

A SETPOINT IS ONLY THE BEGINNING

ULT freezer market benchmark: uniformity and door-opening recovery

Why this benchmark matters

Reaching a target temperature does not describe the full performance of a cold-storage system. This benchmark brings together available results from six different ULT freezers to examine two additional measures: temperature uniformity and recovery following door openings lasting between 15 seconds and one minute.

27 min

Average reported recovery | 4 results

2.95°C

Average reported uniformity | 5 results

Study background and conditions

Equipment scope	Six different ULT freezers; supplier and model names anonymized.
Cabinet condition	Empty cabinets. Loaded-product performance is outside this summary.
Temperature range	Study scope described as -70°C to -80°C. The source recovery column is labelled "-75 to -80°C."
Door opening	Varied across the benchmark: shortest 15 seconds; longest 60 seconds. Recovery results therefore reflect different opening durations.
Data availability	Four recovery results and five uniformity results. Missing entries were excluded from the respective averages.

What the reported results show

Recovery: available values range from 14 to 35 minutes (14, 24, 34 and 35 minutes). Their arithmetic mean is 26.75 minutes, rounded to 27 minutes. Opening durations differ, so this is not a like-for-like recovery comparison.

Uniformity: available values range from 2.27°C to 3.50°C (2.27, 2.50, 3.00, 3.50 and 3.50°C). Their arithmetic mean is 2.954°C, rounded to 2.95°C.

The main takeaway

Performance varies beyond the setpoint. Review temperature consistency and recovery alongside the test conditions when evaluating cold storage through the Pharma 4.0 principles of resilience, data-driven decisions and operational efficiency.

Interpretation and scope

This is a descriptive benchmark of the available entries, not a representative market average or a controlled head-to-head test. Door-opening durations vary from 15 to 60 seconds; the available summary does not link each duration to its recovery result. The source summary does not define uniformity (for example, ± deviation versus total spread), recovery endpoint, sensor placement or ambient conditions. Confirm these details before making direct comparisons. Empty-cabinet results do not establish product-temperature performance.