

Mill Test Certificate

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

Fax: 001 (780) 469-6986 Tel: 001 (780) 469-6603

www.brichemsteel.com

Production Date: Feb 10, 2014

Seamless Carbon Steel Pipe Product Heat Number: BSM-1621 Product Size: 20XS

Product Standards: ASME B36.10-2004, API 5L-45th Ed. Grade B/X42 PSL1, ASTM/ASME A/SA106-2013 Grade B NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010 Hot Expansion **Product Heat Treatment:** As-rolled Certificate No.: MTR-

Production Method:

Product Markings | CAPI> 5L-0898 API SPEC 5L NPS 20 XS 0.500 INCHWT GR B/X42 PSL1 SMLS 2014/02 NDE 1890PSI MANUFACTURING HEAT BSM-1621 (PIPE # LENGTH MASS) 104.1lb/ft ASTM/ASME A/SA106 GR B A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

| | BSM-1621 | | Heat | |
|---------|-----------------------|----------------|--------------|-------------------------|
| | 1 Heat | | Test Type | |
| | | | pe | |
| | NPS 20 XS 0.500in. WT | | Product Size | Product: Details |
| | 8 | | Pieces | |
| 2000 | DRL | | Length | |
| - 10000 | 104.1 | lb/ft | Mass | |
| | <5 | μR/hr | Geiger | |
| | <10 | Gauss | Res. Mag. | |
| | Pass | Insp. | Visual | |
| | Pass | | OD | No |
| | Pass | WT | TU | n-Destruct |
| | Pass | ASTM E213 ASTM | TU | Non-Destructive Testing |
| | Pass | | ET | |
| | Pass | 1890 PSI/ 5 s | HydroTest | |
| | 32.5° Bevel | S Condition | End | |

| | BSM-1621 | Heat | |
|-------------|---|--------------------|-------------------------|
| | Blast Furnace; EAF; Ladle Refining; Vacuum Degas: Fully Killed | Steelmaking Method | |
| Product | Heat | Test Type | |
| 0.22 | 0.20 | С | |
| 0.92 | 0.88 | Mn | |
| 0.022 | 0.012 | Р | |
| 0.022 0.007 | 0.008 | S | Chemical |
| 0.30 | 0.26 | Si | Chemical Analysis (wt%) |
| 0.07 | 0.04 | Cr | wt%) |
| 0.01 | 0.01 | Cu | |
| 0.00 | | Мо | |
| 0.04 | 0.01 | N: | |
| 0.002 | | ٧ | |
| 0.003 | | П | |
| 0.001 | | Nb | |
| 0.0003 | | В | |
| 0.39 | t | CE(IIW) | |
| 0.39 | i, | CE(CSA) | |

| | | | | | Mechanical Properties | | | | |
|----------|-----------|--------------------|----------|-----------------|----------------------------|---------------|--------------|------------|----------------|
| Heat | Test Type | Microstructure | Hardness | Flattening Test | Tension Test | Yield (Rt0.5) | Tensile (Rm) | ٧/٦ | Elongation (A) |
| | | | | | 50mm GL | psi | psi | (Rt0.5/Rm) | % |
| BSM-1621 | Heat | Ferrite & Pearlite | 74 HRBW | Pass | Longitudinal; 38.1 mm x WT | 42,500 | 69,500 | 0.61 | 44 |
| | | | | | | | | | |

| BSM-1621 | | Heat |
|----------|----------------|-------------------|
| | Standard | Test |
| 1 | Sample Details | Impact Test |
| | റ് | Temp |
| , | J | |
| | J | Impact |
| 1 | J | Energy |
| 1 | AVG | |
| , | % | |
| ı | % | % Shear |
| 1 | % | ear |
| 1 | AVG | |
| 4 | mm | |
| | mm | Lateral Expansion |
| , | mm | pansion |
| | AVG | |

Additional Details:

- ✓ We hereby certify that this pipe product was manufactured, sampled, tested and inspected by Bri-Steel Manufacturing Inc. in that the results meet the corresponding requirements. accordance with API 5L-45th Ed., ASTM/ASME A/SA106-2013 Grade B A/SA53-2012, and the purchase order requirements, and
- √ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service-2009 NACE MR0103-2010 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:

o Sander 2014 FEB12

Paul Sowden, T.T.

