



# Mill Test Certificate

Bri-Steel Manufacturing Inc.  
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1739 Product Size: 16S100 Production Date: Mar 28, 2014  
Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 001005  
Product Standards: ASME B36.10-2004, ASTM/ASME A/SA106-2013 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

## Product Markings



NPS 16 SCH 100 1.031 INCHWT SMLS 2014/03 NDE  
HEAT BSM-1739 (PIPE # LENGTH MASS) 164.8lb/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 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   | UT WT | UT ASTM E213 | ET ASTM | HydroTest | End Condition |
| BSM-1739         | Heat      | NPS 16 SCH 100 1.031in. WT | 1      | DRL    | 164.8                   | <5                | <20             | Pass         | Pass | Pass  | Pass         | Pass    | -         | Plain End     |

| Chemical Analysis (wt%) |   |           |      |      |       |       |      |      |      |      |      |       |       |       |        |        |         |
|-------------------------|---|-----------|------|------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|--------|---------|
| Heat                    | Steelmaking Method  | Test Type | C    | Mn   | P     | S     | Si   | Cr   | Cu   | Mo   | Ni   | V     | Ti    | Nb    | B      | CE(IW) | CE(CSA) |
| BSM-1739                | Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed | Heat      | 0.20 | 0.89 | 0.011 | 0.002 | 0.31 | 0.05 | 0.06 | 0.00 | 0.03 | 0.003 | 0.002 | 0.001 | 0.0003 | -      | -       |
|                         |   | Product   | 0.21 | 0.88 | 0.017 | 0.002 | 0.28 | 0.06 | 0.06 | 0.01 | 0.03 | 0.004 | 0.002 | 0.001 | 0.0003 | 0.38   | 0.38    |

| Mechanical Properties |           |                    |          |                 |                             |                   |                  |                |                  |  |  |  |  |
|-----------------------|-----------|--------------------|----------|-----------------|-----------------------------|-------------------|------------------|----------------|------------------|--|--|--|--|
| Heat                  | Test Type | Microstructure     | Hardness | Flattening Test | Tension Test 50mm GL        | Yield (Rt0.5) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % |  |  |  |  |
| BSM-1739              | Heat      | Ferrite & Pearlite | 77 HRBW  | Pass            | Longitudinal: 19.05 mm x WT | 48,000            | 72,000           | 0.67           | 45               |  |  |  |  |

| Heat     | Test Standard | Impact Test Sample Details | Temp °C | Impact Energy |   |   |     | % Shear |   |   |     | Lateral Expansion |    |    |     |
|----------|---------------|----------------------------|---------|---------------|---|---|-----|---------|---|---|-----|-------------------|----|----|-----|
| BSM-1739 | -             | -                          | -       | J             | J | J | AVG | %       | % | % | AVG | 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 ASTM/ASME A/SA106-2013 Grade B/C 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-2009 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*  
2014 APR 09

Paul Sowden, T.T.  
Assistant QA Manager