SOP Title: Use and Maintenance of -80°C Freezers in the HPV Serology Laboratory		
Document ID: HSL_EQ_008	Version	2.0
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1. PURPOSE

1.1. The purpose of this procedure is to describe the proper use and handling of a -80°C freezer.

2. SCOPE

2.1. This procedure applies to the Human Papillomavirus (HPV) Serology Laboratory located at the Advanced Technology Research Facility (ATRF), room C2007.

3. REFERENCES

3.1. Revco -80°C Freezer User Manual

3.2. HSL_GL_001: Waste Disposal at the Advanced Technology Research Facility

4. RESPONSIBILITIES

4.1. The Research Associate, hereafter referred to as analyst, is responsible for reviewing and following this procedure.

4.2. The Scientific Manager or designee is responsible for training personnel in this procedure and reviewing associated documentation.

4.3. The Quality Assurance Specialist is responsible for quality oversight and approval of this procedure.

5. REAGENTS, MATERIALS AND EQUIPMENT

5.1. -80°C Freezer

5.2. Cavicide (Warehouse, Cat # 79300360 or equivalent)

5.3. PCC-54 Detergent Concentrate (Fisher, Cat # PI72288 or equivalent)

5.4. Wypalls Paper Towel (Warehouse, Cat # 79300335 or equivalent)

5.5. Sealed Lead Acid Battery (Thermo Cat # 400159 or equivalent)

6. HEALTH AND SAFETY CONSIDERAIONS

6.1. Proper safety precautions should be taken while working in a laboratory setting. This includes, but is not limited to, proper protective equipment such as lab coats, safety glasses, closed-toe shoes, and non-latex gloves.

6.2. Refer to the respective Safety Data Sheets when working with any chemicals.

6.3. Users may utilize freezer gloves when working in the unit for a period of time.

6.4. Refer to "HSL_GL_001: Waste Disposal at the Advanced Technology Research Facility" regarding waste disposal processes at the ATRF.

7. PROCEDURE PRINCIPLES

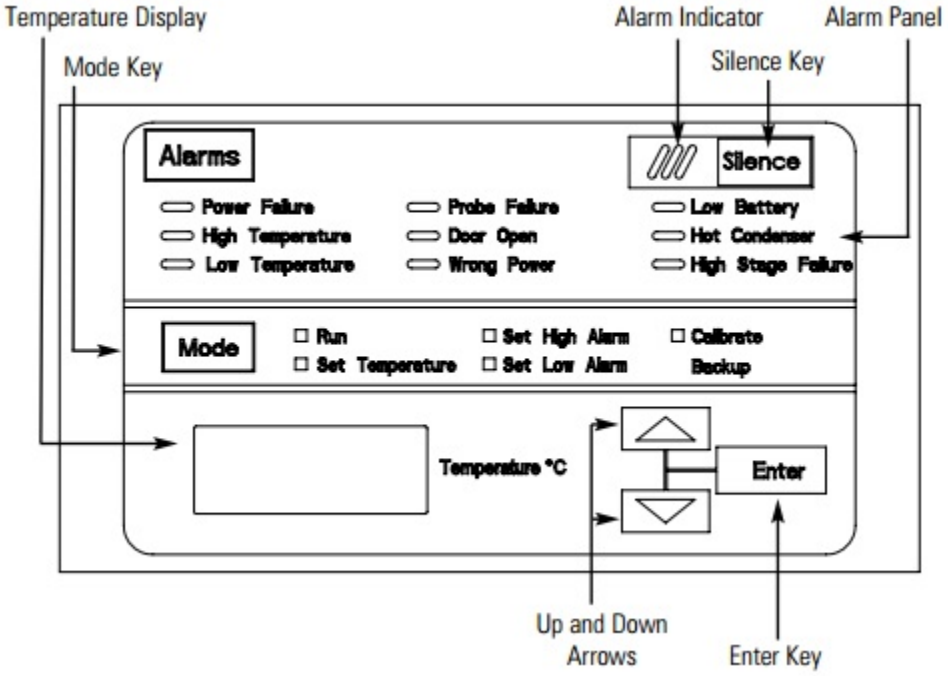
7.1. The -80°C Freezer is set-up with the Rees alarm system and maintained by ATRF facilities engineer.

7.2. The freezer has an operating temperature range of -50°C to -86°C.

8. OPERATION

8.1. Control Panel

Figure 1: Control Panel



8.1.1. **Mode** Key - Used to select Run, Set Temperature, Set High Alarm, Set Low Alarm, Calibrate, Backup.

8.1.2. Temperature Display - Displays temperature in degrees Celsius.

8.1.3. Alarm Indicator - Light pulses on/off during an alarm condition of the cabinet.

8.1.4. **Silence** Key - Silences the audible alarm. See Section 4 for alarm ring back times.

8.1.5. Alarm Panel - Indicates the current alarm condition.

8.1.6. **Up** and **Down** Arrows - Increases or decreases values, toggles between choices.

8.1.7. **Enter** Key - Stores the value into memory.

8.2. Operation of the Key Pad

8.2.1. **Up Arrow**: Increases or toggles the parameter value.

8.2.2. **Enter**: Must press Enter key to save to memory all changed values.

8.2.3. **Down Arrow**: Decreases or toggles the parameter value.

8.2.4. **Silence** Key: Press to silence the audible alarm.

