Bri-Steel Manufacturing Inc.
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Mill Test Certificate

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-1384** Product Size: **NPS 16 STD** Production Date: **November 8, 2013**
MTR **577**

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

Product Standards: ASME B36.10-2004, 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 MANUFACTURING INC. NPS 16 STD 0.375INCH WT SMLS NDE 2013/11 PAULSEN PIPE PO# 10330
HEAT BSM 1384(PIPE# LENGTH WEIGHT)62.58LB/FT ASTM/ASME A/SA333 GR 6 A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 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	End Condition
BSM-1384	Heat	NPS 16 STD 0.375 in.WT	13	DRL	62.58	<5	<20	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 (Pcm)	CE (CSA)
BSM-1384	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.12	1.21	0.014	0.002	0.23	0.12	0.15	0.07	0.09	0.080	0.003	0.027	0.0003	-	-
		Product	0.12	1.24	0.015	0.002	0.24	0.12	0.14	0.07	0.08	0.076	0.002	0.027	0.0001	0.22	0.33

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-1384	Heat	Ferrite & Pearlite	82	Pass	Longitudinal; 38.1mm x WT	59,500	78,000	0.76	42

Heat	Test Standard	Impact Test Sample Details	Temp ºC	Impact Energy J	J	J	AVG	% Shear %	%	%	AVG	Lateral Expansion mm	mm	mm	AVG
BSM-1384	A/SA333	CVN Longitudinal (X-Y) 10x8	-45ºC	115	112	110	112	60	50	55	55	2.07	1.88	1.86	1.94

Additional Details:

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with 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.

Mill Test Certificate approved by:

2013 NOV 08

Paul Sowden, T.T.
Assistant QA Manager