



Mill Test Certificate

Bri-Steel Manufacturing
 2125-64 Avenue, Edmonton, AB Canada T6P 1Z4
 Tel: 001 (780) 469-6603
 Fax: 001 (780) 469-6986
 www.bri-steel.com

Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3151 Product Size: NPS 20 STD Production Date: May 31, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003365
 Product Standards: ASME B36.10M-2015, ASTM/ASME A106-2014/SA106-2015 Grade B NDE, A53-2012/SA53-2015 Grade B Type S, NACE MR0175/ISO 15156-2:2009 MR0103/ISO 17495:2015

Product Markings
 NPS 20 STD 0.375 INCHWT SMLS 2017/05 NDE 900PSI
 HEAT BSM-3151 (PIPE # LENGTH MASS) 78.71lb/ft ASTM/ASME A/SA106 GR B 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 μ R/hr | Res. Mag. Gauss | Visual Insp. | OD | UT (WT) ASTM E114 | UT ASTM E213 | ET ASTM E309 | HydroTest 900PSI/ 5 s | End Condition |
| BSM-3151 | Heat | NPS 20 STD 0.375in. WT | 24 | DRL | 78.71 | <5 | <10 | Pass | Pass | Pass | N12.5 Pass | - | Pass | 35° Bevel |

| Chemical Analysis (wt%) | | | | | | | | | | | | | | | | | | |
|-------------------------|-----------|--|------|------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|----------|-------------|----------|
| Heat | Test Type | Steelmaking Method | C | Mn | P | S | Si | Cr | Cu | Mo | Ni | V | Ti | Nb | B | CE (IIW) | CE (IIW)Max | CE (CSA) |
| BSM-3151 | Heat | Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed | 0.20 | 0.56 | 0.010 | 0.007 | 0.23 | 0.04 | 0.02 | 0.01 | 0.01 | 0.003 | 0.002 | 0.001 | 0.0004 | 0.31 | - | 0.32 |
| | Product | | 0.22 | 0.55 | 0.011 | 0.008 | 0.25 | 0.03 | 0.02 | 0.01 | 0.01 | 0.002 | 0.002 | 0.001 | 0.0005 | 0.32 | - | 0.33 |
| | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

| Mechanical Properties | | | | | | | | | |
|-----------------------|-----------|--------------------|----------|-----------------|----------------------------|-------------------|------------------|----------------|------------------|
| Heat | Test Type | Microstructure | Hardness | Flattening Test | Tension Test 2 in. GL | Yield (Rt0.5) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % |
| BSM-3151 | Heat | Ferrite & Pearlite | 73 HRBW | Pass | Longitudinal; 1.5 in. x WT | 40 000 | 67 500 | 0.59 | 42 |

| Heat | Test Standard | Result | Impact Test Sample Details | Temp °C | Impact Energy Min. (J) (3 Tests) AVG | Impact Energy Results (J) (3 Tests) AVG | Shear (%) (3 Tests) AVG | Lateral Expansion (mm) (3 Tests) AVG |
|----------|---------------|--------|----------------------------|---------|--------------------------------------|---|-------------------------|--------------------------------------|
| BSM-3151 | - | - | - | - | - | - | - | - |

Additional Details:
 ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with ASTM/ASME A106-2014/SA106-2015, A53-2012/SA53-2015, and the purchase order requirements, and that the results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO 9001:2015 (APIQR-1584), API Q1, and PED 2014/68/EU.
 ✓ 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/ISO 17495:2015 Section 13.1.
 ✓ 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, P. Tech (Eng.)
 Assistant QA Manager