



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-1123** Product Size: **NPS 18 TRUE80** Production Date: **August 1, 2013**

Production Method: **Hot Expansion** Product Heat Treatment: **As-rolled** Certificate No: **000156**

Product Standards: **ASME B36.10-2004, ASTM/ASME A/SA106-2011 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **<API & L/C No.> API SPEC 5L NPS 18 TRUE 80 0.940 INCHWT GR BR PSL2 SMLS 2013/08 NDE 2230PSI**

HEAT BSM-1123 (PIPE # LENGTH MASS) 170.8lb/ft ASTM/ASME 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	Geliger	Res. Mag.	Visual	OD	WT	UT	ET	HydroTest	End
BSM-1123	Heat	NPS 18 TRUE80 0.94 in. WT	5	DRL	170.80	µR/hr	Gauss	Insp.	Pass	Pass	Pass	Pass	PSI/ 5s	Condition
						<5	<20	Pass	Pass	Pass	Pass	Pass	2230	Plain End

Chemical Analysis (wt%)																	
Heat	Steelmaking Method	Analysis															
		C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE	CE	
BSM-1123	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.18	0.89	0.010	0.004	0.31	0.05	0.08	0.01	0.02	0.006	0.002	0.001	0.0002	-	-
		Product	0.22	0.90	0.013	0.005	0.31	0.05	0.06	0.01	0.03	0.004	0.002	0.001	0.0002	0.39	0.40
			0.21	0.89	0.01	0.005	0.31	0.05	0.06	0.01	0.03	0.004	0.002	0.001	0.0002	0.38	0.39

Mechanical Properties										
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test		Yield (Rt0.5)	Tensile (Rm)	Y/T	Elongation (A)
					HRBW	50mm GL				
BSM-1123	Heat	Ferrite & Pearlite	77	Pass	Longitudinal; 38.1mm x WT	48,300	73,000	0.66	59	

Heat	Test Standard	Impact Test Sample Details	Temp	Impact Energy			% Shear			Lateral Expansion						
				J	AVG	%	J	AVG	%	mm	mm	mm	AVG			
BSM-1123	API 5L PSL2	CVN Trans 10 x 10mm	0	189	143	163	165	80	60	60	60	67	2.19	1.92	1.74	1.95

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/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:

[Signature]
 2016 Feb 9

Kenton Dechant, P.Eng.
 Manager of Quality and R&D