

**Interpretation IC 72-2005-1 of
ANSI/ASHRAE Standard 72-2005
Method of Testing Commercial Refrigerators and Freezers**

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Reference: This request for interpretation refers to the requirements in ANSI/ASHRAE Standard 72-2005, Section 6.1.1, regarding installed accessories and operational requirements for commercial refrigerators (coolers) and freezers during testing.

Background: California Energy Commission requires manufacturers of commercial refrigerators and freezers to measure a model's daily energy consumption according to ASHRAE Standard 117-1992 (for those with doors) or ASHRAE Standard 72-1998 (for those without doors). Standard 117-1992 has been superseded by 117-2002, which in turn was superseded by 72-2005. Standard 72-2002 has also been superseded by 72-2005. New energy management devices are coming to market that are installed in such a way that the operator will not be able to adjust the settings. These devices respond to external conditions, such as product sales and temperature, to control the refrigeration cycle of the machine. We would like clarification as to whether the results of testing with these new energy management devices installed and enabled are valid given the test requirements of Standard 72-2005 below:

“6.1.1 Accessories. All necessary accessories shall be installed prior to loading the storage and display areas with test simulators and filler packages. During the test period, all standard components, such as shelves, end enclosures, lights, anti-condensate heaters, racks, and similar items that would normally be used during shopping or working periods, shall be installed and used as recommended by the manufacturer.”

Interpretation: Commercial refrigerators (coolers) and freezers that have energy management devices permanently installed, such that the operator is not able to adjust the settings, meet the requirements of Section 6.1.1 of ASHRAE Standard 72-2005. As such, the test results for these machines are valid.

Question: Is this interpretation correct?

Answer: Yes, the test results for these machines are valid; if the energy management device will never change to a new AT after the test has been concluded (AT is defined as *average temperature of all test simulators*, also known as *integrated average product temperature*).

Comments: As a method-of-test standard, the purpose of Standard 72 is to allow fair and repeatable testing, not to restrict or influence design choices. Although Standard 72 is neither an energy efficiency standard nor a food safety standard, it *is* referenced and used by those concerned with food safety and energy efficiency. Therefore, it is important that the results of the test are representative of the ongoing, steady-state performance of the refrigerator. Concerns regarding fairness arise when an adaptive energy management device operates in an energy-

efficient mode during the first few days of operation – including the test period – then adapts to a different mode of operation which uses more energy. This would invalidate the test results. Similarly, concerns regarding food safety arise when an adaptive energy management device operates in an initial mode during the first few days of operation – including the test period – then adapts to a different mode of operation which significantly changes AT. This would also invalidate the test results. Standard 72-2005 requires the refrigerator to be operated through a *stabilization period* (7.4) until a *steady-state condition* has been established, prior to the collection of data (7.1.1). *Steady-state* is defined as, “the condition where the average temperature of all test simulators changes less than 0.2°C (0.4°F) from one 24-hour period or refrigeration cycle to the next.” This definition relies on the assumption that an adaptive energy management device will not shift to a different AT during or after the test. If an adaptive energy management device will shift to a different AT during or after the test, then the *steady-state condition* has **not** been established and the test is not valid. If the *stabilization period* is allowed to continue until the adaptive energy management device will never change to a different AT, then a *steady-state condition* **has** been established, the data collection can begin and the results will be valid (assuming all the other conditions of Standard 72 are also met).