



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-1051** Product Size: **NPS 18 SCH 120** Production Date: **July 8, 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 18 SCH 120 1.375 inchWT HEAT BSM-1051 (PIPE # LENGTH MASS) 244.1lb/ft NDE SMILS NACE MR0175 2013/07 MADE IN CANADA.**

| Product Details | | | | Non-Destructive Testing | | | | | | | | | | | |
|-----------------|-----------|----------------------------|--------|-------------------------|------------|-------------------|-----------------|--------------|------|------|------|------|------|-----------|---------------|
| Heat | Test Type | Product Size | Pieces | Length | Mass lb/ft | Geiger μ R/hr | Res. Mag. Gauss | Visual Insp. | OD** | WT | UT | UT | ET | HydroTest | End Condition |
| BSM-1051 | Heat | NPS 18 SCH 120 1.375 in.WT | 7 | DRL | 244.10 | <5 | <20 | Pass | Pass | Pass | Pass | Pass | Pass | * | Plain End |

| Chemical Analysis (wt%) | | | | | | | | | | | | | | | | | |
|-------------------------|--|----------|------|------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|----------|----------|
| Heat | Steelmaking Method | Analysis | C | Min | P | S | SI | Cr | Cu | Mn | Ni | V | Ti | Nb | B | CE (IIV) | CE (CSA) |
| BSM-1051 | Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed | Heat | 0.19 | 0.89 | 0.015 | 0.003 | 0.30 | 0.04 | 0.07 | 0.01 | 0.04 | 0.003 | 0.002 | 0.001 | 0.0004 | - | - |
| | | Product | 0.19 | 0.89 | 0.015 | 0.004 | 0.31 | 0.05 | 0.04 | 0.01 | 0.03 | 0.004 | 0.002 | 0.001 | 0.0001 | 0.36 | 0.36 |

| Mechanical Properties | | | | | | | | | | | | | | | | |
|-----------------------|---------------|----------------------------|-------------------|-----------------|---------------------------|--------|-------------------|------------------|----------------|------------------|-----|----|----|----|----|-----|
| Heat | Test Type | Microstructure | Hardness HRBW | Flattening Test | Tension Test 50mm GL | | Yield (Rt0.5) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % | | | | | | |
| BSM-1051 | Heat | Ferrite & Pearlite | 74 | Pass | Longitudinal: 19.1mm x WT | 40,100 | 68,000 | 0.59 | 50 | | | | | | | |
| Heat | Test Standard | Impact Test Sample Details | Temp $^{\circ}$ C | J | J | J | AVG | % | % | % | AVG | mm | mm | mm | mm | AVG |
| BSM-1051 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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.
- *Note that this product was hydrotested to 1000 psi for 5 seconds.
- **OD Tolerances as per API

Mill Test Certificate approved by:

Paul Sowden

2013 JUL 10

Paul Sowden, T.T.
 Assistant QA Manager