



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2649 Product Size: NPS 20 SCH 60 Production Date: Feb 22, 2016
 Production Method: Hot Expansion Product Heat Treatment: As Rolled Certificate No.: MTR- 002094
 Product Standards: ASME B36.10M-2015, ASTM/ASME A106-2014/SA106-2013 Grade B NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009 MR0103-2012
 Product Markings: NPS 20 SCH 60 0.812 INCHWT SMLS 2016/02 NDE 1700PSI
 HEAT BSM-2649 (PIPE # LENGTH MASS) 166.4lb/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 | UT ASTM E213 | ET ASTM E309 | HydroTest 1700PSI/ 5 s | End Condition |
| BSM-2649 | Heat | NPS 20 SCH 60 0.812in. WT | 24 | DRL | 166.4 | <5 | <20 | 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) | |
| | | | Heat | 0.21 | 0.56 | 0.018 | 0.013 | 0.24 | 0.19 | 0.01 | 0.01 | 0.01 | 0.05 | 0.001 | 0.001 | 0.001 | 0.0005 | 0.35 |
| BSM-2649 | Blast Furnace; EAF; Ladle Refining; Vacuum Degass; Fully Killed | Heat | 0.20 | 0.57 | 0.014 | 0.006 | 0.25 | 0.19 | 0.01 | 0.01 | 0.01 | 0.05 | 0.002 | 0.002 | 0.001 | 0.0002 | 0.34 | 0.35 |

| 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-2649 | Heat | Ferrite & Pearlite | 73 HRBW | Pass | Longitudinal; 0.5 in. Round Bar | 40,900 | 69,000 | 0.59 | 40 |

| Heat | Test Standard | Impact Test Sample Details | Temp °C | Impact Energy | | | | % Shear | | | | Lateral Expansion | | | | | |
|----------|---------------|----------------------------|---------|---------------|---|---|-----|---------|---|---|-----|-------------------|----|----|----|-----|---|
| | | | | J | J | J | AVG | % | % | % | AVG | mm | mm | mm | mm | AVG | |
| BSM-2649 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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/SA106-2013, 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, 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:

T. Lam Feb 24 / 2016
 Tonya Lam, P. Tech (Eng.)
 Assistant QA Manager