

# CCP-TP-055

Revision 4

## CCP

# Varian Porta-Test Leak Detector Operations

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APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
2	03/10/2003	Changes to 1.0, 2.1, 4.19.3, NOTE before 4.23, and 5.1. Added WARNING before 4.5.
3	01/05/2004	Change to 4.0 and updated references. Added new Section 3.3, and Step 4.4.4, concerning Facility Records Custodian.
4	11/07/2006	Revised to add DOE/WIPP 02-3284, <i>RH Packaging Operations Manual</i> and grammatical corrections.

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## 1.0 PURPOSE

This procedure provides guidance for start-up, tuning, calibration, and shutdown of the Varian Porta-Test Leak Detector. This procedure also includes the document which provides proof of calibration. This procedure generates the Varian Porta-Test Leak Detector Calibration Records shown in Attachment 1.

This procedure specifies instructions for calibrating and operating the Varian Porta-Test Leak Detector. Results of the calibration procedure are recorded in sign-off blocks located on the Varian Porta-Test Leak Detector Calibration Record (Attachment 1).

### 1.1 Scope

Central Characterization Project (CCP) personnel at the Shipment Sites are responsible for startup, tuning for helium, calibration, and shutdown of the Varian Porta-Test Leak Detector.

## 2.0 REQUIREMENTS

### 2.1 References

#### Baseline Documents

- DOE Order 5480.20A. *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*

#### Referenced Documents

- *CH Packaging Operations Manual* (DOE/WIPP 02-3184)
- *RH Packaging Operations Manual* (DOE/WIPP 02-3284)
- DOE/WIPP 02-3220, *CH Packaging Operations for High Wattage Waste*
- CCP-PO-008, *CCP Quality Assurance Interface with WTS Quality Assurance Program*
- CCP-QP-002, *CCP Training and Qualification Plan*
- CCP-QP-008, *CCP Records Management*
- CCP-QP-010, *CCP Document Preparation, Approval and Control*

2.2 Training Requirements

2.2.1 Workers performing this procedure have been trained and qualified in accordance with CCP-QP-002, *CCP Training and Qualification Plan* prior to performing this procedure.

2.3 Equipment List

2.3.1 Measuring and Test Equipment (M&TE)

2.3.2 Varian Porta-Test Leak Detector with 7 cubic feet per minute (CFM) minimum to a maximum of 14 CFM mechanical vacuum pump.

2.3.3 Varian Porta-Test Leak Detector, Model #959

2.3.4 Helium calibrated leak (10<sup>-8</sup> scale). Referred to as “calibrated leak.”

2.3.5 Temperature measuring device, ±2°F accuracy.

2.3.6 Watch or stopwatch, digital seconds or sweep second hand. No calibration required.

2.3.7 Data Sheets

2.3.8 Varian Porta-Test Leak Detector Calibration Record (Attachment 1).

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**NOTE**

Instrument knobs or switches are shown in the text of this procedure as all capital letters.

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2.4 Precautions and Limitations

2.4.1 DO **NOT** pressurize any part of the leak detector above atmospheric pressure.

2.4.2 DO **NOT** operate the turbo pump (place the MAIN POWER switch inside the cabinet in the “ON” position) if the vacuum pump is **NOT** operating.

2.4.3 The turbo pump can cause burns when touched. Surfaces must be allowed to cool prior to touching the pump.

2.4.4 If, during the performance of this procedure, an off-normal situation occurs that causes deviation from the normal process, and this off-normal condition CAN **NOT** be corrected as directed in this procedure, the technician shall STOP WORK IMMEDIATELY, and notify Level II/III Supervisor.

2.5 Prerequisite Actions

2.5.1 None

2.6 Definitions

2.6.1 None

### 3.0 RESPONSIBILITIES

#### 3.1 Level II/III Supervisor

3.1.1 Verifies that the startup, tuning, and calibration of the Varian Porta-Test Leak Detector have been performed properly and records this verification by signing the Varian Porta-Test Leak Detector Calibration Record (Attachment 1), if used.

#### 3.2 Leak Test Examiner

3.2.1 Performs the specific functions of this procedure.

#### 3.3 Facility Records Custodian

3.3.1 Transmits Attachment 1 in accordance with CCP-QP-008, *CCP Records Management*.

## 4.0 PROCEDURE

### 4.1 Leak Detector Startup

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#### NOTE

This section is performed ONLY if the leak detector has been shutdown and de-energized.

