



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2703 Product Size: NPS 24 STD Production Date: Apr 04, 2016
 Production Method: Hot Expansion Product Heat Treatment: As Rolled Certificate No.: MTR- 002153
 Product Standards: ASME B36.10M-2015, ASTM/ASME A333-2015/SA333-2013 Grade 6 LT(M45C) A106-2014/SA106-2013 Grade B NDE, AS3-2012/SA53-2013 Grade B Type S, NACE MR0175-2009
 Product Markings: MR0103-2012
 NPS 24 STD 0.375 INCHWT SMLS 2016/04 NDE 660PSI
 HEAT BSM-2703 (PIPE # LENGTH MASS) 94.62lb/ft ASTM/ASME A/SA333 GR 6 LT(M45C) A/SA106 GR B A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

Product: Details

| 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 | Hydro Test 660 PSI/ 5 s | End Condition | |
| BSM-2703 | Heat | NPS 24 STD 0.375in. WT | 6 | DRL | 94.62 | <5 | <20 | Pass | Pass | Pass | N12.5 Pass | - | Pass | 32° Bevel | |

| Heat | Steelmaking Method | Test Type | Chemical Analysis (wt%) | | | | | | | | | | | | | | | |
|----------|---|-----------|-------------------------|------|-------|-------|------|------|------|------|------|------|-------|---|---|--------------------------------------|----------------------|---------|
| | | | C | Mn | P | S | Si | Cr | Cu | Mo | Ni | V | Ti | Nb | B | CE(IIW) | CE(IIW)Max | CE(CSA) |
| | | | 0.16 | 1.13 | 0.010 | 0.002 | 0.25 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.060 | 0.002 | 0.001 | 0.0001 | 0.0001 |
| BSM-2703 | Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed | Heat | 0.16 | 1.13 | 0.010 | 0.002 | 0.25 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.060 | 0.002 <td>0.001 <td>0.0001 <td>0.36</td> </td></td> | 0.001 <td>0.0001 <td>0.36</td> </td> | 0.0001 <td>0.36</td> | 0.36 |
| | | Product | 0.16 | 1.11 | 0.009 | 0.004 | 0.27 | 0.05 | 0.01 | 0.01 | 0.01 | 0.02 | 0.060 | 0.002 <td>0.001 <td>0.0001 <td>0.37</td> </td></td> | 0.001 <td>0.0001 <td>0.37</td> </td> | 0.0001 <td>0.37</td> | 0.37 | |

| Mechanical Properties | | | | | | | | | |
|-----------------------|-----------|--------------------|----------|-----------------|--|-------------------|------------------|----------------|------------------|
| Heat | Test Type | Microstructure | Hardness | Flattening Test | Tension Test 2 in. GL | Yield (Rt0.5) psi | Tensile (Rm) psi | v/T (Rt0.5/Rm) | Elongation (A) % |
| BSM-2703 | Heat | Ferrite & Pearlite | 81 HRBW | Pass | Longitudinal; 1.5 in. x WT Longitudinal; 1.5 in. x WT | 47 200 | 73 500 | 0.64 | 45 |
| | | | | Pass | | 51 500 | 76 000 | 0.68 | 46 |

| Heat | Test Standard | Impact Test Sample Details | Temp °C | Impact Energy Min. (J) | Impact Energy (J) | Shear (%) | Lateral Expansion (mm) |
|----------|---------------|----------------------------|---------|------------------------|------------------------------|-----------------------------|-------------------------------------|
| BSM-2703 | ASTM A333 | CVN Long 10 x 7.5 mm | -48 | (11/11/11) 14 | (3 Tests) AVG (98/100/90) 96 | (3 Tests) AVG (40/40/40) 40 | (3 Tests) AVG (2.09/2.09/1.78) 1.99 |

Additional Details:
 ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with ASTM/ASME A333-2015/SA333-2013, A106-2014/SA106-2013, AS3-2012/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, API Q1, and PED 97/23/EC.
 ✓ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service, and 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.

Mill Test Certificate approved by:

Tonya Lam
 Tonya Lam, P. Tech (Eng.)
 Assistant QA Manager
 April 10/2016