ANSI/AWWA C502-05
(Revision of ANSI/AWWA C502-94)

American Water Works Association

The Authoritative Resource on Safe Water℠

AWWA Standard

Dry-Barrel Fire Hydrants

ANSI American National Standards Institute

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AWWA Standard

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Committee Personnel

The Standards Committee on Fire Hydrants, which reviewed and approved this standard, had the following personnel at the time of approval:

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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.

Foreword

This Foreword is for information only and is not a part of ANSI/AWWA C502.

I. Introduction.

I.A. *Background.* This standard covers dry-barrel fire hydrants that are intended for use in water supply systems in all climates, including those where freezing temperatures occur. Wet-barrel fire hydrants, which are intended for use only in areas where the climate is mild and freezing temperatures do not occur, are covered in ANSI/AWWA C503, Wet-Barrel Fire Hydrants.

I.B. *History.* The first edition of this standard was approved on June 24, 1913, as Standard Specifications for Hydrants and Valves. Subsequent revisions to ANSI/AWWA C502 were approved by the AWWA Board of Directors in 1916, 1937, 1938, 1940, 1943, 1953, 1964, 1973, 1980, 1985, and 1994. This thirteenth edition of C502 was approved by the AWWA Board of Directors on June 12, 2005.

I.C. *Acceptance.* Sec. 1.2.3 of NSF/ANSI 61-2001, Drinking Water System Components—Health Effects, states that fire hydrants are not covered by the Scope of this (NSF 61) standard.

In the United States, authority to regulate products for use in, or 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 International (NSF), NSF†/ANSI‡ 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.

*Persons outside the US should contact the appropriate authority having jurisdiction.

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

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

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 jurisdiction. 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.

ANSI/AWWA C502 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. 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 it is operated by members of the fire department rather than by water utility personnel.

The use of fire hydrants as a source of water for street cleaning, construction projects, or for any purpose other than fire fighting is beyond the primary purpose for which the units are installed. Such usage of hydrants should be rigidly restricted and controlled in the interest of keeping the equipment in good working order for use during times of fire.

The water utility, unless expressly relieved by the fire department in accordance with a written agreement, public ordinance, or other ownership, should schedule regular and sufficiently frequent inspections of hydrants to ensure that they are in

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

good working condition. AWWA Manual M17, *Installation, Field Testing, and Maintenance of Fire Hydrants*, provides an excellent guide for owners of fire hydrants.

Hydrants produced according to ANSI/AWWA C502 are designed to be operated by one person using a 15-in. (380-mm) wrench. The use of a longer wrench or an indefinite extender operated by two or more persons is not considered to be good practice. If one person cannot open and close a fire hydrant with a 15-in. (380-mm) wrench, then it is not in proper working order and should be promptly repaired. Wrenches for fire hydrants should be constructed so that the openings can be readily reversed.

Hydrants produced according to ANSI/AWWA C502 are required to meet a test of 200 lbf·ft (270 N·m) torque applied at the operating nut in both opening and closing directions. This torque is considered to be fully adequate to operate a hydrant that is in good working condition. Hydrants with barrels longer than 5 ft (1.5 m) of bury may require special design.

Hydrants with a single $2^1/_2$-in. (64-mm) outlet nozzle are not considered to be suitable for normal fire protection service.

If Table 5 of the standard does not show permissible loss of head for a particular flow rate, the manufacturer should be consulted on head losses at the particular flow rate for the products.

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 C502, Dry-Barrel Fire Hydrants, of latest edition.
2. 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.
3. Quantity required.
4. Number of outlet nozzles for hose and pumper.
5. Nominal inside diameter of the outlet nozzles, in inches (or millimeters).
6. Type of outlet-nozzle threads. Outlet-nozzle threads should conform to those in service in the system where the hydrant is to be installed. If the threads are to

conform with National Fire Protection Association (NFPA)* 1963, Standard for Fire Hose Connections, reproduced in part in appendix A of this standard, this requirement should be specified. If the threads are not of this type, the following thread detail dimensions, with acceptable tolerance, should be specified (or a suitable sample supplied): major diameter, minor diameter, pitch diameter, thread form, and number of threads per inch.

