



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe

Product Heat Number: BSM-2351

Product Size: NPS 24 TRUE 80

Production Date: Apr 14, 2015

Production Method: Hot Expansion

Product Heat Treatment: ThermoMechanical Formed

Certificate No.: MTR- 001856

Product Standards: ASME B36.10-2004, API 5L-45th Ed. Grade BM/X42M/X46M/X52M/X56M/X60M/X65M PSL2, NACE MR0175-2009 MR0103-2012

Product Markings



<API & L/C No.> API SPEC 5L NPS 24 TRUE 80 1.219 INCHWT GR BM/X42M/X46M/X52M/X56M/X60M/X65M PSL2 SMLS 2015/04 NDE 2970PSI
HEAT BSM-2351 (PIPE # LENGTH MASS) 296.4lb/ft NACE MR0175/MR0103 MADE IN CANADA

Product: Details					Non-Destructive Testing									
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Geiger $\mu R/hr$	Res. Mag. Gauss	Visual Insp.	OD	UT	UT	ET	HydroTest	End Condition
BSM-2351	Heat	NPS 24 TRUE 80 1.219in. WT	6	DRL	296.4	<5	<10	Pass	Pass	Pass	Pass	Pass	Pass	Plain End

Steelmaking Method		Chemical Analysis (wt%)													
Heat	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)
BSM-2351	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.25	1.32	0.015	0.002	0.48	0.07	0.08	0.01	0.02	0.119	0.006	0.001	0.52
		Product	0.27	1.31	0.013	0.006	0.52	0.05	0.05	0.01	0.02	0.123	0.009	0.001	0.53
			0.26	1.32	0.013	0.005	0.51	0.05	0.05	0.01	0.02	0.121	0.008	0.001	0.54

Mechanical Properties					Tension Test					Yield (Rt0.5)					Tensile (Rm)					V/T					Elongation (A)				
Heat	Test Type	Microstructure	Hardness	Flattening Test	2 in. GI	0.5 in. Round Bar				psi					psi					(Rt0.5/Rm)					%				
BSM-2351	Heat	Ferrite & Pearlite	79 HRBW	Pass	Longitudinal; 0.5 in. Round Bar					68,000					93,500					0.73					32				

Heat	Test	Standard	Impact Test Sample Details	Temp $^{\circ}C$	Impact Energy					% Shear					Lateral Expansion				
					J	J	J	AVG	%	%	%	%	AVG	mm	mm	mm	mm	mm	AVG
BSM-2351		API 5L PSL2	CVN Trans 10 x 10 mm	0	108.0	120.5	143.0	123.8	45	55	60	53		0.95	unbroken	unbroken	unbroken	unbroken	0.95

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. M 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.

Mill Test Certificate approved by:

✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and NACE MR0103-2012 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.

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

Tonya Lam *July 12/2015*