



BSR/ASHRAE Standard 32.2-2018 RA20XX

Public Review Draft

**Methods of Testing for
Rating Premix and Postmix
Beverage Dispensing Equipment**

First Public Review (October 2025)

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NOTE

Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE website at www.ashrae.org/technology.

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FOREWORD

ASHRAE Standard 32.2 prescribes a uniform method for testing and rating the capacity and efficiency of premix and postmix beverage dispensing equipment.

This is a reaffirmation of Standard 32.2-2018. This standard was prepared under the auspices of ASHRAE. It may be used, in whole or in part, by an association or government agency with due credit to ASHRAE. Adherence is strictly on a voluntary basis and merely in the interests of obtaining uniform guidelines throughout the industry. This version of the reaffirmation includes no changes.

Insert Foreword as
shown on next page

1. PURPOSE

The purpose of this standard is to specify uniform methods of testing for rating the capacity and energy efficiency of premix and postmix beverage dispensing equipment.

2. SCOPE

This standard

- a. establishes uniform methods of testing for determining the performance of premix and postmix chilled-beverage dispensers that are electrically operated and mechanically refrigerated or ice cooled;
- b. defines the terms used in the methods of testing; and
- c. establishes test conditions for rating.

This standard does not cover

- a. drink-quality elements other than temperature or
- b. frozen beverage types.

3. DEFINITIONS

beverage: as defined in this standard, a carbonated or noncarbonated drink, other than water, for human consumption.

casual drink temperature: temperature of the first drink drawn after an extended time interval.

draw rate: number of standard drinks per minute drawn from the equipment at equal time intervals.

dry-type equipment: mechanical refrigerated equipment using a cold block as a direct heat transfer medium and for reserve cooling capacity.

flow rate: volume of beverage drawn from the equipment per unit of time.

ice-cooled equipment: equipment that uses a cold plate cooled by ice produced separately from the dispenser as a direct heat transfer medium.

integral-type equipment: equipment with the refrigeration system and dispensing valves contained in one cabinet.

peak draw capacity: the maximum number of standard drinks drawn under standard test conditions without the beverage exceeding 4.4°C (40°F) at a draw rate defined by the manufacturer within a given time limit.

postmix beverage: a beverage that is blended in the equipment by mixing syrup with plain or carbonated water.

premix: a ready-to-drink beverage that has been mixed and supplied by a beverage manufacturer.

primary circuit: a circuit that has greater cooling capacity than the other circuits in the unit.

recirculating unit: a remote cooling unit that transports cold water and/or cold carbonated water through one or more lines to the dispensing valves and recirculates the water(s) back to the cooling unit for refrigerating.

(This foreword is not a part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard.)

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refrigeration cycle: consists of the ON time and OFF time periods for the mechanical refrigeration system in response to the temperature controls for the bath and/or ice bank, starting with compressor cut-out and ending with the next successive compressor cut-out.

remote dispensing unit: a premix or postmix dispenser having the dispensing valves separated from the refrigerating and/or carbonating unit but connected by means of product lines.

standard draw capacity: number of standard drinks drawn without the liquid exceeding 40°F (4.4°C) at a standard draw rate of four standard drinks per minute at test conditions.

standard drink: a premix or postmix beverage of 354.9 mL (12 oz) liquid volume that is drawn and has a maximum beverage temperature of 4.4°C (40°F).

standard drink temperature: the minimum temperature reached by the standard drink after dispensing into the test cup as measured with a thermocouple placed into the center of the cup.

standby: equipment operation in a maintained cold-state condition without beverage draws.

water-bath equipment: mechanically refrigerated equipment that uses water for heat transfer and that optionally freezes and stores ice for reserve cooling capacity.

