ANSI/AWWA **C708-19**

(Revision of ANSI/AWWA C708-15)

AWWA Standard

Cold-Water Meters—Multijet Type

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American Water Works Association

Approved American National Standard ANSI

STANDARD Since 1881

AWWA Standard

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Committee Personnel

The AWWA Subcommittee on Multijet Vane-Type Meters, which reviewed, developed, and approved this revision of AWWA C708, had the following personnel at that time:

Craig C. Hannah, *Chair*

R.A. Barillas, Badger Meter, Milwaukee, Wis.
G.H. De Jarlais, Badger Meter, Milwaukee, Wis.
D.J. Devane, Zenner USA, Leeds, Ala.
L. Gregory, RG3 Meter Company, Longview, Tex.
J.G. Gunn, Johnson Controls, Inc., Victor, N.Y.
C.C. Hannah, Johnson Controls, Inc., Lubbock, Tex.
A. Hendey Sr., Hendey Meter, Beaumont, Calif.
M.C. Johnson, Utah Water Research Laboratory, Utah State University, Logan, Utah
T.A. Kelly Jr., Washington Suburban Sanitary Commission, Hyattsville, Md.
R.N. Koch, Master Meter Inc., Pittsburgh, Pa.
J. Pintok, RG3 Meter Company, Lake Mary, Fla.
J.A. Reiss, Elster AMCO Water LLC, Ocala, Fla.
R. Sloan, Birmingham Water Works Board, Birmingham, Ala.
T. Smith, Sensus, Morrisville, N.C.
S.M. Swanson, Sensus, Uniontown, Pa.
W.J. Vetter, Master Meter Inc., Mansfield, Tex.
A.M. Watson, Elster AMCO Water LLC, Ocala, Fla.

The AWWA Standards Committee on Water Meters, which reviewed and approved this revision, had the following personnel at the time of approval:

Thomas A. Kelly Jr., *Chair*
Michael L. Mastic, *Secretary*

General Interest Members

J.E. Cray, Wright-Pierce, Andover, Mass.
A. Dabak, Texas Instruments, Dallas, Tex.
D. Faber, Faber & Associates, Columbus, Ind.
R.C. Graff, Poway, Calif.
J.G. Gunn (*alternate*), Johnson Controls Inc., Victor, N.Y.

C.C. Hannah, Johnson Controls, Inc., Lubbock, Tex.
D.E. Hood, M.E. Simpson Company Inc., Valparaiso, Ind.
A.M. Horbovetz (*alternate*), M.E. Simpson Company Inc., Valparaiso, Ind.
M.C. Johnson, Utah Water Research Laboratory, Utah State University, Logan, Utah
F.S. Kurtz (*liaison, nonvoting*), Standards Engineer Liaison, AWWA, Denver, Colo.
M.L. Mastic, MARS Company, Ocala, Fla.
R.A. Richter, National Institute of Standards and Technology, Gaithersburg, Md.
S. Thakurdesai (*alternate*), Texas Instruments, Dallas, Tex.

Producer Members

F.J. Begale (*alternate*), Badger Meter, Milwaukee, Wis.
T.D. Bianchi, Neptune Technology Group Inc., Tallassee, Ala.
C. Brunson (*alternate*), Neptune Technology Group Inc., Tallassee, Ala.
D. Casper (*alternate*), Mueller Systems, Cleveland, N.C.
M.D. Cole, Meter Technology Werks, Tampa, Fla.
G.H. De Jarlais, Badger Meter, Milwaukee, Wis.
D.J. Devane, Zenner USA, Leeds, Ala.
L. Gregory (*alternate*), RG3 Meter Company, Longview, Tex.
A. Hendey Sr., Hendey Meter, Beaumont, Calif.
R.N. Koch, Master Meter Inc., Pittsburgh, Pa.
M. Laird (*alternate*), Metron-Farnier LLC, Boulder, Colo.
J.A. McCraven, Mueller Systems, Cleveland, N.C.
J. Pintok, RG3 Meter Company, Lake Mary, Fla.
J.A. Reiss (*alternate*), Elster AMCO Water LLC, Ocala, Fla.
M. Shamley, Metron-Farnier LLC, Boulder, Colo.
T. Smith (*alternate*), Sensus, Morrisville, N.C.
S.M. Swanson, Sensus, Uniontown, Pa.
W.J. Vetter (*alternate*), Master Meter Inc., Mansfield, Tex.
A.M. Watson, Elster AMCO Water LLC, Ocala, Fla.

User Members

M.J. Aragon, Denver Water, Denver, Colo.
M.C. Bowen, City of Columbus, Division of Water, Columbus, Ohio
J. Conover Jr., City of Sacramento, Sacramento, Calif.
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T.A. Kelly Jr., Washington Suburban Sanitary Commission, Laurel, Md.
A. Land, Dallas Water Utilities, Dallas, Tex.
S.U. Mills-Wright (*liaison, nonvoting*), Standards Council Liaison, Dallas Water Utilities, Dallas, Tex.
R. Molhoek, Desert Water Agency, Palm Springs, Calif.
K.C. Molli, Veolia Water North America, Chicago, Ill.
J.A. Novak, Milwaukee Water Works, Milwaukee, Wis.
R. Sloan, Birmingham Water Works Board, Birmingham, Ala.
D. Strub, Austin Water Utility, Austin, Tex.

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C708.*

I. Introduction.

I.A. *Background*. For the past century, no tool available to water utilities has played a greater part in water conservation than the water meter. It has reduced waste and distributed the cost of operating a water system in the most equitable manner possible. Multijet meters, which were first designed and produced in 1867, have proved satisfactory for measuring domestic water service.

