



Cold storage

## Advantages of utilizing chest freezers for sample storage

When planning for your sample storage needs, there's no doubt you've discovered the many types of freezers on the market—upright, under-counter, side-by-side, and chest, to name a few. So, what advantages do chest freezers have over other types of freezers?

### Sample safety

One of the first considerations is how the freezer performs. Do you need to satisfy the requirements of an in-house procedure or protocol? Is there a governing body with requirements that need to be met? Maybe you need to satisfy both types of requirements. A governing body may have created procedures or protocols that call out specific temperature requirements. For example, United States Pharmacopeia (USP) General Chapters have such requirements. This is why it's important to know how the freezer will be qualified and what the test acceptance limits will be. This information will help determine which freezer will work best for your needs. Since this information is often needed to fulfill the requirements of your design qualification (DQ), you can request a technical data sheet (TDS) and end-of-line testing document from your sales representative. This documentation can be added to your DQ document showing that the design and performance of the freezer will meet your specific need.

Now that you have identified the qualification criteria, let's talk about temperature recovery time. Have you ever opened a  $-80^{\circ}\text{C}$ , upright freezer and witnessed the cold "falling" out? It's

fun to watch, but it's also an indicator of the cold that will need regenerating to maintain the temperature specification. Chest freezers can be more beneficial because they typically recover much quicker than upright freezers. When you open a chest freezer door, the "cold" stays in the box, unable to "fall" out. This will allow you to keep the door open longer in case you need to find, reorganize, and conduct inventory of samples in the freezer.

Another advantage of a chest freezer is that you can create sample storage solutions not possible with an upright freezer. For example, sometimes samples need to be stored inverted for a period of time before they can be stored upright. In this case, a small rack with hooks can be fabricated and used to hang the samples so that when it's time to invert them, you can simply unhook the samples, flip them upright, and reattach them back on the rack. This type of application is used to test container seals and rubber closures.

Additionally, storing bulk products in a chest freezer can be easier. How many times have you received samples at the end of the day, only to find that you must break them down to fit properly in an upright freezer? This time-consuming process can put samples at risk. With a chest freezer, you can store the samples immediately, and break down the boxes at a later more convenient time. Also, the large box design of a chest freezer offers endless sample storage configurations, benefitting the businesses that don't know what the sample packaging will look like until it arrives.

### Manual defrost considerations

When defrosting an upright freezer, it's common practice to shut off the power, open the doors, and place an absorbent material on the floor. As the ice melts, the water runs to the shelves, out of the freezer, and onto the floor, creating a potential safety hazard. Not only is the absorbent material a tripping hazard, but it can also be challenging to guess how much material is needed. If the absorbent material becomes too saturated, the excess water will create a slipping hazard. Defrosting a chest freezer is similar, but the water will stay inside the unit until it is removed in a safe manner, which helps avoid potential safety hazards.

These are only a few examples of why you should choose a chest freezer for your business application. Planning sample storage shouldn't be overlooked because it sets up your experiments for success. With less than a two-minute open-door recovery time and minimized safety hazards, chest freezers are the optimal choice for sample storage. With endless sample storage configurations, increased performance during door-open situations, and safer manual defrost maintenance, choosing a chest freezer may be just what you need to complete your sample storage area.



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