4. CLASSIFICATION

For the purpose of this standard, equipment is classified as follows:

- a. **Mechanically refrigerated.** Beverage chilling is accomplished through the inclusion of an electrically powered refrigeration apparatus. This can either be an integral or remote arrangement and generally includes a means for energy storage in the form of a cold block, water bath, or ice bank.
- b. **Ice cooled.** Beverage chilling is accomplished through melting of ice on a cold plate through which beverage tubing passes for heat transfer.

5. MEASUREMENTS

5.1 Calibration. Instruments shall be of the types and have the accuracies listed below and shall be calibrated and traceable to National Institute of Standards and Technology (NIST) standards according to the schedule defined by the quality system for the test laboratory used, or at least annually if no quality system schedule exists for the lab.

5.2 Temperature Measurement. Temperature shall be measured with an instrument accurate to $\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$).

5.3 Energy Consumption Measurement. Electrical energy input shall be measured with an integrating instrument with the smallest-scale division reading 0.01 kWh. The instrument shall be accurate within the limits of $\pm 0.5\%$. Input voltage shall be measured with an indicating instrument having an accuracy within the limits of $\pm 1.0\%$.

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

5.5 Flow Measurement. Flow shall be measured with instruments that measure mass or volume per time within an accuracy of $\pm 1\%$ of the quantity measured.

5.6 Mass Measurement. Mass shall be measured with instruments having an accuracy within 1.0% of the quantity measured.

5.7 Velocity Measurement. Velocity shall be measured with instruments having an accuracy of 5% of the quantity measured.

5.8 Relative Humidity. Relative humidity shall be measured with instruments having an accuracy of 5% of the quantity measured.

6. TEST CONDITIONS

6.1 Standard Test Conditions. The test conditions specified in Table 1 shall be used to determine performance.

6.2 Voltage and Frequency. Tests shall be performed at the nameplate rated voltage $\pm 2\%$ and at the rated frequency $\pm 1\%$.

Table 1 Standard Test Conditions

Test Conditions	Standby Energy Consumption Tests (Section 8)	Standard Initial Pulldown Test (Section 9.2.1)	High-Temperature Performance Tests (Section 9.2)	Room-Temperature Performance Tests (Section 9.3)	Very-High-Temperature Performance Tests (Section 9.4)
Ambient temperature			32.2°C ± 1°C (90°F ± 2°F)	23.9°C ± 1°C (75°F ± 2°F)	40°C ± 1°C (104°F ± 2°F)
Room temp. (A)	23.9°C ± 1°C (75°F ± 2°F)	23.9°C ± 1°C (75°F ± 2°F)			
High temp. (B)	32.2°C ± 1°C (90°F ± 2°F)	32.2°C ± 1°C (90°F ± 2°F)			
Relative humidity	45% ± 5% (A) 75% (B)	75% ± 5%	75% ± 5%	45% ± 5%	75% ± 5%
Average premix, water, and syrup temperature	2.2°C ± 1°C (36°F ± 2°F)	23.9°C (A)/32.2°C (B) ± 1°C (75°F [A]/90°F [B] ± 2°F) initial temperature	32.2°C ± 1°C (90°F ± 2°F) inlet temperature	23.9°C ± 1°C (75°F ± 2°F) inlet temperature	40°C ± 1°C (104°F ± 2°F) inlet temperature

7. TEST PROCEDURE GENERAL REQUIREMENTS

7.1 Installation

- The dispenser shall be
 - installed in accordance with the manufacturer's instructions and as it would be installed in service;
 - installed in a level position, unless the instructions state otherwise;
 - operated with normal lighting and control settings;
 - protected against effects of nearby heating or cooling equipment; and
 - protected from air moving at greater than 0.25 m/s (50 ft/min).
- The countertop section shall be located on the countertop as it would be in service.
- For remote-type units, the beverage product lines connecting the dispensing head to the refrigeration unit shall be 15.24 m (50 ft).

7.2 Circulation of Air. To restrict the circulation of air at the rear of the equipment, a vertical partition or wall shall be located 150 mm (6 in.) from the rear of the cabinet and extend at least beyond each side of the cabinet from the floor (or countertop) to not less than 300 mm (12 in.) above the top of the cabinet.

