ANSI/AWWA **C670-25**

(Revision of ANSI/AWWA C670-20)

AWWA Standard

Online Chlorine Analyzer Operation and Maintenance

Effective date: Jan. 1, 2026.
First edition approved by Board of Directors June 14, 2009.
This edition approved Oct. 13, 2025.
Approved by American National Standards Institute Sept. 5, 2025.

American Water Works Association

Approved American National Standard ANSI

STANDARD Since 1881

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ISBN-13, print: 978-1-64717-289-3

ISBN-13, electronic: 978-1-61300-809-6

DOI: https://doi.org/10.12999/AWWA.C670.25

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Committee Personnel

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

Darryl Green, *Chair*
Brian G. LaBelle, *Vice-Chair*
Raj Vaidya, *Vice-Chair*

General Interest Members

M. Dummer, SPI, Vista, Calif.
T.L Engelhardt, Loveland, Colo.
E.S. Ralph (*liaison, nonvoting*), Standards Engineer Liaison, AWWA, Denver, Colo.
W.J. Soucie, Central Lake County Joint Action Water Agency, Lake Bluff, Ill.
K.B. Stark (*liaison, nonvoting*), Standards Council Liaison, NSF International, Ann Arbor, Mich.
R. Vaidya, PCL Construction, Tampa, Fla.
Z.R. Yu, WSP, Waterloo, Ont.

Producer Members

J. Evans (*alternate*), Chemtrac Systems Inc., Norcross, Ga.
B.G. LaBelle, GF Piping Systems, Irvine, Calif.
V. Malkov, Hach Company, Loveland, Colo.
V.V. Rajasekharan (*alternate*), Hach Company, Loveland, Colo.
M. Sadar, Tintometer Inc., Loveland, Colo.
M. Vandiver, Chemtrac Inc., Norcross, Ga.

User Members

D. Green, Henderson Utility Department, Henderson, Tenn.
J. Miller, American Water, Parrish, Fla.
C.D. Tona, City of Redding, Redding, Calif.
J. Wilcox, Amazon Data Services, Hermiston, Ore.

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C670.*

I. Introduction

I.A. *Background*. This standard describes online chlorine analyzer operation and maintenance (O&M) when the online chlorine analyzer is used for monitoring in the treatment of municipal water supplies or in the treatment of municipal wastewater.

I.B. *History*. The first scientific approach to the use of chlorine in water treatment was conducted between 1917 and 1920 by A. Wolman and L. Enslow. Their determination of chlorine absorption in water demonstrated the use of the orthotolidine test for chlorine residuals. The chlorination breakpoint phenomenon was discovered in 1939 and revealed the speciation of free available and combined chlorine residuals. The amperometric titration method of measuring total chlorine residuals was introduced in 1942 and was followed by an amperometric titration method of measuring free chlorine, monochloramine, and dichloramine in 1951. Colorimetric methods of determining chlorine residuals were established in 1949.

The AWWA Standards Council approved the formation of a committee to create a standard for online chlorine analyzer operation and maintenance during its March 2006 meeting. A chair for the new Online Monitoring Committee was selected in August 2006, and the committee held its first meeting at the Water Quality and Technology Conference in Denver, Colorado, in November 2006.

The first edition of ANSI/AWWA Standard C670 was approved by the AWWA Board of Directors on June 14, 2009. Subsequent editions were approved on June 7, 2015, and Oct. 26, 2020. This edition was approved on Oct. 13, 2025.

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

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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. Four standards developed under the direction of NSF:[‡] NSF/ANSI/CAN[§] 60, Drinking Water Treatment Chemicals—Health Effects; NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects; NSF/ANSI/CAN 372, Drinking Water System Components—Lead Content; and NSF/ANSI/CAN 600, Health Effects Evaluation and Criteria for Chemicals in Drinking Water.

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 jurisdictions. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

NSF/ANSI/CAN 600 (which formerly appeared in NSF/ANSI/CAN 60 and 61 as Annex A, "Toxicology Review and Evaluation Procedures") 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 NSF/ANSI/CAN 600 procedures may not always be identical, depending on the certifier.

ANSI/AWWA C670 does not address additives requirements. Users of this standard should consult the appropriate state, provincial, 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.

[†] 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 Academies Press, 500 Fifth Street, NW, Washington, DC 20001.

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II. Special Issues

II.A. *Information on the Application of This Standard.* The online chlorine analyzer chosen for a particular application depends most on the water characteristics at the point of sampling and the reason for sampling (regulatory compliance, process control, or other). The initial selection and purchasing of an online chlorine analyzer are beyond the scope of this standard. However, as an analyzer is operated and maintained, attention should be paid to whether the water characteristics are within the range of water temperature, pH, and other parameters in which the analyzer is designed to operate.

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 C670, Online Chlorine Analyzer Operation and Maintenance, of latest revision.

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. Updated Sec. I.C., Acceptance, in the foreword with the latest Standards Council language reflecting the addition of reference to NSF/ANSI/CAN 372 and NSF/ANSI/CAN 600.
2. In Section 3, Definitions, item 25 Photometric method was revised.
3. Sec. 4.1.2, Photometric chlorine analyzers, was revised to include monochloramine.
4. Sec. 4.2.1, Amperometric chlorine analyzers, was expanded to provide additional information on the two types of chlorine sensors: membrane type and bare electrode systems.
5. Sec. 4.2.2, Photometric chlorine analyzers, was revised to provide information on monochloramine.
6. Sec. 4.6.3, Flow requirements, was updated to address pressure pulses at the sampling point and provide sampling pump guidance.
7. Sec. 4.7.4.1, Noise, was revised to address interference with instrument electronics.

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V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services at 303.794.7711; write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098; or email standards@awwa.org.

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AWWA Standard

Online Chlorine Analyzer Operation and Maintenance

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes online chlorine analyzer operation and maintenance (O&M) when the online chlorine analyzer is used for monitoring in the treatment of potable water, reclaimed water, or wastewater.

Sec. 1.2 Purpose

Continuous chlorine residual monitoring is used for two primary purposes: process control and regulatory compliance. Process control implies that the reason for testing the chlorine content of water is primarily to determine how well a process is working (e.g., how consistent the chlorine residual is downstream of the mixer or contact tank, how much chlorine is consumed after disinfection, etc.), to control chlorine feed equipment, and to ensure appropriate chlorination of the final product. The efficiency of monochloramine formation may be controlled by the total chlorine residual (for regulatory reporting purposes) and free ammonia concentration to maintain an acceptable chloramine speciation. Process control may also imply analyzing residual chlorine content in distribution or transmission systems. A sudden decrease in measured chlorine residual may be indicative of malfunctioning equipment, system failure, untreated water intrusion, or introduction of some chlorine-consuming contaminants.

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