

**Ultra Low Temperature Freezers – Management Guide**

Laboratories typically account for a significant majority of the University’s total carbon emissions whilst occupying a minority in terms of space. Ultra Low Temperature Freezers (ULT Freezers) typically operate between -70 and -80oC, consuming between 16-22KWh per day, roughly twice the average daily consumption of a U.K household (9KWh/day).

An audit of select departments within the University of Cambridge (2013) found that many ULT freezers were consuming significantly more energy than needed due to poor management and maintenance.

The following guidelines provide advice on how to manage your ULT freezers more effectively to reduce energy consumption and prolong freezer life whilst safeguarding samples.

1. **Close the doors!**

Ensure that the internal doors are shut properly before the main door is closed promptly. This prevents warm air entering and reduces ice build-up.

1. **Keep an Inventory**

Minimise how long the door is kept open by keeping an up-to-date inventory stuck on the outside or near each unit. It should detail clearly both the sample and the location. If possible keep samples in boxes on racking, to allow for quick retrieval.

1. **Label your Samples Clearly**

Label clearly all samples, including contact details and if possible an ‘expiry date’. Remove old samples were possible, particularly when members of staff leave.

1. **Manage your Space**

Freezer space should be maximized whilst ensuring that samples do not block grills, vents or obstruct the airflow to and from coolers, as this will compromise temperature control. Avoid large empty spaces - the energy a freezer uses is spent cooling the air that enters upon opening the freezer door. Use spare polystyrene ice boxes to fill spaces or share freezer space with other labs.

1. **Position your Freezer**
* Store in a well-ventilated area away from sources of heat and out of direct sunlight with low ambient temperatures. High ambient temperatures increases energy consumption and may also increase the risk of freezer failure.
* Ensure that there is space around the unit’s vents (keep 15cm of space around behind and on top). Do not store items on top off or around ULT freezers.
1. **Make sure your freezer is reaching its temperature set point**

If you can hear the compressor running constantly, or if the freezer does not reach its set point (as seen from another thermometer), inform the lab manager or relevant maintenance staff to have the unit looked at immediately.

1. **Periodic Maintenance**

Arrange for regular maintenance checks

1. **Cleaning**

Arrange for an appropriately trained member of staff to regularly defrost (at least annually), de-ice and clean filters. The seals should also be checked.

1. **Replace old inefficient ULT freezers**

Freezers over 10 years old can be replaced with support from the Energy and Carbon Reduction Project – email environment@admin.cam.ac.uk for more details.