

Mill Test Certificate

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0438** Product Size: **NPS 16 SCH60** Production Date: **August 7, 2012**

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

Product Standards: **ASTM/ASME A/SA106-2011 Grade B/C, A/SA53-2012 Grade B Type S, NACE MR0175-2009**

Product Markings: **.BRI-STEEL MFG NPS 16 SCH60 ASTM/ASME A/SA106 GR B/C A/SA53 GR B HEAT BSM-0438 (PIPE # LENGTH MASS) 136.5lb/ft NDE NH NACE MR0175 2012/08 MADE IN CANADA.**

Product Details							Non-Destructive Testing								
Heat	Test Type	NPS	Wall Thickness	Pieces	Length	Mass lb/ft	Geiger μ R/hr	Res.Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest	End Condition
BSM-0438	Heat	16	SCH60*	3	SRL	136.50*	<5	<20	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-0438	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.19	0.88	0.006	0.003	0.23	0.06	0.06	0.03	0.03	-	-	-	0.0005	-	-
		Product	0.19	0.87	0.007	0.005	0.23	0.05	0.06	0.04	0.03	0.002	0.001	0.001	0.0002	0.36	0.37

Mechanical Properties											
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (Rt0.5) psi	Yield (Rp0.2) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
					50mm GL						
BSM-0438	Heat	Ferrite & Pearlite	75	Pass	Transverse; 38.1mm x WT		54,000	53,000	72,500	0.74	49
					Longitudinal; 38.1mm x WT						

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 meet 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 no mercury contamination.
- ✓ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

*Note that these 3 pipes were downgraded from NPS 16 SCH80.

Mill Test Certificate approved by:


 2012 Sept 5

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

MTR #3461