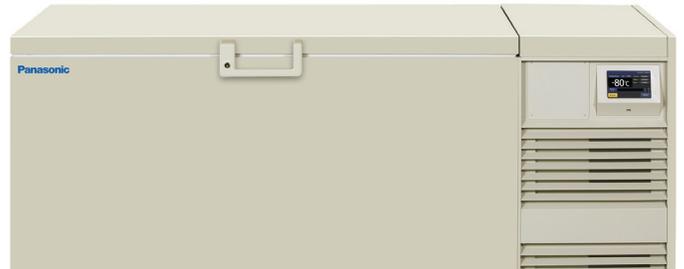


TwinGuard® Series

Reliable Ultra-Low
Temperature Storage Solution



TECHNICAL BULLETIN

MDF-DC700VXC-PA

In pharmaceutical and biotechnology sectors, research institutes or blood and tissue banks, the ultimate protection of valuable samples is extremely critical to the facility's daily operation. If a freezer failure were to occur, even over night, swift transfer of precious samples to a safe, ultra-low temperature environment would need to take place within hours to preserve their integrity.

Therefore, any failure significantly increases the risk of losing a unique, irreplaceable or potentially life-saving collection of samples. Any type of equipment malfunction that compromises the temperature accuracy or uniformity could consequently halt promising research, delay medical treatments or simply cause substantial financial losses, as well as provoke an administrative nightmare.

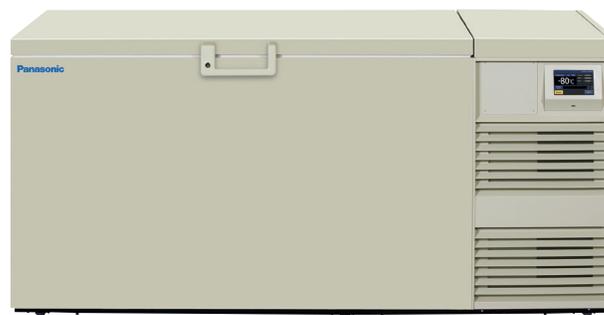
Panasonic has specifically developed the **TwinGuard®** freezer series with Dual Cool Technology to greatly reduce this risk. Our advanced **TwinGuard®** series provides an unparalleled level of safety and added peace of mind through the use of two independent refrigeration systems that reliably maintain an ultra-low temperature environment, even if an unexpected service event should occur.

The world's first **TwinGuard®** freezer – Panasonic's MDF-U500VXC – was launched in 2010. Following its success, the larger volume MDF-U700VXC was first introduced in 2011. Since then, customers with samples that are irreplaceable, potentially life-saving or have pathogenic implications, have benefited from the added assurance, capacity and advanced features of our freezers.



MDF-U700VXC-PA

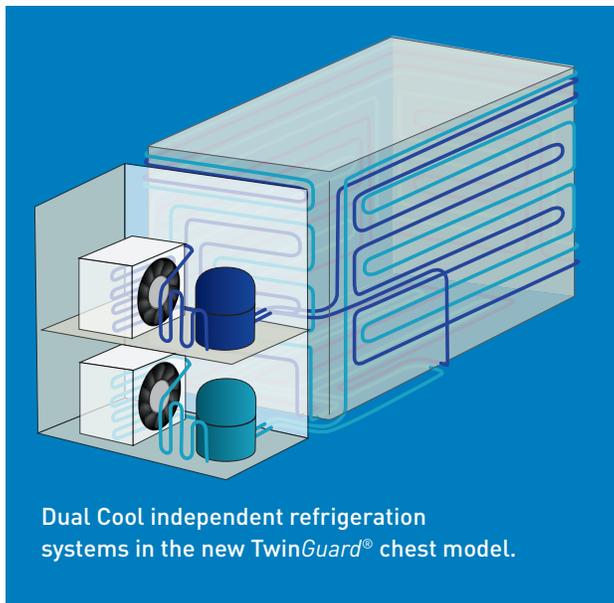
Following the popularity of the advanced Dual Cool Technology and the benefits it offers, Panasonic has added a chest freezer (MDF-DC700VXC) to the **TwinGuard®** series. This latest product addition offers exceptional temperature stability and uniformity, along with a new full color LCD touch screen and a USB port for convenient data logging.



MDF-DC700VXC-PA

TECHNICAL BULLETIN

Models: MDF-U500VXC-PA | MDF-U700VXC-PA | MDF-DC700VXC-PA



Dual Cool independent refrigeration systems in the new TwinGuard® chest model.

Unparalleled Performance

Panasonic's Dual Cool Technology differs significantly from conventional cascade refrigeration technology in its fundamental design and operation. The two independent refrigeration systems provide a reliable -86°C ultra-low temperature environment. If one circuit were to require servicing, the other would maintain the freezer at a minimum of -65°C. This level of ultra-low temperature back-up cannot be achieved by conventional cascade systems.

The unique functionality of Dual Cool Technology is achieved through the use of two, completely independent, auto-cascade systems; the compressors, evaporators and cooling fans operate separately from each other. Two efficient evaporator circuits surround the interior chamber in a strategically designed arrangement to ensure the highest levels of temperature uniformity with either one or both of the refrigeration systems functioning.

