ANSI/AWWA **C231-24**

(Revision of ANSI/AWWA C231-17)

AWWA Standard

Field Welding of Stainless-Steel Water Pipe

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American Water Works Association

AWWA Standard

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Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C231.*

I. Introduction.

I.A. *Background*. The provisions of this standard describe the requirements for welding stainless-steel water pipe joints in potable water, wastewater, and reclaimed water lines. The purchaser for each project is responsible for determining if any unusual circumstances related to the project require additional provisions that are not included in the standard.

The design of field-welded joints is not discussed in this standard. Useful information on this subject may be found in AWWA M11, *Steel Pipe: A Guide for Design and Installation,*[†] and in AISI's *Useful Information on the Design of Plate Structures.*[‡]

I.B. *History*. The first edition of this standard was approved by the AWWA Board of Directors on June 11, 2017. This edition was approved on Jan. 11, 2024.

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.

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.

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

† AWWA Manual M11. *Steel Pipe—A Guide for Design and Installation.* Denver, CO: AWWA.

‡ American Iron and Steel Institute (AISI). *Useful Information on the Design of Plate Structures, Steel Plate Engineering Data*, Vol. 2. Washington, DC: AISI.

§ NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

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

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 C231 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. 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.

** Standards Council of Canada, 55 Metcalf Street, Suite 600, Ottawa, ON K1P 6LS Canada.

†† Both publications available from National Academies Press, 500 Fifth Street, NW, Washington, DC 20418.

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

1. Standard used—that is, ANSI/AWWA C231, Field Welding of Stainless-Steel Water Pipe, of latest revision.

2. Whether compliance with NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects, is required.

3. Details of federal, state, provincial, territorial, and local requirements (Sec. 4.1.1).

4. Type of joint (Sec. 4.2).

5. Option regarding backing rings (Sec. 4.2.3).

6. Weld inspection, if required (Sec. 5.1.3).

7. Testing methods, if required (Sec. 5.2).

8. Nondestructive testing of welded joints if substituted for hydrostatic tests (Sec. 5.2.2).

9. Affidavit of compliance (Sec. 6.2).

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. 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 2 References, ASTM A380 was added.

3. The definition for welding operator was added to Section 3 Definitions.

4. Updated Sec. 4.1.1 Materials with the latest Standards Council boilerplate language.

5. Sec. 4.2.3 Butt joints was revised to better define the different types of butt joints.

6. A new Sec. 4.3.2 Welding procedure specification (WPS) was added.

7. A sentence was added to Sec. 4.3.3 Welding procedure qualification record (PQR) to better define PQRs.

8. The cleaning language in Sec. 4.5.6 Application and weld contour was removed, and a new Sec. 4.7 Cleaning and Descaling was added to provide guidance on cleaning, descaling, and heat tint removal.

9. Sec. 5.1.4 Visual inspection was revised for clarity.

10. Sec. 6.1 Marking was expanded to include a requirement for contaminants in markings.

11. Table A.2 was revised to include base metal grade and types for 316L.

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

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American Water Works Association
Dedicated to the World's Most Vital Resource®

AWWA Standard

Field Welding of Stainless-Steel Water Pipe

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes manual, semiautomatic, and automatic field welding by the metal arc-welding processes for stainless-steel potable water, wastewater, and reclaimed water pipe manufactured in accordance with ANSI*/AWWA C220. This standard describes field welding of two types of circumferential pipe joints: lap joints and butt joints. This standard also applies to other welding required in field fabrication and installation of specials and appurtenances. When possible, fabrications should be performed by the manufacturer at a manufacturing facility. The design of field-welded joints is not within the scope of this standard.

This standard recognizes AWS† D1.6/D1.6M as the supporting document that provides more specific information except as noted in this standard.

Sec. 1.2 Purpose

The purpose of this standard is to provide minimum requirements for field welding and inspection of field welds on stainless-steel potable water, wastewater, and reclaimed water pipe.

* American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.
† American Welding Society, 8669 NW 36 Street, #130, Miami, FL 33166.