	1.0	1.2	1.1	1.2	1.1		5	1.2	1.1	1.1	2.5	0.9	1.3	1.5		
CS	1/5	2.0	2.2	2.0	1.6	1.7	2.0	1.7		1/5	2.2	3.0	2.8	3.4	2.9	2.6	3.0		
Bd		-12.5															-8.4		

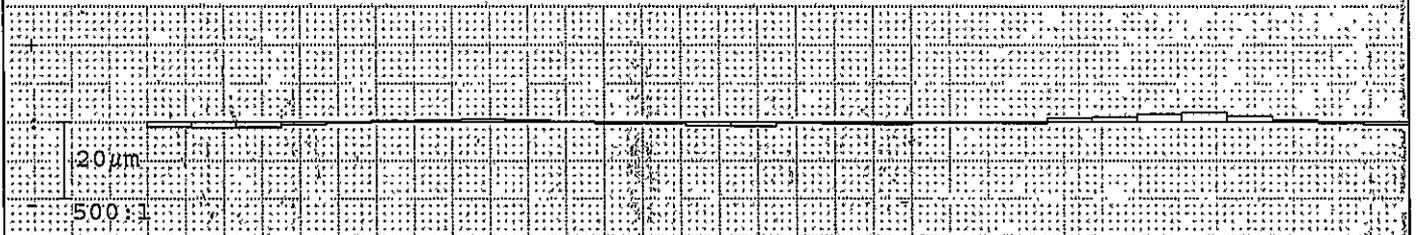


Ruota cilindrica Divisione

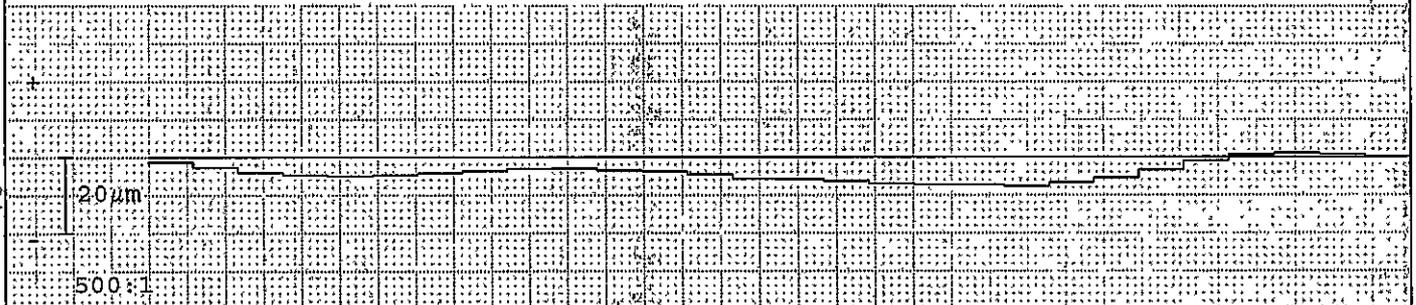


Nr. prog.: STI0412 06 0	P26 B7590	Controllore: turno B	Data: 03.11.2017 15:54
Denominazione: SR6		Numero denti z: 28	Angolo pressione: 17.5°
Numero disegno: D51.1.1231.50-ICA		Modulo m: 2.05mm	Angolo elicita: -28.9°
Comessa/serie nr.: 1		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: FORM 6	Erzdg:	Charge:

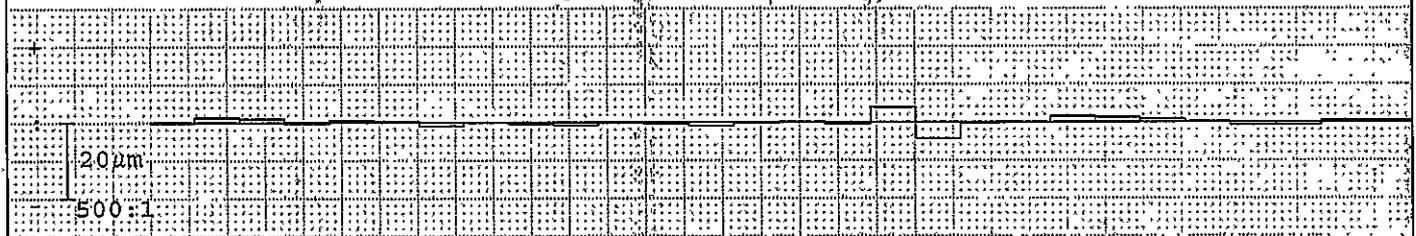
Errori singoli di divisione fp fianco sinistro



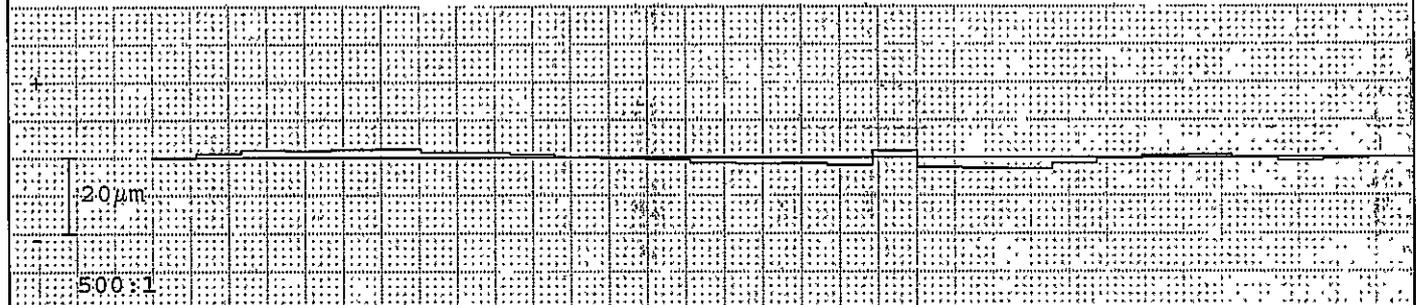
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

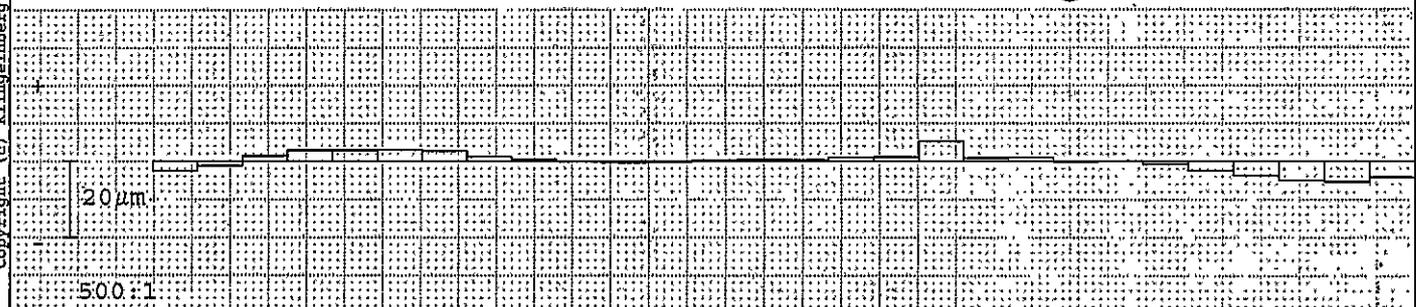


Errore somma di divisione Fp fianco destro



	Corsa per misura divis.: 67.727 z=8.2mm	fianco sinistro				fianco destro / TIRO			
		Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	2.5		10.0		4.4		10.0	
Gr. salto di passo	fu max	1.3		12.0		8.2		12.0	
Scarto di divisione	Rp	4.0				8.3			
Err. globale di divisione	fp	8.7		45.0		5.3		45.0	
Err. cordale di divisione	Fpz/8	7.3				3.7			

Centricità Fr (Ø-sfera =3.25mm) ⊙ : 3.9µm



Err. di concentricità	Fr	10.5	32.0
Variaz. spessore dente	Rs		

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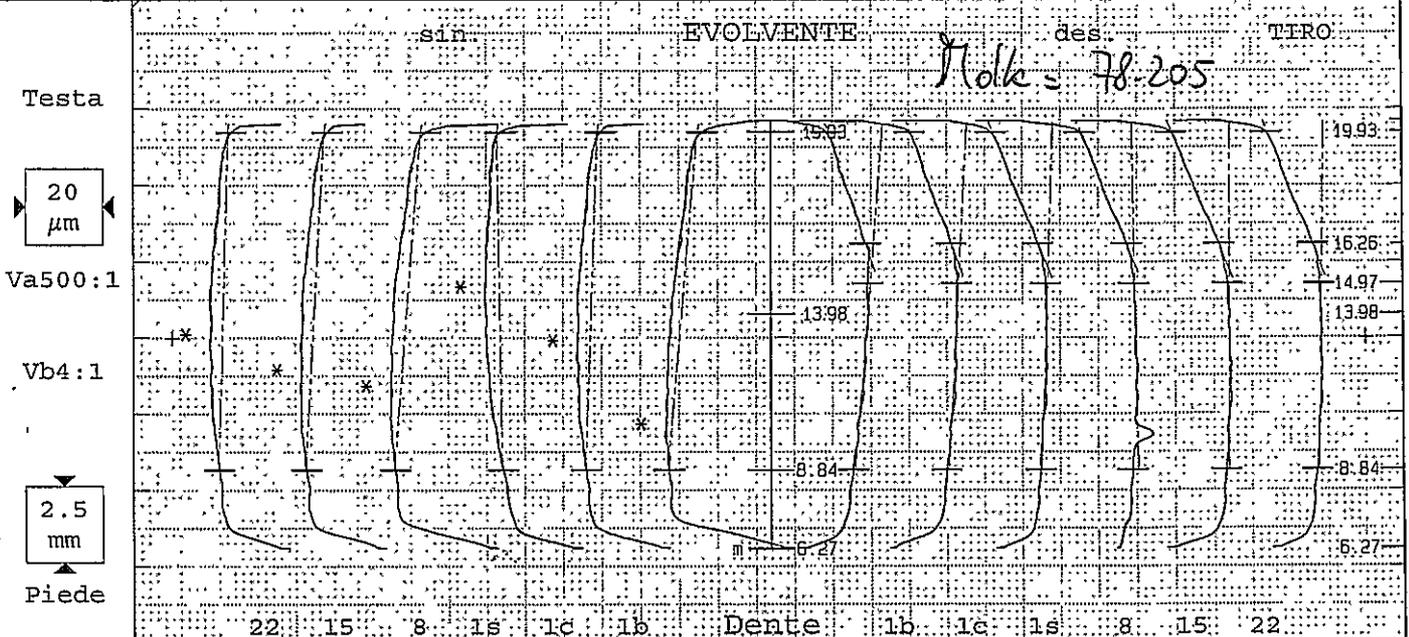


