



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe**

Product Heat Number: **BSM-1099**

Product Size: **NPS 20 TRUE80**

Production Date: **July 23, 2013**

Production Method: **Hot Expansion**

Product Heat Treatment: **As-rolled**

Certificate No: **000286**

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 TRUE80 1.031 inchWT HEAT BSM-1099 (PIPE # LENGTH MASS) 208.9lb/ft NDE SMIS NACE MR0175 2013/07 MADE IN CANADA.**

Product Details				Non-Destructive Testing									
Heat	Test Type	Product Size	Pieces	Length	Mass	Geiger	Res.Mag.	Visual	UT	UT	ET	HydroTest	End
BSM-1099	Heat	NPS 20 TRUE80 1.031 in.WT	1	DRL	lb/ft	µR/hr	Gauss	Insp.	Pass	ASTM E213	ASTM E309	Pass	Condition
					208.90	<5	<20	Pass	Pass	Pass	Pass		Plain End

Chemical Analysis (wt%)																	
Heat	Steelmaking Method	Analysis	C	Min	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE	CE
			Heat	0.20	0.95	0.013	0.002	0.32	0.04	0.04	0.03	0.02	0.003	0.002	0.001	0.0003	-
BSM-1099	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Product	0.21	0.93	0.017	0.004	0.31	0.07	0.05	0.03	0.02	0.004	0.002	0.001	0.0001	0.39	0.41

Mechanical Properties																	
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test		Yield (Rt0.5)	Tensile (Rm)	Y/T	Elongation (A)	Lateral Expansion						
					HRBW	50mm GL					psi	psi	%	mm	mm	mm	
BSM-1099	Heat	Ferrite & Pearlite	76	Pass	Longitudinal; 19.1mm x WT	45,700	70,500	0.65									
Heat	Test Standard	Impact Test	Temp	Impact Energy		% Shear	AVG	AVG	mm	mm	mm	AVG					
				J	J								%	%	mm	mm	mm
BSM-1099	-	Sample Details	-	-	-	-	-	-	-	-	-	-					

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.

Mill Test Certificate approved by:

[Signature]
 2016 Feb 3

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

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