



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3031 Product Size: NPS 24 STD Production Date: Jan 26, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003133
 Product Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade BN/X42N/X46N PSL2, CSA Z245.1-2014 Grade 244/290 CAT 1, ASTM/ASME A333-2016/SA333-2015 Grade 6 LT(M45C) A106-2014/SA106-2015 Grade B/C NDE, A53-2012/SA53-2015 Grade B Type S, NACE MR0175/ISO 15156-2:2009 MR0103/ISO 17495:2015
 Product Markings: <API & L/C No.> API SPEC 5L NPS 24 STD 0.375 INCHWT GR BN/X42N/X46N PSL2 SM15 2017/01 NDE 1300PSI
 HEAT BSM-3031 (PIPE # LENGTH MASS) 94.76lb/ft CSA Z245.1 GR 244/290 CAT 1 ASTM/ASME A/SA333 GR 6 LT(M45C) A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA



Product: Details										Non-Destructive Testing									
Heat	Test Type	Product Size	Pieces	Length	Mass lb/ft	Gelger µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT (WT)	UT	ET	HydroTest	End Condition					
BSM-3031	Heat	NPS 24 STD 0.375in. WT	8	DRL	94.76	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	35° Bevel					

Heat	BSM-3031	Steelmaking Method Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed (at TPCO China)	Chemical Analysis (wt%)																	
			Test Type		C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)/Max	CE(CSA)
			Heat	Product	0.15	1.06	0.014	0.003	0.25	0.06	0.01	0.01	0.01	0.038	0.002	0.002	0.0005	0.35	-	0.34
			0.17	1.08	0.016	0.002	0.26	0.06	0.02	0.01	0.01	0.039 <td>0.002 <td>0.001 <td>0.0004 <td>0.37 <td></td> <td>0.43 <td>0.37</td> </td></td></td></td></td>	0.002 <td>0.001 <td>0.0004 <td>0.37 <td></td> <td>0.43 <td>0.37</td> </td></td></td></td>	0.001 <td>0.0004 <td>0.37 <td></td> <td>0.43 <td>0.37</td> </td></td></td>	0.0004 <td>0.37 <td></td> <td>0.43 <td>0.37</td> </td></td>	0.37 <td></td> <td>0.43 <td>0.37</td> </td>		0.43 <td>0.37</td>	0.37	
			0.18	1.09	0.015	0.002	0.27	0.06	0.02	0.01	0.01	0.040 <td>0.002 <td>0.001 <td>0.0004 <td>0.39</td> <td></td> <td>0.43 <td>0.39</td> </td></td></td></td>	0.002 <td>0.001 <td>0.0004 <td>0.39</td> <td></td> <td>0.43 <td>0.39</td> </td></td></td>	0.001 <td>0.0004 <td>0.39</td> <td></td> <td>0.43 <td>0.39</td> </td></td>	0.0004 <td>0.39</td> <td></td> <td>0.43 <td>0.39</td> </td>	0.39		0.43 <td>0.39</td>	0.39	

Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 2 in. GL	Yield (Rt0.5) psi	Tensile (Rm) psi	V/T (Rt0.5/Rm)	Elongation (A) %
BSM-3031	Heat	Ferrite & Pearlite	77 HRBW	Pass	Longitudinal; 1.5 in. x WT	48 600	71 500	0.68	41
				Pass	Longitudinal; 1.5 in. x WT	48 200	72 000	0.67	45

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-3031	ASTM A333	Pass	CVN Long 10 x 7.5 mm	-48	(11/11/11) 14	(192/168/200) 187	(100/100/100) 100	(UNB/2.20/UNB) 2.20
BSM-3031	API 5L PSL2	Pass	CVN Trans 10 x 7.5 mm	0	(15/15/15) 20	(188/214/182) 195	(100/100/100) 100	(UNB/UNB/UNB) UNB

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., N CSA Z245.1-2014 Grade 244/290 CAT 1, ASTM/ASME A333-2016/SA333-2015, A106-2014/SA106-2015, A53-2012/SA53-2015, and the purchase order requirements, and that the results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO-9001:2008 (APIQR-1584), API Q1, and PED 2014/68/EU.
- ✓ 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/ISO 17495:2015 Section 13.1.
- ✓ 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:

T. Lam Feb 10/2017

Tonya Lam, P. Tech (Eng.)
 Assistant QA Manager