



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2822 Product Size: NPS 24 TRUE 40 Production Date: Jun 29, 2016
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 002889
 Product Standards: ASME B36.10M-2015, ASTM/ASME A333-2016/SA333-2015 Grade 6 LT(M45C) NDE, A53-2012/SA53-2015 Grade B Type S, NACE MR0175/ISO 15156-2:2009 MR0103/ISO 17495:2015

Product Markings: NPS 24 TRUE 40 0.688 INCHWTS SMLS 2016/06 NDE 1200PSI
 HEAT BSM-2822 (PIPE # LENGTH MASS) 171.2lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA



Heat		Product: Details				Non-Destructive Testing									
Test Type	Product Size	Pieces	Length	Mass lb/ft	Geiger µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT Pass	ET ASTM E213	ET Pass	HydroTest 1200PSI/ 5 s	End Condition	
BSM-2822	Heat NPS 24 TRUE 40 0.688in. WT	4	DRL	171.2	<5	<20	Pass	Pass	Pass	N12.5	Pass	-	Pass	35° Bevel	

Heat		Chemical Analysis (wt%)														
Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	CE(IIW)	CE(IIW)Max	CE(CSA)
Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.18	1.09	0.011	0.006	0.30	0.04	0.02	0.00	0.01	0.058	0.003	0.001	0.0002	0.38	0.39
	Product	0.17	1.10	0.012	0.007	0.32	0.03	0.02	0.01	0.01	0.060	0.001	0.001	0.0003	0.38	0.38
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Heat		Mechanical Properties						
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-2822	Heat	Ferrite & Pearlite	81 HRBW	Pass	Longitudinal; 1.5 in. x WT	74 000	0.70	53
				Pass	Longitudinal; 1.5 in. x WT	74 500	0.70	52

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 (%) (3 Tests) AVG	Lateral Expansion (mm) (3 Tests) AVG
BSM-2822	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(14/14/14) 18	(60/48/63) 57	(30/20/30) 27	(1.05/0.82/0.98) 0.95

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, 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:

T. Lam *Suly/05/2016*
 Tonya Lam, P. Tech (Eng.)
 Assistant QA Manager