



# Mill Test Certificate

Bri-Steel Manufacturing  
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Product: Seamless Carbon Steel Pipe      Product Heat Number: BSM-1493      Product Size: NPS 16 XS  
 Production Method: Hot Expansion      Product Heat Treatment: As Rolled      Certificate No.: MTR- 002787  
 Production Standards: ASME B36.10M-2015, API 5L-45th Ed. GradeB 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 5, 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-1493 (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	Res. Mag.	Visual Insp.	OD	UT WT	UT	ET	HydroTest	End Condition
BSM-1493	Heat	NPS 16 XS 0.500in. WT	18	DRL	82.77	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	33° Bevel

Heat	Steelmaking Method	Test Type	Chemical Analysis (wt%)												
			C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B
			Heat	Product	0.20	0.92	0.009	0.013	0.23	0.06	0.09	0.01	0.07	-	-
BSM-1493	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed (at PFCO China)	Heat	0.20	0.92	0.009	0.013	0.23	0.06	0.09	0.01	0.07	-	-	0.0003	0.38
		Product	0.20	0.92	0.012	0.009	0.25	0.06	0.09	0.01	0.06	0.002	0.002	0.0003	0.37
			0.20	0.92	0.012	0.009	0.25	0.06	0.09	0.01	0.06	0.002	0.002	0.0003	0.37

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test	Yield (Rt0.5)	Tensile (Rm)	V/T	Elongation (A)
BSM-1493	Heat	Ferrite & Pearlite	77 HRBW	Pass	Longitudinal; 1.5 in. x WT Longitudinal; 1.5 in. x WT	45 700 45 700	74 500 74 500	(Rt0.5/Rm) 0.61	42 42

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy (J)	Shear (%)	Lateral Expansion (mm)
BSM-1493	ASTM A333	CVN Long 10 x 10 mm	-45	(3 Tests) AVG (14/14/14) 18	(3 Tests) AVG (31/20/27) 26	(3 Tests) AVG (0/0/0) 0	(3 Tests) AVG (0.55/0.42/0.50) 0.49

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/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.

Mill Test Certificate approved by:

*T. Lam* APR/26/2016

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