



Alfa Laval Inc.
5400 International Trade Dr.
Richmond, VA 23231

Date: 8/19/2015

Rev.: 1

Title: Data Book Index

Doc. No.: 85480-3-DBI

Page 1 of 1

Customer: Viridia B2X, LLC

SU Order No: 85480-30

Model : TL3-PFG

Serial No: 30116-93127

Customer PO: 148

Item No: HE-28503

PLATE HEAT EXCHANGER DATABOOK

Section 1: GA Drawing / Plate Hanging List / Technical Specification Sheet

Section 2: ASME Data Report / Code Plate Copy / Certificate of Conformance

Section 3: Pressure Part Material Certificates

- Frame and Pressure Plate MTR
- Channel Plate MTR
- Tightening Bolt and Nut (Representative MTR)

Section 4: Standard Hydrostatic Test Certificate

Section 5: Calculations

- Stress Calculations - Not applicable for this model
- Lifting Device Calculations – Not applicable for this model

Prepared By: Peter Scholtes

Approved By: Peter Scholtes

Rev1: Revised for change in design

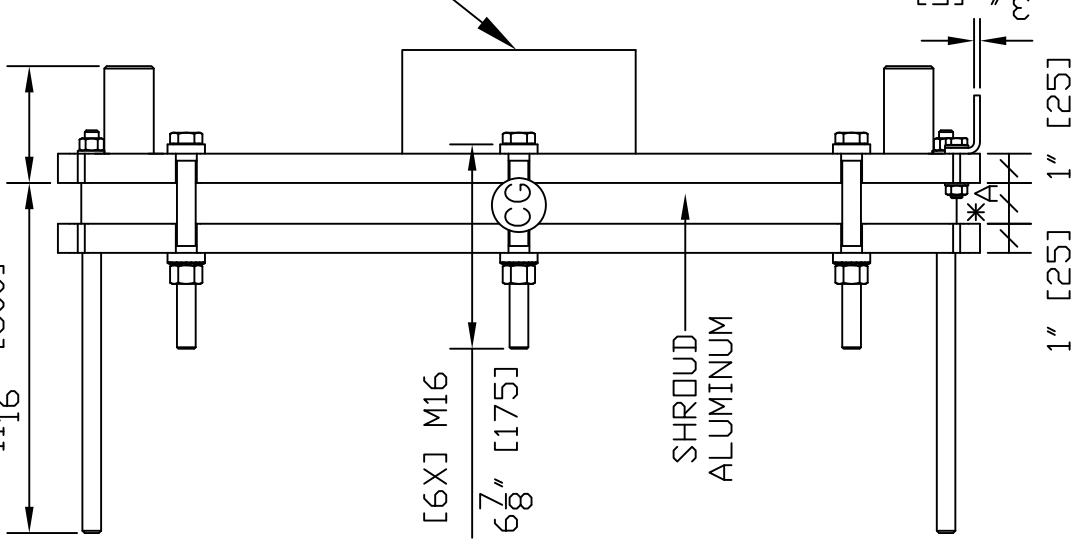
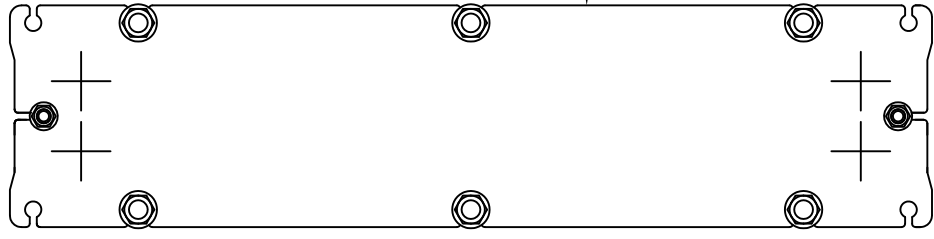
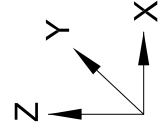
CERTIFIED
APPROVED FOR FABRICATION
BY PS DATE SEPT-9-2015

REAR

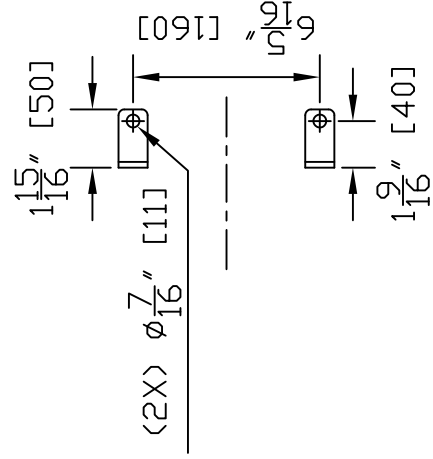
SIDE

FRONT

| CENTER OF GRAVITY | |
|-------------------|----------------|
| X (FROM FACE) | 1 3/4" [44] |
| Y (FROM SIDE) | 3 3/4" [95] |
| Z (FROM FLOOR) | 15 8/16" [395] |



FOOTPRINT



NOTES:

PAINT: CARBOLINE CARBOTHANE 8832 ALIPHATIC POLYURETHANE,
3-5 MILS DFT, COLOR AL-BLUE.
AIR DRY, LONG TERM STORAGE PROCEDURE.

* PLATE PACK TIGHTENING DIMENSION
A = N x (3.02 + X) = 10 x (3.02 + 0.5) = 35 mm +/- 1%

DIMENSIONS IN BRACKETS ARE MILLIMETERS [mm].
DIMENSIONAL TOLERANCES +/- 1/8"

| REMARKS: | SIDE 1 | SIDE 2 | GASKET | EPDMP CLIP-ON |
|--------------------|----------|----------|------------------|----------------------------------|
| DESIGN PRESSURE | 150 PSIG | 150 PSIG | PLATE MATERIAL | SA-240-316 |
| MAWP | 150 PSIG | 150 PSIG | PLATE THICKNESS | 0.50 mm |
| TEST PRESSURE | 195 PSIG | 195 PSIG | HEATING SURFACE | 5.9 FT ² |
| DESIGN TEMPERATURE | 300 °F | 300 °F | PLATE GROUPING | 1*4L / 1*5L = 10 PLATES (16 MAX) |
| MDMT | -20 °F | -20 °F | OPERATING WEIGHT | 157 LBS |
| | | | NET WEIGHT | 154 LBS |

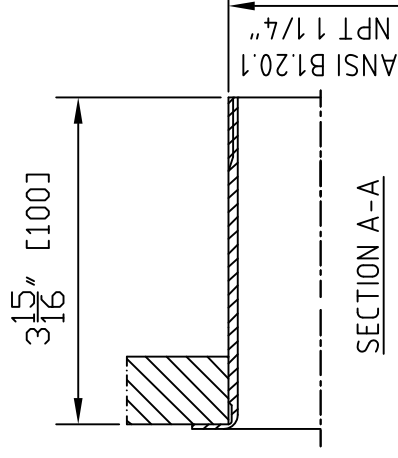
| | | |
|--|--------------------------------------|-------------------|
| SUPPLIER: ALFA LAVAL INC. RE: 1828203 | ORDER NO. 85480-30 | |
| CUSTOMER VIRDIA B2X, LLC | CUSTOMER P.O. NO. 148 | |
| ITEM NO. HE-2850 | ITEM DESCRIPTION SSMB FEED HEATER | |
| DRAWN BY DMN | CHECKED BY PSS | DATE 8-12-2015 |

