



Bri-Steel Manufacturing Inc.
 2125-64 Avenue, Edmonton, AB Canada T6P 1Z4
 Tel: 001 (780) 469-6603
 Fax: 001 (780) 469-6986
 www.brichemsteel.com

Mill Test Certificate

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-1383** Product Size: **NPS 20 STD** Production Date: **November 12, 2013**
 Production Method: **Hot Expansion** Product Heat Treatment: **As-rolled** MTR#: **589**

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:  **NPS 20 STD 0.375 INCHWT SMLS 2013/11 NDE PAULSEN PIPE PO# 10330**
HEAT BSM-1383 (PIPE# LENGTH WEIGHT) 78.6lb/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 $\mu R/hr$	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	Hydro Test	End Condition
BSM-1383	Heat	NPS 20 STD 0.375 in. WT	2	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	CE (Pcm)	CE (CSA)
BSM-1383	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.10	1.21	0.009	0.004	0.23	0.04	0.07	0.03	0.04	0.025	0.016	0.001	0.0001	-
		Product	0.11	1.22	0.012	0.004	0.22	0.04	0.07	0.03	0.03	0.024	0.014	0.001	0.0001	0.19

Mechanical Properties										
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
					50mm GL	Longitudinal; 38.1mm x WT				
BSM-1383	Heat	Ferrite & Pearlite	81	Pass	Pass	Pass	56,500	71,000	0.80	38

Heat	Standard	Impact Test Sample Details	Temp $^{\circ}C$	Impact Energy			% Shear			Lateral Expansion				
				J	J	J	%	%	%	mm	mm	mm	mm	mm
BSM-1383	A/SA333	CVN Longitudinal (X-Y) 10x8	-45 $^{\circ}C$	168	123	65	70	50	15	45	2.23	2.04	1.33	1.87

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 12

Paul Sowden, T.T.
 Assistant QA Manager