

## Mill Test Certificate

2125-64 Avenue, Edmonton, AB Canada T6P 1Z4 Bri-Steel Manufacturing Inc.

Fax: 001 (780) 469-6986 www.brichemsteel.com Tel: 001 (780) 469-6603

Product: Seamless Carbon Steel Pipe

Product Heat Number:

Product Size:

NPS 24 TRUE80

Production Method: **Hot Expansion** 

BSM-0647

Production Date: January 10, 2013

Product Heat Treatment: As-rolled

**Product Standards:** ASME B36.10-2004, 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 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 24 TRUE80 HEAT BSM-0647 (PIPE # LENGTH MASS) 296.41b/ft NDE SMLS NACE MR0175 2013/01 MADE IN CANADA.

Heat Test Type NPS Thickness Pieces Length BSM-0647 Heat 24 TRUE80 7 DRL 296.40 <5 <20 Pass Pass Pass Pass Pass Pass Pass Pas	İ															
Product Details  Non-Destructive Testing  Wall  Wall  Mass Geiger Res.Mag. Visual  UT  UT  UT  ASTM E213 ASTN  Test Type NPS Thickness Pieces Length Ib/ft μR/hr Gauss Insp.  Non-Destructive Testing  Non-Destructive Testing		*	Pass	Pass	Pass	Pass	Pass	<20	\$	296.40	DRL	7	TRUE80	24	Heat	BSM-0647
s Non-Destri			ASTM E309	ASTM E213	WT	OD	lnsp.	Gauss	μR/hr	lb/ft	Length	Pieces	Thickness	NPS	Test Type	Heat
5	_	HydroTest	ET	TU	UT		Visual	Res.Mag.	Geiger	Mass			Wall			
		30		esting	estructive T	Non-D						S	Product Detail			

0.38	0.38	0.0002	0.001	0.003	0.007	0.03	0.03	0.06	0.06	0.31	0.025   0.004   (		1.08	0.17	Product	Vacuum Degas; Fully Killed	
1	1	0.0001	0.001	0.003	0.007	0.02	0.03	0.06		0.34	0.002	T	1.03	0.15	Heat	Blast Furnace; EAF; Ladle Refining;	BSM-0647
(CSA)	(IW)	В	Nb	Ħ	<	Z.	Mo	5	Q.	Si	S	P	Μ'n	0	Analysis	Steelmaking Method	Heat
CE	CE			17451													
									s (wt%)	Chemical Analysis (wt%)	Chemica						

Test         Yield (Rt0.5)         Yield (Rt0.5)           GL         psi           1mm x WT         43,600	Mechanical Propert Ten Flattening Test Pass Transverse	Hardness HRBW 75	Microstructure Ferrite & Pearlite	Test Type Heat	Heat BSM-0647
Yie	Test GL 1mm x WT	Tension Test 50mm GL Transverse; 38.1mm x WT	Mechanical Properties  Tension Test Flattening Test Flattening Test Flattening Test Longitudinal; 38.1mm x WT	Hardness Hardness HRBW Flattening Test Flatten	Mechanical Properties  Tension Test  Microstructure  Hardness  Hardness  Flattening Test  Ferrite & Pearlite  75  Pass  Longitudinal; 38.1mm x WT

Additional Details:

results meet the corresponding requirements. Inc. in accordance with ASTM/ASME A/SA106-2011, A/SA53-2012 and the purchase order requirements, and that the ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing

Service, and NACE MR0103-2010 Section 2.1 This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour

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.

\*Note that this product was hydrotested to 1000 psi for 5 seconds.

Mill Test Certificate approved by:

Kenton Dechant, P.Eng. 2013 Jan 30

Manager of Quality and R&D



## Mill Test Certificate

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Product: Seamless Carbon Steel Pipe

Product Heat Number:

BSM-0647

**NPS 24 SCH60** 

Production Date:

Production Method: Hot Expansion

Product Size:

January 10, 2013

Product Heat Treatment: As-rolled

Product Standards: ASME B36.10-2004, 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 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 24 SCH60 HEAT BSM-0647 (PIPE # LENGTH MASS) 296.41b/ft NDE SMLS NACE MR0175 2013/01 MADE IN CANADA.

BSM-0647 Heat	Heat Test Type		
24	oe NPS		-
SCH60	Thickness	Wall	Product Detail
7	Pieces		ails
DRL	Length		
296.40	lb/ft	Mass	
G	μR/hr	Geiger	
<20	Gauss	Res.Mag.	
Pass	insp.	Visual	
Pass	OD		Non-D
Pass	WT	TU	Destructive T
Pass	ASTM E213	TD	esting
Pass	ASTM E309	ET	
*		HydroTest	
Plain End	Condition	End	

Heat Steelmaking Method	Analysis	0	Mn	Р	Chemical A	Si Cr	Cr (wt%)	5	≤ o	<u>Z</u> .	<	=1	N D	Φ.	(IIW CE
	Analysis	C	Mn	P	S	Si	<del>ر</del>	5	M <sub>o</sub>	<u>z</u> .	<	=	N N		В
RSM-0647 Blast Furnace; EAF; Ladle Refining;	g; Heat	0.15	1.03	0.020	0.002	0.34	0.07	0.06	0.03	0.02	0.007	0.003	0.001	-	0.0001
Vacuum Degas; Fully Killed	Product	0.17	1.08		0.025 0.004	0.31	0.06	0.06	0.03	0.03	0.007	0.003	0.001	-	0.0002

				Mechan	Mechanical Properties					
			Hardness		Tension Test	Yield (Rt0.5)	Yield (Rp0.2)	Tensile (Rm)	Τ/γ	Elongation (A
Heat	Test Type	Microstructure	HRBW	Flattening Test	50mm GL	psi	psi	psi	(Rt0.5/Rm)	%
BSM-0647	Heat	Ferrite & Pearlite	75	Pass	Transverse; 38.1mm x WT	43,600	43,800	70,000	0.62	62
					Longitudinal; 38.1mm x WT	46,600	47,400	68,500	0.68	60

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## Additional Details:

- results meet the corresponding requirements. Inc. in accordance with ASTM/ASME A/SA106-2011, A/SA53-2012 and the purchase order requirements, and that the ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing
- Service, and NACE MR0103-2010 Section 2.1. This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour
- 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.

\*Note that this product was hydrotested to 1000 psi for 5 seconds.

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