



# Mill Test Certificate

Bri-Steel Manufacturing  
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Product: Seamless Carbon Steel Pipe      Product Heat Number: BSM-3211      Production Date: Jul 31, 2017  
 Production Method: Hot Expansion      Product Heat Treatment: Normalizing Forming      Certificate No.: MTR- 003426  
 Product Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade BN/X42N PSL2, 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 15156-2:2015 MR0103/ISO 17495:2015  
 Product Markings: <API & L/C No. > API SPEC 5L NPS 20 XS 0.500 INCHWT GR BN/X42N PSL2 SMLS 2017/07 NDE 1890PSI  
 HEAT BSM-3211 (PIPE # LENGTH MASS) 104.23lb/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	ET	HydroTest	End Condition					
BSM-3211	Heat	NPS 20 XS 0.500in. WT	13	DRL	104.23	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	35° 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(IIW)Max	CE(CSA)
			0.15	1.24	0.008	0.001	0.32	0.06	0.04	0.01	0.02	0.043	0.001	0.001	0.0001	0.38	-	0.37
Heat	Blast Furnace, EAF, Ladle Refining, Vacuum Degas, Fully Killed (at TPCCO China)	Heat	0.16	1.26	0.009	0.003	0.33	0.06	0.04	0.01	0.02	0.040	0.002	0.001	0.0004	0.40	0.43	0.39
		Product	0.16	1.26	0.009	0.003	0.33	0.06	0.04	0.01	0.02	0.040	0.002	0.001	0.0004	0.40	0.43	0.39

Heat	Test Type	Microstructure	Hardness	Mechanical Properties					
				Flattening Test	Tension Test 2 in. GL	Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-3211	Heat	Ferrite & Pearlite	79 HRBW	Pass	Longitudinal: 1.5 in. x WT Longitudinal: 1.5 in. x WT	46 200	75 000	0.62	49
				Pass		54 500	77 000	0.71	47

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)		Shear (%)	Lateral Expansion (mm)
					(3 Tests) AVG	(3 Tests) AVG		
BSM-3211	ASTM A333	Pass	CVN Long 8STR 10x10mm	-45	(14/14/14) 18	(114/154/143) 137	(30/50/40) 40	(1.75/2.20/1.88) 1.94
BSM-3211	API 5L PSL2	Pass	CVN Trans 8STR 10x10mm	0	(20/20/20) 27	(296/292/288) 292	(100/100/100) 100	(UNB/UNB/UNB) UNB

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 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 9001:2015 (APIQR-1584), API Q1, and PED 2014/68/EU.  
 ✓ This pipe product meets the **SOUR SERVICE** requirements of ANSI/NACE MR0175/ISO 15156-2A:2015 (Annex A2 for Region 3 Sour Service), and ANSI/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:  
  
 2017 Aug 3  
 Kenton Dechant, P.Eng.  
 Manager of Quality and R&D