



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3091 Production Date: Mar 20, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003265
 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
 Product Markings: <API & L/C No.> API SPEC 5L NPS 24 TRUE 80 1.219 INCHWT GRB/X42 PSL1 SMLS 2017/03 NDE 2970PSI
 HEAT BSM-3091 (PIPE # LENGTH MASS) 296.84lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) A/SA106 GR B/C A/SA53 GR B NACE MR0175 MADE IN CANADA



Product: Details				Non-Destructive Testing											
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Gelger μR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT (WT)	UT	ET	HydroTest	End Condition	
BSM-3091	Heat	NPS 24 TRUE 80 1.219in. WT	3	DRL	296.84	<5	<10	Pass	Pass	ASTM E114	ASTM E213	ASTM E309	2970PSI/ 5s	Plain End	

Heat	Steelmaking Method	Test Type	Chemical Analysis (wt%)																		
			C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)			
			BSM-3091	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed (at TPCCO China)	Heat	0.16	1.16	0.014	0.002	0.25	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.056	0.002	0.001	0.0001
		Product	0.15	1.12	0.016	0.004	0.26	0.04	0.01	0.01	0.01	0.02	0.056	0.001	0.001	0.0002	0.001	0.0002	0.36	-	0.35
			0.16	1.20	0.012	0.003	0.27	0.05	0.01	0.01	0.01	0.02	0.056	0.002	0.001	0.0002	0.001	0.0002	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-3091	Heat	Ferrite & Pearlite	78 HRBW	Pass	Longitudinal; 0.5 in. Round Bar	51 000	75 500	0.68	36
				Pass	Longitudinal; 0.5 in. Round Bar	51 500	75 000	0.69	37

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Results (J)		Shear (%)	Lateral Expansion (mm)
					Impact Energy Min. (J)	Impact Energy Results (J)		
BSM-3091	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(14/14/14) 18	(3 Tests) AVG (58/63/66) 62	(3 Tests) AVG (5/5/5) 5	(3 Tests) AVG (0.92/1.01/1.07) 1.00

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

Mill Test Certificate approved by:

T. Lam APR 10 / 2017

- ✓ 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, P. Tech (Eng.)
 Assistant QA Manager