PLATE HEAT EXCHANGER
TL3-PFG
ASME

| | |
|---------------------------|-------------------|
| | |
| SERIAL NO. 30116-93127 | REVISION No. 0 |

| SIDE | MEDIA | CONNECTIONS | MATERIAL | INLET | TEMPERATURE | OUTLET | TEMPERATURE | FLOW RATE | PRESSURE DROP | LIQUID VOLUME |
|------|-------------|-------------|------------|-------|-------------|--------|-------------|-----------|---------------|----------------------|
| 1 | WATER-STEAM | 1 1/4" NPT | SA-312-316 | S4 | 250.0 °F | S3 | 250.0 °F | 340 LB/H | 3.10 PSI | 0.03 FT ³ |
| 2 | 45% SUGAR | 1 1/4" NPT | SA-312-316 | S2 | 95.0 °F | S1 | 150.0 °F | 7500 LB/H | 4.36 PSI | 0.04 FT ³ |

SECTION A-A



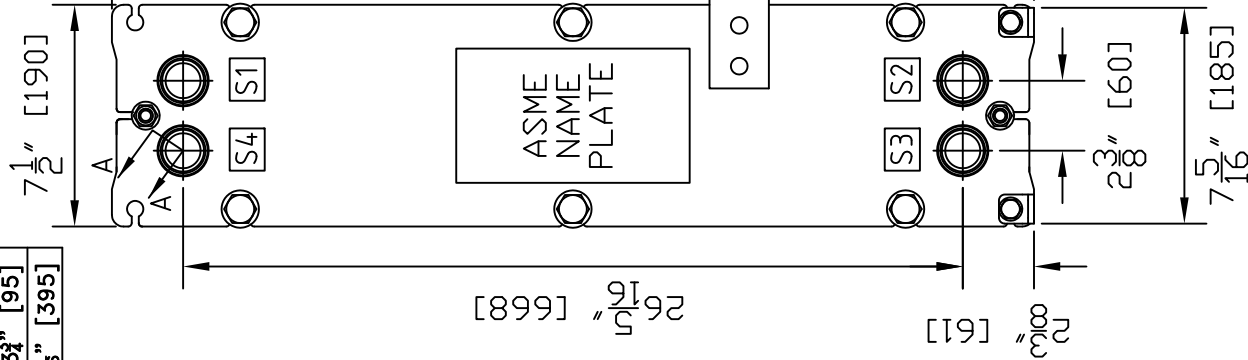
GROUNDING LUG FP
9 9/16" [14] DIA. HOLE

NAME PLATE
BRACKET
BOLT-ON

SHROUD-
ALUMINUM

23 5/8" [600]
RECOMMENDED
FREE SPACE
FOR SERVICING
(EACH SIDE)

FRONT



ANSI B1.20.1
NPT 1 1/4"



Alfa Laval, Plate Heat Exchanger Channel Plate Installation Description

2015-08-11

| | | | |
|--------------|------------------|--------------|-------------|
| Customer: | Viridia B2X, LLC | SU Order No: | 85480-30 |
| Model : | TL3-PFG | Serial No: | 30116-93127 |
| Customer PO: | 148 | Item No: | HE-2850 |

Plate material and Thickness: SA-240-316 0.50 mm

A Dimension: 35 mm

| | | |
|-------------------|-----------------|------------------|
| | Hot side | Cold side |
| Grouping: | 1*4L | 1*5L |
| Sealing material: | EPDMP CLIP-ON | EPDMP CLIP-ON |
| Port Locations: | S4 -> S3 | S2 -> S1 |

Connection material: SA-240-316 SA-240-316

Port hole with flow on the gasketed side: U

Port hole sealed with O-ring: O

Plates are assembled with the gasket side facing the frame plate.

| Plate no. | Plate code no. | Plate Pattern | | Punched corner of the plate | | | | Flow direction on the gasket side of the plate |
|-----------|----------------|---------------|---|-----------------------------|------------|-------------|-------------|--|
| | | | | upper left | lower left | lower right | upper right | |
| | | | | S1 | S2 | S3 | S4 | |
| | | | | =<= | =>= | =>= | =<= | |
| | FRAME PLATE | | | | | | | |
| 1 | 39508494 83 | TL3 P2 | A | O | O | O | O | |
| 2 | 39508493 03 | TL3 P1 | B | U --<--- | U | O | O | Up |
| 3 | 39508493 03 | TL3 P1 | A | O | O | U --<--- | U | Down |
| 4 | 39508493 03 | TL3 P1 | B | U --<--- | U | O | O | Up |
| 5 | 39508493 03 | TL3 P1 | A | O | O | U --<--- | U | Down |
| 6 | 39508493 03 | TL3 P1 | B | U --<--- | U | O | O | Up |
| 7 | 39508493 03 | TL3 P1 | A | O | O | U --<--- | U | Down |
| 8 | 39508493 03 | TL3 P1 | B | U --<--- | U | O | O | Up |
| 9 | 39508493 03 | TL3 P1 | A | O | O | U --<--- | U | Down |
| 10 | 39508494 76 | TL3 P2 | B | --<--- | | | | Up |
| | PRESSURE PLATE | | | | | | | |
| | | | | T1 | T2 | T3 | T4 | |

| | |
|-------------|-----------|
| Article No: | Quantity: |
| 39508494 83 | 1 |
| 39508493 03 | 8 |
| 39508494 76 | 1 |



Alfa Laval, Plate Heat Exchanger Technical Specification

2015-08-11

| | | | |
|--------------|------------------|--------------|-------------|
| Customer: | Viridia B2X, LLC | SU Order No: | 85480-30 |
| Model : | TL3-PFG | Serial No: | 30116-93127 |
| Customer PO: | 148 | Item No: | HE-2850 |

| Fluid | | Water-Steam | 45% Sugar |
|-----------------------------------|---------------------------|----------------------|---------------|
| Mass flow rate | lb/h | 340.2 | 7500 |
| Fluid Condensed/Vapourized | lb/h | 340.2 | 0.000 |
| Inlet temperature | °F | 250.0 | 95.0 |
| Outlet temperature (vapor/liquid) | °F | 243.8/225.4 | 150.0 |
| Operating pressure (In/Out) | psia | 29.8/26.7 | |
| Pressure drop | psi | 3.10 | 4.36 |
| Velocity Connection (In/Out) | ft/s | 174/0.210 | 3.70/3.70 |
| Heat Exchanged | kBtu/h | 330.0 | |
| Mean Temperature Difference | °F | 122.2 | |
| O.H.T.C | Btu/ft ² ,h,°F | 455.0 | |
| Relative directions of fluids | | Countercurrent | |
| Number of plates | | 10 | |
| Number of passes | | 1 | 1 |
| Extension capacity | | | 6 |
| Plate material/ Thickness | | SA-240-316 / 0.50 mm | |
| Sealing material | | EPDMP CLIP-ON | EPDMP CLIP-ON |
| Connection material | | SA-240-316 | SA-240-316 |
| Connection diameter | | 1 ¼" | 1 ¼" |
| Nozzle orientation | | S4 -> S3 | S1 <- S2 |
| Pressure vessel code | | ASME | |
| Flange rating | | ASME | |
| Design pressure | psig | 150.0 | 150.0 |
| Test pressure | psig | 195.0 | 195.0 |
| Design temperature | °F | 300.0 | 300.0 |
| Overall length x width x height | in | 16 x 8 x 31 | |
| Liquid volume | ft ³ | 0.03 | 0.04 |
| Net Weight Empty / Operating | lb | 154 / 157 | |

Performance is conditioned on the accuracy of customers data and customers ability to supply equipment Data, specifications, and other kind of information of technological nature set out in this document and submitted by Alfa Laval to you (Proprietary Information) are intellectual proprietary rights of Alfa Laval. The Proprietary Information shall remain the exclusive property of Alfa Laval and shall only be used for the purpose of evaluating Alfa Laval's quotation. The Proprietary Information may not, without the written consent of Alfa Laval, be used or copied, reproduced, transmitted or communicated or disclosed in any other way to a third party.