7.3 Measurement of Ambient Temperature. The ambient temperature shall be measured by a single sensor located 300 mm (12 in.) in front of midpoint of the condenser inlet, and maintained at the temperature specified in Table 1 throughout the test.

8. STANDBY ENERGY CONSUMPTION TEST

8.1 Purpose. The purpose of this test is to determine the daily energy consumption of a mechanically refrigerated dispenser operating on standby.

8.2 Procedure

8.2.1 A temperature measuring instrument mounted adjacent to each of the dispenser product temperature control sensors shall be used to measure the premix temperature or the water-and-syrup average temperature.

8.2.2 The dispenser shall be filled to the capacity specified by the manufacturer. If the dispenser is equipped with temperature control for a recirculating system for water, syrup, or premix, it shall be adjusted to achieve the specified standard test temperature for the premix or water and syrup, and the equipment shall be allowed to stabilize while operating under standard conditions. Temperature stabilization is considered to be achieved when the beverage temperature is within the specified tolerance and the refrigeration system has cut out for three successive cycles.

8.2.3 The test shall begin once temperature stabilization has been achieved and shall start immediately following compressor cut-out, and the following data shall be recorded at least once per

minute for at least four consecutive hours. Test duration shall include at least three complete refrigeration cycles.

- a. Ambient temperature
- b. Relative humidity
- c. Product temperatures at refrigeration cut-in and cut-out
- d. Energy consumption
- e. Input voltage
- f. Percent runtime
- g. Duration of test

8.2.4 Calculation of Daily Standby Energy Consumption. The daily rated energy consumption of dispensers other than ice-cooled types shall be determined by the following equation:

$$E_D = E_T / t_T \times 24$$

where

E_D = rated energy consumption per day, kWh

E_T = energy consumed during the test, kWh

t_T = duration of the test, h

24 = number of hours, per day

9. PERFORMANCE TESTS

9.1 Purpose. The purpose of these tests is to determine the energy used during initial pulldown, and energy and drink capacity for standard draw, peak draw, and casual drink draw modes of a dispenser.

9.2 High Ambient Temperature Performance Tests

9.2.1 Standard Initial Pulldown Test

9.2.1.1 The equipment shall be filled with product and allowed to stabilize until all temperatures meet the requirements in Table 1.

9.2.1.2 Water-bath equipment shall be filled with water at the specified temperature and allowed to stabilize until water temperature meets the requirement in Table 1.

9.2.1.3 At the start of the test, the ambient temperature, humidity, refrigeration control setting, input voltage, and energy consumed shall be recorded. The refrigerating unit shall be started, and a record of ambient temperature, humidity, refrigeration control state, input voltage, and energy consumption shall be made until the temperature control causes cut-out. Recordings shall be made every minute or less. The pulldown test shall be considered complete when the refrigeration system cycles OFF normally on the refrigeration control the first time. At initial cut-out, the ambient temperature, input voltage, energy used, and time to cut-out shall be recorded.

9.2.1.4 On water-bath equipment, the mass of ice produced after at least 16 hours of stabilized operation following initial refrigeration cut-off shall be determined and recorded.

9.2.1.5 The following data shall be reported:

- a. Average ambient temperature and humidity for the duration of the test
- b. Refrigeration control setting (knob position or percent of total range adjustment) if control is adjustable
- c. Pulldown time to initial control cut-out
- d. Average input voltage
- e. Input energy to initial cut-out
- f. Mass of ice manufactured (water-bath equipment only)

9.2.2 Standard Draw Capacity Test

9.2.2.1 Prior to the start of this test, the dispenser shall be adjusted to the proper flow rate and ratio as follows:

- a. 44.4 mL (1.5 oz) $\pm$ 2.2 mL (0.075 oz) per second minimum for premix dispensers
- b. 88.7 mL (3.0 oz) $\pm$ 4.4 mL (0.15 oz) finished beverage per second for postmix dispensers

The syrup shall be adjusted to obtain the manufacturer's recommended ratio.

