



Mill Test Certificate

Bri-Steel Manufacturing
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Product: **Seamless Alloy Steel Pipe** Product Heat Number: **BSM-2985** Product Size: **NPS 28 X 1.010** Production Date: **December 6, 2016**

Production Method: **Hot Expansion** Product Heat Treatment: **Normalized (1060°C/25min) and Tempered (770°C/90min)** MTR Certificate: **003082**

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 (0.884 inch Min Wall)**
HEAT BSM-2985 (PIPE # LENGTH MASS) 291.1lb/ft NDE(UT) SMIS 2016/12 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-2985	Heat	NPS 28 X 1.010 in. WT	1	SRL	lb/ft	µR/hr	Gauss	Insp.	Pass	Pass	Pass	ASTM E213	ASTM E309	Condition				
Chemical Analysis (wt%)																		
Steelmaking Method	Analysis	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	N	Al	Zr	N:Al
		Heat	0.09	0.42	0.011	0.002	0.28	8.69	0.02	0.99	0.16	0.190	0.001	0.070	0.0005	0.045	0.002	0.002
Refining: Vacuum Degass, Fully Killed	Product	0.08	0.46	0.012	0.006	0.28	8.41	0.02	0.93	0.14	0.189	0.001	0.084	0.0005	*	*	*	*
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mechanical Properties																		
Microstructure	Hardness	HRBW	Flattening Test	Tension Test		Yield (Rt0.5)	Tensile (Rm)	Y/T	Elongation (A)									
				50mm GI	psi													
Tempered Martensite & Fine Carbides	98	Pass	Pass	Longitudinal; 12.7mm Round Bar	-	88,900	105,800	0.84	26									
				-	-													

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.
- ✓ Heat Treatment was performed after all hot forming operations.

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

Mill Test Certificate approved by:

[Signature]
 2016 Dec 9

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