



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2891 Product Size: NPS 24 TRUE 40 Production Date: Sep 21, 2016
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 002970
 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 INCHWT SMLS 2016/09 NDE 1200PSI
 HEAT BSM-2891 (PIPE # LENGTH MASS) 171.2lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) 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	ET	HydroTest	End Condition					
BSM-2891	Heat	NPS 24 TRUE 40 0.688in. WT	4	DRL	171.2	<5	<10	Pass	Pass	ASTM E114	ASTM E213	ASTM E309	1200PSI/ 5 s	30° Bevel					

Heat	Test Type	Steelmaking Method	Test Type	Chemical Analysis (wt%)																	
				C	Min	P	S	SI	Cr	Cu	Mo	Ni	V	TI	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)		
BSM-2891	Heat	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.18	1.10	0.014	0.003	0.32	0.04	0.01	0.01	0.01	0.01	0.01	0.057	0.003	0.001	0.0005	0.39	-	0.39
			Product	0.17	1.08	0.014	0.005	0.33	0.05	0.01	0.01	0.01	0.01	0.059	0.003	0.001	0.0004	0.38	-	0.38	

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-2891	Heat	Ferrite & Pearlite	83 HRBW	Pass	Longitudinal; 1.5 in. x WT Longitudinal; 1.5 in. x WT	56 500	78 000	0.72	49
				Pass		53 000	77 000	0.69	47

Heat	Test	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-2891	Standard	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(3 Tests) AVG (14/14/14) 18	(3 Tests) AVG (24/53/28) 35	(5/10/5) 7	(3 Tests) AVG (0.42/0.73/0.47) 0.54

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 2014/68/EU.

Mill Test Certificate approved by:

- ✓ 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.

T. Lam Sept 126/2016

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 Assistant QA Manager