

GREEN V.I.P.® -86°C Ultra Low Freezers

**MDF-U73VC
MDF-U53VC
MDF-U33V**



SANYO ultra low freezers provide energy savings while minimizing carbon footprint throughout the laboratory without compromising performance. Ideally suited for ultra low storage for biosafety, security, accessibility and performance. Long term preservation of biologics, reagents, specimens, components, and in testing of various types.

Model: MDF-U73VC

SANYO is committed to developing green technologies that provide energy efficiency resulting in lower operational costs with less impact on the environment.



SANYO GREEN: -86°C Ultra Low Temperature Freezers

Laboratory facilities present a unique challenge for energy efficient and sustainable design, with their inherent complexity of systems, health and safety requirements, long-term flexibility and adaptability needs, energy use intensity, and environmental impact. The typical laboratory is about five times to as much as ten times as energy intensive as a typical office building and costs about three times as much per unit area. Any effort to reduce energy use and environmental impact are heavily influenced by special functional and health and safety requirements, which need to be considered in rating and benchmarking the overall environmental performance of a laboratory.

Elements of the SANYO ULT design that reflect GREEN initiatives include:

- CFC Free Refrigerants
- RoHS Compliance
- Energy Efficiency
- Noise Reduction
- Operating Costs
- High Density Storage
- Storage Volume Efficiency

SANYO V.I.P.[®] Ultra Low temperature freezers offer the most advanced combination of low-temperature refrigeration, cabinet and control technology in the clinical and life science industry. These units offer lower operational costs than conventionally insulated models. Space-saving, high-density V.I.P.[®] vacuum insulation panel construction allows up to 25% more storage volume in the same or less foot print than conventional freezers.

SANYO GREEN Advantage Summary

Energy Efficiency - SANYO freezers provide reduced power consumption by capacity. This allows for lower operational costs while maintaining high performance and reliability.

CFC Free Refrigerants - SANYO was the first ultra-low freezer manufacturer to employ non-HCFC R508 low-stage refrigerant, now recognized as today's industry standard and widely available. This universal refrigerant is available to refrigeration service professionals on the open market.

SANYO High Density Storage - VIP[®] vacuum insulation panel cabinet, SANYO can offer more useable storage volume within the same sq.ft. of floor space than competitive models. The cost per cu.ft. (or liter) of interior storage space is significantly lower in a SANYO ultra-low freezer.

SANYO Ultra Low Refrigeration System - Allows for better temperature uniformity, permitting the entire interior volume to be used for long-term storage. This ensures greater system longevity and reliability by minimizing compressor operating temperatures, efficient location of evaporator systems around the interior chamber, and balanced refrigeration system.

Noise Reduction - If operating noise from refrigeration compressors is excessive, the working environment is severely compromised. SANYO has included advanced noise abatement in all contemporary ultra-low freezers and noise reduction levels are well below those of competitive freezers.

ISO 14001 Environmental Standard - This standard is applicable to any organization that wishes to implement, maintain and improve an environmental management system



SANYO GREEN Ultra Low Freezers

As part of our global commitment to help the environment, SANYO took the initiative to revamp and redesign newer refrigeration systems that resulted in lower operating costs and efficiency (Chart 1). SANYO ultra low freezers provide energy savings while minimizing carbon footprint throughout the laboratory without compromising performance (Chart 2).

SANYO GREEN Benefits:

- Minimize carbon footprint with less impact on the environment.
- Maximized lab space with smaller footprint for ultra high density storage.
- Reduced operational costs through high storage volume efficiency.
- Minimized HVAC loads and air handling requirements in facilities.
- Emits less heat into the laboratory environment, minimizing air conditioning costs.

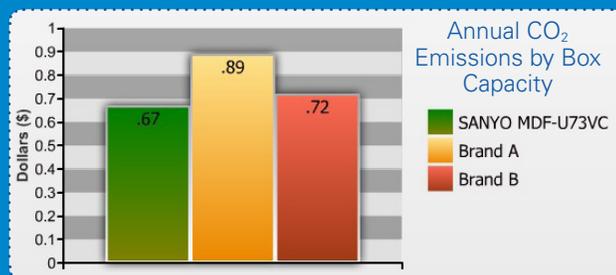


Chart 1 - SANYO Freezers help the environment by reducing carbon footprint.*



Chart 2 - SANYO Freezers emit less heat into the laboratory, minimizing air conditioning costs.*

to assure itself of its conformance with its own stated environmental policy.

