



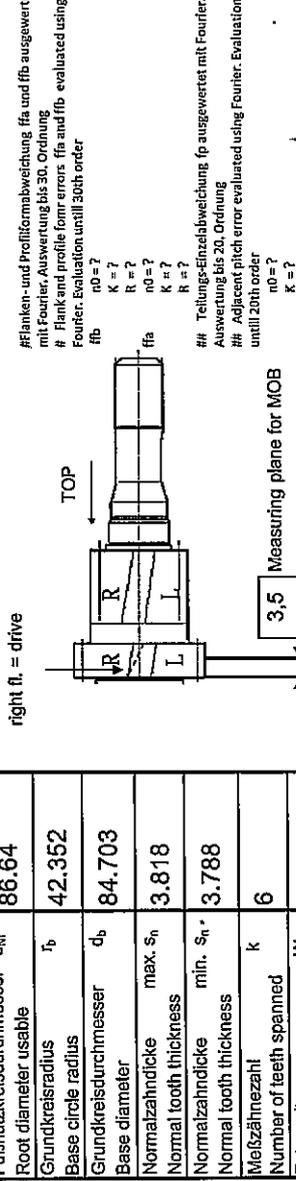




■ ■ ■ GETRAG		Geardata-Sheet			D-No.: 251.6.1071.35		z = 35		
External gearing				Remark:					
Mating gear: ./.		i 0 / 35		a ./.		Type: 251		Speed: IS2 4th./6th	
		i / .		a		Customer: RSA			
z 35		m <sub>n</sub> 2.250000		α 17 ° 30 ' 0 ''		β 29 ° 0 ' 0 ''		RIGHT	
x 0.200		d 90.039		d <sub>b</sub> 84.703		d <sub>a</sub> 98.00 <sup>-0.20</sup>		d <sub>f</sub> 83.37 <sup>-0.30</sup>	
Gear quality; Tolerance zone					Tooth thickn. sn [ 3.818 ÷ 3.788 ]				
Test group acc. to DIN 3961 of Aug. 78					Base tangent length over 6 teeth				
Radial composite err. Fi''		Tangent. comp. err. Fi'			finished: [ 38.438 ÷ 38.409 ]				
Rad. tooth to tooth comp. err. fi''		Tang. tooth to tooth comp. err. fi'			shaped: 38.544 ÷ 38.515				
Profile form error fHα		Profile angle error fHα			shaved: ÷				
Total profile error Fα		Adjacent pitch err. fp			Measurement over 2 balls DM= 3.00				
Normal pitch error fpe		Diff. bet. adj. pitch. fu			finished: [ 92.611 ÷ 92.513 ]				
Cumulative pitch error Fp		Cum. circ. pitch err. Fpk			shaped: 92.949 ÷ 92.853				
Cum. circ. pitch err. 1/8 extent Fpz/8		Radial run-out Fr			shaved: ÷				
Range of tooth thickn. error Rs		Longit. alignm. err. ffβ			usable diameter dNa 97.12		dNf 86.65		
Tooth alignment err. fHβ		Total alignment err. Fβ			rad. of curvature pdNa 23.76		pdNf 9.13		
Tool		FRW -		m <sub>n0</sub> 2.221561		α <sub>n0</sub> 14.8273 °		β <sub>0</sub> 28.5993 °	
grinding wheel		h <sub>aP0</sub>		ρ <sub>aP0</sub>		b			
<b>FOR PREMACHINING ONLY (HARD CONDITION) !</b>									
Final measurement dimensions (gear errors and modifications) see final check gear data !									
Correction dimensions for machining in hard and soft condition in accordance with final measurement dim. !									
Root diam. (soft): df = 83.31 -0.21									
Premachining with comma chip (soft): fHα = 15 μm									
Measurement according to the tool data, fHα ca. 0 μm									
Feedback soft - hard analysis necessary?									
no									
yes X									
Ch.ind. Ch. No. Changes Date Name									
VBL created: CRICENTI . Date: 2015-12-04 Subst. for:									

