



Mill Test Certificate

Bri-Steel Manufacturing
 2125-64 Avenue, Edmonton, AB Canada T6P 1Z4
 Tel: 001 (780) 469-6603
 Fax: 001 (780) 469-6986
 www.bri-steel.com

Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3210 Product Size: NPS 20 XS Production Date: Jul 26, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003425
 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-3210 (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	Res. Mag. Gauss	Visual Insp.	OD	UT (WT)	UT	ET	HydroTest	End Condition	
BSM-3210	Heat	NPS 20 XS 0.500in. WT	12	DRL	104.23	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	35° Bevel	

Heat	Steelmaking Method	Test Type	Chemical Analysis (wt%)															
			C	Min	P	S	SI	Cr	Cu	Mo	Ni	V	TI	Nb	B	CE(I/W)	CE(I/W)Max	CE(CSA)
			Heat	0.15	1.24	0.008	0.001	0.32	0.06	0.04	0.01	0.02	0.043	0.001	0.0001	0.38	-	0.37
BSM-3210	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed (at TRCO China)	Heat	0.16	1.25	0.010	0.003	0.32	0.06 <td>0.04</td> <td>0.01</td> <td>0.02</td> <td>0.039</td> <td>0.002</td> <td>0.001 <td>0.0004</td> <td>0.39</td> <td>0.43</td> <td>0.39</td> </td>	0.04	0.01	0.02	0.039	0.002	0.001 <td>0.0004</td> <td>0.39</td> <td>0.43</td> <td>0.39</td>	0.0004	0.39	0.43	0.39
		Product	0.16	1.25	0.009	0.003	0.33	0.06 <td>0.04</td> <td>0.01</td> <td>0.02</td> <td>0.039</td> <td>0.002</td> <td>0.001 <td>0.0004</td> <td>0.39</td> <td>0.43</td> <td>0.39</td> </td>	0.04	0.01	0.02	0.039	0.002	0.001 <td>0.0004</td> <td>0.39</td> <td>0.43</td> <td>0.39</td>	0.0004	0.39	0.43	0.39

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test	Yield (R10.5) psi	Tensile (Rm) psi	V/T (R10.5/Rm)	Elongation (A) %
BSM-3210	Heat	Ferrite & Pearlite	78 HRBW	Pass	Longitudinal; 1.5 in. x WT Longitudinal; 1.5 in. x WT	46 800	74 000	0.63	47
				Pass		50 500	76 500	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)
					(3 Tests) AVG	(14/14/14) 18	(3 Tests) AVG	(132/159/102) 131		
BSM-3210	ASTM A333	Pass	CVN Long 85TR 10x10mm	-45	(14/14/14) 18	(132/159/102) 131	(40/40/20) 33	(2.01/2.10/1.22) 1.78		
BSM-3210	API 5L PSL2	Pass	CVN Trans 85TR 10x10mm	0	(20/20/20) 27	(158/128/144) 143	(60/40/50) 50	(2.42/1.67/2.12) 2.07		

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