



# Mill Test Certificate

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

Product Heat Number: BSM-2109

Product Size: 20S60

Production Date: Oct 29, 2014

Production Method: Hot Expansion

Product Heat Treatment: As-rolled

Certificate No.: MTR- 001438

Product Standards:

ASME B36.10-2004, API 5L-45th Ed. Grade B PSL1, ASTM/ASME A/SA333-2013 Grade 6 LT(M45C) A106-2014/SA106-2013 Grade B/C NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009 MR0103-2012

Product Markings



<API & L/C No.> API SPEC SL NPS 20 SCH 60 0.812 INCHWT GR B PSL1 SMLS 2014/10 NDE 1900PSI  
HEAT BSM-2109 (PIPE # LENGTH MASS) 166.4lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) 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	Geiger μR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM	HydroTest 1900 PSI/ 5 s	End Condition
BSM-2109	Heat	NPS 20 SCH 60 0.812in. WT	7	DRL	166.4	<5	<10	Pass	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)
		Heat	0.15	1.07	0.012	0.007	0.24	0.03	0.02	0.02	0.01	0.052				-	-
			Product	0.19	1.11	0.010	0.006	0.27	0.04	0.02	0.01	0.01	0.049	0.003	0.001	0.0005	0.40
BSM-2109	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed																

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-2109	Heat	Ferrite & Pearlite	80 HRBW	Pass	Longitudinal; 38.1 mm x WT	48,400	71,500	0.68	53				

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy J			AVG	% Shear			AVG	Lateral Expansion mm			AVG
BSM-2109	ASTM A333	CVN Long 10 x 10 mm	-45	105.0	92.5	110.0	102.5	40	30	35	35	1.75	1.38	2.02	1.72

## Additional Details:

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-45th Ed., ASTM/ASME A/SA333-2013 Grade 6 LT(M45C) A106-2014/SA106-2013 Grade B/C A53-2012/SA53-2013, and the purchase order requirements, and that the results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO 9001:2008 and API Q1.

✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service-2009 NACE MR0103-2012 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:

*T. Lam*  
Tonya Lam, C.E.T.  
Assistant QA Manager  
Nov. 04. 2014

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