

Product:

Mill Test Certificate

2125-64 Avenue, Edmonton, AB Canada T6P 1Z4 Bri-Steel Manufacturing Inc.

Tel: 001 (780) 469-6603

Fax: 001 (780) 469-6986 www.bri-steel.com

Seamless Carbon Steel Pipe Product Heat Number: BSM-2249 Product Size: 18STD Production Date:

Feb 19, 2015

Product Standards: Production Method: ASME B36.10-2004, API 5L-45th Ed. Grade B/X42 PSL1, ASTM/ASME A106-2014/SA106-2013 Grade B/C NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009 MR0103-Hot Expansion **Product Heat Treatment:** As-rolled Certificate No.: MTR- 001720

Product Markings

HEAT BSM-2249 (PIPE # LENGTH MASS) 70.59Ib/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA <API & L/C No.> API SPEC 5L NPS 18 STD 0.375 INCHWT GR B/X42 PSL1 SMLS 2015/02 NDE 1490PSI

| BSM-2249 | | I | | | | BSM-2249 | I | | BSM-2249 | | I | |
|----------------------------|------------|-----------------|-----------------------|---|-------------------|--|--------------------|-------------------------|------------------------|------------------------|--------------|-------------------------|
| 2249 | | Heat | | | | | Heat | | 2249 | | Heat | |
| Heat | | Test Type | | | Degas, runy vinen | Blast Furnace; E | Stee | | Heat | | Test Type | |
| Ferrite & Pearlite | | Microstructure | | | - | Blast Furnace; EAF; Ladle Refining; Vacuum | Steelmaking Method | | NPS 18 STD 0.375in. WT | | Product Size | Product: Details |
| 79 | | Har | | | Product | Heat | Test Type | | | | Pi | ails |
| 79 HRBW | | Hardness | | ı | 0.23 | 0.20 | С | | 53 | | Pieces | |
| T. | | Flatter | | 1 | 0.90 | 0.86 | Mn | | DRL | | Length | |
| Pass | | Flattening Test | | 1 | 0.024 | 0.020 | P | 0 | 70.59 | lb/ft | Mass | |
| Lon | | | Mechanical Properties | , | 0.019 | 0.015 | S | Chemical Analysis (wt%) | <5 | μR/hr | Geiger | |
| gitudina | 50 | Ten | al Prope | ı | 0.29 | 0.27 | Si | nalysis (| _ | | | |
| Longitudinal; 38.1 mm x WT | 50mm GL | Tension Test | ties | , | 0.07 | 0.06 | Cr | wt%) | <10 | Gauss | Res. Mag. | |
| m x WT | | | | • | 0.01 | 0.01 | Cu | | Pass | Insp. | Visual | |
| 4 | | Yiel | | - | 0.01 | 0.01 | Mo | | Pass | | 8 | Z |
| 45,400 | psi | Yield (Rt0.5) | | | 0.03 | 0.03 | Z. | | Pass | _ ∀T | TU | Non-Destructive Testing |
| 75,000 | psi | Tensile (Rm) | | • | 0.004 | 0.002 | ٧ | | Pass | ASTM E213 | UT | ctive Testi |
| 8 | | (Rm) | | | 0.003 | ı | Tì | | | | | Bu |
| 0.61 | (Rt0.5/Rm) | ٧/٢ | | 1 | 0.001 | ı | Nb | | Pass | ASTM | 띄 | |
| ii | /Rm) | | | | 0.0003 | ē | В | | Pass | 1490PSI/ 5 5 Condition | HydroTest | |
| 41 | % | Elongation (A) | | ı | 0.40 | ŧ. | CE(IIW) | | | 55 | est | |
| | * | tion (A) | | | 0.40 | í | CE(IIW) CE(CSA) | | 32.5° Bevel | Condition | End | |

| BSM-2249 | | Heat |
|----------|----------------|-------------|
| , | Standard | Test |
| 3 | Sample Details | Impact Test |
| 1 | റ് | Temp |
| | J | |
| ı | j | Impact E |
| ľ | Į | Energy |
| , | AVG | |
| ı | % | |
| 1 | % | % Shear |
| , | % | ear |
| , | AVG | |
| ı | mm | |
| , | mm | Lateral Ex |
| 1 | mm | pansion |
| | AVG | |

Additional Details:

We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO-9001:2008 and API Q1. API 51-45th Ed., ASTM/ASME A106-2014/SA106-2013 Grade B/C A53-2012/SA53-2013, and the purchase order requirements, and that the

√ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service-2009 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.

 \checkmark This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Assistant QA Manager

Tonya Lam, C.E.T.

