



# Mill Test Certificate

**Bri-Steel Manufacturing**  
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Product: **Seamless Alloy Steel Pipe** Product Heat Number: **BSM-2984** 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: **003081**


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-2984 (PIPE # LENGTH MASS) 291.1lb/ft NDE(UT) SMLS 2016/12 MADE IN CANADA.**

Product Details				Non-Destructive Testing														
Heat	Test Type	Product Size	Pieces	Length	Mass	Geiger	Res. Mag.	Visual	OD	WT	UT	UT	ET	HydroTest	End Condition			
BSM-2984	Heat	NPS 28 X 1.010 In. WT	1	SRL	lb/ft	µR/hr	Gauss	Insp.	Pass	Pass	Pass	ASTM E213	ASTM E309	-	PE			
<b>Chemical Analysis (wt%)</b>																		
Steelmaking Method	Analysis	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	B	N	Al	Zr	N:Al
Blast Furnace, EAF, Ladle	Heat	0.11	0.41	0.015	0.004	0.34	8.61	0.05	0.94	0.11	0.200	0.005	0.070	0.0001	0.049	0.005	0.001	9.8
Refining: Vacuum Degass: Fully Killed	Product	0.10	0.51	0.012	0.001	0.22	8.47	0.03	0.94	0.14	0.199	0.002	0.084	0.0005	*	*	*	*
<b>Mechanical Properties</b>																		
Microstructure	Hardness HRBW	Flattening Test	Tension Test		Yield (Rt0.5) psi	Tensile (Rm) psi	Y/T (Rt0.5/Rm)	Elongation (A) %										
			50mm GL	12.7mm Round Bar														
Tempered Martensite & Fine Carbides	95	Pass	-	-	84,400	99,100	0.85	29										

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:  
  
 Kenton Dechant, P.Eng.  
 Manager of Quality and R&D  
 2016 Dec 9