



# Mill Test Certificate

Bri-Steel Manufacturing  
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Product: Seamless Carbon Steel Pipe      Product Heat Number: BSM-3111      Product Size: NPS 20 STD      Production Date: Apr 13, 2017  
 Production Method: Hot Expansion      Product Heat Treatment: Normalizing Forming      Certificate No.: MTR- 003296  
 Product Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade BN/X42N PSL2, ASTM/ASME A106-2014/SA106-2015 Grade B/C NDE, AS3-2012/SA53-2015 Grade B Type S, NACE MR0175/ISO 15156-2:2009  
 Product Markings: <API & L/C No.> API SPEC 5L NPS 20 STD 0.375 INCHWT GR BN/X42N PSL2 SMLS 2017/04 NDE 1420PSI  
 HEAT BSM-3111 (PIPE # LENGTH MASS) 78.71lb/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175 MADE IN CANADA



Product: Details				Non-Destructive Testing														
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Gelger	Res. Mag. Gauss	Visual Insp.	OD	UT (WT)	UT	ET	HydroTest	End Condition				
BSM-3111	Heat	NPS 20 STD 0.375in. WT	9	DRL	78.71	<5	<40	Pass	Pass	ASTM E114	ASTM E213	ASTM E309	1420PSI/ 5s	Pass				
Chemical Analysis (wt%)																		
			C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-3111	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed (at TPCCO China)	Steelmaking Method	Heat	0.21	0.88	0.015	0.009	0.22	0.03	0.03	0.01	0.004	0.020	0.001	0.0004	0.37	-	0.38
			Product	0.21	0.89	0.017	0.006	0.23	0.02	0.03	0.03	0.01	0.003	0.036	0.001	0.0004	0.37	-
			0.20	0.87	0.019	0.004	0.24	0.02	0.03	0.00	0.01	0.006	0.027	0.001	0.0004	0.35	-	0.36

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test	Yield (Rt0.5)	Tensile (Rm)	Y/T	Elongation (A)
BSM-3111	Heat	Ferrite & Pearlite	78 HRBW	Pass	Longitudinal; 1.5 in. x WT	psi 45 600	psi 74 000	(Rt0.5/Rm) 0.62	% 40

Heat	Test	Result	Impact Test	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-3111	Standard	Pass	CVN Trans 10 x 7.5 mm	0	(15/15/15) 20	(3 Tests) AVG	(3 Tests) AVG	(3 Tests) AVG
						(38/33/43) 38	(30/20/20) 23	(0.41/0.33/0.50) 0.41

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., N ASTM/ASME A106-2014/SA106-2015, AS3-2012/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  
 ✓ 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:

*Tillem* APR 19 2017

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