



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1491 Product Size: NPS 16 XS
 Production Method: Hot Expansion Product Heat Treatment: As Rolled Certificate No.: MTR- 002789
 Production Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade B PSL1, ASTM/ASME A333-2015/SA333-2013 Grade 6 LT(M45C) A106-2014/SA106-2013 Grade B/C NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009 MR0103-2012
 Production Date: Dec 19, 2013
 Product Markings: <API & L/C No.> API SPEC 5L NPS 16 XS 0.500 INCHWT GRB PSL1 SMLS 2013/12 NDE 1500PSI
 HEAT BSM-1491 (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	Geiger µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 1500 PSI/ 5 s	End Condition
BSM-1491	Heat	NPS 16 XS 0.500in. WT	20	DRL	82.77	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	34° Bevel

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)
			0.19	0.94	0.012	0.008	0.25	0.06	0.08	0.01	0.07	-	-	0.0005	0.37	-	0.38	
BSM-1491	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed (at TPCO China)	Heat	0.18	0.92	0.010	0.008	0.25	0.06	0.09	0.01	0.06	0.003	0.001	0.001	0.0003	0.36	-	0.36
		Product	0.18	0.92	0.010	0.008	0.25	0.06	0.09	0.01	0.06	0.003	0.001	0.001	0.0003	0.36	-	0.36

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 2 in. GL	Yield (Rt0.5) psi	Tensile (Rm) psi	V/T (Rt0.5/Rm)	Elongation (A) %
BSM-1491	Heat	Ferrite & Pearlite	74 HRBW	Pass	Longitudinal; 1.5 in. x WT	58 000	74 500	0.78	44
				Pass	Longitudinal; 1.5 in. x WT	58 000	74 500	0.78	44

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy (J)	Shear (%)	Lateral Expansion (mm)
BSM-1491	ASTM A333	CVN long 10 x 10 mm	-45	(14/14/14) 18	(3 Tests) AVG (20/21/22) 21	(3 Tests) AVG (0/0/0) 0	(3 Tests) AVG (0.39/0.44/0.44) 0.42

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, ASTM/ASME A333-2015/SA333-2013, A106-2014/SA106-2013, A53-2012/SA53-2013, 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/SO 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.

Mill Test Certificate approved by:

 Tonya Lam, P. Tech (Eng.)
 Assistant QA Manager
 APR 26 / 2016