

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

September 12, 2012

www.brichemsteel.com

Seamless Carbon Steel Pipe Product Heat Number: BSM-0470 Product Size: **NPS 20 XS** Production Date:

Production Method: Hot Expansion Product Heat Treatment: As-rolled Product:

Product Standards: ASME B36.10-2004, API 51-44th Ed. Grade B PSL1, 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 <API> 51-0898 API 51 GR B PSL1 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 20 XS HEAT BSM-0470 (PIPE # LENGTH MASS) 104.11b/ft NDE 1100PSI SMLS NACE MR0175 2012/09 MADE IN CANADA.

37.5° Bevel	Pass	Pass	Pass	Pass	Pass	Pass	<20	<5	104.10	DRL	47	XS	20	Heat	BSM-0470
Condition	/ E309 1100 psi/5s	ASTM E309	ASTM E213	¥Τ	OD	insp.	Gauss	μR/hr	lb/ft	Length	Pieces	Thickness	NPS	Test Type	Heat
End	HydroTest	ET	딕	UT		Visual	Res.Mag.	Geiger	Mass			Wall			
			esting	n-Destructive T	Non-C						5	Product Detail			

						Chemica	Analysis	(wt%)			300						
Heat	Steelmaking Method	Analysis	0	Mn	ס	S	IS	Cr	Сп	Мо	Ni	٧	Ħ	Nb	В	(IIW)	
70	Blast Furnace; EAF; Ladle Refining;	Heat	0.18	0.86	0.012	0.007	0.25	0.05	0.11	10.0	0.07	ı	ı	-	0.0004		
07.40-IAICG	Vacuum Degas; Fully Killed	Product	0.20	0.85	0.85 0.015 0.014	0.014	0.25	0.05	0.12	10.0	0.07	0.002	0.001	0.001	0.0002	0.37	

				Mechan	ical Properties					
			Hardness		Tension Test	Yield (Rt0.5)	Yield (Rp0.2)	Tensile (Rm)	Y/T	Elongation (A)
Heat	Test Type	Microstructure	HRBW	Flattening Test	50mm GL	psi	psi	psi	(Rt0.5/Rm)	%
BSM-0470	Heat	Ferrite & Pearlite	76	Pass	Longitudinal; 38.1mm x WT	44,900	45,000	71,500	0.63	46

Additional Details:

- and that the results meet the corresponding requirements. Inc. in accordance with API 5L-44th Ed., ASTM/ASME A/SA106-2011, A/SA53-2012 and the purchase order requirements, 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.

Mill Test Certificate approved by:

Kenton Dechant, P.Eng.

201+Sept 4

Manager of Quality and R&D



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Product: Seamless Carbon Steel Pipe

Product Heat Number:

BSM-0470

Product Size:

Production Date: September 12, 2012

NPS 20 XS

Production Method: Hot Expansion Product Heat Treatment: As-rolled

Product Standards: ASME B36.10-2004, API 5L-44th Ed. Grade B PSL1, 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 <API> SI-0898 API SI GR B PSL1 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 20 XS HEAT BSM-0470 (PIPE # LENGTH MASS) 104.11b/ft NDE 1100PSI SMLS NACE MR0175 2012/09 MADE IN CANADA.

BSM-0470	Heat		
Heat	Test Type		
20	NPS		P
XS	Thickness	Wall	Product Detail
47	Pieces		S
DRL	Length		
104.10	lb/ft	Mass	
<5	μR/hr	Geiger	
<20	Gauss	Res.Mag.	
Pass	Insp.	Visual	
Pass	OD		Non-E
Pass	₩Ţ	TU	n-Destructive 1
Pass	ASTM E213	UΤ	esting
Pass	ASTM E309 1	ET	
Pass	100	HydroTest	
37.5° Bevel	psi/5s Condition	End	

7				1			_		_
	Heat				0.140-14100	BSM-0470	Heat		
	Test Type				Vacuum I	Blast Furnace	Steelm		
	Microstructure				Vacuum Degas; Fully Killed	Blast Furnace; EAF; Ladle Refining;	Steelmaking Method		
	Jre				Product	Heat	Analysis		
and the second s	HRBW	Hardness			0.20	0.18	С		
-	W	ness			0.85	0.86	Mn		
	Flattening Test				0.85 0.015 0.014 0.25	0.012 0.007	Р		
	ng Test		Mechani		0.014	0.007	S		Chemical Analysis (wt%)
And in case of the last of the		Te	Mechanical Properties			0.25	Si		Analysis
-	50mm GL	Tension Test	rties		0.05 0.12	0.05	ଦ		(wt%)
The same of the sa		S‡			0.12	0.11	Cu		
A COLUMN TWO IS NOT THE OWNER, TH	psi	Yield (Rt0			0.01	0.01	Mo		
		5			0.07	0.07	Z.		
	psi	Yield (Rp0.2) Tensile (Rm)			0.002	•	٧		
) Tens			0.001	,	T		
	psi	ile (Rm)			0.001	٠	Nb		
	(Rt0.5/Rm	۲/۲			0.002 0.001 0.0002 0.37	0.0004	В		
	2	Elong			0.37	•	(IIW)	33	
	%	Elongation (A)			0.37		(CSA)	æ	

Additional Details:

BSM-0470

Heat

Ferrite & Pearlite Microstructure

HRBW 76

Pass

Longitudinal; 38.1mm x WT

44,900

45,000

71,500

0.63

46 %

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2014 Sept 4

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



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BSM-0470	Heat		
Heat	Test Type		
20	SdN		70
XS	Thickness	Wall	Product Detail
47	Pieces		5
DRL	Length		
104.10	lb/ft	Mass	
S.	µR/hr	Geiger	
<20	Gauss	Res.Mag.	
Pass	insp.	Visual	
Pass	99		Non-
Pass	TW	u	Destructive
Pass	ASTM E213	TU	Testing
Pass	ASTM E309	目	
Pass	1100 psi/5s	HydroTest	
37.5° Bevel	Condition	End	

	BSM-0470	Heat	
Vacuum Degas; Fully Killed	Blast Furnace; EAF; Ladle Refining;	Steelmaking Method	
Product	Heat	Analysis	
0.20	0.18	C	
0.85	0.86	N ₅	
0.015	0.012	р	
0.85 0.015 0.014 0.25	0.007	S	Chemical A
0.25	0.25	Si	Analysis (wt%
0.05	0.05	Cr	(wt%)
0.12	0.11	Cn	
0.01	0.01	Mo	
0.07	0.07	Z	
0.002	1	<	
0.001	,	Ⅎ	
0.001	ŧ	Nb	
0.0002	0.0004	В	
0.37	1	(IIW) CE	
0.37	,	CE (CSA)	

		-		_
	BSM-0470 Heat	Heat		
	Heat	Test Type	************	
	Ferrite & Pearlite	Microstructure		
	76	HRBW	Hardness	
	Pass	Flattening Test		Mechar
Longitudinal; 38.1mm x WT	Transverse; 38.1mm x WT	50mm GL	Tension Test	Mechanical Properties
44,900	46,500	psi	Yield (Rt0.5)	
45,000	45,300	psi	Yield (Rp0.2)	
71,500	73,000	psi	Tensile (Rm)	
0.63	0.64	(Rt0.5/Rm)	Y/T E	
46	45	%	longation (A)	

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