



# Mill Test Certificate

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

Product: **Seamless Carbon Steel Pipe**

Product Heat Number: **BSM-0447**

Product Size: **NPS 18 XS**

Product Size: **NPS 18 XS**

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/SAA106-2011 Grade B/C, A/SAS3-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **BRI-STEEL MFG <API> 5L-0898 API 5L GR B PSL1 ASTM/ASME A/SAA106 GR B A/SAS3 GR B NPS 18 XS HEAT BSM-0447 (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 $\mu$ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 1180 psi/5s	End Condition
BSM-0447	Heat	18	XS	28	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)	
			Heat	0.20	0.92	0.009	0.013	0.23	0.06	0.09	0.01	0.07	-	-	-	0.0003	-	-
			Vacuum Degass: Fully Killed	Product	0.22	0.91	0.012	0.017	0.22	0.06	0.10	0.01	0.06	0.002	0.001	0.001	0.0003	0.40

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	Transverse: 38.1mm x WT					
					Pass	Longitudinal: 38.1mm x WT					
BSM-0447	Heat	Ferrite & Pearlite	77	Pass		48,400	46,700	73,500	0.66	43	

**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/SAA106-2011, A/SAS3-2012 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]*  
 2013 Sept 24

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