



# 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-0841** Product Size: **NPS 20 TRUE80** Production Date: **April 16, 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 20 TRUE80 1.031 inchWT HEAT BSM-0841 (PIPE # LENGTH MASS) 208.9lb/ft NDE SMIS NACE MR0175 2013/04 MADE IN CANADA.**

| Product Details |           |                           |        | Non-Destructive Testing |            |                   |                 |              |      |      |      |      |      |           |               |
|-----------------|-----------|---------------------------|--------|-------------------------|------------|-------------------|-----------------|--------------|------|------|------|------|------|-----------|---------------|
| Heat            | Test Type | Product Size              | Pieces | Length                  | Mass lb/ft | Geiger $\mu$ R/hr | Res. Mag. Gauss | Visual Insp. | OD   | WT   | UT   | UT   | ET   | HydroTest | End Condition |
| BSM-0841        | Heat      | NPS 20 TRUE80 1.031 in.WT | 4      | DRL                     | 208.90     | <5                | <20             | Pass         | 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 (IIV) | CE (CSA) |
| BSM-0841                | Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed | Heat     | 0.19 | 0.89 | 0.009 | 0.009 | 0.24 | 0.03 | 0.11 | 0.02 | 0.05 | -     | -     | -     | 0.0003 | -        | -        |
|                         |   | Product  | 0.19 | 0.84 | 0.009 | 0.003 | 0.23 | 0.05 | 0.07 | 0.01 | 0.05 | 0.002 | 0.001 | 0.001 | 0.0001 | 0.35     | 0.35     |

| 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-0841              | Heat          | Ferrite & Pearlite         | 75                | Pass            | Longitudinal; 38.1mm x WT | 40,700            | 65,000           | 0.63                 | 49               |     |  |
| Heat                  | Test Standard | Impact Test Sample Details | Temp $^{\circ}$ C | Impact Energy J | AVG                       | % Shear           | AVG              | Lateral Expansion mm | mm               | AVG |  |
| BSM-0841              | -             | -                          | -                 | -               | -                         | -                 | -                | -                    | -                | -   |  |

**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.

Mill Test Certificate approved by:

*[Signature]*  
 2013 Apr 24

Kenton Dechant, P.Eng.  
 Manager of Quality and R&D