



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0448** Product Size: **NPS 18 XS** Production Date: **August 21, 2012**

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

Product Standards: **ASME B36.10-2004, API 5L-44th Ed. Grade B PSL1, ASTM/ASME A/SA106-2011 Grade B/C, A/SA53-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **BRI-STEEL MFG <API> 5L-0998 API 5L GR B PSL1 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 18 XS HEAT BSM-0448 (PIPE # LENGTH MASS) 93.45lb/ft NDE 1180PSI SMLS NACE MR0175 2012/08 MADE IN CANADA.**

Product Details				Non-Destructive Testing											
Heat	Test Type	NPS	Wall Thickness	Pieces	Length	Mass lb/ft	Geiger μR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 1180 psi/5s	End Condition
BSM-0448	Heat	18	XS	33	DRL	93.45	<5	<20	Pass	Pass	Pass	Pass	Pass	Pass	37.5° Bevel

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-0448	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.20	0.87	0.006	0.009	0.21	0.06	0.08	0.01	0.06	0.06	-	-
		Product	0.21	0.87	0.006	0.010	0.20	0.05	0.09	0.01	0.06	0.002	0.001	0.001	0.0001	0.38

Mechanical Properties											
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test					Elongation (A) %	
					50mm GL		Yield (Rp0.2) psi	Yield (Rt0.5) psi	Tensile (Rm) psi		Y/T (Rt0.5/Rm)
					Transverse: 38.1mm x WT	Longitudinal: 38.1mm x WT					
BSM-0448	Heat	Ferrite & Pearlite	76	Pass	47,800	45,100	46,900	74,000	0.65	40	

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-44th Ed., 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.

Mill Test Certificate approved by:

[Signature]
 2013 Sept 24
 Kenton Dechant, P. Eng.
 Manager of Quality and R&D