78675

FACSIMILE LEAD SHEET

12429-N
#36851

RSPA-00-6973-3

00 MAY -5 PM 12:54

Pages: Lead + 21

Date 4/14/00

Sensitive: ☐ Yes ☒ No

BOEING

The Boeing Company
P.O. Box 21233
Kennedy Space Center, Fl 32815

To:	CHERYL FREEMAN	Phone No.	202 366-6808	Fax No.	202 366-3753
From	FRED LONG	Phone No.	321 867-5634	Fax No.	321 867-6580

Remarks...

CHERYL:

HERE IS THE DATA CONCERNING THE PRESSURIZATION OF THE PFE.

IF YOU HAVE ANY ADDITIONAL QUESTIONS PLEASE FEEL FREE TO CALL

THANKS

FRED

Z

FRED LONG
321-867-5634

Consolidated Laboratories, Inc.
732 Arrow Grand Circle
Covina, California 91722
(818) 915-8991

REPORT NO. 6608 #36851 Addt'l Info.
PAGE 132 TWA 9/9/96

LAB DATA SHEET

Part No. 84482 S/N 001 Sample 1 Job 6608
Description Portable Fire Extinguisher Co. Arde
Page 3.0

TEST: THERMAL CYCLE		Start	To Cpt.	Cptd
To Spec: QA 10060, Paras. 5.13 & 5.14	Date	5-12-96		5-16-96
	Test By	[signature]		[signature]
	Photo	✓		

Photo Req'd YES

CAUTION: Use clean nylon, polyvinyl or cotton gloves in handling the test unit. Protect the wit by placing it, in a polyethylene bag, in its Arde supplied crate when not in use.

1. Fill the specimen with gas and pressurize per Arde procedure ME 10009, except only 5.5 co 5.6 lb of CO_2. Install the pressurized test sample in a temperature chamber with the nozzle unattached at ambient conditions. Connect a thermocouple co the unit at the point which has the longest thermal lag in order to determine unit temperature stabilization. Record the temperature and pressure of the unit below and on the Arde Data Sheet.

   Pressure?? 660 PSIG Temperature?? 63°F

2. Decrease the chamber temperature to 20°F. Monitor the unit temperature and, after unit temperature stabilization, maintain the chamber at temperature for a period of 1 hour, minimum.

3. At the end of the 1 hour hold, record the temperature and pressure of the unit below and on the Arde Data Sheet. Then connect the nozzle assembly to the PFP port, pull the pin while pressing the button and squeeze the trigger to discharge the CO_2 until the tank is empty.

   Pressure?? 420 PSIG Temperature?? 22°F

   Did the unit discharge properly?? YES

4. Re-fill the specimen with gas and pressurize per Arde procedure ME 10009, except only 5.5 to 5.6 lb of CO_2. Re-install the pressurized test sample in the temperature chamber with the nozzle unattached at ambient conditions and re-connect the thermocouple co the unit. Record the temperature and pressure of the unit below and on the Arde Data sheet.

   Pressure?? 700 PSIG Temperature?? 68°F

5. Increase the chamber temperature to 129°F. Monitor the unit temperature and, after unit temperature stabilization, maintain the chamber at that temperature for a period of 1 hour, minimum.

6. At the end of the 1 hour hold, record the temperature and pressure of the unit below and on the Arde Data Sheet. Then connect the nozzle assembly to the PFP port;, pull the pin while pressing the button and squeeze the trigger to discharge the CO_2 until the tank is empty.

   Pressure?? 950 PSIG Temperature?? 127°F

   Did the unit discharge properly?? YES

(Continued on next page.)

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LAB DATA SHEET

Part No. E4... S/N 001 Sample 1 Job 6608
Description: ...re Extinguisher Co. Arde
Page 3.1

TEST: THERMAL CYC... ...ntinued)
To Spec.: QA 1006... ...graphs 5.13 & 5.14

7. Re-fill the ... ...h gas and pressurize per Arde procedure ME 10009, except only 5.5 to 5.... Re-install the pressurized test sample in the temperature c... ...h the nozzle unattached at ambient conditions and re-connect the... ...ple to the unit. Record the temperature and pressure of the unit belo... the Arde Data Sheet.

Pressure?? 730 PSIG Temperature?? 73°F

8. Repeat the pr... ...Steps 2 through 6 for a total of 21 cycles, except perform the C... ...only during the last cycle.

St... ...Time	Finish Date/Time
5-15-95 1130	5-16-95 / 1320

After last 20 Pressure?? 410 PSIG Temperature?? 20°F

Before last 1... Pressure?? 700 PSIG Temperature?? 59°F

After last 1... Pressure?? 1060 PSIG Temperature?? 128°F

Did the unit ... properly on every occasion?? YES

9. With the unit... ...mbient conditions, visually inspect for damage.

Any visible ev... ...damage?? NO

10. Fill the specim... ...gas and pressurize per Arde procedure ME 10009. Record the tot... ...weight and pressure gauge reading and compare the pressure with T... ...of QA 10060. Record results below and on the Arde QA 10060 data she...

