

312869

**LABORATORY REPORT**  
 GETRAG S.p.A. - B/WLQ 2

**REPORT 14/125**

 Date: 03/07/2014  
 Author: Mauro de Dato

**Reason for analysis:** PPAP + Full Layout dimensional

**Requester:** WLQ5 - Auditor Bari

**Part Name:** SR5

**P/N:** 250.1.3644.37

**State of parts:** Finished

**Material:** GCG\_805000\_Part 2

**Customer:** Ford

**Result:** OK

**Distribution List:**  
 WLQ5 - Auditor Bari  
 WLQ1 - G. Montenegro  
 GPS1 - G. Russo

**Notes:** Production lot 14737779 - rack #02/09  
 Forno 4 charge 54586

**Surface Hardness Verification**

Sample	Scale	Position	Values [mm]	Range	Component
-	HRC	M1	60,5	-	Gear
-	HRA	M1	81,5	80.5 + 2.5	Gear
2095/14	HV 5	M2	726	680 + 130	Engagement ring

**Core Hardness Verification**

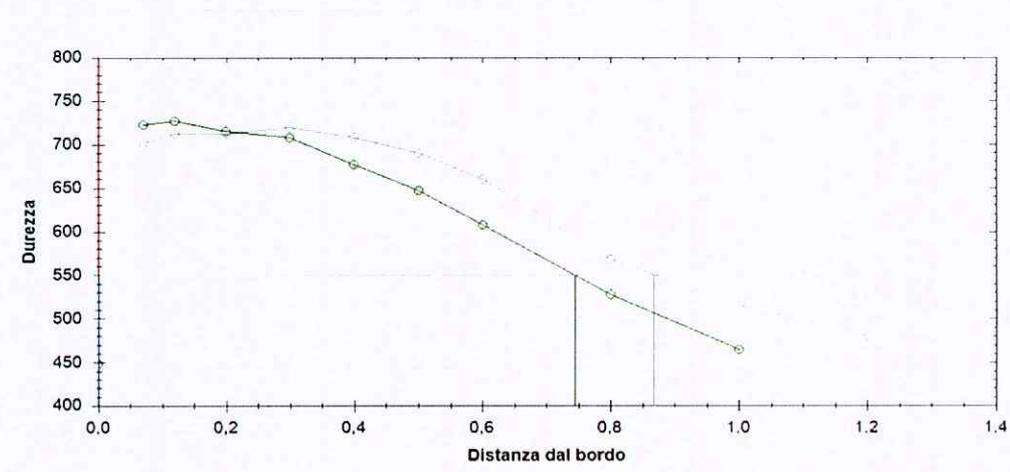
Sample	Scale	Position	Values [HV10]	Range	Component
2095/14	HV10	M4	448	≥ 300	Gear

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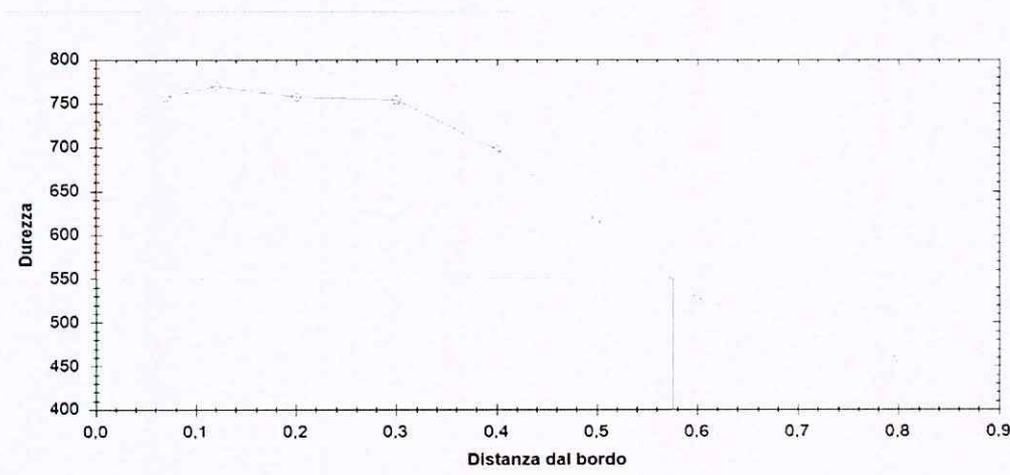
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*CHD Verification*

Sample		Position	Values [mm]	Range	Component
2095/14	CHD 550 HV1	M2	0,87	0.5 + 0.4 mm	Gear
2095/14	CHD 550 HV1	M3	0,75	min. 0.3 mm	Gear
2095/14	CHD 550 HV1	M1	0,58	0.4 + 0.4 mm	Engagement ring



Picture 1: gear - Hardness profiles



Picture 2: Engagement ring - Hardness profiles

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*Metallographic Analysis*

Sample #	2095/14
Gear - Tooth flank surface structure:	Martensite + 15±20% retained austenite (OK)
Gear - Tooth base core structure:	Martensite + bainite (OK)



Picture 3: Gear - Surface microstructure at tooth flank (X500)



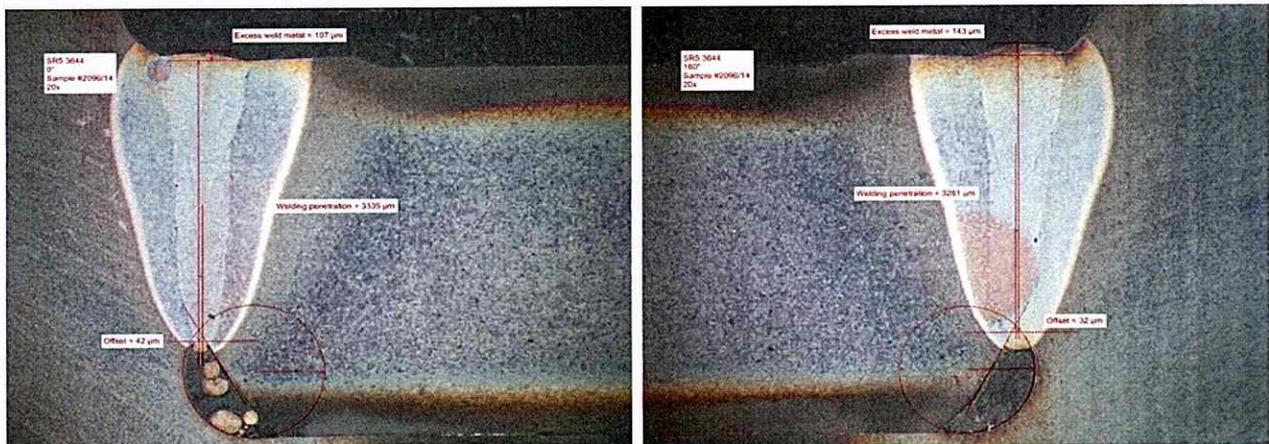
Picture 4: Gear - Core microstructure at tooth base (X500)

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*Weld Seam Analysis*

	Position	Welding penetration [mm]	offset [mm]	Excess weld metal [mm]
Sample # 2096/14	0°	3,335	0,042	0,107
Sample # 2096/14	180°	3,281	0,032	0,143
Range		min 2,8	max ± 0.1 mm	max 0.5 mm



Picture 5: macro of the joint