

## 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

Seamless Carbon Steel Pipe

Product Heat Number:

BSM-1624 Product Size: 20 X 0.450

Production Date:

Feb 11, 2014

Production Method: **Hot Expansion** 

Product Heat Treatment:

As-rolled

Certificate No.: MTR- 000864

Product Standards: ASME B36.10-2004, ASTM/ASME A/SA106-2013 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

**Product Markings** 

NPS 20 X 0.450 INCHWT SMLS 2014/02 NDE 1890PSI MEAT BSM-1624 (PIPE # LENGTH MASS) 93.69lb/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

	BSM-1624		Heat	
	Heat		Test Type	
	NPS 20 X 0.450in. WT		Product Size	Product: Details
	2		Pieces	
	DRL		Length	
	93.69	lb/ft	Mass	
	<b>5</b>	μR/hr	Geiger	
	<10	Gauss	Res. Mag.	
	Pass	Insp.	Visual	
	Pass		OD	Z
	Pass	TW	TU	Non-Destructive Testin
	Pass	ASTM E213 ASTM	UT	tive Testing
	Pass	ASTM	ET	
The second secon	Pass	1890 PSI/ 5 s	HydroTest	
	32.5° Bevel	5 <sub>S</sub> Condition	End	-

		BSM-1624		
			Heat	
	Chas, any miner	Blast Furnace; EAF; Ladle Refining; Vacuum	Steelmaking Method	
	Product	Heat	Test Type	
100000	0.22	0.20	С	
	0.89	0.88	Mn	
	0.019	0.012	Р	
	0.012	0.008	S	Chemical Analysis (wt%)
	0.23	0.26	Si	Analysis (
	0.06	0.04	Cr	wt%)
	0.01	0.01	Cu	
	0.00		Mo	
	0.04	0.01	N:	
	0.003		<	
	0.002		=	
	0.001		Мb	
	0.0002		В	
	0.39	1	CE(IIW)	
	0.39	1	CE(CSA)	

48	0.58	72,000	41,900	Longitudinal; 38.1 mm x WT	Pass	// HKBW	rerrite & Pearlite	пеац	PZOT-IAICO
					,	77   10011	Counity & Deputity	Lincot	VC21 VV30
%	(Rt0.5/Rm)	psi:	psi	50mm GL					
Elongation (A	Υ/Τ	Tensile (Rm)	Yield (Rt0.5)	Tension Test	Flattening Test	Hardness	Microstructure	Test Type	Heat
				Mechanical Properties					

## Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in results meet the corresponding requirements. accordance with ASTM/ASME A/SA106-2013 Grade B/C A/SA53-2012, and the purchase order requirements, and that the
- √ 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.
- $\checkmark$  This product has not come into contact with mercury during the Bri-Steel Manufacturing processes
- $\checkmark$  This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Mill Test Certificate approved by:

Sounder 2014 FEB 13

Assistant QA Manager Paul Sowden, T.T.



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Seamless Carbon Steel Pipe Product Heat Number: BSM-1624 Product Size: 20XS Production Date: Feb 11, 2014

Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 000862

Production Method:

Product:

Product Standards: ASME B36.10-2004, API 5L-45th Ed. Grade B PSL1, ASTM/ASME A/SA106-2013 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

**Product Markings** | CAPI> 5L-0898 API SPEC 5L NPS 20 XS 0.500 INCHWT GR B PSL1 SMLS 2014/02 NDE 1890PSI HEAT BSM-1624 (PIPE # LENGTH MASS) 104.1lb/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

		BSM-1624 Heat NPS 20 XS 0 S00in WT 2	Heat NPS 20 XS 0 S00in WT 2	Test Type Product Size Pieces  Heat NPS 20 XS 0 S 0 1 2 2
	2 DRL			Pieces Length
	104.1		lb/ft	
	<5		μR/hr	` ¬
	<10		Gauss	Res. Mag. Gauss
	Pass		lnsp.	Visual Insp.
	Pass			OD
	Pass	:	¥,	TW
	Pass	1011111111	ASTM F213 ASTM	UT ASTM F213
	Pass			
	Pass	TOSUPSI/ 35	1900 DEL/ E 2	HydroTest
The state of the s	32.5° Bevel	S	Condition	End

		BSM-1624	Heat	
	Control Miles	Blast Furnace; EAF; Ladle Refining; Vacuum Degas: Fully Killed	Steelmaking Method	
	Product	Heat	Test Type	
	0.22	0.20	C	
	0.89	0.88	Mn	
	0.019	0.012	Р	
	0.012	0.008	S	Chemical Analysis (wt%)
	0.23	0.26	Si	Analysis (
	0.06	0.04	Cr	wt%)
	0.01	0.01	Cu	
	0.00		Мо	
	0.04	10.0	N:	
100	0.003		<	
	0.002		∄	
	0.001		Мb	
	0.0002		В	
	0.39		CE(IIW)	
	0.39	1	CE(CSA)	

BSM-1624			
1624		Heat	
Heat		Test Type	
Ferrite & Pearlite		Microstructure	
77 HRBW		Hardness	
Pass		Flattening Test	
Longitudinal; 38.1 mm x WT	50mm GL	Tension Test	Mechanical Properties
41,900	psi	Yield (Rt0.5)	
72,000	psi	Tensile (Rm)	
0.58	(Rt0.5/Rm)	Τ/Υ	
48	%	Elongation (A)	

	BSM-1624		Heat
		Standard	Test
	1	Sample Details	Impact Test
	,	- °C	
	,	J	
	1	J	Impact
	i	J	Energy
		AVG	
	-	%	
	1	%	% Shear
	ı	%	iear
		AVG	
The second named in column 1	•	mm	
Name and Address of the Owner, or other Persons	1	mm	Lateral Expansion
		mm	cpansion
	ı	AVG	

## 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/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.
- $\checkmark$  This product has not come into contact with mercury during the Bri-Steel Manufacturing processes.
- $\checkmark$  This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

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Assistant QA Manager