9.2.2.2 This test shall be conducted following a period of at least two hours of stabilized standby operation at the specified test conditions. It shall begin at normal refrigeration cycle OFF. Rate of draw shall be four standard drinks per minute. At the start of the test, the ambient temperature, humidity, refrigeration control setting, input voltage, and energy consumed shall be recorded. The refrigerating unit shall be started, and ambient temperature, humidity, refrigeration control state, input voltage, and energy consumption shall be recorded at least once per minute until the test is completed.

9.2.2.3 The drink draw portion of the test shall be completed when all drink temperatures reach 7.2°C (45°F), or, in the case of ice cooled dispensers, after ten draw sequences. The number of standard drinks at 4.4°C (40°F) or colder shall be recorded. For units having a primary circuit, the draw sequence shall be 1, 2, 1, 3, 1, 4, etc., where the number 1 represents the primary circuit and the remaining numbers represent the other flavors. For units that do not have a primary circuit, the draw sequence shall be 1, 2, 3, 4, etc., where the numbers represent each flavor. Following the draw portion of the test, the unit shall be allowed to operate until the refrigeration system has cycled OFF by the refrigeration control. The test is complete when the refrigeration system cycles OFF.

9.2.2.4 The total amount of beverage drawn shall be measured and shall be within $\pm 2\%$ of the calculated volume of standard drinks drawn ($354.9 \text{ mL [12 oz]} \times \text{total number of drinks}$).

9.2.2.5 The following data shall be reported:

- a. Average ambient temperature and humidity
- b. Number of drinks drawn
- c. Total volume of beverage drawn
- d. Number of standard drinks
- e. Energy consumption during test
- f. Time duration for draw test
- g. Time duration for recovery

9.2.3 Peak Draw Capacity Test

9.2.3.1 After at least two hours or three refrigeration cycles, whichever is longer in duration, following the standard draw capacity test (Section 9.2.2) at normal refrigeration cycle OFF, drinks shall be drawn at the manufacturer's stated maximum number per minute. The drink draw portion of the test shall be completed when all drink temperatures reach 7.2°C (45°F), or, in the case of ice-cooled dispensers, after ten draw sequences. The number of standard drinks at 4.4°C (40°F) or colder shall be recorded. Following the draw portion of the test, the unit shall be allowed to operate until the refrigeration system has cycled OFF by the refrigeration control. The test is complete when the refrigeration system cycles OFF.

9.2.3.2 The draw sequence shall be the same as defined in Section 9.2.2.3.

9.2.3.3 Record and report data as outlined in Section 9.2.2.5.

9.2.4 Casual Drink Temperature Test

9.2.4.1 After at least two hours or three refrigeration cycles, whichever is longer in duration, following either the standard or peak draw test; one drink shall be drawn from the primary circuit for equipment with a primary circuit, or from any circuit for equipment without a primary circuit. Fifteen minutes later, one more drink shall be drawn from the same circuit. Thirty minutes after the second drink is drawn, one additional drink shall be drawn from this same circuit, and 60 minutes after the third drink is drawn, one final drink shall be drawn from the same circuit. All drinks drawn shall be $354.9 \text{ mL (12 oz)} \pm 7 \text{ mL (0.24 oz)}$ fluid volume. In each instance, the temperature of the beverage drawn shall be measured and recorded. Ambient temperature and humidity and energy consumption shall be recorded at least once per minute during the test.

9.2.4.2 The following data shall be reported:

- a. Average ambient temperature and humidity
- b. Each casual drink temperature
- c. Energy consumed

9.2.5 Optional Standard Draw Capacity Test

9.2.5.1 The test defined in Section 9.2.2 may be repeated, drawing drinks of another size instead of standard 354.9 mL (12 oz) drinks.

