



Mill Test Certificate

Bri-Steel Manufacturing Inc.
 2125-64 Avenue, Edmonton, AB Canada T6P 1Z4
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1564 ✓ Product Size: 24STD Production Date: Jan 23, 2014
 Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 000788

Product Standards: ASME B36.10-2004, API 5L-45th Ed. Grade B/X42/X46/X52 PSL1, ASTM/ASME A/SA333-2013 Grade 6 LT(M45C) A/SA106-2013 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

Product Markings <API> 5L-0898 API SPEC 5L NPS 24 STD 0.375 INCHWT GR B/X42/X46/X52 PSL1 SMLS 2014/01 NDE 1470PSI
 HEAT BSM-1564 (PIPE # LENGTH MASS) 94.62lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) 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	Geiger μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM	HydroTest 1470PSI/ 5s	End Condition
✓ BSM-1564	Heat	NPS 24 STD 0.375in. WT	27	DRL	94.62	<5	<10	Pass	Pass	Pass	Pass	Pass	Pass	32.5° Bevel

Chemical Analysis (wt%)																	
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(CSA)
✓ BSM-1564	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Heat	0.20	0.95	0.010	0.001	0.24	0.05	0.03	0.01	0.02	0.048				-	-
		Product	0.23	0.97	0.008	0.008	0.25	0.05	0.03	0.01	0.03	0.053	0.002	0.001	0.0004	0.42	0.42

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-1564	Heat	Ferrite & Pearlite	77 HRBW	Pass	Longitudinal; 38.1 mm x WT	54,500	78,500	0.69	40

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy				% Shear				Lateral Expansion			
				J	J	J	AVG	%	%	%	AVG	mm	mm	mm	AVG
✓ BSM-1564	ASTM A333	CVN Long 10 x 8 mm	-45	68.0	60.0	68.5	65.5	10	10	10	10	1.54	1.34	1.53	1.47

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-45th Ed., ASTM/ASME A/SA333-2013 Grade 6 LT(M45C) A/SA106-2013 Grade B/C 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-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:

2014 Jan 31

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

Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1564 Product Size: 24STD Production Date: Jan 23, 2014



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Bri-Steel Manufacturing Inc.
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1566 Product Size: 24 STD Production Date: Jan 24, 2014
 Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 000792
 Product Standards: ASME B36.10-2004, API 5L-45th Ed. Grade B/X42/X46/X52 PSL1, ASTM/ASME A/SA333-2011 Grade 6 LT(M45C) A/SA106-2011 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

Product Markings: <API> 5L-0898 API SPEC 5L NPS 24 STD 0.375 INCHWT GR B/X42/X46/X52 PSL1 SMLS 2014/01 NDE 1470PSI
 HEAT BSM-1566 (PIPE # LENGTH MASS) 94.62lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) 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	Geiger μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM	HydroTest 1470 PSI/ 5s	End Condition
BSM-1566	Heat	NPS 24 STD 0.375in. WT	1	DRL	94.62	<5	<10	Pass	Pass	Pass	Pass	Pass	Pass	34° Bevel

Chemical Analysis (wt%)																	
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(CSA)
BSM-1566	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed	Heat	0.20	0.92	0.014	0.001	0.26	0.07	0.02	0.01	0.03	0.044				-	-
		Product	0.21	0.97	0.008	0.008	0.25	0.05	0.03	0.01	0.03	0.002	0.003	0.001	0.0003	0.38	0.38

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-1566	Heat	Ferrite & Pearlite	81 HRBW	Pass	Longitudinal; 38.1 mm x WT	56,500	76,000	0.74	41

Heat	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy				% Shear				Lateral Expansion			
				J	J	J	AVG	%	%	%	AVG	mm	mm	mm	AVG
BSM-1566	ASTM A333	CVN Long 10 x 8 mm	-45	22.0	28.0	44.0	31.3	10	10	10	10	0.81	0.86	1.02	0.90

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-45th Ed., ASTM/ASME A/SA333-2011 Grade 6 LT(M45C) A/SA106 2011 Grade B/C 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-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:

2014 JAN 29

Paul Sowden, T.T.
 Assistant QA Manager