



Mill Test Certificate

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

Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1431 Product Size: 14 XS Production Date: Nov 21, 2013
 Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 000635

Product Standards: ASME B36.10-2004, API SL-45th Ed. Grade B PSL1, ASTM/ASME A/S4106-2011 Grade B/C NDE A/S453-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

Product Markings: <API> SL-0898 API SPEC SL NPS 14 XS 0.500 INCHWT GR B PSL1 SMLS 2013/11 NDE 1700PSI
 HEAT BSM-1431 (PIPE # LENGTH MASS) 72.09lb/ft ASTM/ASME A/S4106 GR B/C A/S453 GR B NACE MR0175/MR0103 MADE IN CANADA

Product: Details				Non-Destructive Testing										
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Gelger µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM	HydroTest 1700PSI/ 5 s	End Condition
BSM-1431	Heat	NPS 14 XS 0.500in. WT	5	ORL	72.09	<5	<10	Pass	Pass	Pass	Pass	Pass	Pass	Plain End

Chemical Analysis (wt%)																	
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mg	Ni	V	Ti	Nb	B	CE(IIW)	CE(CSA)
BSM-1431	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Product	0.22	0.93	0.010	0.004	0.26	0.06	0.08	0.01	0.04	0.003	0.001	0.001	0.0004	0.39	

Mechanical Properties										
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test		Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
					50mm GL	Longitudinal				
BSM-1431	Heat	Ferrite & Pearlite	78 HRBW	Pass						45

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy			% Shear			Lateral Expansion				
				J	J	J	%	%	%	mm	mm	mm	AVG	
BSM-1431														

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-45th Ed., ASTM/ASME A/S4106-2011 Grade B/C A/S453-2012, 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 2009 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 NOV 28
 Paul Sowden, T.T.
 Assistant QA Manager



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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1431 Product Size: NPS 14 TRUE 40 Production Date: Nov 21, 2013
 Production Method: Hot Expansion Product Heat Treatment: ThermoMechanical Formed Certificate No.: MTR- 002064
 Product Standards: ASME B36.10M-2015, ASTM/ASME A106-2014/SA106-2013 Grade B/C NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009 MR0103-2012
 Product Markings: NPS 14 TRUE 40 0.438 INCHWT SMLS 2013/11 NDE 1700PSI
 HEAT BSM-1431 (PIPE # LENGTH MASS) 63.67lb/ft ASTM/ASME 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	Geliger μR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 1700 PSI/ 5 s	End Condition	
BSM-1431	Heat	NPS 14 TRUE 40 0.438in. WT	5	DRL	63.67	<5	<10	Pass	Pass	Pass	Pass	Pass	Pass	Plain End	

Heat	Steelmaking Method	Test Type	Chemical Analysis (wt%)														
			C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(CSA)
BSM-1431	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.20	0.92	0.012	0.003	0.25	0.06	0.07	0.01	0.04	-	-	-	0.0004	0.37	0.38
		Product	0.22	0.93	0.010	0.004	0.26	0.06	0.08	0.01	0.04	0.003	0.001	0.001	0.0004	0.39	0.40

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) %
					Longitudinal: 1.5 in. x WT	Transverse: 1.5 in. x WT				
BSM-1431	Heat	Ferrite & Pearlite	78 HRBW	Pass	42,300	74,500	0.57	45		

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy			Lateral Expansion					
				J	J	J	AVG	%	mm	mm	AVG	
BSM-1431	-	-	-	-	-	-	-	-	-	-	-	-

Additional Details:

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with ASTM/ASME 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, API Q1, and PED 97/23/EC.

✓ 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 12/5/2016

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