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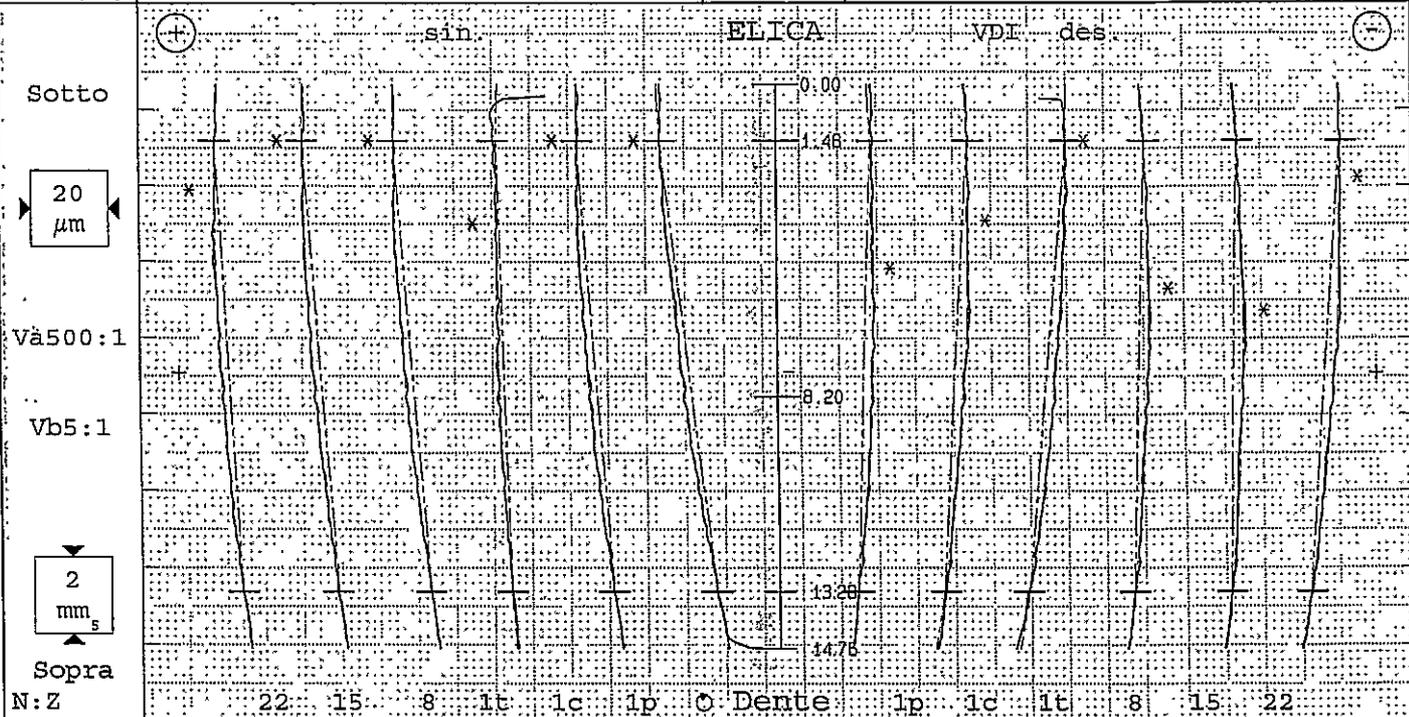
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0412 06 0	P26 B7590	Controllore: turno c	Data: 05.11.2017 13:11
Denominazione: SR6		Numero denti z 28	Largh. fasc. dent. b 14.76mm
Numero disegno.: D51.1.1231.50-ICA		Modulo m 2.05mm	Tratto evolv. La 11.09/6.13mm
Commessa/serie nr.: 10-2		Angolo pressione 17.5°	Tratto elica LE 11.81mm
Masch. Nr.: M001	Spindel: Forme	Angolo elica -28.9°	Inizio elab. M1 8.84mm
Untersuchungszweck: Laufende Messung		Ø Base db 61.6865mm	Palpatore Ø (#2C) 1mm
Werkzeug:	Charge:	Ang. Base -27.446°	Fat. scor. pr. x .985



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
fHm ±6	-4.4	Var a 4.5								±6	Var a 6.3							1.2		
fHa ±10	-4.4	-2.5	-5.0	-7.0	1.2	-3.1	-7.8		±10	7.1	4.6	2.9	-1.7	0.4	1.4	1.2				
Fa	6.4	4.8	6.7	9.0	3.8	5.2	9.3			4.3	2.9	1.8	5.4	1.5	1.5	2.8				
ffa 5	1.5	1.4	1.4	1.9	1.4	1.2	1.8		5	1.3	1.4	1.1	5.6	1.4	1.2	2.4				
Ca 1/5	3.3	3.2	3.1	3.5	3.7	3.4	2.7													
Ca										-19/-11	-14.1	-14.8	-15.8	-13.3	-15.1	-14.8	-14.5			
ffaf 3	0.0	0.4	0.2	0.2	0.0	0.3	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
P/T-Ø [mm]	61.364	[61.25/61.6]									74.109	[74.04/74.3]								



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual
fHm 10±6	10.6	Var β 3.4								-12±6	Var β 7.9							-6.8	
fHB 10±10	10.6	8.3	11.1	11.7	4.1	11.4	17.5		-12±10	-4.8	-8.6	-13.1	-4.2	-3.2	-11.1	-6.8			
FK	2.1	2.3	1.8	2.3	4.7	2.0	6.1			5.6	3.4	2.6	6.7	7.3	2.6	5.0			
ffβ 5	1.0	1.2	0.9	1.1	1.5	0.9	1.0		5	1.2	1.1	1.0	1.1	1.3	1.2	1.2			
CS 1/5	2.1	2.2	2.0	2.1	1.3	2.1	1.9		1/5	2.2	2.7	2.4	2.5	2.6	2.7	2.6			
-Bd	-13.4																		

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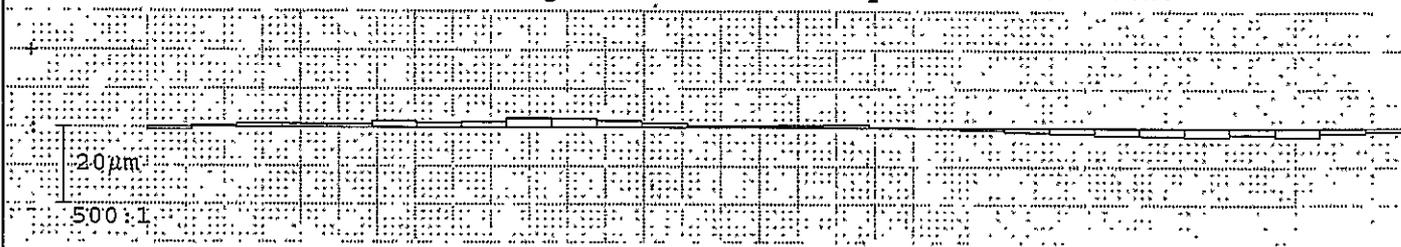


Ruota cilindrica Divisione

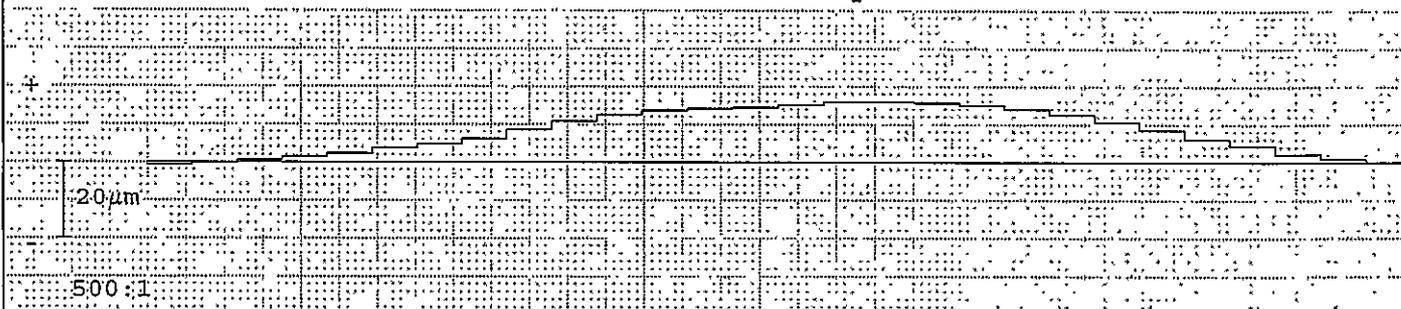


Nr. prog.: STI0412 06 0	P26 B7590	Controllore: turno c	Data: 05.11.2017 13:11
Denominazione: SR6	Numero denti z: 28	Angolo pressione: 17.5°	
Numero disegno.: D51.1.1231.50-ICA	Modulo m: 2.05mm	Angolo elicita: -28.9°	
Comessa/serie nr.: 10 -2	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001	Spindel: Formelwerkzeug	Charge:	

