

**STANDARD**



**ANSI/ASHRAE Standard 72-2014**

(Supersedes ANSI/ASHRAE Standard 72-2005)

# **Method of Testing Open and Closed Commercial Refrigerators and Freezers**

Approved by the ASHRAE Standards Committee on June 28, 2014; by the ASHRAE Board of Directors on July 2, 2014; and by the American National Standards Institute on July 3, 2014.

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#### NOTE

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## FOREWORD

ASHRAE Standard 72, first published in 1986, is classified as an ASHRAE Standard Method of Test.

The 2005 revision combined Standard 72-1998 for open refrigerators and Standard 117-2002 for closed refrigerators. These two standards were developed so that comparative evaluations could be made of refrigeration equipment performance using standardized criteria.

This 2014 revision of ASHRAE Standard 72-2005 adds energy management devices and drawer openings for refrigerator and freezer units with drawers. It also clarifies door and drawer opening methods, test probe locations for units over 1220 mm (4 ft) in width, electrical loads that need to be on during the test, air current measurements within the test room, and the measurement of internal volumes in Informative Appendix A.

In addition, the 2014 revision clarifies door opening requirements, shelf loading, and test definitions and adds requirements to improve the consistency of ambient temperatures.

## 1. PURPOSE

The purpose of this standard is to prescribe a uniform method of testing open and closed refrigerators and freezers for rating so that comparative evaluations can be made of energy consumption, product temperature performance, refrigeration load, the suction pressures required, and other performance factors.

## 2. SCOPE

This standard applies to the following types of open and closed commercial refrigerators and freezers used for displaying or holding products for which refrigeration is either required or desired:

- a. Horizontal, semivertical, and vertical open and closed refrigerators and freezers
- b. Both remote and self-contained open and closed refrigerators and freezers

This standard does not apply to walk-in coolers or refrigerators and freezers where the refrigerated air is in communication with walk-in coolers.

## 3. DEFINITIONS

The following definitions apply to terms as they are used in this standard.

**AHAM volume:** the interior volume of a refrigerator as calculated by ANSI/AHAM Standard HRF-1.<sup>1</sup>

**closed refrigerator:** a display or holding refrigerator where product is accessible for removal by opening or moving doors or panels.

**condenser cooling liquid:** the fluid used as the condensing media in a liquid-cooled, self-contained refrigerator.

**condensing unit:** an apparatus for processing low-pressure refrigerant vapor back into high-pressure liquid refrigerant.

**coolant single-phase temperature difference:** the difference in temperature of the secondary coolant entering and leaving the refrigerator.

**energy management devices:** a system of equipment that energizes or deenergizes electrical loads to achieve a desired use of electrical power. The equipment is intended to control electrical loads by responding to sensors or transducers monitoring power consumption, by sequencing, by cycling the loads through the use of preprogrammed data logic circuits, or any combination thereof.

**filler material:** material consisting of water, or of a 50/50 mixture ( $\pm 2\%$ ) of water and propylene glycol, or wood blocks with an overall density not less than  $480 \text{ kg/m}^3$  ( $30 \text{ lb/ft}^3$ ); used for filling the refrigerator spaces not occupied by test simulators.

**filler package:** a container with filler material that closely approximates food product characteristics; used to fill the spaces between test simulators for product mass.

**freezer:** a refrigerator that maintains product in a frozen state. In this standard, *low temperature refrigerator* shall be synonymous with *freezer*.

**fully open (for hinged doors):** opened to an angle of not less than 75 degrees.

**fully open (for sliding doors):** opened at least 80% of its full normal travel.

**fully open (for drawers):** opened not less than 66% of their full travel.

**liquid-cooled unit:** a condensing unit in which the condensing media is a liquid (for example, water).

**liquid quantity meter:** a device for determining the quantity of refrigerant, secondary coolant, or condenser cooling liquid that flows during the prescribed test period.

**load limit:** the maximum space available within the display or storage compartments of the refrigerator usable for products as specified by the manufacturer.

**load-line volume:** the gross interior volume of the refrigerator contained within the load-limit lines. This gross volume is calculated without display devices installed.

**low temperature:** the temperature range for maintaining product in a frozen state in refrigeration applications.

**medium temperature:** the temperature range for maintaining product above freezing in refrigeration applications.

**net usable volume:** the volume of interior usable space intended for refrigerated storage or display, specifically consisting of the usable interior volume within the claimed load limit boundaries. Any of this volume occupied by evaporator coils, fan grilles, ducts (including any space intentionally