

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: BSM-0196

Product Size:

NPS 20 STD

Production Date:

February 7, 2012

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

ASTM/ASME A/SA106-2011 Grade B/C, A/SA53-2010 Grade B Type S, NACE MR0175-2009

Product Standards:

Product Markings: .BRI-STEEL MFG NPS 20 STD ASTM/ASME A/SA106 GR B/C A/SA53 GR B HEAT BSM-0196 (PIPE # LENGTH MASS) NDE 910PSI NACE MR0175 2012/02 MADE IN CANADA.

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BSM-0196	Heat		
Heat	Test Type		
20	NPS		P
STD	SCH		roduct Detai
10	Pieces		ls
DRL	Length		
78.60	lb/ft	Mass	
<5	μR/hr	Geiger	
<20	Gauss	Res.Mag.	
Pass	Insp.	Visual	
Pass	OD		Non-E
Pass	WT	TU	estructive T
3	ASTM E213	TU	esting
Pass	ASTM E309	ET	
Pass	910 psi/5s	HydroTest	
37.5° Bevel	Condition	End	

Heat Test Type Blast Furnace; EAF; Ladle C Mn P S Si Cr Cu Mo Ni V Ti Nb B (IIW) (CSA) BSM-0196 Heat Refining; Vacuum Degas 0.21 0.93 0.011 0.011 0.03 0.10 0.01 0.03 0.001 0.002 0.38 0.39		Т	-	
Steelmaking Method Chemical Analysis (wt%) CE CE <td>BSM-0196</td> <td>Heat</td> <td></td> <td></td>	BSM-0196	Heat		
Chemical Analysis (wt%) Chemical Analysis (wt%) CE Ni Ni Ni Ni Ni Ni Ni Ni Ni N	Heat	Test Type		
Chemical Analysis (wt%) Mn P S Si Cr Cu Mo Ni V Ti Nb B (IIW)	1 =:	Blast Furnace; EAF; Ladle	>	
Chemical Analysis (wt%) P S Si Cr Cu Mo Ni V Ti Nb B (IIW) 0.011 0.011 0.23 0.03 0.10 0.01 0.03 0.003 0.001 0.002 0.38	0.21	C		
Chemical Analysis (wt%) S Si Cr Cu Mo Ni V Ti Nb B (IIW) 0.011 0.23 0.03 0.10 0.01 0.03 0.001 0.002 0.0002 0.38	0.93	Mn		
Cu Mo Ni V Ti Nb B (IIW) 3 0.10 0.01 0.03 0.003 0.001 0.002 0.0002 0.38	0.011	Р		
Cu Mo Ni V Ti Nb B (IIW) 3 0.10 0.01 0.03 0.003 0.001 0.002 0.0002 0.38	0.011	S		Chemical
Cu Mo Ni V Ti Nb B (IIW) 3 0.10 0.01 0.03 0.003 0.001 0.002 0.0002 0.38	0.23	Si		Analysis
Mo Ni V Ti Nb B (IIW) 0.01 0.03 0.003 0.001 0.002 0.0002 0.38	0.03	Cr		(wt%)
Ni V Ti Nb B (IIW) 0.03 0.003 0.001 0.002 0.0002 0.38	0.10	Cu		
V Ti Nb B (IIW) 0.003 0.001 0.002 0.0002 0.38	0.01	Mo		
Ti Nb B (IIW) 0.001 0.002 0.0002 0.38	0.03	Z:		
Nb B (IIW) 0.0002 0.38	0.003	٧		
CE B (IIW) 0.0002 0.38		Ξ	- 170.0	
	0.002	Nb		
	0.0002	В		
CE (CSA) 0.39	0.38	(IIW)	Œ	
	0.39	(CSA)	Œ	

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	BSM-0196 Heat	Heat		
	Heat	Test Type	à	
	Ferrite & Pearlite	Microstructure		
	76	HRBW	Hardness	
	Pass	Flattening Test		Mechan
Longitudinal	Transverse	Flattening Test 50mm GL; 38mm x WT	Tension Test	Mechanical Properties
45,000	41,700	psi	Yield (Rt0.5)	
46,200	41,900	psi	Yield (Rp0.2)	
73,000	74,000	psi	Tensile (Rm)	
0.62	0.56	(Rt0.5/Rm)	Τ/Υ	
41	41	%	Elongation (A)	

Additional Details:

- results meet the corresponding requirements. Inc. in accordance with ASTM/ASME A/SA106-2011, A/SA53-2010 and the purchase order requirements, and that the 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. \prime No weld repairs have been performed on this product. This product has no mercury contamination.

This pipe product meet the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour

 $\checkmark~$ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Mill Test Certificate approved by:

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