




Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3249 Product Size: NPS 24 STD Production Date: Sep 13, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003508
 Product Standards: ASME B36.10M-2015, CSA Z245.1-2014 Grade 290 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 15156-2:2015 MR0103/ISO 17495:2015
 Product Markings:  NPS 24 STD 0.375 INCHWT SMLS 2017/09 NDE 1190PSI
 HEAT BSM-3249 (PIPE # LENGTH MASS) 94.76lb/ft CSA Z245.1 GR 290 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	Geiger μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT (WT) ASTM E114	UT ASTM E213	ET ASTM E309	HydroTest 1190PSI/ 10s	End Condition
BSM-3249	Heat	NPS 24 STD 0.375in. WT	6	DRL	94.76	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	35° Bevel

Chemical Analysis (wt%)

Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	Mn/C	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-3249	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed (at TPCO China)	Heat	0.14	1.31	0.015	0.002	0.33	0.05	0.04	0.01	0.02	0.046	0.005	0.001	0.0006	9.36	0.38	-	0.36
		Product	0.16	1.30	0.016	0.003	0.34	0.06	0.04	0.01	0.02	0.048	0.005	0.001	0.0004	8.12	0.40	-	0.40
			0.16	1.29	0.016	0.003	0.35	0.06	0.04	0.01	0.02	0.046	0.004	0.001	0.0004	8.06	0.40	-	0.40

Mechanical Properties

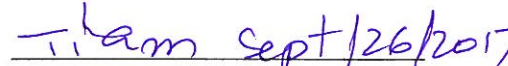
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 2 in. GL	Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-3249	Heat	Ferrite & Pearlite	82 HRBW	Pass	Longitudinal; 1.5 in. x WT	51 000	78 500	0.65	41
				Pass	Longitudinal; 1.5 in. x WT	51 500	77 500	0.66	40

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
					(3 Tests) AVG	(3 Tests) AVG	(3 Tests) AVG	(3 Tests) AVG
BSM-3249	ASTM A333	Pass	CVN Long 8STR 10x7.5mm	-48	(11/11/11) 14	(33/79/59) 57	(5/15/10) 10	(0.68/1.81/1.16) 1.22

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with CSA Z245.1-2014 Grade 290 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 9001:2015 (APIQR-1584), API Q1, and PED 2014/68/EU.
- ✓ This pipe product meets the **SOUR SERVICE** requirements of ANSI/NACE MR0175/ISO 15156-2A:2015 (Annex A2 for Region 3 Sour Service), and ANSI/NACE MR0103/ISO 17495:2015 Section 13.1

Mill Test Certificate approved by:


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

- ✓ 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.