



**American Water Works
Association**

The Authoritative Resource on Safe WaterSM

ANSI/AWWA C503-05
(Revision of ANSI/AWWA C503-97)

AWWA Standard

Wet-Barrel Fire Hydrants



Effective date: Jan. 1, 2006.

First edition approved by AWWA Board of Directors July 7, 1959.

This edition approved June 12, 2005.

Approved by American National Standards Institute Aug. 19, 2005.

AWWA Standard

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Foreword

This Foreword is for information only and is not part of ANSI/AWWA C503.

I. Introduction.

I.A. *Background.* A fire hydrant is usually a unit of a water utility's property that is provided for public fire-protection service. However, during fire emergencies, a hydrant is operated by members of a fire department rather than by water utility personnel.

The use of a fire hydrant as a source of water for street cleaning, construction projects, or any purpose other than fire fighting is beyond the primary purpose for which the unit is installed. The use of hydrants in this manner should be rigidly restricted and controlled in the interest of maintaining the equipment in satisfactory working condition for use at times of fire emergencies.

This standard pertains to wet-barrel fire hydrants that are intended for use in water-supply systems in areas where the climate is mild and freezing temperatures do not occur.

ANSI/AWWA C502, Dry-Barrel Fire Hydrants, pertains to dry-barrel fire hydrants that are intended for use in water-supply systems, including those where freezing temperatures do occur.

Unless expressly relieved by the fire department by written agreement, public ordinance, or other ownership, water utilities should schedule regular and frequent inspections of hydrants to ensure that they are in satisfactory working condition. AWWA Manual M17, *Installation, Field Testing, and Maintenance of Fire Hydrants*, provides an excellent guide for owners of fire hydrants.

I.B. *History.* Previous editions of ANSI/AWWA C503 were approved by the AWWA Board of Directors in January 1958 (tentative), July 1959, January 1970, June 1975, February 1982, June 1988, and June 1997. This eighth edition of C503 was approved by the AWWA Board of Directors on June 12, 2005.

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSF) to develop voluntary third-party consensus standards and a certification program for direct and indirect drinking water additives. Other members of the original consortium included the American Water Works Association Research Foundation (AwwaRF) and the Conference of State Health

and Environmental Managers (COSHEM). The American Water Works Association (AWWA) and the Association of State Drinking Water Administrators (ASDWA) joined later.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.* Local agencies may choose to impose requirements more stringent than those required by the state. To evaluate the health effects of products and drinking water additives from such products, state and local agencies may use various references, including

1. An advisory program formerly administered by USEPA, Office of Drinking Water, discontinued on Apr. 7, 1990.
2. Specific policies of the state or local agency.
3. Two standards developed under the direction of NSF, NSF[†]/ANSI[‡] 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.
4. Other references including AWWA standards, *Food Chemicals Codex*, *Water Chemicals Codex*,[§] and other standards considered appropriate by the state or local agency.

Various certification organizations may be involved in certifying products in accordance with NSF/ANSI 61. Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdictions. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Annex A, “Toxicology Review and Evaluation Procedures,” to NSF/ANSI 61 does not stipulate a maximum allowable level (MAL) of a contaminant for substances not regulated by a USEPA final maximum contaminant level (MCL). The MALs of an unspecified list of “unregulated contaminants” are based on toxicity testing guidelines (noncarcinogens) and risk characterization methodology (carcinogens). Use of Annex A procedures may not always be identical, depending on the certifier.

*Persons outside the United States should contact the appropriate authority having jurisdiction.

†NSF International, 789 N. Dixboro Road, Ann Arbor, MI 48105.

‡American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

§Both publications available from National Academy of Sciences, 500 Fifth Street, N.W., Washington, DC 20001.

ANSI/AWWA C503 does not address additives requirements. Users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additives requirements, including applicable standards.
2. Determine the status of certifications by all parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

II. Special Issues.

II.A. *Gate Valve.* Installing a gate valve on the branch connection of hydrants is considered good water utility practice. This practice is particularly important for wet-barrel hydrants. Dry-barrel hydrants manufactured according to ANSI/AWWA C502 are designed so that if the hydrant is damaged or broken above or near the grade level, the main valve will remain closed and reasonably tight against leakage. However, in the case of wet-barrel hydrants, a break will discharge water. The gate valve on the branch connection enables the water to be shut off in the shortest possible time to prevent or reduce damage.

II.B. *Torque.* Hydrants produced according to this standard shall meet a torque requirement of 200 ft-lb (270 N·m) of torque applied at the operating nut in both opening and closing directions, as required in Sec. 4.6.13.1. This amount of torque is considered fully adequate to operate a hydrant that is in satisfactory working condition. The use of a wrench longer than 15 in. (380 mm), or an indefinite extender operated by two or more persons, is not considered good practice. If one person using a 15-in. (380-mm) wrench cannot open and close a fire hydrant, the hydrant is not in proper working condition, and it should be repaired promptly.

A fire-hydrant wrench shall be readily reversible.

II.C. *Single-Outlet Nozzle.* Hydrants with a single 2½-in. (65-mm) outlet nozzle are not considered suitable for normal fire-protection service.

II.D. *Head Loss.* Table 3 of ANSI/AWWA C503 does not show permissible loss of head above a flow of 1,500 gpm (0.096 m³/sec). If hydrants are to be required to deliver more than 1,500 gpm (0.096 m³/sec), the manufacturer should be consulted regarding head losses at higher flows to determine the suitability of the hydrant for its intended purpose.

III. **Use of This Standard.** It is the responsibility of the user of an AWWA standard to determine that the products described in that standard are suitable for use in the particular application being considered.

