



**American Water Works
Association**

ANSI/AWWA C561-12
(Revision of ANSI/AWWA C561-04)

The Authoritative Resource on Safe Water®

AWWA Standard

Fabricated Stainless- Steel Slide Gates



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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C561.*

I. Introduction.

I.A. *Background.* A fabricated stainless-steel slide gate is a vertically sliding gate with a fabricated, reinforced stainless-steel slide and a frame with ultra-high-molecular-weight (UHMW) polyethylene seating faces and seals or UHMW polyethylene seating faces and resilient rubber seals. The slide gate consists of a self-contained frame or non-self-contained frame and a slide. Examples of where this type of gate is used include the control of water and wastewater through orifice openings in walls, at the end of pipes, at the ends of open-top channels or within open-top channels, and controlling flow at openings in tank walls. Downward-opening gates act as weir gates. Slide gates are raised and lowered by means of a stem or rod using a manually operated screw stem hoist, an electrically driven screw stem hoist, or by a hydraulic or pneumatic cylinder. Gates are mounted directly to concrete walls with anchor bolts, grouted into blockouts within concrete channel walls, or bolted to a pipe flange or wall thimble. Another term used to describe slide gates is *sluice gates*.

The term *slide gate* has been adopted for use by this series of standards, which supersede ANSI/AWWA C501-92. The standards are

ANSI/AWWA C560—Cast-Iron Slide Gates

ANSI/AWWA C561—Fabricated Stainless-Steel Slide Gates

ANSI/AWWA C562—Fabricated Aluminum Slide Gates

ANSI/AWWA C563—Fabricated Composite Slide Gates

The slide gates represented by ANSI/AWWA C560 through ANSI/AWWA C563 differ in material and means of sealing between the slide and the fixed frame as described below.

ANSI/AWWA C560 gates have a cast-iron or cast-ductile-iron slide and frame with machined metal seating faces and wedges to force the slide to seal between the seating faces on the slide and frame.

ANSI/AWWA C561 gates have a fabricated, reinforced stainless-steel slide and a frame with UHMW polyethylene seating faces and seals or UHMW polyethylene seating faces and resilient rubber seals.

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

ANSI/AWWA C562 gates have a fabricated, reinforced aluminum slide and a frame with UHMW polyethylene seating faces and seals or UHMW polyethylene seating faces and resilient rubber seals.

ANSI/AWWA C563 gates have fiberglass reinforced composite-plastic or rigid compressed plastic slides and frames of either fiberglass-reinforced composite-plastic stainless-steel or coated carbon steel, with UHMW polyethylene seating faces and seals or UHMW polyethylene seating faces and resilient rubber seals.

I.B. *History.* The original AWWA standard for slide gates (then referred to as sluice gates) was approved as tentative on June 26, 1941, and described cast-iron gates. The tentative standard was revised and approved on June 4, 1967, as AWWA C501. Subsequent editions were approved in January 1980, June 1987, and June 1992. Following the latest revision, the Standards Council authorized the development of additional standards for slide gates to recognize the widespread use of slide gates similar to ANSI/AWWA C501 gates in performance but manufactured by different methods and from different materials. For consistency among the new standards and recognizing the new designs employed, the Standards Council directed that each of the standards use the name *slide gate* in lieu of the term *sluice gate*. The Standards Council also directed that ANSI/AWWA C501 be redesignated ANSI/AWWA C560, with subsequent slide gate standards numbered consecutively. The first edition of ANSI/AWWA C561, Fabricated Stainless-Steel Slide Gates, was approved on Jan. 18, 2004. This edition was approved on Jan. 22, 2012.

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 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

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

1. An advisory program formerly administered by USEPA, Office of Drinking Water, discontinued on April 7, 1990.
2. Specific policies of the state or local agency.
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 Chemical 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 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 C561 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 additive 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. This standard has no applicable information for this section.

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.

* 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 Street, NW, Washington, DC 20001.

