

ENERGY STAR® 2017 Emerging Technology Award Requirements: Solid-State Refrigeration¹

Performance Metric	Criteria		Test Method/Required Documentation
Product Performance			
Energy Efficiency ²	Coolers³	Outperform California Energy Commission (CEC) wine cooler maximum energy consumption requirements by a minimum of 5%	2015 CEC Appliance Program ⁴ Section 1605.3.a.1 or DOE Test Procedure for Miscellaneous Refrigeration Products – 10 CFR 430, Subpart B, Appendix A ⁵
	Laboratory Grade Refrigeration	ENERGY STAR Certified and outperform ENERGY STAR maximum energy consumption requirements by a minimum of 15%	ENERGY STAR Laboratory Grade Refrigerators and Freezers Version 1.0 Program Requirements ⁶
	Other cooling products⁷		
	Energy measurements must be performed at an EPA-recognized accredited lab ⁸		
Noise test – required for coolers and lab grade	< 45 dBA		Applicant may perform sound tests at their own in-house facilities
Warranty Minimum	One year parts and labor		Copy of warranty agreement
Certification	Must meet all applicable U.S. electrical safety requirements		Copy of case files
Additional Company Requirements			
Product Commercial Status	This Award is only granted to products that are available for sale in the U.S. Product(s) must meet one of the following criteria: 1) available for sale at numerous retail and/or supplier locations, or 2) have commercial orders pending and firm plans to sell products to customers within 3 months of the Award application date.		

¹Solid-State Refrigeration Products: coolers, laboratory grade refrigerators, or other cooling devices that use solid-state cooling as an alternative to compressors/refrigerants.

²Maximum energy consumption criteria, defined as maximum annual energy consumption (MAEC, kWh/yr) and maximum daily energy consumption (MDEC, kWh/day), are noted in detail on the following page. The volume (V) used to calculate these maximum energy values shall be consistent with the volume used by the standard designated for each product category.

³Cooler means a cabinet, used with one or more doors, that has a source of refrigeration capable of operating on single-phase, alternating current and is capable of maintaining compartment temperatures either: 1) no lower than 39°F, or 2) in a range that extends no lower than 37°F but at least as high as 60°F (10 CFR Subpart A, Section 430.2). EPA will consider residential coolers (V ≤ 30 ft³) for the Award.

⁴<http://www.energy.ca.gov/2015publications/CEC-400-2015-021/CEC-400-2015-021.pdf>

⁵http://www.ecfr.gov/cgi-bin/text-idx?SID=b993df402cbc05b38d6fc4e2d7927cce&mc=true&node=ap10.3.430_127.a&rgn=div9

⁶https://www.energystar.gov/sites/default/files/ENERGY%20STAR%20V1.0%20Lab%20Grade%20Refrigerator%20and%20Freezer%20Program%20Requirements_0.pdf

⁷Other cooling products (e.g. commercial refrigerators) will be considered if the submitter can provide EPA with an industry standard and test method that the product significantly outperforms.

⁸https://www.energystar.gov/index.cfm?c=third_party_certification.tpc_index

Appendix: Emerging Technology Award Energy Consumption Requirements

The levels shown below are the actual requirements for the Award, not the ENERGY STAR levels from which the Award requirements are derived.

Coolers – Maximum Annual Energy Consumption

- $MAEC \leq 16.6V + 327$

Laboratory Grade Refrigerators – Maximum Daily Energy Consumption

General Purpose Refrigerators⁹

- $0 < V < 25$
 $MDEC \leq 0.105V + 1.70$
- $25 \leq V$
 $MDEC \leq 0.103V + 1.76$

High-Performance Refrigerators¹⁰

- $0 < V < 25$
 $MDEC \leq 0.156V + 2.98$
- $25 \leq V < 44$
 $MDEC \leq 0.130V + 3.64$
- $44 \leq V$
 $MDEC \leq 0.106V + 4.68$

⁹General Purpose: A laboratory grade refrigerator product that cannot support a maximum peak variation in temperature equal to or less than 6 °C.

¹⁰High Performance: A laboratory grade refrigerator product that is designed to support a maximum peak variation in temperature no greater than 6 °C.