soft- hard analysis on date: no X

STIRNRAD GEAR		Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) gültig für Werte am Einzelzahn Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth	
außenverzahnt external		linke Fl. left flank	rechte Fl. right flank
Zähnezahl Number of teeth	35	0.004	0.014
Modul Normal module	2.250000		0.014
Eingriffswinkel Normal pressure angle	17° 30' 0"		0.018
Schraubungswinkel Helix angle	29° 0' 0"		
Steigungsrichtung Hand of helix	RECHTS		
Profilverstärkungsfaktor Addendum modification coef.	0.200		
Teilkreisdurchmesser Pitch diameter	90.039		
Kopfkreisdurchmesser Outside diameter	98.00 -0,26		
Kopfnutzkreis, theo. max. Tip diam. usable theo. max.	97.55		
Kopfnutzkreis, theo. min. Tip diam. usable theo. min.	97.20		
Fußkreisdurchmesser Root diameter	83.37 -0,30		
Fußnutzkreisdurchmesser Root diameter usable	86.64		
Grundkreisradius Base circle radius	42.352		
Grundkreisdurchmesser Base diameter	84.703		
Normalzahnstärke Normal tooth thickness	3.818		
Normalzahnstärke Normal tooth thickness	3.788		
Melzähnezahl Number of teeth spanned	6		
Zahnweite max. W <sub>k</sub>	38.438		
Zahnweite min. W <sub>k</sub>	38.409		
Melzkugeldurchmesser Ball diameter	3.0000		
Diam. Zweikugelmaß Measurement o. balls	92.611		
Diam. Zweikugelmaß Measurement o. balls	92.513		
Vordrehflankenspiel Circumferential backlash	0.065 0.167		



Toleranzen der Verzahnung (DIN 3961 vom Aug. 1978) gültig für Werte am Einzelzahn Tolerances of gearing (DIN 3961 of Aug. 1978) valid for values at individual tooth	
linke Flanke left flank	rechte Flanke right flank
24.19 23.84 17.44 15.98 9.11	24.19 23.84 17.44 15.98 9.11
$f_{ht} = 0.000 \pm 0.006$	$f_{hr} = +0.021 \pm 0.006$
* Schreibbeginn $\varnothing = 85.60 -0,30 \cong 6.18$	
* Start of checking	
linke Flanke left flank	rechte Flanke right flank
Flankenlinie Tooth trace	Flankenlinie Tooth trace
Längsbölgigkeit: $0.001 +0.004 (0.8^*b)$	Längsbölgigkeit: $f_{fp} = +0.020 \pm 0.006$
$f_{fp} = 0.000 \pm 0.006$	$f_{fp} = +0.020 \pm 0.006$
* $f_{fp}$ (zwischen dNf und dem Schreibbeginn ds) max ffp/2, jedoch 0.003 zulässig	
* $f_{fp}$ (between dNf and start of checking ds) max ffp/2, 0.003 allowable.	
Profil- und Flankenliniennormmessung nach G_808006 und VDI/VDE 2612 Flankenlinienprüfbereich $L_p = 0.8^*b$ hochgerechnet auf $1.0^*b$ Begriffe für Stirnräder nach DIN 868, 3960, 3998	
Profile and helix checking according to G_808006 and VDI/VDE 2612 Tooth trace testing area $L_p = 0.8^*b$ calculated to $1.0^*b$ Terms of the tooth system according to DIN (German Industrial Standards) No. 868, 3960, 3998	

