



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3145 Production Date: May 23, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003359
 Product Standards: ASME B36.10M-2015, ASTM/ASME A333-2015 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 16 TRUE 80 0.844 INCHWT SMLS 2017/05 NDE
 HEAT BSM-3145 (PIPE # LENGTH MASS) 136.76lb/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	Gelger	Res. Mag.	Visual Insp.	OD	UT (WT)	UT	ET	HydroTest	End Condition
BSM-3145	Heat	NPS 16 TRUE 80 0.844in. WT	11	DRL	136.76	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	-	Plain End

Heat	Steelmaking Method	Test Type	Chemical Analysis (wt%)															
			C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-3145	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.16	1.30	0.008	0.002	0.27	0.05	0.04	0.01	0.02	0.048	0.001	0.0001	0.40	-	-	0.39
			Product	0.17	1.28	0.009	0.003	0.30	0.06	0.04	0.01	0.02	0.042	0.002	0.001	0.0004	0.41	-

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test	Yield (Rt0.5)	Tensile (Rm)	Y/T	Elongation (A)
BSM-3145	Heat	Ferrite & Pearlite	79 HRBW	Pass	2 in. GL Longitudinal: 0.5 in. Round Bar Longitudinal: 0.5 in. Round Bar	psi 46 000	psi 75 000	(Rt0.5/Rm) 0.61	38
				Pass		48 300	76 500	0.63	37

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-3145	ASTM A333	Pass	CVN Long 85TR 10x10mm	-45	(14/14/14) 18	(143/33/41) 72	(90/5/5) 33	(2.38/0.24/0.58) 1.07
					(3 Tests) AVG	(3 Tests) AVG	(3 Tests) AVG	(3 Tests) AVG

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 9001:2015 (APIQR-1584), API Q1, and PED 2014/68/EU.
 ✓ 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:
 Tonya Lam, P. Tech (Eng.)
 Assistant QA Manager
 Date: May 30 / 2017