Electrical Standards - All SANYO products including ultra-low temperature freezers are tested and certified by SGS NRTL (National Recognized Testing Laboratory) to assure compliance with US and International standards for electrical safety prescribed in 29 CFR 1910.7(c).

RoHS Compliance - RoHS relates to the restriction of hazardous substances (i.e. lead, cadmium, mercury, chromium 6+, PBB and PBDE) and reductions in environmental pollution. All SANYO ultra-low freezers and components are now 100% compliant to RoHS standards.

How is SANYO conscious of the need to protect our environment and conserve energy?

This commitment was demonstrated when SANYO took the initiative to revamp and redesign newer refrigeration systems that would employ new, environmentally-friendly refrigerants throughout the laboratory without compromising performance. "Think GREEN, Think GAIA" expresses SANYO's commitment to run its business and product development in a way that recognizes the need to protect the environment and conserve energy.

SANYO's focus on "green products" is expressed through more efficient motor operation with reduced energy consumption in their ultra low freezers. As a corporate pioneer in the life science and commercial equipment industries, and a global source of solutions ranging from energy management to solar power and alternative energies, SANYO remains committed to providing the best possible laboratory equipment for research and clinical needs.

Criteria for Energy Efficient Laboratory Equipment

Whether your facility is seeking LEED certification or incorporating more sustainable practices, SANYO offers laboratory equipment to provide a more energy efficient environment

- Lower energy use – More research buildings are conforming and adopting to energy conscious directives such as LEEDs with the recommendation of energy efficient lab equipment
- Efficient space utilization – Biomedical – High density storage is strongly advocated as lab design is focusing on making researchers share ULT storage space.
- Selecting energy efficient and low-demand lab equipment is thus one of the most effective and immediate ways to reduce energy consumption.
- Energy, electrical and ventilation systems can benefit from recapture and reuse potentials.

Power Consumption by Box Capacity

Chart 3 - SANYO freezers provide reduced operational costs for highly efficient sample



Sustainable Operations Think GREEN, Think GAIA

SANYO's Application Specific Compressor

SANYO's new ultra low temperature compressor employs a unique orientation of conventional components to reduce discharge temperatures and compressor heat. The result is more efficient internal cooling and greater system reliability. Heat reduction results range more than 40°C below leading brand compressors used by numerous competitors (Chart 5). With lower compressor discharge temperatures and pressures, newer refrigerants can be more effective. Combined with SANYO's patented VIP® insulation, the migration of ambient heat from the laboratory to the interior is minimized. This improves operational efficiency and lowers air conditioning costs (Chart 4). SANYO continues to improve the efficiency of their compressors for meeting green requirements.



Chart 4 - SANYO Freezers reduce your air conditioning costs and allow you to reduce the size of air handling requirements.*

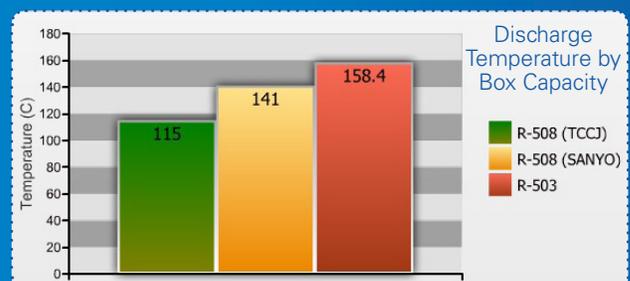


Chart 5 - SANYO Compressors offer lower discharge temperatures, greater reliability and efficient operation.*