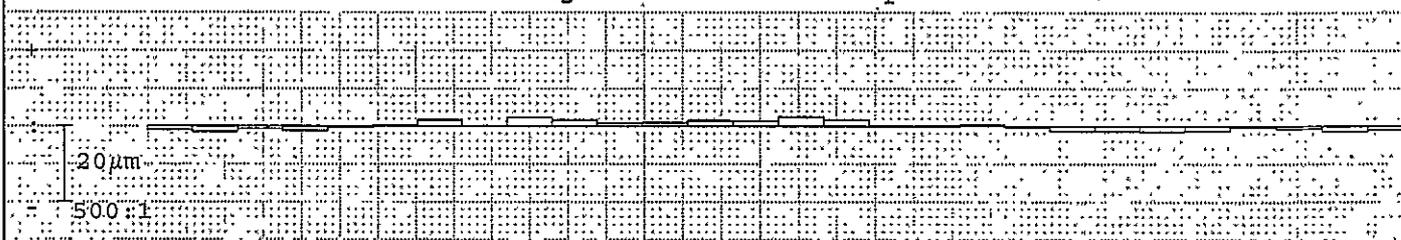
Errori singoli di divisione fp fianco sinistro



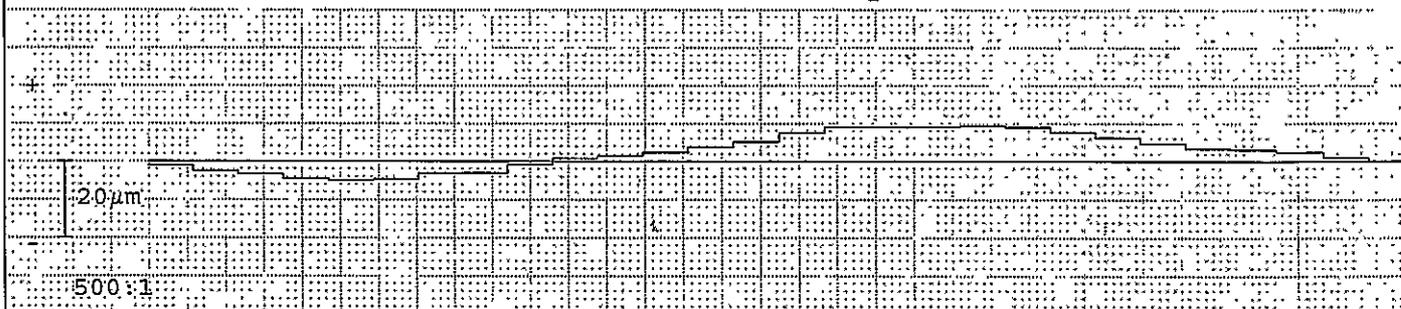
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

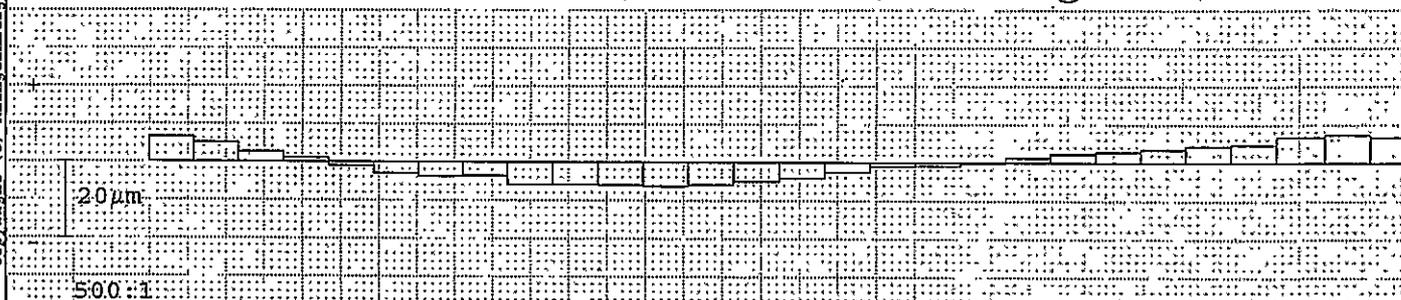


Errore somma di divisione Fp fianco destro



	fianco sinistro				fianco destro / TIRO			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	2.4		10.0		2.4		10.0	
Gr. salto di passo fu max	1.1		12.0		2.2		12.0	
Scarto di divisione Rp	4.7				3.9			
Err. globale di divisione Fp	16.5		45.0		14.4		45.0	
Err. cordale di divisione Fpz/8	8.4				6.7			

Centricità Fr (Ø-sfera =3.25mm) ⊙ : 12.3µm



Err. di concentricità Fr	13.6	32.0	
Variab. spessore dente Rs			

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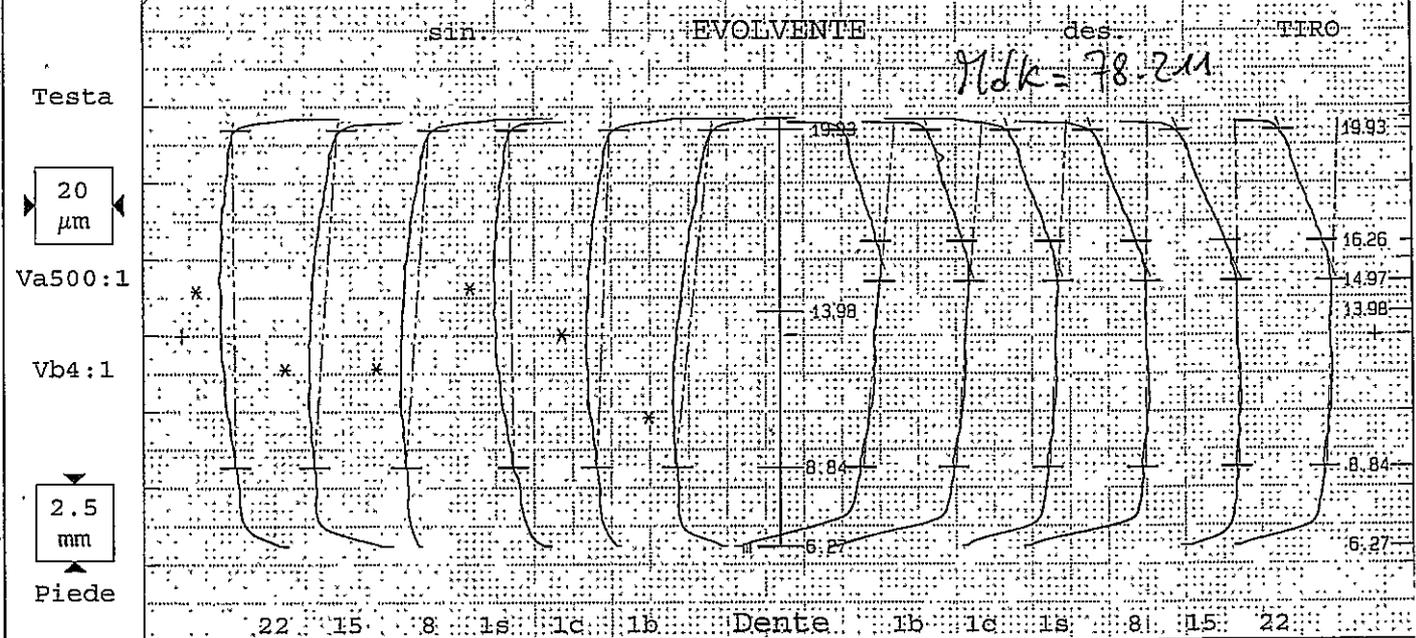


Docum. archiviato elettronicamente. Archiviazione cartacea non necessaria

Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0412 06 0	P26 B7590	Controllore: turno c	Data: 05.11.2017 13:01
Denominazione: SR6		Numero denti z 28	Largh. fasc. dent. b 14.76mm
Numero disegno.: D51.1.1231.50-ICA		Modulo m 2.05mm	Tratto evolv. La 11.09/6.13mm
Commessa/serie nr.: 8 - 3		Angolo pressione 17.5°	Tratto elica L3 11.81mm
Masch. Nr.: M001	Spindel: FORMULA	Angolo elica -28.9°	Inizio elab. M1 8.84mm
Untersuchungszweck: Laufende Messung		Ø Base db 61.6865mm	Palpatore Ø (#2C) 1mm
Werkzeug:	Charge:	Ang. Base -27.446°	Fat. scor. pr. x .985



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual		
fHm	±6	-3.8	Var a 6.9								±6	Var a 7.3							2.5		
fHa	±10	-3.8	0.7	-6.2	-6.1	1.1	-3.5	-9.4		±10	8.2	6.8	4.3	0.5	-0.5	3.3	2.5				
Fa		6.7	3.4	8.4	8.4	3.9	6.5	10.2			5.6	4.3	3.1	1.9	1.6	2.6	2.6				
ffa	5	1.7	1.3	1.9	1.8	1.1	1.8	1.3		5	1.9	1.6	1.6	1.8	1.7	1.6	1.7				
Ca	1/5	3.8	3.5	3.7	3.7	4.5	4.2	3.4													
Ca										-19/-11	-13.4	-14.1	-15.1	-14.4	-15.3	-15.1	-14.7				
ffaf	3	0.0	0.9	0.9	0.8	0.6	1.1	0.0		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
P/T-Ø [mm]		61.347	[61.25/61.6]									74.096	[74.04/74.3]								



fHm	10±6	10.1	Var β 6.9								-12±6	Var β 10.9							-6.5
fHβ	10±10	10.1	5.5	12.4	9.9	6.1	12.4	19.3		-12±10	-0.2	-3.4	-8.7	-4.7	-3.4	-14.3	-6.5		
Fβ		2.7	3.9	2.6	1.7	3.6	2.5	8.6			9.1	7.1	4.0	6.2	7.4	3.2	6.0		
ffβ	5	1.1	0.8	1.0	1.2	1.3	1.3	1.2		5	1.2	0.9	1.4	1.0	0.9	1.1	1.0		
Cβ	1/5	2.0	2.1	1.8	2.2	1.3	1.7	1.6		1/5	2.2	2.9	2.9	2.5	2.9	2.7	2.8		
β		13.2																	-8.5

