Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3200 Product Size: NPS 16 SCH 100 Production Date: Jul 20, 2017

Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003417

Product Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade BN/X42N/X46N/X52N PSL2, ASTM/ASME A106-2014/SA106-2015 Grade B 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 16 SCH 100 1.031 INCHWT GR BN/X42N/X46N/X52N PSL2 SMLS 2017/07 NDE 2970PSI
HEAT BSM-3200 (PIPE # LENGTH MASS) 164.99lb/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	Geiger µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT (WT) ASTM E114	UT ASTM E213	ET ASTM E309	HydroTest 2970PSI/ 5 s	End Condition
BSM-3200	Heat	NPS 16 SCH 100 1.031in. WT	4	DRL	164.99	<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	CE(IIW)	CE(IIW)Max	CE(CSA)
BSM-3200	Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed (at HYST Valin China)	Heat	0.14	1.40	0.010	0.003	0.31	0.05	0.07	0.01	0.02	0.003	0.026	0.038	0.0001	0.39	-	0.37
		Product	0.16	1.41	0.013	0.005	0.34	0.06	0.06	0.02	0.02	0.005	0.027	0.045	0.0005	0.42	0.43	0.42
			0.15	1.40	0.012	0.005	0.34	0.07	0.06	0.02	0.02	0.005	0.026	0.044	0.0005	0.41	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	Y/T (Rt0.5/Rm)	Elongation (A) %
BSM-3200	Heat	Ferrite & Pearlite	94 HRBW	Pass	Longitudinal; 0.5 in. Round Bar	82 000	96 500	0.85	34

Heat	Test Standard	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J) (3 Tests) AVG	Impact Energy Results (J) (3 Tests) AVG	Shear (%) (3 Tests) AVG	Lateral Expansion (mm) (3 Tests) AVG
BSM-3200	API 5L PSL2	Pass	CVN Trans 8STR 10x10mm	0	(20/20/20) 27	(178/180/182) 180	(80/80/80) 80	(1.83/1.81/UNB) 1.82

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, 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:

T. Lam July 26/2017

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