Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3103 Product Size: NPS 24 TRUE 40 Production Date: Apr 11, 2017

Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003286

Product Standards: ASME B36.10M-2015, API 5L-45th Ed. GradeB/X42 PSL1, 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 15156-2:2009 MR0103/ISO 17495:2015

Product Markings: <API & L/C No.> API SPEC 5L NPS 24 TRUE 40 0.688 INCHWT GRB/X42 PSL1 SMLS 2017/04 NDE 2170PSI HEAT BSM-3103 (PIPE # LENGTH MASS) 171.5lb/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) ASTM E114	UT ASTM E213	ET ASTM E309	HydroTest 2170PSI/ 5 s	End Condition
BSM-3103	Heat	NPS 24 TRUE 40 0.688in. WT	6	DRL	171.5	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	Plain End

Chemical Analysis (wt%)

Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-3103	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed (at TPCO China)	Heat	0.17	1.11	0.012	0.002	0.32	0.05	0.01	0.01	0.01	0.054	0.002	0.001	0.0004	0.38	-	0.38
		Product	0.16	1.10	0.011	0.003	0.32	0.05	0.01	0.00	0.01	0.057	0.004	0.001	0.0003	0.37	-	0.36
			0.17	1.11	0.011	0.003	0.33	0.06	0.01	0.00	0.01	0.057	0.002	0.001	0.0004	0.38	-	0.38

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-3103	Heat	Ferrite & Pearlite	80 HRBW	Pass	Longitudinal; 1.5 in. x WT	47 700	76 000	0.63	51
				Pass	Longitudinal; 1.5 in. x WT	50 000	76 500	0.65	50

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J) (3 Tests) AVG	Impact Energy Results (J) (3 Tests) AVG	Shear (%) (3 Tests) AVG	Lateral Expansion (mm) (3 Tests) AVG
BSM-3103	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(14/14/14) 18	(31/82/78) 64	(5/15/15) 12	(0.48/1.28/1.07) 0.94

Additional Details:

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with GRX42 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-9001:2008 (APIQR-1584), API Q1, and PED 2014/68/EU.

✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and 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:

T. Lam APR/17/2017

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