

312566

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

REPORT 13/156

 Date: 11/10/2013
 Author: R. Padolecchia

Reason for analysis:	Full Layout dimensional
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Requester:	WLQ1 - Auditor Bari
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Part Name:	DG
P/N:	250.1.3692.76
State of parts:	Finished

Material:	GCG_805000_Part 2
Customer:	Ford

Result:	OK
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Distribution List:	WLQ1 - Auditor Bari WLQ1 - G. Montenegro GPS1 - G. Russo GPS1 - R. Malerba
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Notes:	Charge 12852 - Furnace #6 Heat charges: H (422091) / P (363991) Production lot #1489857, L.K. #06/06
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Surface Hardness Verification

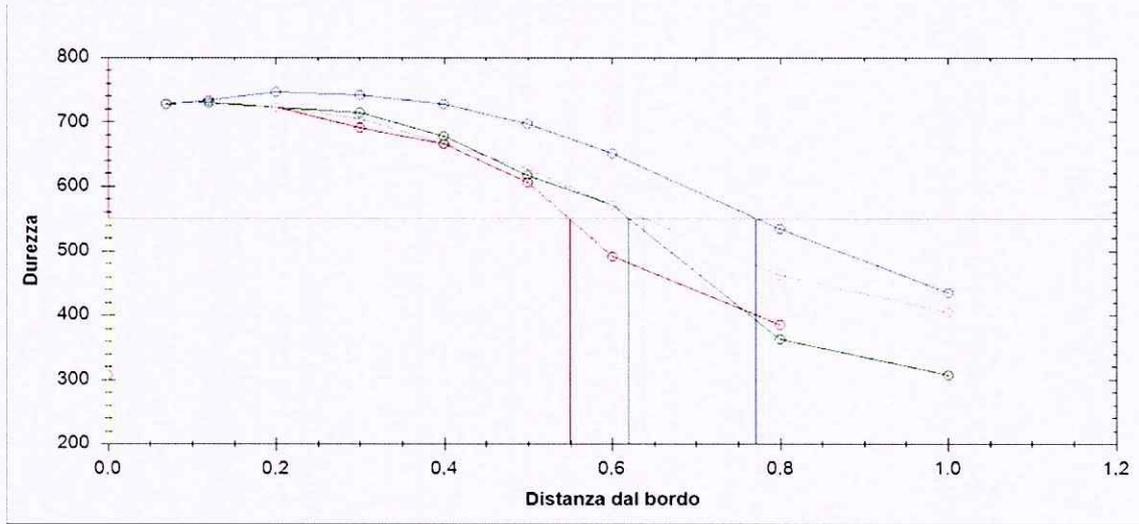
Scale	Position	Values [mm]	Range
HRC	M1	60,1	-
HRA	M1	81,4	80.5 + 2.5

Core Hardness Verification

Sample	Scale	Position	Values [HV10]	Range	Component
3802/13	HV10	M4	397	≥ 300	Gear 2nd
3802/13	HV10	M4	306	≥ 300	DG-Rev
3802/13	HV10	M4	361	≥ 300	Clutch Ring

CHD Verification

Sample	Scale	Position	Values [mm]	Range [mm]	Component
3802/13	CHD 550 HV1	M2	0,64	0.5 + 0.4	Gear 2nd
3802/13	CHD 550 HV1	M2	0,62	0.5 + 0.4	DG-Rev
3802/13	CHD 550 HV1	M2	0,77	0.5 + 0.4	Clutch Ring
3802/13	CHD 550 HV2	M3	0,55	min. 0.3	DG-Rev



Picture 1: Hardness profiles

Metallographic Analysis

Sample # 3802/13	Gear 2nd
Gear - Tooth flank surface structure:	Martensite + 5% retained austenite (OK)
Gear - Tooth base core structure:	Martensite + bainite (OK)

