



**American Water Works
Association**

The Authoritative Resource on Safe Water®

ANSI/AWWA C517-09
(Revision of ANSI/AWWA C517-05)

AWWA Standard

Resilient-Seated Cast-Iron Eccentric Plug Valves



Effective date: March 1, 2010.

First edition approved by AWWA Board of Directors June 12, 2005.

This edition approved June 14, 2009.

Approved by American National Standards Institute Jan. 14, 2010.

6666 West Quincy Avenue
Denver, CO 80235-3098
T 800.926.7337
www.awwa.org

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Committee Personnel

The AWWA Standards Committee on Eccentric Plug Valves, which reviewed and approved this standard, had the following personnel at the time of approval:

Fred L. Hinker, *Chair*

Amzad Ali, *Vice-Chair*

General Interest Members

K.R. Augenbergs, HNTB Corporation, Indianapolis, Ind.	(AWWA)
F.L. Hinker, Santa Rosa, N.M.	(AWWA)
M.B. Horsley, Black & Veatch Corporation, Kansas City, Mo.	(AWWA)
T.J. McCandless,* Standards Engineer Liaison, AWWA, Denver, Colo.	(AWWA)
W.H. Peffley, Crawford Murphy & Tilly, Springfield, Ill.	(AWWA)
B.M. Shepherd,* Standards Council Liaison, Claremont, Calif.	(AWWA)
R.B. Woodbury, ARCADIS, Toledo, Ohio	(AWWA)

Producer Members

A. Abuellel, Henry Pratt Company, Aurora, Ill.	(AWWA)
J.V. Ballun, Val-Matic Valve & Manufacturing Corporation, Elmhurst, Ill.	(AWWA)
M.A. Bell, Victaulic, Bainbridge Island, Wash.	(AWWA)
J. Bottenfield, Clow Valve Company, Oskaloosa, Iowa	(AWWA)
P. Janagan, DeZURIK Water Controls, Sartell, Minn.	(AWWA)

User Members

A. Ali, Metro Vancouver, Surrey, B.C., Canada	(AWWA)
T.M. Curry, Laurel, Md.	(AWWA)
J.L. Reddy, Kansas Water Pollutions Department, Kansas City, Mo.	(AWWA)
M.A. Sayed, Detroit Water & Sewerage Department, Detroit, Mich.	(AWWA)
T.F. Walz, Phoenix Water Services Department, Phoenix, Ariz.	(AWWA)

* Liaison, nonvoting

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C517.

I. Introduction.

I.A. *Background.* Resilient-seated cast-iron eccentric plug valves were introduced in the 1930s as a tight-sealing and wear-resistant valve for handling fluids with solids content. The valve has since grown in use for both potable and wastewater applications.

I.B. *History.* Resilient-seated cast-iron eccentric plug valves were first standardized by the Manufacturers Standardization Society (MSS) in 1991, in standard practice SP-108. The need for standardization of resilient-seated cast-iron eccentric plug valves by the American Water Works Association (AWWA) was recognized in 1995. In 1998, the AWWA Standards Council authorized the Eccentric Plug Valve Committee to develop a new standard. The first edition of C517 was approved by the AWWA Board of Directors on June 12, 2005. This edition was approved on June 14, 2009.

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, now Water Research Foundation) 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 the 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.

* 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.

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 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 C517 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. *General.* Conditions under which a valve is to be operated must be evaluated carefully by the purchaser. Torque requirements for valve operation vary considerably with differential pressure across the valve, fluid velocity, fluid temperature, and upstream piping conditions.

Flow and pressure direction is important in the installation and use of an eccentric plug valve. Valve performance and sealing characteristics vary with direction of flow and pressure.

II.B. *Advisory Information on Product Application.* This standard does not cover all possible applications or manufacturing technologies. The purchaser should

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

† Both publications available from National Academy of Sciences, 500 Fifth St., NW, Washington, DC 20001.

identify special requirements and required deviations from this standard and include appropriate language in purchase documents (refer to Sec. III.A) in this foreword. Other advisory information is provided below.

