




Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3101 Product Size: NPS 24 TRUE 40 Production Date: Apr 06, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003282

Product Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade B/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 INCH WT GRB/X42 PSL1 SMLS 2017/04 NDE 2190PSI
 HEAT BSM-3101 (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	Gelger	Res. Mag. Gauss	Visual Insp.	OD	UT (WT)	UT	ET	HydroTest	End Condition	
BSM-3101	Heat	NPS 24 TRUE 40 0.688in. WT	4	DRL	171.5	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	Plain End	

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)												
																			Chemical Analysis (wt%)											
																			Heat	Product	0.17	1.10	0.017	0.003	0.31	0.04	0.02	0.01	0.01	0.058
BSM-3101	Blast Furnace; EAF; ladle Refining; Vacuum Degas; Fully Killed (at TPCCO China)	Product	0.17	1.08	0.015	0.005	0.32	0.05	0.01	0.00	0.01	0.059	0.004	0.001	0.0004	0.37	-	0.38												
		Product	0.17	1.09	0.012	0.005	0.33	0.03	0.02	0.00	0.01	0.059	0.002	0.001	0.0004	0.37	-	0.38												

Mechanical Properties											
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test		Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %	
					2 in. GL	1.5 in. x WT					
BSM-3101	Heat	Ferrite & Pearlite	81 HRBW	Pass	Longitudinal: 1.5 in. x WT	Longitudinal: 1.5 in. x WT	47 800	76 500	0.62	50	
				Pass	Longitudinal: 1.5 in. x WT	Longitudinal: 1.5 in. x WT	47 400	73 500	0.64	51	

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			
BSM-3101	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(3 Tests) AVG	(14/14/14) 18	(3 Tests) AVG	(3 Tests) AVG	(3 Tests) AVG
							(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