



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2772 Production Date: May 18, 2016
 Production Method: Hot Expansion Product Heat Treatment: As Rolled Certificate No.: MTR- 002834
 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 XS 0.500 INCHWT SMLS 2016/05 NDE
 HEAT BSM-2772 (PIPE # LENGTH MASS) 104.1lb/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	Gelger µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest	End Condition	
BSM-2772	Heat	NPS 20 XS 0.500in. WT	17	DRL	104.1	<5	<20	Pass	Pass	Pass	Pass	N12.5 Pass	-	-	30° Bevel

Heat	BSM-2772	Steelmaking Method Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	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	0.17	0.15	1.13	1.12	0.009	0.013	0.003	0.004	0.24	0.26	0.13	0.09	0.01	0.01	0.01	0.01	0.01	0.01	0.050	0.059	0.001	0.001	0.001	0.001	0.0003	0.40	0.37	-	-	0.39	0.36	

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-2772	Heat	Ferrite & Pearlite	86 HRBW	Pass	Longitudinal; 1.5 in. x WT Longitudinal; 1.5 in. x WT	55 500	82 000	0.68	42
				Pass		55 500	81 500	0.68	42

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy Min. (J) (3 Tests) AVG	Impact Energy (J) (3 Tests) AVG	Shear (%) (5/5/5) 5	Lateral Expansion (mm) (3 Tests) AVG
BSM-2772	ASTM A333	CVN Long 10 x 10 mm	-45	(14/14/14) 18	(32/26/18) 25	(5/5/5) 5	(0.39/0.31/0.22) 0.31

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:

Kenton Dechant
 2016 May 24

Kenton Dechant, P. Eng.
 Manager of Quality and R&D