



# Mill Test Certificate

Bri-Steel Manufacturing  
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Product: Seamless Carbon Steel Pipe    Product Heat Number: BSM-2844    Product Size: NPS 16 SCH 160    Production Date: Jul 18, 2016  
 Production Method: Hot Expansion    Product Heat Treatment: Normalizing Forming    Certificate No.: MTR- 002931

Product Standards: ASME B36.10M-2015, ASTM/ASME A333-2016/SA333-2015 Grade 6 LT(M45C) A106-2014/SA106-2015 Grade B NDE, A53-2012/SA53-2015 Grade B Type S, NACE MR0175/ISO 15156-2:2009 MR0103/ISO 17495:2015

Product Markings: NPS 16 SCH 160 1.594 INCHWT SMLS 2016/07 NDE 2800PSI  
 HEAT BSM-2844 (PIPE # LENGTH MASS) 245.1lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) A/SA106 GR B 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) ASTM E114	UT ASTM E213	ET ASTM E309	Hydro Test 2800PSI/ 5s	End Condition
BSM-2844	Heat	NPS 16 SCH 160 1.594in. WT	9	DRL	245.1	<5	<20	Pass	Pass	N12.5	Pass	-	Pass	32° Bevel

Chemical Analysis (wt%)																		
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-2844	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.15	1.14	0.008	0.002	0.24	0.07	0.08	0.01	0.06	0.050	0.001	0.001	0.0005	0.38	-	0.36
		Product	0.13	1.02	0.010	0.004	0.27	0.04	0.07	0.01	0.04	0.035	0.001	0.001	0.0001	0.32	-	0.29
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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-2844	Heat	Ferrite & Pearlite	83 HRBW	Pass	Longitudinal; 0.5 in. Round Bar	47 100	74 000	0.64	35
				Pass	Longitudinal; 0.5 in. Round Bar	46 300	74 000	0.63	36

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J) (3 Tests) AVG	Shear (%) (3 Tests) AVG	Lateral Expansion (mm) (3 Tests) AVG
BSM-2844	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(14/14/14) 18	(5/5/5) 5	(0.23/0.24/0.27) 0.25
			Impact Energy Results (J) (3 Tests) AVG		(18/22/18) 19		

Additional Details:  
 ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with 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, 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