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS

As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by Alfa Laval Inc., 5400 International Trade Drive, Richmond, Virginia, 23231
(Name and address of Manufacturer)

2. Manufactured for Viridia B2X, LLC, 1319 HWY 182, Raceland, LA, 70394
(Name and address of Purchaser)

3. Location of installation Unknown
(Name and address)

4. Type Vertical Plate Heat Exchanger 30116-93127
(Horiz., vert., or sphere) (Tank, separator, jkt. vessel, heat exh., etc.) (Mfg's serial No.)

N/A 30116-93127.0 36556 2015
(CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)

5. ASME Code, Section VIII, Div. 1 2013/ N/A 2523, 2766 N/A
Edition and Addenda (date) Code Case No. Special Service per UG-120(d)

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multichamber vessels.

6. Shell (a) No. of course(s): 0 (b) Overall length: 0'

| Course(s) | | | Material | Thickness | | Long. Joint (Cat. A) | | | Circum. Joint (Cat. A, B, & C) | | | Heat Treatment | |
|-----------|------------|------------|---------------------|------------|------------|----------------------|------------------|------------|--------------------------------|------------------|------------|----------------|------------|
| No. | Diameter | Length | Spec./Grade or Type | Nom. | Corr. | Type | Full, Spot, None | Eff. | Type | Full, Spot, None | Eff. | Temp. | Time |
| | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> |

7. Heads: (a) SA-516-70 (b) SA-516-70
(Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.) (Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.)

| | Location (Top, Bottom, Ends) | Thickness | | Radius | | Elliptical Ratio | Conical Apex Angle | Hemispherical Radius | Flat Diameter | Side to Pressure | | Category A | | |
|-----|------------------------------|-----------|-----------|------------|------------|------------------|--------------------|----------------------|-------------------|------------------|---------|------------|------------------|------------|
| | | Min. | Corr. | Crown | Knuckle | | | | | Convex | Concave | Type | Full, Spot, None | Eff. |
| (a) | <u>Fixed</u> | <u>1"</u> | <u>0"</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>31" x 7.5"</u> | | | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> |
| (b) | <u>Movable</u> | <u>1"</u> | <u>0"</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>31" x 7.5"</u> | | | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> |

If removable, bolts used (describe other fastening) SA193-B7 (6) 0.630" (M16 actual) BOLTS
(Mat'l, Spec. No., Grade, Size, No.)

8. Type of jacket N/A Jacket closure N/A
(Describe as ogee & weld, bar, etc.)

If bar, give dimensions N/A If bolted, describe or sketch.

9. MAWP 150 psi N/A at max. temp. 300 °F N/A Min. design metal temp. -20 °F at 150 psi
(internal) (external) (internal) (external)

10. Impact test NO (Impact Exemption UCS-66(a), (b), UHA-51, UNF-65, as applicable) at test temperature of N/A
(Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu., or comb. test press. HYDRO at 195 psi Proof test N/A

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: N/A N/A N/A N/A N/A
Stationary (Mat'l Spec. No.) Dia., (subject to press.) Nom. thk. Corr. Allow. Attachment (welded or bolted)

N/A N/A N/A N/A N/A
Floating (Mat'l Spec. No.) Dia. Nom. thk. Corr. Allow. Attachment

13. Tubes: N/A N/A N/A N/A N/A
Mat'l Spec. No., Grade or Type O. D. (Nom. thk.) Number Type (Straight or U)

Items 14-18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell (a) No. of course(s): 0 (b) Overall length: N/A

| Course(s) | | | Material | Thickness | | Long. Joint (Cat. A) | | | Circum. Joint (Cat. A, B, & C) | | | Heat Treatment | |
|-----------|------------|------------|---------------------|------------|------------|----------------------|------------------|------------|--------------------------------|------------------|------------|----------------|------------|
| No. | Diameter | Length | Spec./Grade or Type | Nom. | Corr. | Type | Full, Spot, None | Eff. | Type | Full, Spot, None | Eff. | Temp. | Time |
| | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> |

15. Heads: (a) N/A (b) N/A
(Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.) (Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.)

| | Location (Top, Bottom, Ends) | Thickness | | Radius | | Elliptical Ratio | Conical Apex Angle | Hemispherical Radius | Flat Diameter | Side to Pressure | | Category A | | |
|------------|------------------------------|------------|------------|------------|------------|------------------|--------------------|----------------------|---------------|------------------|---------|------------|------------------|------------|
| | | Min. | Corr. | Crown | Knuckle | | | | | Convex | Concave | Type | Full, Spot, None | Eff. |
| <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> | | | <u>N/A</u> | <u>N/A</u> | <u>N/A</u> |

If removable, bolts used (describe other fastening) N/A
(Mat'l, Spec. No., Grade, Size, No.)

16. MAWP N/A N/A at max. temp. N/A N/A Min. design metal temp. N/A at N/A
 (internal) (external) (internal) (external)

17. Impact test N/A at test temperature of N/A
 (Indicate yes or no and the component(s) impact tested)

18. Hydro., pneu., or comb. test press. N/A Proof test N/A

19. Nozzles, inspection, and safety valve openings:

| Purpose (Inlet, Outlet, Drain, etc.) | No. | Diameter or Size | Flange Type | Material | | Nozzle Thickness | | Reinforcement Material | How Attached | | Location (Insp. Open.) |
|--------------------------------------|-----|------------------|-------------|-----------|--------|------------------|-------|------------------------|--------------|--------|------------------------|
| | | | | Nozzle | Flange | Nom. | Corr. | | Nozzle | Flange | |
| Outlet | 2 | 1 1/4" | PIPE | SA312-316 | | SCH 40 | | | | | |
| Inlet | 2 | 1 1/4" | PIPE | SA312-316 | | SCH 40 | | | | | |

20. Supports: Skirt _____ Lugs N/A Legs N/A Others FEET Attached BOLTED
 (Yes or no) (No.) (No.) (Describe) (Where and how)

21. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:
N/A
 (List the name of part, item number, mfg's. name and identifying number)

22. Remarks:
Actual Plates (10) SA-240-316 (ALLOY 316) 0.5 mm (16) Plates Maximum; Distance between Heads = 35 mm; Customer PO#: 148; Tag #: SSMB Feed HeaterHE-2850; Owner to supply Safety Valve/Noncorrosive Service Only;

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1. U Certificate of Authorization No. 25017 Expires July 5, 2016
 Date 10/02/2015 Name Alfa Laval Inc. Signed [Signature]
 (Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of VA and employed by OneCIS Insurance Company, of Lynn, MA have inspected the pressure vessel described in this Manufacturer's Data Report on October 2, 2015, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.
 Date 10/14/2015 Signed [Signature] Commissions 10803A, VA951R
 (Authorized Inspector) (Nat'l Board incl. endorsements, State, Province and No.)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements made in this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME Code, Section VIII, Division 1. U Certificate of Authorization No. _____ Expires _____
 Date _____ Name _____ Signed _____
 (Assembler) (Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of _____ and employed by _____ of _____ have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items _____, not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with the ASME Code, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of _____ psi. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.
 Date _____ Signed _____ Commissions _____
 (Authorized Inspector) (Nat'l Board incl. endorsements, State, Province and No.)



