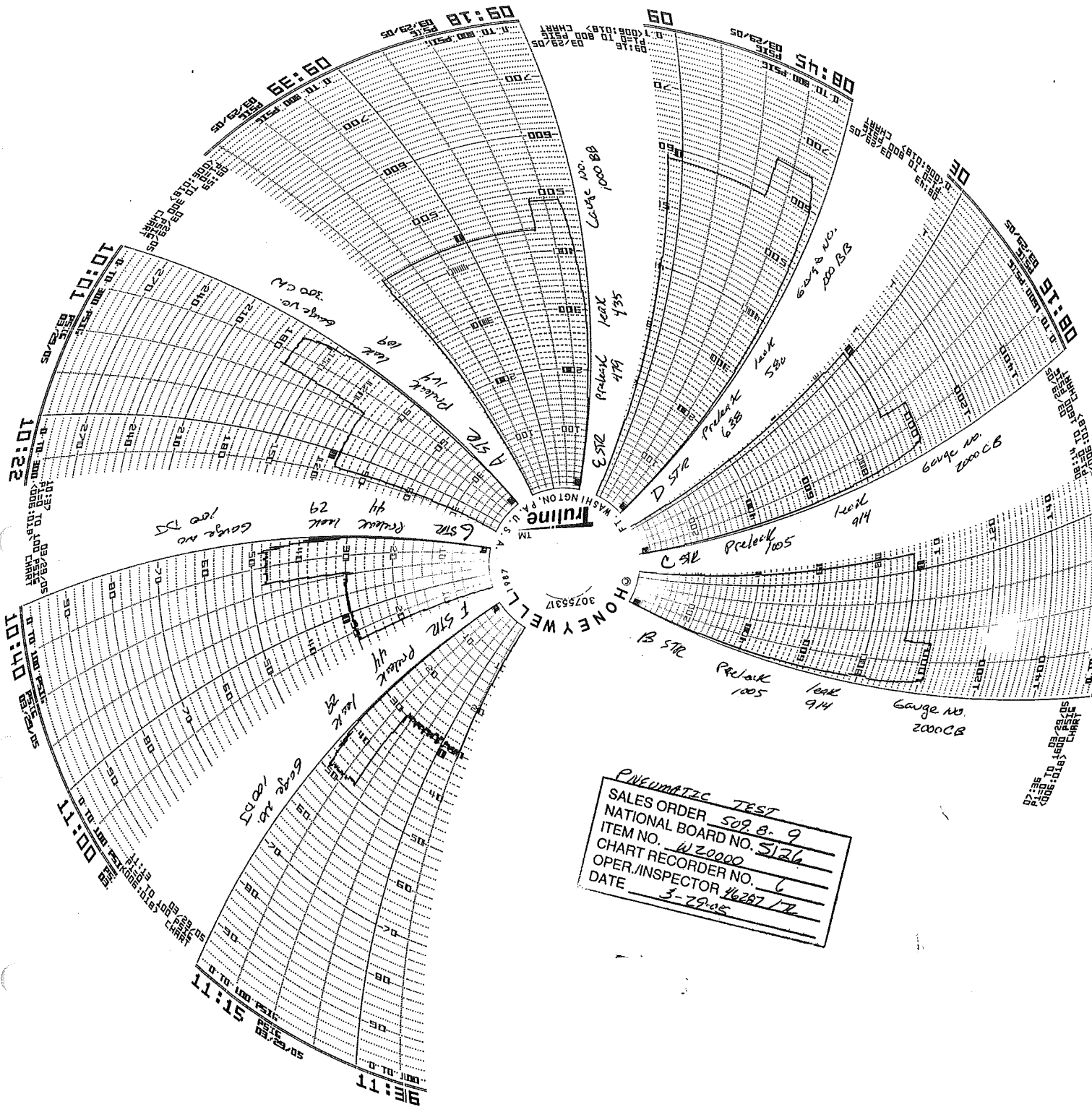


SALES ORDER 509.8-9  
 NATIONAL BOARD NO. 5126  
 ITEM NO. W20000  
 CHART RECORDER NO. 5  
 OPER./INSPECTOR 46424/REC  
 DATE 3-16-05



PNEUMATIC TEST  
SALES ORDER 502 B. 9  
NATIONAL BOARD NO. 5126  
ITEM NO. W20000  
CHART RECORDER NO. 6  
OPER./INSPECTOR 46287/72  
DATE 3-29-05



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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 509.8-9

DRAWING NO. 15770A REV A

1. STREAM UNDER VACUUM F

2. STREAM VACUUM VALUE 23 MICRONS

3. STREAM WITH HELIUM A BACKGROUND  $1.00 \times 10^{-6}$  STD-CC/SEC

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START N/A

END N/A

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1.0 \times 10^{-3}$  STD-CC/SEC

