



Tel. (+39) (030) 6828911  
 Fax. (39) (030) 6820618  
 Via Industriale, 1 - 25021 BAGNOLO MELLA (BS) ITALY

**CERTIFICATE OF QUALITY AND MATERIAL TESTING**

INSPECTION CERTIFICATE N. **AC/ 3459** DATE: **22/10/14**  
 according to EN 10204.1

FIRM: **MAGELLAN CORPORATION - CHICAGO (US)**  
 ORDER: **210080** ORDER CONFIRMATION: **202395**

HEAT	N. of PCS	MATERIAL DESCRIPTION	MATERIAL GRADE
58289	14	FORGED ROUND PEELED BAR Ø3"	UNS S31603 MIC 1701 12/06/2013 ASTM A276-13a ASTM A314-13a ASTM A473-13 ASTM A478-14 ASTM A484-14 ASME Sec. II Part A SA478-12 AISI 316/316L AMS 5848L AMS 5853H AMS QQ-S 783B NACE MR0109-2012 NACE MR0175/ISO 15168-2008

H.T. CONDITION: Solution annealed 1922 °F + water quenched (Condition A)

**HEAT ANALYSIS**

C	Mn	Si	P	S	Cr	Ni	Mo	Cu	Sn
0,020	1,73	0,28	0,030	0,0235	17,48	10,20	2,12	0,322	
Ca	Al	V	Ti	W	Ta	As	Co	Nb	Pb
	0,005	0,033	0,002	0,063			0,075	0,039	
B	N	Zr	Sb	Fe	PRE	Feche (%)	Grain size ASTM E118-12		
	0,073						5		

**TEST RESULTS ON ACTUAL BAR PROLONGATION**

Temp. [°C]	Direction	R <sub>p0.2</sub> [ksi]	R <sub>m</sub> [ksi]	A [%]	Z [%]	KV (10 x 10 mm) [ft-lbs]	HB
RT	L	43	84	52,5	62,9	321,2 - 317,5 - 328,4	169
RT	T					110,8 - 108,4 - 113,9	
RT	Ext.	HB					152
RT	Mild Radius	HB					152

Steelmaking process E.A.F. + A.O.D./ingot cast/Bottom pouring  
 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 182-part 1, when relevant  
 Mechanical tests performed according to ASTM A370-12a (Ø12,5mm-50mm length) + ASTM E10-12 + ASTM E23-12  
 Chemical analysis according to ASME SA193-10 Sec. II Part A Grade B8M, ASME SA320-10 Class1 B8M, ASTM A193-12b Grade B8M and ASTM A320-11a Class1 B8M  
 PMI performed  
 Chemical composition tested in accordance with ASTM A761-11  
 Chemical analysis and mechanical properties according to ASME Sec. II Part A SA193-10 and ASTM A193-13 F816/F316L  
 Corrosion test according to ASTM A262 Pt.E satisfactory performed  
 Italfond is in compliance with DPARS Regulation 252.225-7014 + RoHS  
 Microstructure: Satisfactory  
 Forging rate 6,9:1  
 Country of melt and manufacture: ITALY

SURVEYORS	CUSTOMER INSPECTION	ITALFOND S.p.A. Quality Assurance  GARANZIA QUALITÀ
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From: TK Materials CA, Ltd.

Cust. M2M MACHINING

CstAr

Wgt.: 42 LB

Del.: 2404912024

CstOr 2016-692

Date 12/01/2016



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**CERTIFICATE OF QUALITY AND MATERIAL TESTING**

**ULTRASONIC TEST**

INSPECTION CERTIFICATE N. **UT7 3459** DATE: **22/10/14**  
 according to EN 10204.3.1

FIRM: **MAGELLAN CORPORATION - CHICAGO (US)**  
 ORDER: **210080** ORDER CONFIRMATION **202395**

HEAT	N. of PCS	MATERIAL DESCRIPTION	MATERIAL GRADE
56299	14	FORGED ROUND PEELED BAR Ø8"	UNS S31603 MIC 1701 12/08/2013 ASTM A276-13a ASTM A314-13a ASTM A473-13 ASTM A478-14 ASTM A484-14 ASME Sec.II Part A SA478-12 AISI 316/316L AMS 5648L AMS 5653H AMS QQ8 763B NACE MR0103-2012 NACE MR0175/ISO 15156-2009

H.T. CONDITION: **Solution annealed 1922 °F + water quenched (Condition A)**

**ULTRASONIC TEST REPORT**

EQUIPMENT	:	KRAUTKRAMER USN 58L
PROBE	:	B26
COUPLANT	:	Gel
SURFACE CONDITION	:	Pealed
CALIBRATION METHOD	:	Backwall echo
TESTING PROCEDURE	:	ASTM A388-11
ACCEPTANCE CRITERIA	:	ASME VIII Div.2 Par. 3.3.4
CALIBRATION METHOD	:	Backwall echo-AVG Method
TESTING PROCEDURE	:	SEP1921 Class 3
ACCEPTANCE CRITERIA	:	D/d
RESULT	:	No recordable indications found

SURVEYORS	CUSTOMER INSPECTION	ITALFOND S.p.A. NDE Inspector
		SNT - TC - 1A LEVEL II BRUNO BROCCA

From: TK Materials CA, Ltd.

Cust. M2M MACHINING

CstAr

Wgt.: 42 LB

Del.: 2404912024

CstOr 2016-692

Date 12/01/2016



Tel. (39).(030).6829911  
 Fax. (39).(030).6820916  
 Via Industriale, 1 - 26021 BAGNOLO MELLA (BS) ITALY

**CERTIFICATE OF QUALITY AND MATERIAL TESTING**

**DEGREE OF IMPURITIES**

INSPECTION CERTIFICATE N. **INV 3459** DATE: **22/10/14**  
 according to EN 10204.3.1

FIRM: **MAGELLAN CORPORATION - CHICAGO (US)**  
 ORDER: **210080** ORDER CONFIRMATION: **202395**

HEAT	N. of PCS	MATERIAL DESCRIPTION	MATERIAL GRADE
56299	14	FORGED ROUND PEELLED BAR Ø8"	UNS S31603 MC 1701 12/06/2013 ASTM A276-13a ASTM A314-13a ASTM A473-13 ASTM A479-14 ASTM A484-14 ASME Sec.II Part A SA479-12 AISI 316/316L AMS 5648L AMS 5653H AMS QQS 763B NACE MR0103-2012 NACE MR0175/ISO 15156-2009

H.T. CONDITION: Solution annealed 1822 °F + water quenched (Condition A)

**INCLUSION CONTENT ASSESSEMENT**

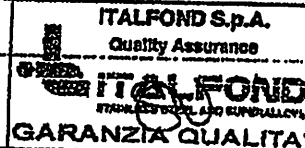
Reference standard ASTM E45-A-13

**MID RADIUS**

FIELD	A		B		C		D	
	T	H	T	H	T	H	T	H
1	0	0	0	0	0	0	1	0
2	0	1	0	0	0	0	0	0
3	0	0	0	0	0	0	0	1
4	1	0	0	0	0	0	0	0
5	0	0	0	0	0	0	1	1
6	1	1	0	0	0	0	0	0
AVERAGE	0,33	0,33	0,00	0,00	0,00	0,00	0,33	0,33

SURVEYORS

CUSTOMER INSPECTION



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Date 12/01/2016

*Thomas Sanchez*