



# Mill Test Certificate

**Bri-Steel Manufacturing Inc.**  
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0546** Product Size: **NPS 20 SCH 60** Production Date: **November 7, 2012**

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

Product Standards: **ASME B36.10-2004, API 5L-44th Ed. Grade B PSL1, ASTM/ASME A/SAA106-2011 Grade B/C NDE, A/SAS3-2012 Grade B Type S, NACE MR0175-2009, MR0103-2010**

Product Markings: **.BRI-STEEL MEG ASTM/ASME A/SAA106 GR B/C A/SAS3 GR B NPS 20 SCH 60 HEAT BSM-0546 (PIPE # LENGTH MASS) 166.4lb/ft NDE 1000PSI SMLS NACE MR0175 2012/11 MADE IN CANADA.**

| Product Details |           |     |                | Non-Destructive Testing |        |        |        |           |        |      |      |           |           |             |               |
|-----------------|-----------|-----|----------------|-------------------------|--------|--------|--------|-----------|--------|------|------|-----------|-----------|-------------|---------------|
| Heat            | Test Type | NPS | Wall Thickness | Pieces                  | Length | Mass   | Geiger | Res. Mag. | Visual | OD   | UT   | UT        | ET        | HydroTest   | End Condition |
| BSM-0546        | Heat      | 20  | SCH 60         | 13                      | DRL    | 166.40 | µR/hr  | Gauss     | Insp.  | Pass | Pass | ASTM E213 | ASTM E309 | 1000 psi/5s | Plain End     |

| Heat     |   | Chemical Analysis (wt%) |      |       |       |      |      |      |      |      |       |       |       |        |    |    |
|----------|---|-------------------------|------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|----|----|
| BSM-0546 | Steelmaking Method  | C                       | Mn   | P     | S     | Si   | Cr   | Cu   | Mo   | Ni   | V     | Ti    | Nb    | B      | CE | CE |
| BSM-0546 | Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed | 0.21                    | 0.95 | 0.018 | 0.002 | 0.29 | 0.05 | 0.07 | 0.01 | 0.03 | 0.004 | 0.002 | 0.001 | 0.0003 | -  | -  |

| Mechanical Properties |           |                    |          |              |                           |               |               |              |      |                |
|-----------------------|-----------|--------------------|----------|--------------|---------------------------|---------------|---------------|--------------|------|----------------|
| Heat                  | Test Type | Microstructure     | Hardness | Tension Test |                           | Yield (Rt0.5) | Yield (Rp0.2) | Tensile (Rm) | Y/T  | Elongation (A) |
|                       |           |                    |          | HRBW         | Flattening Test           |               |               |              |      |                |
| BSM-0546              | Heat      | Ferrite & Pearlite | 79       | Pass         | Transverse; 38.1mm x WT   | 52,500        | 52,000        | 77,000       | 0.68 | 53             |
|                       |           |                    |          |              | Longitudinal; 38.1mm x WT | 50,500        | 50,500        | 75,500       | 0.67 | 53             |

**Additional Details:**

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with API 5L-44th Ed., ASTM/ASME A/SAA106-2011, A/SAS3-2012 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.

Mill Test Certificate approved by:

*[Signature]*  
 2013 Apr 3

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