1. The maximum anticipated flow velocity through the valve, maximum non-shock shutoff pressure, and water temperature range are used by manufacturers to calculate torque requirements, which then may determine valve operating-component design and actuator sizing. This information should be provided under items 6, 7, and 18 of Sec. III.A in this foreword.

NOTE: If this information is not provided by the purchaser, valve actuators may be sized to actuate the valve at a shutoff pressure differential equal to the design working pressure of the valve and a flow velocity of 8 fps (2.4 mps). This may result in an oversized valve actuator and a significant unwarranted expense for the purchaser.

2. This standard limits handwheel rim pull, but not handwheel diameter. A smaller handwheel may require a more expensive actuator requiring more turns. If a large-diameter handwheel is of concern, because of clearance or other limitations, the diameter should be limited to an acceptable dimension under item 14 of Sec. III.A in this foreword.

3. This standard does not require a minimum waterway area nor does it limit head loss across the valve. If this is of concern, limitations should be provided.

4. This standard allows a party other than the valve manufacturer to mount an actuator to a valve. The purchaser is cautioned that the valve manufacturer cannot assume responsibility for the valve's sealing and operating performance if the actuator is mounted or adjusted by a party other than the valve manufacturer. If this is a concern, requirements on actuator mounting should be included in the purchase documents.

5. Electric actuators meeting ANSI/AWWA C542, Standard for Electric Motor Actuators for Valves and Slide Gates, can be supplied with or without an intermediate quarter-turn mechanism. If desired, the purchaser should specify a multiturn actuator coupled to an intermediate mechanism meeting ANSI/AWWA C542.

6. This standard does not require rubber parts to be specifically tested or to be specifically suitable for service with line content containing chlorine or chloramines. Standardized tests measuring resistance to chlorine or chloramine-bearing waters were not available at the date of introduction of this standard.

If these or other chemical constituents are of concern, special requirements may be included in the purchase documents. Refer to item 26 of Sec. III.A in the foreword.

7. Valves produced in accordance with this standard are also commonly used for wastewater applications with high solids content. For water containing suspended solids or fluids other than water, the manufacturer should be consulted about the applicability of the valve and the materials of construction.

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 to be used—that is, ANSI/AWWA C517, Resilient-Seated Cast-Iron Eccentric Plug Valves, of the latest revision.
2. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.
3. Size of valve.
4. Quantity required.
5. Type of ends: flanged, grooved (flexible or rigid), or mechanical-joint ends.
6. Maximum nonshock shutoff pressure and maximum nonshock line pressure.
7. Maximum flow velocity through the valve when plug is in the full open position. For applications requiring a fluid velocity greater than 8 fps (2.4 mps) when the valve is in the full open position, consult the manufacturer.
8. Description of connecting piping: material, pipe outside diameter, and flanged, grooved, or plain end.
9. Materials.
 - a. If one or more of the materials included in this standard are unacceptable for an application, specify the acceptable materials that are included in this standard.
 - b. If materials included in the standard are not suitable for exposure to line content or are otherwise unacceptable for an application, it is recommended that the purchaser specify materials that are suitable and acceptable for the application after ensuring the alternate material availability from the manufacturer.
10. Type of installation: buried or aboveground.
11. Actuator type and service conditions.
 - a. Actuator type: manual, electric, or other.
 - b. Service condition: open/close or modulating.
12. Manual actuator.
 - a. Type: handwheel, chainwheel, or wrench nut.

