



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2842 Production Date: Jul 18, 2016
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 002909
 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 20 TRUE 80 1.031 INCHWT SM1S 2016/07 NDE 2200PSI
 HEAT BSM-2842 (PIPE # LENGTH MASS) 208.9lb/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 μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 2200PSI/ 5 s	End Condition					
BSM-2842	Heat	NPS 20 TRUE 80 1.031in. WT	3	DRL	208.9	<5	<20	Pass	Pass	Pass	N12.5 Pass	-	Pass	Plain End					

Heat	BSM-2842	/	Chemical Analysis (wt%)																		
			Test Type		C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)	
			Heat	Product	0.16	0.91	0.011	0.001	0.23	0.05	0.14	0.03	0.09	0.002	-	-	-	0.34	-	0.34	
						0.16	0.89	0.009	0.002	0.24	0.06	0.13	0.03	0.08	0.002	0.001	0.001	0.0001	0.34	-	0.33

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-2842	Heat	Ferrite & Pearlite	75 HRBW	Pass	Longitudinal; 0.5 in. Round Bar	45 200	69 000	0.66	35
				Pass	Longitudinal; 0.5 in. Round Bar	43 200	71 500	0.60	36

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-2842	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(14/14/14) 18	(3 Tests) AVG (24/48/20) 31	(5/5/5) 5	(3 Tests) AVG (0.46/0.63/0.51) 0.53

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:

Tony Lam July 21/2016

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