



Mill Test Certificate

Bri-Steel Manufacturing Inc.
 2125-64 Avenue, Edmonton, AB Canada T6P 1Z4
 Tel: 001 (780) 469-6603
 Fax: 001 (780) 469-6986
 www.brichemsteel.com

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0361** Product Size: **NPS 20 XS** Production Date: **June 12, 2012**

Production Method: **Hot Expansion** Product Heat Treatment: **As-rolled**

Product Standards: **ASTM/ASME A/SA106-2011 Grade B/C, A/SA53-2012 Grade B Type S, NACE MR0175-2009**

Product Markings: **.BRI-STEEL MFG NPS 20 XS ASTM/ASME A/SA106 GR B/C A/SA53 GR B HEAT BSM-0361 (PIPE # LENGTH MASS) 104.1lb/ft NDE 1000PSI NACE MR0175 2012/06 MADE IN CANADA.**

Product Details						Non-Destructive Testing									
Heat	Test Type	NPS	SCH	Pieces	Length	Mass lb/ft	Geiger μ R/hr	Res. Mag. Gauss	Visual Insp.	OD Pass	UT WT Pass	UT ASTM E213	ET ASTM E309	HydroTest 1000 psi/5s	End Condition
BSM-0361	Heat	20	XS	11	DRL	104.10	<5	<20	Pass	Pass	Pass	---	Pass	Pass	37.5" Bevel


		Chemical Analysis (wt%)														
Heat	Test Type	Steelmaking Method														
		Blast Furnace; EAF; Ladle Refining; Vacuum Degass														
BSM-0361	Heat	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE (IIW)	CE (CSA)
		0.19	0.90	0.009	0.008	0.21	0.03	0.09	0.01	0.04	0.004	0.001	0.002	0.0002	0.36	0.36

Mechanical Properties											
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (Rp0.2) psi	Yield (Rp0.2) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
					50mm GL, 38mm x WT	Transverse					
BSM-0361	Heat	Ferrite & Pearlite	75	Pass	Longitudinal	47,100	47,100	74,500	0.63	44	

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 A/SA106-2011, A/SA53-2012 and the purchase order requirements, and that the results meet the corresponding requirements.
- ✓ This pipe product meet the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and NACE MR0103-2010 Section 2.1.
- ✓ No weld repairs have been performed on this product. This product has no mercury contamination.
- ✓ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Mill Test Certificate approved by:


 2012 June 27
 Kenton Dechant, P.Eng,
 Manager of Quality and R&D



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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0361** Product Size: **NPS 20 STD** Production Date: **June 12, 2012**

Production Method: **Hot Expansion** Product Heat Treatment: **As-rolled**

Product Standards: **ASTM/ASME A/SAA106-2011 Grade B/C, A/SAS3-2012 Grade B Type S, NACE MR0175-2009**

Product Markings: **.BRI-STEEL MFG NPS 20 STD ASTM/ASME A/SAA106 GR B/C A/SAS3 GR B HEAT BSM-0361 (PIPE # LENGTH MASS) 104.1lb/ft NDE 1000PSI NACE MR0175 2012/06 MADE IN CANADA.**

Product Details						Non-Destructive Testing									
Heat	Test Type	NPS	SCH	Pieces	Length	Mass lb/ft	Geiger μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 1000 psi/5s	End Condition
BSM-0361	Heat	20	STD*	11	DRL	104.10	<5	<20	Pass	Pass	Pass	---	Pass	Pass	37.5° Bevel


		Chemical Analysis (wt%)																
Heat	Test Type	Steelmaking Method		C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE	CE
		Blast Furnace; EAF; Ladle Refining; Vacuum Degass	0.19	0.90	0.009	0.008	0.21	0.03	0.09	0.01	0.04	0.004	0.001	0.002	0.0002	0.36	0.36	
BSM-0361	Heat																	

Mechanical Properties											
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (Rp0.5) psi	Yield (Rp0.2) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
					50mm GL, 38mm x WT	Transverse					
BSM-0361	Heat	Ferrite & Pearlite	75	Pass	Longitudinal	47,100	47,100	74,500	0.63	44	

Additional Details:

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 - ✓ This pipe product meet the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and NACE MR0103-2010 Section 2.1.
 - ✓ No weld repairs have been performed on this product. This product has no mercury contamination.
 - ✓ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.
- *Note that Pipes 002B, 004A, 005A, 008B and 009B were downgraded to NPS 20 STD from NPS 20 XS

Mill Test Certificate approved by:


 2012 JUN 27
 Kenton Dechant, P. Eng.
 Manager of Quality and R&D