



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0591** Product Size: **NPS 20 TRUE80** Production Date: **December 7, 2012**

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 HEAT BSM-0591 (PIPE # LENGTH MASS) 208.9lb/ft NDE SMLS NACE MR0175 2012/12 MADE IN CANADA.**


Product Details				Non-Destructive Testing												
Heat	Test Type	NPS	Wall Thickness	Pieces	Length	Mass	Geiger	Res. Mag.	Visual	OD	UT	UT	ET	HydroTest	End Condition	
BSM-0591	Heat	20	TRUE80	7	DRL	208.90	µR/hr	Gauss	Insp.	Pass	Pass	ASTM E213	ASTM E309	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-0591	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.20	0.90	0.013	0.002	0.29	0.04	0.05	0.01	0.02	0.003	0.003	0.001	0.0003	-	-
		Product	0.21	0.95	0.013	0.004	0.32	0.03	0.06	0.01	0.02	0.003	0.003	0.001	0.0001	0.38	0.39

Mechanical Properties										
Heat	Test Type	Microstructure	Hardness	Tension Test		Yield (Rt0.5)	Yield (Rp0.2)	Tensile (Rm)	Y/T	Elongation (A)
				HRBW	Flattening Test					
BSM-0591	Heat	Ferrite & Pearlite	77	Pass	50mm GL	52,500	51,000	74,000	0.71	50
					Transverse; 38.1mm x WT	44,900	42,100	70,500	0.64	55
					Longitudinal; 38.1mm x WT					

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:

 2012 Dec 21
 Kenton Dechant, P.Eng.
 Manager of Quality and R&D