

TDE Series -86°C Ultra-Low Temperature Chest Freezers



Green benefits

- Energy efficient—use up to 38% less energy than prior model

Introduction

Thermo Fisher Scientific is committed to designing our products with the environment in mind—it's part of our mission to enable our customers to make the world healthier, cleaner and safer. This fact sheet provides the rationale behind the environmental claim that Thermo Scientific™ TDE Series -86°C ultra-low temperature (ULT) chest freezers are energy efficient and use up to 38% less energy compared to prior models.

Product description

Building off Thermo Fisher's 80 years of experience developing cold storage solutions, the Thermo Scientific TDE Series -86°C chest freezers, powered by H-drive hydrocarbon systems, deliver the reliability and enhanced performance required for vital research without compromising sustainability goals. With rapid temperature recovery after the door opens and tight peak variation, the TDE Series chest freezers are designed for both frequent entry and long-term storage applications while using energy more efficiently.

TDE Series ultra-low chest freezers use natural, non-hydrofluorocarbon (HFC) refrigerants, which help reduce environmental impact and further increase cooling efficiency. The United States Environmental Protection Agency¹ and European Commission² have identified HFCs as powerful greenhouse gases with significant global warming potential. Thermo Fisher has phased out use of these refrigerants in our freezers and refrigerators in favor of using more environmentally friendly hydrocarbon alternatives. As an additional improvement, the foam insulation in TDE Series ULT chest freezers is now made from a material that has zero global warming potential and does not deplete ozone.



Figure 1. Thermo Scientific TDE Series ULT chest freezer.

Green features

Energy efficient

TDE Series ULT chest freezers use up to 38% less energy than prior TSC Series models (Table 1). Switching to the TDE Series ultra-low temperature chest freezers from a prior model TSC would reduce energy use by 19–38%, saving 800–2,340 kWh of energy over the course of one year. This savings represents

0.57–1.7 metric tons of CO₂ equivalents, the same greenhouse gas emissions from driving 1,400–4,100 miles in an average passenger car³. The reduced energy consumption also translates into energy cost savings of up to 724 Euros annually⁴, based on commercial sector electricity rates.

Table 1: Comparison of energy usage between TDE Series ultra-low temperature chest freezers and prior TSC Series models operating at -80°C.*

Unit capacity (cubic feet)	New model TDE Series ULT chest freezer	Total energy usage (kWh/day)	Prior model TSC Series ULT chest freezer	Total energy usage (kWh/day)	Energy reduction with TDE unit (%)
13	TDEC25286FV	8.5	TSC1390V	11.0	23%
13	TDEC25286FD	9.4	TSC1390D	11.6	19%
20	TDEC39686FV	10.8	TSC2090V	14.7	27%
20	TDEC39686FD	10.5	TSC2090D	16.9	38%

*Does not include energy use related to HVAC.

Table 2: Comparison of energy cost savings between TDE Series ultra-low temperature chest freezers and prior TSC Series models due to reduced energy usage of TDE models.

Unit capacity (cubic feet)	New model TDE Series ULT chest freezer	TDE annual cost to run one unit	Prior model TSC Series ULT chest freezer	TSC annual cost to run one unit	TDE annual energy cost savings
13	TDEC25286FV	€ 962	TSC1390V	€ 1,245	€ 283
13	TDEC25286FD	€ 1,064	TSC1390D	€ 1,313	€ 249
20	TDEC39686FV	€ 1,222	TSC2090V	€ 1,663	€ 441
20	TDEC39686FD	€ 1,188	TSC2090D	€ 1,912	€ 724

To measure and capture all sustainability benefits associated with the new TDE Series freezers, we also completed an in-depth product review and labeling process through My Green Lab's ACT label program, to provide the total Environmental Impact Factor for each product. Learn more about the ACT label principles at <https://act.mygreenlab.org/>

Designing the TDE Series ULT chest freezers to be more energy efficient is a win for our customers, our company and the planet.

References

1. www.epa.gov/snap
2. https://ec.europa.eu/clima/policies/f-gas_en
3. US EPA Greenhouse Gas Equivalencies Calculator, <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>, accessed 23 January 2023
4. Based on an energy rate of 0.31 Euros per kWh, based on data from <https://www.globalpetrolprices.com/>.