



Mill Test Certificate

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

Product Heat Number: **BSM-1102**

Product Size: **NPS 20 TRUE80**

Production Date: **July 23, 2013**

Production Method: **Hot Expansion**

Product Heat Treatment: **As-rolled**

Certificate No: **000287**

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-1102 (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	Geiger μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest	End Condition
BSM-1102	Heat	NPS 20 TRUE80 1.031 In.WT	1	DRL	208.90	<5	<20	Pass	Pass	Pass	Pass	Pass	*	Plain End

Chemical Analysis (wt%)																			
Heat	BSM-1102	Steelmaking Method Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Analysis		C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE	CE
			Heat	Product	0.19	0.87	0.013	0.002	0.32	0.04	0.04	0.04	0.03	0.02	0.003	0.002	0.001	0.0003	(lim)
					0.20	0.93	0.015	0.008	0.33	0.04	0.05	0.01	0.02	0.004	0.002	0.001	0.0001	0.37	0.38

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-1102	Heat	Ferrite & Pearlite	76	Pass	Longitudinal; 19.1mm x WT		45,500	70,000	0.65	49
Heat	Test Standard	Impact Test Sample Details	Temp $^{\circ}$ C	Impact Energy J		% Shear		Lateral Expansion mm		
BSM-1102	-	-	-	-		-		-		

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:

 2016 Feb 3
 Kerton Dechant, P. Eng.
 Manager of Quality and R&D

*Note that this product was hydrotested to 1000 psi for 5 seconds.