



# Mill Test Certificate

Bri-Steel Manufacturing Inc.  
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0102** Product Size: **NPS 16 STD** Production Date: **2011 Nov 15**

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

Product Standards: **ASTM/ASME A/SA106-2010 Grade B/C, A/SA53-2010 Grade B Type S, NACE MR0175-2009**

Product Markings: **.BRI-STEEL MFG NPS 16 STD ASTM/ASME A/SA106 GR B/C A/SA53 GR B HEAT BSM-0102 (PIPE # LENGTH MASS) NDE 1140PSI NACE MR0175 2011/11 MADE IN CANADA.**

| Product Details |           |     |     | Non-Destructive Testing |        |       |         |           |        |      |      |      |      |           |             |
|-----------------|-----------|-----|-----|-------------------------|--------|-------|---------|-----------|--------|------|------|------|------|-----------|-------------|
| Heat            | Test Type | NPS | SCH | Pieces                  | Length | Mass  | Galiger | Res. Mag. | Visual | OD   | UT   | UT   | ET   | HydroTest | End         |
| BSM-0102        | Heat      | 16  | STD | 1                       | DRL    | 62.58 | µR/hr   | Gauss     | Insp.  | Pass | Pass | Pass | Pass | Pass      | Condition   |
|                 |           |     |     |                         |        |       | <5      | <20       | Pass   | Pass | Pass | ---  | Pass | Pass      | 37.5° Bevel |


| Steelmaking Method |           | Chemical Analysis (wt%)   |  |      |      |       |       |      |      |      |      |      |       |       |       |        |      |      |
|--------------------|-----------|---------------------------|--|------|------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|------|------|
| Heat               | Test Type | Blast Furnace; EAF; Ladle |  | C    | Mn   | P     | S     | Si   | Cr   | Cu   | Mo   | Ni   | V     | Ti    | Nb    | B      | CE   | CE   |
| BSM-0102           | Heat      | Refining; Vacuum Degas    |  | 0.21 | 0.88 | 0.015 | 0.007 | 0.23 | 0.04 | 0.09 | 0.01 | 0.03 | 0.004 | 0.002 | 0.001 | 0.0002 | 0.38 | 0.38 |

| Mechanical Properties |           |                    |          |                 |                    |            |               |               |              |      |                |
|-----------------------|-----------|--------------------|----------|-----------------|--------------------|------------|---------------|---------------|--------------|------|----------------|
| Heat                  | Test Type | Microstructure     | Hardness | Flattening Test | Tension Test       |            | Yield (Rt0.5) | Yield (Rp0.2) | Tensile (Rm) | Y/T  | Elongation (A) |
| BSM-0102              | Heat      | Ferrite & Pearlite | HRBW     | Pass            | 50mm GL; 38mm x WT | Transverse | psi           | psi           | psi          | 0.66 | 35             |
|                       |           |                    | 77       |                 | Longitudinal       |            | 47,300        | 47,600        | 74,500       | 0.63 | 41             |

**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/SA106-2010, A/SA53-2010 and the purchase order requirements, and that the results meet the corresponding requirements.
- ✓ This pipe product meet 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 no mercury contamination.
- ✓ This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Mill Test Certificate approved by:

  
 2012 Feb 3  
 Kenton Dechant, P.Eng.  
 Manager of Quality and R&D