



**Bri-Steel Manufacturing Inc.**  
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## Mill Test Certificate

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0801** Product Size: **NPS 24 SCH 60** Production Date: **April 1, 2013**

Production Method: **Hot Expansion** Product Heat Treatment: **Hot Worked (845 - 945°C) & Air Cooled**

Product Standards: **ASME B36.10-2004, ASTM/ASME A/SA106-2011 Grade B NDE, A/SA53-2012 Grade B Type S, A/SA333-2011 Grade 6, NACE MR0175-2009, MR0103-2010**

Product Markings: **.BRI-STEEL MFG ASTM/ASME A/SA333 GR 6 A/SA106 GR B A/SA53 GR B NPS 24 SCH 60 0.969 inchWT HEAT BSM-0801 (PIPE # LENGTH MASS) 238.1lb/ft NDE SMIS NACE MR0175 2013/04 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	HydroTest	End Condition
BSM-0801	Heat	NPS 24 SCH 60 0.969 in. WT	2	DRL	238.10	<5	<20	Pass	Pass	Pass	Pass	Pass	*	Plain End

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-0801	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.11	1.09	0.018	0.007	0.26	0.04	0.05	0.01	0.02	0.004	0.002	0.001
		Product	0.11	1.09	0.016	0.009	0.24	0.04	0.05	0.01	0.02	0.004	0.002	0.001	0.0001	0.31	0.25

Mechanical Properties											
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (Rt0.5) psi	Yield (Rp0.2) psi	Tensile (Rm) psi	V/T (Rt0.5/Rm)	Elongation (A) %
					50mm GL	Transverse: 38.1mm x WT					
BSM-0801	Heat	Ferrite & Pearlite	74	Pass	Longitudinal: 38.1mm x WT		45,100	44,200	68,000	0.66	61
							48,500	48,600	67,000	0.72	62

Heat	Test Standard	Impact Test Sample Details	Temp $^{\circ}$ C	Impact Energy			AVG	% Shear			Lateral Expansion				
				J	J	J		%	%	%	mm unbroken	mm unbroken	mm unbroken	mm unbroken	
BSM-0801	A/SA333	CVN Longitudinal (X-Y) 10x10	-45 $^{\circ}$ C	295	295	294	295	100	100	100	100	100	unbroken	unbroken	unbroken

**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/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 Apr 19  
 Kenton Dechant, P.Eng.  
 Manager of Quality and R&D