



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1316 Production Date: Oct 10, 2013
 Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 000527
 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: NPS 18 STD 0.375 INCHWT SMLS 2013/10 NDE 1000PSI
 HEAT BSM-1316 (PIPE # LENGTH MASS) 70.59lb/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 | Geliger $\mu R/hr$ | Res. Mag. Gauss | Visual Insp. | OD | UT WT | UT ASTM E213 | ET ASTM | HydroTest 1000 PSI/ 5 s | End Condition | |
| BSM-1316 | Heat | NPS 18 STD 0.375in. WT | 10 | DRL | 70.59 | <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-1316 | Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed | Heat | 0.19 | 0.90 | 0.024 | 0.009 | 0.23 | 0.08 | 0.01 | | 0.04 | | | | | - | - |
| | | Product | 0.17 | 0.93 | 0.028 | 0.012 | 0.26 | 0.08 | 0.01 | 0.01 | 0.04 | 0.006 | 0.002 | 0.001 | 0.0001 | 0.35 | 0.35 |

| Mechanical Properties | | | | | | | | | |
|-----------------------|-----------|--------------------|----------|-----------------|----------------------------|-------------------|------------------|----------------|------------------|
| Heat | Test Type | Microstructure | Hardness | Flattening Test | Tension Test 50mm GI | Yield (Rt0.5) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % |
| BSM-1316 | Heat | Ferrite & Pearlite | 77 HRBW | Pass | Longitudinal; 38.1 mm x WT | 48,700 | 73,000 | 0.67 | 44 |

| Heat | Test Standard | Impact Test Sample Details | Temp °C | Impact Energy | | | % Shear | | | Lateral Expansion | | | | |
|----------|---------------|----------------------------|---------|---------------|---|---|---------|---|---|-------------------|----|----|-----|---|
| | | | | J | J | J | % | % | % | mm | mm | mm | AVG | |
| BSM-1316 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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 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:

2013 OCT 23

Paul Sowden, T.T.
 Assistant QA Manager