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- 4.1.1 Check the vacuum pump connection to the leak detector.
- 4.1.2 Check the oil level in the vacuum pump, **AND** again when the unit is operating (if vacuum pump is oil filled).
- 4.1.3 Ensure the test port plug is installed in the test port, hand tight.
- 4.1.4 Turn on the MAIN POWER switch on the back of the cart.

#### WARNING

Turbo pumps operate at elevated temperatures. DO **NOT** touch Turbo Pump as it may cause burns.

- 4.1.5 Open the right hand door, **AND** turn on the MAIN POWER switch.
  - 4.1.6 Wait until the "Turbo Ready" indicator lights up.
  - 4.1.7 Wait until the green "HI-VAC-OK" light illuminates.
- ### 4.2 Leak Detector Tuning

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#### NOTE

This section must be performed prior to conducting pre-shift calibration.

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- 4.2.1 Set RANGE to the value of the calibrated leak using the RANGE knob.
- 4.2.2 Ensure the leak detector is set to VENT.
- 4.2.3 Ensure the valve on the calibrated leak is open a minimum one turn counterclockwise.
- 4.2.4 Remove the plug from the test port on top of the leak detector.
- 4.2.5 Install calibrated leak in the test port.

- 4.2.6 Push the START button.
- 4.2.7 Allow leak detector to cycle to TEST.
- 4.2.8 Close the valve on the calibrated leak.
- 4.2.9 Adjust using ZERO, on cabinet front, and/or COARSE ZERO, inside the cabinet, to obtain a zero indication on the bar graph (i.e., one light segment on at the bottom of the scale).
- 4.2.10 Open the valve on the calibrated leak one turn.
- 4.2.11 Ensure range indication is between 1 and 9 on the bar graph.
- 4.2.12 Tune the leak detector for helium as follows:
  - [A] Carefully adjust FOCUS for a maximum peak reading on the bar graph.
  - [B] Carefully adjust ION for a maximum peak reading on the bar graph.
  - [C] Repeat steps 4.2.12[A] through 4.2.12[B] until the indication **DOES NOT** change.

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**NOTE**

If the bar graph indication decreases to zero, the detector is tuned for helium and is ready for calibration.

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- 4.2.13 Close the valve on the calibrated leak.
- 4.2.14 **IF** the bar graph indication decreases to zero,  
**THEN GO TO** the section "Leak Detector Calibration."
- 4.2.15 **IF** the bar graph indication **DOES NOT** decrease to zero,  
**THEN** repeat steps 4.2.10 through 4.2.15 with the following limitations:
  - [A] Repeat two times if necessary.
  - [B] **IF** the leak detector is **NOT** tuned after two repeats,  
**THEN** notify the Level II/III Supervisor.

### 4.3 Leak Detector Calibration

#### NOTE

If performing DOE/WIPP 02-3184, *CH Packaging Operations Manual*, DOE/WIPP 02-3220, *CH Packaging Operations for High Wattage Waste*, or DOE/WIPP 02-3284, *RH Packaging Operations Manual*, Attachment 1 is not required. Calibration information will be recorded on leak test report in DOE/WIPP 02-3184, DOE/WIPP 02-3220, or DOE/WIPP 02-3284.

- 4.3.1 Record equipment identification and calibration data on Attachment 1 **AND** initial.
- 4.3.2 **IF** Leak Detector Tuning, was performed, **THEN** GO TO step 4.3.6.
- 4.3.3 **IF** Leak Detector Tuning, was **NOT** performed, **THEN** perform the following:
  - [A] Ensure the leak detector is set to VENT.
  - [B] Remove the plug from the test port on top of the cabinet.
  - [C] Install calibrated leak in the test port.
  - [D] Ensure the valve on the calibrated leak is one turn open.
- 4.3.4 Push the START button.
- 4.3.5 Allow leak detector to cycle to TEST.
- 4.3.6 Ensure the valve on the calibrated leak is one turn open.
- 4.3.7 Using a calibrated temperature indicating device, measure the temperature of the calibration leak, **AND** record on Attachment 1 and initial.

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**NOTE**

Ensure the temperature correction chart is applicable to the specific calibrated leak being used by comparing the equipment ID numbers listed on the calibrated leak and the temperature correction chart.

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- 4.3.8 Determine the temperature corrected value for the calibrated leak as follows:

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**NOTE**

A decay correction factor, based on the age of the calibrated leak, has been applied to the corrected leak rate value shown on the temperature correction chart.

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- [A] Look up the temperature corrected leak for the calibrated leak using the temperature correction chart for that leak standard.