In inferential-type meters, the moving element is a rotor; the basic principle of this meter is to design it in such a manner that, over the working range of the instrument, the speed of rotation of the rotor bears a linear relationship to the velocity of flow through the meter.

In multijet meters, the moving element takes the form of a multiblade rotor mounted on a vertical spindle within a cylindrical measuring chamber. The liquid enters the measuring chamber through several tangential orifices around the circumference and leaves the measuring chamber through another set of tangential orifices placed at a different level in the measuring chamber.

I.B. *History*. Advances made in the development of nonmetallic materials for water meter construction have been recognized in the Materials section of this standard. Several plastic materials are currently being used successfully for meter components. Several suitable plastic materials are included in this revision.

The first edition of the standard was approved by the AWWA Board of Directors on June 20, 1976. Subsequent editions of this standard were approved on Feb. 1, 1982; Jan. 27, 1991; June 23, 1996; Jan. 16, 2005; June 12, 2011; and Jan. 24, 2015. This edition was approved on Oct. 28, 2019.

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). AWWA and the Association of State Drinking Water Administrators (ASDWA) joined later.

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

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. Specific policies of the state or local agency.
2. Two standards developed under the direction of NSF,† NSF/ANSI/CAN‡ 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects.
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/CAN 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/CAN 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.

In an alternative approach to inadvertent drinking water additives, some jurisdictions (including California, Louisiana, Maryland, and Vermont, at the time of this writing) are calling for reduced lead limits for materials in contact with potable water. Various third-party certifiers have been assessing products against these lead content criteria, and a first-edition ANSI-approved national standard, NSF/ANSI 372, Drinking Water System Components—Lead Content, was published in 2010.

On Jan. 4, 2011, legislation was signed revising the definition for "lead free" within the Safe Drinking Water Act (SDWA) as it pertains to "pipe, pipe fittings, plumbing fittings, and fixtures." The changes went into effect on Jan. 4, 2014. In brief, the new

* Persons outside the United States should contact the appropriate authority having jurisdiction.
† NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.
‡ Standards Council of Canada, 55 Metcalfe Street, Suite 600, Ottawa, ON K1P 6L5 Canada.
§ Both publications available from National Academy of Sciences, 500 Fifth Street NW, Washington, DC 20001.

provisions to the SDWA require that these products meet a weighted average lead content of not more than 0.25 percent.

ANSI/AWWA C708 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. *Fire Flow*. The meters described in this standard are not designed to be used in water service piping intended to extinguish fire. Requirements for meters used for residential fire sprinkler applications that meet the requirements of NFPA* 13D in single- and two-family dwellings and manufactured homes, sizes ¾ in. (20 mm) through 2 in. (50 mm), are found in ANSI/AWWA C714.

II.B. *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 information should be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA C708, Cold-Water Meters—Multijet Type, of latest revision.

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

2. Whether compliance with NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects; NSF/ANSI 372, Drinking Water System Components—Lead Content; or an alternative lead content criterion is required.

3. If warranty requirements will be specified.

4. If the meter is to be read in US gallons, cubic feet, or cubic meters.

5. Details of federal, state, and local requirements (Sec. 4.1).

6. If main casings are to be constructed of a copper alloy, stainless steel, or a suitable engineering plastic (Sec. 4.1.2).

7. If meters are to be provided with cast-iron, stainless-steel, copper-alloy, or suitable engineering plastic top or bottom covers (Sec. 4.1.11), and if there is a preference.

8. Size of meter (Sec. 4.2.1) and quantity required.

9. If corrosion protection is required, such as for cast-iron frost-protection covers (Sec. 4.2.6), and if there is a preference.

10. Modifications of test specifications (Sec. 4.2.8) if operating water temperatures will exceed 80°F (27°C) (Sec. A.4.2).

11. If 1½-in. (40-mm) and 2-in. (50-mm) meters (Sec. 4.3.3) are to be provided with flanged ends or threaded (spud) ends. If threaded (spud) ends are required, specify if threads are to be external NPSM or internal NPT.

12. If couplings (tailpieces) are to be provided with ⅝-in. (15-mm) to 2-in. (50-mm) meters (Sec. 4.3.4) and whether components are to be of a copper alloy, stainless steel, or a suitable engineering plastic (Sec. 4.1.9).

13. If 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, stainless steel, or a suitable engineering plastic (Sec. 4.1.10).

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

15. If an encoder-type remote register is required (Sec. 4.3.6.4), including specifications in detail, and including detailed warranty requirements as to battery life and compatibility with various radio frequency (RF) reading devices.

16. If the size of individual meters will be permanently marked on the register dial face (Sec. 4.4).

17. If an affidavit of compliance (Sec. 6.2) and certificate of testing for accuracy (Sec. A.2.3) are required.

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

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

1. Guidance on selection of materials in terms of chlorine and chloramine degradation of elastomers has been provided in the foreword (Sec. II.B).
2. Reference to ANSI/AWWA C706 on Direct-Reading, Remote-Registration Systems for Cold-Water Meters has been removed (Sec. 4.3.6.4). (ANSI/AWWA C706 was withdrawn as an AWWA standard in 2015.)
3. Provisions for meter marking have been moved from Sec. 6.1 to Sec. 4.4. (The content of the requirements is unchanged.)

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Support at 303.794.7711; FAX at 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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American Water Works Association
Dedicated to the World's Most Important Resource®

AWWA Standard

Cold-Water Meters—Multijet Type

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes cold-water multijet meters in sizes ⅝ in. (15 mm) through 2 in. (50 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 set in motion by the force of flowing water striking the blades.

Sec. 1.2 Purpose

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

Sec. 1.3 Application

This standard can be referenced in specifications for purchasing and receiving cold-water meters—multijet type. 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 meters—multijet type.