

Tel. (+39)(030).6829911
 Fax. (39)(030).6820616
 Via Industriale, 1 - 25021 BAGNOLO MELLA (BS) ITALY

CERTIFICATE OF QUALITY AND MATERIAL TESTING

INSPECTION CERTIFICATE N. **AC/ 3197** DATE : 11/10/17
 according to EN 10204.3.1

FIRM : **ESP SPECIALTY STEEL PRODUCTS - HOUSTON (TX)**
 ORDER : ORDER CONFIRMATION : 205563

HEAT	N. of PCS	MATERIAL DESCRIPTION	MATERIAL GRADE
61098	1	FORGED ROUND TURNED BAR Ø17"	316/316L UNS S31600 /S31603 SS1 Rev.5 ASTM A276-17 ASTM A479-17 ASTM A484-15 ASME Code Sec.II Part. A SA479-15 AMS 5653H AMS QQS 763D Cond.A AMS 5648M AMS S-7720 316 NACE MR 0103-15 NACE MR 0175/ISO 15156-2015

H.T. CONDITION: Solution annealed 1050°C (8h) + water quenched

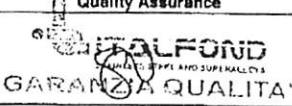
HEAT ANALYSIS


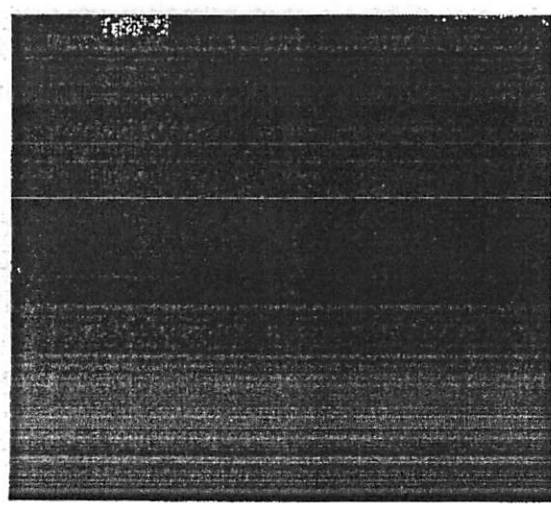
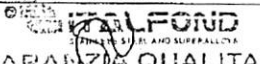
C	Mn	Si	P	S	Cr	Ni	Mo	Cu	Sn
0,014	1,84	0,31	0,025	0,0230	17,00	10,24	2,19	0,316	0,0061
Ca	Al	V	Ti	W	Ta	As	Co	Nb	Pb
0,0055	0,006	0,039	0,003	0,052	0,0059	0,005	0,059	0,062	0,0025
B	N	Zr	Sb	Fe	PRE	Ferrite (%) ASTM E562		Grain size ASTM E112	
0,0002	0,068							5	

TEST RESULTS ON ACTUAL BAR PROLONGATION

Temp. [°C]	Direction	R _{p0.2} [KSI]	R _m [KSI]	A [%]	Z [%]	KV (10 X 10 mm) [J]	Hardness
RT	L	36	77	59,4	73,6		HBw 143 HRc <0

Steelmaking process E.A.F. + A.O.D. refining
 No welding performed on material
 Material free from Mercury contamination
 Material inspected with a gamma spectrometer and with no radioactive contamination beyond the limits provided for by the EU-Radiation Protection 122- part 1, when relevant
 Mechanical tests performed according to ASTM A370-14 (Ø12,5mm-50mm length) + ASTM E10-14 + ASTM E18-14a
 Corrosion test according to ASTM A262 Pr.E satisfactory performed
 Chemical analysis and mechanical properties according to ASTM A182-16a-ASME SA182-15 (F316-F316L) - ASTM A193-16 - ASME SA193-15 (Grade B8M Class 1)
 Country of melt and country of manufacture: Italy
 Italfond is in compliance with DFARS regulation 252.225-7017
 Forging ratio ≥3:1
 PMI performed

SURVEYORS	CUSTOMER INSPECTION	ITALFOND S.p.A. Quality Assurance
		

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CERTIFICATE OF QUALITY AND MATERIAL TESTING MACROGRAPHIC EXAMINATION			
INSPECTION CERTIFICATE N.		ME2/ 3197	DATE : 11/10/17
according to EN 10204.3.1			
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H.T. CONDITION : Solution annealed 1050°C (8h) + water quenched			
MACROGRAPHIC EXAMINATION			
Etching: 50% H ₂ O + 50% Hcl			
			
SURVEYORS		CUSTOMER INSPECTION	
		ITALFOND S.p.A. Quality Assurance  GARANZIA QUALITA'	

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CERTIFICATE OF QUALITY AND MATERIAL TESTING
MICROGRAPHIC EXAMINATION

INSPECTION CERTIFICATE N. **ME/ 3197** DATE : **11/10/17**
according to EN 10204.3.1

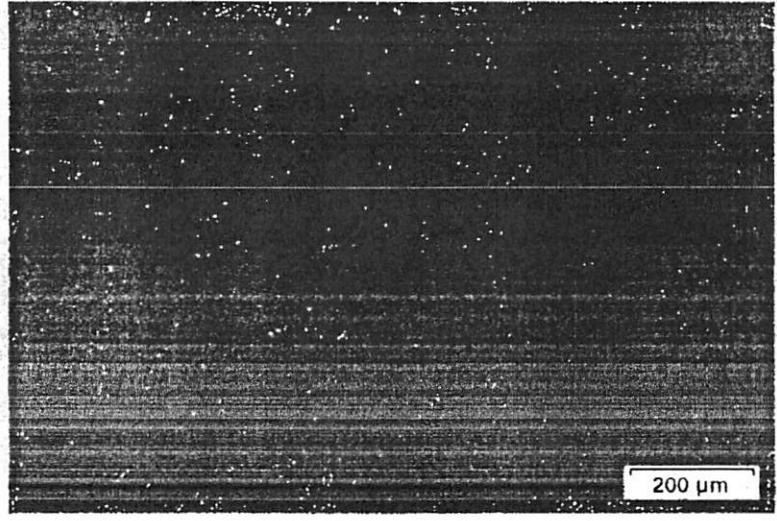
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MICROGRAPHIC EXAMINATION - MID RADIUS

Magnification: 100 x
Etching: electrolytic, Oxalic Acid 3v 120s according to ASTM E407



RESULT: Omogeneous structure free from detrimental phases and precipitates

SURVEYORS	CUSTOMER INSPECTION	ITALFOND S.p.A. Quality Assurance