GCG 808006

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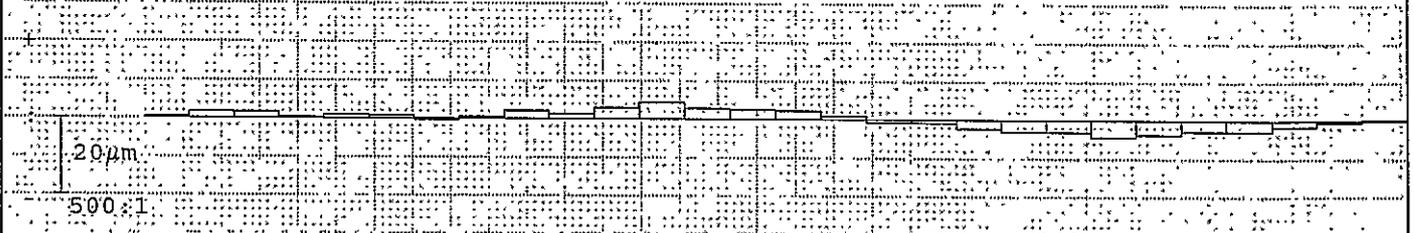


Ruota cilindrica Divisione

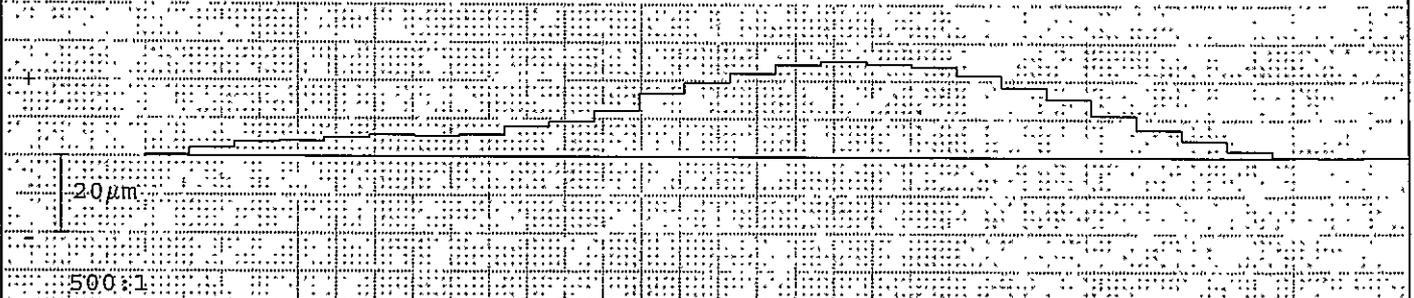


Nr. prog.: STI0412 06 0	P26 B7590	Controllore: turno c	Data: 05.11.2017 13:01
Denominazione: SR6		Numero denti z 28	Angolo pressione 17.5°
Numero disegno.: D51.1.1231.50-ICA		Modulo m 2.05mm	Angolo elica -28.9°
Comessa/serie nr.: 8 - 3		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Formstein	Werkzeug:	Charge:

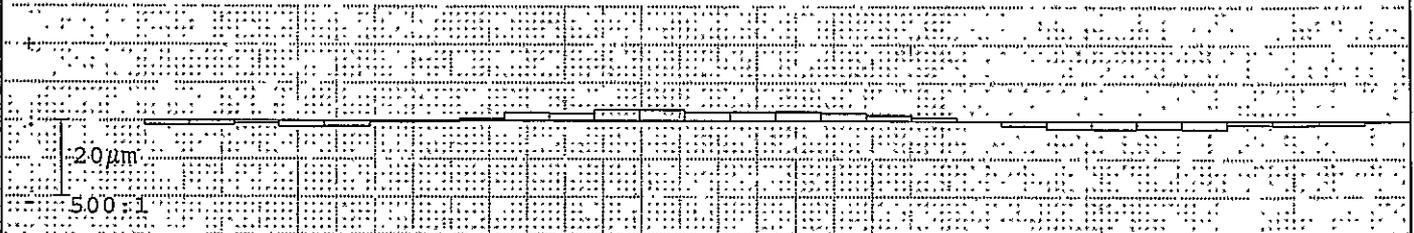
Errori singoli di divisione fp fianco sinistro



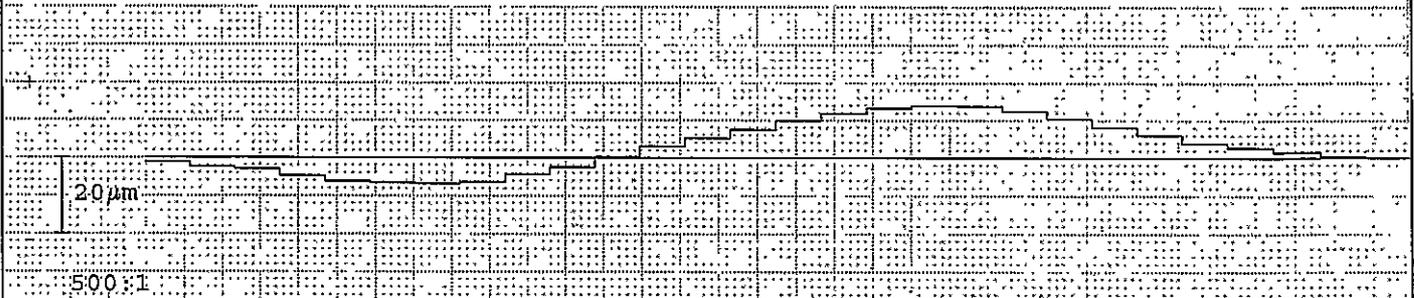
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

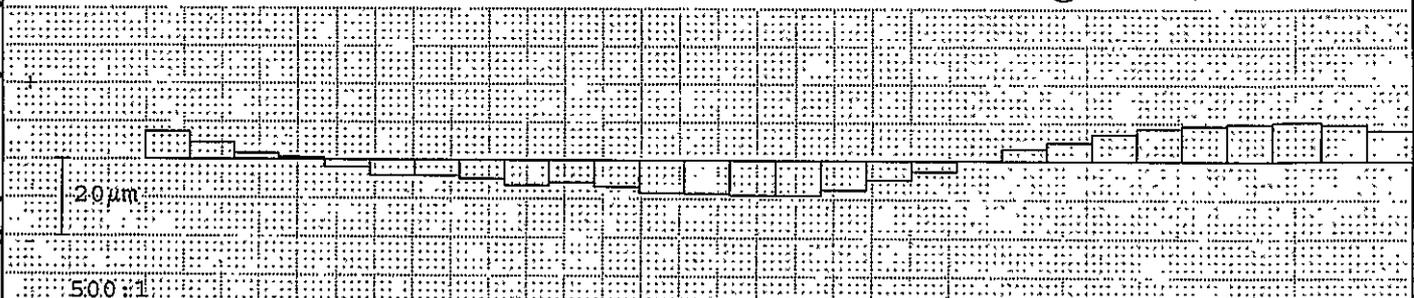


Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 67.727 z=8.2mm		fianco sinistro		fianco destro		TIRO			
		Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione	fp max	4.4		10.0		2.8		10.0	
Gr. salto di passo	fu max	1.6		12.0		1.6		12.0	
Scarto di divisione	Rp	8.7				5.1			
Err. globale di divisione	Fp	25.3		45.0		20.8		45.0	
Err. cordale di divisione	Fpz/8	14.1				10.0			