Weight?? 6.0# Pressure?? 700 PSIG

Is the pressur... ...within specifications for its temperature?? NO DUE TO NOT ACHIEVING TEMP STABILIZATION

11. Perform the In... ...akage and Functional Tests of QA 10060. See Consolidated Lab Data Sheet... ... for procedures. Record results below and on the Arde QA 10060 data ...

Internal Leaka... .1 sec/hr (1.35 sec/hr, Max.) Stu Bell 6/5/95

Did the unit d... ...without any unusual resistance?? YES

Any visible evi... ...damage?? NO

12. List test equi... ...Test Equipment List, attached.

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LAB DATA SHEET

Part No. E4482 S/N 001 Sample 1 Job 6608,
Description Portable Fire Extinguisher Co. Arde
Page 3.1

TEST: THERMAL CYCLING (Continued)
To Spec.: QA 10060, Paragraphs 5.13 & 5.14

7. Re-fill the specimen with gas and pressurize per Arde procedure NE 10009, except only 5.5 to 5.6 lb of CO_2. Re-install the pressurized test sample in the temperature chamber with the nozzle unattached at ambient conditions and re-connect the thermocouple to the unit. Record the temperature and pressure of the unit below and on the Arde Data Sheet.

Pressure?? 730 PSIG Temperature?? 73°F

8. Repeat the procedures of Steps 2 through 6 for a total of 21 cycles. except perform the CO_2 discharge only during the Last cycle.

Start Date/Time	Finish Date/Time
5-13-95 / 1130	5-16-95 / 1320

After last 20°F hold: Pressure?? 410 PSIG Temperature?? 20°F

Before last 129°F hold: Pressure?? 700 PSIG Temperature?? 59°F

After last 129°F hold: Pressure?? 1060 PSIG Temperature?? 128°F

Did the unit discharge properly on every occasion?? YES

9. With the unit at room ambient conditions, visually inspect for damage.

Any visible evidence of damage?? NO

10. Fill the specimen with CO_2 gas and pressurize per Arde procedure ME 10009. Record the total filled weight and pressure gauge reading and compare the pressure with Table 5.7-1 of QA 10060. Record results below and on the Arde QA 10060 data sheet.

Weight?? 6.04 Pressure?? 700 PSIG

Is the pressure reading within specifications for its temperature?? NO

11. Perform the Internal Leakage and Functional Tests of QA 10060. See Consolidated tab Data Sheet, Page 0.0, for procedures. Record results below and on the Arde QA 10060 data sheet.

Internal Leakage?? 0.1 scc/hr (1.35 scc/hr, Max.)

Did the unit discharge without any unusual resistance.. YES

Any visible evidence of damage?? NO

12. List test equipment used on Test: Equipment List, attached-

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TEST REPORT

TW 9/5/95

BOTTLE FILLING DATA

(Before) During or After (circle one) Which Test?? THERMAL CYCLE

Date/Time?? 5-12-95 / 1624

PFE Tare Dry Weight (Step c)?? 8.59

PFE Installed Tare Weight (Step j)?? 8.58

PFE Filled Weight (Step m)?? 14.52

PFE Pressure?? 650 PSIG and Temperature?? 60.6 °F (Step o)

PFE Filled Weight (Step r)?? 13.87

Calculated CO_2 Weight (Step r)?? 5.28

7 ARDE 4 ARDE

MRR 4900D-033
USE AS IS.
VER # HR02353

Pressure Gauge Reading (Step s)?? 650 PSIG

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TEST REPORT

9/5/95.

BOTTLE FILLING DATA

Before, (During) or After (circle one) Which Test?? THERMAL CYCLE (AFTER FIRST COLD CYCLE)

Date/Time?? 5-13-95 / 0845

PPE Tare Dry Weight (Step c)?? 8.63

PPE Installed Tare Weight (Step j)?? 9.22

PPE Filled Weight (Step m)?? 14.22

PPE Pressure?? 700 PSIG and Temperature?? 66.5°F (Step o)

PPE Filled Weight (Step r)?? 13.63

Calculated CO_2 Weight (Step r)?? 5.0

ARDE

MWL 49000-033
USE AS IS.
VER # HR02353

Pressure Gauge Reading (Step s)?? 700 PSIG

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TEST REPORT

BOTTLE FILLING DATA

Before, During or After (circle one) Which Test?? THERMAL CYCLE (AFTER FIRST HOT CYCLE)

Date/Time?? 5-13-95 / 1100

PFE Tare Dry Weight (Step c)?? 8.60

PFE Installed Tare Weight (Step j)?? 9.25

PFE Filled Weight (Step m)?? 14.30

PFE Pressure?? 700 PSIG and Temperature?? 67.8°F (Step o)

