



Mill Test Certificate

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

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-1138** Product Size: **NPS 18 TRUE80** Production Date: **August 7, 2013**

Production Method: **Hot Expansion** Product Heat Treatment: **As-rolled**

Product Standards: **ASME B36.10-2004, ASTM/ASME A/SA106-2011 Grade B NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **BRI-STEEL MFG ASTM/ASME A/SA106 GR B A/SA53 GR B NPS 18 TRUE80 0.94 inchWT HEAT BSM-1138 (PIPE # LENGTH MASS) 170.8lb/ft NDE SMLS NACE MR0175 2013/08 MADE IN CANADA.**

| Product Details | | | | Non-Destructive Testing | | | | | | | | | | |
|-----------------|-----------|---------------------------|--------|-------------------------|------------|---------------|-----------------|--------------|---------|------------|-------------------|-------------------|-----------|---------------|
| Heat | Test Type | Product Size | Pieces | Length | Mass lb/ft | Geiger R/R/hr | Res. Mag. Gauss | Visual Insp. | OD Pass | UT WT Pass | UT ASTM E213 Pass | ET ASTM E309 Pass | HydroTest | End Condition |
| BSM-1138 | Heat | NPS 18 TRUE80 0.94 in. WT | 2 | DRL | 170.80 | <5 | <20 | Pass | Pass | Pass | Pass | Pass | * | Plain End |

| Chemical Analysis (wt%) | | | | | | | | | | | | | | | | | |
|-------------------------|--|----------|------|------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|----------|----------|
| Heat | Steelmaking Method | Analysis | C | Mn | P | S | Si | Cr | Cu | Mo | Ni | V | Ti | Nb | B | CE (lim) | CE (CSA) |
| BSM-1138 | Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed | Heat | 0.20 | 0.92 | 0.016 | 0.001 | 0.33 | 0.06 | 0.07 | 0.06 | 0.02 | 0.005 | 0.002 | 0.001 | 0.0003 | - | - |
| | | Product | 0.21 | 0.93 | 0.018 | 0.005 | 0.30 | 0.05 | 0.06 | 0.01 | 0.03 | 0.003 | 0.002 | 0.001 | 0.0001 | 0.38 | 0.39 |

| Mechanical Properties | | | | | | | | | | |
|-----------------------|---------------|----------------------------|---------------|-----------------|---------------------------|-------------------|------------------|----------------|----------------------|-----|
| Heat | Test Type | Microstructure | Hardness HRBW | Flattening Test | Tension Test 50mm GL | Yield (Rt0.5) psi | Tensile (Rm) psi | V/T (Rt0.5/Rm) | Elongation (A) % | |
| BSM-1138 | Heat | Ferrite & Pearlite | 77 | Pass | Longitudinal; 38.1mm x WT | 47,400 | 69,000 | 0.69 | 57 | |
| Heat | Test Standard | Impact Test Sample Details | Temp °C | J | Impact Energy | % Shear | AVG | mm | Lateral Expansion mm | AVG |
| BSM-1138 | - | - | - | - | - | - | - | - | - | - |

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/SA106-2011, A/SA53-2012, and the purchase order requirements, and that the results meet the corresponding requirements.
- ✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and NACE MR0103-2010 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.

*Note that this product was hydrotested to 1000 psi for 5 seconds.

Mill Test Certificate approved by:

[Signature]

2013 AUG 15

Paul Sowden, T.T.
 Assistant QA Manager

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