



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

## Mill Test Certificate

Product: **Seamless Alloy Steel Pipe**    Product Heat Number: **BSM-2939**    Product Size: **NPS 18 SCH 60**    Production Date: **November 7, 2016**  
 Production Method: **Hot Expansion**    Product Heat Treatment: **Normalized (1060°C/20min) and Tempered (770°C/90min)**    MTR Certificate: **003029**


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 18 SCH 60 0.750 inchWT**  
**HEAT BSM-2939 (PIPE # LENGTH MASS) 138.2lb/ft NDE(UT) 2800 PSI SMLS NACE MR0175/MR0103 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	Hydro Test	End				
BSM-2939	Heat	NPS 18 SCH 60 0.750 in. WT	4	DRL	138.20	<5	<20	Pass	Pass	Pass	ASTM E213	ASTM E309	2800 psi/5s	Condition				
<b>Chemical Analysis (wt%)</b>																		
Steelmaking Method		Analysis	C	Mn	P	S	Si	Cr	Cu	Mo	Ni	V	Ti	Nb	Al	Zr		
		Heat	0.10	0.42	0.012	0.003	0.29	8.55	0.04	0.99	0.16	0.190	0.001	0.08	0.0005	0.042	0.001	
Blast Furnace; EAF; Ladle Refining;		Product	0.08	0.42	0.012	0.003	0.29	8.56	0.05	0.96	0.15	0.185	0.002	0.08	0.0005	*	*	
Vacuum Degass; Fully Killed		Product	0.08	0.42	0.011	0.003	0.29	8.65	0.05	0.95	0.16	0.192	0.002	0.08	0.0004	*	*	
<b>Mechanical Properties</b>																		
Microstructure		Hardness	HBW		210		Flattening Test		Tension Test		Yield (RT0.5)		Tensile (Rm)		Y/T		Elongation (A)	
Tempered Martensite & Fine Carbides		Pass		50mm GL		Longitudinal; 12.7mm Round Bar		Longitudinal; 12.7mm Round Bar		psi		psi		(RT0.5/Rm)		%		
		Pass		Pass		Pass		Pass		89,300		105,400		0.85		28		
		Pass		Pass		Pass		Pass		90,600		107,100		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.

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

Mill Test Certificate approved by:  
  
 2016 Nov 14  
 Kenton Dechant, P.Eng.  
 Manager of Quality and R&D