



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2807 Product Size: NPS 24 STD Production Date: Jun 20, 2016
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 002871
 Product Standards: ASME B36.10M-2015, ASTM/ASME A333-2015 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 24 STD 0.375 INCHWT SMLS 2016/06 NDE 750PSI
 HEAT BSM-2807 (PIPE # LENGTH MASS) 94.62lb/ft 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	Geiger µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 750PSI/ 5s	End Condition
BSM-2807	Heat	NPS 24 STD 0.375in. WT	9	DRL	94.62	<5	<60	Pass	Pass	Pass	N12.5 Pass	-	Pass	30° Bevel

Heat	BSM-2807	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	1.11	0.013	0.005	0.34	0.04	0.01	0.01	0.01	0.01	0.060	0.002	0.001	0.0003	0.38	-	0.38
						0.19	1.14	0.013	0.008	0.36	0.04	0.01	0.01	0.01	0.068	0.002 <td>0.001 <td>0.0003 <td>0.40</td> <td>-</td> <td>0.41</td> </td></td>	0.001 <td>0.0003 <td>0.40</td> <td>-</td> <td>0.41</td> </td>	0.0003 <td>0.40</td> <td>-</td> <td>0.41</td>	0.40	-	0.41

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 2 in. GI	Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-2807	Heat	Ferrite & Pearlite	86 HRBW	Pass	Longitudinal; 1.5 in. x WT	54 500	80 000	0.68	42
				Pass	Longitudinal; 1.5 in. x WT	53 500	79 000	0.68	41

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-2807	ASTM A333	Pass	CVN Long 10 x 7.5 mm	-48	(11/11/11) 14	(3 Tests) AVG (99/64/74) 79	(3 Tests) AVG (70/40/50) 53	(3 Tests) AVG (1.78/1.31/1.48) 1.52

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with ASTM/ASME A333-2015/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 / 21/2016

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