

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.bri-steel.com

Production Method: Product: Seamless Carbon Steel Pipe Hot Expansion

Product Heat Number: Product Heat Treatment: As-rolled

BSM-1620 Product Size: 20XS

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

Production Date:

Certificate No.: MTR- 001772

Product Markings

Product Standards:

NPS 20 XS 0.500 INCHWT 104.1LB/FT SMLS 2014/02 NDE 1890PSI

HEAT BSM-1620 (PIPE # LENGTH MASS) 104.11b/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

		Product: Details							7	lon-Destru	Non-Destructive Testing			
Heat	Test Type	Product Size	Pieces	Length	Mass	Geiger	Res. Mag.	;. Visual	90	TU	UT	ET	HydroTest	t End
					lb/ft	μR/hr	Gauss	Insp.		¥	ASTM E21	ASTM E213 ASTM E309 1890 PSI/		5 _S Condition
BSM-1620	Heat	NPS 20 XS 0.500in. WT	1	DRL	104.1	<5	<10	Pass	Pass	Pass	Pass	Pass	Pass	32.5° Bevel
					C	nemical An	Chemical Analysis (wt%)							
Heat	Stee	Steelmaking Method Te	Test Type (Mn	P	S	Si	Cu Cu	Mo	Z.	۷	Ti Nb	в с	CE(IIW) CE(CSA)

BSM-1620 Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed Product Heat 0.22 0.21 0.86 0.85 0.017 0.015 Mechanical Properties 0.013 0.016 0.26 0.22 0.05 0.04 0.01 0.01 0.00 0.04 0.04 0.002 0.002 0.001 0.0003 0.38 0.38

В	
BSM-1620	Heat
Heat	lest lype
Ferrite & Pearlite	Microstructure
74 HRBW	Hardness
Pass	Flattening Test
Longitudinal; 1.5 in. x WT	Tension Test 2 in. GL
43,100	Yield (Rt0.5)
74,500	Tensile (Rm) psi
0.58	γ/T (Rt0.5/Rm)
40	Elongation (A) %

Heat	Test	Impact Test	Temp		impact	Energy			15 %	Shear			Lateral Ex	quasion	
	Standard	Sample Details	°C	J	ſ	ſ	AVG	%	%	%	AVG	mm	mm	mm	AVG
BSM-1620			1		1		,		,		ŧ		,		,

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 Grade B/C 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-2009 NACE MR0103-2012 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.

Mill Test Certificate approved by:

Assistant QA Manager Tonya Lam, C.E.T.



Mill Test Certificate

Bri-Steel Manufacturing Inc. 2125-64 Avenue, Edmonton, AB Canada T6P 124 Fax: 001 (780) 469-6986 Tel: 001 (780) 469-6603

www.brichemsteel.com

Product: Seamless Carbon Steel Pipe

Product Heat Number:

BSM-1620

Production Date:

Feb 10, 2014

Production Method: Hot Expansion

Product Heat Treatment: As-rolled

Product Size: 20 X 0.450

Certificate No.: MTR- 000856

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

MASS) 93.69Ib/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

BSM-1620		Heat	
Heat		Test Type	
NPS 20 X 0,450in, WT		Product Size	Product: Details
1		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	Non-Destructive Testing
Pass	ASTM E213 ASTM	UΤ	tive Testing
Pass	ASTM	ET	
Pass	1890PSI/ 5 s	HydroTest	
32,5° Bevel	5 _S Condition	End	

	BSM-1620	Heat	
Coges, ruly nited	Blast Furnace; EAF; Ladle Refining; Vacuum	Steelmaking Method	
Product	Heat	Test Type	
0.22	0.21	С	
0.86	0.85	Μ'n	
0.017	0.015	P	
0.013	0.016	s	Chemical Analysis (wt%)
0.26	0.22	Si	Analysis {
0.05	0.04	Cr	wt%)
0.01	0.01	Cu	
0.00		Mo	
0.04	0.04	N.	
0.002		٧	
0.002		Ti	
0.001		Nb	
1 0.0003		В	
0.38	ı	CE(IIW)	
0.38	,	CE(CSA)	

BSM-1620 Heat Ferrite & Pearlite		Heat Test Type Microstructure	
74 HRBW		Hardness	
Pass		Flattening Test	7
Longitudinal; 38.1 mm x WT	50mm GL	Tension Test	Mechanical Properties
43,100	psi	Yield (Rt0.5)	
74,500	psi	Tensile (Rm)	
0.58	(Rt0.5/Rm)	γ/τ	
40	%	Elongation (A)	

BSM-1620		Heat
,	Standard	Test
ž.	Sample Details	Impact Test
ı	റ്	Temp
,	L.	
e.	_	Impact
ı	L	Energy
-	AVG	
	%	
,	%	% Shear
F	%	ear
t	AVG	
	mm	
c	mm	Lateral Ex
ť	mm	xpansion
,	AVG	

Additional Details:

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Souder 2014 FEB 12

Assistant QA Manager Paul Sowden, T.T.