PFE Filled Weight (Step r)?? 13.62

Calculated CO_2 Weight (Step r)?? 5.02

Pressure Gauge Reading (Step s)?? 720 PSIG

MAR 490DA-033
USE AS IS.
VER # HR 62353

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TEST REPORT

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BOTTLE FILLING DATA

Before (Lucing) or After (circle one) Which Test?? THERMAL CYCLE (AFTER LAST COLD CYCLE)

Time?? 5-16-95 1000

Bare Dry Weight (Step c)?? 9.62

Installed Tare Weight (Step j)?? 9.35

Filled Weight (Step m)?? 15.00

Pressure?? 680 PSIG and Temperature?? 58.8°F (Step o)

Filled Weight (Step r)?? 14.15

Stated CO_2 Weight (Step r)?? 5.53

Pressure Gauge Reading (Step s)?? 700 PSIG

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TEST REPORT

BOTTLE FILLING DATA

Before, During or (After) (circle one) Which Test?? THERMAL CYCLE

Date/Time?? 5-16-95 / 1500

PFE Tare Dry Weight (Step c)?? 3.60

PFE Installed Tare Weight (Step j)?? 9.38

PFE Filled Weight [Step m)?? 15.82

PFE Pressure?? 700 PSIG and Temperature?? 64°F (Step o)

PFE Filled Weight (Step r)?? 14.64

Calculated CO_2 Weight (Step r)?? 6.04

Pressure Gauge Reading (Step a)?? 700 PSIG

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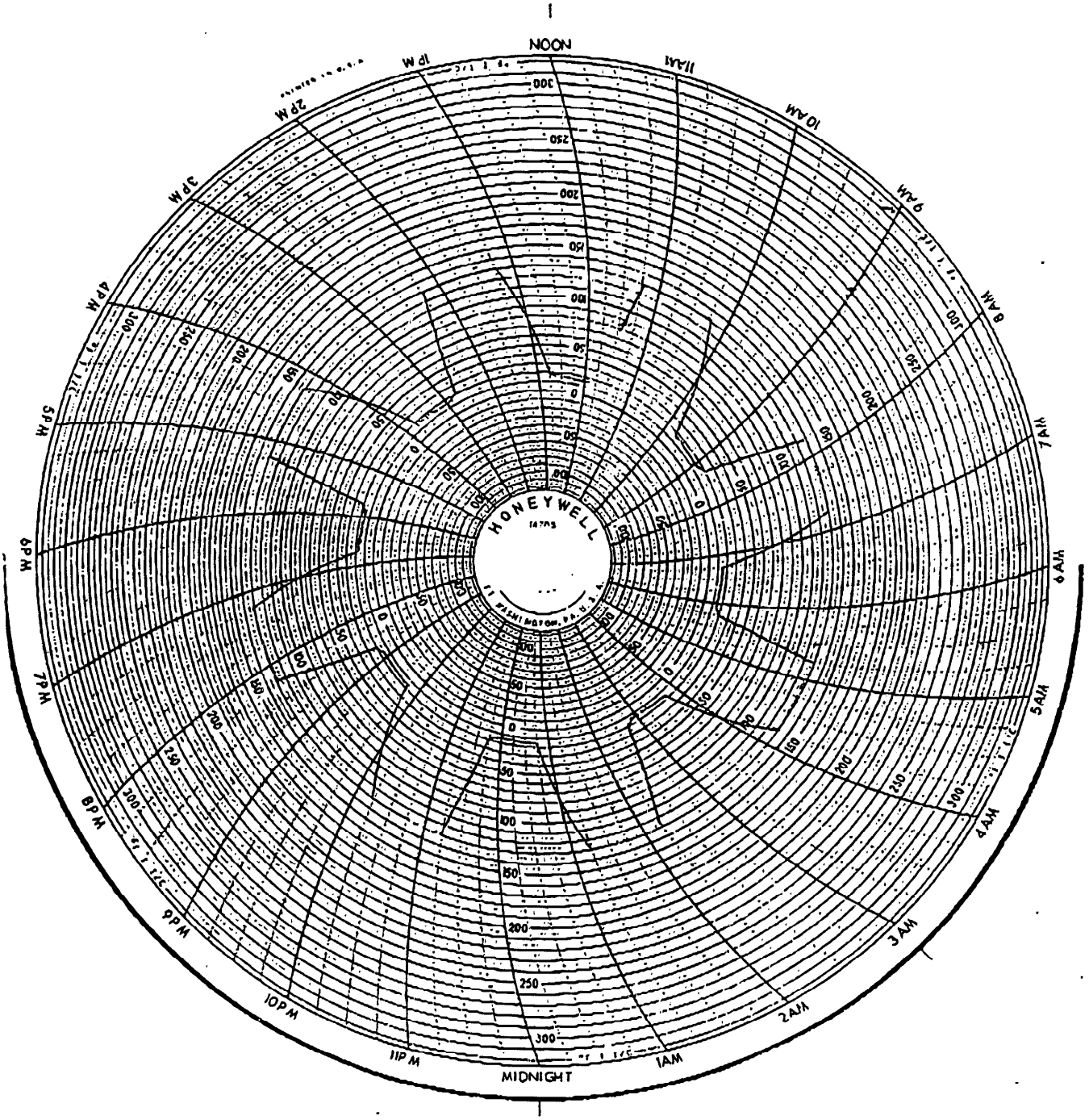
TEST REPORT

