



**American Water Works  
Association**

The Authoritative Resource on Safe Water®

ANSI/AWWA C712-10  
(Revision of ANSI/AWWA C712-02)

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*AWWA Standard*

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# Cold-Water Meters— Singlejet Type



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## Foreword

*This foreword is for information only and is not a part of ANSI/AWWA C712.*

### **I. Introduction.**

I.A. *Background.* The subcommittee that drafted this standard was formed in June 1998 from the AWWA Standards Committee on Water Meters.

Singlejet meters have been available commercially in the United States and Canada for use in potable water applications since 1991.

The singlejet type, like some class I turbine (with helical blades or flat blades) and multijet types, is an inferential meter in which the moving element is a multi-bladed rotor, mounted on a vertical spindle within a cylindrical cavity. The operating objective is that the speed of rotation of the rotor is linearly proportional to the velocity of water flow through the meter.

The singlejet-type meter has one large opening at the inlet side that gradually reduces in diameter, resulting in the water flow becoming a jet, usually integral with the main case that directs the water flow against the rotor. The opening is sized to achieve the above-linear speed objective. Most singlejet meters do not have a separate measuring chamber to house the rotor and jet nozzle. Also, the singlejet type differs in that it does not usually employ a valved bypass to adjust the rotor speed, as is done on many multijet and turbine-type meters. In a singlejet, rotor speed adjustments are made by either gear selection in the register or by moving the upper or lower damping vane's position relative to the rotor surfaces, thereby adjusting the fluid drag effects on rotor speed.

I.B. *History.* Early European references to singlejet (originally called Faller) meters date back to the turn of the 20th century. An early text reference can be found in an article by G. Daries, engineer for the Water Service in Paris, France, entitled "Note on Water Meters," published in 1911, in which he questions the early design's accuracy and longevity. These meters were used primarily in Europe and Asia, where low price was of more concern than performance.

In the 1950s and 1960s, some American water meter companies produced low-cost singlejet meters in relatively small numbers for the submetering and export markets.

With the advent of the modern singlejet meter in the 1970s, the deficiencies in performance and durability were reduced from the earlier designs of singlejet meters.

The first edition of ANSI/AWWA C712 was approved by the AWWA Board of Directors on January 20, 2002. This edition was approved Jan. 17, 2010.

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 the 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 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, NSF<sup>†</sup>/ANSI<sup>‡</sup> 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*,<sup>§</sup> 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.

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

† NSF International, 789 N. Dixboro Road, Ann Arbor, MI 48113.

‡ 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, N.W., Washington, DC 20001.

ANSI/AWWA C712 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 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. *Fire Flow.* The meters described in this standard are not designed to be used in water service piping intended to extinguish fire. Requirements for residential fire service products and combined residential domestic/fire service products are currently being developed as a part of a new ANSI/AWWA water meter standard, Standard for Cold-Water Meters—Residential Fire Service Type.

**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.* This standard provides for several options and alternatives that purchasers must designate if they wish to exercise the options or if they have preferences among alternatives. Also, several items must be specified by purchasers to describe completely the type, size, and quantity of meters required. All such items, options, and alternatives are summarized in the following itemized list. Purchasers should review each one and make the appropriate provisions in the purchaser's documents to describe specific requirements.

1. Standard used—that is, ANSI/AWWA C712, Cold-Water Meters—Singlejet Type, of latest revision.
2. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.
3. Details of other federal, state or provincial, and local requirements (Sec. 4.1).
4. Whether main cases are to be constructed of a copper alloy or a suitable engineering plastic (Sec. 4.1.2).
5. Size of meter (Sec. 4.2.1) and quantity required.
6. Modifications of test specifications (Sec. 4.2.8) if operating water temperatures will exceed 80°F (27°C) (Sec. A.4.2).
7. Type of connections for 1½-in. (40-mm) and 2-in. (50-mm) meters (Sec. 4.3.3).
8. Type of connections for ⅝-in. (15-mm), ⅝-in. × ¾-in. (15-mm × 20-mm), ¾-in. (20-mm), and 1-in. (25-mm) meters (Sec. 4.3.3.3).

9. Whether couplings (tailpieces) are to be provided (Sec. 4.3.4), and whether components are to be of a copper alloy or a suitable engineering plastic (Sec. 4.1.9).

10. Whether companion flanges, gaskets, bolts, and nuts are to be provided with flanged meters (Sec. 4.3.5), and whether companion flanges are to be made of a copper alloy, cast iron, or a suitable engineering plastic (Sec. 4.1.10).

11. Details of the register to be provided (i.e., US gallons, cubic feet, or cubic meters; dry or wet register; mechanical or electronic display type) (Sec. 4.3.6).

12. If a direct-reading remote register or a remote-encoder register is required (Sec. 4.3.7), to be specified in detail.

13. If warranty requirements will be required (Sec. 5.1).

14. Whether an affidavit of compliance will be required (Sec. 6.3).

15. Special materials required, if any, to resist corrosion if water is highly aggressive (Sec. A.4.3).

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.** The major revisions to the standard in this edition include the following:

1. Reference to the discontinued ASTM D2135 has been removed from the references section (Section 2), and from the materials section for measuring rotors (Sec. 4.1.5) and rotor spindles (Sec. 4.1.6).

2. Definitions for electronic display and mechanical display have been added (Section 3).

3. The section on registers has been expanded to describe electronic display registers (Sec. 4.3.6 and subsections).

4. The scope of the standard has been broadened to include meter sizes  $\frac{5}{8}$  in. (15 mm) through 6 in. (150 mm).

5. A new section on Fire Flow, Sec. II.A, has been added to the foreword.

6. Table 1, Operating Characteristics, has been modified, and now includes meter sizes  $\frac{5}{8}$  in. to 1 in. (15 mm to 25 mm). A footnote on "Recommended Maximum Rates for Continuous Duty" has also been added.

7. The minimum thickness values provided in Table 3 have been modified.

**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 303.795.7603, write to the group at 6666 West Quincy Avenue, Denver, CO 80235-3098, or e-mail at standards@awwa.org.



**American Water Works  
Association**

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*AWWA Standard*

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# **Cold-Water Meters— Singlejet Type**

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## **SECTION 1: GENERAL**

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### **Sec. 1.1 Scope**

This standard describes the various types and classes of cold-water, singlejet meters in sizes  $\frac{5}{8}$  in. (15 mm) through 6 in. (150 mm) for water utilities' customer service and the materials and workmanship employed in their fabrication. These meters register by recording the revolutions of a rotor powered by the force of flowing water striking its blades.

### **Sec. 1.2 Purpose**

The purpose of this standard is to provide the minimum requirements for cold-water singlejet meters, including material and design.

### **Sec. 1.3 Application**

This standard can be referenced in specifications for purchasing and receiving cold-water singlejet meters. This standard can be used for manufacturing this type of meter. The stipulations of this standard apply when this document has been referenced, and then only to cold-water singlejet meters.