



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2850 Product Size: NPS 20 TRUE 40 Production Date: Jul 26, 2016
Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR-002919
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 40 0.594 INCHWT SMLS 2016/07 NDE 1200PSI
HEAT BSM-2850 (PIPE # LENGTH MASS) 122.9lb/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 Pass	ET ASTM E309	HydroTest 1200PSI/ 5 s	End Condition
BSM-2850	Heat	NPS 20 TRUE 40 0.594in. WT	15	DRL	122.9	<5	<40	Pass	Pass	N12.5	Pass	-	Pass	33° Bevel

Chemical Analysis (wt%)																	
Heat	Steelmaking Method	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-2850	Blast Furnace; EAF; Ladle Refining; Vacuum Degassing; Fully Killed	0.14	1.02	0.014	0.028	0.28	0.05	0.05	0.03	0.02	0.061	0.002	0.001	0.0001	0.34	-	0.32
	Product	0.14	0.97	0.014	0.003	0.29	0.05	0.05	0.02	0.02	0.004	0.002	0.001	0.0004	0.32	-	0.30
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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-2850	Heat	Ferrite & Pearlite	75 HRBW	Pass	Longitudinal; 1.5 in. x WT	47 500	69 500	0.68	49
				Pass	Longitudinal; 1.5 in. x WT	44 200	66 000	0.67	48

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-2850	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(14/14/14) 18	(141/130/178) 150	(60/60/80) 67	(2.27/2.01/2.61) 2.30

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:

T. Lam July 29/2016

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