CHART RECORDING OF TYPICAL THERMAL CYCLES

Trace is Chamber Temperature

(5-13-95 through 5-16-95)

GLI & INSP



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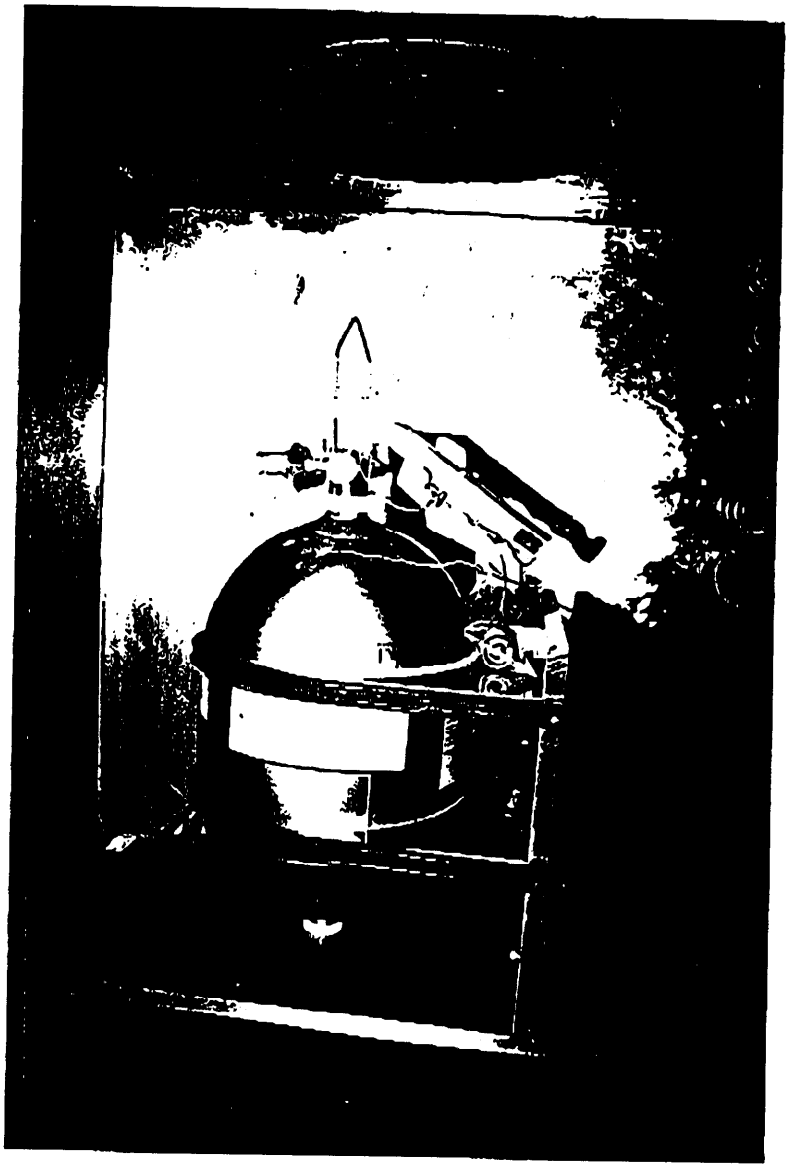
TEST REPORT

PHOTO 10

THERMAL CYCLE TEST SETUP

(Unit Close-Up)



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LAB DATA SHEET

Part No. E4482 S/N 001 Sample 1 Job 6608
Description Portable Fire Extinguisher Co. Arde
Page 4.0

TEST: HUMIDITY		Start	To Cpt.	Cptd
To Spec: QA 10060, Para. 5.15	Date	5-26-95		5-26-95
	Test By	CLI Jp		CLI Jp
	Photo	✓ CLI A INSP		CLI 2 INSP

Photo Req'd YES

CAUTION: Use clean nylon, polyvinyl or cotton gloves in handling the test unit. Protect the unit by placing it, in a polyethylene bag, in its Arde supplied crate when not in use.

1. Fill the specimen with CO_2 gas and pressurize per Arde procedure ME 10009. Place the pressurized specimen into a humidity chamber, with the nozzle unattached at ambient conditions, on non-corrosive supports. Use distilled, demineralized or deionized water with pH between 6.0 and 7.2 to obtain the required humidity. Air velocity throughout the exposure area must not exceed 150 FPM.

