




Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3235 Product Size: NPS 20 SCH 60 Production Date: Aug 28, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003492
 Product Standards: ASME B36.10M-2015, API 5L-45th Ed. GradeB/X42/X46 PSL1, 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 15156-2:2015 MR0103/ISO 17495:2015
 Product Markings:  <API & L/C No.> API SPEC 5L NPS 20 SCH 60 0.812 INCHWT GRB/X42/X46 PSL1 SMLS 2017/08 NDE 2970PSI
 HEAT BSM-3235 (PIPE # LENGTH MASS) 166.52lb/ft 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	Geiger μ R/hr	Res. Mag. Gauss	Visual Insp.	OD	UT (WT) ASTM E114	UT ASTM E213	ET ASTM E309	HydroTest 2970psi/ 5s	End Condition	
BSM-3235	Heat	NPS 20 SCH 60 0.812in. WT	20	DRL	166.52	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	Plain End	

Chemical Analysis (wt%)																			
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	Mn/C	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-3235	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed (at TPCO China)	Heat	0.16	1.26	0.016	0.002	0.32	0.03	0.03	0.02	0.01	0.038	0.003	0.004	0.0003	7.88	0.39	-	0.39
		Product	0.17	1.26	0.015	0.006	0.34	0.03	0.03	0.01	0.01	0.039	0.002	0.001	0.0003	7.41	0.40	-	0.40
			0.17	1.26	0.018	0.006	0.35	0.03	0.03	0.00	0.01	0.038	0.004	0.001	0.0004	7.41	0.40	-	0.40

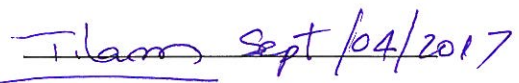
Mechanical Properties									
Heat	Test Type	Microstructure	Hardness	Flattening Test	Tension Test 2 in. GL	Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-3235	Heat	Ferrite & Pearlite	80 HRBW	Pass	Longitudinal; 0.5 in. Round Bar	53 500	77 500	0.69	37
				Pass	Longitudinal; 0.5 in. Round Bar	52 000	78 500	0.66	35

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
					(3 Tests) AVG	(3 Tests) AVG	(3 Tests) AVG	(3 Tests) AVG
BSM-3235	ASTM A333	Pass	CVN Long 8STR 10x10mm	-45	(14/14/14) 18	(54/30/32) 39	(10/5/5) 7	(0.80/0.43/0.50) 0.58

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with GRX42X46 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 9001:2015 (APIQR-1584), API Q1, and PED 2014/68/EU.
- ✓ This pipe product meets the **SOUR SERVICE** requirements of ANSI/NACE MR0175/ISO 15156-2A:2015 (Annex A2 for Region 3 Sour Service), and ANSI/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:


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