



R & M Forge & Fittings

6455 Wesco Way

Houston, TX 77041

† (713) 896 – 4081 ☎ (713) 896 – 6206

[www.rmforge.com](http://www.rmforge.com)

### MATERIAL TEST REPORT

Date: 09/13/2022

Customer:	PO# 2022-1416	Line Item: 2	R&M S/O#: 45792
	DESCRIPTION: ROUGH MACHINED 1/4" ALLOWANCE – 250 RMS 11.0" OD X 2.75" THK		
	TAG: JOB# 6251		
	HEAT NUMBER: 68159		QTY. Shipped: 1 PC.
Spec: ASME SA182 F51 (S31803)	2021 EDITION / LATEST ADDENDA		Mill: ITALFOND (ITALY)

	C	MN	P	S	SI	NI	CR	MO	CU	V	CB/NB
LADLE	.014	1.53	.024	.0006	.42	5.68	22.17	3.10			
PRODUCT											
	N	AL	CE	FE	TI	W	SB	SN	AS	CB+TA	J-FACTOR
LADLE	.184										
PRODUCT											

Mechanical Properties	
YIELD (PSI)	70,400
0.2% OFFSET	
TENSILE (PSI)	103,000
ELONG. (%) 2"	43.0
R/A (%)	78.0
HARDNESS	230-230 BHN
CVN (FT/LBS)	202-184-179
AVG.	188.33
LAT. EXP.	.102-.097-.093
SHEAR (%)	100-100-100
CVN TEMP.	-40F

Heat Treatment
SOLUTION ANNEALED @ 1922F FOR 7 HOURS / WATER QUENCHED

Requirements & Other Results
EAF AOD
PER NACE MR0175
CVN @ -40F PER UHA-51
.015 MIN LATERAL EXPANSION
PER EN 10204 3.1

**COMMENTS:**

THIS PRODUCT HAS NOT COME IN CONTACT WITH MERCURY OR MERCURY COMPOUNDS. NO WELDING PERFORMED.

**CERTIFICATION OF CONFORMANCE**

THIS IS TO CERTIFY THAT THE ITEMS DESCRIBED ON THIS DOCUMENT ARE IN FULL CONFORMANCE WITH ALL REQUIREMENTS OF YOUR PURCHASE ORDER AND MATERIAL SPECIFICATIONS.

We hereby certify that all test results and process information contained herein are correct and true as contained in the records of the company.

This 13th day of September 2022

Beau Christoffersen/Quality Control

## CERTIFICATE OF QUALITY AND MATERIAL TESTING

INSPECTION CERTIFICATE N.

AC/ 2130Rev.4  
according to EN 10204.3.1

DATE : 12/04/22

FIRM :

ORDER : **FF-25334**

ORDER CONFIRMATION: **209917**

HEAT	N. of PCS	MATERIAL DESCRIPTION	MATERIAL GRADE
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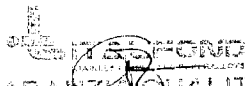
68159	2	FORGED ROUND GROUND BARS Ø12"	F51/F60
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**H.T. CONDITION:**

**HEAT ANALYSIS [% by mass]**

C	Si	Mn	P	S	Cr	Mo	Ni	Cu	B
0,014	0,42	1,53	0,024	0,0006	22,17	3,10	5,68		0,0021
Ca	Al	V	Ti	W	Ta	N	Co	Nb	Fe
	0,018	0,059		0,083		0,184			

Steelmaking process E.A.F. + A.O.D. refining  
No welding performed on material  
Material free from Mercury contamination  
Material inspected with a gamma spektrometer and with no radioactive contamination beyond the limits provided for by the EU-Radiation Protection 122-part 1, when relevant, especially Co-60 < 0,1 Bq/g  
Chemical analysis according to your order and ASTM A182 (F51/F60)  
Forging ratio 5:1  
Issued in agreement with TÜV Süd Industrie Service GmbH (March 1995)  
QMS approved according to PED 2014/68/EU, Annex I, Para. 4.3 by Notified Body 0036  
Certification no. DGR-0036-QS-W 55/2002/MUC  
**The delivered products comply with the standards, specifications and requirements of the order.**

SURVEYORS	CUSTOMER INSPECTION	ITALFOND S.p.A. Quality Assurance
		 <b>GARANZIA QUALITÀ</b>



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

**CERTIFICATE OF QUALITY AND MATERIAL TESTING**

**ULTRASONIC TEST**

INSPECTION CERTIFICATE N. **UT/ 2130Rev.4** DATE : **12/04/22**  
 according to EN 10204.3.1

FIRM :

ORDER : **FF-25334** ORDER CONFIRMATION: **209917**

HEAT	N. of PCS	MATERIAL DESCRIPTION	MATERIAL GRADE
68159	2	FORGED ROUND GROUND BARS Ø12"	F51/F60

H.T. CONDITION :

**ULTRASONIC TEST REPORT**

EQUIPMENT : KRAUTKRAMER USM 36  
 CALIBRATION METHOD : BACK WALL ECHO  
 COUPLANT : GEL  
 KIND OF PROBE : B2S  
 SURFACE CONDITION : Ground  
 TESTING PROCEDURE : ASTM A388  
 ACCEPTANCE CRITERIA : ASME VIII Div.2 Par. 3.3.4  
 RESULT : No recordable indications found

SURVEYORS	CUSTOMER INSPECTION	ITALFOND S.p.A. NDE Inspector
		ISO 9712 - UT PT Lev. 2 SNT-TC 1A - UT PT Lev. II STEFANO TEOLODI