

Mill Test Certificate

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

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

www.brichemsteel.com

Product: Seamless Carbon Steel Pipe

Production Method:

Product Heat Number: BSM-1593

Product Size: 205100

Production Date: Jan 31, 2014

Hot Expansion Product Heat Treatment:

As-rolled

Certificate No.: MTR- 000830

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 SCH 100 1.281 INCHWT SMLS 2014/01 NDE

EXEMPLICATION NOTICE

**HEAT BSM-1593 (PIPE # LENGTH MASS) 256.1Ib/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

		Product: Details							Z	on-Destruc	Von-Destructive Testing			
Heat	Test Type	Product Size	Pieces	Length	Mass	Geiger	Res. Mag.	Visual	00	ΤU	TU T	ET	HydroTest	End
					lb/ft	μR/hr	Gauss	Insp.		TW	ASTM E213 ASTM	ASTM		Condition
BSM-1593	Heat	NPS 20 SCH 100 1.281in. WT	2	DRL	256.1	Ğ	<10	Pass	Pass	Pass	Pass	Pass	*	Plain End

						Chemical	Analysis (wt%)									
Heat	Steelmaking Method	Test Type	C	Mn	P	S	iS	Cr	Cu	Mo	<u>z</u> .	<	Ti	МЬ	В	CE(IIW)	CE(CSA)
BSM-1593	Blast Furnace; EAF; Ladle Refining; Vacuum	Heat	0.20	0.96	0.001	0.003	0.31	0.04	0.05	0.08	0.02	0.001	0.002	0.001	0.0004	1	ł
	Cegas, rong smed	Product	0.20	0.95	0.009	0.003	0.30	0.07	0.06	10.0	0.03	0.003	0.001	0,001	0.0003	0.38	0.38

	BSM-1593		ī	
	1593		Heat	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	Heat		Test Type	
	Ferrite & Pearlite		Microstructure	
	75 HRBW		Hardness	
	Pass		Flattening Test	
8.0	Longitudinal; 19.05 mm x WT	50mm GL	Tension Test	Mechanical Properties
	42,200	psi	Yield (Rt0.5)	
	70,500	psi	Tensile (Rm)	
	0.60	(Rt0.5/Rm)	1/4	
	48	%	Elongation (A)	

Heat	Test	Impact Test	Temp		Impact	Energy			% Shear	ear			Lateral Ex	pansion	
	Standard	Sample Details	°C	_	J	J	AVG	%	%	%	AVG	mm	mm	mm	AVG
BSM-1593		ı			1	ī	-	1	•		,	1		·	

Additional Details:

 \checkmark We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with 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.

√ 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.

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

Mill Test Certificate approved by:

FEB 0

Assistant QA Manager Paul Sowden, T.T.



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Product Heat Number: BSM-1593 Product Size: NPS 20 SCH 100 Production Date: Jan 31, 2014

ASME B36.10-2004, ASTM/ASME A106-2014/SA106-2013 Grade B/C NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009 MR0103-2012 Hot Expansion **Product Heat Treatment:** ThermoMechanical Formed Certificate No.: MTR- 001863

Product Markings

Product Standards: Production Method:

Product:

Seamless Carbon Steel Pipe

NPS 20 SCH 100 1.281 INCHWT SMLS 2014/01 NDE

HEAT BSM-1593 (PIPE # LENGTH MASS) 256.1Ib/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 Geiger Res. Mag. Visual OD UT UT ET HydroTest End BSM-1593 Heat NPS 20 SCH 100 1.281in. WT 2 DRL 256.1 <5 <10 Pass Pass <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>lysis (wt%)</th><th>Chemical Analysis (wt%)</th><th>유</th><th>E STEERSTER STEERS</th><th></th><th></th><th></th><th></th></td<>								lysis (wt%)	Chemical Analysis (wt%)	유	E STEERSTER STEERS				
Product: Details Non-Destructive Testing	Plain End	*	Pass	Pass	Pass	Pass	Pass	<10	ራ	256.1	DRL	2	NPS 20 SCH 100 1.281in. WT	Heat	BSM-1593
Product: Details Non-Destructive Testing Test Type Product Size Pieces Length Mass Geiger Res. Mag. Visual OD UT UT ET HydroTest	Condition		ASTM E309	ASTM E213	TW		Insp.	Gauss	μR/hr	lb/ft					
s	End	HydroTest	ET	u u	S	00	Visual	Res. Mag.	Geiger	Mass	Length	Pieces	Product Size	Test Type	Heat
				tive Testing	on-Destruc	N							Product: Details		

			BSM-1593	Heat
		Degas; rully killed	Blast Furnace; EAF; Ladle Refining; Vacuum	Steelmaking Method
		Product	Heat	Test Type
	1	0.20	0.20	C
	1	0.95	0.96	Mn
	,	0.009	0.001	P
Mechanical Properties		0.95 0.009 0.003 0.30	0.96 0.001 0.003	S
ical Prope		0.30	0.31	Si
erties	ŧ	0.07	0.04	ਪ
	ı	0.06	0.05	C
	,	0.01	0.08	Mo
	ı	0.03	0.02	Z
	ı	0.003	0.001	<
		0.001	0.002	11
		0.001	0.001	Νb
	,	0.0003	0.0004	В
	,	0.38	0.17	CE(IIW)
	1	0.39	0.08	CE(CSA)

48	0.60	70,500	42,200	Longitudinal; 0.75 in. x WT	Pass	75 HRBW	Ferrite & Pearlite	Heat	BSM-1593
%	(Rt0.5/Rm)	psi	psi	2 in. GL					
Elongation (A)	۲/۲	Tensile (Rm)	Yield (Rt0.5)	Tension Test	Flattening Test	Hardness	Microstructure	Test Type	Heat

BSM-1593		Heat
	Standard	Test
ł	Sample Details	Impact Test
1	റ്	Temp
ţ	J	
1	J	Impact Ener
٠	Ĺ	Energy
1	AVG	
1	%	
ż	%	% Shea
,	%	ear
t	AVG	
,	mm	
,	mm	Lateral Ex
•	mm	(pansion
ı	AVG	

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 and API Q1.

✓ 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.

 \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.

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

Mill Test Certificate approved by:

2015 July B

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