5. TEST TIME: 20 MINUTES

6. RESULT: F10A STREAM = 5.20  $\times 10^{-6}$  STD-CC/SEC

7. TEST COMPLETION DATE: 3-25-05 OPERATOR: 46287

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 716-1054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9-9-05 DISPLAYED LEAK:  $1.12 \times 10^{-7}$  std cc/sec

@ 81 °F

Rev. 10/23/03  
3/29/00

Gerald A. Bonsack  
Sr. Principle Mfg. Engineer  
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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 309.8-9

DRAWING NO. 15770A REV. A

1. STREAM UNDER VACUUM D

2. STREAM VACUUM VALUE 43 MICRONS

3. STREAM WITH HELIUM B BACKGROUND  $4.55 \times 10^{-8}$  STD-CC/SEC

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START N/A

END N/A

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1.0 \times 10^{-3}$  STD-CC/SEC

5. TEST TIME: 20 MINUTES

6. RESULT: D to B STREAM =  $3.60 \times 10^{-8}$  STD-CC/SEC

7. TEST COMPLETION DATE: 3-25-05 OPERATOR: 46287

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 716-1054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9-9-05 DISPLAYED LEAK:  $1.02 \times 10^{-7}$  std cc/sec

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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 509.8-9

DRAWING NO. 15770A REV A

1. STREAM UNDER VACUUM E

2. STREAM VACUUM VALUE 39 MICRONS

3. STREAM WITH HELIUM B BACKGROUND  $3.25 \times 10^{-8}$  STD-CC/S

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START N/A

END N/A

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1.0 \times 10^{-3}$  STD-CC/SEC

5. TEST TIME: 20 MINUTES

6. RESULT: E to B STREAM =  $3.70 \times 10^{-8}$  STD-CC/SEC

7. TEST COMPLETION DATE: 3-25-05 OPERATOR: 46287

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 716-1054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9-9-05 DISPLAYED LEAK:  $1.02 \times 10^{-7}$  std cc/sec

@ 79 °F



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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 509.8-9

DRAWING NO. 15770A REV A

1. STREAM UNDER VACUUM F

2. STREAM VACUUM VALUE 25 MICRONS

3. STREAM WITH HELIUM B BACKGROUND  $1.42 \times 10^{-8}$  STD CC/SEC

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START N/A

END N/A

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1.0 \times 10^{-3}$  STD CC/SEC

5. TEST TIME: 20 MINUTES

6. RESULT: F to B STREAM = 1.42  $\times 10^{-8}$  8 STD - CC/SEC

7. TEST COMPLETION DATE: 3-25-05 OPERATOR: 46287

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 716-1054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9-9-05 DISPLAYED LEAK:  $1.15 \times 10^{-7}$  std cc/sec

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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 509.8-9

DRAWING NO. 15770A REV. A

1. STREAM UNDER VACUUM D

2. STREAM VACUUM VALUE 44 MICRONS

3. STREAM WITH HELIUM C BACKGROUND  $3.90 \times 10^{-8}$  STD-CC/SEC

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START N/A

END N/A

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1.0 \times 10^{-3}$  STD-CC/SEC

5. TEST TIME: 20 MINUTES

6. RESULT: D to C STREAM = 0.92  $\times 10^{-7}$  7 STD-CC/SEC

7. TEST COMPLETION DATE: 3-25-05 OPERATOR: 46287

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 716-1054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9-9-05 DISPLAYED LEAK:  $1.05 \times 10^{-7}$  std cc/sec

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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 509.8-9

DRAWING NO. 15770A REV. A

1. STREAM UNDER VACUUM E

2. STREAM VACUUM VALUE 42 MICRONS

3. STREAM WITH HELIUM C BACKGROUND  $3.15 \times 10^{-8}$  STD-CC/SEC

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START N/A

END N/A

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1.0 \times 10^{-3}$  STD-CC/SEC

5. TEST TIME: 20 MINUTES

6. RESULT: E to C STREAM = 4.25  $\times 10^{-8}$  STD-CC/SEC

7. TEST COMPLETION DATE: 3-25-05 OPERATOR: 46287

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 716-1054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9-9-05 DISPLAYED LEAK:  $1.05 \times 10^{-7}$  std cc/sec

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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 5098-9

DRAWING NO. 15770A REV. A

1. STREAM UNDER VACUUM F

2. STREAM VACUUM VALUE 25 MICRONS

3. STREAM WITH HELIUM C BACKGROUND  $1.25 \times 10^{-8}$  STD-CC/S

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START N/A

END N/A

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1.0 \times 10^{-3}$  STD-CC/SEC

5. TEST TIME: 20 MINUTES

6. RESULT: F to C STREAM =  $1.25 \times 10^{-8}$  STD - CC/SEC

7. TEST COMPLETION DATE: 3-25-05 OPERATOR: 46287

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 716-1054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9-9-05 DISPLAYED LEAK:  $1.05 \times 10^{-7}$  std cc/sec

