

BioEscalator Laboratory Standard Operation Procedure: Eppendorf CryoCube -80°C Freezers

Purpose

The purpose of this SOP is to instruct the user how to effectively operate and maintain the Eppendorf Cryocube.

Scope of policy

This SOP will cover general operation of the Cryocube, how to maintain and clean the Cryocube, and important safety information when using the freezers. This freezer should only be operated by those qualified to do so and lab personnel.

Introduction

The Cryocube is an Eppendorf freezer which can drop to temperatures as low as -86°C at 32°C maximum ambient temperature. The freezer is designed to provide precise, ultra-low temperature environments and can be used to store biological samples/ scientific materials for research purposes.

Safety information

The temperature of operation is such that direct contact with the cold contents or inside the equipment can burn unprotected skin. Use freezer gloves at all times when loading and unloading the Cryocube.

Maintenance, adjustment, and repair work should only be carried out by qualified and experienced personnel who have been authorised by Eppendorf to undertake such work.

Observe good housekeeping practices, at all times keeping the equipment and the adjacent areas clean, dry and uncluttered.

The hydrocarbon refrigerants used in these freezers are flammable and therefore appropriate attention must be paid to avoid leaks and to keep the freezer away from sparks and flames.

Operation

Note: the on/off circuit breaker and battery switch are fitted with IP65 plastic covers, to prevent a possible source of ignition. DO NOT remove the covers, cover replacement must be performed by a qualified and authorised person.

The on/off circuit breaker is located within the lockable panel at the bottom right-hand corner of the freezer. To remove the lockable panel and turn the circuit breaker and battery switch on/off:

1. Insert and turn the key one quarter turn to the right
2. Remove the panel
3. Set the on/off circuit breaker and battery switch to the **I (ON)** position. The temperature display illuminates immediately. Note the battery switch is the one above the circuit breaker, when turning the freezer on always set both switches to **ON**

NOTE: the backup battery gives around 48 hrs of power in case of a power shutdown. It does not power the freezer, it powers the display so that the alarm can sound.

The alarm will sound when freezer temperature rises above -70°C and below -85°C. When switching on a freezer, it will take around 4hrs to reach a temperature of -

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80°C. Until the set temperature is reached, the alarm will sound every 30 mins, to mute it press alarm test/mute button.

After closing the freezer door, a vacuum may be created. Before the door can be opened again, it may be necessary to wait 1 or 2 min for the vacuum to be released by the vent port. Do not try to force the door open. During the release of the vacuum, a slight hissing sound may be heard. The heated vent is designed to keep the port clear of ice.

Setting operating temperature:

1. Press the LOCK key. The LOCK indicator will flash if a lock code is required.
2. Press the SET TEMP key. Its indicator will flash and the display will read 0.
3. Using the numerical keys, enter a new temperature. (between -50°C and-86°C)
4. Press the **E** key to enter the data.
5. Press the LOCK key to exit programming.

Note: press **C** to clear the display during programming

Setting high alarm set point:

1. Press the LOCK key
2. Press the HIGH ALARM key
3. Using the numerical keys, enter a new alarm set point temperature.
4. Press the **E** key to enter the data
5. Press the LOCK key to exit programming.

Setting low alarm set point:

Follow same steps for high alarm, but select LOW ALARM key instead.

To change the lock codes:

1. Press the CODE CHANGE key
2. Using the numerical keys, enter the new four digit number. Check it on the display.
3. Press the C key to cancel the entry if the display shows it to be incorrect, then enter the correct number.
4. When the number is correct, record the new number somewhere secure.
Then press the **E** key
5. Press the LOCK key.

Setting the lock code to 0000 disables the lock completely. With the 0000 code, press the LOCK key to reprogram the freezer.

Maintenance and cleaning

All exterior paint work and inner doors should be cleaned using a solution of mild detergent in water. Do not use abrasive cleaners or solvents.

The interior panels and shelves are made of stainless steel. They may be cleaned and sterilised. Apply recommended cleaning solvent (70% ethanol, 30% distilled water) with a soft, lint free cloth.

Serious damage to the Cryocube may occur if air intake is blocked. Check that there is no obstruction of the airflow to the freezer. Remove the filter from behind the grill

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by turning the thumbscrews $\frac{1}{4}$ turn and opening grill downward. The filter should be washed in warm soapy water and left to air dry before replacing.

The air intake grill must be cleaned regularly to keep it free from dust and debris. Under normal conditions, clean the grill once every 3 months. If the area around the grill is very dusty or dirty, clean it more often. Brush the grill with a soft brush and if a vacuum cleaner is available, vacuum the dust off from the grill.

The electrically heated vent port must never be obstructed, blocked, or sealed off. It is recommended to wipe the both the door seal and the surface against which it seals with a soft dry cloth once a month as freezers cannot operate with a defective seal.

All freezers will have their filters cleaned monthly by the BioEscalator apprentice laboratory technician. The BioEscalator apprentice laboratory technician will also clean the door frame and seal and sweep the shelves every two weeks (i.e. de-ice regularly) to prevent build of ice. This is all recorded.

All freezers are defrosted as and when required by scraping of the interior by emptying the freezer contents to the spare freezer (particularly in areas which can be compromised seals using the correct tools without damaging the freezer).

Every 12 months the outer door hinges and the handle mechanism should be lightly lubricated using general-purpose oil or spray grease.

When defrosting freezers, do not use a sharp object to chip or scrape the ice, instead allow the ice to melt naturally.

Defrosting the freezers

1. Deactivate the alarm by switching the battery switch on the front of the freezer to off
2. Unplug the freezer from the mains/power supply
3. Leave the inner and outer doors open
4. Allow the accumulated ice to melt
5. Mop up the resulting water
6. Dry and decontaminate the interior of the freezer
7. When defrosting is complete, reconnect the freezer to the mains/power supply
8. Turn the main/power switch on and reactivate the battery switch.