



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2909 Product Size: NPS 20 STD Production Date: Oct 05, 2016
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 002995
 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 15156-2-2:2009 MR0103/ISO 17495:2015
 Product Markings: NPS 20 STD 0.375 INCHWT SMLS 2016/10 NDE 800PSI
 HEAT BSM-2909 (PIPE # LENGTH MASS) 78.6lb/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	Gelger μR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT (WT)	UT	ET	HydroTest	End Condition					
BSM-2909	Heat	NPS 20 STD 0.375in. WT	4	DRL	78.6	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	30° Bevel					
Chemical Analysis (wt%)																			
BSM-2909	Steelmaking Method Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)	
																			Heat
		Product	0.18	1.10	0.015	0.006	0.33	0.05	0.02	0.01	0.01	0.058	0.003	0.001	0.0004	0.39	-	-	0.40

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test	Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-2909	Heat	Ferrite & Pearlite	82 HRBW	Pass	Longitudinal: 1.5 in. x WT Longitudinal: 1.5 in. x WT	55 500	78 000	0.71	42
				Pass		54 500	80 000	0.68	40

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-2909	ASTM A333	Pass	CVN Long 10 x 7.5 mm	-48	(11/11/11) 14	(3 Tests) AVG (22/41/64) 42	(3 Tests) AVG (10/20/25) 18	(3 Tests) AVG (0.44/0.82/1.34) 0.87

- 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:

IL 10/06/2016

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