The accurate ultra-low temperatures within TwinGuard® freezers are managed and monitored by an integrated microprocessor controller complete with a comprehensive alarm system and diagnostic functions. Freezer status and control is accessible via the LCD information center which provides a clear overview of freezer conditions while allowing easy adjustments of settings and parameters. In the unlikely case of a service event, a message is displayed on the central panel so that operators can contact their local Panasonic Service Team and explain precisely what has happened. This enables our Service Technicians to determine if repair components are required and when an engineer needs to make a site visit.

Built for Long-Term Durability

As with all Panasonic products, TwinGuard® freezers are designed to ensure optimal reliability, longevity and efficiency. Panasonic-designed Dual Cool compressors employ innovative refrigerant feedback processes to reduce compressor temperature, extending compressor life and minimizing heat output. The upright freezers feature a vacuum-release port which creates smooth door openings in an environment where frequent access is required, reducing the need to put excessive pressure on the door and handle of the freezer.

Feature	What it does	Why it is important
-86°C Dual Cool Refrigeration Technology	Two independent refrigeration systems operate together or individually, depending on loading and operating conditions.	If one refrigeration system requires service, the other can maintain the freezer at a minimum of -65°C.
ECO Mode Performance	Two independent refrigeration systems running in overlapping cycles.	ECO mode optimizes run time and minimizes energy costs while maintaining optimal performance.
Filterless Condenser Design	Transfers energy from the refrigeration system with minimal heat output.	Maintains optimum condenser air flow and eliminates the need for an air filter, as well as the associated cleaning and maintenance.
Patented VIP® PLUS Vacuum Insulation Panels	Combines high-efficiency vacuum panels with conventional polyurethane structural foam and barrier film into a high-tech wall assembly.	Increases interior volume within conventional dimensions offering more storage capacity per ft² of occupied floor space.
LCD Control Center	Combines all control, alarm, monitoring and data management functions into a single door-mounted system controller.	High visibility LCD display provides a convenient user interface to set points, current and previous temperature status, alarm parameters, internal diagnostics, communications and security.
Enhanced Cabinet Construction	Robust cabinet design with high-strength lockable door latches and doors.	Simplifies installation and operation. Exceptional durability under demanding conditions in busy laboratory environments.

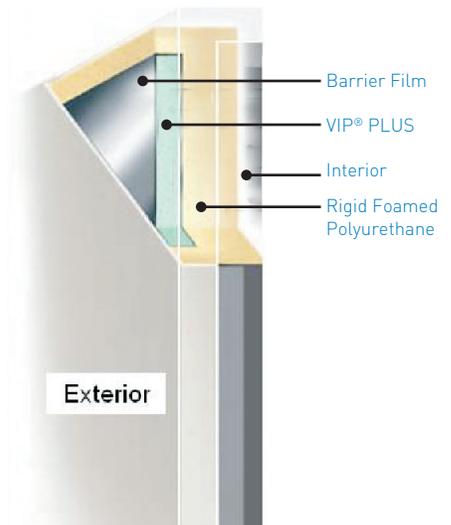
Additional TwinGuard® Features

Minimal Footprint

Panasonic’s patented VIP® PLUS technology has resulted in a revolutionary vacuum insulation cabinet construction that reduces wall thickness by approximately half and achieves up to 30% more storage capacity than in conventionally-insulated freezers of equal size.

In addition, VIP® PLUS requires a smaller installation space in the laboratory which contributes to the overall energy efficiency of the freezers due to the low thermal conductivity of the insulation.

TwinGuard® freezers can be set to Normal or ECO mode operation depending on the requirements of the user. A unique, intelligent ECO mode overlaps refrigeration system cycles to significantly reduce energy consumption while maintaining optimum interior uniformity from top-to-bottom and front-to-back for the protection of high-value materials.



The microprocessor controller constantly monitors the load status of the freezer to optimize the operation of the two compressors and minimize energy use while protecting valuable samples. ECO mode is recommended for 90-95% of applications, while normal mode maintains the most repeatable, cycling wave form for the strictest of GMP applications.

Unsurpassed Protection

For complete protection of samples, many customers opt for a combination of TwinGuard® freezers with optional Liquid Nitrogen or Liquid CO₂ back-up system in case of a power failure. This offers complete and unsurpassed protection for samples under any circumstances. Access ports within the freezers permit insertion of independent probes for temperature monitoring, instrumentation or back-up injectors.

Relevant Applications

Application	Sample or Laboratory Characteristics	Benefit of TwinGuard® Freezers
<p>For laboratories active in storing: Stem Cells, Cord Blood, T-Cells, Engineered Tissue, Organs, Vaccines, Bone Marrow, Hybridomas, Lymphocytes, Cancer Cells, Clinical Specimens, Fibroblasts, Ova, Sperm.</p> <p>Storage in BSL-3/4 or Highly Secured Labs.</p>	<p>For samples that are highly sensitive to temperature fluctuations or uneven temperature distribution within the freezer.</p> <ul style="list-style-type: none"> • Valuable samples • Irreplaceable samples • Longitudinal studies and on-going research • Restricted access laboratories where serviceability is limited 	<p>Dual Cool technology greatly extends the critical time necessary to react in the case of a service event.</p> <p>Enhanced temperature uniformity, top-to-bottom and front-to-back, assures sample stability at all inventory locations.</p>