36556

Certified by

Alfa Laval - Richmond, VA

U

Single ratings apply to all chambers
Multiple ratings are listed as Hot/Cold

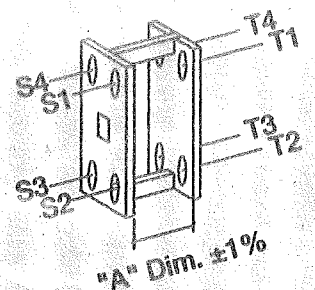
| | | | |
|-------|----------------------|------|------|
| MAWP | 150 PSIG AT 300 °F | | |
| MDMT | -20 °F AT 150 PSIG | | |
| S/N | 30116-93127 | Year | 2015 |
| Model | TL3-PFG | | |
| Area | 5.9 SQ. FT. | | |
| A-Dim | 35mm w/10 0.5mm PLTS | | |
| Order | 1828203 | | |

VIRDIA PO 148
 ITEM NO HE-2850
 DUTY 330,000 BTU/HR
 OHTC 455.0 BTU/FT²,H.F
 MAX NO OF 316 SS PLATES: 16

Customer Service

866-ALFALAVAL

WWW.ALFALAVAL.COM



October 7, 2015



Alfa Laval Inc.
5400 International Trade Drive
Richmond, VA 23232
USA
Tel: +1 804-222-5300
www.alfalaval.com

| | | |
|------------|----------------------------|-----------------|
| Reference: | Alfa Laval Order: | 85480 / 1828203 |
| | Serial Number: | 30116-93127 |
| | Customer Reference Number: | 148 |
| | Customer Item No: | HE-2850 |

CERTIFICATE OF CONFORMANCE

Alfa Laval hereby states that the methods and materials used to fabricate the plate heat exchanger(s) referenced above conform to the applicable requirements of Alfa Laval Richmond's ISO 9001-2008 Quality Management System requirements. Additionally, if an ASME code stamp has been applied to the equipment, we hereby state that it meets the applicable requirements of ASME Section VIII, Div.1.

Sincerely,

A handwritten signature in cursive script that reads "Michael J. Gunnoe".

Michael J. Gunnoe – Quality Technician, Quality Assurance
Alfa Laval Inc – USA, VA

MISSION STATEMENT: To optimize the performance of our customer's processes.
Time and time again.



FRAME & PRESSURE PLATES



1770 Bill Sharp Boulevard, Muscatine, IA 52761-9412, US

Test Certificate

Form TC1: Revision 2: Date 23 Apr 2014

| | | | |
|--|-------------------------------------|-------------------------------------|---|
| Customer: RYERSON INC. ACCOUNTS PAYABLE DEPT. PO BOX 91601 LUBBOCK TX 79480-1601 | Customer P.O.No.: 4500668948 | Mill Order No.: 41-419062-01 | Shipping Manifest: MT250166 |
| Product Description: ASTM A516-70/ASME SA516-70(13) | Ship Date: 30 Jan 15 | Cert No.: 061498580 | Cert Date: 30 Jan 15 (Page 1 of 1) |
| Size: 1.000 X 96.00 X 240.0 (IN) | | | |

| Heat Id | Piece Id | Tst Loc | YS (KSI) | UTS (KSI) | %RA | Elong % | Tst Dir | Hardness | Charpy Impact Tests | | | Tst Tmp | Tst Dir | Tst Siz (mm) | BDWTT Tmp %Shr |
|---------|----------|---------|----------|-----------|-----|---------|---------|----------|---------------------|---|---|---------|---------|--------------|----------------|
| | | | | | | | | | 1 | 2 | 3 | | | | |
| ASA157 | A09 | L 51 | 76 | 76 | | 25 | T | | | | | | | | |
| BSA630 | E19 | L 57 | 78 | 78 | | 20 | T | | | | | | | | |

| Heat Id | Chemical Analysis | | | | | | | | | | | ORGN | | | | | |
|---------|-------------------|------|------|------|-----|-------|--------|-----|-----|-----|-----|------|------|------|-------|-----|-----|
| | C | Mn | P | S | Si | Total | Sol Al | Cu | Ni | Cr | Mo | | Cb | V | Ti | B | Cav |
| ASA157 | .18 | 1.01 | .011 | .003 | .24 | .026 | .023 | .32 | .19 | .12 | .06 | .001 | .006 | .006 | .0004 | .41 | USA |
| BSA630 | .16 | .99 | .011 | .007 | .18 | .027 | .025 | .36 | .17 | .09 | .04 | .002 | .030 | .001 | .0004 | .39 | USA |

5-1432909

KILLED STEEL
 MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT.
 KILLED STEEL, PRODUCED TO A FINE GRAIN PRACTICE
 CEV (LIM) = C + MN/6 + (CR+MO+V)/5 + (NI+CU)/15
 MTR EN 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT
 100% MELTED AND MANUFACTURED IN THE USA.
 PRODUCTS SHIPPED:
 BSA630 E19 PCS: 2, LBS: 13068 *ASA157 A09 PCS: 1, LBS: 6534

Digitally signed by
 herbert.wathan@alfalaval.com
 DN:
 cn=herbert.wathan@alfalaval.com
 Date: 2015.03.31 08:49:44 -04'00'

WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH, AND MEETS THE REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION

Cust Part #: 160005134

Brian Wales +1 563 381 5300
 SENIOR METALLURGIST - PRODUCT

herbert.wathan@alfalaval.com

SSAB

Test Certificate

Form TC1: Revision 2: Date 23 Apr 2014

1770 Bill Sharp Boulevard, Muscatine, IA 52761-9412, US

Customer:
RYERSON INC.
ACCOUNTS PAYABLE DEPT.
PO BOX 91601
LUBBOCK
TX 79490-1601

Customer P.O. No.: 4500685127

Product Description: ASTM A516-70(10)/ASME SA516-70(13)

Mill Order No.: 41-429197-01

Shipping Manifest: MT257278

Ship Date: 06 May 15
Cert Date: 06 May 15

Cert No: 061513868
(Page 1 of 1)

