



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1209 Product Size: 20 SCH 60 Production Date: Sep 03, 2013
 Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 000041
 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: NPS 20 SCH 60 0.812 INCHWT SMLS 2013/09 NDE
 HEAT BSM-1209 (PIPE # LENGTH MASS) 166.4lb/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

Product: Details				Non-Destructive Testing											
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Gelger μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM	HydroTest	End Condition	
BSM-1209	Heat	NPS 20 SCH 60 0.812in. WT	11	DRL	166.4	< 5	< 20	Pass	Pass	Pass	Pass	Pass	*	Plain End	

Chemical Analysis (wt%)																	
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(CSA)
BSM-1209		Heat	0.19	0.87	0.010	0.010	0.24	0.05	0.01		0.04						-
		Product	0.22	0.89	0.015	0.014	0.25	0.05	0.01	0.01	0.01	0.04	0.002	0.002	0.001	0.0002	0.38

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 50mm GL	Yield (Rt0.5) psi	Tensile (Rm) psi	V/T (Rt0.5/Rm)	Elongation (A) %
BSM-1209	Heat	Ferrite & Pearlite	77 HRBW	Pass	Longitudinal: 38.1 mm x WT	49,600	73,500	0.67	49

Heat	Test Standard	Impact Test Sample Details	Temp $^{\circ}$ C	Impact Energy				Lateral Expansion									
				J	J	J	AVG	%	%	%	AVG	mm	mm	mm	AVG		
BSM-1209	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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 Grade B/C 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-2009 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 that this product was hydrotested to 1000 psi for 5 seconds.

Mill Test Certificate approved by:

Tonya Lam, C.E.T.