

ANSI/ASHRAE Standard 32.1-2004



ASHRAE STANDARD

Methods of Testing for Rating Vending Machines for Bottled, Canned, and Other Sealed Beverages

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NOTE

When addenda, interpretations, or errata to this standard have been approved, they can be downloaded free of charge from the ASHRAE Web site at <http://www.ashrae.org>.

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(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process.)

FOREWORD

This revised standard expands the scope of the 1997 version of the standard to include not only vending machines for bottled and canned beverages but also newer machines capable of vending beverages in other types of sealed containers. The Energy Consumption Test provisions in Section 7.2 have been expanded to include two tests instead of one: the first at $90\pm 2^{\circ}\text{F}$ ($32.2\pm 1^{\circ}\text{C}$) ambient temperature to replicate typical outdoor conditions, and the other at a $75\pm 2^{\circ}\text{F}$ ($23.9\pm 1^{\circ}\text{C}$) ambient temperature to replicate typical indoor conditions. Conditions for a voluntary third test with a $105\pm 2^{\circ}\text{F}$ ($40.6\pm 1^{\circ}\text{C}$) ambient temperature to replicate extreme outdoor conditions are described in Appendix B.

1. PURPOSE

The purpose of this standard is to specify methods of testing for rating the capacity and efficiency of self-contained, mechanically refrigerated vending machines for bottled, canned, or other sealed beverages.

2. SCOPE

This standard

- (a) defines standard bottled, canned, or other sealed beverage storage capacity;
- (b) establishes uniform methods of testing for determining laboratory performance of vending machines for bottled, canned, or other sealed beverages;
- (c) lists and defines the terms used in the methods of testing; and
- (d) establishes test conditions for rating.

3. DEFINITIONS

bottle: a glass or plastic container in which a beverage is sealed.

can: a container made of metal or paperboard or a combination of both in which a beverage is sealed.

basic model: all vending machines of a given type with electrical characteristics that are essentially identical and without any differing physical or functional characteristics that affect energy consumption.

energy management system: a control device or set of control devices that allow for adjustment of the operation of refrigerated vending machines depending on environmental and other operational variables in the vending location.

full loading: bottled, canned, or other sealed beverages placed in conformance with Section 5 of this standard.

product: bottled, canned, or other sealed beverages.

product storage rack: that portion of the machine into which bottles, cans, or other sealed packages are placed for vending.

recovery time: the time taken by a vending machine when tested according to Section 7.4 to cool product to the desired vending temperature, calculated as two hours less than the time required to satisfy the requirements of Section 7.4.2.4.

special package: a sealed beverage container that is not a can or a bottle.

stabilized operation: the operating condition at which all test values would be repetitive (or cyclic) if the machine were operated for an extended period of time.

standard product: the product to be used in testing the beverage vending machine.

standard test package: a beverage container of the size and shape for which the vending machine is designed, altered to include a temperature-measuring instrument at its center of mass. The package may be of a different type material than the material that is used for the containers in the vending machine.

standby: a mode of operation with no vending.

vend: to dispense product.

4. INSTRUMENTS

4.1 Temperature Measurement

Temperature shall be measured with a calibrated instrument accurate to $\pm 1^{\circ}\text{F}$ ($\pm 0.5^{\circ}\text{C}$), traceable to NIST, within one year of the instrument's calibration.

4.2 Electrical Measurement

Electrical energy input shall be measured with an integrating instrument with resolution of 0.01 kWh or better. The instrument shall be accurate within the limits of $\pm 0.5\%$, traceable to NIST, within one year of the instrument's calibration. Input voltage shall be measured with an indicating instrument having an accuracy within the limits of $\pm 1.0\%$, traceable to NIST, within one year of the instrument's calibration.

4.3 Time Measurement

Time shall be measured with instruments having an accuracy within $\pm 0.1\%$ of the interval measured.

5. VENDING MACHINE CAPACITY

The vendible capacity shall be the maximum quantity of standard product that can be dispensed from one full loading of the vending machine without further reload operations when used as recommended by the manufacturer.

The standard product shall be 12 oz (355 ml) cans for machines that are capable of dispensing 12 oz (355 ml) cans. For all other machines, the standard product shall be the product specified by the manufacturer as the standard product.