Smart Notes

I need a ultra-low freezer to store my samples. Does the initial pull down time of a freezer indicate how well the unit can protect my samples after a door opening?

The initial pull down of a freezer can be seen as a rare event, typically occurring when the unit is first installed and after a manual defrost is performed — conditions where your samples are NOT inside of the freezer. A fast initial pull down does not necessarily indicate superior performance of a freezer and can be viewed as wasting energy. In fact, some manufacturers put controls or monitoring in place to manage the speed of the initial pull down to prevent a refrigeration system overload (limiting compressor stress during high load conditions).

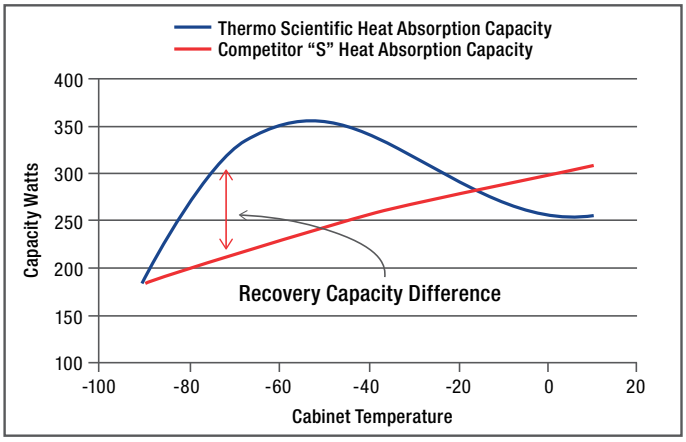
A more important specification to consider is the freezer's door opening recovery (DOR) speed. A typical ultra-low temperature freezer will have between 2–4 door openings per day, but in some cases, may see upwards of 20 door openings in a single day. As a result, any door-opening events can place a substantial heat load burden from the ambient environment outside the freezer upon the freezer, and your samples. In order to recover from these daily events and maintain a stable internal temperature, the freezer needs to adjust cooling performance quickly and effectively.



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Thermo Scientific ultra-low freezers take advantage of vapor compression cycle physics to add heat absorption capacity to the liquid refrigerant entering the evaporator as part of its system design. This design attribute is especially effective at temperatures of -40°C and lower. This temperature range is where sample protection needs capacity to recover quickly (<30 minutes) in situations like a door opening event, unlike a pull down where no samples should be present and system stresses should be managed for optimum reliability.



Conclusion

A fast initial pull down does not necessarily indicate superior performance of a freezer and can be viewed as wasting energy. A more important specification to consider is the freezer's door opening recovery (DOR) speed.

Find out more at **thermofisher.com/cold**

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