

## 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

Product. Seamless Carbon Steel Pipe

Product Heat Number:

September 17, 2012

Production Method: Hot Expansion

Product Heat Treatment: As-rolled

BSM-0472

Product Size: **NPS 20 XS** 

Production Date:

Product Standards: ASME 836.10-2004, API 5L-44th Ed. Grade 8 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 8 PSL1 A5TM/A5ME A/SA106 GR B/C A/SA53 GR B NPS 20 XS HEAT BSM-0472 (PIPE # LENGTH MASS) 104.11b/ft NDE 1100PSI SMLS NACE MR0175 2012/09 MADE IN CANADA.

BSM-0472	Heat		
Heat	Test Type		
20	NPS		
xs	Thickness	Wall	Product Detail
18	Pieces		S
DRL	Length		
104.10	lb/ft	Mass	
S	µR/hr	Geiger	
<20	Gauss	Res.Mag.	
Pass	insp.	Visual	
Pass	QD		Non-(
Pass	TW	TU	Destructive :
Pass	ASTM E213	TU	Testing
Pass	ASTM E309	ET	
Pass	1100 psi/5s	HydroTest	
37.5° Bevel	ss Condition	End	

++	0.05 0.05	0.01		Cr 0.07	Si 0.28	Chemica S 0.015	0.009	Mn 0.85	C 0.19	Analysis Heat	Steelmaking Method Blast Furnace; EAF, Ladle Refining;	Heat BSM-0472
Cale I may 1 1	V Ti	0,002	Ni V 0.05 - 0.06 0.002	Cu Mo Ni V 0.11 0.01 0.05 - 0.11 0.01 0.06 0.002	) Cu Mo Ni V 70.11 0.01 0.05 - 0.002	nalysis (wt%)       Si     Cr     Cu     Mo     Ni     V       0.28     0.07     0.11     0.01     0.05     -       0.24     0.06     0.11     0.01     0.06     0.002	nalysis (wt%)       Si     Cr     Cu     Mo     Ni     V       0.28     0.07     0.11     0.01     0.05     -       0.24     0.06     0.11     0.01     0.06     0.002	nalysis (wt%)       Si     Cr     Cu     Mo     Ni     V       0.28     0.07     0.11     0.01     0.05     -       0.24     0.06     0.11     0.01     0.06     0.002	Chemical Analysis (wt%)  Mn P S Si Cr Cu Mo Ni V  0.85 0.009 0.015 0.28 0.07 0.11 0.01 0.05 -  0.87 0.009 0.009 0.24 0.06 0.11 0.01 0.06 0.002	Chemical Analysis (wt%)           Mn         P         S         Si         Cr         Cu         Mo         Ni         V           0.85         0.009         0.015         0.28         0.07         0.11         0.01         0.05         -           0.87         0.009         0.009         0.24         0.06         0.11         0.01         0.06         0.002	Chemical Analysis (wt%)  S C Mn P S Si Cr Cu Mo Ni V  O.19 O.85 O.009 O.015 O.28 O.07 O.11 O.01 O.05 -  t O.20 O.87 O.009 O.009 O.24 O.06 O.11 O.01 O.06 O.002	Analysis   C   Mn   P   S   Cr   Cu   Mo   Ni   V
ا ا ا		0,002	Ni V	Cu Mo Ni V 0.11 0.01 0.05 - 0.11 0.01 0.06 0.002	) Cu Mo Ni V 70.11 0.01 0.05 - 0.002	nalysis (wt%)       Si     Cr     Cu     Mo     Ni     V       0.28     0.07     0.11     0.01     0.05     -       0.24     0.06     0.11     0.01     0.06     0.002	nalysis (wt%)       Si     Cr     Cu     Mo     Ni     V       0.28     0.07     0.11     0.01     0.05     -       0.24     0.06     0.11     0.01     0.06     0.002	nalysis (wt%)       Si     Cr     Cu     Mo     Ni     V       0.28     0.07     0.11     0.01     0.05     -       0.24     0.06     0.11     0.01     0.06     0.002	Chemical Analysis (wt%)  Mn P S Si Cr Cu Mo Ni V  0.85 0.009 0.015 0.28 0.07 0.11 0.01 0.05 -  0.87 0.009 0.009 0.24 0.06 0.11 0.01 0.06 0.002	Chemical Analysis (wt%)           Mn         P         S         Si         Cr         Cu         Mo         Ni         V           0.85         0.009         0.015         0.28         0.07         0.11         0.01         0.05         -           0.87         0.009         0.009         0.24         0.06         0.11         0.01         0.06         0.002	Chemical Analysis (wt%)  C Mn P S Si Cr Cu Mo Ni V  0.19 0.85 0.009 0.015 0.28 0.07 0.11 0.01 0.05 -  0.20 0.87 0.009 0.24 0.06 0.11 0.01 0.06 0.002	Analysis         C         Mn         P         S         Sj         Cr         Cu         Mo         Ni         V           Heat         0.19         0.85         0.009         0.015         0.28         0.07         0.11         0.01         0.05         -           Product         0.20         0.87         0.009         0.024         0.06         0.11         0.01         0.06         0.002