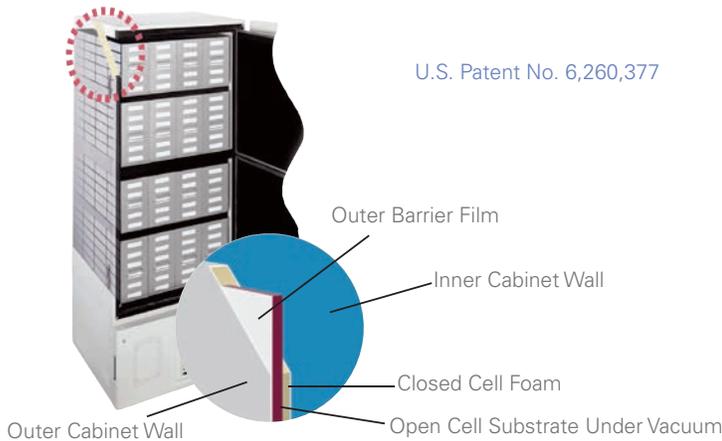
Green Data



SANYO GREEN Justification

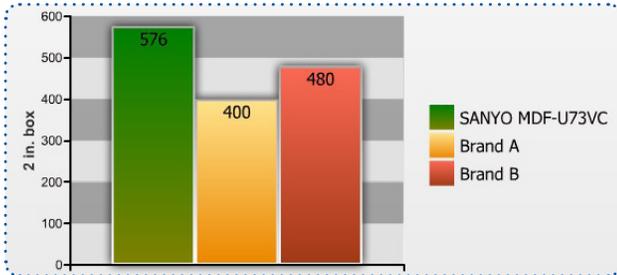
Patented V.I.P.[®] Insulation Increases Interior Volume By As Much As 25%

SANYO patented V.I.P.[®] Vacuum Insulation Panel technology and high-tech, thin profile cabinet walls increase interior volume by as much as 25% for high density storage in a minimal cabinet footprint (Chart 6). Cellular wall construction combines vacuum insulation with polyurethane foam for structural stability and highest insulation values while reducing wall thickness by as much as 50% over conventional methods.



Box Capacity

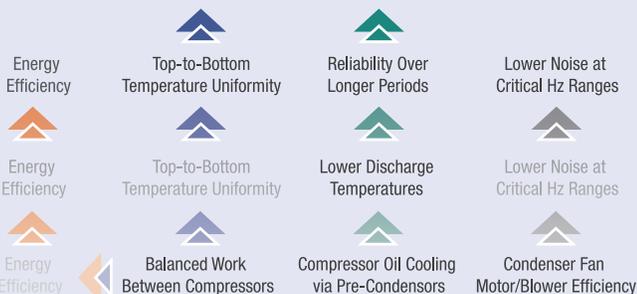
Chart 6 - SANYO freezers maximize available space at a reduced footprint for high density storage.*



Green Ultra Low Refrigeration System

SANYO refrigeration technology provides for a greater system reliability, energy efficiency and lower operational costs with reduced carbon footprint.

Improved Cell Viability



SANYO Ultra-Low Refrigeration Technology

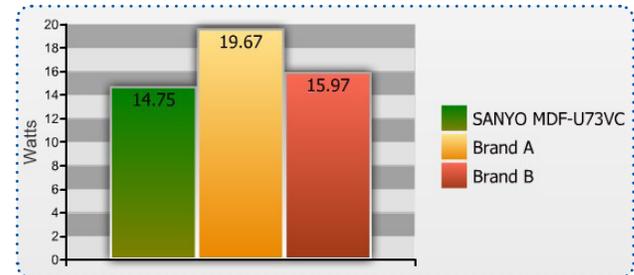
Ultra Low Freezer Case Study

In June 2008, a green justification study was conducted for a major research university that instituted key sustainable directives in their procurement process. This study examined several key areas that focus on energy efficiency and sustainable design including: annual CO₂ emissions, life cycle operational and facility HVAC costs. The study showed operational and energy savings for SANYO ultra low freezers when compared to other brands. The following graphs show the energy savings, which is then translated into cost savings and CO₂ savings per year.

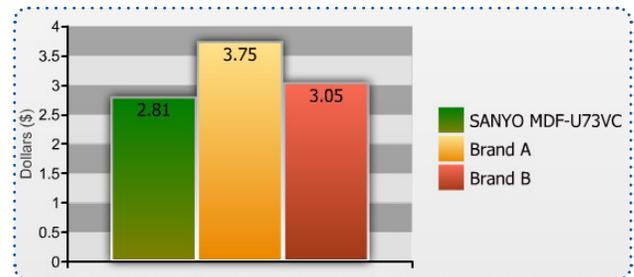
Annual CO₂ Emissions by Box Capacity*



Additional Energy Consumption for cooling by the HVAC system by Box Capacity*



Total Cost for Operation and Cooling per Box Capacity*



*Based on internal performance data. Tested in 25°C ambient environment. Freezer cycling at -80°C. Cabinet volume, 25 cu. ft. Average cabinet temperature based on temperature mapping (15 thermocouples).



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