



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-2961 Product Size: NPS 24 STD Production Date: Nov 23, 2016
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003061

Product Standards: ASME B36.10M-2015, API 5L-45th Ed. GradeB PSL1, ASTM/ASME A333-2016/SA333-2015 Grade 6 LT(M45C) A106-2014/SA106-2015 Grade B/C NDE, A53-2012/SA53-2015 Grade B Type S, NACE MR0175/ISO 15156-2:2009 MR0103/ISO 17495:2015

Product Markings
 <API & L/C No.> API SPEC 5L NPS 24 STD 0.375 INCHWT GRB PSL1 SMLS 2016/11 NDE 750PSI
 HEAT BSM-2961 (PIPE # LENGTH MASS) 94.62lb/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) ASTM E114 | UT ASTM E213 | ET ASTM E309 | HydroTest 750PSI/ 5 s | End Condition |
| BSM-2961 | Heat | NPS 24 STD 0.375in. WT | 1 | DRL | 94.62 | <5 | ~24 | Pass | Pass | N12.5 | Pass | - | Pass | 30° Bevel |

Chemical Analysis (wt%)

| Heat | Steelmaking Method | Test Type | C | Mn | P | S | Si | Cr | Mo | Ni | V | Ti | Nb | B | CE(IIW) | CE(IIV)Max | CE(CSA) |
|----------|--|-----------|------|------|-------|-------|------|------|------|------|-------|-------|-------|--------|---------|------------|---------|
| BSM-2961 | Blast Furnace; EAF; Ladle Refining; Vacuum Degas; Fully Killed (at TPCO China) | Heat | 0.17 | 1.14 | 0.011 | 0.003 | 0.32 | 0.03 | 0.01 | 0.01 | 0.058 | 0.002 | 0.003 | 0.0005 | 0.38 | - | 0.38 |
| | | Product | 0.18 | 1.13 | 0.010 | 0.007 | 0.32 | 0.03 | 0.01 | 0.01 | 0.058 | 0.002 | 0.001 | 0.0004 | 0.39 | - | 0.40 |
| | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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-2961 | Heat | Ferrite & Pearlite | 82 HRBW | Pass | Longitudinal; 1.5 in. x WT | 50 000 | 77 500 | 0.65 | 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-2961 | ASTM A333 | Pass | CVN Long 10 x 7.5 mm | -48 | (11/11/11) 14 | (40/46/23) 36 | (15/15/0) 10 | (0.71/0.91/0.35) 0.66 |

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing in accordance with API 5L-45th Ed., ASTM/ASME A333-2016/SA333-2015, 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-9001:2008 (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:

T. Lam *NOV 29 2016*

Tonya Lam, P. Tech (Eng.)
 Assistant QA Manager