



Mill Test Certificate

Bri-Steel Manufacturing
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Product: **Seamless Alloy Steel Pipe** Product Heat Number: **BSM-2945** Product Size: **NPS 28 X 1.010** Production Date: **November 7, 2016**

Production Method: **Hot Expansion** Product Heat Treatment: **Normalized (1060°C/20min) and Tempered (770°C/90min)** MTR Certificate: **003036**

Product Standards: **ASME B36.10-2004, ASTM A335/ASME SA335-2015 GRADE P91**

Product Markings: **BRI-STEEL MFG ASTM/ASME A/SA335 GR P91 NPS 28 X 1.010 inchWT**
HEAT BSM-2945 (PIPE # LENGTH MASS) 291.1lb/ft NDE(UT) 2600PSI SMIS 2016/11 MADE IN CANADA.

Product Details										Non-Destructive Testing										
Heat	Test Type	Product Size*	Pieces	Length	Mass	Geiger	Res. Mag.	Visual	OD	UT	UT	ET	HydroTest	End						
BSM-2945	Heat	NPS 28 X 1.010 in.WT	8	DRL	291.10	µR/hr	Gauss	Insp.	Pass	Pass	Pass	ASTM E213	ASTM E309	2600 psi/5s	Condition					
Chemical Analysis (wt%)																				
Steelmaking Method		Analysis	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	N	Al	Zr		
		Heat	0.09	0.43	0.010	0.002	0.27	8.52	0.03	0.98	0.16	0.190	0.001	0.07	0.0005	0.038	0.003	0.002		
Blast Furnace; EAF; Ladle Refining;		Product	0.09	0.42	0.009	0.001	0.27	8.39	0.04	1.00	0.16	0.192	0.002	0.09	0.0005	*	*	*		
Vacuum Degas; Fully Killed		Product	0.08	0.42	0.010	0.001	0.29	8.56	0.04	1.00	0.16	0.193	0.002	0.09	0.0004	*	*	*		
Mechanical Properties																				
Microstructure				Hardness		Flattening Test		Tension Test				Yield (Rt0.5)		Tensile (Rm)		Y/T		Elongation (A)		
Tempered Martensite & Fine Carbides				HBW		Pass		50mm GL				psi		psi		(Rt0.5/Rm)		%		
				216				Longitudinal; 12.7mm Round Bar				86,400		104,900		0.82		26		
								Longitudinal; 12.7mm Round Bar				81,300		101,100		0.80		28		

- Additional Details:
- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with ASTM/ASME A/SA335-2015, and the purchase order requirements, and that the results meet the corresponding requirements.
 - ✓ 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.
 - ✓ No weld repairs have been performed on this product.
 - ✓ Bri-Steel Manufacturing is registered and certified to ISO-9001:2008, API Q1 and PED 97/23/EC.

Mill Test Certificate approved by:

Kenton Dechant
 2016 Nov 15

Kenton Dechant, P.Eng.
 Manager of Quality and R&D

* The product analysis instrument was not capable of measuring this element.