




# Mill Test Certificate

Bri-Steel Manufacturing  
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Product: Seamless Carbon Steel Pipe      Product Heat Number: BSM-2547      Product Size: NPS 20 XS      Production Date: Oct 06, 2015  
 Production Method: Hot Expansion      Product Heat Treatment: ThermoMechanical Formed      Certificate No.: MTR- 001969  
 Product Standards: ASME B36.10-2004, API 5L-45th Ed. GradeB/X42 PSL1, ASTM/ASME A/SAS333-2013 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 5L NPS 20 XS 0.500 INCHWT GRB/X42 PSL1 SM1S 2015/10 NDE 1890PSI  
 HEAT BSM-2547 (PIPE # LENGTH MASS) 104.1lb/ft ASTM/ASME A/SAS333 GR 6 LT(M45C) A/SA106 GR B/C A/SAS3 GR B NACE MR0175/MR0103 MADE IN CANADA


Product: Details				Non-Destructive Testing										
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Geiger	Res. Mag.	Visual Insp.	OD	UT	UT	ET	HydroTest	End Condition
BSM-2547	Heat	NPS 20 XS 0.500in. WT	4	DRL	104.1	<5	<20	Pass	Pass	Pass	Pass	Pass	Pass	31° Bevel

Heat	Steelmaking Method	Test Type	Chemical Analysis (wt%)															
			C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(CSA)	
			Heat	0.15	1.16	0.010	0.002	0.25	0.01	0.01	0.01	0.01	0.02	0.050	0.001	0.001	0.0001	0.36
BSM-2547	Blast Furnace; EAF; ladle Refining; Vacuum Degass; Fully Killed	Product	0.17	1.14	0.011	0.003	0.28	0.03	0.01	0.01	0.01	0.02	0.055	0.001	0.001	0.0002	0.38	0.38
			0.16	1.14	0.011	0.003	0.27	0.04	0.01	0.01	0.01	0.02	0.054	0.002	0.001	0.0002	0.37	0.37

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-2547	Heat	Ferrite & Pearlite	80 HRBW	Pass	Longitudinal; 1.5 in. x WT	53,000	77,000	0.69	44
				Pass	Longitudinal; 1.5 in. x WT	49,300	74,500	0.66	45

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy			% Shear			Lateral Expansion						
				J	J	J	%	%	%	AVG	mm	mm	mm	AVG		
BSM-2547	ASTM A333	CVN Long 10 x 10 mm	-45	114.0	130.0	110.0	118.0	40	40	40	40	40	1.93	2.10	1.88	1.97

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 A/SAS333-2013, A106-2014/SA106-2013, 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, and 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:  
  
 Tonya Lam, C.E.T.  
 Assistant QA Manager  
 Oct 10/08/2015