9.2.5.2 The following data shall be reported:

- a. Average ambient temperature and humidity
- b. The drink volume and total number of drinks drawn without exceeding 4.4°C (40°F) at a standard draw rate of four drinks per minute
- c. Energy consumed

9.3 Room-Temperature Performance Tests

9.3.1 Purpose. The purpose of these tests is to determine the standard draw capacity, peak draw capacity, and casual drink temperature for dispensers at 23.9°C (75°F).

9.3.2 Standard Draw Capacity Test. The tests specified in Section 9.2.2 shall be repeated, substituting 23.9°C (75°F) for 32.2°C (90°F) in all instances.

9.3.3 Peak Draw Capacity Test. The tests specified in Section 9.2.3 shall be repeated, substituting 23.9°C (75°F) for 32.2°C (90°F) in all instances.

9.3.4 Casual Drink Temperature Test. The tests specified in Section 9.2.4 shall be repeated, substituting 23.9°C (75°F) for 32.2°C (90°F) in all instances.

9.4 Very-High Ambient Temperature Performance Tests

9.4.1 Purpose. The purpose of these tests is to determine the standard draw capacity, peak draw capacity, and casual drink temperature for dispensers at 40°C (104°F).

9.4.2 Standard Draw Capacity Test. The tests specified in Section 9.2.2 shall be repeated, substituting 40°C (104°F) for 32.2°C (90°F) in all instances.

9.4.3 Peak Draw Capacity Test. The tests specified in Section 9.2.3 shall be repeated, substituting 40°C (104°F) for 32.2°C (90°F) in all instances.

9.4.4 Casual Drink Temperature Test. The tests specified in Section 9.2.4 shall be repeated, substituting 40°C (104°F) for 32.2°C (90°F) in all instances.

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INFORMATIVE APPENDIX A REPORTING FORMS FOR EQUIPMENT TESTED USING ANSI/ASHRAE STANDARD 32.2

Table A-1 General Description

Section	Measure	Data
	Manufacturer	
	Model number	
4	Type: premix or postmix	
4	Style: integral or remote refrigeration system	
4	Classification: dry, water-bath, or liquid bath (eutectic solution)	
6.2	Rated voltage	
6.2	Rated frequency	

Table A-2 Most Recent Calibration (Section 5)

Section	Measure	Data
5.2	Temperature measurement	
5.3	Energy consumption measurement	
5.4	Time measurement	
5.5	Flow measurement	
5.6	Mass measurement	
5.7	Velocity measurement	
5.8	Relative humidity measurement	

Table A-3 Standby Energy Consumption Test (Section 8)

Section	Measure	Data
8.2.3 (a)	Average ambient temperature	
8.2.3 (b)	Average relative humidity	
8.2.3 (c)	Average product temperatures	
8.2.3 (d)	Energy consumption	
8.2.3 (e)	Average input voltage	
8.2.3 (f)	Percent runtime	
8.2.3 (g)	Duration of test	
8.2.4	Daily rated energy consumption	

Table A-4 High Ambient Temperature Product Delivery Performance Test (Section 9.2)