Centricità Fr (Ø-sfera = 3.25mm) Ⓞ : 18.6µm



Err. di concentricità	Fr	19.3	32.0
Variaz. spessore dente	Rs		

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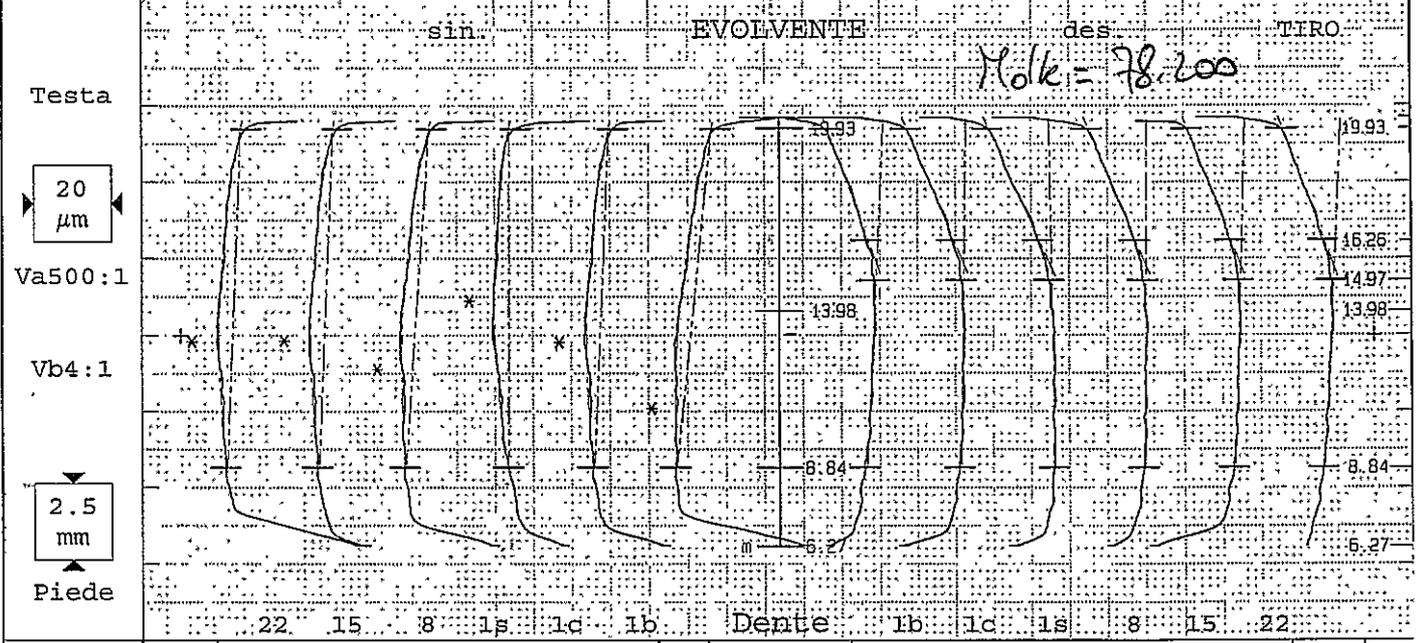
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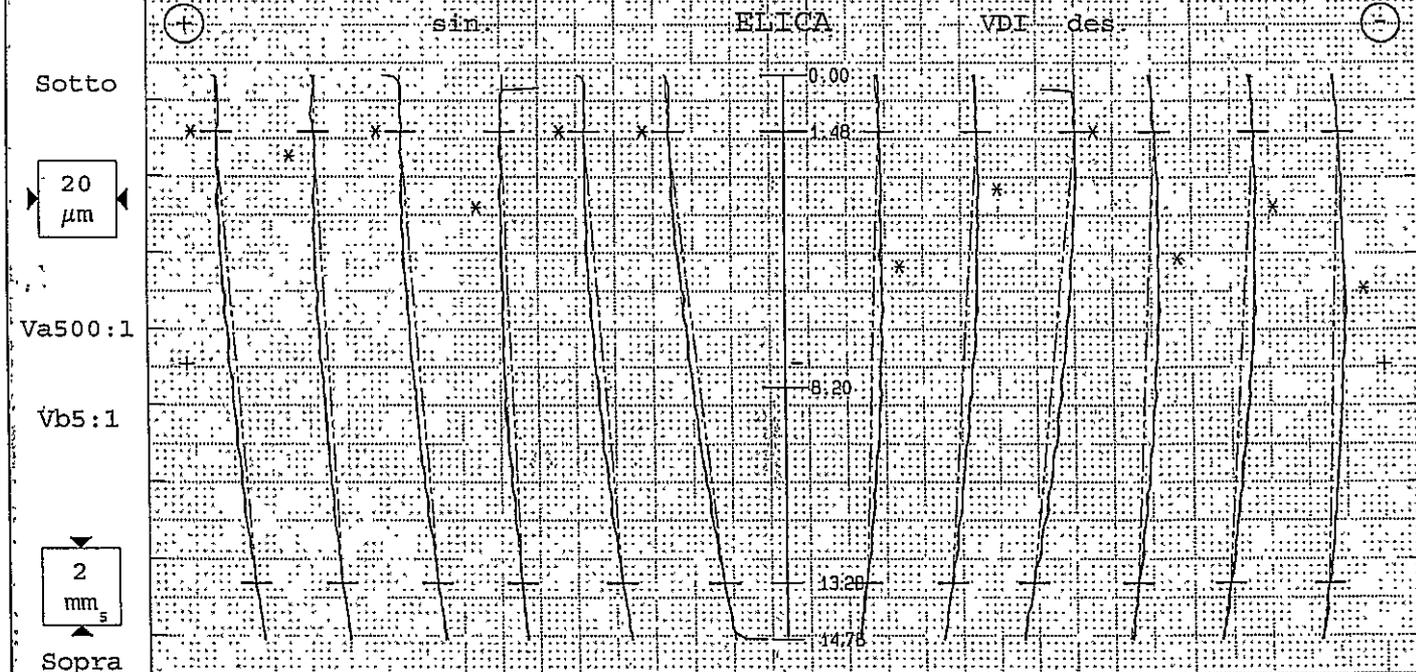
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0412 06 0	P26 B7590	Controllore: turno c	Data: 05.11.2017 14:05
Denominazione: SR6		Numero denti z: 28	Largh. fasc. dent. b: 14.76mm
Numero disegno: D51.1.1231.50-ICA		Modulo m: 2.05mm	Tratto evolv. La: 11.09/5.13mm
Commessa/serie nr.: 18-4		Angolo pressione: 17.5°	Tratto elica Ls: 11.81mm
Masch. Nr.: M001	Spindel: Form. est. elica	-28.9°	Inizio elab. M1: 8.84mm
Untersuchungszweck: Laufende Messung	Ø Base: db	61.6865mm	Palpatore Ø (#2C): 1mm
Werkzeug: Charge:	Ang. Base	-27.446°	Pat. scor. pr. x: .985



Tolerance	Medio	Val. misur [µm]							Qual	Tolerance	Val. misur [µm]							Medio	Qual	
fH _{am}	±6	-4.4	Var a 2.3								±6	Var a 4.2							2.3	
fH _a	±10	-4.4	-3.8	-3.8	-6.1	-0.3	-3.8	-9.0		±10	4.2	1.3	-1.6	0.4	2.7	4.6	2.3			
F _a		6.9	6.8	6.6	7.6	5.1	6.5	10.5			2.9	1.5	1.8	1.4	2.1	2.9	2.0			
ff _a	5	1.7	1.8	1.7	1.4	2.3	1.7	1.7		5	1.2	1.2	1.3	1.4	1.1	1.1	1.2			
Ca	1/5	3.7	3.8	3.8	3.6	3.8	3.6	3.5												
Ca										-19/-11	-14.5	-15.5	-15.9	-15.2	-15.0	-15.5	-15.3			
ff _{af}	3	0.0	0.8	0.9	0.8	0.2	0.8	0.6		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
P/T-Ø [mm]		61.360 [61.25/61.6]									74.108 [74.04/74.3]									



N:Z		Val. misur [µm]								Val. misur [µm]									
fH _{sm}	10±5	11.1	Var β 3.5								-12±6	Var β 5.0							-7.2
fH _s	10±10	11.1	12.1	8.6	11.8	6.1	11.8	17.3		-12±10	-4.5	-9.3	-14.5	-6.2	-9.0	-4.3	-7.2		
F _β		3.2	2.4	2.0	5.5	3.3	2.8	6.5			5.8	3.1	3.4	5.3	3.3	6.6	4.6		
ff _β	5	0.9	0.9	0.9	1.0	1.2	0.8	1.1		5	1.1	1.0	1.0	1.0	1.1	1.1	1.1		
C _β	1/5	2.0	1.9	1.9	2.0	1.9	2.2	1.9		1/5	2.3	2.5	2.9	2.9	2.7	2.8	2.7		
B _d		-11.2																-10.0	

GCG 808006

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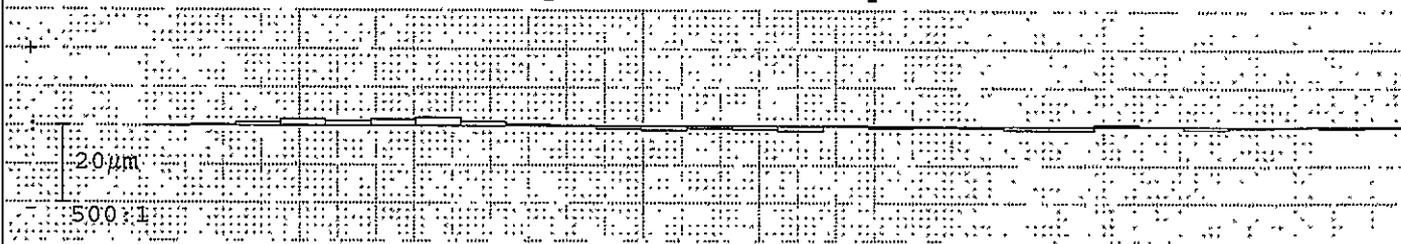


Ruota cilindrica Divisione

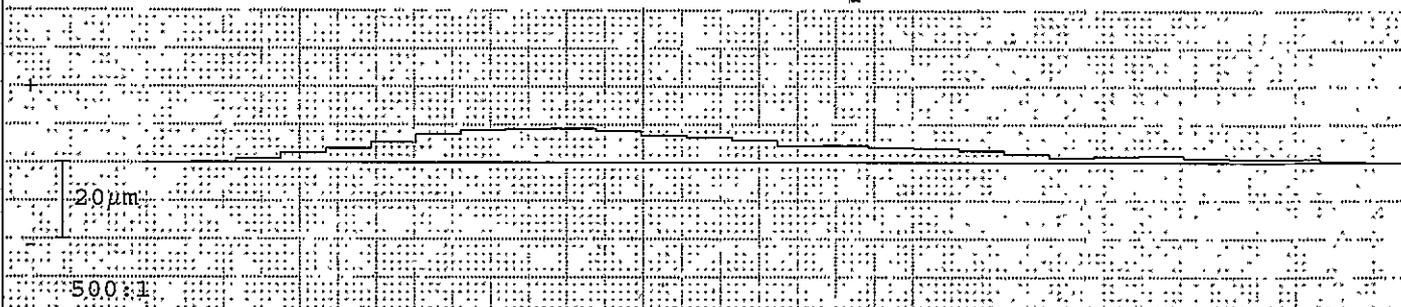


Nr. prog.: STI0412 06 0	P26 B7590	Controllore: turno c	Data: 05.11.2017 14:05
Denominazione: SR6	Numero denti z: 28	Angolo pressione: 17.5°	
Numero disegno: D51.1.1231.50-ICA	Modulo m: 2.05mm	Angolo elica: -28.9°	
Comessa/serie nr.: 18 - 4	Untersuchungszweck: Laufende Messung		
Masch.Nr.: M001	Spindel: Formelwerkzeug	Charge:	

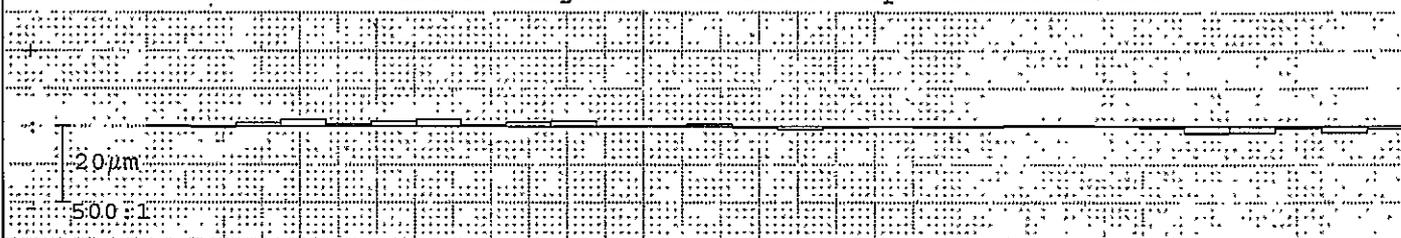
Errori singoli di divisione fp fianco sinistro



