




# Mill Test Certificate

Bri-Steel Manufacturing  
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Product: Seamless Carbon Steel Pipe      Product Heat Number: BSM-2952      Product Size: NPS 24 STD      Production Date: Nov 15, 2016  
 Production Method: Hot Expansion      Product Heat Treatment: Normalizing Forming      Certificate No.: MTR- 003050

Product Standards: ASME B36.10M-2015, API 5L-45th Ed. GradeB PSL1, ASTM/ASME A333-2016/SA333-2015 Grade 6 LT(M45C) A106-2014/SA106-2015 Grade B/C NDE, A53-2012/SA53-2015 Grade B Type S, NACE MR0175/ISO 15156-2:2009 MR0103/ISO 17495:2015

Product Markings  
   
 <API & L/C No.> API SPEC 5L NPS 24 STD 0.375 INCHWT GRB PSL1 SMLS 2016/11 NDE 750PSI  
 HEAT BSM-2952 (PIPE # LENGTH MASS) 94.62lb/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 $\mu$ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT (WT)	UT	ET	HydroTest	End Condition						
BSM-2952	Heat	NPS 24 STD 0.375in. WT	6	DRL	94.62	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	30° Bevel						
Chemical Analysis (wt%)																				
BSM-2952	Steelmaking Method Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed (at TPCCO China)	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)		
			Heat	0.17	1.14	0.011	0.003	0.32	0.03	0.03	0.03	0.01	0.01	0.058	0.002	0.003	0.0005	0.38	-	0.38
			Product	0.18	1.13	0.011	0.006	0.33	0.03	0.02	0.02	0.01	0.01	0.061	0.002	0.001	0.0004	0.39	-	0.40
			0.17	1.13	0.012	0.004	0.34	0.02	0.02	0.01	0.01	0.062	0.002	0.001	0.0004	0.38	-	0.38		

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 2 in. GL	Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-2952	Heat	Ferrite & Pearlite	82 HRBW	Pass	Longitudinal: 1.5 in. x WT Longitudinal: 1.5 in. x WT	51 000	82 000	0.62	44
				Pass		52 000	78 500	0.66	46

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-2952	ASTM A333	Pass	CVN Long 10 x 7.5 mm	-48	(3 Tests) AVG (11/11/11) 14	(3 Tests) AVG (22/34/41) 32	(5/5/10) 7	(3 Tests) AVG (0.60/1.00/1.02) 0.87

Additional Details:

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with API 5L-45th Ed., ASTM/ASME A333-2016/SA333-2015, A106-2014/SA106-2015, A53-2012/SA53-2015, and the purchase order requirements, and that the results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO-9001:2008 (APIQR-1584), API Q1, and PED 2014/68/EU.

✓ 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/ISO 17495:2015 Section 13.1

✓ 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* Nov/22/2016

Tonya Lam, P. Tech (Eng.)  
 Assistant QA Manager