



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2544 Product Size: NPS 24 SCH 60 Production Date: Sep 29, 2015
 Production Method: Hot Expansion Product Heat Treatment: ThermoMechanical Formed Certificate No.: MTR- 001965
 Product Standards: ASME B36.10-2004, ASTM/ASME A/SA333-2013 Grade 6 LT(M45C) A106-2014/SA106-2013 Grade B/C NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009 MR0103-2012
 Product Markings: NPS 24 SCH 60 0.969 INCH WT SMLS 2015/09 NDE 1900PSI
 HEAT BSM-2544 (PIPE # LENGTH MASS) 238.1lb/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 1900PSI/ 5 s	End Condition				
BSM-2544	Heat	NPS 24 SCH 60 0.969In. WT	5	DRL	238.1	<5	<10	Pass	Pass	Pass	Pass	Pass	Pass	Plain End				
Chemical Analysis (wt%)																		
BSM-2544	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(CSA)
	Product		0.16	1.20	0.008	0.003	0.28	0.03	0.02	0.01	0.01	0.01	0.054	0.002	0.001	0.0003	0.38	0.37

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-2544	Heat	Ferrite & Pearlite	78 HRBW	Pass	Longitudinal; 0.5 in. Round Bar	46,600	73,000	0.64	42
				Pass	Longitudinal; 0.5 in. Round Bar	46,900	72,000	0.65	42

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy				% Shear				Lateral Expansion			
				J	J	J	AVG	%	%	%	AVG	mm	mm	mm	AVG
BSM-2544	ASTM A333	CVN Long 10 x 10 mm	-45	92.0	150.0	132.0	124.7	20	50	30	33	1.45	2.04	1.90	1.80

Additional Details:
 ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with ASTM/ASME A/SA333-2013, A106-2014/SA106-2013, A53-2012/SA53-2013, and the purchase order requirements, and that the results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO-9001:2008 and API Q1.
 ✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and NACE MR0103-2012 Section 2.1.
 ✓ 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, C.E.T.
 Assistant QA Manager