	BSM-0472 Heat	Heat		
	Heat	Test Type		-
	Ferrite & Pearlite	Microstructure		
	77	HRBW	Hardness	
	Pass	Flattening Test		Mechai
Longitudinal; 38.1mm x WT	Transverse; 38.1mm x WT	50mm GL	Tension Test	Mechanical Properties
46,300	44,100	psi	Yield (Rt0.5)	
46,300	42,200	psi	Yield (Rp0.2)	
73,500	73,000	psi	Tensile (Rm)	
0.63	0.60	(Rt0.5/Rm)	γ/τ	
44	44	%	Elongation (A)	

Additional Details:

- and that the results meet the corresponding requirements. Inc. in accordance with API SL-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:

2013 Apr3

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



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Production Date:

September 17, 2012

## Mill Test Certificate

Seamless Carbon Steel Pipe Product Heat Number: BSM-0472 Product Size: NPS 20 XS

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

Product:

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> 51-0898 API 5L GR B PSL1 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 20 XS HEAT BSM-0472 (PIPE # LENGTH MASS) 104.11b/ft NDE 1100PSI SMLS NACE MR0175 2012/09 MADE IN CANADA.

BSM-047	Heat		
2 Heat	Test Type		
20	NPS		
XS	Thickness	Wall	Product Detail
18	Pieces		ls
DRL	Length		
104.10	lb/ft	Mass	
\$	µR/hr	Geiger	
<20	Gauss	Res.Mag.	
Pass	Insp.	Visual	
Pass	OD		Non-l
Pass	WT	TU	Destructive
Pass	ASTM E213	TU	Testing
Pass	ASTM E309	ET	
Pass	1100 psi/5s	HydroTest	
37.5° Bevel	Condition	End	

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0.38	75.0	0.0002	0.002	0.001	0.002	0.06	0.01	0.11	0.06	0.24	0.009	0.009 0.009	0.87	0.20	Product	Vacuum Degas; Fully Killed	0011
	,	0.0004	1	,	,	0.05	0.01	0.11	0.07	0.28	0.015	0.009	0.85	0.19	Heat	Blast Furnace; EAF; Ladle Refining;	BSM-0472
(CSA	(IIW)	В	Νb	Ti	۷	N.	Mo	Cu	ರ	S	S	ъ	Ŋ,	0	Analysis	Steelmaking Method	Heat
Œ	E																
									s (wt%)	Analysis	Chemical Analysis (						

44	0.63	73,500	46,300	46,300	Longitudinal; 38.1mm x	Pass	777	Ferrite & Pearlite	Heat	BSM-0472
%	(Rt0.5/Rm)	psi	psi	psi	50mm GL	Flattening Test	HRBW	Microstructure	Test Type	Heat
Elongation (A)	Τ/Υ	Tensile (Rm)	Yield (Rp0.2)	Yield (Rt0.5)	Tension Test		Hardness			
					mical Properties	iviechan				

## Additional Details:

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- This certificate represents a quality control system that is compliant with EN 10204;2004 Type 3.1.

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Manager of Quality and R&D Kenton Dechant, P.Eng. 7014 Sept4