

# TSG Series general-purpose chromatography refrigerators and laboratory refrigerators



## Introduction

We are committed to designing our products with the environment in mind—it's part of how we support our mission to enable our customers to make the world healthier, cleaner, and safer. This fact sheet provides support for the claim that Thermo Scientific™ TSG Series general-purpose chromatography refrigerators and laboratory refrigerators both meet ENERGY STAR criteria for lab-grade refrigerators and freezers and are more energy efficient compared to some conventional refrigerator models.

## Product description

TSG Series general-purpose chromatography refrigerators and laboratory refrigerators are ideal for the demanding requirements of daily use in research, clinical, and industrial laboratories that store noncritical products such as reagents, media, proteins, and other samples requiring a controlled environment of 2° to 10°C.

TSG Series refrigerators use natural, hydrocarbon (HC) refrigerants (which have a lower global warming potential than non-hydrofluorocarbon (HFC) refrigerants), have zero ozone-depletion potential (ODP), and help increase cooling efficiency. HFC refrigerants have been identified by the United States Environmental Protection Agency and



**Thermo Scientific TSG Series  
49 cu. ft. Refrigerator**

European Commission as powerful greenhouse gasses with significant global warming potential [1,2].

Our commitment to environmental responsibility doesn't end there. Our TSG Series refrigerators are manufactured in a zero-waste-to-landfill facility, meaning more than 90% of the waste generated at our manufacturing site is diverted from landfills [3]. Finally, the TSG Series refrigerators operate at 51 decibels, which is a similar noise level to a home conversation [4]; this allows them to be located conveniently inside the lab.

## Green feature

### Energy efficiency

TSG Series general-purpose chromatography refrigerators and laboratory refrigerators have the ENERGY STAR certification, meeting established ENERGY STAR certification criteria for lab-grade refrigerators and freezers. ENERGY STAR is the US government-backed program for energy-efficient choices. The program aims to provide simple, credible, and unbiased information to help consumers and businesses make well-informed purchasing decisions. The US Environmental Protection Agency ensures each qualified product is independently certified to deliver expected quality, performance, and savings.

TSG Series general-purpose chromatography refrigerators and laboratory refrigerators not only meet the ENERGY STAR requirement for lab-grade refrigerators and freezers, they are also more energy efficient than other models. For example, the Thermo Scientific™ TSG49RPGA, a 49 cubic-foot unit with double glass

doors, uses 10% less energy than the conventional-refrigerant Thermo Scientific™ MR49PA-GAEE-TS; and the Thermo Scientific™ TSG25RPGA, a 25 cubic-foot unit with a single glass door, uses 25% less energy than the Thermo Scientific™ MR25PA-GAEE-TS (Table 1). Power consumption (kW) for each model is based on the temperature being set to +5°C without door openings [5]. Power consumption was measured for a 24-hour span to determine daily energy usage (kWh/day). The energy use reduction percentage shows the gain in energy efficiency when switching to the specified TSG model from the comparative model listed.

General-purpose chromatography refrigerators and laboratory refrigerators are relatively low energy consumers, but choosing the TSG25RPGA refrigerator over the MR25PA could help save more than 182 kWh of energy in a single year, representing 0.129 metric tons of CO<sub>2</sub> equivalents [6].

**Table 1. Comparison of energy usage between Thermo Scientific TSG Series and conventional laboratory refrigerators operating at +5°C.**

Thermo Scientific refrigerator model	Size	Power usage (kWh/cu ft/day)	Daily energy usage (kWh/day)	Energy use reduction	Annual CO <sub>2</sub> equivalents (metric tons)	Average annual operational cost [7]	ENERGY STAR certification	Cat. No.
TSG Series	49 cu. ft.	0.057	2.8	10%	0.72	\$110	✓	TSG49RPGA
Conventional		0.063	3.1		0.80	\$122	✗	MR49PA-GAEE-TS
TSG Series	25 cu. ft.	0.060	1.5	25%	0.39	\$59	✓	TSG25RPGA
Conventional		0.087	2.0		0.52	\$78	✗	MR25PA-GAEE-TS

## References

1. [www.epa.gov/snap](http://www.epa.gov/snap)
2. [https://ec.europa.eu/clima/policies/f-gas\\_en](https://ec.europa.eu/clima/policies/f-gas_en)
3. 90% diversion is based on internal audits. Certification is pending.
4. <http://www.industrialnoisecontrol.com/comparative-noise-examples.htm>
5. The ENERGY STAR test is conducted at 24°C ambient temperature, with a set point of 5°C, a defrost cycle, and 24 door openings. Data under these test conditions were not available for the Thermo Scientific MR94PA and MR25PA, so we chose to compare all of them at the same conditions (20°C ambient temperatures, with a set point of 5°C, and without door openings). Under the ENERGY STAR test conditions, the Thermo Scientific TSG49RPGA consumes 4.2 kWh/day and the Thermo Scientific TSG25RPGA consumes 2.2 kWh/day.
6. US EPA Greenhouse Gas Equivalencies Calculator, [epa.gov/cleanenergy/energy-resources/calculator.html](http://epa.gov/cleanenergy/energy-resources/calculator.html), accessed 17 January, 2019.
7. Based on an energy rate of \$0.1074 as reported as the national average commercial rate by the US Energy Information. [https://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.cfm?t=epmt\\_5\\_6\\_a](https://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_6_a), accessed 17 January 2019.

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