Size: 1.000 X 96.00 X 240.0 (IN)

| Heat Id | Piece Id | Tested Thickness | Tensiles | | | | Charpy Impact Tests | | | | Tst Dir | Tst Siz (mm) | BDWTT Temp %Shr | |
|---------|----------|------------------|----------|----------|-----------|-------------------|---------------------|--------------------------|---------------|-----|---------|--------------|-----------------|--|
| | | | Tst Loc | YS (KSI) | UTS (KSI) | %RA Elong 2in 8in | Hardness | Abs. Energy (FTLB) 1 2 3 | % Shear 1 2 3 | Avg | | | | |
| B5D801 | C30 | 1.000 (DISCRT) | L | 58 | 77 | | | | | | | | | |
| B5D832 | C01 | 0.997 (DISCRT) | L | 54 | 79 | 26 T | 22 T | | | | | | | |

| Heat Id | Chemical Analysis | | | | | | | | | | | | | | CEV | ORGN | |
|---------|-------------------|------|------|------|-----|--------|--------|-----|-----|-----|-----|------|------|------|-------|------|-----|
| | C | Mn | P | S | Si | Tot Al | Sol Al | Cu | Ni | Cr | Mo | Co | V | Ti | | | B |
| B5D801 | .17 | 1.03 | .008 | .001 | .17 | .024 | .022 | .33 | .17 | .09 | .04 | .002 | .029 | .001 | .0004 | .40 | USA |
| B5D832 | .21 | 1.12 | .006 | .008 | .18 | .030 | .027 | .29 | .15 | .11 | .02 | .001 | .003 | .007 | .0002 | .45 | USA |

KILLED STEEL
MERCURY IS NOT A METALLURGICAL COMPONENT OF THE STEEL AND NO MERCURY WAS INTENTIONALLY ADDED DURING THE MANUFACTURE OF THIS PRODUCT.
KILLED STEEL, PRODUCED TO A FINE GRAIN PRACTICE
CEV (LIW) = C + MN/6 + (CR+MO+V)/5 + (NI+CU)/15
MTR EN 10204:2004 INSPECTION CERTIFICATE 3.1 COMPLIANT
100% MELTED AND MANUFACTURED IN THE USA.
PRODUCTS SHIPPED: C01 B5D832
PCES: 4, LBS: 26136

Digitally signed by
herbert.wathan@alfalaval.com
DN:
cn=herbert.wathan@alfalaval.com
Date: 2015.09.28 07:31:27 -04'00'

B5D801
PCES: 2, LBS: 13068
C30

WE HEREBY CERTIFY THAT THIS MATERIAL WAS TESTED IN ACCORDANCE WITH, AND MEETS THE REQUIREMENTS OF, THE APPROPRIATE SPECIFICATION


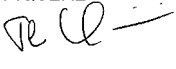
Brian Wales
SENIOR METALLURGIST - PRODUCT


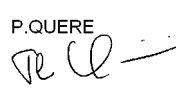
Cust Part #: 160005134



(U)



CHANNEL PLATES

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|---|--|---|--|---|--|---|--|---|--|---|--|----------|--|----------|--|----------|--|-----|--|-----|--|-----|--|-----|--|-----|--|-----|--|
|  <p>Aperam - Stainless France Aperam Gueugnon 71130 Gueugnon FRANCE</p> | | MILL CERTIFICATE BS EN 10204/3.1 CERTIFICAT DE RECEPTION NF EN 10204/3.1 ABNAHMEPRUEFZEUGNIS DIN EN 10204/3.1 | | | | | | | | N-Nr-N 14G0318484-01 V02 | | | | | | | | | | | | | | | | | | | | | | | |
| | | ISO 9001 V2008 - ISO TS 16949 V2009 - ISO 14001 V 2004 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Manufacturer's works order number N° de la commande usine productrice Werksauftragsnummer 80228383 /01-53423/1 | | Purchaser and/or consignee Client et/ou destinataire Besteller und/oder Empfaenger Alfa Laval Lund AB Rudeboksvägen 1 221 00 LUND SUEDE | | Purchaser's order number N° de commande client Kundenbestellnummer OMCP-129613 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Product - Produit - Erzeugnis COLD-ROLLED COIL BOBINE LAMINEE A FROID KALTGEWALZTES BAND | | Customer article number N.article client Artikelnummer des Kunden | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Steel designation Désignation de l'acier Stahlbezeichnung ASTM A 240 / 14 - TYPE 316L - TYPE 316 ASME SA 240 / 13 - TYPE 316L - TYPE 316 EN 10028-7 / 08 - 1.4404 - 1.4401 EN 10088-2 / 05 - 1.4404 - 1.4401 | | Finish Présentation Ausführung 2B 2B 2B 2B | | Steelmaking process Mode d'élaboration de l'acier - Stahlherstellungsverfahren Prod.proces: Electric arc furnace - VOD/AOD - Continuous casting Proc.fabric.: Four à arc - VOD/AOD - Coulée continue Fertigungsablauf: Elektro-Ofen - VOD/AOD - Stranggussanlage | | | | Product delivery condition Etat de livraison du produit - Lieferzustand Solution treated Hypertrempe : 1040-1110 C Loesungsgegl+abgeschreckt | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Any supplementary requirements Prescriptions supplémentaires - Zusätzliche Anforderungen AL1112359-63/5-AL1112349- | | Forced Air Air forcé Geblaese Luft | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NACE MR 0175/ISO 15156-1 /ISO 15156-3 / CORROSION TEST:ASTM A 262-E:OK / ATTESTATION PED 97/23/EC PAR TUV SUD / NACE MR 0103// HARDNESS-DURETE-HAER TE : HB - LOCATION 1 : 158 - LOCATION 2 : 159 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Identification of the product Identification du produit - Identifizierung des Erzeugnisses MELTED IN BELGIUM, MADE IN FRANCE | | Dimensions Dimensions - Abmessungen Thickness B09 Epaisseur - Staerke 0,500 mm | | | | Width B10 Largeur - Breite 125,00 mm | | Length B11 Longueur - Laenge | | Number of pieces B08 Nb de pièces - Stueckzahl 3 | | | | | | | | | | | | | | | | | | | | | | | |
| Coil n. N. Bobine - Band Nr. 730400 | | Heat n. N.Coulée - Schmelz Nr. 422039 | | | | | | Net weight B13 Poids net - netto Gewicht 2076 KGS | | | | | | | | | | | | | | | | | | | | | | | | | |
| CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | C | | Si | | Mn | | Ni | | Cr | | Mo | | Ti | | N | | S | | P | | | | | | | | | | | | | |
| Required -Exigé %mini Anforderung. %maxi | | 0,030 | | 0,75 | | 2,00 | | 10,00 13,00 | | 16,50 18,00 | | 2,000 2,500 | | | | 0,100 | | 0,0150 | | 0,045 | | | | | | | | | | | | | |
| Cast Analysis Analyse coulée Analyse Schmelze | | 0,021 | | 0,32 | | 1,27 | | 10,02 | | 16,70 | | 2,030 | | | | 0,050 | | 0,0031 | | 0,031 | | | | | | | | | | | | | |
| | | C71 | | C72 | | C73 | | C74 | | C75 | | C76 | | C77 | | C78 | | C79 | | C80 | | C81 | | C82 | | C83 | | C84 | | C85 | | C86 | |
| Positive material identification carried out : OK Tests de vérification de la conformité de la nuance fournie : OK Verwechslungsprüfung wurde durchgeführt : OK | | | | | | | | | | | | | | | | D52 | | | | | | | | | | | | | | | | | |
| Location (1) | | MECHANICAL PROPERTIES - PROPRIETES MECANIQUES - MECHANISCHE WERTE | | | | | | | | | | C20 | | | | | | | | | | | | | | | | | | | | | |
| | | Room temperature - Température ambiante - Raumtemperatur | | | | | | | | | | C03 | | | | | | | | | | | | | | | | | | | | | |
| Direction (2) | | Yield or proof strength Limite d'élasticité Dehngrenze MPa | | Tensile Strength Résistance à la traction Zugfestigkeit MPa | | Elongation after fracture Allongement après rupt. Bruchdehnung % | | Hardness Dureté Haerte | | Yield or proof strength Limite d'élasticité Dehngrenze MPa | | Tensile str. Résist. MPa Zugfestigkeit | | Elongation % Allongement. Bruchdehnung | | | | | | | | | | | | | | | | | | | |
| Required Exigé Anforderung | | Rp0.2% Rp1% | | Rm | | 80mm 50mm | | HV5 C30 | | Rp0.2% Rp1% | | Rm | | | | | | | | | | | | | | | | | | | | | |
| mini maxi | | 240 270 | | 530 680 | | 45 45 | | 130 180 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Obtained Obtenu Ergebnisse | | 295 342 | | 589 | | 55 55 | | 158 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | C11 | | C14 | | C12 | | C13 | | C15 | | C31 | | C16 | | C17 | | C18 | | C19 | | | | | | | | | | | | | |
| Impact strength test Essai de résilience Kerbschlagzähigkeitstest | | Corrosion test Test de corrosion Korrosionstest | | | | GRAIN ASTM E 112 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C40 t(°c) C44 | | | | | | 8,3 C50 | | C51 | | C52 | | C53 | | C54 | | C55 | | C05 | | | | | | | | | | | | | | | |
| | | | | | | D51 | | Internal cleanliness: | | A: | | B: | | C: | | D: | | C57 | | | | | | | | | | | | | | | |
| Location of the sample (1) Emplacement de l'échantillon Lage des Probenabschnittes 1. Front - Début - Anfang 2. Back - Fin - Ende 3. Middle - Milieu - Mitte | | The delivery is in accordance with the order La fourniture est conforme aux exigences de la commande Die lieferung entspricht den Bestellbedingungen | | | | Z01 | | Organisation inspection Organisme et/ou service contrôle Ueberwachungsabteilung | | | | A05 | | | | | | | | | | | | | | | | | | | | | |
| | | Packing list Avis d'expédition Lieferscheinnummer 141020G03460-101132 | | | | A10 | | Service Métallurgique 21/10/2014 P.QUERE  | | | | | | | | | | | | | | | | | | | | | | | | | |
| Direction of the test pieces (2) Orientation des éprouvettes Probenrichtung T. Transverse - Travers - Quer L. Longitudinal - Long - Laengs | | Marking, inspection and measurement : without objection Contrôle de marquage, d'aspect et de dimensions : satisfaisants Pruefung der Stempelung, des Oberflaechenaspekts und der Abmessungen : ohne Beanstandung | | | | D01 | | The inspector Le responsable Der Werkssachverstaendige | | | | Z02 | | | | | | | | | | | | | | | | | | | | | |

