

The Top Five Mistakes to Avoid in Ultra-Low Temperature Storage Design

#1 Not considering how fast your freezer will recover from door openings.

One design challenge often overlooked in cold wall freezer storage engineering plans is a unit's ability to recover from multiple door openings. Retrieving or adding product frequently is a drain on your freezer's mechanical system. Left unchecked, temperature deviation can put sample integrity at risk. Additionally, alarms that result from slow temperature recovery of freezers, require increased quality documentation for temperature deviation. Cold wall freezer temperature uniformity is +/- 6 or 8°C. Farrar Scientific powered by Trane Technologies offers cold storage innovation that is purpose-built for the biopharma industry. With forced air convection cooling that enables temperature uniformity of +/- 3°C in the cabinet, recovery is faster (minutes vs. hours), allowing nuisance alarms and deviation reports to be minimized to only those changes that require immediate attention.



#2 Misalignment between the design of your freezer and your process.

It's important to consider the amount of "warm" product placed inside the freezer. Cold wall freezers are not designed to remove large amounts of energy (heat) within the cabinet. This results in overworked compressors constantly running to try to reduce the internal cabinet temperature. You risk the unit overheating which can lead to system critical failure. Ensuring your freezer is designed to handle specific product is key. Farrar Scientific powered by Trane Technologies offers balanced dynamic refrigeration which is engineered and designed to pull down large volumes of energy quickly and efficiently—eliminating this risk.



#3 Forgetting to make a back-up plan.

Most freezers are designed to operate at -80°C. Should your freezer encounter a failure, what are your plans to safeguard your product? Sufficient space is required to relocate frozen product into back-up freezers. You risk compromising product integrity and can incur significant CapEx expense. Farrar Scientific powered by Trane Technologies offers fully redundant refrigeration, control, and electrical. This ensures 100% protection of product viability without additional process and equipment.



#4 Not planning for bulk storage.

Cold wall freezers are not designed for bulk storage. Customers and CMOs have different container needs that range from 2-20 liter/rigid containers or bags. Biopharma manufacturing has been faced with one option for freeze/thaw production and two choices when designing new capacity: to build massive lab-scale freezer farms or to build large capital-intensive cold rooms. Farrar Scientific powered by Trane Technologies fills an unmet need fitting in between these extremes on the technical front, as a flexible, scalable, dynamic, and self-redundant solution. On the economic front, these innovative solutions provide superior payload density, accept all forms of storage containers, improve handling safety, and offer best cost-per-liter and space efficiency.



#5 Failing to consider total cost of ownership.

Perhaps the costliest of the mistakes. Installation and operation qualifications are mandatory. With a standard freezer farm, every unit, including back-up equipment for product storage, must have an IQ/OQ performed to meet regulatory guidelines. For example, 8 cold wall freezers = 8 IQ/OQ, + 8 independent temperature monitoring + 8 equipment maintenances + 8 circuit breakers + additional HVAC costs. Farrar Scientific solutions powered by Trane Technologies are built with infrastructure in mind. A ULC can lower your total cost of ownership. For example, 1 ULC + 1 independent temperature monitoring + 2 equipment maintenance + 2 circuit breakers + connection to existing chilled water system eliminates the need for additional HVAC costs.



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