



Mill Test Certificate

Bri-Steel Manufacturing Inc.
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-1304 Product Size: 18T80 Production Date: Oct 09, 2013
 Production Method: Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR- 000512
 Product Standards: ASME B36.10-2004, ASTM/ASME A/SA333-2013 Grade 6 LT(M45C) A106-2014/SA106-2013 Grade B/C NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009 MR0103-2012
 Product Markings: NPS 18 TRUE 80 0.940 INCHWT SMLS 2013/10 NDE
 HEAT BSM-1304 (PIPE # LENGTH MASS) 170.8lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) 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 | HydroTest | End Condition |
| BSM-1304 | Heat | NPS 18 TRUE 80 0.940in. WT | 5 | DRL | 170.8 | <5 | <10 | Pass | Pass | Pass | Pass | Pass | * | Plain End |

| Heat | Steelmaking Method | Test Type | Chemical Analysis (wt%) | | | | | | | | | | | | | | |
|----------|----------------------------------------------------------------|-----------|-------------------------|------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|---------|---------|
| | | | C | Mn | P | S | Si | Cr | Cu | Mo | NI | V | Ti | Nb | B | CE(IIW) | CE(CSA) |
| BSM-1304 | Blast Furnace: EAF; Ladle Refining: Vacuum Degas; Fully Killed | Heat | 0.22 | 0.90 | 0.012 | 0.002 | 0.32 | 0.05 | 0.06 | 0.01 | 0.02 | 0.002 | 0.002 | 0.001 | 0.0003 | - | - |
| | | Product | 0.21 | 0.91 | 0.022 | 0.005 | 0.30 | 0.05 | 0.06 | 0.01 | 0.03 | 0.004 | 0.001 | 0.001 | 0.0001 | 0.38 | 0.38 |

| 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) % |
| | | | | | 77 HRBW | Pass | | | | |
| BSM-1304 | Heat | Ferrite & Pearlite | 77 HRBW | Pass | Pass | Pass | 47,400 | 71,000 | 0.67 | 51 |

| Heat | Test Standard | Impact Test Sample Details | Temp °C | Impact Energy J | | | % Shear | | | Lateral Expansion mm | | | AVG | | |
|----------|---------------|----------------------------|---------|-----------------|------|------|---------|---|---|----------------------|----|------|------|------|------|
| | | | | J | J | J | % | % | % | mm | mm | mm | | | |
| BSM-1304 | ASTM A333 | CVN long 10 x 10 mm | -45 | 28.5 | 15.0 | 26.5 | 23.3 | 0 | 0 | 0 | 0 | 0.32 | 0.18 | 0.35 | 0.28 |

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/SA333-2013 Grade 6 LT(M45C) A106-2014/SA106-2013 Grade B/C A53-2012/SA53-2013, 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.
- ✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service-2009 NACE MR0103-2012 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.

* Note that this product was hydrotested to 1000 psi for 5 seconds.

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Mill Test Certificate approved by:

Kesh
 2015 Feb 20

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