



Mill Test Certificate

Bri-Steel Manufacturing
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Product: Seamless Carbon Steel Pipe Product Heat Number: BSM-3110 Production Date: Apr 11, 2017
 Production Method: Hot Expansion Product Heat Treatment: Normalizing Forming Certificate No.: MTR- 003295
 Product Standards: ASME B36.10M-2015, API 5L-45th Ed. Grade BN/X42N/X46N PSL2, CSA Z245.1-2014 Grade 241/290 CAT 3, 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 GR BN/X42N/X46N PSL2 SMLS 2017/04 NDE 1470PSI
 HEAT BSM-3110 (PIPE # LENGTH MASS) 94.76lb/ft CSA Z245.1 GR 241/290 CAT 3 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

| Heat | Test Type | Product Size | Pieces | Length | Mass lb/ft | Chemical Analysis (wt%) | | | | | | | | | | Non-Destructive Testing | | | | | End Condition | | |
|----------|-----------|------------------------|--------|--------|------------|-------------------------|-----|------|------|------|------|------|------|------|------|-------------------------|------|------|---------|------------|---------------|---------|-----------|
| | | | | | | C | Mn | P | S | Si | Cr | Cu | Mo | Ni | V | Ti | Nb | B | CE(IIW) | CE(IIW)Max | | CE(CSA) | |
| BSM-3110 | Heat | NPS 24 STD 0.375in. WT | 7 | DRL | 94.76 | <5 | <10 | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | 35° Bevel |

| Heat | Test Type | Product Size | Test Type | C | Mn | P | S | Si | Cr | Cu | Mo | Ni | V | Ti | Nb | B | CE(IIW) | CE(IIW)Max | CE(CSA) |
|------|-----------|--------------|-----------|-------|-------|------|------|------|------|------|-------|-------|-------|--------|--------|------|---------|------------|---------|
| | | | | | | | | | | | | | | | | | | | |
| | Product | 0.16 | 1.06 | 0.010 | 0.002 | 0.27 | 0.06 | 0.02 | 0.01 | 0.01 | 0.01 | 0.040 | 0.002 | 0.001 | 0.0004 | 0.36 | 0.43 | 0.36 | |
| | | 0.16 | 1.06 | 0.015 | 0.002 | 0.27 | 0.06 | 0.01 | 0.01 | 0.01 | 0.041 | 0.002 | 0.001 | 0.0004 | 0.36 | 0.43 | 0.36 | | |

| Heat | Test Type | Microstructure | Hardness | Flattening Test | Tension Test | | Yield (Rt0.5) psi | Tensile (Rm) psi | Y/T (Rt0.5/Rm) | Elongation (A) % |
|----------|-----------|--------------------|----------|-----------------|----------------------------|--------------|-------------------|------------------|----------------|------------------|
| | | | | | 2 in. GL | 1.5 in. x WT | | | | |
| BSM-3110 | Heat | Ferrite & Pearlite | 79 HRBW | Pass | Longitudinal: 1.5 in. x WT | 50 500 | 72 000 | 0.70 | 41 | |
| | | | | Pass | Longitudinal: 1.5 in. x WT | 50 500 | 71 500 | 0.71 | 41 | |

| Heat | Test Standard | Result | Impact Test Sample Details | Temp °C | Impact Energy Min. (J) | Impact Energy Results (J) | Shear (%) | Lateral Expansion (mm) |
|----------|-------------------|--------|----------------------------|---------|------------------------|---------------------------|-------------------|------------------------|
| | | | | | | | | |
| BSM-3110 | ASTM A333 | Pass | CVN Long 10 x 7.5 mm | -48 | (11/11/11) 14 | (178/183/155) 172 | (100/100/100) 100 | (2.33/UNB/2.07) 2.20 |
| BSM-3110 | API PSL2/CSA CAT3 | Pass | CVN Trans 10 x 7.5 mm | -45 | (15/15/15) 20 | (196/178/186) 187 | (100/100/100) 100 | (UNB/2.20/UNB) 2.20 |

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., N CSA Z245.1-2014 Grade 241/290 CAT 3, 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 9001:2015 (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

Mill Test Certificate approved by:

 2017 May 16

- ✓ 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.

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