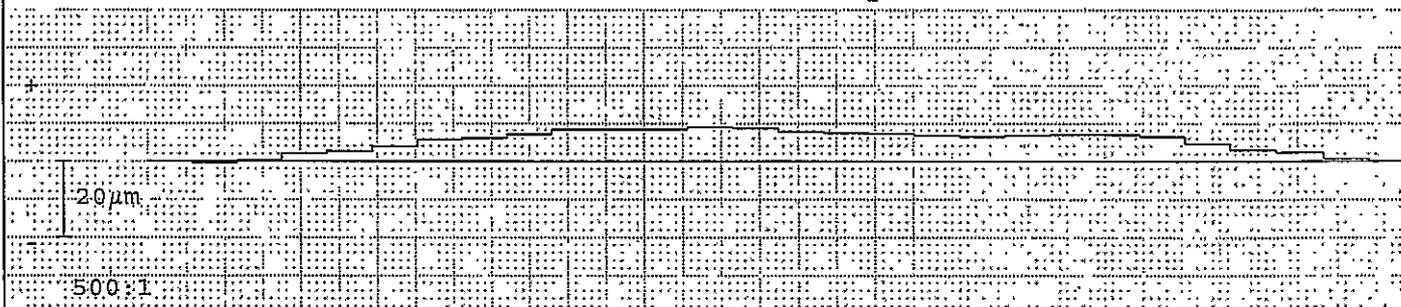
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

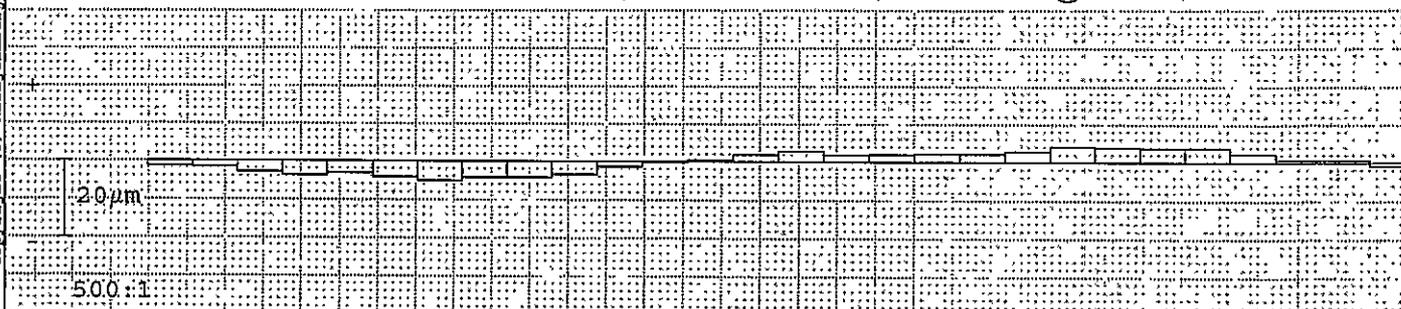


Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 67.727 z=8.2mm	fianco sinistro				fianco destro / TIRO			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	2.1		10.0		1.9		10.0	
Gr. salto di passo fu max	1.5		12.0		1.5		12.0	
Scarto di divisione Rp	3.4				3.7			
Err. globale di divisione Fp	9.0		45.0		9.5		45.0	
Err. cordale di divisione Fpz/8	6.5				5.8			

Centricità Fr (Ø-sfera = 3.25mm) Ⓞ : 7.8µm



Err. di concentricità Fr	9.2	32.0	
Variab. spessore dente Rs			

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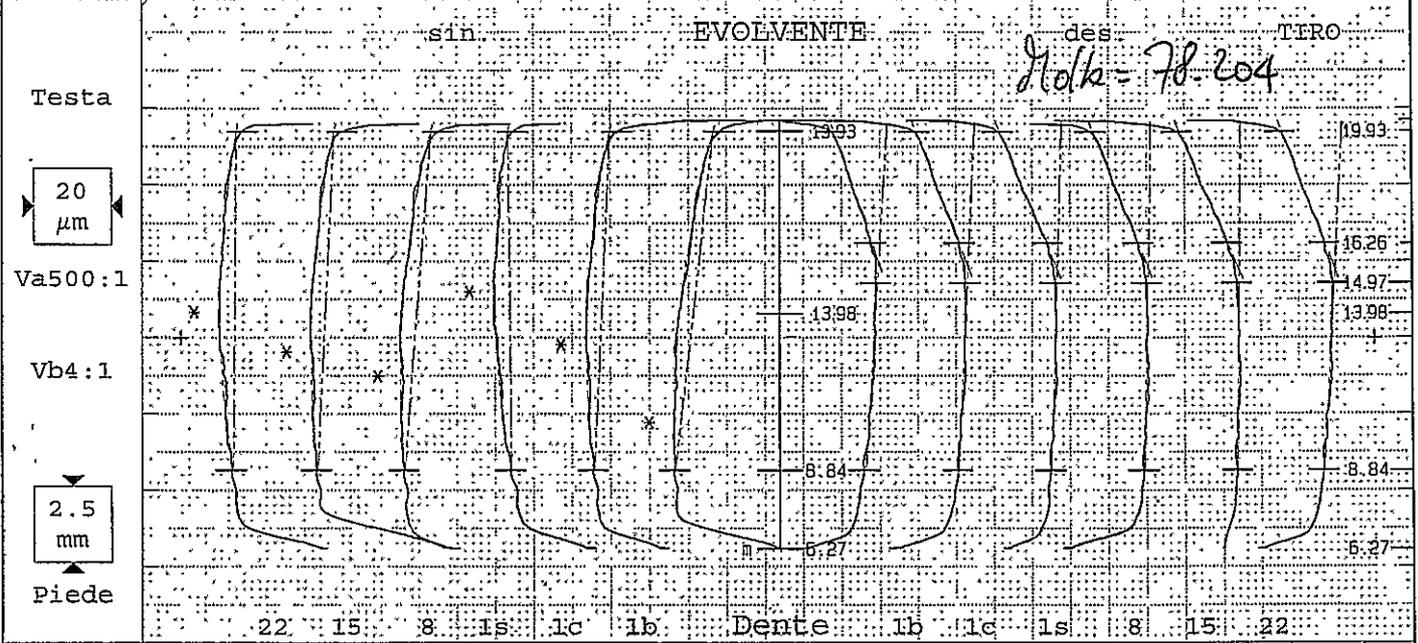
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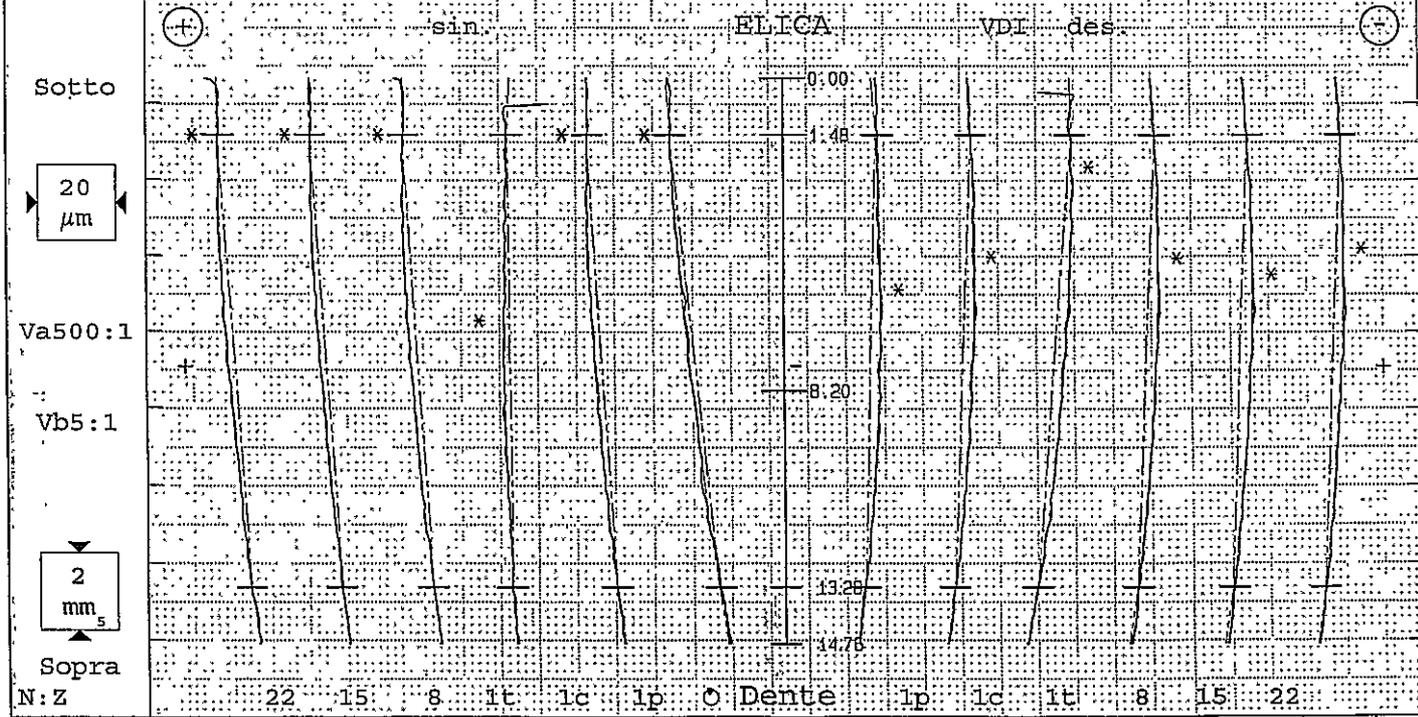
Ruota cilindrica Evolvente/Elica