2. Cycle 1

   a) Increase the chamber temperature to 95°F over a one (1) hour period and then increase the relative humidity to not less than 95% over a one (I) hour period.

   b) Maintain these conditions for two (2) hours.

   c) Reduce the chamber temperature to 36°F over a two (2) hour period with relative humidity maintained at 95% or greater.

   d) Maintain these conditions for two (2) hours.

3. Cycle 2

   a) Increase the chamber temperature to 95°F over a two (2) hour period with no moisture being added to the chamber until 95°F is reached.

   b) Maintain these conditions (95°F & 95%) for two (2) hours.

   c) Reduce the chamber temperature to 36°F over a two (2) hour period with relative humidity maintained at 95% or greater.

   d) Maintain these conditions for two (2) hours.

4. Cycle 3

   a) Dry the unit at room temperature and 50% maximum relative humidity by blowing air through the chamber, at a rate of 1 - 3 times the chamber volume per minute, for six (6) hours.

(Continued on *next* page.)

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LAB DATA SHEET

Part No. E4482 S/N 001 Sample 1 Job 6608
Description Portable Fire Extinguisher Co. Arde
Page 4.1

TEST: HUMIDITY (Continued)
To Spec.: QA 10060, Paragraph 5.15

4. Cycle 3 (Continued)

b) Within two (2) hours after completing this cycle, record the temperature and pressure of the unit below and on the Arde Data Sheet. Then connect the nozzle assembly to the PFE port, pull the pin while pressing the button and squeeze the trigger co discharge the CO_2 for 45 seconds. Weigh the units to determine the amount of CO_2 discharged in 45 seconds, then squeeze the trigger until the tank is empty.

Pressure?? 857 PSIG Temperature?? °F (ARDE) OK 5.5@ 70°F

Weight after 45 seconds?? 9.132 lb [CO_2 discharged?? 5.538 lb (91.24 %) J (CLI 12) (CLI 7 INSP)

5. Re-fill the specimen with CO_2 gas and, pressurize per Arde procedure ME 10009. Re-install the pressurized test sample in the humidity chamber with the nozzle unattached at ambient conditions.

6. Cycle 4

a) Increase the chamber temperature to 95°F and the relative humidity to 90% over a one (1) hour period.

b) Maintain these conditions for at least one (1) hour.

c) At the end of the one (1) hour period, record the temperature and pressure of the unit below and on the Arde Data Sheet. Then connect the nozzle assembly c o the PFE port, pull the pin while pressing the button and squeeze the trigger to discharge the CO_2 for 45 seconds. Weigh the unit to determine the amount of- CO_2 discharged in 45 seconds, then squeeze the trigger until the tank is empty.

Pressure?? 960 PSIG Temperature?? 95 °F (ARDE) 5.5 min @ 70°F 90%

Weight after 45 seconds?? 8.858 lb [CO_2 discharged?? 5.742 lb (95.7 %)] (CLI 12) (CLI 7 INSP)

d) Re-fill the specimen with CO_2 gas and pressurize per Arde procedure ME 10009. Re-install the pressurized test sample in the humidity chamber with the nozzle unattached et ambient conditions.

e) Reduce the chamber temperature co 36°F over a one (1) hour period with relative humidity maintained at 90%.

f) Maintain these conditions for at least one (1) hour:

(Continued on next page.)

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LAB DATA SHEET

Part No. P4482 S/N 001 Sample 1 Job-- 6608
Description Portable Fire Extinguisher Co. Arde
Page 4.2

TEST: HUMIDITY (Continued)
To Spec.: QA 10060, Paragraph 5.15

6. Cycle 4 (Continued)

g) At the end of the one (1) hour period, record the temperature and pressure of the unit below and on the Arde Data Sheet. Then connect the nozzle assembly to the PFE port, pull the pin while pressing the button and squeeze the trigger to discharge the CO_2 for 45 seconds. Weigh the unit to determine the amount of CO_2 discharged in 45 seconds, then squeeze the trigger until the tank is empty.

Pressure?? 600 PSIG Temperature?? 36°F (ARDE) NO HEAT FOR COLD CASE GMD (GLI 12)

Weight after 45 seconds?? 9.922 lb [CO_2 discharged?? 4.688 lb (78 %)] (GLI 2 IMCP)

7. Following completion of the fourth cycle, dry the unit as described in Cycle 3, Step 4, above. Remove the unit from the test chamber and visually examine for evidence of deterioration or damage.