7. Details of other federal, state, local, and provincial requirements (Sec. 4.4.1).

8. Length of bury, to nearest ½ ft (152 mm) (Sec. 4.6.4).

9. Direction of rotation of the operating nut to open the hydrant; that is, left (counterclockwise) or right (clockwise). This direction should conform to the practice in the system where the hydrant is to be installed (Sec. 4.6.5.3).

10. Size and type of inlet connection and joint accessories, such as gaskets, bolts, or nuts, if any (Sec. 4.7).

11. Size of hydrant, designated by the nominal diameter of the main valve opening (Sec. 4.8.1.4).

12. Color of the finish paint above the ground line and any special paint requirements (Sec. 4.13.2 and Sec. 4.13.3).

13. Location to which hydrants are to be shipped and any special shipping instructions or requirements (Sec. 6.2).

Optional information (if required by purchaser)

1. Type of shutoff, if there is a preference (Sec. 1.1).

2. Special designs or features (Sec. 4.2 and Sec. 4.5).

3. Catalog and maintenance data, net weight, and drawings. Specify whether drawings are to be accepted before the manufacture of the hydrants (Sec. 4.3).

4. Alternate materials, if the water that will be used in the hydrants promotes galvanic corrosion (Sec. 4.4.2.5.3; also, consult manufacturers).

5. Outlet-nozzle cap chains and cap gasket, if not desired (Sec. 4.6.3.2).

6. Operating and outlet-nozzle cap nuts—if different from those specified in this standard and if special protection of the operating nut is required (Sec. 4.6.5.5).

7. Harnessing lugs (Sec. 4.7.2).

8. Drain outlet—whether it is to be omitted or retained and tapped for drain pipe (Sec. 4.8.2).

9. Corrosion-resistant bolts and nuts (Sec. 4.11).

*National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269.

10. Records of production tests (Sec. 5.1).
11. Whether inspection is required (Sec. 5.3.1).
12. Affidavit of compliance (Sec. 6.3).

III.B. *Modification to standard.* Any modification of 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. Edited throughout to conform to the current AWWA recommended format.
2. NSF/ANSI 61 references for fire hydrants corrected.
3. Sec. 1.2, Purpose, and Sec. 1.3, Application, were added.
4. Identification of copper alloys changed to refer to their respective ASTM* standard number in Table 1 in place of the letter grade of bronzes.
5. References to metric bolting added.
6. Table 5 expanded to include loss of head at 1,500 gpm flow rates.
7. Figure A.1 added for the "American National Fire Hose Screw Thread" configuration.
8. Figure A.2 added for the "Nominal Dimensions of Connections."

V. Comments. If you have any comments or questions about this standard, please call the AWWA Volunteer and Technical Support Group, (303) 794-7711, FAX (303) 795-7603, write to the group at 6666 West Quincy Avenue, Denver, CO 80235-3098, or e-mail at standards@awwa.org.

*ASTM International, 100 Barr Harbor Dr., West Conshohocken, PA 19428.

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AWWA Standard

Dry-Barrel Fire Hydrants

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes post-type, dry-barrel fire hydrants with compression shutoff (opening against or with the pressure) or gate shutoff for use in water supply service in all climates, including those where freezing occurs.

1.1.1 *Exceptions.* This standard does not cover the wet-barrel or flush-type of hydrants. (For wet-barrel type, see ANSI/AWWA C503. For flush-type, see AWWA Manual M17, *Installation, Field Testing, and Maintenance of Fire Hydrants.*) This standard, ANSI/AWWA C502, does not provide instructions for installation of fire hydrants. For installation information, see ANSI/AWWA C600 and AWWA Manual M17.

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum requirements for dry-barrel fire hydrants for fire-protection service, including materials, general design, and testing.

Sec. 1.3 Application

This standard can be referenced in specifications for purchasing and receiving dry-barrel fire hydrants for water supply service and can be used as a guide for