8.3. Setting Operating Temperature

8.3.1. Press the **Mode** key until the set temperature indicator lights.

8.3.2. Press the **Up** or **Down** arrow key until the desired temperature set point is displayed.

8.3.3. Press **Enter** to save the set point.

8.3.4. Press the **Mode** key until the Run indicator lights for the Run Mode after 5 minutes.

8.4. Setting High Temperature Alarm

8.4.1. Press the **Mode** key until the Set High Alarm Indicator lights.

8.4.2. Press the **Up** or **Down** arrow key until the desired high temperature alarm set point is displayed.

Note: High alarm set point must be at least 5°C from control set point.

8.4.3. Press **Enter** to save the setting.

8.4.4. Press the **Mode** key until the Run Indicator lights for Run mode.

8.5. Setting Low Temperature Alarm

8.5.1. Press the **Mode** key until the Set Low Alarm Indicator lights.

8.5.2. Press the **Up** or **Down** arrow key until the desired high temperature alarm set point is displayed.

Note: High alarm set point must be at least 5°C from control set point.

8.5.3. Press **Enter** to save the setting.

8.5.4. Press the **Mode** key until the Run Indicator lights for Run mode.

8.6. Use

8.6.1. Do not leave door ajar for extended periods of time. An audible alarm will start when the door is propped open for more than 1 minute. The alarm can be silenced by pressing the **Silence** button.

8.6.2. The unit will activate an audible/visual warning when the freezer chamber temperature has reached or exceeded the high or low temperature alarm set point.

8.6.3. If during use the temperature goes out of range and the Rees alarm is activated, an entry is made on “HSL_EQ_008.01: -80°C Freezer Maintenance Form” explaining the use/cause of alarm.

9. MAINTENANCE

9.1. Monthly Maintenance

9.1.1. Maintenance is performed on door gasket monthly, at minimum, to remove dirt or excessive frost build-up.

9.1.2. Using designated freezer scraper, remove any frost build-up from the gasket and door(s).

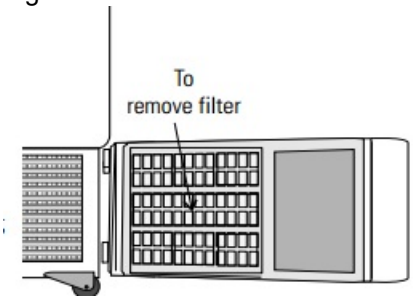
9.1.3. Record maintenance on HSL_EQ_008.01.

9.2. Quarterly Maintenance

9.2.1. Open the front lower door by grasping the bottom left corner.

9.2.2. Locate the grille on the door (see Figure 2). Grasp the middle of the filter material behind the grille and gently pull out to remove.

Figure 2: Filter Removal



9.2.3. Wash the filter material using water and a mild detergent.

9.2.4. Dry the filter by pressing between paper towels.

9.2.5. Install the filter back into the grille once dry and close the door.

9.2.6. Record maintenance on HSL_EQ_008.01.

9.3. Annual Maintenance

9.3.1. Open the front lower door by grasping the bottom left corner.

9.3.2. Being careful not to damage the condenser fins, using a vacuum cleaner, clean the condenser.

9.3.3. Record maintenance on HSL_EQ_008.01.

9.4. Biennial Maintenance

9.4.1. Unit Defrost

9.4.1.1. Inhibit Rees system for 72 hours.

9.4.1.2. Move materials to another freezer.

9.4.1.3. Turn off unit and unplug. Place paper towels on the floor in front of the unit to absorb moisture as the unit thaws.

9.4.1.4. When unit is thawed, wipe interior clean with Cavicide.

9.4.1.5. Plug unit back in and turn on unit. Allow unit to equilibrate overnight before loading materials.

9.4.2. Replace Battery

9.4.2.1. To gain access to the battery, open the lower door by the grasping the bottom left corner. The battery is rectangular in shape, located on the front left corner of the compressor compartment and is secured in place by a mounting bracket.

9.4.2.2. Directly above the battery is the battery power switch. Turn the battery power switch to the off position (O).

9.4.2.3. Disconnect the battery connections.

9.4.2.4. Remove the old battery and install the new battery.

9.4.2.5. Reconnect the battery (red to positive and black to negative).

9.4.2.6. Turn the battery power switch to Standby mode.

9.4.2.7. Close the lower panel door.

9.4.3. Record maintenance on HSL_EQ_008.01.

10. ATTACHMENTS

10.1. Attachment 1: HSL_EQ_008.01: -80°C Freezer Maintenance Form

Attachment 1: HSL_EQ_008.01: -80°C Freezer Maintenance Form

Frederick National Laboratory for Cancer Research sponsored by the National Cancer Institute		HPV Serology Laboratory Standard Operating Procedure Form	
Form Title: -80°C Freezer Maintenance Form			
Document ID: HSL_EQ_008.01		Version:	2.0
Associated SOP: HSL_EQ_008		Effective Date:	
Supersedes Version:	1.0	**Page 1 of 2**	

Maintenance Year:	
Equipment ID:	HSL_00

Monthly Maintenance

Month	January	February	March	April	May	June
Performed by/date:						
Reviewed by/date:						
Month	July	August	September	October	November	December
Performed by/date:						
Reviewed by/date:						

Quarterly Maintenance

Quarter	Q1	Q2	Q3	Q4
Performed by/date:				
Reviewed by/date:				

Annual Maintenance

Recorded by/date:	
Reviewed by/date:	

Biennial Maintenance

Date due:	
Recorded by/date:	

☐ N/A Column

Cavicide Lot Number:	
Cavicide Expiration Date:	
Performed by/date:	
Reviewed by/date:	

Verify current version prior to use. Use of a superseded or obsolete document is prohibited.

Unscheduled Maintenance

Date	QE Number	Activity Performed	Recorded by/date	Reviewed by/date

QA Reviewed by/date: _____