



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

Mill Test Certificate

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0938** Product Size: **NPS 22 STD** Production Date: **May 28, 2013**

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

Product Standards: **ASME B36.10-2004, API 5L-44th Ed. Grade B PSL1, ASTM/ASME A/SA106-2011 Grade B/C, NACE MR0175-2009, MR0103-2010**

Product Markings: **BRI-STEEL MFG <API> 5L-0898 API 5L GR B PSL1 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 22 STD 0.375 inchWT HEAT BSM-0938 (PIPE # LENGTH MASS) 86.61lb/ft NDE 800 PSI SMILS NACE MR0175 2013/05 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-0938 | Heat | NPS 22 STD 0.375 in. WT | 1 | DRL | 86.61 lb/ft | µR/hr | Gauss | Insp. | Pass | Pass | Pass | Pass | 800 psi/5s | Condition |
| | | | | | | <5 | <20 | Pass | Pass | Pass | Pass | Pass | Pass | 32.5° Bevel |

| Chemical Analysis (wt%) | | | | | | | | | | | | | | | | | |
|-------------------------|---|----------|------|------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|------|------|
| Heat | Steelmaking Method | Analysis | C | Mn | P | S | Si | Cr | Cu | Mo | Ni | V | Ti | Nb | B | CE | CE |
| BSM-0938 | Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed | Heat | 0.19 | 0.86 | 0.008 | 0.005 | 0.24 | 0.03 | 0.08 | 0.02 | 0.05 | - | - | - | 0.0003 | - | - |
| | | Product | 0.20 | 0.86 | 0.008 | 0.006 | 0.24 | 0.03 | 0.09 | 0.02 | 0.04 | 0.001 | 0.002 | 0.001 | 0.0002 | 0.36 | 0.37 |

| Mechanical Properties | | | | | | | | | | | | | | |
|-----------------------|---------------|--------------------|----------|-----------------|---------------------------|-------------------|--------------|------------|----------------|----|----|----|----|-----|
| Heat | Test Type | Microstructure | Hardness | Flattening Test | Tension Test | Yield (Rt0.5) | Tensile (Rm) | Y/T | Elongation (A) | | | | | |
| BSM-0938 | Heat | Ferrite & Pearlite | HRBW | Pass | 50mm GL | psi | psi | (Rt0.5/Rm) | % | | | | | |
| | | | 78 | | Longitudinal; 38.1mm x WT | 51,500 | 74,500 | 0.69 | 43 | | | | | |
| Heat | Test Standard | Impact Test | Temp | Impact Energy | % Shear | Lateral Expansion | AVG | mm | mm | mm | mm | mm | mm | AVG |
| BSM-0938 | - | Sample Details | °C | J | % | mm | mm | mm | mm | mm | mm | mm | mm | AVG |
| | | | - | - | - | - | - | - | - | - | - | - | - | - |

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-44th Ed., 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.

Mill Test Certificate approved by:

2013 MAY 31

Paul Sowden, T.T.
 Assistant QA Manager