Any visible evidence of deterioration or damage?? NO (GLI I)

8. List test equipment used on Test Equipment List, attached.

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TEST REPORT

BOTTLE FILLING DATA

(Before) During or After (circle one) Which Test?? HUMIDITY

Date/Time?? 5-24-95 / 1030

PFE Tare Dry Weight (Step c)?? 8.60

PFE Installed Tare Weight (Step j)?? 9.15

PFE Filled Weight (Step m)?? 15.21

PFE Pressure?? 830 PSIG and Temperature?? 74°F (Step o)

PFE Filled Weight (Step r)?? 14.67

Calculated CO_2 Weight (Step r)?? 6.07 ARDE

Pressure Gauge Reading (Step s)?? 825 PSIG

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TEST REPORT

BOTTLE FILLING DATA

Before, (During) or After (circle one) Which Test?? HUMIDITY (AFTER CYCLE 3)

Date/Time?? 5-25-95 / 1035

PFE Tare Dry Weight (Step c)?? 8.60

PFE Installed Tare Weight (Step j)?? 9.09

PFE Filled Weight (Step m)?? 15.09

PFE Pressure?? 850 PSIG and Temperature?? 78°F (Step o)

PFE Filled Weight (Step r)?? 14.60

Calculated CO_2 Weight (Step r)?? 6.00 (APPROVED)

Pressure Gauge Reading (Step s)?? 850 PSIG

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TEST REPORT

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BOTTLE FILLING DATA

Before, (During) or After (circle one) Which Test?? HUMIDITY (AFTER 1HR @95°F+90%)

Date/Time?? 5-25-95 / 1330

PPE Tare Dry Weight (Step c)?? 8.60

PPE Installed Tare Weight (Step j)?? 9.11

PPE Filled Weight (Step m)?? 15.12

PPE Pressure?? 850 PSIG and Temperature?? 79°F (Step o)

PPE Filled Weight (Step r)?? 14.61

Calculated CO_2 Weight (Step r)?? 6.01

Pressure Gauge Reading (Step s)?? 870 PSIG

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TEST REPORT

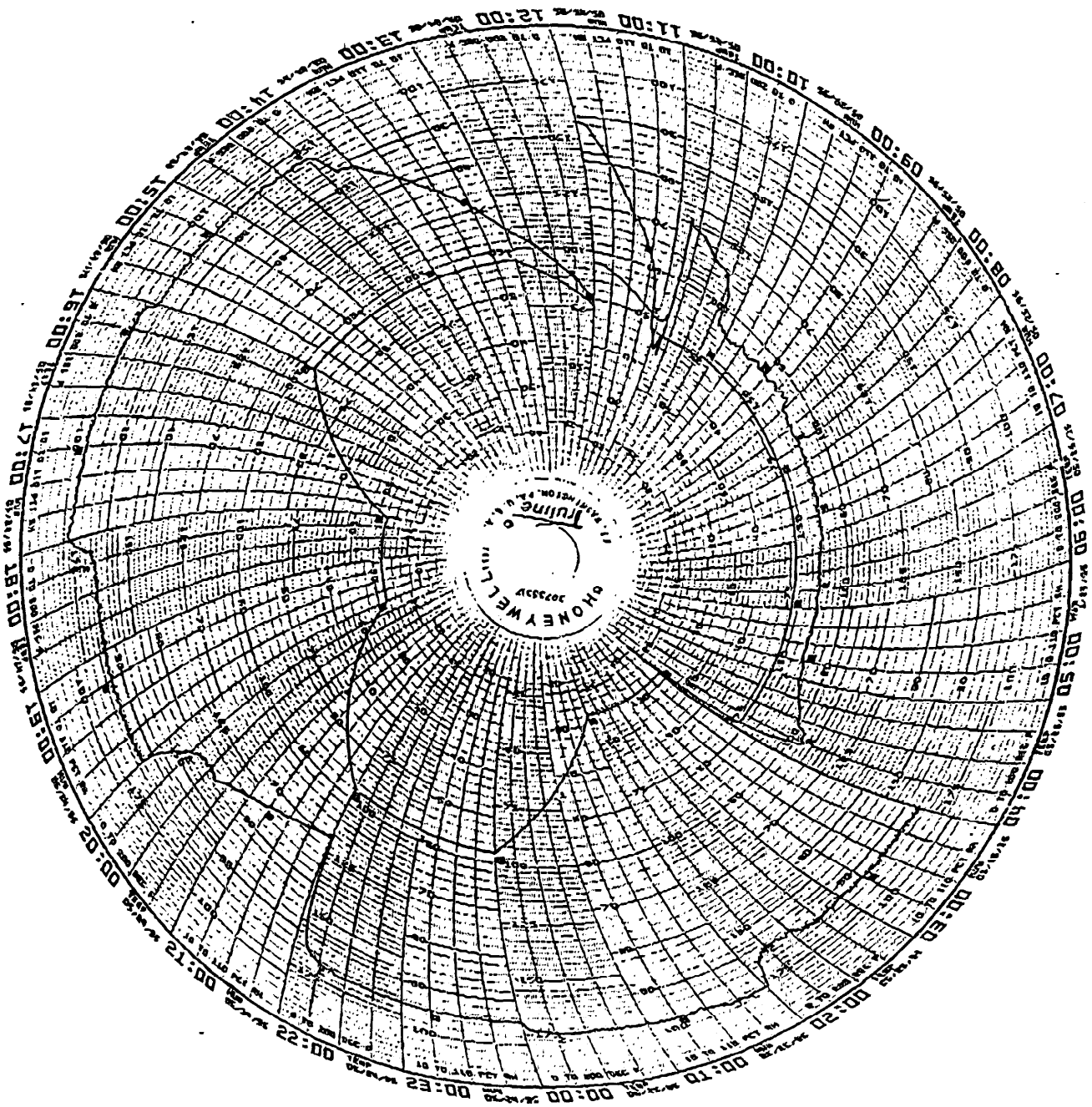
CHART RECORDING HUMIDITY TEST

Trace Number 1 (Inside) is Chamber Temperature

Trace Number 2 (Outside) is Chamber Humidity

(5/24/95 through 5/25/95)

