



**American Water Works
Association**

The Authoritative Resource on Safe WaterSM

ANSI/AWWA C517-05
(First Edition)

AWWA Standard

Resilient-Seated Cast-Iron Eccentric Plug Valves



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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. This edition of C517 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 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.

*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.

*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 St., N.W., Washington, DC 20001.

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 identify special requirements and required deviations from this standard and include appropriate language in purchase documents. Refer to Sec. III.B 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 5, 6, and 23 of Sec. III.B 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.B 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 C540, Standard for Power-Actuating Devices for Valves and Slide Gates, can be supplied with or without an intermediate quarter-turn mechanism. If desired, the purchaser should specify a multi-turn actuator coupled to an intermediate mechanism meeting ANSI/AWWA C540.

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 document. Refer to item 27 of Sec. III.B 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 in addition to the requirements of the Safe Drinking Water Act.
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 handwheel 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 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.
20. Minimum durations of shell and seat tests, if different durations than those shown in Table 3 of the standard are desired.
21. For low-pressure applications, <25 psig, the purchaser should request a low-pressure 5-psig seat test to assure that the valve will not leak. For pressures below 5 psig, the purchaser should contact the manufacturer.
22. This standard requires flat-faced flanges, ASME/ANSI B16.1, class 125 cast-iron flanges. If other facings are desired, they must be specified by the purchaser.
23. 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.
24. If certified drawings are to be furnished by the manufacturer (Sec. 4.2).
25. Details of other federal, state, local, and provincial requirements (Sec. 4.3.1).