- 4.3.9 Record the temperature corrected leak rate on Attachment 1 **AND** initial.
- 4.3.10 Ensure the RANGE on the leak detector is set to the value of the calibrated leak.
- 4.3.11 Ensure the valve on the calibrated leak is closed.
- 4.3.12 Verify the bar graph indication decreases to zero (one light segment on at the bottom of the scale).
- 4.3.13 **IF** the bar graph indication **DOES NOT** decrease to zero, **THEN** adjust using ZERO, **AND/OR** COARSE ZERO, to obtain a zero indication on the bar graph
- 4.3.14 Open the valve on the calibrated leak.
- 4.3.15 Allow the leak detector indication to stabilize.
- 4.3.16 Adjust CAL knob, inside the cabinet, until the temperature corrected calibrated leak value recorded for step 4.3.9 is indicated on the bar graph.
- 4.3.17 Close the valve on the calibrated leak.
- 4.3.18 Verify the bar graph indication decreases to zero (one light segment on at the bottom of the scale).

4.3.19 **IF** the bar graph indication **DOES NOT** decrease to approximately zero,  
**THEN** repeat steps 4.3.13 through 4.3.19, with the following limitations:

[A] Repeat two times if necessary.

[B] **IF** the bar graph indication **DOES NOT** decrease to approximately zero, after two repeats,  
**THEN** notify the Level II/III Supervisor.

4.3.20 Record the bar graph indication on Attachment 1 **AND** initial.

4.3.21 Open the valve on the calibrated leak.

4.3.22 Allow the leak detector indication to stabilize.

4.3.23 Record the bar graph indication on Attachment 1 **AND** initial.

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**NOTE**

**ACCEPTANCE CRITERIA:** The bar graph reading recorded in step 4.3.23 is equal to the temperature corrected leak value recorded in step 4.3.9, and the value recorded in step 4.3.20 is equal to zero (one light segment at the bottom of the scale).

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4.3.24 Indicate if the Acceptance Criteria was met by placing a (√) in the “Yes” or “No” block in the “Acceptance Criteria Satisfied” block on Attachment 1.

4.3.25 On Attachment 1, step 4.3.24 print and sign name, **AND** record level, date and time.

4.3.26 Set the leak detector to VENT.

4.3.27 Remove the calibrated leak from the test port, **AND** store with the valve open.

4.3.28 Install the plug hand tight in the test port.

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**NOTE**

If working at a site without a Facility Records Custodian, then the record will be transmitted to CCP records by the Transportation Certification Official.

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4.3.29 Give completed Attachment 1 to the Facility Records Custodian to be transmitted as a record.

4.3.30 Facility records Custodian, transmit Attachment 1 in accordance with CCP-QP-008.

4.4 Leak Detector Shutdown

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**NOTE**

This Section is to be performed ONLY if the Varian Porta-Test Leak Detector is to be shutdown.

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4.4.1 Verify the leak detector is set on VENT, **AND** install the test port plug hand tight.

4.4.2 Turn OFF the MAIN POWER switch on the front panel.

4.4.3 Turn OFF the MAIN POWER switch on the back of the cart.

5.0 RECORDS

5.1 Records generated during the performance of this procedure are maintained as Quality Assurance (QA) records in accordance with CCP-QP-008. The records are the following:

5.1.1 QA/Non-Permanent

[A] Varian Porta-Test Leak Detector Calibration Record  
(Attachment 1)

Attachment 1 — Varian Porta-Test Leak Detector Calibration Record

Date: \_\_\_\_\_ Time: \_\_\_\_\_

STEP NO.	DESCRIPTION	INITIAL
4.3.1	Varian ID:	
	Helium Calibration Leak, std-cc/sec  _____ Cal Value      _____ Equip ID      _____ Cal Due Date	
	Temperature measuring device  _____ Equip ID      _____ Cal Due Date	
	Temperature of known value that standard leak was calibrated  _____	
4.3.7	Calibrated Leak Temp:	
4.3.9	Calibrated Leak Value:	
4.3.20	Bar Graph Indication:	
4.3.23	Bar Graph Indication:	
4.3.24	ACCEPTANCE CRITERIA SATISFIED: (√) [ ] Yes [ ] No  _____/_____/_____/_____/_____ LT (Print Name)      Signature      Level      Date      Time	

Remarks: \_\_\_\_\_  
\_\_\_\_\_

REVIEW:

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Level II/III Supervisor      Signature      Level      Date      Time  
(Print Name)