



# Mill Test Certificate

**Bri-Steel Manufacturing Inc.**  
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0491** Product Size: **NPS 24 TRUE80** Production Date: **October 9, 2012**

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

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: **BRI-STEEL MFG ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 24 TRUE80 HEAT BSM-0491 (PIPE # LENGTH MASS) 296.4lb/ft NDE SMLS NACE MR0175 2012/10 MADE IN CANADA.**

Product Details				Non-Destructive Testing											
Heat	Test Type	NPS	Wall Thickness	Pieces	Length	Mass	Geiger	Res. Mag.	Visual	OD	UT	UT	ET	HydroTest	End Condition
BSM-0491	Heat	24	TRUE80	9	DRL	lb/ft	µR/hr	Gauss	Insp.	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-0491	Blast Furnace: EAF; Ladle Refining: Vacuum Degas; Fully Killed	Heat	0.18	0.93	0.010	0.015	0.26	0.10	0.07	0.01	0.03	-	-	-	0.0003	-	-
		Product	0.20	0.92	0.011	0.013	0.25	0.08	0.06	0.02	0.03	0.002	0.001	0.001	0.0001	0.38	0.39

Mechanical Properties											
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (Rp0.5) psi	Yield (Rp0.2) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
					50mm GL	Transverse: 19.1mm x WT					
BSM-0491	Heat	Ferrite & Pearlite	72	Pass	Longitudinal: 19.1mm x WT		49,000	47,700	71,000	0.69	41

**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.
- ✓ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

\* Note that hydrotesting was performed at 1000psi for 5s.

Mill Test Certificate approved by:

*[Signature]*  
 2012oct 25  
 Kenton Dechant, P. Eng.  
 Manager of Quality and R&D