



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1658 Product Size: NPS 16 XS Production Date: Feb 24, 2014
Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 002913
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 16 XS 0.500 INCHWT GRB/X42 PSL1 SMLS 2014/02 NDE 2240PSI
HEAT BSM-1658 (PIPE # LENGTH MASS) 82.77lb/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 µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 2240PSI/ 5s	End Condition
BSM-1658	Heat	NPS 16 XS 0.500in. WT	13	DRL	82.77	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	33° Bevel
Chemical Analysis (wt%)														
BSM-1658	Steelmaking Method Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed (at TPCCO China)	Test Type												
			C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb
			Heat	0.20	0.92	0.012	0.003	0.25	0.06	0.07	0.01	0.04	-	-
		Product	0.22	0.92	0.010	0.003	0.26	0.06	0.08	0.01	0.04	0.003	0.001	0.001
			0.21	0.92	0.010	0.003	0.26	0.06	0.08	0.01	0.04	0.003	0.001	0.001

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-1658	Heat	Ferrite & Pearlite	78 HRBW	Pass	Longitudinal; 1.5 in. x WT	46 200	75 000	0.62	43
				Pass	Longitudinal; 1.5 in. x WT	49 000	76 000	0.64	45

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-1658	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(3 Tests) AVG (14/14/14) 18	(3 Tests) AVG (26/24/15) 22	(5/5/0) 3	(0.44/0.35/0.30) 0.36

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 97/23/EC.
- ✓ 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:

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

T. Lam *July 12/2016*