



## Green Labs' Chilling Up Guide

Chilling up lab freezers, from -80 to -75 or -70 degrees Celsius, not only saves energy, but decreases the strain put on freezers, making them last longer and saving money in the long term.

### Is chilling up safe?

Storing samples at -70 degrees was common practice for decades. Temperatures were decreased to -80 degrees because of marketing tactics and manufacturer competition, rather than any storage advantage <sup>1</sup>.

Research suggests that most samples, including proteins and viruses, are safe to store at -70 degrees Celsius. The various papers that prove this can be read [here](#).

A situation where chilling up may not be appropriate is when freezers are only partially full. This is because a lower mass of samples in the freezer can cause higher temperature swings when the freezer is opened <sup>2</sup>.

**How can you prevent this?** If your freezer is only partially filled, ask other lab groups to share your freezer space. This means less freezers are used, saving even more energy.

### What happens if the freezer fails?

Some researchers are (understandably) nervous about chilling up, as some samples are precious or rare, and they don't want to risk losing them if the freezer fails.

However, having the freezer set to -80 degrees, instead of -70, only offers an extra half hour before the samples are lost <sup>1</sup>.

To safeguard against sample loss, researchers can instead create instructions in the event of a freezer malfunction, and purchase portable -70 degrees freezers as back up, to ensure samples are saved <sup>1</sup>.

### What are the benefits of chilling up lab freezers?

By moving the temperature up by 10 degrees, you can save up to 30% of the energy used per freezer <sup>1</sup>.

Chilling up reduces workload on the compressor, prolonging freezer life and leading to better performance.

### How to make chilling up work for you

- Clean out freezers of old samples and frost before chilling up. This creates more space, allows other lab groups to share, improves operation and saves time locating samples. **Register for the annual Green Labs' Freezer Challenge, run by UQ Sustainability Office, to get started.**
- If your lab freezer is 15 years old or older, its energy usage almost doubles. Upgrading will save energy, as long as a certified, energy-efficient brand is purchased.
- Create an inventory per freezer. Every minute a ULT freezer door is opened, it takes approx. 10 minutes for the temperature reset to set point. Keeping an inventory allows easy sample location and decreases the risk of compromising sample integrity.

### References

1. <https://www.labconscious.com/green-lab-tips/2017/3/17/north-american-freezer-challenge-ult-freezer-80s-chill-up>
2. <https://sustainable.stanford.edu/sites/default/files/ChillUpFreezer1.24.pdf>

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