



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-1093** Product Size: **NPS 20 TRUE80** Production Date: **July 22, 2013**

Production Method: **Hot Expansion** Product Heat Treatment: **As-rolled** Certificate No: **000220**

Product Standards: **ASME B36.10-2004, ASTM/ASME A/SAS106-2011 Grade B/C NDE, A/SAS3-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **BRI-STEEL MFG ASTM/ASME A/SAS106 GR B/C A/SAS3 GR B NPS 20 TRUE80 1.031 inchWT HEAT BSM-1093 (PIPE # LENGTH MASS) 208.9lb/ft NDE SMILS NACE MR0175 2013/07 MADE IN CANADA.**

Product Details						Non-Destructive Testing							
Heat	Test Type	Product Size	Pieces	Length	Mass	Gelger	Res. Mag.	Visual	OD	UT	ET	HydroTest	End Condition
BSM-1093	Heat	NPS 20 TRUE80 1.031 in. WT	1	DRL	208.90	UR/hr	Gauss	Insp.	Pass	Pass	Pass	Pass	*
						<5	<20	Pass	Pass	Pass	Pass	Pass	Plain End

Chemical Analysis (wt%)																
Heat	Steelmaking Method	Analysis	Element													
			C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE (IIW)
BSM-1093	Blast Furnace; EAF; ladle Refining; Vacuum Degas; Fully Killed	Heat	0.18	0.88	0.010	0.005	0.25	0.03	0.04	0.01	0.02	0.002	0.001	0.0002	-	-
		Product	0.21	0.94	0.015	0.008	0.33	0.04	0.05	0.01	0.03	0.004	0.006	0.001	0.0001	0.38

Mechanical Properties										
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
					Pass	50mm GL				
BSM-1093	Heat	Ferrite & Pearlite	76	Pass	Pass	46,500	71,500	0.65	49	

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy			% Shear			Lateral Expansion			
				J	J	J	%	%	%	mm	mm	mm	AVG
BSM-1093	-	-	-	-	-	-	-	-	-	-	-	-	-

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/SAS106-2011, 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. *Note

Mill Test Certificate approved by:

[Signature]
 2016 Feb 3

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