III.A. *Purchaser Options and Alternatives.* The following items shall be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA C561, Fabricated Stainless-Steel Slide Gates, of latest revision.
2. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.
3. Number of units required.
4. Type of closure: conventional or flush-bottom.
 - a. Size, by width and height of clear opening.
5. Design head measured from the surface of water/wastewater to centerline of gate, in ft (m), for the following:
 - a. Seating head.
 - b. Unseating head.
6. Operating head measured from surface of water/wastewater to centerline of gate, in ft (m), in both seating and unseating conditions.
7. Type of lift actuator: manual, electric-motor-driven, or hydraulic-cylinder. If electric-motor-driven or hydraulic-cylinder, the purchaser should refer to ANSI/AWWA C542, Electric Motor Actuators for Valves and Slide Gates, or ANSI/AWWA C541, Hydraulic and Pneumatic Cylinder and Vane-Type Actuators for Valves and Slide Gates, respectively, of latest revision.
8. Conventional mounted frame or self-contained thrust reaction frame.
9. Upward- or downward-opening gate.
10. If hydraulic or pneumatic actuators are specified, provide cylinder operating media and pressure (refer to ANSI/AWWA C541, Hydraulic and Pneumatic Cylinder and Vane-Type Actuators for Valves and Slide Gates, of latest revision).
11. Definition of any special design and construction required for conditions beyond the scope of this standard, such as throttling service, environmental conditions, sediment or grit exposure, and intended operation frequency and duration.
12. Frequency of operation and special operating conditions, such as ice formation.
13. An installation-requirement drawing showing clearances, wall and floor thicknesses, details of wall pipe and thimble installation, and location of actuator.
14. Any drawings and material requirements required of the supplier or of the manufacturer (Sec. 4.1 and 4.2).
15. Details of other federal, state or provincial, and local requirements (Sec. 4.3)

16. If test records must be viewed (Sec. 4.3.2).
17. Acceptable materials (Sec. 4.3.3).
18. If seals, separate from seats, are to be provided (Sec. 4.3.3.8).
19. Rising stem or nonrising stem (Sec. 4.4.7 and 4.4.11).
20. Type of gate mounting used; if a wall thimble is used, required length and shape (Sec. 4.4.10).
21. Omission of stem covers if not required (Sec. 4.4.13.6).
22. If a gate position indicator is to be provided with the actuator (Sec. 4.4.13.7).
23. If an actuator stand is needed (Sec. 4.4.14).
24. Weld inspections, if required (Sec. 4.5.1.3.2).
25. Inspection by purchaser, if required (Sec. 5.1).
26. Leakage tests in the shop (Sec. 5.2.1) and in the field (Sec. 5.2.2), if required.
27. Separate shipment of embedded items, if required (Sec. 6.2).
28. Affidavit of compliance, if required (Sec. 6.3).

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

IV. Major Revisions. Major revisions made to the standard in this edition include the following:

1. The foreword was extensively updated to bring consistency among the four slide gate standards: Fabricated Stainless-steel, Fabricated Aluminum, Fabricated Composite, and Cast Iron.
2. Wastewater considerations were included where applicable.
3. Section 4, Requirements, was extensively updated to read identically in the four slide gate standards except where materially different.
4. Safety factors (both ultimate and yield) were increased to ensure that the yoke would be designed at yield.
5. Tensile, compressive, and critical buckling loads were readdressed and language clarified.
6. Maximum pressure velocity factors under defined operating conditions (modulating open/close) were added to the general design along with new language for lift nut requirements, specifically pressure on the thread contact area and the ratio of the lift nut length to the diameter of the stem.
7. Allowable leakage rate for seating and unseating head was determined the same for all materials of construction.

V. Comments. If you have any comments or questions about this standard, please call 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.





**American Water Works
Association**

AWWA Standard

Fabricated Stainless-Steel Slide Gates

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes vertically mounted, fabricated stainless-steel slide gates with full-aperture closure, designed for either seating or unseating head, or both, in ordinary water supply and wastewater service. The gates are primarily used to shut off or throttle water or wastewater flow through a rectangular or round orifice, end of channel, or in-channel opening. They may be either of conventional-closure or flush-bottom-closure type and may open upward or downward. This standard also describes manual gate actuator mechanisms together with standard accessories. Power-actuated mechanisms (including electric, hydraulic, or pneumatic) are described in ANSI/AWWA C541 and ANSI/AWWA C542.

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum requirements for fabricated stainless-steel slide gates, including materials, general design, manufacture, testing, inspection, and shipment.

Sec. 1.3 Application

This standard can be referenced in specifications for purchasing and receiving stainless-steel slide gates and can also be used as a guide for designing and manufacturing fabricated stainless-steel slide gates. The stipulations of this standard