Nr. prog.: STI0412 06 0	P26 B7590	Controllore: turno c	Data: 05.11.2017 14:11
Denominazione: SR6		Numero denti z 28	Largh.fasc.dent. b 14.76mm
Numero disegno.: D51.1.1231.50-ICA		Modulo m 2.05mm	Tratto evolv. La 11.09/6.13mm
Commessa/serie nr.: 19-5		Angolo pressione 17.5°	Tratto elica Ls 11.81mm
Masch.Nr.: M001	Spindel: FORMULA	Angolo elica -28.9°	Inizio elab. M1 8.84mm
Untersuchungszweck: Laufende Messung		Ø Base db 61.6865mm	Palpatore Ø (#2C) 1mm
Werkzeug:	Charge:	Ang. Base -27.446°	Fat.scor.pr. x .985



Tolerance	Medio	Val. misur [µm]						Qual	Tolerance	Val. misur [µm]						Medio	Qual	
fHm ±6	-4.1	Var a 5.9							±6	Var a 3.9						2.9		
fHa ±10	-4.1	-1.0	-4.4	-6.9	0.8	-4.0	-10.1		±10	5.4	4.1	2.5	1.5	1.0	4.9	2.9		
Fa	7.4	5.2	7.6	9.5	4.2	7.2	11.9			3.3	2.4	1.9	1.7	1.6	2.6	2.1		
ffa 5	2.6	2.2	2.8	2.8	1.9	2.5	2.2		5	1.3	1.3	1.3	1.4	1.4	1.3	1.4		
Ca 1/5	3.8	3.8	3.6	3.9	3.8	3.8	3.5											
Ca									-19/-11	-13.8	-15.3	-16.2	-14.9	-16.0	-15.9	-15.5		
ffaf 3	0.0	0.9	0.7	1.0	0.5	0.8	0.4		3	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
P/T-Ø [mm]	61.344	[61.25/61.6]								74.096	[74.04/74.3]							



Tolerance	Medio	Val. misur [µm]						Qual	Tolerance	Val. misur [µm]						Medio	Qual
fHβm 10±6	10.1	Var β 1.0							-12±6	Var β 0.5						-6.1	
fHβ 10±10	10.1	10.6	10.3	9.8	1.3	9.6	15.4		-12±10	-3.8	-6.0	-11.7	-6.4	-5.9	-6.2	-6.1	
Fβ	1.9	3.1	1.0	2.0	7.3	1.4	4.8			6.2	5.1	2.6	5.0	5.4	5.1	5.2	
ffβ 5	0.8	0.8	0.7	0.9	1.0	0.8	1.7		5	1.1	1.0	1.1	0.8	1.0	1.2	1.0	
CB 1/5	1.9	1.8	1.7	2.0	1.5	1.9	1.5		1/5	2.4	2.7	2.7	2.8	3.1	2.5	2.8	

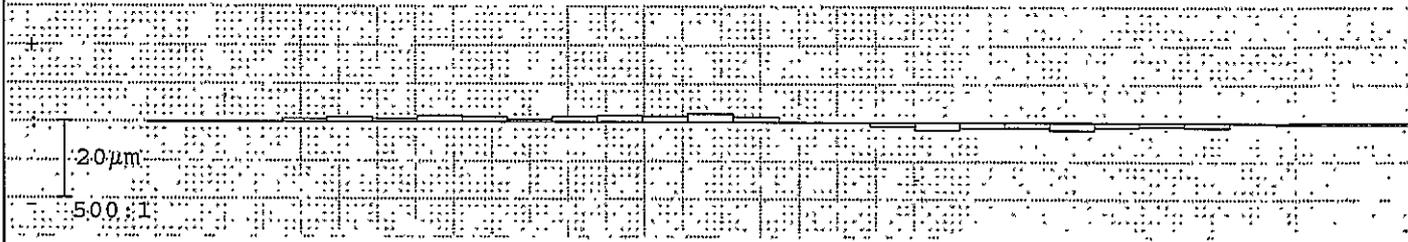


Ruota cilindrica Divisione

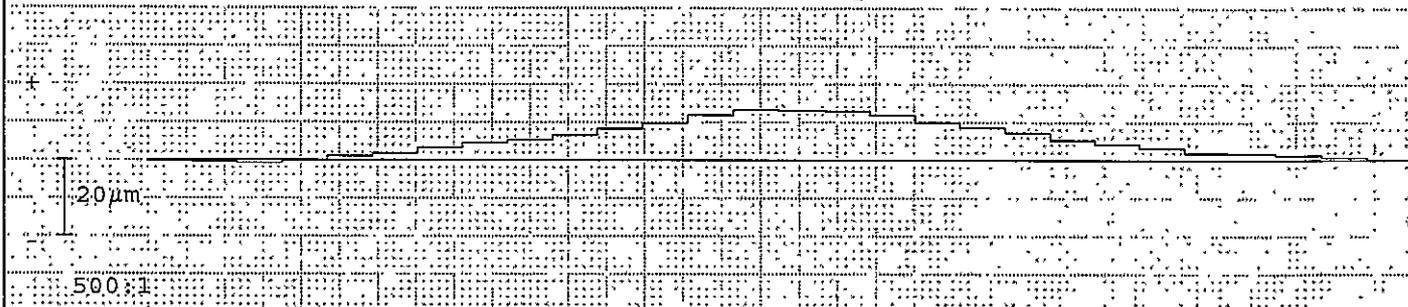


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Denominazione: SR6		Numero denti z 28	Angolo pressione 17.5°
Numero disegno: D51.1.1231.50-ICA		Modulo m 2.05mm	Angolo elica -28.9°
Comessa/serie nr.: 19 - 5		Untersuchungszweck: Laufende Messung	
Masch.Nr.: M001	Spindel: Formel	Werkzeug:	Charge:

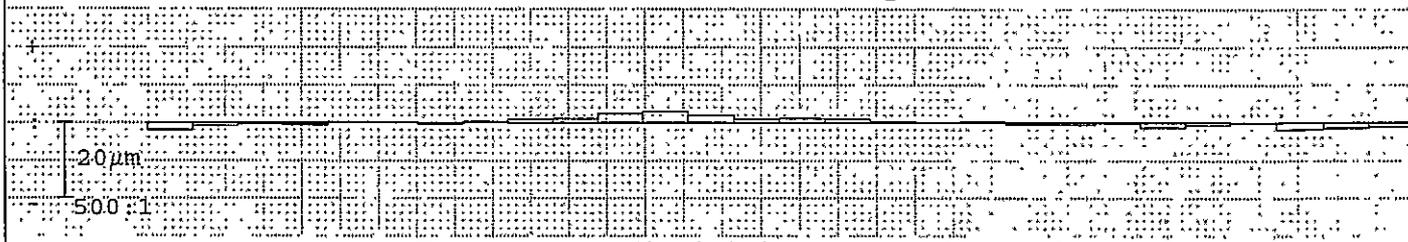
Errori singoli di divisione fp fianco sinistro



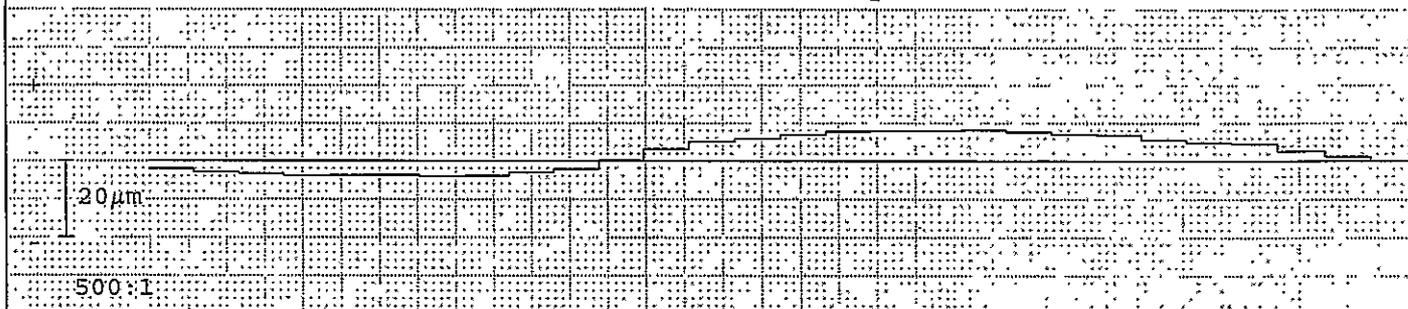
Errore somma di divisione Fp fianco sinistro



Errori singoli di divisione fp fianco destro

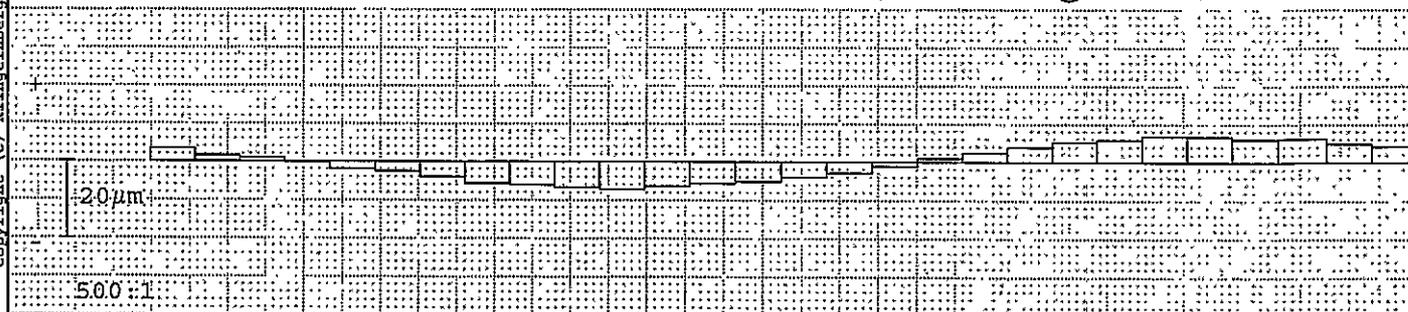


Errore somma di divisione Fp fianco destro



Corsa per misura divis.: 67.727 z=8.2mm	fianco sinistro				fianco destro / TTR0			
	Val. misur	Qual.	Val. amm	Qual.	Val. misur	Qual.	Val. amm	Qual.
Gr. err. singoli divisione fp max	2.1		10.0		2.9		10.0	
Gr. salto di passo fu max	1.6		12.0		1.6		12.0	
Scarto di divisione Rp	4.1				4.9			
Err. globale di divisione Fp	13.9		45.0		12.2		45.0	
Err. cordale di divisione Fpz/8	6.6				8.1			

