



# Mill Test Certificate

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Product: Seamless Carbon Steel Pipe      Product Heat Number: BSM-2044      Product Size: 24S60      Production Date: Sep 29, 2014  
Production Method: Hot Expansion      Product Heat Treatment: As-rolled      Certificate No.: MTR- 001374  
Product Standards: ASME B36.10-2004, API 5L-45th Ed. Grade B PSL1, ASTM/ASME A/SA106-2014 Grade B/C NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

## Product Markings



<API & L/C No.> API SPEC 5L NPS 24 SCH 60 0.969 INCHWT GR B PSL1 SMLS 2014/09 NDE 1900PSI  
HEAT BSM-2044 (PIPE # LENGTH MASS) 238.1lb/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 1900 PSI/ 5 s | End Condition |
| BSM-2044         | Heat      | NPS 24 SCH 60 0.969in. WT | 1      | DRL    | 238.1                   | <5                | <10             | Pass         | Pass | Pass  | Pass         | Pass    | Pass                    | Plain End     |

| 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) |
|                         |                    |           | Heat  | 0.22    | 0.91 | 0.002 | 0.003 | 0.28  | 0.06 | 0.07 | 0.07 | 0.03 | 0.004 | 0.002 | 0.001 | 0.0004  | -       |
|                         |                    | BSM-2044  | Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed | Product | 0.20 | 0.91  | 0.010 | 0.002 | 0.28 | 0.05 | 0.06 | 0.01 | 0.03  | 0.004 | 0.002 | 0.001   | 0.0003  |

| Mechanical Properties |           |                    |          |                 |                             |                   |                  |                |                  |  |  |  |  |
|-----------------------|-----------|--------------------|----------|-----------------|-----------------------------|-------------------|------------------|----------------|------------------|--|--|--|--|
| Heat                  | Test Type | Microstructure     | Hardness | Flattening Test | Tension Test 50mm GL        | Yield (Rt0.5) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % |  |  |  |  |
| BSM-2044              | Heat      | Ferrite & Pearlite | 78 HRBW  | Pass            | Longitudinal; 19.05 mm x WT | 51,500            | 71,500           | 0.72           | 47               |  |  |  |  |

| Heat     | Test Standard | Impact Test Sample Details | Temp $^{\circ}$ C | Impact Energy |   |   |     |   | % Shear |   |     | Lateral Expansion |    |    |     |
|----------|---------------|----------------------------|-------------------|---------------|---|---|-----|---|---------|---|-----|-------------------|----|----|-----|
|          |               |                            |                   | J             | J | J | AVG | % | %       | % | AVG | mm                | mm | mm | AVG |
| BSM-2044 | -             | -                          | -                 | -             | - | - | -   | - | -       | - | -   | -                 | -  | -  | -   |

## 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/SA106-2014 Grade B/C A/SA53-2012, and the purchase order requirements, and that the results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO-9001:2008 and API Q1.

Mill Test Certificate approved by:

✓ 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.

Tonya Lam, C.E.T.  
Assistant QA Manager

*T. Lam* Oct. 10 / 2014