



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-1172** Product Size: **NPS 14 SCH 160** Production Date: **August 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/SAS3-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **BRI-STEEL MFG ASTM/ASME A/SA106 GR B/C A/SAS3 GR B NPS 14 SCH 160 1.406 inchWT HEAT BSM-1172 (PIPE # LENGTH MASS) 189.1lb/ft NDE SMILS NACE MR0175 2013/08 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	End Condition
BSM-1172	Heat	NPS 14 SCH 160 1.406 in. WT	6	DRL	189.10	<5	<20	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-1172	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.22	0.94	0.014	0.002	0.31	0.05	0.05	0.01	0.02	0.003	0.002	0.001
		Product	0.21	0.94	0.016	0.003	0.31	0.05	0.05	0.01	0.02	0.003	0.002	0.001	0.0001	0.38	0.39

Mechanical Properties														
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (R _{0.5}) psi	Tensile (R _m) psi	Y/T (R _{0.5} /R _m)	Lateral Expansion			Elongation (A) %	
					Pass	Longitudinal; 19.1mm x WT				% Shear	AVG	mm		mm
BSM-1172	Heat	Ferrite & Pearlite	77	Pass	Pass	48,300	72,000	0.67	-	-	-	-	49	
Heat	Test Standard	Impact Test Sample Details	Temp $^{\circ}$ C	J	J	J	AVG	%	%	AVG	mm	mm	mm	AVG
BSM-1172	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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/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.

Mill Test Certificate approved by:

[Signature]
 2013 Aug 28

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