

04552

FORONI S.p.A.

21055 Goria Minore (VA)
Italia



CERTIFIED MATERIAL TEST REPORT

Inspection certificate EN 10204-3.1

Cert. n° 2008/0428

Rev. 0
Date 3/3/2008

Customer FORONI METALS OF TEXAS, INC.
Material: F51; UNS S31803; AF.F51 Gr.2.

Order n°: 07 065 + Order confirmation
Delivery condition: Forged, solution annealed and peeled.

Item: 12

Specifications: ASTM A182-06¹, A276-06, A370-05, A479-06a; ASME/D4 & Add.05-06 SA182¹, SA370, SA479; NACE MR0175/ISO 15156-3:2003. (* Chemical and mechanical properties only)

AOD / VIDP n° 04552	Heat Treatment: Lot n°: 5351	CYT n°:	Description: R.P. Bars	Size 7,00 inches	Length inches
VAR / ESR n°	- Solution annealing at 1940°F x 1/4 h/inch - W.Q..		N° of pieces 8	Weight 20492 Lbs	Bar Identification:
Steel making process: E.F.I.A.O.D.	- Furnace calibration in accordance with AMS-H-6875A.		Forging ratio: 22,1		

Chemical analysis			Mechanical properties			Other properties		
% w	Heat	Product	Test n°	6274		Specification:	Description:	Results:
C	0,015	0,014	Type	1 See remarks		Grain size		
MN	1,47	1,47	Position	M.R.		Ferrita content to	ASTM E562-05	50 %
SI	0,42	0,42	Direction	LNG		Corrosion test		
CR	22,39	22,29	Temperature °F	68		Macro examination		
NI	5,43	5,47	Y.S. 0,2% Ksi	70,7		 TRACER# 167148	ROLLED ALLOYS QUALITY ASSURANCE APPROVED <i>[Signature]</i> DATE <i>04/28/08</i>	
MO	3,15	3,12	Y.S. 1% Ksi				Microstructure test	
S	0,0003	0,0003	U.T.S. Ksi	100,8		Inclusional content		
P	0,0240	0,0240	Elongation %	40 45,2		UT to	API 6A 19th Ed.	PSL3 (Par. 7.4.2.3.15) Passed
CU	0,33	0,33	Red. of Area %	81,3		Visual check		Passed
CO	0,067	0,067	Hardness HB	223		Dimensional check		Passed
N	0,183	0,184	Hardness HRC			P.M.I. check		Passed
FE	Bal.	Bal.	<i>as delivered</i> Position M.R. Direction LNG Temperature °F -50			Fatigue testing		Passed
PRE	35,71	35,53	Charpy A Ft.Lbs	215		Remarks: <i>Material not intended for use in aerospace/aircraft applications.</i> - Chemical analysis also in accordance with chemistry requirements of ASME/D4 & Add.05-06 SA182, SA479 and ASTM A182-06, A276-06, A479-06a for UNS S32205. - ¹ Mechanical testing performed from bar prolongation; tensile test on standard 0,500 inch diameter specimen.		
			Lateral expansion inches	0,094				
				0,077				
				0,081				
			Shear %	98				
				84				
				86				
			Temperature °F					
			Load Ksi					
			Load Increm.					
			Duration hours					
			Elongation %					

Material made in Italy. No welds, no mercury and radioactive contamination.

The material is in compliance with the mentioned specifications. Material produced according to the Quality System described in the FORONI S.p.A. MSQ Manual.

Quality System Manual MSQ Ed. 2003 Rev. 0

S.C.Q. Department M. Gallina

R.S.Q. Inspector *[Signature]*