

American Water Works Association

ANSI/AWWA C503-97

(Revision of ANSI/AWWA C503-88)



AWWA STANDARD
FOR
Wet-Barrel Fire Hydrants



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AMERICAN WATER WORKS ASSOCIATION

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AWWA Standard

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Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

SEC.	PAGE	SEC.	PAGE
Foreword			
I	Introduction.....	vii	
I.A	Background.....	vii	
I.B	History	vii	
I.C	Acceptance	vii	
II	Special Issues.....	viii	
II.A	Gate Valve.....	viii	
II.B	Torque.....	viii	
II.C	Single Outlet Nozzle.....	viii	
II.D	Head Loss	ix	
III	Use of This Standard.....	ix	
III.A	Purchaser Options and Alternatives.....	ix	
III.B	Modification to Standard.....	x	
IV	Major Revisions.....	x	
V	Comments	xi	
Standard			
1	General		
1.1	Scope	1	
1.2	Purpose	1	
1.3	Application.....	1	
2	References	2	
3	Definitions	3	
4	Requirements		
4.1	Permeation	4	
4.2	Data to Be Supplied by the Purchaser	4	
4.3	Drawings or Data to Be Furnished by the Manufacturer	4	
4.4	Materials.....	5	
4.5	General Design	7	
4.6	Detailed Design	8	
4.7	Coating	11	
4.8	Workmanship.....	11	
5	Verification		
5.1	Inspection.....	12	
5.2	Fire-Hydrant Component Tests	12	
5.3	Production Tests.....	12	
5.4	Rejection.....	12	
6	Delivery		
6.1	Marking.....	13	
6.2	Preparing for Shipment	13	
6.3	Affidavit of Compliance.....	13	
Appendixes			
A	Characteristics of National Standard Fire-Hose Coupling Screw Threads	15	
B	Uniform Color Scheme for Fire Hydrants	18	
Tables			
1	Copper Alloys.....	6	
2	Minimum Wall Thickness for Sections of Wet-Barrel Hydrants	8	
3	Maximum Permissible Loss of Head for Hydrants	9	
A.1	Nominal Dimensions of NH (Fire-Hose) Threads	16	
A.2	Basic Dimensions of NH (Fire-Hose) Threads	17	

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Foreword

This foreword is for information only and is not a part of AWWA C503-97.

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, Standard for Dry-Barrel Fire Hydrants, pertains to dry-barrel fire hydrants that are intended for use in water-supply systems in all areas, including those where freezing temperatures do not occur.

Unless expressly relieved by the fire department by written agreement, public ordinance, or other ownership, water utilities should schedule regular, 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 this standard were approved in January 1958 (tentative), July 1959; January 1970; June 1975; February 1982; and June 1988. This edition was approved by the AWWA Board of Directors on June 15, 1997.

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 all 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.

*Persons in Canada, Mexico, and non-North American countries should contact the appropriate authority having jurisdiction.

3. Two standards developed under the direction of NSF, ANSI^{*}/NSF[†] 60, Drinking Water Treatment Chemicals—Health Effects, and ANSI/NSF 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 ANSI/NSF 61. Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdiction. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Appendix A, “Toxicology Review and Evaluation Procedures,” to ANSI/NSF 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 Appendix A procedures may not always be identical, depending on the certifier.

AWWA C503-97 does not address additives requirements. Thus, 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 all 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, then 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.

^{*}American National Standards Institute, 11 W. 42nd St., New York, NY 10036.

[†]NSF International, 3475 Plymouth Rd., Ann Arbor, MI 48106.

[‡]Both publications available from National Academy of Sciences, 2102 Constitution Ave. N.W., Washington, DC 20418.

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/s). If hydrants are to be required to deliver more than 1,500 gpm (0.096 m³/s), then 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. AWWA has no responsibility for the suitability or compatibility of the provisions of this standard to any intended application by any user. Accordingly, each user of this standard is responsible for determining that the standard's provisions are suitable for and compatible with that user's intended application.

III.A. *Purchaser Options and Alternatives.* When hydrants are purchased according to this standard, the purchaser's specifications should provide specific information regarding the following:

Essential information

1. Standard used—that is, AWWA C503, Standard for Wet-Barrel Fire Hydrants, of latest revision.

2. Quantity required. If a complete hydrant (that is, a hydrant top section and bury section bolted together) is not desired, then the purchaser should specify the quantity of each section.

3. 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, also should be specified (Sec. 4.6.7.3).

4. 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.

5. The number of hose and pumper outlet nozzles.

6. Bury-section length, in feet (to nearest 6 in.), 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.)

7. The nominal inside diameter (ID) of the outlet nozzles, in inches.

8. 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 Screw Threads and Gaskets 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, then 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.

*National Fire Protection Association, One Batterymarch Park, Quincy, MA 02269.

- e. Number of threads per inch.
- 9. 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.
- 10. Whether the outlet-nozzle cap is not to have pressure-relief capability (Sec. 4.6.10.4).
- 11. Size, shape, and dimensions of stem-operating nut and outlet-nozzle cap nuts, if different from those specified in this standard and whether an attachable stem-operating nut is required (Sec. 4.6.14).
- 12. The color and type of paint to be applied on the outside of the hydrant top section and any special coating requirements (Sec. 4.4.13 and 4.7).
- 13. Shipping destination and any special shipping instructions or requirements (Sec. 6.2).

Optional information, if required by the purchaser

- 1. Alternate materials, if the water that will be used in the hydrants promotes galvanic corrosion (Sec. 4.4.6.3).
- 2. Special designs or features, if required (Sec. 4.2, 4.5.1, 4.5.2, and 4.6.11).
- 3. Catalog and maintenance data, net weight, and drawings, if required. If the manufacturer is required to furnish drawings, specify the number of drawings and whether the drawings are to be approved before the hydrants are manufactured (Sec. 4.3).
- 4. Affidavit of compliance, if required (Sec. 6.3).
- 5. Records of standard tests, if required (Sec. 5.2).
- 6. Corrosion-resistant bolts and nuts, if required (Sec. 4.4.10.2).
- 7. Harnessing lugs, if required (Sec. 4.6.8).
- 8. Outlet-nozzle cap chains and cap gasket, if *not* required (Sec. 4.6.10).
- 9. Whether the outlet-nozzle caps may be made of a suitable type of plastic (Sec. 4.6.10.5).
- 10. 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.

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

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

- 1. The format has been changed to AWWA standard style.
- 2. Section I.C, Acceptance, has been added to the foreword.
- 3. Section 1.1, Scope, has been revised and Sec. 1.2, Purpose, and Sec. 1.3, Application, were added.
- 4. The definitions of parties (Sec. 3) have been revised to approved wording.
- 5. Section 4.4.6, Copper Alloys (including subsections 4.4.6.1 through 4.4.6.7), has been added. All references to copper alloys have been revised to conform to ASTM specifications and UNS designations.
- 6. Table 1 has been revised and retitled "Copper alloys."
- 7. Table 3, Maximum permissible loss of head for hydrants, has been expanded to include flow rates up to 1,500 gpm.