



**Bri-Steel Manufacturing Inc.**  
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## Mill Test Certificate

Product: **Seamless Carbon Steel Pipe**      Product Heat Number: **BSM-1168**      Product Size: **NPS 14 TRUE80**      Production Date: **August 21, 2013**

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

Product Standards: **ASME B36.10-2004, 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 ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 14 TRUE80 0.75 inchWT HEAT BSM-1168 (PIPE # LENGTH MASS) 106.1lb/ft NDE SMLS NACE MR0175 2013/08 MADE IN CANADA.**

| Product Details |           |                          |        | Non-Destructive Testing |        |     |        |                         |                 |              |    |      |       |      |              |      |              |      |           |               |           |
|-----------------|-----------|--------------------------|--------|-------------------------|--------|-----|--------|-------------------------|-----------------|--------------|----|------|-------|------|--------------|------|--------------|------|-----------|---------------|-----------|
| Heat            | Test Type | Product Size             | Pieces | Mass lb/ft              | Length | DRL | 106.10 | Geiger $\mu\text{R/hr}$ | Res. Mag. Gauss | Visual Insp. | OD | Pass | UT WT | Pass | UT ASTM E213 | Pass | ET ASTM E309 | Pass | HydroTest | End Condition |           |
| BSM-1168        | Heat      | NPS 14 TRUE80 0.75 in.WT | 18     |                         |        |     |        | <5                      | <20             | Pass         |    | 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    | CE (IIW) | CE (CSA) |        |      |
| BSM-1168                | Blast Furnace; EAF; Ladle Refining; | 0.19     | 0.96 | 0.009 | 0.003 | 0.26 | 0.06 | 0.06 | 0.01 | 0.05 | -     | -     | -     | -        | -        | 0.0005 | -    |
|                         | Vacuum Degass; Fully Killed         | 0.18     | 0.94 | 0.014 | 0.002 | 0.24 | 0.05 | 0.06 | 0.01 | 0.03 | 0.003 | 0.001 | 0.001 | 0.001    | 0.0001   | 0.0001 | 0.35 |

| 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-1168              | Heat      | Ferrite & Pearlite | 76            | Pass            | Pass         | Pass                      | 40,500            | 70,000           | 0.58           | 52               |

| Heat     | Test Standard | Impact Test Sample Details | Temp $^{\circ}\text{C}$ | Impact Energy |   |   | % Shear |   |   | Lateral Expansion |    |    |   |   |   |   |   |   |   |   |   |
|----------|---------------|----------------------------|-------------------------|---------------|---|---|---------|---|---|-------------------|----|----|---|---|---|---|---|---|---|---|---|
|          |               |                            |                         | J             | J | J | %       | % | % | mm                | mm | mm |   |   |   |   |   |   |   |   |   |
| BSM-1168 | -             | -                          | -                       | -             | - | - | -       | - | - | -                 | -  | -  | - | - | - | - | - | - | - | - | - |

**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:

*Kenton Dechant*  
 2013 Aug 28

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