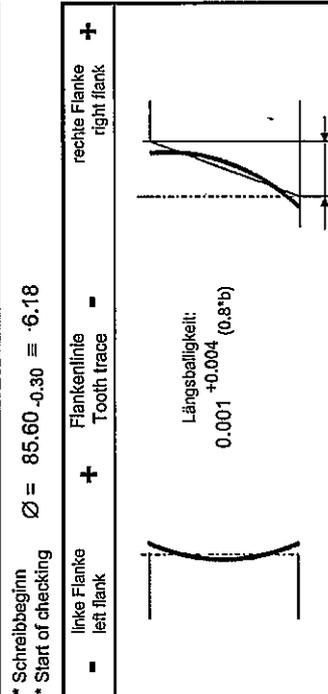
Verzahnungsblatt Endkontrolle Final Check Gear Data	
Buch.	Anz.
Abbildungen sind unmaßstäblich. Diagrams not to scale.	
Datum	Name
2015-12-03	Cricenti, Fabrizio
gez.	Benennung:
gepr.	Namhng:
Antrw. aussen 4./6.Gg.	

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

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

251.6.1071.35

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251.6.1071.35

**REPORT 16/251**

Date: 03/11/16  
Author: Mauro de Dato

<b>Reason for analysis:</b> <i>Motivo dell'indagine:</i>	PPAP
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<b>Requester:</b> <i>Richiedente:</i>	WLQ - Stefano Picerno
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<b>Part Name:</b> <i>Nome particolare:</i>	IS2 INPUT SHAFT OUTER
<b>Material:</b> <i>Materiale:</i>	GCG_805000 Part 2
<b>State of part:</b> <i>Stato del particolare:</i>	Finito

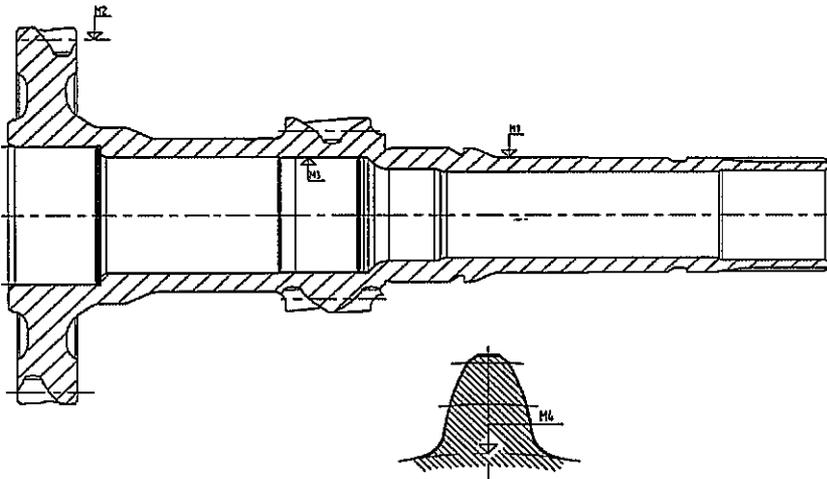
<b>P/N:</b>	251.6.1071.35
<b>S/N:</b>	-
<b>Customer:</b> <i>Cliente:</i>	-

<b>Result:</b> <i>Risultato:</i>	OK
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<b>Distribution list:</b> <i>Lista di distribuzione:</i>	WLQ - S. Picerno WLQ - L. D'Elia
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<b>Notes:</b> <i>Note:</i>	Componente trattato 24/10/2016 Forno 7 carica 161024119 Colata A
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**Drawing (Disegno)**



Picture 1: estratto del disegno del particolare, posizione dei punti di misura per le caratteristiche metallurgiche.