|  <p>Aperam - Stainless France Aperam Gueugnon 71130 Gueugnon FRANCE</p> | | MILL CERTIFICATE BS EN 10204/3.1 CERTIFICAT DE RECEPTION NF EN 10204/3.1 ABNAHMEPRUEFZEUGNIS DIN EN 10204/3.1 | | | | | | | | N-Nr-N 15G0337052-01 V01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--------------|--|-------------|---|----------------|--|----|---|---------------|---|--|---|---|---|----|----|----|----|----|---|---|---|--|--|--|--|--|--|--|-------|------|------|----------------|----------------|----------------|--|-------|--------|-------|--|--|--|--|--|--|---|--------------|-------------|-------------|--------------|--------------|--------------|--|--------------|---------------|--------------|--|--|--|--|--|--|
| | | ISO 9001 V2008 - ISO TS 16949 V2009 - ISO 14001 V 2004 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Manufacturer's works order number N° de la commande usine productrice Werksauftragsnummer 80246583 /01-59124/1 | | Purchaser and/or consignee Client et/ou destinataire Besteller und/oder Empfaenger Alfa Laval Lund AB Rudeboksvägen 1 221 00 LUND SUEDE | | Purchaser's order number N° de commande client Kundenbestellnummer OMCP-132679 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Product - Produit - Erzeugnis COLD-ROLLED COIL BOBINE LAMINEE A FROID KALTGEWALZTES BAND | | Customer article number N.article client Artikelnummer des Kunden | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | Any supplementary requirements Prescriptions supplémentaires - Zusätzliche Anforderungen AL1112359-63/5-AL1112349- | | Forced Air Air forcé Gebläse Luft | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NACE MR 0103 / ATTESTATION PED 97/23/EC PAR TUV SUD / CORROSIONTEST:ASTM A 262-E :OK / NACE MR 0175/ISO 15156-1 / ISO 15156-3 // | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Identification of the product Identification du produit - Identifizierung des Erzeugnisses MELTED IN BELGIUM, MADE IN FRANCE | | Dimensions Dimensions - Abmessungen Thickness B09 Epaisseur - Staerke 0,500 mm | | | | Width B10 Largeur - Breite 125,00 mm | | Length B11 Longueur - Laenge | | Number of pieces B08 Nb de pièces - Stueckzahl 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Coil n. N. Bobine - Band Nr. 731208 | | Heat n. N.Coulée - Schmelz Nr. 501048 | | | | | | Net weight B13 Poids net - netto Gewicht 2222 KGS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th></th> <th>C</th> <th>Si</th> <th>Mn</th> <th>Ni</th> <th>Cr</th> <th>Mo</th> <th>Ti</th> <th>N</th> <th>S</th> <th>P</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>Required -Exigé %mini Anforderung. %maxi</td> <td>0,030</td> <td>0,75</td> <td>2,00</td> <td>10,00 13,00</td> <td>16,50 18,00</td> <td>2,000 2,500</td> <td></td> <td>0,100</td> <td>0,0150</td> <td>0,045</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Cast Analysis Analyse coulée Analyse Schmelze</td> <td>0,017 C71</td> <td>0,38 C72</td> <td>1,33 C73</td> <td>10,02 C74</td> <td>16,55 C75</td> <td>2,020 C76</td> <td></td> <td>0,057 C78</td> <td>0,0027 C79</td> <td>0,033 C80</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | | | | | | | | | | | | | C | Si | Mn | Ni | Cr | Mo | Ti | N | S | P | | | | | | | Required -Exigé %mini Anforderung. %maxi | 0,030 | 0,75 | 2,00 | 10,00 13,00 | 16,50 18,00 | 2,000 2,500 | | 0,100 | 0,0150 | 0,045 | | | | | | | Cast Analysis Analyse coulée Analyse Schmelze | 0,017 C71 | 0,38 C72 | 1,33 C73 | 10,02 C74 | 16,55 C75 | 2,020 C76 | | 0,057 C78 | 0,0027 C79 | 0,033 C80 | | | | | | |
| | C | Si | Mn | Ni | Cr | Mo | Ti | N | S | P | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Required -Exigé %mini Anforderung. %maxi | 0,030 | 0,75 | 2,00 | 10,00 13,00 | 16,50 18,00 | 2,000 2,500 | | 0,100 | 0,0150 | 0,045 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cast Analysis Analyse coulée Analyse Schmelze | 0,017 C71 | 0,38 C72 | 1,33 C73 | 10,02 C74 | 16,55 C75 | 2,020 C76 | | 0,057 C78 | 0,0027 C79 | 0,033 C80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Positive material identification carried out : OK Tests de vérification de la conformité de la nuance fournie : OK Verwechslungsprüfung wurde durchgeführt : OK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location (1) | | MECHANICAL PROPERTIES - PROPRIETES MECANIQUES - MECHANISCHE WERTE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Room temperature - Température ambiante - Raumtemperatur | | | | | | | | Test temperature (°C) : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Direction (2) | | Yield or proof strength Limite d'élasticité Dehngrenze MPa | | Tensile Strength Résistance à la traction Zugfestigkeit MPa | | Elongation after fracture Allongement après rupt. Bruchdehnung % | | Hardness Dureté Haerte | | Yield or proof strength Limite d'élasticité Dehngrenze MPa | | Tensile str. Résist. MPa Zugfestigkeit | | Elongation % Allongement. Bruchdehnung | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Required Exigé Anforderung | | Rp0.2% Rp1% | | Rm | | 80mm 50mm HB C30 | | Rp0.2% Rp1% Rm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | mini maxi | | 240 270 | | 530 680 | | 45 45 130 180 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 T | | Obtained Obtenu | | 259 302 | | 587 | | 56 56 141 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 T | | Ergebnisse | | 259 302 | | 587 | | 56 56 145 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Impact strength test Essai de résilience Kerbschlagzähigkeitstest | | Corrosion test Test de corrosion Korrosionstest | | GRAIN ASTM E 112 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C40 t(°c) C44 | | | | 8,5 C50 C51 C52 C53 C54 C55 C05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Internal cleanliness: A: B: C: D: C57 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Location of the sample (1) Emplacement de l'échantillon Lage des Probenabschnittes 1. Front - Début - Anfang 2. Back - Fin - Ende 3. Middle - Milieu - Mitte | | The delivery is in accordance with the order La fourniture est conforme aux exigences de la commande Die lieferung entspricht den Bestellbedingungen | | | | Organisation inspection Organisme et/ou service contrôle Ueberwachungsabteilung | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Packing list Avis d'expédition 150224G04852-101132 Lieferscheinnummer | | | | Service Métallurgique | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Direction of the test pieces (2) Orientation des éprouvettes Probenrichtung T. Transverse - Travers - Quer L. Longitudinal - Long - Laengs | | Marking, inspection and measurement : without objection Contrôle de marquage, d'aspect et de dimensions : satisfaisants Pruefung der Stempelung, des Oberflaechenaspekts und der Abmessungen : ohne Beanstandung | | | | 24/02/2015 P.QUERE  | | The inspector Le responsable Der Werkssachverstaendige | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|---|--|--|--|---|--|---|--|---|--|--|--|----------|--|----------|--|----------|--|-----------|--|-----|--|-----|--|-----|--|-----|--|-----|--|
