



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-0471** Product Size: **NPS 20 STD** Production Date: **September 13, 2012**
 Production Method: **Hot Expansion** Product Heat Treatment: **As-rolled**

Product Standards: **ASME B36.10-2004, API SL-44th Ed, Grade B PSL1, ASTM/ASME A/SA106-2011 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **BRI-STEEL MFG -API- SL-0898 API SL GR B PSL1 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 20 STD HEAT BSM-0471 (PIPE # LENGTH MASS) 78.60lb/ft NDE 1100PSI SMLS NACE MR0175 2012/09 MADE IN CANADA.**

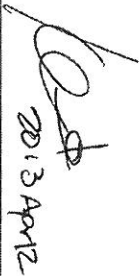
Product Details				Non-Destructive Testing											
Heat	Test Type	NPS	Wall Thickness	Pieces	Length	Mass	Gelger	Res. Mag.	Visual Insp.	OD	UT	UT	ET	HydroTest	End Condition
BSM-0471	Heat	20	STD	18	DRI	78.60	µR/hr	Gauss	Pass	Pass	Pass	Pass	Pass	Pass	37.5" Bevel

Chemical Analysis (wt%)																		
Heat	BSM-0471	Steelmaking Method	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Analysis										CE	CE			
				C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	(IIV)	(CSA)
				0.21	0.91	0.014	0.012	0.26	0.05	0.10	0.01	0.07	-	-	-	0.0004	-	
				0.20	0.87	0.015	0.011	0.25	0.05	0.11	0.01	0.07	0.002	0.001	0.001	0.0002	0.37	0.38

Mechanical Properties															
Heat	BSM-0471	Test Type	Heat	Microstructure	Ferrite & Pearlite	Hardness HRBW	76	Flattening Test	Pass	Tension Test				Y/T	Elongation (A)
										50mm GL	Yield (Rt0.5)	Yield (Rp0.2)	Tensile (Rm)		
								Transverse: 38.1mm x WT	Pass	45,300	44,900	72,500	0.62	44	
								Longitudinal: 38.1mm x WT	Pass	45,800	45,800	72,000	0.64	44	

- Additional Details:
- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API SL-44th Ed., ASTM/ASME A/SA106-2011, A/SA53-2012 and the purchase order requirements, and that the results meet the corresponding requirements.
 - ✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and NACE MR0103-2010 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:



2013 Apr 12
 Kenton Dechant, P.Eng.
 Manager of Quality and R&D



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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0471** Product Size: **NPS 20 XS** Production Date: **September 13, 2012**

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

Product Standards: **ASME B36.10-2004, API SL-44th Ed. Grade B PSL1, ASTM/ASME A/S1A106-2011 Grade B/C NDE, A/SAS3-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **.BRI-STEEL MFG <API> SL-0898 API SL GR B PSL1 ASTM/ASME A/S1A106 GR B/C A/SAS3 GR B NPS 20 XS HEAT BSM-0471 (PIPE # LENGTH MASS) 104.1lb/ft NDE 1100PSI 5MLS NACE MR0175 2012/09 MADE IN CANADA.**

Product Details						Non-Destructive Testing										
Heat	Test Type	NPS	Wall Thickness	Pieces	Length	Mass lb/ft	Geiger HR/hr	Res. Mag. Gauss	Visual Insp.	OD	WT	UT	UT	ET	HydroTest	End Condition
BSM-0471	Heat	20	XS	18	DRL	104.10	<5	<20	Pass	Pass	Pass	Pass	Pass	Pass	Pass	37.5° Bevel

Chemical Analysis (wt%)																	
Heat	Steelmaking Method	Analysis	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE (IIV)	CE (CSA)
BSM-0471	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.21	0.91	0.014	0.012	0.26	0.05	0.10	0.01	0.07	-	-	-	0.0004	-	-
		Product	0.20	0.87	0.015	0.011	0.25	0.05	0.11	0.01	0.07	0.002	0.001	0.001	0.0002	0.37	0.38

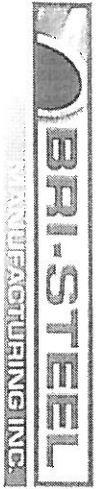
Mechanical Properties											
Heat	Test Type	Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (Rt0.5) psi	Yield (Rp0.2) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
					50mm GL	Longitudinal: 38.1mm x WT					
BSM-0471	Heat	Ferrite & Pearlite	76	Pass			45,800	45,800	72,000	0.64	44

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API SL-44th Ed., ASTM/ASME A/S1A106-2011, A/SAS3-2012 and the purchase order requirements, and that the results meet the corresponding requirements.
- ✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour service, and NACE MR0103-2010 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.
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Kenton Dechant
 2014 Sept 4
 Kenton Dechant, P. Eng.
 Manager of Quality and R&D



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

Product Standards: **ASME B36.10-2004, API 5L-44th Ed. Grade B PSL1, ASTM/ASME A/SA106-2011 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **.BRI-STEEL MFG-4PI-5L-0899 API 5L GR B PSL1 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 20 XS HEAT BSM-0471 (PIPE # LENGTH MASS) 104.1lb/ft NDE 1100PSI SM15 NACE MR0175 2012/09 MADE IN CANADA.**

Product Details				Non-Destructive Testing											
Heat	Test Type	NPS	Wall Thickness	Pieces	Length	Mass	Gelger	Res. Mag.	Visual	UT	UT	FT	HydroTest	End	
BSM-0471	Heat	20	XS	18	DRL	104.10	µf/hr	Gauss	Insp.	OD	WT	ASTM E213	ASTM E309	1100 psi/5s	Condition
							<5	<20	Pass	Pass	Pass	Pass	Pass	37.5° Bevel	

Steelmaking Method		Chemical Analysis (wt%)														
Heat	Blast Furnace; EAF; Ladle Refining;	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE	CE
BSM-0471	Vacuum Degass; Fully Killed	0.21	0.91	0.014	0.012	0.26	0.05	0.10	0.01	0.07	-	-	-	0.0004	-	-
		Product	0.20	0.87	0.015	0.011	0.25	0.05	0.11	0.01	0.07	0.002	0.001	0.0002	0.37	0.38

Mechanical Properties										
Heat	Test Type	Microstructure	Hardness	Tension Test		Yield (R10.5)	Yield (Rp0.2)	Tensile (Rm)	Y/T	Elongation (A)
				HRBW	Flattening Test					
BSM-0471	Heat	Ferrite & Pearlite	76	Pass	Transverse: 38.1mm x WT	45,300	44,900	72,500	0.62	44
					Longitudinal: 38.1mm x WT	45,800	45,800	72,000	0.64	44

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[Signature]
 2013 Apr 3
 Kenton Dechant, P. Eng.
 Manager of Quality and R&D