

# SmartTips

Know more. Achieve more.

# QA

## Can Thermo Scientific™ Savant™ SpeedVac™ Systems be used for lyophilization or freeze drying samples?

Yes, with the correct equipment.

Lyophilization, also known as freeze drying, is a process of removing water and other solvents from concentrated samples while keeping the samples in a frozen state. The solvents are removed by evaporation, during which the solvents go directly from a solid (ice) to a vapor in a process called sublimation.

Freeze drying in a vacuum concentrator can be used for samples that are: sensitive to heat, need long term storage at room temperature or need the solvent removed to stop biological activity. This is used by a variety of laboratories processing biological samples such as proteomics, genetics, cancer research, pharmacology, and agriculture.

### What is at risk if the solvents goes into a liquid state instead of sublimation?

If the sample warms to the point where the solvent turns into liquid, there is a risk of sample degradation. For example, if the samples are mixed with solvents such as acetonitrile or ethanol, the sample can go back into solution. Once the organics are evaporated, the water in the sample will refreeze and the freeze drying process will continue, which could change the quality of the final product.



## Important tips for freeze drying in a vacuum concentrator

- Start with frozen samples
  - Samples must be frozen from -50 to -80°C. If samples are concentrated in plastic tubes, insert tubes in the rotor and place rotor in -80 freezer. Freezing the tubes at a 45° angle gives the sample more surface area and thus faster sublimation.
- Use the SpeedVac vacuum to remove solvents
  - Select a SpeedVac system that can pull a deep vacuum with a high capacity oil pump of >190 lph and vacuum of 0.025 microns. The deep vacuum is necessary to reduce the pressure in the chamber low enough so the samples remain frozen, the solvents can sublime and then be collected in the cold trap.
- Slow drying? Add heat carefully
  - If samples appear to be drying slowly, add heat to speed up sublimation. The samples will remain safe because as the solvent sublimates, the sample will remain frozen. Only use heat if necessary.
- Solvent collection with correct cold trap:
  - Select a system with a cold trap temperature range of -50°C or colder to collect the solvent or water vapor as it is removed from the samples.

## Why use a SpeedVac Vacuum Concentrator for freeze drying?

- One instrument with multiple uses saves space and money.
- Savant SpeedVac Systems with programmability are designed to quickly process samples.
- **Recommended equipment: Savant SpeedVac SPD120P2 Vacuum Concentrator Kit.**
  - Kit includes components needed to successfully freeze dry samples.
- See [thermofisher.com/speedvac](https://thermofisher.com/speedvac) for specifications and rotor choices.



Savant SpeedVac SPD120P2 Vacuum Concentrator Kit

Find out more at [thermofisher.com/speedvac](https://thermofisher.com/speedvac)