



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-0436** Product Size: **NPS 16 TRUE80** Production Date: **August 2, 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 16 TRUE80 ASTM/ASME A/SA106 GR B/C A/SA53 GR B HEAT BSM-0436 (PIPE # LENGTH MASS) 136.5lb/ft NDE NH NACE MR0175 2012/08 MADE IN CANADA.**

Product Details				Non-Destructive Testing											
Heat	Test Type	NPS	Wall Thickness	Pieces	Length	Mass lb/ft	Geiger $\mu R/hr$	Res. Mag. Gauss	Visual Insp.	OD	WT	UT	ET	HydroTest	End Condition
BSM-0436	Heat	16	TRUE80	14	DRL	136.50	<5	<20	Pass	Pass	Pass	Pass	Pass	Pass	Plain End

Heat	Steelmaking Method	Chemical Analysis (wt%)														
		C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE (IIW)	CE (CSA)
BSM-0436	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	0.19	0.88	0.006	0.003	0.23	0.06	0.06	0.03	0.03	-	-	-	0.0005	-	-
		Product	0.19	0.86	0.006	0.004	0.21	0.06	0.06	0.04	0.03	0.002	0.001	0.001	0.0003	0.36

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	Transverse: 38.1mm x WT					
BSM-0436	Heat	Ferrite & Pearlite	71	Pass	Longitudinal: 38.1mm x WT		47,000	47,000	71,000	0.66	51

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:

Kenton Dechant
 2012 Aug 20
 Kenton Dechant, P.Eng.
 Manager of Quality and R&D



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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0436** Product Size: **NPS 16 SCH 60** Production Date: **August 2, 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 16 SCH 60 ASTM/ASME A/SA106 GR B/C A/SA53 GR B HEAT BSM-0436 (PIPE # LENGTH MASS) 107.5lb/ft NDE NH NACE MR0175 2012/08 MADE IN CANADA.**

Product Details				Non-Destructive Testing											
Heat	Test Type	NPS	Wall Thickness	Pieces	Length	Mass lb/ft	Geiger μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT	ET	HydroTest	End Condition
BSM-0436	Heat	16	SCH 60	14	DRL	107.50	<5	<20	Pass	Pass	Pass	---	Pass	---	Plain End


Chemical Analysis (wt%)																	
Heat	Steelmaking Method	Analysis	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE (IIW)	CE (CSA)
BSM-0436	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.19	0.88	0.006	0.003	0.23	0.06	0.06	0.03	0.03	-	-	-	0.0005	-	-
		Product	0.19	0.86	0.006	0.004	0.21	0.06	0.06	0.04	0.03	0.002	0.001	0.001	0.0003	0.36	0.36

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	50mm GL					
BSM-0436	Heat	Ferrite & Pearlite	71	Pass	Transverse; 38.1mm x WT	Longitudinal; 38.1mm x WT	47,000	47,000	72,000	0.78	46

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.
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- ✓ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Mill Test Certificate approved by:


 2013 July 31
 Kenton Dechant, P.Eng.
 Manager of Quality and R&D