@ 80 °F



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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 509.8-9

DRAWING NO. 15770A REV. A

1. STREAM UNDER VACUUM E

2. STREAM VACUUM VALUE 36 MICRONS

3. STREAM WITH HELIUM D BACKGROUND  $1.08 \times 10^{-6}$

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START \_\_\_\_\_

END \_\_\_\_\_

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1 \times 10^{-3}$

5. TEST TIME: 65 MINUTES

6. RESULT: E-D STREAM =  $3.85 \times 10^{-7}$  STD - CC/SEC

7. TEST COMPLETION DATE: 3/25/05 OPERATOR: 46424

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 7161054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9/9/05 DISPLAYED LEAK:  $1.35 \times 10^{-7}$  std cc/sec

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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 5098-9

DRAWING NO. 15770A REV. A

1. STREAM UNDER VACUUM F

2. STREAM VACUUM VALUE 24 MICRONS

3. STREAM WITH HELIUM D BACKGROUND  $0.82 \times 10^{-6}$

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START \_\_\_\_\_

END \_\_\_\_\_

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1 \times 10^{-3}$

5. TEST TIME: 90 MINUTES

6. RESULT: F-D STREAM =  $0.85 \times 10^{-5}$  STD - CC/SEC

7. TEST COMPLETION DATE: 3/25/05 OPERATOR: 46424

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 7161054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9/9/05 DISPLAYED LEAK:  $1.35 \times 10^{-7}$  std cc/sec

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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 509.8-9

DRAWING NO. 15770A REV.A

1. STREAM UNDER VACUUM D

2. STREAM VACUUM VALUE 45 MICRONS

3. STREAM WITH HELIUM E BACKGROUND  $1.95 \times 10^{-8}$  STD-CC/SEC

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START N/A

END N/A

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1.0 \times 10^{-3}$  STD-CC/SEC

5. TEST TIME: 20 MINUTES

6. RESULT: D to E STREAM = 1.48  $\times 10^{-7}$  STD-CC/SEC

7. TEST COMPLETION DATE: 3-25-05 OPERATOR: 46287

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 716-1054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9-9-05 DISPLAYED LEAK:  $1.18 \times 10^{-7}$  std cc/sec

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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 509.8-9

DRAWING NO. 15770A REV. A

1. STREAM UNDER VACUUM F

2. STREAM VACUUM VALUE 24 MICRONS

3. STREAM WITH HELIUM E BACKGROUND  $3.25 \times 10^{-6}$  STD-CC/SEC

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START N/A

END N/A

4. ACCEPTABLE LEAK RATE (FROM ASSY. DRAWING)  $1.0 \times 10^{-3}$  STD-CC/SEC

5. TEST TIME: 20 MINUTES

6. RESULT: F to E STREAM =  $5.50 \times 10^{-6}$  STD-CC/SEC

7. TEST COMPLETION DATE: 3-25-05 OPERATOR: 46287

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 716-1054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9-9-05 DISPLAYED LEAK:  $1.22 \times 10^{-7}$  std cc/sec

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## HELIUM LEAK TEST REPORT

SALES ORDER NO. 509.8-9

DRAWING NO. 15770A REV. A

1. STREAM UNDER VACUUM F

2. STREAM VACUUM VALUE 24 MICRONS

3. STREAM WITH HELIUM G BACKGROUND  $1.12 \times 10^{-8}$  STD-CC/SEC

FOR EXTERNAL TESTS, HELIUM CONCENTRATION START N/A

END N/A

4. ACCEPTABLE LEAK RATE  
(FROM ASSY. DRAWING)  $1.0 \times 10^{-3}$  STD-CC/SEC

5. TEST TIME: 20 MINUTES

6. RESULT: F to G STREAM =  $3.20 \times 10^{-6}$  STD - CC/SEC

7. TEST COMPLETION DATE: 3-25-05 OPERATOR: 46287

8. MASS SPECTROMETER, IDENTIFICATION #: Edwards II

CALIBRATED LEAK, SERIAL #: 716-1054 LEAK RATE OF STD:  $1.1 \times 10^{-7}$  std cc/sec

RECALIBRATION DATE: 9-9-05 DISPLAYED LEAK:  $1.12 \times 10^{-7}$  std cc/sec

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This letter certifies that the Core as identified has been cleaned and inspected for oxygen services per Chart Standard Engineering Specification Section 9 No. 9-14.00.

Sales Order 509.8-9 Core No. \_\_\_\_\_  
National Board No. 5126 Core Serial No. 509.8-9  
Chart Inspector EO H h  
Date Inspected 3-31-05

CHART HEAT EXCHANGER L.P.

QUALITY DEPARTMENT

- (1) Attach White Original to Core Nameplate
- (1) One Copy to Quality Files