Section	Measure	Data
9.2.1	Standard Initial Pulldown Test	
9.2.1.5 (a)	Average ambient temperature and humidity	
9.2.1.5 (b)	Refrigeration control setting	
9.2.1.5 (c)	Pulldown time to initial control cut-out	
9.2.1.5 (d)	Average input voltage	
9.2.1.5 (e)	Input energy to initial cut-out	
9.2.1.5 (f)	Mass of ice (kg) manufactured (water-bath equipment only)	
9.2.2	Standard Draw Capacity Test	
9.2.2.5 (a)	Average ambient temperature and humidity	
9.2.2.5 (b)	Number of drinks drawn	
9.2.2.5 (c)	Total volume of beverage drawn	
9.2.2.5 (d)	Number of standard drinks	
9.2.2.5 (e)	Energy consumption during test	
9.2.2.5 (f)	Time duration for draw test	
9.2.2.5 (g)	Time duration for recovery	
9.2.3	Peak Draw Capacity Test	
	Manufacturer's stated maximum draw rate	
	Total drinks	
9.2.3.3 (Same data as reported for Section 9.2.2.5)	Average ambient temperature and humidity	
	Number of drinks drawn	
	Total volume of beverage drawn	
	Number of standard drinks	
	Energy consumption during test	
	Time duration for draw test	
	Time duration for recovery	
9.2.4	Casual Drink Temperature Test	
9.2.4.2 (a)	Average ambient temperature and humidity	
9.2.4.2 (b)	Each casual drink temperature	
9.2.4.2 (c)	Energy consumed	
9.2.5	Optional Standard Draw Capacity Test	
9.2.5.1	Volume of optional sized drink	
9.2.5.2 (a)	Average ambient temperature and humidity	
9.2.5.2.(b)	Total number of drinks	
9.2.5.2.(c)	Energy consumed	

Table A-5 Room Temperature Performance Test (Section 9.3)

Section	Measure	Data
9.3.2 (Same data as reported for Section 9.2.2.5)	Standard Draw Capacity Test	
	Average ambient temperature and humidity	
	Number of drinks drawn	
	Total volume of beverage drawn	
	Number of standard drinks	
	Energy consumption during test	
	Time duration for draw test	
	Time duration for recovery	
9.3.3	Peak Draw Capacity Test	
	Manufacturer's stated maximum draw rate	
	Total drinks	
(Same data as reported for Section 9.2.2.5)	Average ambient temperature and humidity	
	Number of drinks drawn	
	Total volume of beverage drawn	
	Number of standard drinks	
	Energy consumption during test	
	Time duration for draw test	
	Time duration for recovery	
9.3.4 (Same data as reported for Section 9.2.4.2)	Casual Drink Temperature Test	
	Average ambient temperature and humidity	
	Each casual drink temperature	
	Energy consumed	

Table A-6 Very-High Ambient Temperature Performance Test (Section 9.4)

Section	Measure	Data
9.4.2 (Same data as reported for Section 9.2.2.5)	Standard Draw Capacity Test	
	Average ambient temperature and humidity	
	Number of drinks drawn	
	Total volume of beverage drawn	
	Number of standard drinks	
	Energy consumption during test	
	Time duration for draw test	
	Time duration for recovery	
9.4.3	Peak Draw Capacity Test	
	Manufacturer's stated maximum draw rate	
	Total drinks	
(Same data as reported for Section 9.2.2.5)	Average ambient temperature and humidity	
	Number of drinks drawn	
	Total volume of beverage drawn	
	Number of standard drinks	
	Energy consumption during test	
	Time duration for draw test	
	Time duration for recovery	
9.4.4 (Same data as reported for Section 9.2.4.2)	Casual Drink Temperature Test	
	Average ambient temperature and humidity	
	Each casual drink temperature	
	Energy consumed	

(This appendix 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. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

INFORMATIVE APPENDIX B

DAILY ENERGY EFFICIENCY METRIC

For mechanically refrigerated dispensers, a typical daily energy profile could be represented by two standard draw test energy consumption totals plus the standby energy use for the remaining time of the day:

$$\text{Daily Energy} = 2 \times \text{Standard Draw Energy Consumption} + \\ \text{Standby Hourly Energy Consumption} \times (24 - 2 \times \text{Standard Draw Test Duration [h]})$$

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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About ASHRAE

Founded in 1894, ASHRAE is a global professional society committed to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration, and their allied fields.

As an industry leader in research, standards writing, publishing, certification, and continuing education, ASHRAE and its members are dedicated to promoting a healthy and sustainable built environment for all, through strategic partnerships with organizations in the HVAC&R community and across related industries.

To stay current with this and other ASHRAE Standards and Guidelines, visit www.ashrae.org/standards, and connect on LinkedIn, Facebook, Twitter, and YouTube.

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