# Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: Seamless Carbon Steel Pipe  Product Heat Number: BSM-1460  Product Size: 22 XS  Production Date: Dec 05, 2013

Production Method: Hot Expansion  Product Heat Treatment: As-rolled  Certificate No.: MTR- 000666

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 22 XS 0.500 INCHWT GR B PSL1 SMLS 2013/12 NDE 1720PSI
HEAT BSM-1460 (PIPE # LENGTH MASS) 114.8lb/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 µR/hr | Res. Mag. Gauss | Visual Insp. | OD | UT WT | UT ASTM E213 | ET ASTM E309 | HydroTest 1720PSI/ 5s | End Condition |
| BSM-1460 | Heat | NPS 22 XS 0.500in. WT | 4 | DRL | 114.8 | <5 | <10 | Pass | Pass | Pass | Pass | Pass | Pass | 34° 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-1460 | Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed | Heat | 0.19 | 0.89 | 0.014 | 0.008 | 0.22 | 0.03 | 0.06 | 0.01 | 0.03 | | | | 0.0003 | - | - |
| | | Product | 0.20 | 0.88 | 0.012 | 0.008 | 0.22 | 0.03 | 0.06 | 0.02 | 0.03 | 0.003 | 0.001 | 0.001 | 0.0002 | 0.36 | 0.36 |

| 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-1460 | Heat | Ferrite & Pearlite | 72 HRBW | Pass | Longitudinal; 38.1 mm x WT | 41,600 | 70,000 | 0.59 | 46 |

| Heat | Test Standard | Impact Test Sample Details | Temp °C | Impact Energy | | | | % Shear | | | | Lateral Expansion | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | J | J | J | AVG | % | % | % | AVG | mm | mm | mm | AVG |
| BSM-1460 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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.

*API WT Minimum tolerance increased to 0.495inch by customer request

Mill Test Certificate approved by:

2013 DEC 12

Paul Sowden, T.T.
Assistant QA Manager