




Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3088 Product Size: NPS 20 TRUE 40 Production Date: Mar 16, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003253
 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 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 20 TRUE 40 0.594 INCHWT GRB/X42/X46 PSL1 SMLS 2017/03 NDE 2790PSI
 HEAT BSM-3088 (PIPE # LENGTH MASS) 123.24lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) 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	ET	HydroTest	End Condition
BSM-3088	Heat	NPS 20 TRUE 40 0.594in. WT	3	DRL	123.24	<5	<28	Pass	Pass	Pass	N12.5 Pass	-	Pass	Plain End

Heat	BSM-3088	Steelmaking Method Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed (at HVT Vallin China)	Chemical Analysis (wt%)																	
			Test Type		C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIIW)Max	CE(CSA)
			Heat	Product	0.16	0.99	0.013	0.004	0.27	0.09	0.04	0.04	0.02	0.036	0.002	0.001	0.0005	0.36	-	0.36
			0.15	0.98	0.016	0.004	0.27	0.09	0.03	0.04	0.02	0.004	0.002	0.001	0.0004	0.35	-	0.35		
			0.15	1.00	0.016	0.003	0.28	0.08	0.04	0.04	0.02	0.004	0.002	0.001	0.0003	0.35	-	0.33		

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-3088	Heat	Ferrite & Pearlite	75 HRBW	Pass	Longitudinal: 1.5 in. x WT Longitudinal: 1.5 in. x WT	49 300	70 500	0.70	47
				Pass		47 300	69 000	0.69	47

Heat	Test Type	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-3088	Standard	Pass	CVN Long 10 x 10 mm	-45	(3 Tests) AVG (14/14/14) 18	(3 Tests) AVG (128/102/128) 119	(30/20/30) 27	(3 Tests) AVG (1.95/1.60/1.92) 1.82

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 9001:2008 (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 MAR 23 2017

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