



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2219 Product Size: 18STD Production Date: Jan 14, 2015
Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 001541
Product Standards: ASME B36.10-2004, API 5L-45th Ed. Grade B/X42/X46 PSL1, ASTM/ASME A/SA333-2013 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 18 STD 0.375 INCHWT GR B/X42/X46 PSL1 SM15 2015/01 NDE 1850PSI
HEAT BSM-2219 (PIPE # LENGTH MASS) 70.59lb/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 μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM	HydroTest 1850 PSI/ 5 s	End Condition
BSM-2219	Heat	NPS 18 STD 0.375in. WT	26	DRL	70.59	<5	<10	Pass	Pass	Pass	Pass	Pass	Pass	32.5° Bevel

Chemical Analysis (wt%)														
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb
			0.18	1.14	0.017	0.004	0.24	0.12	0.03	0.01	0.02	0.053		
			Heat	Product	0.18	1.23	0.018	0.004	0.23	0.03	0.02	0.01	0.01	0.064
BSM-2219	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed													

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 50mm GL	Yield (Rt0.5) psi	Tensile (Rm) psi	V/T (Rt0.5/Rm)	Elongation (A) %
BSM-2219	Heat	Ferrite & Pearlite	82 HRBW	Pass	Longitudinal; 38.1 mm x WT	51,500	71,500	0.72	44

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy				% Shear				Lateral Expansion			
				J	J	J	AVG	%	%	%	AVG	mm	mm	mm	AVG
BSM-2219	ASTM A333	CVN Long 10 x 7.5 mm	-48	123.5	94.5	124.0	114.0	90	80	95	88	2.58	2.32	2.48	2.46

Additional Details:

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-45th Ed., ASTM/ASME A/SA333-2013 Grade 6 LT(M45C) A106-2014/SA106-2013 Grade B/C 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-2009 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.

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Mill Test Certificate approved by:

Tonya Lam, C.E.T.
Assistant QA Manager

T. Lam Jan 15. 2015