



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2848 Product Size: NPS 16 TRUE 80 Production Date: Jul 25, 2016
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 002922

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-2848 (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



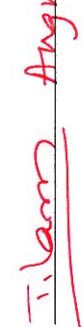
Product: Details		Non-Destructive Testing												
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Geiger µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT Pass	ET ASTM E309	HydroTest 2200PSI/ 5 s	End Condition
BSM-2848	Heat	NPS 16 TRUE 80 0.844in. WT	8	DRL	136.5	<5	<20	Pass	Pass	N12.5	Pass	-	Pass	Plain End

Chemical Analysis (wt%)																	
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-2848	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	0.18	1.06	0.018	0.004	0.36	0.06	0.03	0.01	0.01	0.062	0.002	0.001	0.0004	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-2848	Heat	Ferrite & Pearlite	83 HRBW	Pass	Longitudinal; 0.5 in. Round Bar	52 500	78 500	0.67	36
				Pass	Longitudinal; 0.5 in. Round Bar	53 500	77 000	0.69	36

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 (%) (20/15/30) 22	Lateral Expansion (mm) (3 Tests) AVG
BSM-2848	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(14/14/14) 18	(78/69/82) 76	(20/15/30) 22	(1.15/0.94/1.36) 1.15

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 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