Centricità Fr (Ø-sfera =3.25mm) \odot : 13.3µm



Err. di concentricità Fr		14.1	32.0
Variab. spessore dente Rs			

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REPORT 18/009

Date: 04/01/18
Author: R. Padolecchia

Reason for analysis: <i>Motivo dell'indagine:</i>	PPAP G_904340-2 part compliance control
---	--

Requester: <i>Richiedente:</i>	WLQ - Stefano Picerno
--	-----------------------

Part Name: <i>Nome particolare:</i>	7 DCT 300 gearset - 21A variant
Material: <i>Materiale:</i>	GCG_805000 Part 2
State of part: <i>Stato del particolare:</i>	Finished

P/N:	-
S/N:	-
Customer: <i>Cliente:</i>	Renault

Result: <i>Risultato:</i>	OK
-------------------------------------	----

Distribution list: <i>Lista di distribuzione:</i>	WLQ - S. Picerno ME - L. Landriscina
---	---

Notes: <i>Note:</i>	Spray equipment: Flushing cabinet Hydac CTU-1230-M-Z-R Spray method: QPS 130033 (gears) QPS 130034 (shafts) Membrane material: cellulose nitrate Pore size [mm]: 5,0
-------------------------------	--

Cleanliness Analysis (Analisi della Pulizia)

Part	P/N	Washing Machine	Detergent	Sampling date	Wetted surface [cm ²]	Gravimetric evaluation [mg/1000cm ²]	Max Allowable [mg/1000cm ²]
SG1	251.1.1081.50	ORE 11033	NC 3300	21/12/17	627.41	0.70	2.5
DG	251.1.1223.50	ORE 11033	NC 3300	18/12/17	613.40	1.40	2.5
SG3	251.1.1225.50	ORE 11033	NC 3300	21/12/17	401.6	1.80	2.5
SG4	251.1.1226.50	ORE 11033	NC 3300	21/12/17	344.46	1.05	2.5
SG5	251.1.1228.50	ORE 11033	NC 3300	20/12/17	340.18	1.16	2.5
SG6	251.1.1230.50	ORE 11033	NC 3300	20/12/17	277.62	1.02	2.5
SG7	251.1.1232.50	ORE 11033	NC 3300	20/12/17	152.64	0.85	2.5
REV	251.1.1094.50	ORE 11033	NC 3300	02/01/18	434.08	1.04	2.5
RG	251.1.1080.50	ORE 11033	NC 3300	02/01/18	1036.22	1.25	2.5
DG_Fix	251.1.1220.35	ORE 11033	NC 3300	02/01/18	561.69	1.55	2.5
IS1	251.6.1073.35	ORE 11033	NC 3300	03/01/18	416.99	2.03	2.5
IS2	251.6.1218.35	ORE 11033	NC 3300	03/01/18	671.89	1.09	2.5
OS1	251.6.1076.35	ORE 11033	NC 3300	04/01/18	610.51	1.98	2.5
OS2	251.6.1078.35	ORE 11033	NC 3300	04/01/18	514.21	1.51	2.5

REPORT 18/007

Date: 03/01/2018
Author: M. de Dato

Reason for analysis: <i>Motivo dell'indagine:</i>	PPAP
---	------

Requester: <i>Richiedente:</i>	WLQ - M. Vicenti
--	------------------

Part Name: <i>Nome particolare:</i>	SG6
Material: <i>Materiale:</i>	GCG_805000 Part 2
State of part: <i>Stato del particolare:</i>	Finito

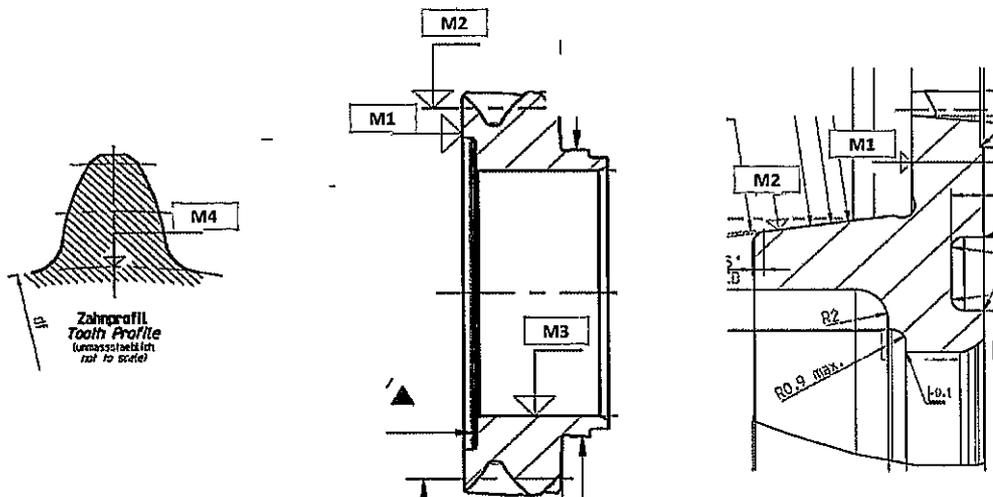
P/N:	251.1.1230.50
S/N:	-
Customer: <i>Cliente:</i>	Renault

Result: <i>Risultato:</i>	OK
-------------------------------------	----

Distribution list: <i>Lista di distribuzione:</i>	WLQ - M. Vicenti
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Notes: <i>Note:</i>	Gearset 21A
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Drawing (Disegno)



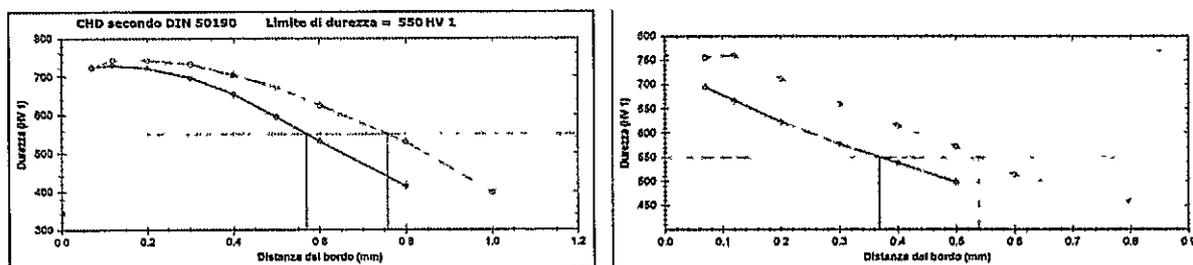
Picture 1: posizioni di misura a disegno.

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
Clutch cone ring	HV 5	M	760	680 + 130

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

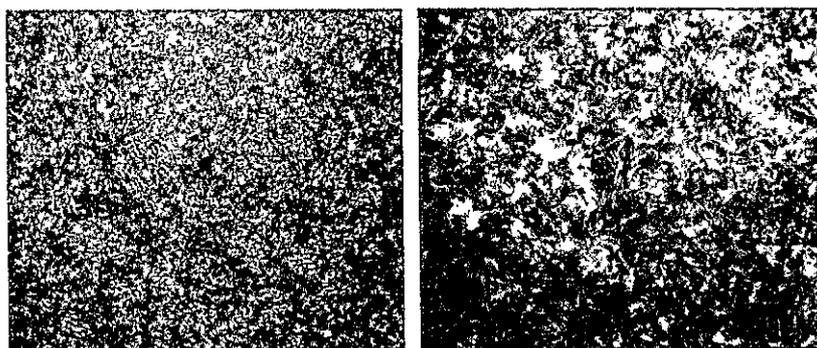
Component	Scale	Sample #	Position	Measured Value	Range
Gear	CHD 550 HV1	35/18	M2 (tooth flank)	0.76	0.50+0.40 mm
Gear	CHD 550 HV1	35/18	M3 (Bore)	0.57	0.30 mm min.
Gear	Core hardness HV10	35/18	M4 (tooth core)	344	≥ 300
Clutch cone ring	CHD 550 HV1	35/18	M1	0.54	0.30+0.40 mm
Clutch cone ring	CHD 550 HV1	35/18	M2	0.37	0.10 mm min.



Picture 2: profili di durezza per la ruota e per il corpo d'aggancio.

Microstructure analysis (analisi della microstruttura)

Sample #	35/18
Gear - Tooth flank surface structure:	Martensite e austenite residua (5%)
Gear - Tooth base core structure:	Martensite, bainite



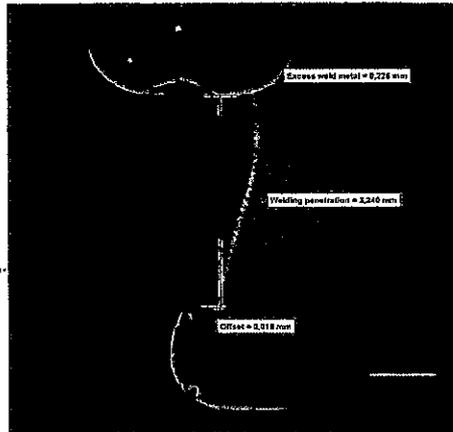
Picture 3: Microstruttura sul fianco dente (a sinistra) ed a cuore sulla base dente (a destra).

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Date: 03/01/2018
Author: M. de Dato

Weld bead analysis (analisi della saldatura)

	Radial Offset [mm]	Penetration [mm]	Excess weld metal	Sample#
SG6	0.018	3.240	0.226	36/18
Range	max 0,1	min 2,8	max 0,5	



Picture 4: macro di 2 sezioni a 180°, saldatura OK.