Assistant QA Manager



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Seamless Carbon Steel Pipe

Product Heat Number:

BSM-1621

Product Size: 20 X 0.450

Production Date: Feb 10, 2014

Production Method:

Hot Expansion

Product Heat Treatment:

As-rolled

Certificate No.: MTR- 000853

Product Standards: ASME B36.10-2004, ASTM/ASME A/SA106-2013 Grade B NDE, A/SA53-2012 Grade B Type S, NACE MR0175-2009 MR0103-2010

Product Markings

NBRI-STEEL NPS 20 X 0.450 INCHWT SMLS 2014/02 NDE 1890PSI

MEAT BSM-1621 (PIPE # LENGTH MASS) 93.69lb/ft ASTM/ASME A/SA106 GR B A/SA53 GR B NACE MR0175/MR0103 MADE IN CANADA

| | | Product: Details | | | | | | | Z | on-Destruc | Non-Destructive Testing | | | |
|----------|-----------|----------------------|--------|--------|-------|--------|-----------|--------|------|------------|-------------------------|-------------|---------------|-------------|
| Heat | Test Type | Product Size | Pieces | Length | Mass | Geiger | Res. Mag. | Visual | OD | TU | UT | ET | HydroTest | End |
| | | | | | lb/ft | μR/hr | Gauss | Insp. | | TW | ASTM E213 ASTM | ASTM | 1890 PSI/ 5 s | s Condition |
| BSM-1621 | Heat | NPS 20 X 0.450in. WT | 8 | DRL | 93.69 | Ġ. | <10 | Pass | Pass | Pass | Pass | Pass | Pass | 32.5° Bevel |
| | | | | | | | | | | | | | | |

| | | BSM-1621 | Heat | |
|---|----------------------|--|--------------------|-------------------------|
| | C Coop only State of | Blast Furnace; EAF; Ladle Refining; Vacuum | Steelmaking Method | |
| | Product | Heat | Test Type | |
| 200 | 0.22 | 0.20 | С | |
| 200 | 0.92 | 0.88 | Mn | |
| 200000000000000000000000000000000000000 | 0.022 | 0.012 | P | |
| 0.000 | 0.007 | 0.008 | S | Chemical |
| | 0.30 | 0.26 | Si | Chemical Analysis (wt%) |
| | 0.07 | 0.04 | Cr | wt%) |
| | 0.01 | 0.01 | Cu | |
| | 0.00 | | Мо | |
| | 0.04 | 0.01 | N: | |
| | 0.002 | | ٧ | |
| | 0.003 | | П | |
| | 0.001 | | dN | |
| | 0.0003 | | В | |
| | 0.39 | • | CE(IIW) | |
| | 0.39 | ı | CE(CSA) | |

| 44 | 0.61 | 69.500 | 42,500 | Longitudinal; 38.1 mm x WT | Pass | 74 HRBW | Ferrite & Pearlite | Heat | BSM-1621 |
|----------------|------------|--------------|---------------|----------------------------|-----------------|----------|--------------------|-----------|----------|
| % | (Rt0.5/Rm) | psi | psi | 50mm GL | | | | | |
| Elongation (A) | Υ/Τ | Tensile (Rm) | Yield (Rt0.5) | Tension Test | Flattening Test | Hardness | Microstructure | Test Type | Heat |
| | | | 77 | Mechanical Properties | | | | | |

| | | | | The second second second second | | | | | | | | | | | |
|-----|-----------|-----------|----|---------------------------------|---------|-----|---|-----|----------|-------|---|------|----------------|----------|----------|
| (=) | i | - | c | , | | 1 | r | | 1 | 1 | 1 | 1 | | 1 | BSM-1621 |
| AVG | mm | mm | mm | AVG | % | % | % | AVG | J | J | _ | ဂိ | Sample Details | Standard | |
| | Expansion | Lateral E | | | % Shear | % S | | | t Energy | Impac | | 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 ASTM/ASME A/SA106-2013 Grade B A/SA53-2012, and the purchase order requirements, and that the results meet the corresponding requirements.
- √ This pipe product meets the sour service requirements of NACE MR0175/ISO 15156-2:2009 Annex A2 for Region 3 Sour Service-2009 NACE MR0103-2010 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:

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Assistant QA Manager