|  <p>Aperam - Stainless France Aperam Gueugnon 71130 Gueugnon FRANCE</p> | | MILL CERTIFICATE BS EN 10204/3.1 CERTIFICAT DE RECEPTION NF EN 10204/3.1 ABNAHMEPRUEFZEUGNIS DIN EN 10204/3.1 | | | | | | | | | | N-Nr-N 15G0348446-01 V01 | | | | | | | | | | | | | | | | | | | | | |
| | | ISO 9001 V2008 - ISO TS 16949 V2009 - ISO 14001 V 2004 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Manufacturer's works order number N° de la commande usine productrice Werksauftragsnummer 80256724 /01-62427/1 | | Purchaser and/or consignee Client et/ou destinataire Besteller und/oder Empfaenger Alfa Laval Lund AB Rudeboksvägen 1 221 00 LUND SUEDE | | Purchaser's order number N° de commande client Kundenbestellnummer OMCP-134510 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Product - Produit - Erzeugnis COLD-ROLLED COIL BOBINE LAMINEE A FROID KALTGEWALZTES BAND | | Customer article number N.article client Artikelnummer des Kunden | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Steel designation Désignation de l'acier Stahlbezeichnung ASTM A 240 / 14 - TYPE 316L - TYPE 316 ASME SA 240 / 13 - TYPE 316L - TYPE 316 EN 10028-7 / 08 - 1.4404 - 1.4401 EN 10088-2 / 14 - 1.4404 - 1.4401 | | Finish Présentation Ausführung 2B 2B 2B 2B | | Steelmaking process Mode d'élaboration de l'acier - Stahlherstellungsverfahren Prod.proces: Electric arc furnace - VOD/AOD - Continuous casting Proc.fabric.: Four à arc - VOD/AOD - Coulée continue Fertigungsablauf: Elektro-Ofen - VOD/AOD - Stranggussanlage Any supplementary requirements Prescriptions supplémentaires - Zusätzliche Anforderungen AL1112359-63/5-AL1112349- | | | | | | | | | | Product delivery condition Etat de livraison du produit - Lieferzustand Solution treated Hypertrempe : 1040-1110 C Loesungsgegl+abgeschreckt Forced Air Air forcé Gebläse Luft | | | | | | | | | | | | | | | | | | | |
| NACE MR 0103 / ATTESTATION PED 97/23/EC PAR TUV SUD / CORROSIONTEST:ASTM A 262-E :OK / NACE MR 0175/ISO 15156-1 / ISO 15156-3// | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Identification of the product Identification du produit - Identifizierung des Erzeugnisses MELTED IN BELGIUM, MADE IN FRANCE | | Dimensions Dimensions - Abmessungen Thickness B09 Epaisseur - Staerke 0,500 mm | | | | | | Width B10 Largeur - Breite 125,00 mm | | Length B11 Longueur - Laenge | | Number of pieces B08 Nb de pièces - Stueckzahl 1 | | | | | | | | | | | | | | | | | | | | | |
| Coil n. N. Bobine - Band Nr. 731388 | | Heat n. N.Coulée - Schmelz Nr. 509052 | | | | | | | | Net weight B13 Poids net - netto Gewicht 754 KGS | | | | | | | | | | | | | | | | | | | | | | | |
| CHEMICAL ANALYSIS - ANALYSE CHIMIQUE - CHEMISCHE ZUSAMMENSETZUNG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | C | | Si | | Mn | | Ni | | Cr | | Mo | | Ti | | N | | S | | P | | Co | | | | | | | | | | | |
| Required -Exigé % mini Anforderung. %maxi | | 0,030 | | 0,75 | | 2,00 | | 10,00 13,00 | | 16,50 18,00 | | 2,000 2,500 | | | | 0,100 | | 0,0150 | | 0,045 | | | | | | | | | | | | | |
| Cast Analysis Analyse coulée Analyse Schmelze | | 0,022 | | 0,39 | | 1,28 | | 10,01 | | 16,52 | | 2,000 | | | | 0,046 | | 0,0025 | | 0,031 | | 0,238 | | | | | | | | | | | |
| | | C71 | | C72 | | C73 | | C74 | | C75 | | C76 | | C77 | | C78 | | C79 | | C80 | | C81 | | C82 | | C83 | | C84 | | C85 | | C86 | |
| Positive material identification carried out : OK Tests de vérification de la conformité de la nuance fournie : OK Verwechslungsprüfung wurde durchgeführt : OK | | | | | | | | | | | | | | D52 | | | | | | | | | | | | | | | | | | | |
| Location (1) | | MECHANICAL PROPERTIES - PROPRIETES MECANIQUES - MECHANISCHE WERTE | | | | | | | | | | | | C20 | | | | | | | | | | | | | | | | | | | |
| | | Room temperature - Température ambiante - Raumtemperatur | | | | | | | | | | Test temperature (°C) : | | C03 | | | | | | | | | | | | | | | | | | | |
| Direction (2) | | Yield or proof strength Limite d'élasticité Dehngrenze MPa | | Tensile Strength Résistance à la traction Zugfestigkeit MPa | | Elongation after fracture Allongement après rupt. Bruchdehnung % | | Hardness Dureté Haerte | | Yield or proof strength Limite d'élasticité Dehngrenze MPa | | Tensile str. Résist. MPa Zugfestigkeit | | Elongation % Allongement. Bruchdehnung | | | | | | | | | | | | | | | | | | | |
| | | Required Exigé Anforderung | | Rp0.2% Rp1% | | Rm | | 80mm 50mm | | HB C30 | | Rp0.2% Rp1% | | Rm | | | | | | | | | | | | | | | | | | | |
| 1 | | Obtained Obtenu Ergebnisse | | 287 334 | | 530 680 | | 45 45 | | 130 180 | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | C11 C14 | | C12 C13 C15 | | C31 | | C16 C17 C18 C19 | | | | | | | | | | | | | | | | | | | | | | | |
| Impact strength test Essai de résilience Kerbschlagzähigkeitstest | | Corrosion test Test de corrosion Korrosionstest | | GRAIN ASTM E 112 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C40 t(°c) | | C44 | | | | 8,5 C50 C51 | | C52 | | C53 C54 C55 | | C05 | | | | | | | | | | | | | | | | | | | | | |
| | | C42 | | D51 | | Internal cleanliness: | | A: B: C: D: | | | | | | C57 | | | | | | | | | | | | | | | | | | | |
| Location of the sample (1) Emplacement de l'échantillon Lage des Probenabschnittes 1. Front - Début - Anfang 2. Back - Fin - Ende 3. Middle - Milieu - Mitte | | The delivery is in accordance with the order La fourniture est conforme aux exigences de la commande Die lieferung entspricht den Bestellbedingungen | | Packing list Avis d'expédition Lieferscheinnummer 150504G00109-101132 | | Organisation inspection Organisme et/ou service contrôle Ueberwachungsabteilung | | Customer Quality 04/05/2015 Romain GERARD | | The inspector Le responsable Der Werkssachverstaendige | |  | | A05 A10 D01 Z02 | | | | | | | | | | | | | | | | | | | |
| Direction of the test pieces (2) Orientation des éprouvettes Probenrichtung T. Transverse - Travers - Quer L. Longitudinal - Long - Laengs | | Marking, inspection and measurement : without objection Contrôle de marquage, d'aspect et de dimensions : satisfaisants Pruefung der Stempelung, des Oberflaechenaspekts und der Abmessungen : ohne Beanstandung | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



