



Bri-Steel Manufacturing Inc.
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Mill Test Certificate

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-1059** Product Size: **NPS 16 XS** Production Date: **July 9, 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 16 XS 0.5 inchWT HEAT BSM-1059 (PIPE # LENGTH MASS) 82.77lb/ft NDE SMLS NACE MR0175 2013/07 MADE IN CANADA.**

| Product Details | | | | Non-Destructive Testing | | | | | | | | | | |
|-----------------|-----------|----------------------|--------|-------------------------|-------------|--------|-----------|--------|------|------|------|------|-----------|-------------|
| Heat | Test Type | Product Size | Pieces | Length | Mass | Geiger | Res. Mag. | Visual | OD | WT | UT | ET | HydroTest | End |
| BSM-1059 | Heat | NPS 16 XS 0.5 in. WT | 13 | DRL | 82.77 lb/ft | µR/hr | Gauss | Insp. | 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 | Nb | B | CE | CE |
| BSM-1059 | Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed | Heat | 0.18 | 0.91 | 0.011 | 0.009 | 0.24 | 0.03 | 0.07 | 0.01 | 0.04 | - | - | - | - | 0.0003 | - |
| | | Product | 0.20 | 0.92 | 0.016 | 0.007 | 0.24 | 0.03 | 0.07 | 0.01 | 0.04 | 0.004 | 0.001 | 0.001 | 0.0001 | 0.37 | 0.38 |

| Mechanical Properties | | | | | | | | | | | | | |
|-----------------------|-----------|--------------------|----------|-----------------|---------------------------|-------------------|--------------|------------|----------------|----|----|----|-----|
| Heat | Test Type | Microstructure | Hardness | Flattening Test | Tension Test | Yield (Rt0.5) | Tensile (Rm) | Y/T | Elongation (A) | | | | |
| BSM-1059 | Heat | Ferrite & Pearlite | HRBW 75 | Pass | 50mm GL | psi | psi | (Rt0.5/Rm) | % | | | | |
| | | | | | Longitudinal: 38.1mm x WT | 40,800 | 69,500 | 0.59 | 45 | | | | |
| Heat | Test | Impact Test | Temp | Impact Energy | % Shear | Lateral Expansion | AVG | mm | mm | mm | mm | mm | AVG |
| BSM-1059 | Standard | Sample Details | °C | J | J | % | AVG | mm | mm | 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/SA106-2011, A/SA53-2012, and the purchase order requirements, and that the results meet the corresponding requirements.

Mill Test Certificate approved by:

2013 JUL 18

Paul Sowden, T.T.
 Assistant QA Manager

- ✓ 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.