



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2846 Product Size: NPS 20 STD Production Date: Jul 20, 2016
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 002916
 Product Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade BN PSL2, ASTM/ASME A106-2014/SA106-2015 Grade B NDE, AS3-2012/SA53-2015 Grade B Type S, NACE MR0175/ISO 15156-2:2009
 MR0103/ISO 17495:2015



<API & L/C No.> API SPEC 5L NPS 20 STD 0.375 INCHWT GR BN PSL2 SMLS 2016/07 NDE 800PSI
 HEAT BSM-2846 (PIPE # LENGTH MASS) 78.6lb/ft ASTM/ASME A/SA106 GR B 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 ASTM E213	ET ASTM E309	HydroTest 800PSI/ 5 s	End Condition	
BSM-2846	Heat	NPS 20 STD 0.375in. WT	22	DRL	78.6	<5	<30	Pass	Pass	Pass	N12.5 Pass	-	Pass	30° Bevel	

Heat	Steelmaking Method	Test Type	Chemical Analysis (wt%)															
			C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)/Max	CE(CSA)
			0.17	1.12	0.016	0.004	0.31	0.04	0.02	0.01	0.01	0.059	0.002	0.001	0.0004	0.38	-	0.38
BSM-2846	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed (at TPCO China)	Heat	0.18	1.13	0.020	0.005	0.34	0.04	0.02	0.01	0.01	0.058	0.002	0.001	0.0003	0.39	0.43	0.40
		Product	0.18	1.13	0.019	0.005	0.34	0.04	0.01	0.01	0.01	0.058	0.002	0.001	0.0003	0.39	0.43	0.40

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-2846	Heat	Ferrite & Pearlite	84 HRBW	Pass	Longitudinal; 1.5 in. x WT	58 000	79 500	0.73	38

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)		Shear (%)	Lateral Expansion (mm)
					(3 Tests) AVG	(3 Tests) AVG		
BSM-2846	API 5L PSL2	Pass	CVN Trans 10 x 7.5 mm	0	(15/15/15) 20	(116/108/118) 114	(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 ASTM/ASME A106-2014/SA106-2015, AS3-2012/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 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/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
 Tonya Lam, P. Tech (Eng.)
 Assistant QA Manager

July 12/27/2016