



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1654 Product Size: NPS 16 XS Production Date: Feb 20, 2014
Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 002911

Product Standards: ASME B36.10M-2015, API 5L-45th Ed. GradeB/X42 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 15156-2:2009 MR0103/ISO 17495:2015

Product Markings
 <API & L/C No > API SPEC 5L NPS 16 XS 0.500 INCHWT GRB/X42 PSL1 SMLS 2014/02 NDE 2240PSI
HEAT BSM-1654 (PIPE # LENGTH MASS) 82.77lb/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 µR/hr	Res. Mag. Gauss	Visual Insp.	OD	UT WT	UT ASTM E213	ET ASTM E309 2240PSI/ 5 s	HydroTest	End Condition
BSM-1654	Heat	NPS 16 XS 0.500in. WT	3	DRL	82.77	<5	<10	Pass	Pass	Pass	N12.5 Pass	-	Pass	34° Bevel

Chemical Analysis (wt%)														
Heat	Steelmaking Method	Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb
			Heat	0.20	0.87	0.015	0.004	0.25	0.06	0.06	0.01	0.04	-	-
			Product	0.21	0.87	0.014	0.005	0.25	0.05	0.07	0.02	0.04	0.003	0.001
BSM-1654	Blast Furnace, EAF, ladle Refining: Vacuum Degass, Fully Killed (at TPCCO China)			-	-	-	-	-	-	-	-	-	-	-


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-1654	Heat	Ferrite & Pearlite	77 HRBW	Pass	Longitudinal; 1.5 in. x WT	45 200	74 000	0.61	43

Heat	Test	Result	Impact Test Sample Details	Temp °C	Impact Energy Min. (J)	Impact Energy Results (J)	Shear (%)	Lateral Expansion (mm)
BSM-1654	ASTM A333	Pass	CVN Long 10 x 10 mm	-45	(3 Tests) AVG (14/14/14) 18	(3 Tests) AVG (18/24/31) 24	(3 Tests) AVG (0/5/5) 3	(3 Tests) AVG (0.25/0.43/0.58) 0.42

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with GRX42 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 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:


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


July 21/2016