



# Mill Test Certificate

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-1094** Product Size: **NPS 20 TRUE80** Production Date: **July 22, 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 TRUE80 1.031 inchWT HEAT BSM-1094 (PIPE # LENGTH MASS) 208.9lb/ft NDE SMLS NACE MR0175 2013/07 MADE IN CANADA.**

Product Details				Non-Destructive Testing									
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Gelger	Res. Mag.	Visual	UT	UT	ET	HydroTest	End Condition
BSM-1094	Heat	NPS 20 TRUE80 1.031 in. WT	2	DRL	208.90	µR/hr	Gauss	Insp.	Pass	Pass	Pass	Pass	*
						<5	<20	Pass	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 (IIW)	CE (CSA)
BSM-1094	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.20	0.94	0.014	0.005	0.33	0.04	0.05	0.01	0.02	0.003	0.002	0.002	0.0003	-	-
		Product	0.22	0.94	0.014	0.003	0.31	0.04	0.05	0.03	0.02	0.004	0.003	0.001	0.0001	0.39	0.40

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) %	
BSM-1094	Heat	Ferrite & Pearlite	76	Pass	50mm GL Longitudinal; 19.1mm x WT	45,800	70,000	0.65	51	
Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy J	Impact Energy J	% Shear	AVG	mm	Lateral Expansion mm	AVG
BSM-1094	-	-	-	J	J	%	AVG	mm	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 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:

*Paul Sowden*

2013 JUL 26

Paul Sowden, T.T.  
Assistant QA Manager