Bri-Steel Manufacturing Inc.
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Mill Test Certificate

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-1558** Product Size: **NPS 20 x 0.350** Production Date: **January 24, 2014**
MTR **772**

Production Method: Hot Expansion Product Heat Treatment: As-rolled

Product Standards: ASME B36.10-2004, API 5L-44th Ed. Grade B PSL1, A/SA333-2011 Grade 6, ASTM/ASME A/SA106-2011 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010

Product Markings: **BRI-STEEL MFG <API> 5L-0898 API SPEC 5L NPS 20 X 0.350 INCHWT GR B/X42/X46/X52 PSL1 SMLS 2014/01 NDE 1760PSI HEAT BSM-1558 (PIPE # LENGTH MASS) 78.6lb/ft ASTM/ASME A/SA333 GR 6 A/SA106 GR B/C A/SA53 GR B NACE MR0175 2014/01 MADE IN CANADA.**

Product Details						Non-Destructive Testing								
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Geiger µR/hr	Res.Mag. Gauss	Visual Insp.	OD*	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 1760 psi/5s	End Condition
BSM-1558	Heat	NPS 20 STD 0.375 in.WT	20	DRL	78.60	<5	<20	Pass	Pass	Pass	Pass	Pass	Pass	32.5° Bevel

Chemical Analysis (wt%)																	
Heat	Steelmaking Method	Analysis	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE (IIW)	CE (CSA)
BSM-1558	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.17	1.13	0.016	0.011	0.33	0.07	0.02	-	0.04	0.070	-	-	-	-	-
		Product	0.17	1.12	0.014	0.010	0.31	0.05	0.02	0.01	0.04	0.051	0.002	0.001	0.0002	0.38	0.38

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test 50mm GL	Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-1558	Heat	Ferrite & Pearlite	79	Pass	Longitudinal; 38.1mm x WT	57,000	77,500	0.74	40

	Test	Impact Test	Temp	Impact Energy				% Shear				Lateral Expansion			
Heat	Standard	Sample Details	ºC	J	J	J	AVG	%	%	%	AVG	mm	mm	mm	AVG
BSM-1558	A/SA333	CVN Longitudinal (X-Y) 10x8	-45ºC	118	131	69	106	50	45	35	43	2.32	2.13	-	2.23

Additional Details:

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-44th Ed., ASTM/ASME A/SA333-2011, A/SA106-2011, A/SA53-2012, and the purchase order requirements, and that the results meet the corresponding requirements.

✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and NACE MR0103-2010 Section 2.1.

✓ No weld repairs have been performed on this product.

✓ This product has not come into contact with mercury during the Bri-Steel Manufacturing processes.

✓ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

*OD Tolerances as per API

Mill Test Certificate approved by:

2014 JAN 24

Paul Sowden, T.T.
Assistant QA Manager