Mill Test Certificate

Bri-Steel Manufacturing
2125-64 Avenue, Edmonton, AB Canada T6P 1Z4
Tel: 001 (780) 469-6603
Fax: 001 (780) 469-6986
www.bri-steel.com

Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2602 Product Size: NPS 18 TRUE 40 Production Date: Dec 10, 2015

Production Method: Hot Expansion Product Heat Treatment: As Rolled Certificate No.: MTR- 002030

Product Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade BR PSL2, ASTM/ASME A106-2014/SA106-2013 Grade B Type S, 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-2602 (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 1330 PSI/ 5 s	End Condition
BSM-2602	Heat	NPS 18 TRUE 40 0.562in. WT	8	DRL	104.8	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	32° Bevel

Chemical Analysis (wt%)

Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-2602	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed (at TPCO China)	Heat	0.20	0.55	0.012	0.003	0.23	0.02	0.01	0.01	0.01	0.003	0.002	0.001	0.0001	0.30	-	0.31
		Product	0.22	0.53	0.013	0.004	0.25	0.02	0.01	0.01	0.01	0.001	0.001	0.001	0.0003	0.32	0.43	0.33
			0.21	0.53	0.012	0.004	0.25	0.02	0.01	0.01	0.01	0.001	0.001	0.001	0.0003	0.31	0.43	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-2602	Heat	Ferrite & Pearlite	77 HRBW	Pass	Longitudinal; 1.5 in. x WT	47 000	68 500	0.69	41

Heat	Test Standard	Impact Test Sample Details	T (°C)	Impact Energy Min. (J) (3 Tests) AVG	Impact Energy (J) (3 Tests) AVG	Shear (%) (3 Tests) AVG	Lateral Expansion (mm) (3 Tests) AVG
BSM-2602	API 5L PSL2	CVN Trans 10 x 10 mm	0	(20/20/20) 27	(29/21/48) 33	(5/5/5) 5	(0.30/0.20/0.81) 0.44

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:

2016 Feb 25

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