



Tel. (+39)(030)6029011  
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 Via Industriale, 1 - 25021 BAGNOLO MELLA (BS) ITALY

**CERTIFICATE OF QUALITY AND MATERIAL TESTING**

INSPECTION CERTIFICATE N. **AC/ 4053** DATE: **15/12/14**  
 according to EN 10204.3.1

FIRM: **MAGELLAN CORPORATION - CHICAGO (US)**  
 ORDER: **210090** ORDER CONFIRMATION: **202396**

HEAT	N. of PCS	MATERIAL DESCRIPTION	MATERIAL GRADE
56474	12	FORGED ROUND PEELED BARS Ø9"	UNS S31603 MIC 1701 12/05/2013 ASTM A276-13a ASTM A314-13a ASTM A479-13 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 15168-2009

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

**HEAT ANALYSIS**

C	Mn	SI	P	S	Cr	NI	Mo	Cu	Sn
0,019	1,74	0,23	0,029	0,0233	16,98	10,30	2,13	0,307	
Ca	Al	V	Ti	W	Ta	As	Co	Nb	Pb
	0,006	0,029	0,002	0,054			0,071	0,021	
B	N	Zr	Sb	Fe	PRE	Ferrite (%)	Grain size ASTM E112-12		
	0,089						5		

**TEST RESULTS ON ACTUAL BAR PROLONGATION**

Temp. [°C]	Direction	R <sub>po2</sub> [ksi]	R <sub>m</sub> [ksi]	A [%]	Z [%]	KV (10 X 10 mm) [FT-lbs]	
RT	L	35	78	55,4	62,8	295,4 - 287,9 - 290,3	
RT	T					95,3 - 90,2 - 87,6	
		HB					
RT	Ext.	155					
RT	Mtd Radius	154					

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 122-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 SA182-10 and ASTM A182-13 F316/F316L  
 Corrosion test according to ASTM A262 Pt.E satisfactory performed  
 Italfond is in compliance with DFARS Regulation 252.225-7014 + RoHS  
 Microstructure: Satisfactory  
 Forging ratio 8:1  
 Country of melt and manufacture: ITALY

SURVEYORS	CUSTOMER INSPECTION	<b>ITALFOND S.p.A.</b> Quality Assurance  GARANZIA QUALITÀ
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Vnc# 7095  
 e Pa 6 FSE40

From: TK Materials CA, Ltd.

Cust.

Del.: 2404738505

CstAr

CstOr 80000

Wgt.: 28 LB

Date 08/31/2016

*Thomas Sanchez*



Tel. (39)(030)8820911  
 Fax. (39)(030)8820910  
 Via Industriale, 1 - 25021 BAGNOLO MELLA (BS) ITALY

**CERTIFICATE OF QUALITY AND MATERIAL TESTING**

**ULTRASONIC TEST**

INSPECTION CERTIFICATE N. **UT/ 4053** DATE: **15/12/14**  
 according to EN 10204.3.1

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 ORDER: **210090** ORDER CONFIRMATION **202396**

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

**ULTRASONIC TEST REPORT**

EQUIPMENT	:	KRAUTKRAMER USN 58L
PROBE	:	B2S
COUPLANT	:	Gel
SURFACE CONDITION	:	Peeled
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
		SN7 TC - 1A LEVEL II BRUNO BROCCA

From: TK Materials CA, Ltd.

Cust.

CstAr

Wgt.: 28 LB

Del.: 2404738505

CstOr 80000

Date 08/31/2016



Tel. (39)(030)6829911  
 Fax. (39)(030)6820618  
 Via Industriale, 1 - 25021 BAGNOLO MELLA (BS) ITALY

**CERTIFICATE OF QUALITY AND MATERIAL TESTING**

**DEGREE OF IMPURITIES**

INSPECTION CERTIFICATE N. **INW 4053** DATE: **15/12/14**  
 according to EN 10204.3.1

FIRM: **MAGELLAN CORPORATION - CHICAGO (US)**  
 ORDER: **210090** ORDER CONFIRMATION: **202396**

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

**INCLUSION CONTENT ASSESSEMENT**

Reference standard ASTM E45-A-13

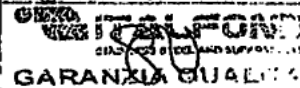
**MID RADIUS**

FIELD	A		B		C		D	
	T	H	T	H	T	H	T	H
1	0	0	0	0	0	0	0	0
2	1	1	0	0	0	0	0	0
3	0	0	0	0	0	0	0	1
4	1	0	0	0	0	0	1	0
5	0	0	0	0	0	0	1	1
6	0	0	0	0	0	0	0	0
AVERAGE	0,33	0,17	0,00	0,00	0,00	0,00	0,33	0,33

SURVEYORS

CUSTOMER INSPECTION

ITALFOND S.p.A.  
 Quality Assurance



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