



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: **Seamless Carbon Steel Pipe** Product Heat Number: **BSM-0128** Product Size: **NPS 20 STD** Production Date: **2011 Dec 05**

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

Product Standards: **ASTM/ASME A/SA106-2010 Grade B/C, A/SA53-2010 Grade B Type S, NACE MR0175-2009**

Product Markings: **.BRI-STEEL MFG NPS 20 STD ASTM/ASME A/SA106 GR B/C A/SA53 GR B HEAT BSM-0128 (PIPE # LENGTH MASS) NDE 910PSI NACE MR0175 2011/11 MADE IN CANADA.**

| Product Details | | | | | | Non-Destructive Testing | | | | | | | | | |
|-----------------|-----------|-----|-----|--------|--------|-------------------------|-------------------|-----------------|--------------|------|-------|--------------|--------------|----------------------|---------------|
| Heat | Test Type | NPS | SCH | Pieces | Length | Mass | Geiger μ R/hr | Res. Mag. Gauss | Visual Insp. | OD | UT WT | UT ASTM E213 | ET ASTM E309 | HydroTest 910 psi/5s | End Condition |
| BSM-0128 | Heat | 20 | STD | 3 | DRL | 8905 LB | <5 | <20 | Pass | Pass | Pass | --- | Pass | Pass | 37.5° Bevel |


| | | Chemical Analysis (wt%) | | | | | | | | | | | | | | |
|----------|-----------|---|------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|----------|----------|
| Heat | Test Type | Steelmaking Method | | | | | | | | | | | | | | |
| | | Blast Furnace; EAF; Ladle Refining; Vacuum Degass | | | | | | | | | | | | | | |
| BSM-0128 | Heat | C | Mn | P | S | Si | Cr | Cu | Mo | Ni | V | Ti | Nb | B | CE (IIW) | CE (CSA) |
| | | 0.19 | 0.86 | 0.011 | 0.006 | 0.24 | 0.03 | 0.10 | 0.02 | 0.03 | 0.002 | 0.001 | 0.001 | 0.0002 | 0.35 | 0.36 |

| Mechanical Properties | | | | | | | | | | | | | |
|-----------------------|-----------|--------------------|---------------|-----------------|--------------------|------------|-------------------|-------------------|------------------|----------------|------------------|----|----|
| Heat | Test Type | Microstructure | Hardness HRBW | Flattening Test | Tension Test | | Yield (Rt0.5) psi | Yield (Rp0.2) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % | | |
| | | | | | 50mm GL, 38mm x WT | Transverse | | | | | | | |
| BSM-0128 | Heat | Ferrite & Pearlite | 79 | Pass | Longitudinal | 48,900 | 48,300 | 76,500 | 0.60 | 75,500 | 0.65 | 43 | 38 |

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/SA106-2010, A/SA53-2010 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:


 2011 Dec 14
 Kenton Dechant, P. Eng.
 Manager of Quality and R&D