TIGHTENING BOLTS/NUTS



Certificat d'essais / Test Certificate NFEN 10204.3.1

NR 14321/14 - 1387/349 - 58517

ALFA LAVAL INC
5400 INTERNATIONAL TRADE DRIVE
RICHMOND, VIRGINIA 23231 U.S.A.

VOTRE/YOUR REF N° US-154963

Poste/item 1 TIGHT.BOLT (VIS) M16X175/125
Qte/Qty 1 000 SA193/B7 ENISO898-1 CL.8.8 ADW7
COAT : ZNCR8
Plan 1624039-02 REV.4

TIGHT BOLT M 16
Coulée : AJ2244

Normes/Standard : ASME SA193-B7

ANALYSE/HEAT ANALYSIS

| C | Mn | Si | S | P | Cr | Mo |
|------|------|------|-------|-------|------|------|
| 0.42 | 0.84 | 0.24 | 0.003 | 0.009 | 0.92 | 0.22 |

CARACTERISTIQUES MECANQUES/MECHANICAL TEST n°84866

| Rm MPa | Rp0.2% MPa | A% 4D | Z% | REV. T° C | HB |
|-----------|---------------|-------|-------|--------------|-----|
| 930 | 838 | 21.97 | 60.54 | 640 | 276 |

CARACTERISTIQUES MECANQUES/MECHANICAL TEST n°84868

| Rm MPa | Rp0.2% MPa | A% 4D | Z% | REV. T° C | HB |
|-----------|---------------|-------|-------|--------------|-----|
| 934 | 842 | 21.85 | 61.55 | 640 | 295 |

CARACTERISTIQUES MECANQUES/MECHANICAL TEST n°84870

| Rm MPa | Rp0.2% MPa | A% 4D | Z% | REV. T° C | HB |
|-----------|---------------|-------|-------|--------------|-----|
| 931 | 840 | 21.7 | 61.64 | 640 | 276 |

CARACTERISTIQUES MECANQUES/MECHANICAL TEST n°84872

| Rm MPa | Rp0.2% MPa | A% 4D | Z% | REV. T° C | HB |
|-----------|---------------|-------|-------|--------------|-----|
| 932 | 839 | 21.61 | 60.77 | 640 | 276 |

Etat livraison : Trempe Revenu
Delivery state : Quenched and tempered
Contrôle visuel et dimensionnel : conforme
Visual and dimensional control : conform
Marquage/Marks : BC B7 8.8
Macrographie : Conforme
Macroetch : Conform

We the undersigned, BECK CRESPEL, hereby certify that the supplied products are fully in accordance with the requirements of the order.
This test certificate applies only the items, designation and quantities as described above.



Alfa Laval Inc.
5400 International Trade Dr.
Richmond, VA 23231

Date: 1/6/12

Rev.: 9

Title: Hydrostatic Test Certificate

Doc. No.: Form 25002

Page 1 of 1

| | |
|------------------------|------------------|
| CUSTOMER | Viridia B2X, LLC |
| P.O. NO. | 148 |
| ALFA LAVAL NO. | 85480 / 1828203 |
| SERIAL NO. | 30116-93127 |
| ITEM NO. or MODEL TYPE | HE-2850 |

| ASME Hydrostatic Test No. | Revision No. |
|---------------------------|--------------|
| WI 25001 | 9 |

| | Test Pressure | Holding Time | Test Gauges | Gauge Due Date | A.I. Witness or Test Operator |
|---------------|---------------------|----------------|-------------|----------------|-------------------------------|
| Single | 195 PSIG / 150 PSIG | 2 min / 10 min | 620 | 3/9/2016 | Herb Wathan (A.I.) |
| Single | 195 PSIG / 150 PSIG | 2 min / 10 min | 620 | 3/9/2016 | Herb Wathan (A.I.) |

| C.I. Hydrostatic Test No. | Revision No. |
|---------------------------|--------------|
| N/A | N/A |

| | Test Pressure | Holding Time | Test Gauges | Gauge Due Date | Customer Witness |
|---------------|---------------|--------------|-------------|----------------|------------------|
| Single | N/A | N/A | N/A | N/A | N/A |
| Single | N/A | N/A | N/A | N/A | N/A |

This hydrostatic pressure test was performed successfully with no visible internal or external leakage from the heat exchanger. Testing was witnessed as noted above.

APPROVED BY: Michael J. Gunnoe (Quality Technician)

DATE OF ASME CODE TEST: 10/2/2015

DATE OF CUSTOMER WITNESS: Waived per Jim Biasca 9/22/2015

| | |
|--|---------------------------|
| Prepared By: Jason Gunnoe | Approved By: Mike Pischke |
| Revision Description: Rev 7: Add sign off for CI inspection Rev 8: added test operator to the selections for non-code/UM PHEs. Rev.9: Added gauge number field & Gauge date field. | |