



R & M Forge & Fittings
 6455 Wesco Way
 Houston, TX 77041

MATERIAL TEST REPORT

(713) 896 - 4081 (713) 896 - 6206
 www.rmforge.com

Shipped to:

Date: 10/28/2021

Customer:	PO# 2021-1298	Line Item: 1	R&M S/O#: 45296
	DESCRIPTION: ROUGH MACHINED 1/4" ALLOWANCE - 250 RMS 28" OD X 5.50" THK		
	TAG: JOB# 1702		
	HEAT NUMBER: S7033	QTY. Shipped: 2 PCS.	
Spec: ASTM A182 F316/316L	2020 EDITION / LATEST ADDENDA		Mill: ELLWOOD (USA)

	C	MN	P	S	SI	NI	CR	MO	CU	V	CB/NB
LADLE	.028	1.65	.033	.022	.45	10.57	16.39	2.10	.40	.068	
PRODUCT											
	N	AL	CE	FE	TI	W	SB	SN	AS	CB+TA	J-FACTOR
LADLE	.0821	.004									
PRODUCT											

Mechanical Properties		Heat Treatment	Requirements & Other Results
YIELD (PSI)	50,000	SOLUTION ANNEALED @ 1950F FOR 6 HOURS / WATER QUENCHED	EF LR VD
0.2% OFFSET			FULLY KILLED
TENSILE (PSI)	84,000		PER EN 10204 3.1
ELONG. (%) 2"	54.0		PER NACE MR0175
R/A (%)	73.0		
HARDNESS	163 BHN		
CVN (FT/LBS)			
AVG.			
LAT. EXP.			
SHEAR (%)			
CVN TEMP.			

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 28TH day of October 2021

Callie Knox / Quality Assurance

ANS

CERTIFIED TEST REPORT

Date: 4/26/21

Report of Tests of: (1), 20" RD - Grade 316/316L Billet

For Company:

Customer's Order: WU-2984-21

Date of Order: 4/26/21

Our Shop Order: HS00000553

Specification: SA182 316/316L

CHEMICAL ANALYSIS

Heat #	C	Mn	P	S	Si	Ni	Cr	Mo	V	Cu	Al	Co	B	Nb
S7033	.028	1.65	.033	.022	.45	10.57	16.39	2.10	.068	.40	.004	.189	.0038	.124
	N													
	.0821													

Material Certified: S7033-02

The material was melted using the electric furnace-ladle refined-vacuum oxygen decarburization-vacuum degassed process and was subsequently bottom poured.

The material was melted and produced in the USA, in accordance with the ENS Quality Manual REV. 4 dtd. 10/10/18 which meets the intent of the latest revisions of AS9100D, ISO 9001:2015, ISO 10012-1, MIL-I-45208, NCA-3800, and 10-CFR-50 App. B for quality assurance, inspection and calibration systems.

Reduction Ratio: 4.07:1

Material forged to 20" RD Billet from 34"x47" ingot.

This material meets the chemistry requirements of ASME BPVC.II.A-2019 SA182/SA182M for grades S31600 (F316) and S31603 (F316L).

I certify that the reported results and statements of this certificate represent the actual attributes of the material furnished and are in full compliance with all purchase order/specification requirements. The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under Federal Statutes. During the manufacturing process, tests, and inspections, the material did not come in direct contact with mercury or any of its compounds nor with any mercury containing device employing a single boundary of containment. No welding or weld repair was performed on this material. The material was produced free of radioactive elements.

Judith G. Stevens