III.A. *Purchaser Options and Alternatives.* The following items should be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA C503, Wet-Barrel Fire Hydrants, of latest revision.
2. Quantity required. If a complete hydrant (a hydrant top section and bury section bolted together) is not desired, the purchaser should specify the quantity of each section.
3. Threaded boss on top of hydrant top section. The top of a wet-barrel hydrant may have a threaded boss of sufficient thickness to receive a supplementary hose-outlet angle valve. If required, the threaded boss must be specified by the purchaser.
4. The number of hose and pumper outlet nozzles.
5. The nominal inside diameter of the outlet nozzles, in inches (millimeters).
6. The type of outlet-nozzle threads. These threads should conform to those in service in the system in which the hydrant is to be installed. If threads conform to NFPA* 1963, Standard for Fire Hose Connections (reproduced in part in Appendix A of this standard), this fact should be specified.

If the threads do not conform to NFPA 1963, the following thread detail dimensions for both nozzle and cap (coupling) should be specified, including appropriate tolerances:

- a. Major diameter.
- b. Minor diameter.
- c. Pitch diameter.
- d. Thread form.
- e. Number of threads per inch.
7. Special designs or features, if required (Sec. 4.2, 4.5.1, 4.5.2, and 4.6.11).
8. Catalog and maintenance data, net weight, and drawings, if required. If the manufacturer is required to provide drawings, specify the number of drawings and whether the drawings are to be approved before the hydrants are manufactured (Sec. 4.3).
9. Details of other federal, state, local, and provincial requirements (Sec. 4.4).
10. Alternate materials, if the water that will be used in the hydrants promotes galvanic corrosion (Sec. 4.4.6.3).
11. Corrosion-resistant bolts and nuts, if required (Sec. 4.4.11.2).

*National Fire Protection Association, P.O. Box 9101, 1 Batterymarch Park, Quincy, MA 02269.

12. The color and type of paint to be applied on the outside of the hydrant top section and any special coating requirements (Sec. 4.4.14 and Appendix B).
13. Bury-section length, in feet (to nearest 6 in. [25.4 mm]), measured vertically between the ground line and the bottom of the pipe connected to the hydrant inlet (Sec. 4.6.4). (See Sec. 3 for definitions used with wet-barrel hydrants.)
14. Size and type of inlet connection and joint accessories, such as gaskets, bolts, or nuts, if any (Sec. 4.6.7). The number of slotted bolt holes, if any, should also be specified (Sec. 4.6.7.3).
15. Harnessing lugs, if required (Sec. 4.6.8).
16. Outlet-nozzle cap chains and cap gasket, if *not* required (Sec. 4.6.10).
17. Whether the outlet-nozzle cap is not to have pressure-relief capability (Sec. 4.6.10.4).
18. Whether the outlet-nozzle caps may be made of a suitable type of plastic (Sec. 4.6.10.5).
19. The hydrant top-section and bury-section flange drilling. If the desired flange detail dimensions do not conform to Sec. 4.6.12, the following details should be specified:
 - a. Bolt-circle diameter.
 - b. Number of bolt holes.
 - c. Size of bolt holes.
 - d. Orientation of bolt holes to centerline of a specified outlet nozzle or bury-section inlet.
20. Direction of opening, if not left (counterclockwise) (Sec. 4.6.13.4). The direction of rotation of the operating nut to open the hydrant should conform to the practice in the system where the hydrant is to be installed.
21. Size, shape, and dimensions of stem-operating nut and outlet-nozzle cap nuts, if different from those in this standard and if an attachable stem-operating nut is required (Sec. 4.6.14).
22. Records of standard tests, if required (Sec. 5.2).
23. Shipping destination and any special shipping instructions or requirements (Sec. 6.2).
24. Affidavit of compliance, if required (Sec. 6.3).
25. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required, in addition to the requirements of the Safe Drinking Water Act.

III.B. *Modification to Standard.* Any modification to the provisions, definitions, or terminology in this standard must be provided by the purchaser.

IV. **Major Revisions.** Major changes made to the standard in this revision include the following:

1. Additional alloys have been included in Table 1, Copper alloys.
2. Table 3, maximum permissible loss of head for hydrants, has been changed.
3. The addition of references to stainless-steel components.
4. Sec. 4.4.13, Gaskets, and Sec. 4.7, Coatings, have been revised.

V. **Comments.** If you have any comments or questions about this standard, please call the AWWA Volunteer and Technical Support Group at 303.794.7711, FAX at 303.795.7603, write to the group at 6666 West Quincy Avenue, Denver, CO 80235-3098, or e-mail at standards@awwa.org.



American Water Works
Association

ANSI/AWWA C503-05
(Revision of ANSI/AWWA C503-97)

AWWA Standard

Wet-Barrel Fire Hydrants

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard pertains to the various types and classes of wet-barrel fire hydrants for use in water-supply service in areas where the climate is mild and freezing temperatures do not occur. A wet-barrel hydrant has one or more valve openings above the ground line and, under normal operating conditions, the entire interior of the hydrant is subjected to water pressure at all times. Each outlet nozzle has an independent, compression-type valve (i.e., working with or against the pressure) that controls discharge from that particular outlet.

This standard does not pertain to dry-barrel fire hydrants. (For such hydrants, see ANSI/AWWA C502, Dry-Barrel Fire Hydrants.)

References to the setting of hydrants are not included in ANSI/AWWA C503. For installation information, see ANSI/AWWA C600, *Installation of Ductile-Iron Water Mains and Their Appurtenances*; ANSI/AWWA C603, *Installation of Asbestos–Cement Pressure Pipe*; and AWWA Manual M17, *Installation, Field Testing, and Maintenance of Fire Hydrants*.

Hydrants of steel-pipe risers and angle-valve construction are not covered in this standard.