



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0990** Product Size: **NPS 20 SCH 60** Production Date: **June 13, 2013**

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 20 SCH 60 0.812 inchWT HEAT BSM-0990 (PIPE # LENGTH MASS) 166.4lb/ft NDE SMILS NACE MR0175 2013/06 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	WT	UT	UT	ET	HydroTest	End Condition
BSM-0990	Heat	NPS 20 SCH 60 0.812 in.WT	2	DRL	166.40	<5	<20	Pass	Pass	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-0990	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.19	0.88	0.012	0.008	0.27	0.05	0.06	0.01	0.04	-	-	-	0.0003	-	-
		Product	0.21	0.89	0.016	0.006	0.26	0.06	0.07	0.01	0.04	0.004	0.001	0.001	0.0001	0.38	0.39

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-0990	Heat	Ferrite & Pearlite	75	Pass	Longitudinal; 38.1mm x WT	41,500	72,000	0.58	49
Heat	Test Standard	Impact Test Sample Details	Temp $^{\circ}$ C	Impact Energy J	% Shear	Lateral Expansion mm	AVG	mm	AVG
BSM-0990	-	-	-	-	-	-	-	-	-

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 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 this product was hydrotested to 1000 psi for 5 seconds.

Mill Test Certificate approved by:

Paul Sowden

2013 JUN 14
 Paul Sowden, T.T.
 Assistant QA Manager