



Mill Test Certificate

Bri-Steel Manufacturing Inc.
 2125-64 Avenue, Edmonton, AB Canada T6P 1Z4
 Tel: 001 (780) 469-6603
 Fax: 001 (780) 469-6986
 www.brichemsteel.com

Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0559** Product Size: **NPS 20 TRUE80** Production Date: **November 13, 2012**
 Production Method: **Hot Expansion** Product Heat Treatment: **As-rolled** Certificate No.: **243**

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 TRUE80 HEAT BSM-0559 (PIPE # LENGTH MASS) 208.9lb/ft NDE SM1S NACE MR0175 2012/11 MADE IN CANADA.**

| Product Details | | | | Non-Destructive Testing | | | | | | | | | | | |
|-----------------|-----------|-----|----------------|-------------------------|--------|------------|--------|-----------|--------------|------|-------|--------------|--------------|-----------|---------------|
| Heat | Test Type | NPS | Wall Thickness | Pieces | Length | Mass lb/ft | Galger | Res. Mag. | Visual Insp. | OD | UT WT | UT ASTM E213 | ET ASTM E309 | HydroTest | End Condition |
| BSM-0559 | Heat | 20 | TRUE80 | 21 | DRL | 208.90 | µR/hr | Gauss | 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) | |
| | | | Heat | 0.20 | 0.94 | 0.013 | 0.010 | 0.22 | 0.05 | 0.07 | 0.03 | 0.05 | - | 0.001 | - | 0.0003 | - | - |
| | | | Vacuum Degass, Fully Killed | Product | 0.21 | 0.85 | 0.010 | 0.016 | 0.21 | 0.04 | 0.09 | 0.01 | 0.06 | 0.002 | 0.001 | 0.001 | 0.0003 | 0.37 |

| Mechanical Properties | | | | | | | | | | | |
|-----------------------|-----------|--------------------|---------------|-----------------|--------------|---------------------------|-------------------|-------------------|------------------|----------------|------------------|
| Heat | Test Type | Microstructure | Hardness HRBW | Flattening Test | Tension Test | | Yield (Rp0.5) psi | Yield (Rp0.2) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % |
| | | | | | 50mm GL | Longitudinal; 38.1mm x WT | | | | | |
| BSM-0559 | Heat | Ferrite & Pearlite | 77 | Pass | | | 44,100 | 43,800 | 70,500 | 0.63 | 52 |

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.

Mill Test Certificate approved by:

[Signature]
 2016 Feb 25.

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