CLI & INS



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TEST REPORT

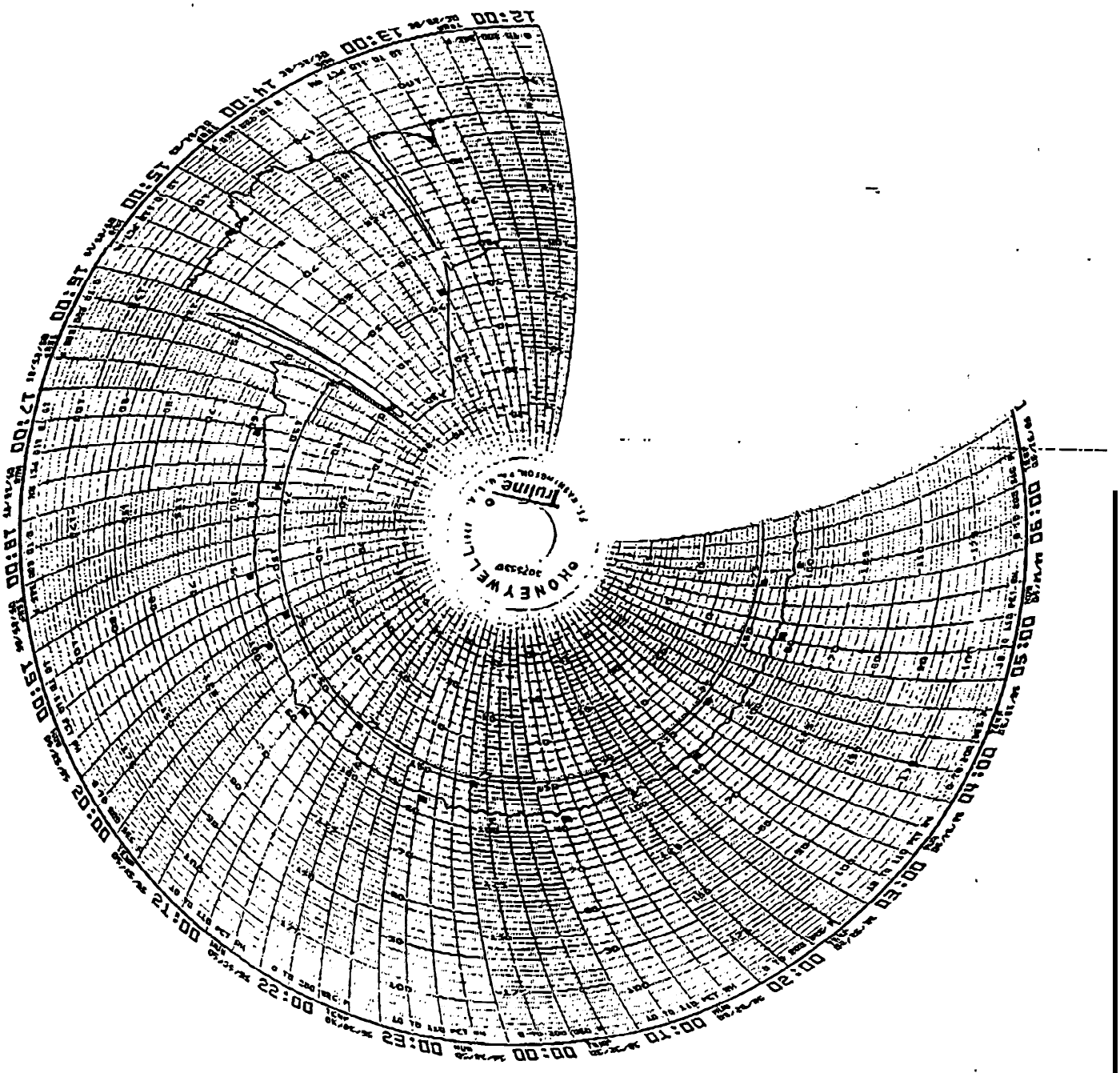
CHART **RECORD& OF HUMIDITY TEST**

Trace **Number 1 (Inside) is Chamber Temperature**

Trace Number 2 (Outside) is Chamber Humidity

CLI & INSP

(5/25/95 through 5/26/95)



