



Bri-Steel Manufacturing Inc.
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Mill Test Certificate

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0594** Product Size: **NPS 20 SCH 120** Production Date: **December 7, 2012**

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

Product Standards: **ASME B36.10-2004, ASTM/ASME A/SA106-2011 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **.BRI-STEEL MFG ASTM/ASME A/SA106 GR B/C A/SA53 GR B NPS 20 SCH 120 HEAT BSM-0594 (PIPE # LENGTH MASS) 296.4lb/ft NDE SMIS NACE MR0175 2012/12 MADE IN CANADA.**

| Product Details | | | | | | Non-Destructive Testing | | | | | | | | | |
|-----------------|-----------|-----|----------------|--------|--------|-------------------------|-------------------|-----------------|--------------|------|-------|--------------|--------------|-----------|---------------|
| Heat | Test Type | NPS | Wall Thickness | Pieces | Length | Mass lb/ft | Geiger μ R/hr | Res. Mag. Gauss | Visual Insp. | OD | UT WT | UT ASTM E213 | ET ASTM E309 | HydroTest | End Condition |
| BSM-0594 | Heat | 20 | SCH 120 | 8 | DRL | 296.40 | <5 | <20 | Pass | Pass | Pass | Pass | Pass | * | Plain End |

| Chemical Analysis (wt%) | | | | | | | | | | | | | | | | | |
|-------------------------|---|----------|------|------|-------|-------|------|------|------|------|------|-------|-------|--------|----------|----------|------|
| Heat | Steelmaking Method | Analysis | | | | | | | | | | | | | | | |
| | | C | Mn | P | S | Si | Cr | Cu | Mo | Ni | V | Ti | Nb | B | CE (IIW) | CE (CSA) | |
| BSM-0594 | Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed | Heat | 0.19 | 0.92 | 0.012 | 0.010 | 0.24 | 0.08 | 0.06 | 0.01 | 0.03 | - | - | 0.0003 | - | - | |
| | | Product | 0.20 | 0.93 | 0.011 | 0.015 | 0.23 | 0.08 | 0.06 | 0.01 | 0.02 | 0.002 | 0.003 | 0.001 | 0.0001 | 0.38 | 0.39 |

| Mechanical Properties | | | | | | | | | | |
|-----------------------|-----------|--------------------|---------------|-----------------|--------------|--------------------------------|-------------------|------------------|----------------|------------------|
| Heat | Test Type | Microstructure | Hardness HRBW | Flattening Test | Tension Test | | Yield (Rt0.5) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % |
| | | | | | 2 in. GL | Longitudinal; 0.5in. Round Bar | | | | |
| BSM-0594 | Heat | Ferrite & Pearlite | 73 | Pass | | | 42,500 | 70,500 | 0.60 | 37 |

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.

Mill Test Certificate approved by:


 2017 June 5

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