



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0890** Product Size: **NPS 20 STD** Production Date: **May 7, 2013**

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 NDE, A/SA53-2012 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/SA106 GR B/C A/SA53 GR B NPS 20 STD 0.375 inchWT HEAT BSM-0890 (PIPE # LENGTH MASS) 78.6lb/ft NDE 910 PSI SMLS NACE MR0175 2013/05 MADE IN CANADA.**

Product Details				Non-Destructive Testing										
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Geiger μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 910 psi/5s	End Condition
BSM-0890	Heat	NPS 20 STD 0.375 in. WT	9	DRL	78.60	<5	<20	Pass	Pass	Pass	Pass	Pass	Pass	32.5" 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-0890	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.19	0.85	0.009	0.012	0.22	0.05	0.08	0.02	0.05	-	-	-	0.0003	-	-
		Product	0.20	0.82	0.010	0.012	0.22	0.05	0.08	0.02	0.05	0.001	0.001	0.001	0.0001	0.36	0.37

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test 50mm GL	Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-0890	Heat	Ferrite & Pearlite	74	Pass	Longitudinal; 38.1mm x WT	44,800	70,000	0.64	43
Heat	Test Standard	Impact Test Sample Details	Temp $^{\circ}$ C	Impact Energy J	Impact Energy J	% Shear	AVG	Lateral Expansion mm	AVG
BSM-0890	-	-	-	J	J	%	AVG	mm	AVG

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.

Mill Test Certificate approved by:

Kenton Dechant
 2013 May 13
 Kenton Dechant, P.Eng.
 Manager of Quality and R&D