



Mill Test Certificate

Bri-Steel Manufacturing
 2125-64 Avenue, Edmonton, AB Canada T6P 1Z4
 Tel: 001 (780) 469-6603
 Fax: 001 (780) 469-6986
 www.bri-steel.com

Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2660 Product Size: NPS 20 TRUE 80 Production Date: Mar 01, 2016
 Production Method: Hot Expansion Product Heat Treatment: As Rolled Certificate No.: MTR- 002101
 Product Standards: ASME B36.10M-2015, ASTM/ASME A333-2015/SA333-2013 Grade 6 LT(M45C) A106-2014/SA106-2013 Grade B NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009
 MR0103-2012
 Product Markings: NPS 20 TRUE 80 1.031 INCHWT SMLS 2016/03 NDE 2200PSI
 HEAT BSM-2660 (PIPE # LENGTH MASS) 208.9lb/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	Geiger	Res. Mag.	Visual Insp.	OD	UT WT	UT	ET	HydroTest	End Condition			
BSM-2660	Heat	NPS 20 TRUE 80 1.031in. WT	9	DRL	208.9	<5	<20	Pass	Pass	Pass	N12.5 Pass	-	2200 PSI/ 5 s	Pass	Plain End		

Heat	BSM-2660	Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed	Steelmaking Method	Chemical Analysis (wt%)																
				Test Type	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	CE(IIW)	CE(IIW)Max	CE(CSA)
Heat	Heat	Product		0.18	1.15	0.016	0.004	0.25	0.03	0.01	0.01	0.01	0.01	0.050	0.002	0.001	0.0001	0.39	-	0.39
				0.18	1.13	0.016	0.004	0.26	0.05	0.01	0.01	0.01	0.01	0.058	0.001	0.001	0.0002	0.39	-	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	Elongation (A) %	
BSM-2660	Heat	Ferrite & Pearlite	87 HRBW	Pass	Longitudinal; 0.5 in. Round Bar	60 500	81 000	0.75	39	
				Pass	Longitudinal; 0.5 in. Round Bar	59 000	80 500	0.73	37	

Heat	BSM-2660	Test Standard	ASTM A333	Impact Test Sample Details	Temp °C	Impact Energy (J)		Lateral Expansion (mm)	
						(3 Tests) AVG	(91/72/84) 82		
				CVN Long 10 x 10 mm	-45	(14/14/14) 18	(91/72/84) 82	(3 Tests) AVG (20/15/20) 18	(3 Tests) AVG (1.37/1.06/1.26) 1.23

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with ASTM/ASME A333-2015/SA333-2013, A106-2014/SA106-2013, A53-2012/SA53-2013, and the purchase order requirements, and that the results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO-9001:2008, 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 MR0103-2012 Section 2.1
- ✓ 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:

Tilman
 March 10/2/2016

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