




# Mill Test Certificate

Bri-Steel Manufacturing  
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Product: Seamless Carbon Steel Pipe    Product Heat Number: BSM-3224    Product Size: NPS 20 STD    Production Date: Aug 21, 2017  
 Production Method: Hot Expansion    Product Heat Treatment: Normalizing Forming    Certificate No.: MTR- 003483  
 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 STD 0.375 INCHWT GR BN/X42N PSL2 SMLS 2017/08 NDE 1420PSI  
 HEAT BSM-3224 (PIPE # LENGTH MASS) 78.71lb/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) ASTM E114	UT ASTM E213	ET ASTM E309	HydroTest 1420PSI/ 5s	End Condition
BSM-3224	Heat	NPS 20 STD 0.375in. WT	1	DRL	78.71	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	35° Bevel

Chemical Analysis (wt%)																			
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	Mn/C	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-3224	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed (at TPCO China)	Heat	0.16	1.28	0.009	0.009	0.31	0.04	0.04	0.01	0.01	0.044	0.003	0.002	0.0004	8.00	0.40	-	0.39
		Product	0.18	1.29	0.010	0.010	0.32	0.04	0.04	0.01	0.01	0.045	0.002	0.001	0.0004	7.17	0.42	0.43	0.42
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.43	-

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-3224	Heat	Ferrite & Pearlite	84 HRBW	Pass	Longitudinal; 1.5 in. x WT	56 500	77 500	0.73	38

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
					(3 Tests) AVG	(3 Tests) AVG	(3 Tests) AVG	(3 Tests) AVG
BSM-3224	ASTM A333	Pass	CVN Long 8STR 10x7.5mm	-48	(11/11/11) 14	(86/60/89) 78	(50/30/50) 43	(1.69/1.14/1.71) 1.51
BSM-3224	API 5L PSL2	Pass	CVN Trans 8STR 10x7.5mm	0	(15/15/15) 20	(88/79/74) 80	(50/40/40) 43	(1.74/1.61/1.71) 1.69

**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.

Mill Test Certificate approved by:

✓ 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

*T. Lam* AUG/24/2017

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

- ✓ 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.