- b. Direction to turn operating shaft to open valves. (Unless otherwise specified, counterclockwise direction to open the valve will be furnished.)
 - c. Position indicator, if required.
 - d. Special devices or features, if required: extension stems, floor stand, or hand-wheel diameter.
13. Other actuators: actuators other than those covered by this standard shall be specified by the purchaser in detail.
 14. Valve and actuator arrangement and position.
 15. If valve–torque data are to be furnished.
 16. If shop inspection by the purchaser is required.
 17. Maximum transient pressure and characteristics.
 18. Fluid temperature range.
 19. If certified drawings are to be furnished by the manufacturer (Sec. 4.2).
 20. Details of other federal, state, or provincial, and local requirements (Sec. 4.3.1).
 21. If delivery of test results is required (Sec. 4.3.4).
 22. Detailed description of nonstandard end connections (Sec. 4.4.1).
 23. This standard requires ASME B16.1 flat-faced, class 125 cast-iron flanges. If other facings are desired, they must be specified by the purchaser.
 24. Type of stem seal (Sec. 4.4.7).
 25. For low-pressure applications, <25 psig, the purchaser should request a low-pressure 5-psig seat test to ensure the valve will not leak. For pressures below 5 psig, the purchaser should contact the manufacturer.
 26. Considerations relating to anticipated problems with rubber components exposed to line content containing chlorine, chloramines, or other chemicals. If such problems are anticipated, the purchaser should identify the maximum expected concentrations of these chemicals and other factors, such as pH and temperature ranges, which may affect the corrosivity of these chemicals. The purchaser should consult with the manufacturers and, if appropriate, specify special requirements for these components.
 27. If the furnishing of test records or reports is required that are specified under Sec. 4.4.9.5.6, 4.4.9.5.7, 5.2.1, and 5.2.2 of this standard. Test records required for power actuators under ANSI/AWWA C541 or C542 may also be requested. The purchaser may require all records or may stipulate a breakdown of production test records and/or proof-of-design test records in the purchase order.
 28. Electric actuator (Sec. 4.4.9.6) requirements.

a. Type: multiturn actuator coupled to an intermediate mechanism or integral quarter-turn mechanism.

b. Characteristics: operating voltage, control scheme, and time of operation (unless otherwise specified, fully open to fully closed, or the reverse, will be approximately 60 sec \pm 10 sec).

c. Position indicator.

d. Special considerations: type of service environment should be stated and appurtenances required.

29. Protective coatings if other than those specified in Sec. 4.5.2 in this standard. Additionally, any requirements for coating interior ferrous surfaces shall be specified in detail.

30. Minimum durations of shell and seat tests, if different durations than those shown in Table 3 of the standard are desired (Sec. 5.2.1).

31. If a bidirectional leakage test is required, and if so, specify the reverse test pressure(s) required. Similarly, specify if a low-pressure test is required for seat leakage (Sec. 5.2.1.4).

32. If an affidavit of compliance is to be furnished (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. Expanded Scope and Purpose to include wastewater and reclaimed water service.

2. Added references to ANSI/AWWA Standards C541 and C542 for power actuator requirements.

3. Removed contractual language from the body of the standard.

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 the group at standards@awwa.org.



**American Water Works
Association**

AWWA Standard

Resilient-Seated Cast-Iron Eccentric Plug Valves

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes resilient-seated cast-iron eccentric plug valves, 3 in. (75 mm) through 72 in. (1,800 mm) in diameter, with flanged, grooved, or mechanical-joint ends, for water, wastewater, and reclaimed water systems having a pH range from 6 to 12 and a temperature range from 33°F to 125°F (0.6°C to 52°C). The minimum design pressure shall be 175 psig (1,208 kPa) for 3 in. through 12 in. (75 mm through 300 mm) sizes and 150 psig (1,034 kPa) for 14 in. through 72 in. (350 mm through 1,800 mm) sizes.

Sec. 1.2 Purpose

The purpose of this standard is to provide minimum requirements for resilient-seated cast-iron eccentric plug valves, suitable for water, wastewater, and reclaimed water service, including materials, application, inspection, handling, and shipping.

Sec. 1.3 Application

This standard can be referenced in purchase documents for resilient-seated cast-iron plug valves. The stipulations of this standard apply when this document has been referenced and then only to resilient-seated cast-iron eccentric plug valves.