



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0272** Product Size: **NPS 24 STD** Production Date: **March 28, 2012**

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

Product Standards: **ASTM/ASME A/SAA106-2011 Grade B/C, A/SAS3-2010 Grade B Type S, NACE MR0175-2009**

Product Markings: **BRI-STEEL MFG NPS 24 STD ASTM/ASME A/SAA106 GR B/C A/SAS3 GR B HEAT BSM-0272 (PIPE # LENGTH MASS) 94.62lb/ft NDE 740PSI NACE MR0175 2012/03 MADE IN CANADA.**

| Product Details | | | | Non-Destructive Testing | | | | | | | | | | | |
|-----------------|-----------|-----|-----|-------------------------|--------|-------|--------|-----------|--------|------|------|-----------|-----------|-------------|-----------|
| Heat | Test Type | NPS | SCH | Pieces | Length | Mass | Geiger | Res. Mag. | Visual | UT | UT | ET | HydroTest | End | |
| BSM-0272 | Heat | 24 | STD | 8 | DRL | 94.62 | µR/hr | Gauss | Insp. | OD | WT | ASTM E213 | ASTM E309 | 740 psi/5s | Condition |
| | | | | | | | <5 | <20 | 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-0272 | Heat | Refining; Vacuum Degass | | 0.22 | 0.89 | 0.012 | 0.012 | 0.24 | 0.03 | 0.13 | 0.02 | 0.04 | 0.004 | 0.001 | 0.002 | 0.0002 | 0.39 | (IIW) | (CSA) |

| Mechanical Properties | | | | | | | | | | | |
|-----------------------|-----------|--------------------|----------|-----------------|--------------------|--------------|---------------|---------------|--------------|------------|----------------|
| Heat | Test Type | Microstructure | Hardness | Flattening Test | Tension Test | | Yield (Rt0.5) | Yield (Rp0.2) | Tensile (Rm) | Y/T | Elongation (A) |
| BSM-0272 | Heat | Ferrite & Pearlite | HRBW | Pass | 50mm GL; 38mm x WT | Transverse | psi | psi | psi | (Rt0.5/Rm) | % |
| | | | 80 | | | Longitudinal | 50,000 | 49,700 | 80,500 | 0.62 | 40 |

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/SAA106-2011, A/SAS3-2010 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 APR 4
 Kenton Dechant, P.Eng.
 Manager of Quality and R&D