



Ultra Low Temperature (ULT) Freezers – Energy-Saving Opportunity

Ultra Low Temperature (ULT) freezers are common in life sciences, biochemistry and biology laboratories. Samples like DNA, RNA, antigens, bacteria, viruses, cell liners and more are stored in these freezers.

ULT freezers have significant operating costs. They can account for 5% or more of a laboratory's electricity use, costing \$750 to \$1000 per year. The U-M campus has 700 registered ULT freezers and an estimated 400 unregistered ULT freezers, so even small reductions in energy use can add up to big savings and contribute to U-M's greenhouse gas reduction goal.

How can you optimize the performance and efficiency of your lab's ULT freezer?

Raise the temperature on your ULT freezer to -70° C

It is only recently that the modern -80° ULT freezers have become the industry norm. Today most ULT freezers operate between -80° and -86° C with a typical factory default setting of -85° C.

Many higher education institutions are now encouraging labs to raise the temperature of ULT freezers by 10° C to save energy without compromising the quality of research. Studies have shown that DNA samples are stable with little or no denaturing when stored at temperatures as high as -20° C over 24 months.

- Raising the temperature by 10° C has been shown to save 10-15% of a freezer's electricity costs—possibly up to 30% for some older models.
- Laboratories performing only DNA research can opt for a residential freezer to save up to 80% of their freezer-related energy costs.

Keep up on preventive maintenance

ULT freezers often contain irreplaceable samples collected over years of research. Simple preventive maintenance can keep the freezer performing reliably *and* reduce energy consumption. A trained technician should always perform advanced servicing and maintenance of laboratory equipment.

- Clean the condenser filter
- Remove frost or ice build-up
- Clean the door gaskets
- Store materials appropriately
- Do not ignore freezer alarms

Is it time to replace that old ULT freezer?

Older model ULT freezers can consume up to 30 Kwh/day—as much as some homes! When you purchase a new ULT freezer, consider a high-efficiency model that consumes as little as 9 Kwh/day.

For more information, contact Ken Keeler at 936-6663 or sustainable-labs@umich.edu.