



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2190 Product Size: 20S160 Production Date: Dec 11, 2014
Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 001560
Product Standards: ASME B36.10-2004, ASTM/ASME A106-2014/SA106-2013 Grade B NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009 MR0103-2012

Product Markings



NPS 20 SCH 160 1.969 INCHWT SMLS 2014/12 NDE 2800PSI
HEAT BSM-2190 (PIPE # LENGTH MASS) 379lb/ft ASTM/ASME 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	Geiger µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT	UT	ET	HydroTest 2800PSI/ 5 s	End Condition
BSM-2190	Heat	NPS 20 SCH 160 1.969in. WT	1	DRL	379	<5	<20	Pass	Pass	Pass	Pass	Pass	Pass	Plain End

Chemical Analysis (wt%)														
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb
			Heat	0.21	0.94	0.015	0.005	0.31	0.04	0.07	0.01	0.03	0.004	0.002
			Product	0.21	0.92	0.012	0.007	0.31	0.04	0.05	0.01	0.02	0.004	0.001
BSM-2190	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed													

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 50mm GL	Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-2190	Heat	Ferrite & Pearlite	73 HRBW	Pass	Longitudinal; 19.05 mm x WT	38,900	67,500	0.58	49

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy					% Shear					Lateral Expansion		
				J	J	J	AVG	%	%	%	AVG	mm	mm	mm	mm	AVG
				-	-	-	-	-	-	-	-	-	-	-	-	-
BSM-2190																

Additional Details:

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with ASTM/ASME A106-2014/SA106-2013 Grade B 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-2009 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:

Tomya Lam, C.E.T.
Assistant QA Manager

T. Lam Feb 103/2015