



# Mill Test Certificate

Bri-Steel Manufacturing  
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Product: Seamless Carbon Steel Pipe    Product Heat Number: BSM-2847    Product Size: NPS 16 TRUE 80    Production Date: Jul 21, 2016  
 Production Method: Hot Expansion    Product Heat Treatment: Normalizing Forming    Certificate No.: MTR- 002917

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 TRUE 80 0.844 INCHWT SMLS 2016/07 NDE 2200PSI



HEAT BSM-2847 (PIPE # LENGTH MASS) 136.5lb/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	Length	Pieces	Mass lb/ft	Geiger $\mu$ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT Pass	ET ASTM E309	HydroTest 2200PSI/ 5s	End Condition
BSM-2847	Heat	NPS 16 TRUE 80 0.844in. WT	DRL	21	136.5	<5	<20	Pass	Pass	N12.5	Pass	-	Pass	Plain End

### 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-2847	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.18	1.14	0.016	0.006	0.32	0.07	0.04	0.01	0.01	0.059	0.004	0.001	0.0005	0.40	-	0.41
		Product	0.17	1.15	0.016	0.005	0.35	0.07	0.04	0.01	0.01	0.062	0.003	0.003	0.001	0.0003	0.39	-
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

### 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-2847	Heat	Ferrite & Pearlite	82 HRBW	Pass	Longitudinal; 0.5 in. Round Bar	52 500	79 500	0.66	35
				Pass	Longitudinal; 0.5 in. Round Bar	53 500	78 500	0.68	37

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J) (3 Tests) AVG	Impact Energy Results (J) (3 Tests) AVG	Shear (%) (3 Tests) AVG	Lateral Expansion (mm) (3 Tests) AVG
BSM-2847	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(14/14/14) 18	(54/55/76) 62	(10/10/20) 13	(0.87/0.82/1.20) 0.96

### Additional Details:

Mill Test Certificate approved by:

✓ 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 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.

*T. Lam* *July 28/2016*

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 Assistant QA Manager