



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-1091** Product Size: **NPS 20 STD** Production Date: **July 22, 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 NDE, A/SA53-2012 Grade B Type S, 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 20 STD 0.375 inchWT HEAT BSM-1091 (PIPE # LENGTH MASS) 78.6lb/ft NDE 900 PSI SMLS NACE MR0175 2013/07 MADE IN CANADA.**

| Product Details | | | | Non-Destructive Testing | | | | | | | | | | |
|-----------------|-----------|-------------------------|--------|-------------------------|------------|-------------------|-----------------|--------------|------|-------|---------|--------------|----------------------|---------------|
| Heat | Test Type | Product Size | Pieces | Length | Mass lb/ft | Geiger μ R/hr | Res. Mag. Gauss | Visual Insp. | OD | UT WT | UT Pass | ET ASTM E309 | HydroTest 900 psi/5s | End Condition |
| BSM-1091 | Heat | NPS 20 STD 0.375 in. WT | 3 | DRL | 78.60 | <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 | CE (IIW) |
| BSM-1091 | Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed | Heat | 0.19 | 0.85 | 0.015 | 0.008 | 0.24 | 0.06 | 0.01 | - | - | - | - | - |
| | | Product | 0.22 | 0.96 | 0.030 | 0.014 | 0.25 | 0.09 | 0.01 | 0.01 | 0.04 | 0.006 | 0.003 | 0.001 |

| Mechanical Properties | | | | | | | | | | |
|-----------------------|-----------|--------------------|---------------|-----------------|--------------|---------------------------|-------------------|------------------|----------------|------------------|
| Heat | Test Type | Microstructure | Hardness HRBW | Flattening Test | Tension Test | | Yield (Rt0.5) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % |
| | | | | | 50mm GL | Longitudinal; 38.1mm x WT | | | | |
| BSM-1091 | Heat | Ferrite & Pearlite | 74 | Pass | Pass | 46,200 | 75,000 | 0.62 | 42 | |

| Heat | Test Standard | Impact Test Sample Details | Temp $^{\circ}$ C | Impact Energy | | | % Shear | | | Lateral Expansion | | | |
|----------|---------------|----------------------------|-------------------|---------------|---|---|---------|---|---|-------------------|----|----|---|
| | | | | J | J | J | % | % | % | mm | mm | mm | |
| BSM-1091 | - | - | - | - | - | - | - | - | - | - | - | - | - |

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:

Paul Sowden
 2013 JUL 25

Paul Sowden, T.T.
 Assistant QA Manager

cert # 219