




# Mill Test Certificate

Bri-Steel Manufacturing  
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Product: Seamless Carbon Steel Pipe      Product Heat Number: BSM-2604      Product Size: NPS 18 TRUE 40      Production Date: Dec 14, 2015  
 Production Method: Hot Expansion      Product Heat Treatment: As Rolled      Certificate No.: MTR- 002032  
 Product Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade BR PSL2, ASTM/ASME A106-2014/SA106-2013 Grade B Type 5, NACE MR0175-2009 MR0103-2012  
 Product Markings  
   
 <API & L/C No.> API SPEC 5L NPS 18 TRUE 40 0.562 INCHWT GR BR PSL2 SMLS 2015/12 NDE 1330PSI  
 HEAT BSM-2604 (PIPE # LENGTH MASS) 104.8lb/ft ASTM/ASME A/SA106 GR B NACE MR0175/MR0103 MADE IN CANADA

Product: Details				Non-Destructive Testing											
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Geiger μR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309	HydroTest 1330PSI/ 5 s	End Condition	
BSM-2604	Heat	NPS 18 TRUE 40 0.562in. WT	6	DRL	104.8	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	33° Bevel	

Heat	BSM-2604	Steelmaking Method Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed (at TPCO China)	Chemical Analysis (wt%)																		
			Test Type		C	Min	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)	
			Heat	Product	0.20	0.55	0.012	0.003	0.23	0.02	0.01	0.01	0.01	0.01	0.003	0.002	0.001	0.0001	0.30	-	0.31
						0.22	0.53	0.012	0.004	0.25	0.02 <td>0.01 <td>0.01 <td>0.01 <td>0.002 <td>0.001 <td>0.001 <td>0.0003 <td>0.32 <td>0.43 <td>0.33</td> </td></td></td></td></td></td></td></td></td>	0.01 <td>0.01 <td>0.01 <td>0.002 <td>0.001 <td>0.001 <td>0.0003 <td>0.32 <td>0.43 <td>0.33</td> </td></td></td></td></td></td></td></td>	0.01 <td>0.01 <td>0.002 <td>0.001 <td>0.001 <td>0.0003 <td>0.32 <td>0.43 <td>0.33</td> </td></td></td></td></td></td></td>	0.01 <td>0.002 <td>0.001 <td>0.001 <td>0.0003 <td>0.32 <td>0.43 <td>0.33</td> </td></td></td></td></td></td>	0.002 <td>0.001 <td>0.001 <td>0.0003 <td>0.32 <td>0.43 <td>0.33</td> </td></td></td></td></td>	0.001 <td>0.001 <td>0.0003 <td>0.32 <td>0.43 <td>0.33</td> </td></td></td></td>	0.001 <td>0.0003 <td>0.32 <td>0.43 <td>0.33</td> </td></td></td>	0.0003 <td>0.32 <td>0.43 <td>0.33</td> </td></td>	0.32 <td>0.43 <td>0.33</td> </td>	0.43 <td>0.33</td>	0.33
						0.21	0.53	0.012	0.004	0.26	0.02 <td>0.01 <td>0.01 <td>0.01 <td>0.002 <td>0.001 <td>0.001 <td>0.0003 <td>0.31 <td>0.43 <td>0.32</td> </td></td></td></td></td></td></td></td></td>	0.01 <td>0.01 <td>0.01 <td>0.002 <td>0.001 <td>0.001 <td>0.0003 <td>0.31 <td>0.43 <td>0.32</td> </td></td></td></td></td></td></td></td>	0.01 <td>0.01 <td>0.002 <td>0.001 <td>0.001 <td>0.0003 <td>0.31 <td>0.43 <td>0.32</td> </td></td></td></td></td></td></td>	0.01 <td>0.002 <td>0.001 <td>0.001 <td>0.0003 <td>0.31 <td>0.43 <td>0.32</td> </td></td></td></td></td></td>	0.002 <td>0.001 <td>0.001 <td>0.0003 <td>0.31 <td>0.43 <td>0.32</td> </td></td></td></td></td>	0.001 <td>0.001 <td>0.0003 <td>0.31 <td>0.43 <td>0.32</td> </td></td></td></td>	0.001 <td>0.0003 <td>0.31 <td>0.43 <td>0.32</td> </td></td></td>	0.0003 <td>0.31 <td>0.43 <td>0.32</td> </td></td>	0.31 <td>0.43 <td>0.32</td> </td>	0.43 <td>0.32</td>	0.32

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 2 in. GL	Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-2604	Heat	Ferrite & Pearlite	77 HRBW	Pass	Longitudinal; 1.5 in. x WT	47 000	68 500	0.69	45

Heat	BSM-2604	Test Standard	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)		Shear (%)	Lateral Expansion (mm)
					(3 Tests) AVG	(48/59/53) 53		
		API 5L PSL2	CVN Trans 10 x 10 mm	0	(20/20/20) 27	(10/20/20) 17	(0.75/1.00/0.75) 0.83	

**Additional Details:**

✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with API 5L-45th Ed., R ASTM/ASME A106-2014/SA106-2013, and the purchase order requirements, and that the results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO-9001:2008, API Q1, and PED 97/23/EC.

✓ 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.
- ✓ 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*  
 2016 Feb 25

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