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TEST REPORT

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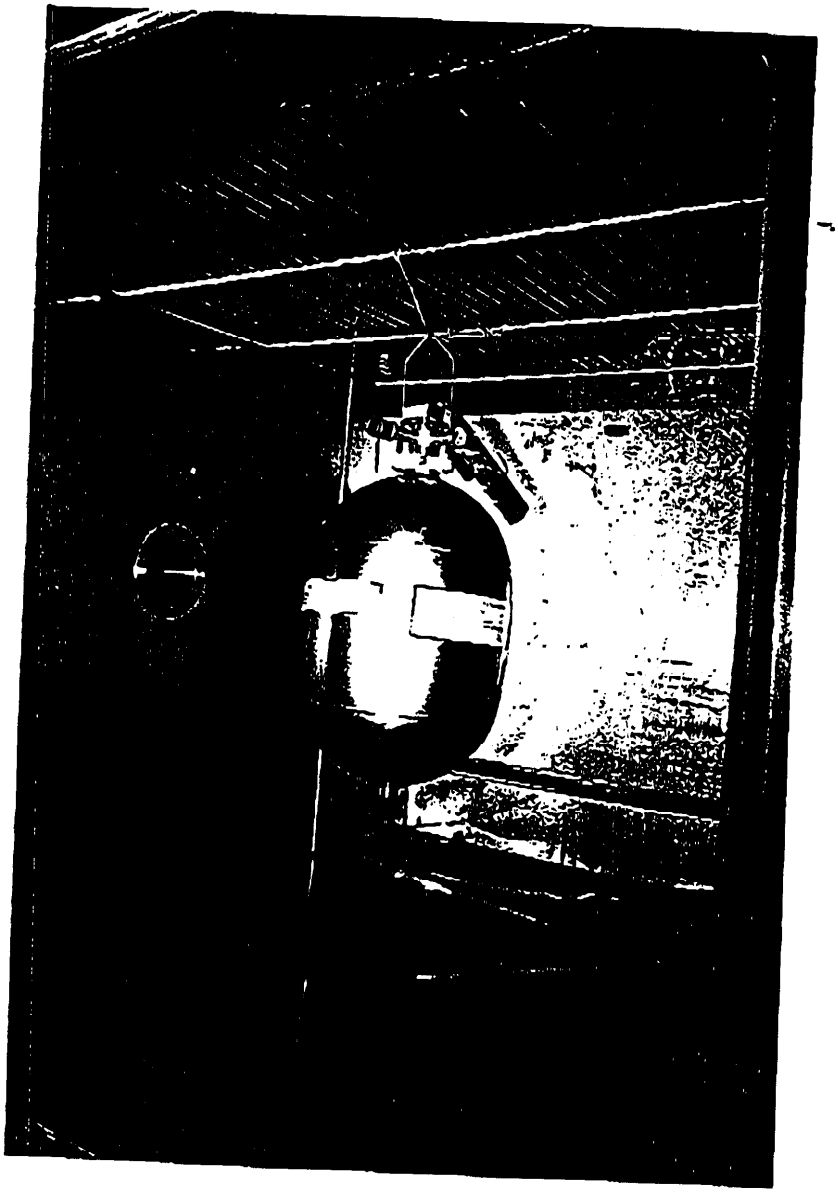
PHOTO 11

HUMIDITY TEST SETUP



Data Sheet

PN : E4482 Date : 5-17-95

SN : 001 Temperature : 65°F

Qualification Test per QA10060, Rev. A Humidity : 60%

para. 5.11 Thermal Vacuum Test

Requirements :	Actual	Inspector
a) CO2 mass fill		
5.50 to 5.60 lbm	5.54	CLT 12
Pressure psig	770 PSIG	
Temperature °F	72°F	

b) Thermal vacuum cycle

Warning: Chamber temperature and PFE skin temperature shall *not* exceed 132°F. The PFE assembly may explode if high temperature limit is violated.

Cycle No. 1

Start time 5-17-95 @ 2000

	Start	End
20°F temp.	20°F	20°F
Chamber Pressure ($1x10^{-5}$ torr)	<1x10⁻⁵	<1x10⁻⁵
Hold time (12 hrs min)	12 HRS	
	Start	End
129°F temp.	129°F	129°F
Chamber Pressure ($1x10^{-5}$ torr)	<1x10⁻⁵	<1x10⁻⁵
PFE Pressure	650 PSIG	1050 PSIG
Hold time (12 hrs min)	15.5 HRS	

Cycle No. 2

Start rime 5-19-95 @ 0830

	Start	End
20°F temp.	20°F	20°F
Chamber Pressure ($1x10^{-5}$ torr)	<1x10⁻⁵	<1x10⁻⁵
Hold time (1 hr min)	1 HR	
	Start	End
129°F temp.	129°F	129°F
Chamber Pressure ($1x10^{-5}$ torr)	<1x10⁻⁵	<1x10⁻⁵
Hold time (1 hr min)	1.5 HR	

A-13 SMB 6/5/95