Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2406 Product Size: 18STD Production Date: May 25, 2015

Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 001796

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 70.59LB/FT GR B/X42/X46 PSL1 SMLS 2015/05 NDE 1640PSI HEAT BSM-2406 (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 µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 1640 PSI/ 5 s	End Condition
BSM-2406	Heat	NPS 18 STD 0.375in. WT	20	DRL	70.59	<5	<20	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	B	CE(IIW)	CE(CSA)
BSM-2406	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.16	1.20	0.011	0.002	0.26	0.03	0.02	0.01	0.01	0.048	-	-	-	-	-
		Product	0.19	1.20	0.012	0.003	0.28	0.03	0.02	0.01	0.01	0.051	0.002	0.001	0.0004	0.41	0.41
			0.19	1.21	0.012	0.003	0.28	0.03	0.02	0.01	0.01	0.051	0.002	0.001	0.0005	0.41	0.41

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-2406	Heat	Ferrite & Pearlite	78 HRBW	Pass	Longitudinal; 1.5 in. x WT	49,100	72,500	0.68	44
				Pass	Longitudinal; 1.5 in. x WT	50,500	73,500	0.69	42

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy				% Shear				Lateral Expansion			
				J	J	J	AVG	%	%	%	AVG	mm	mm	mm	AVG
BSM-2406	ASTM A333	CVN Long 10 x 7.5 mm	-48	110.0	112.0	116.0	112.7	70	70	75	72	2.01	1.84	2.06	1.97

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., 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.

Mill Test Certificate approved by:

T. Lam May 27/2015

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