**Cleanliness Analysis (Analisi della Pulizia)**

<b>Sampler</b>	M. Corsini	<b>Spray equipment</b>	Flushing cabinet Hydac GTU-1230-MZ-R
<b>Sampling point</b>	ORE 11033 washing machine outlet	<b>Spray method</b>	QPS WLQ2_034
<b>Sampling date &amp; time</b>	02/11/16 - 10:00	<b>Membrane material</b>	cellulose nitrate
<b>Wetted surface [cm<sup>2</sup>]</b>	640,68	<b>Pore size [µm]</b>	5,0
<b>Gravimetric evaluation [mg/1000cm<sup>2</sup>]</b>	2,48	<b>Max allowable residual dirt [mg/1000cm<sup>2</sup>]</b>	2,5

REPORT 16/251

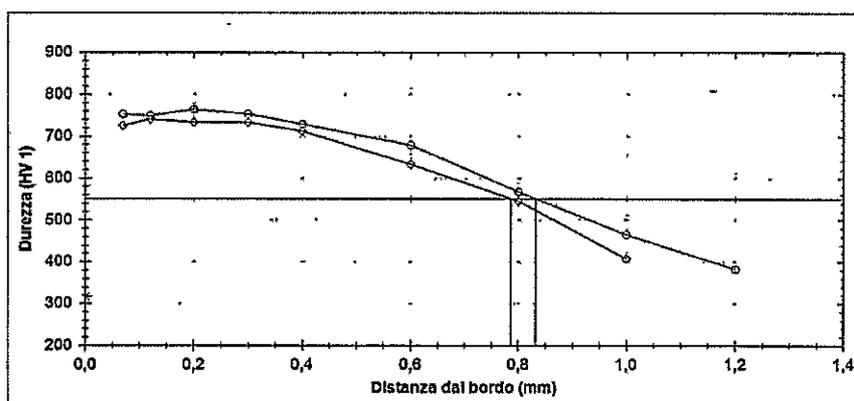
Date: 03/11/16  
Author: Mauro de Dato

*Surface Hardness Verification (Verifica Durezza Superficiale)*

Scale	Position	Values [mm]	Range	Component
HRC	M1	61,8	-	Shaft
HRA	M1	82,2	80,5 + 2.5	Shaft

*CHD Verification (Verifica CHD)*

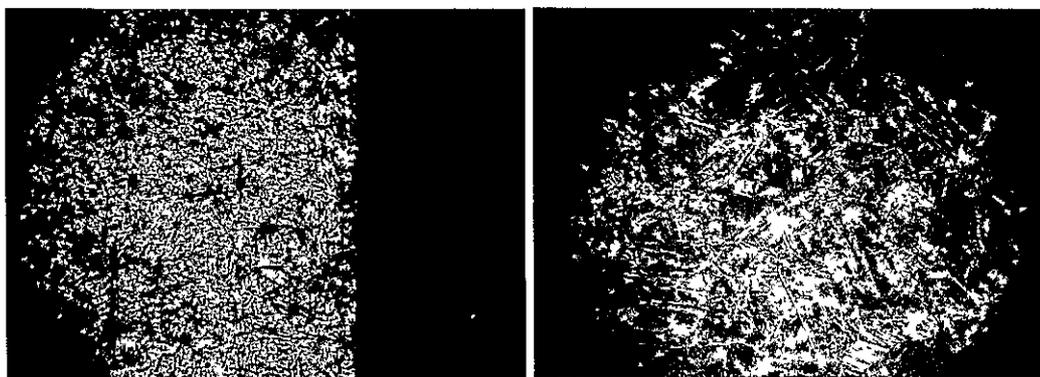
	Sample	Position	Measured Value	Range
CHD 550 HV1	3357/16	M2	0,83	0,70 + 0,50 mm
CHD 550 HV1	3357/16	M3	0,79	min. 0,20 mm
Core hardness HV10	3357/16	M4	316	≥ 300



Picture 2: profili di durezza.

*Analysis at Metallographic Microscope (Analisi al Microscopio Metallografico)*

Sample # 3357/16	
Gear - Tooth flank surface structure:	5% austenite residua
Gear - Tooth base core structure:	martensite + bainite



Picture 3: Microstruttura sul fianco dente (a sinistra) ed a cuore sulla base dente (a destra), ingrandimento 500x.