ANSI/AWWA C502-18
(Revision of ANSI/AWWA C502-14)

American Water Works Association

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AWWA Standard

Dry-Barrel Fire Hydrants

Effective date: Jan. 1, 2019.
First edition approved by AWWA Board of Directors June 24, 1913.
This edition approved Oct. 24, 2018.
Approved by American National Standards Institute Sept. 21, 2018.

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Since 1881

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AWWA Standard

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ISBN-13, print: 978-1-62576-321-2

eISBN-13, electronic: 978-1-61300-498-2

DOI: http://dx.doi.org/10.12999/AWWA.C502.18

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 pertains to 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, 1917, 1938, 1940, 1943, 1953, 1964, 1973, 1980, 1985, 1994, 2005, and 2014. This edition of C502 was approved on Oct. 24, 2018.

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 Water Research Foundation (formerly 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 resides 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. Specific policies of the state or local agency.
2. Standards developed under the direction of NSF‡ NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects; NSF/ANSI 61, Drinking Water System Components—Health Effects; and NSF/ANSI 372 Drinking Water System Components—Lead Content.

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

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

‡ NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

3. 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.

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 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. *Ownership, Use, and Maintenance.* 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 for the conveyance of drinking water, such as for use as components of a temporary bypass piping system, or for dispensing drinking water for special events, are applications that require particular care. Surfaces that are in contact with the water must be properly disinfected and evaluation must be performed to ensure that materials in the waterway are suitable for contact with drinking water. The requirements of NSF/ANSI 61 and 372 address the safety of additives from the surfaces of a fire hydrant that are in contact with drinking water when the main valve is closed. Surfaces that are downstream of the main valve, which are in contact with the water when the main valve is open, are not covered by these standards.

* Both publications available from The National Academies Press, 500 Fifth Street NW, Washington, DC 20001.

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

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

II.B. *Advisory Information on Product Application.* 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, the hydrant is not in proper working order and should be promptly repaired. Wrenches for fire hydrants should be constructed so that the operating nut can be readily reversed.

Hydrants produced according to ANSI/AWWA C502 are required to meet a test of 200 lb·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 2½-in. (64-mm) outlet nozzle are not considered to be suitable for normal fire protection service.

If Table 4 of this 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.

The physical and chemical properties of hydrant component materials should be considered when preparing a specification for fire hydrants. Material melting points, compatibility with treatment chemicals, and other properties can affect performance of a fire hydrant depending on the specific conditions of an application.

II.C. *Chlorine and Chloramine Degradation of Elastomers.* The selection of materials is critical for water service and distribution piping in locations where there is a possibility that elastomers will be in contact with chlorine or chloramines. Documented research has shown that elastomers such as gaskets, seals, valve seats, and encapsulations may be degraded when exposed to chlorine or chloramines. The

impact of degradation is a function of the type of elastomeric material, chemical concentration, contact surface area, elastomer cross-section, environmental conditions, and temperature. Careful selection of and specifications for elastomeric materials and the specifics of their application for each water system component should be considered to provide long-term usefulness and minimum degradation (swelling, loss of elasticity, or softening) of the elastomer specified.

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 revision.

2. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects and NSF/ANSI 372 Drinking Water System Components—Lead Content, 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 connection. Outlet nozzle connections should conform to those in service in the system where the hydrant is to be installed. If the connections 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 connections are threaded and threads are not of this type, the following thread detail dimensions, with acceptable tolerance, should be specified (or a suitable sample supplied):

a) major diameter
b) minor diameter
c) pitch diameter
d) thread form
e) number of threads per inch.

* National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.

7. Bury depth, the distance measured in feet and inches to the nearest 6 in. from the bottom of the connecting pipe to the ground line (trench depth) (See Section 3).

8. Details of federal, state, and local requirements (Sec. 4.4.1).

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. 4.6.4.3).

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 and type of paint to be applied on the outside of the hydrant top section (Sec. 4.13.2).

13. Whether special markings are required (Sec. 6.1).

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

III.B. *Optional Information (if required by purchaser)*

1. Type of shutoff, if there is a preference (Sec. 4.4.1).

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

3. Alternative materials, if the water that will be used in the hydrants promotes corrosion (Sec. 4.4.2.4.3; also, consult manufacturers).

4. Special designs or features (Sec. 4.5 and Sec. 4.6).

5. Outlet-nozzle cap chains and cap gasket, if not desired (Sec. 4.6.3.2 and 4.6.3.4).

6. Operating nuts and threaded outlet-nozzle cap nuts, if different from those specified in this standard and if special protection of the operating nut is required (Sec. 4.6.4.5).

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).

10. Records of production tests (Sec. 5.1).

11. Whether inspection is required (Sec. 5.3.1).

12. Affidavit of compliance (Sec. 6.3).

13. Manufacturer's Certification of Compliance to NSF/ANSI 61, Drinking Water System Components—Health Effects.

III.C. *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. C502 was revised to bring the text into alignment with C503.
2. An advisory statement was added in the Foreword (Sec. II.C) regarding chlorine and chloramine degradation of elastomers.
3. An advisory statement was added in the Foreword (Sec. II) regarding the use of hydrants for the conveyance of drinking water.
4. Added definition for *Potable water* in Section 3.
5. Coverage of hub ends was deleted from Section 4.7.1 *Connections.*
6. Coverage of malleable iron was deleted from Section 4.4.2 *Physical and chemical properties of components* and Section 4.5.4 *Parts made of gray or ductile iron.*

V. Comments. If you have any comments or questions about this standard, please contact AWWA Engineering and Technical Services at 303.794.7711, FAX 303.795.7603, write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098, or email at standards@awwa.org.

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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 fire protection 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.) 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 fire protection service and can be used as a guide for evaluating materials and designing, testing, and inspecting dry-barrel fire hydrants. The stipulations of this standard apply when this document has been referenced and then only to dry-barrel fire hydrants for water supply service.