



# Mill Test Certificate

Bri-Steel Manufacturing Inc.  
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Product: Seamless Carbon Steel Pipe    Product Heat Number: BSM-1448    Product Size: 20 STD    Production Date: Nov 28, 2013  
 Production Method: Hot Expansion    Product Heat Treatment: As-rolled    Certificate No.: MTR- 000652  
 Product Standards: ASME B36.10-2004, API 5L-45th Ed. Grade B PSL1, ASTM/ASME A/SA106-2011 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

Product Markings <API> 5L-0898 API SPEC 5L NPS 20 STD 0.375 INCHWT GR B PSL1 SMLS 2013/11 NDE 1000PSI  
 HEAT BSM-1448 (PIPE # LENGTH MASS) 78.6lb/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

| Product: Details |           |                        |        | Non-Destructive Testing |            |                   |                 |              |      |       |              |         |                         |               |  |
|------------------|-----------|------------------------|--------|-------------------------|------------|-------------------|-----------------|--------------|------|-------|--------------|---------|-------------------------|---------------|--|
| Heat             | Test Type | Product Size           | Pieces | Length                  | Mass lb/ft | Geiger $\mu$ R/hr | Res. Mag. Gauss | Visual Insp. | OD   | UT WT | UT ASTM E213 | ET ASTM | HydroTest 1000 psi/ 5 s | End Condition |  |
| BSM-1448         | Heat      | NPS 20 STD 0.375in. WT | 5      | DRL                     | 78.6       | <5                | <10             | Pass         | Pass | Pass  | Pass         | Pass    | Pass                    | 32.5° Bevel   |  |

| Chemical Analysis (wt%) |   |           |      |      |       |       |      |      |      |      |      |       |       |       |        |         |         |
|-------------------------|---|-----------|------|------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|---------|---------|
| Heat                    | Steelmaking Method  | Test Type | C    | Mn   | P     | S     | Si   | Cr   | Cu   | Mo   | Ni   | V     | Ti    | Nb    | B      | CE(IIW) | CE(CSA) |
| BSM-1448                | Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed | Heat      | 0.19 | 0.85 | 0.015 | 0.008 | 0.24 | 0.06 | 0.01 |      | 0.04 |       |       |       |        |         | -       |
|                         |   | Product   | 0.20 | 0.86 | 0.024 | 0.010 | 0.24 | 0.08 | 0.01 | 0.00 | 0.04 | 0.005 | 0.003 | 0.001 | 0.0002 | 0.37    | 0.37    |

| Mechanical Properties |           |                    |          |                 |                            |                   |                  |                |                  |
|-----------------------|-----------|--------------------|----------|-----------------|----------------------------|-------------------|------------------|----------------|------------------|
| Heat                  | Test Type | Microstructure     | Hardness | Flattening Test | Tension Test 50mm GL       | Yield (Rt0.5) psi | Tensile (Rm) psi | V/T (Rt0.5/Rm) | Elongation (A) % |
| BSM-1448              | Heat      | Ferrite & Pearlite | 78 HRBW  | Pass            | Longitudinal; 38.1 mm x WT | 45,400            | 70,500           | 0.64           | 44               |

| Heat     | Test Standard | Impact Test Sample Details | Temp °C | Impact Energy |   |   |     | % Shear |   |   |     | Lateral Expansion |    |    |    |     |   |
|----------|---------------|----------------------------|---------|---------------|---|---|-----|---------|---|---|-----|-------------------|----|----|----|-----|---|
|          |               |                            |         | J             | J | J | AVG | %       | % | % | AVG | mm                | mm | mm | mm | AVG |   |
| BSM-1448 | -             | -                          | -       | -             | - | - | -   | -       | - | - | -   | -                 | -  | -  | -  | -   | - |

**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-45th Ed., ASTM/ASME A/SA106-2011 Grade B/C 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-2009 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:

*Paul Sowden*  
 2013 Dec 04

Paul Sowden, T.T.  
 Assistant QA Manager