Jam April /13/2015

Mill Test Certificate approved by:



Mill Test Certificate

Bri-Steel Manufacturing Inc. 2125-64 Avenue, Edmonton, AB Canada T6P 124 Tel: 001 (780) 469-6603

Fax: 001 (780) 469-6986 www.bri-steel.com

Seamless Carbon Steel Pipe Product Heat Number: BSM-2249 Product Size: 18STD Production Date: Feb 19, 2015

Product:

Product Standards: Production Method: ASME B36.10-2004, API 5L-45th Ed. Grade B/X42 PSL1, ASTM/ASME A106-2014/SA106-2013 Grade B/C NDE, A53-2012/SA53-2013 Grade B Type S, NACE MR0175-2009 MR0103-Hot Expansion Product Heat Treatment: As-rolled Certificate No.: MTR-001589

Product Markings

<API & L/C No.> API SPEC 5L NPS 18 STD 0.375 INCHWT GR B/X42 PSL1 SMLS 2015/02 NDE 1640PSI HEAT BSM-2249 (PIPE # LENGTH MASS) 70.591b/ft ASTM/ASME A/SA106 GR B/C A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

| Heat | Test Type | Product: Details Product Size | | Pieces | Length | Mass lb/ft | Geiger µR/hr | 1 1 1 | Res. Mag. Gauss | Visual Insp. | OD N | on-Destru UT WT | Non-Destructive Testing UT UT ET ASTM E213 ASTM | E 13 | ET | HydroTest End 1640PSI/ 5 ₅ Condition | st 5 s C | End |
|----------|------------------|--|-----------|--------|--------|---------------|-------------------------|----------|--------------------|-----------------|------|-----------------------|---|------|------|--|----------------|-----|
| BSM-2249 | Heat | NPS 18 STD 0.375in, WT | _ | 65 | DRL | 70.59 | G | | <10 | Pass | Pass | Pass | Pass | | Pass | Pass | 32.5° Bevel | ni |
| | | | | | | С | Chemical Analysis (wt%) | alysis (| wt%) | | | | | | | | | |
| Heat | Stee | Steelmaking Method | Test Type | 0 | M | P | S | Si | Cr | Cu | Мо | N. | ٧ | ĭ | В | В | CE(IIW) CE(CSA | |
| BSM-2249 | Blast Furnace; E | Blast Furnace; EAF; Ladle Refining; Vacuum | Heat | 0.20 | 0.86 | 0.020 | 0.015 0.27 | 0.27 | 0.06 | 0.01 | 0.01 | 0.03 | 0.002 | 1 | 1 | ı | ŧ | |

Degas; Fully Killed

Product

0.23

0.90

0.024

0.019

0.29

0.07

0.01

0.00

0.03

0.004

0.003

0.001 0.0003

0.40

0.40

| 2000 | | Heat | BSM-2249 | | Heat Te | |
|-------|----------------|-------------------|----------------------------|------------|-----------------|-----------------------|
| | Standard | Test | Heat | | Test Type | |
| | Samı | lmi | Ferrite & Pearlite | | Microstructure | ٠ |
| | Sample Details | Impact Test | 79 HRBW | | Hardness | |
| | °C | Temp | Pass | | Flattening Test | |
| 0.000 | ر | | | | | Mechai |
| | _ | Impact Energy | Longitudinal; 38.1 mm x WT | 50 | Ten | Mechanical Properties |
| | _ | Energy | ıl; 38.1 n | 50mm GL | Tension Test | rties |
| | AVG | | TW x mr | | | |
| | % | | | | Yie | |
| | % | % Shear | 45,400 | psi | rield (Rt0.5) | |
| | % | ear | 75 | | Tensi | |
| | AVG | | 75,000 | psi | Tensile (Rm) | |
| • | mm | | 0.61 | (Rt0.5/Rm) | Υ/τ | |
| | mm | Lateral Expansion | | m) | | |
| 1 | mm | xpansion | 41 | % | Elongation (A) | |
| , | AVG | | - | | ion (A) | |

| 1 | | , | , | | , | , | , | ı | , | ı | ī | • | * | BSM-2249 |
|---------|---------|----|-----|------|---------|---|-----|--------|----------|---|------|----------------|----------|----------|
| mm | mm | mm | AVG | % | % | % | AVG | _ | <u>_</u> | _ | ం | Sample Details | Standard | |
| Expansi | Lateral | | | hear | % Shear | | | Energy | Impact | | Temp | Impact Test | Test | Heat |

Additional Details:

🗸 We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in accordance with results meet the corresponding requirements. Bri-Steel Manufacturing is registered and certified to ISO-9001:2008 and API Q1. API 51-45th Ed., ASTM/ASME A106-2014/SA106-2013 Grade B/C A53-2012/SA53-2013, and the purchase order requirements, and that the

√ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service-2009 NACE MR0103-2012 Section 2.1.

✓ No weld repairs have been performed on this product.

 \checkmark This product has not come into contact with mercury during the Bri-Steel Manufacturing processes.

 \checkmark This certificate represents a quality control system that is compliant with EN 10204:2004 Type 3.1.

Mill Test Certificate approved by:

Tonya Lam, C.E.T.

Assistant QA Manager