

Mill Test Certificate

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

Tel: 001 (780) 469-6603

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

Seamless Carbon Steel Pipe Product Heat Number: BSM-1574

Production Method: **Hot Expansion** Product Heat Treatment:

Product Standards:

Product Size: 20XS

As-rolled

Production Date:

Certificate No.: MTR- 000807 Jan 28, 2014

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 BRI-STEEL HEAT BSM-1574 (PIPE # LENGTH MASS) 104.1lb/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA | <API> 5L-0898 API SPEC 5L NPS 20 XS 0.500 INCHWT GR B PSL1 SMLS 2014/01 NDE 1200PSI

	BSM-1574		Heat	
	Heat		Test Type	
	NPS 20 XS 0.500in. WT		Product Size	Product: Details
	4		Pieces	
	DRL		Length	
	104.1	lb/ft	Mass	
	<5	μR/hr	Geiger	
No.	<10	Gauss	Res. Mag.	
	Pass	Insp.	Visual	
	Pass		00	Z
	Pass	WT	UT	Non-Destructive Testing
	Pass	ASTM E213 ASTM	UT	tive Testing
	Pass	ASTM	ET	
	Pass	1200PSI/ 5 s	HydroTest	
	32.5° Bevel	5 _S Condition	End	

		BSM-1574	Heat	
	Degas, runy Nines	Blast Furnace; EAF; Ladle Refining; Vacuum	Steelmaking Method	
	Product	Heat	Test Type	
	0.22	0.20	С	
	0.90	0.82	Mn	
	0.017	0.013 0.008	Р	
	0.015	0.008	S	Chemical
	0.30	0.30	Si	Chemical Analysis (wt%)
	0.07	0.06	Cr	wt%)
and the second s	0.01	0.01	Cu	
	0.00		Mo	
	0.04	0.04	N:	
	0.003		<	
	0.005		Ti	
	0.001		Nb	
	0.0004		В	
	0.39	1	CE(IIW)	
	0.39	,	CE(CSA)	

					Mechanical Properties				
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test	Yield (Rt0.5)	Tensile (Rm)	Υ/Τ	Elongation (A)
					50mm GL	psi	psi	(Rt0.5/Rm)	%
BSM-1574	Heat	Ferrite & Pearlite	76 HRBW	Pass	Longitudinal; 38.1 mm x WT	41,200	73,000	0.56	43

BSM-1574		Heat
	Standard	Test
ī	Sample Details	Impact Test
4	°C	Temp
	J	
	J	Impact
ı	J	Energy
-	AVG	
1	%	
1	%	% Shear
	%	ear
	AVG	
,	mm	
٠	mm	Lateral Expansion
1	mm	pansion
1	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.

Mill Test Certificate approved by:

2014 JAV 30

Paul Sowden, T.T.

Assistant QA Manager



Mill Test Certificate

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Fax: 001 (780) 469-6986 Tel: 001 (780) 469-6603

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Product Heat Number: BSM-1574 Product Size: 20 X 0.450 Production Date:

Jan 28, 2014

Production Method: Seamless Carbon Steel Pipe Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 000799

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 | NBRI-STEEL | NPS 20 X 0.450 | NCHWT SMLS 2014/01 NDE 1200PS

MUERGEDERNOEM HEAT BSM-1574 (PIPE # LENGTH MASS) 93.691b/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

	BSM-1574 Heat		Heat Test Type	
	7		ype	
	NPS 20 X 0.450in. WT		Product Size	Product: Details
	4		Pieces	
	DRL		Length	
	93.69	lb/ft	Mass	
	<5	μR/hr	Geiger	
	<10	Gauss	Res. Mag.	
	Pass	Insp.	Visual	
	Pass		OD	Z
	Pass	WT	TU	on-Destruc
Section 1	Pass	ASTM E213	TU	Non-Destructive Testing
The second secon	Pass	ASTM	ET	
	Pass	1200 PSI/ 5 s	HydroTest	
	32.5° Bevel	s Condition	End	

	BSM-1574	Heat	
	Blast Furnace; EAF; Ladle Refining; Vacuum Degas: Fully Killed	Steelmaking Method	
Product	Heat	Test Type	
0.22	0.20	С	
0.90	0.82	Mn	
0.90 0.017 0.015	0.013	Р	
0.015	0.013 0.008	S	Chemical Analysis (wt%)
0.30	0.30	Si	Analysis (
0.07	0.06	Cr	wt%)
0.01	0.01	Си	
0.00		Mo	
0.04	0.04	Ni	
0.003		٧	
0.005		Ti	
0.001		Nb	
0.0004		В	
0.39	1	CE(IIW)	
0.39	,	CE(CSA)	

(m)	Т	-	
BSM-1574		Heat	
Heat		Test Type	
Ferrite & Pearlite		Microstructure	
76 HRBW		Hardness	
Pass		Flattening Test	_
Longitudinal; 38.1 mm x WT	50mm GL	Tension Test	Mechanical Properties
41,200	psi	Yield (Rt0.5)	
73,000	psi	Tensile (Rm)	
0.56	(Rt0.5/Rm)	Τ/Υ	
43	%	Elongation (A)	

	1	, ,	, .		1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	T AVG		. AVG	. %	. % % AVG	AVG % AVG mm mm	- % % AVG mm
		J	ر		J AVG	J AVG /6	J AVG /6 /6	J AVG % %	%	% % AVG	% % AVG mm	% % AVG mm mm
ోం	_	-			N/C	NIC O	AVG %	AVC % %	2	200		2
Temp	Г		Impact	Impact Energy	Impact Energy	Impact Energy	nergy	Impact Energy % Shear	nergy	nergy	nergy %Shear	nergy

Additional Details:

- \checkmark 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.
- \prime This product has not come into contact with mercury during the Bri-Steel Manufacturing processes.
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Paul Sowden, T.T.

Assistant QA Manager