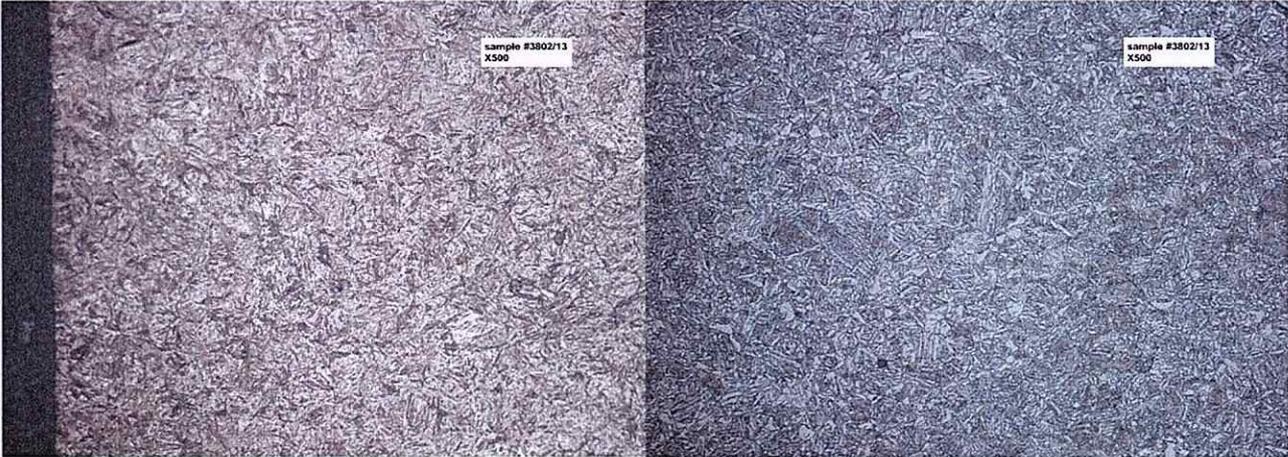


Picture 2: Gear-2nd surface microstructure at tooth flank (left) and at tooth root (right).

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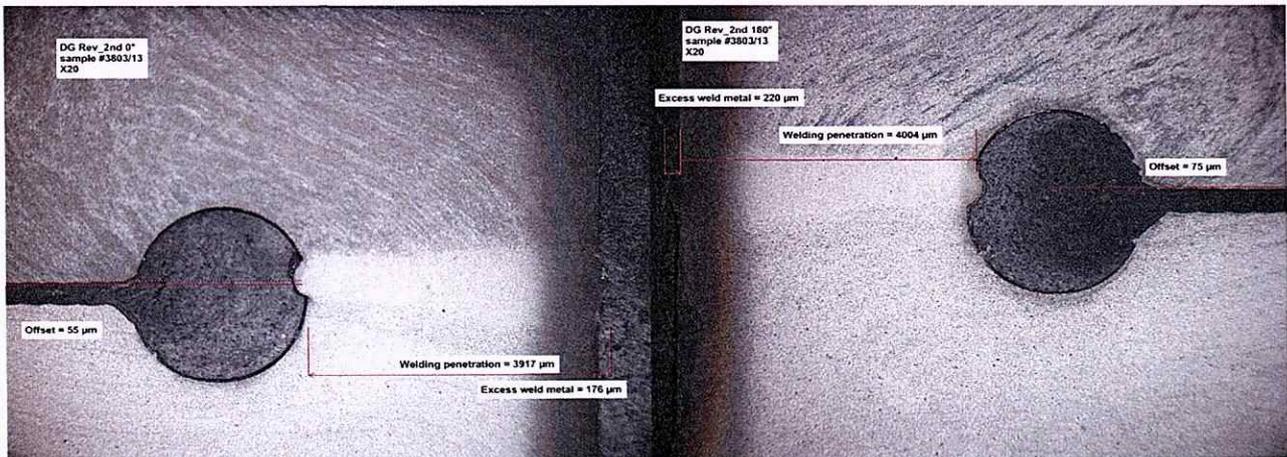
Sample # 3802/13	DG-Reverse
Gear - Tooth flank surface structure:	Martensite + 5% retained austenite (OK)
Gear - Tooth base core structure:	Martensite + bainite (OK)



Picture 2: DG-Rev surface microstructure at tooth flank (left) and at tooth root (right).

Weld Seam Analysis

Sample #	Position	Welding penetration [mm]	Offset [mm]	Excess weld metal [mm]
3803/13	DG-Rev-Gear 2nd 0°	3,92	0,055	0,176
3803/13	DG-Rev-Gear 2nd 180°	4	0,075	0,22
Range		full penetration	max ± 0.1	max 0.5
Magnetic particles insp.	No defective indication			



Picture 3: macro of the joint

P/N 3692
Sample#3832/13
X16
11_10_2013

KK/SOL

Excess weld metal = 0,37 mm

Welding penetration = 3,19 mm

Offset = 0,06 mm

