



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2776 Product Size: NPS 22 XS
 Production Method: Hot Expansion Product Heat Treatment: As Rolled Certificate No.: MTR- 002838 Production Date: May 25, 2016

Product Standards: ASME B36.10M-2015, CSA Z245.1-2007 Grade 241/290/359 CAT 1, ASTM/ASME A333-2016/SA333-2015 Grade 6 LT(M45C) A106-2014/SA106-2015 Grade B/C NDE, A53-2012/SA53-2015 Grade B Type S, NACE MR0175/ISO 15156-2:2009 MR0103/ISO 17495:2015

Product Markings: NPS 22 XS 0.500 INCHWT SM1S 2016/05 NDE 2140PSI
 HEAT BSM-2776 (PIPE # LENGTH MASS) 114.8lb/ft CSA Z245.1 GR 241/290/359 CAT 1 ASTM/ASME A/SA333 GR 6 LT(M45C) A/SA106 GR B/C 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 HR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 2140PSI/ 10 s	End Condition
BSM-2776	Heat	NPS 22 XS 0.500in. WT	8	DRL	114.8	<5	<20	Pass	Pass	Pass	N12.5 Pass	-	Pass	30° Bevel

Heat	BSM-2776	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(IIIW)/Max		CE(CSA)	
			Heat	Product	0.17	0.15	1.13	1.10	0.009	0.010	0.003	0.004	0.24	0.25	0.13	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.050	0.001	0.001	0.001	0.0001	0.40	0.39	0.36	0.34					
			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 2 in. GI	Yield (Rt0.5) psi	Tensile (Rm) psi	V/T (Rt0.5/Rm)	Elongation (A) %
BSM-2776	Heat	Ferrite & Pearlite	82 HRBW	Pass	Longitudinal: 1.5 in. x WT Longitudinal: 1.5 in. x WT	52 500	79 000	0.66	40
				Pass		53 000	80 500	0.66	41

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy (J)	Shear (%)	Lateral Expansion (mm)
BSM-2776	ASTM A333	CVN Long 10 x 10 mm	-45	(14/14/14) 18	(3 Tests) AVG (42/14/66) 41	(5/0/0) 2	(3 Tests) AVG (0.72/0.12/1.02) 0.62

Additional Details:

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with CSA Z245.1-2007 Grade 241/290/359 CAT 1, 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:

Tanya Lam May 13th / 2016

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