

ANSI/ASHRAE/ICC/USGBC/IES Addendum m to ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017

Standard for the Design of High-Performance Green Buildings

Except Low-Rise Residential Buildings

The Complete Technical Content of the International Green Construction Code®

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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

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FOREWORD

Addendum m adds new provisions to enable right-sized tubing for efficient delivery of water through hot-water distribution systems. The new requirement balances health, energy, and plumbing code intents with energy and water efficiency strategies. The addendum is based in part on research by the California Energy Commission on the energy implications of hot-water supply. The volume of water in a pipe is the primary determinant of how long a user must wait for hot water to be delivered at a fixture. This has significant implications for both energy use to heat the water and the volume of water wasted before delivery. Similar provisions are currently included in the 2018 IECC (Section C404.5) and the 2015 IgCC (Section 702.8.)

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strike through~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum m to Standard 189.1-2017

Modify Section 6 as shown (I-P and SI units).

6.3.3 Hot-Water Distribution. Hot-water distribution pipes shall be in accordance with Section 6.3.3.1 and Section 6.3.3.2.

6.3.3.1 Maximum Allowable Pipe Volume. The maximum volume of water in the pipes between the source of hot or tempered water and the fixtures shall be 64 oz (1.9 L) where the source of hot or tempered water is a water heater, and shall be 24 oz (0.71 L) where the source of hot or tempered water is a circulation loop pipe or an electrically heat-traced pipe. For the purpose of Section 6.3.3, the source of hot or tempered water shall be the point of connection to a water heater, heat-traced pipe, or a circulation loop.

The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters, and manifolds between the source of hot or tempered water and the termination of the fixture supply pipe. The volume shall be determined using Table 6.3.3.1. The volume contained within fixture shutoff valves, flexible water supply connectors to a fixture fitting, or within a fixture fitting shall not be included in the water volume determination. Where the source of hot or tempered water is a circulation loop pipe or an electrically heat-traced pipe, the volume shall include the portion of the fitting on the source pipe that supplies water to the fixture. Where the type of pipe is unknown or not specifically included in the table, the generic pipe column shall be used to determine the volume.

Exception to 6.3.3.1: Public lavatory fixtures.

Table 6.3.3.1 Internal Volume of Pipe or Tube in I-P (SI)

Ounces (Litres) of Water per Foot (Metre) of Pipe				
Nominal Size, in. (Dimension Nominal [DN], mm)	Generic Pipe	Copper Type L	CPVC CTS SDR 11	PEX CTS SDR 9
1/4 (8)	0.33 (0.03)	0.52 (0.05)	0.37 (0.04)	0.33 (0.03)
5/16 (9)	0.5 (0.05)	NA (NA)	NA (NA)	0.48 (0.05)
3/8 (10)	0.75 (0.07)	0.97 (0.09)	0.75 (0.07)	0.68 (0.07)
1/2 (15)	1.5 (0.15)	1.55 (0.15)	1.25 (0.12)	1.18 (0.11)
5/8 (18)	2 (0.19)	2.23 (0.22)	NA (NA)	1.78 (0.17)
3/4 (20)	3 (0.29)	3.22 (0.31)	2.67 (0.26)	2.35 (0.23)
1 (25)	5 (0.49)	5.47 (0.53)	4.43 (0.43)	3.91 (0.38)
1 1/4 (32)	8 (0.78)	8.36 (0.81)	6.61 (0.64)	5.81 (0.56)
1 1/2 (40)	11 (1.07)	11.83 (1.15)	9.22 (0.89)	8.09 (0.78)
2 (50)	18 (1.75)	20.58 (2.00)	15.79 (1.53)	13.86 (1.34)

NA = No value provided based on lack of availability of pipe in this size.

6.3.3.2 Maximum Length. The maximum pipe length from the source of hot or tempered water to the termination of the fixture supply pipe serving any plumbing fixture or appliance shall not exceed 50 ft (15 m) of developed length.

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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.

Standard 189.1 and the International Green Construction Code

Standard 189.1 serves as the complete technical content of the International Green Construction Code® (IgCC). The IgCC creates a regulatory framework for new and existing buildings, establishing minimum green requirements for buildings and complementing voluntary rating systems. For more information, visit www.iccsafe.org.

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