ANSI/AWWA D108-19
(Revision of ANSI/AWWA D108-10)

American Water Works Association

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AWWA Standard

Aluminum Dome Roofs for Water Storage Facilities

Effective date: Nov. 1, 2019.
First edition approved by AWWA Board of Directors Jan. 17, 2010.
This edition approved June 7, 2019.
Approved by American National Standards Institute June 11, 2019.

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ISBN-13, print: 978-1-62576-359-9

ISBN-13, electronic: 978-1-61300-524-8

DOI: doi.org/10.12999/AWWA.D108.19

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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.

Foreword

This foreword is for information only and is not a part of ANSI/AWWA D108.*

I. Introduction

I.A. *Background.* In 1982, members of the American Water Works Association (AWWA) became aware of the increased usage of aluminum domes as roofs on water storage tanks and reservoirs. As a result of this, it was decided to incorporate a reference to aluminum domes in the AWWA standards.

I.B. *History.* In 1987, Appendix A, Aluminum Dome Roofs for Water-Storage Tanks, became a part of D103-87, AWWA Standard for Factory Coated Bolted Steel Tanks for Water Storage.

In 1996, Section 15, Structurally Supported Aluminum Dome Roofs, was incorporated into D100-96, AWWA Standard for Welded Steel Tanks for Water Storage Tanks.

In 1997, Aluminum Dome Roofs left Appendix status and became Section 13, Structurally Supported Aluminum Dome Roofs, in D103-97, with revisions similar to those in D100-96.

In 2005, D100-05 was issued, incorporating revisions to Section 15, Structurally Supported Aluminum Dome Roofs.

In 2009, the AWWA Standards Committee on Steel Elevated Tanks, Standpipes, and Reservoirs, as part of an initiative to reorganize the AWWA standards under its umbrella, developed a separate standard for aluminum dome roofs that would be applicable to all tanks. That standard is now designated D108, AWWA Standard for Aluminum Dome Roofs for Water Storage Facilities. The first edition of the standard was approved by the AWWA Board of Directors on Jan. 17, 2010. This second edition was approved on June 7, 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, 4th 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‡ 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 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 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.

ANSI/AWWA D108 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.

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

† NSF International, P.O. Box 130140, 789 North Dixboro Road, Ann Arbor, MI 48105.

‡ American National Standards Institute, 25 West 43rd Street, New York, NY 48105.

§ Both publications available from The National Academies Press, 500 Fifth Street NW, Keck 360, Washington, DC 20001.

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.

Contractual responsibilities for items such as design, material, fabrication, construction, inspection, and testing are not included in this standard and must be addressed by the purchaser.

This standard is based on the accumulated knowledge and experience of purchasers and manufacturers of aluminum dome roofs.

Many aluminum domes built almost 40 years ago are still in service. Properly operated and maintained aluminum dome roofs can have a very long service life.

The term *tanks* where used in this standard shall apply to welded steel tanks, bolted steel tanks, and concrete tanks or reservoirs.

III.A. *Purchaser Options and Alternatives.* Proper use of this standard requires that the purchaser specify certain basic requirements. The purchaser may desire to modify, delete, or amplify sections of this standard to suit special conditions. It is strongly recommended that modifications, deletions, or amplifications be made by supplementing this standard. This standard is not intended to cover aluminum dome roofs that are to be erected in areas subject to regulations that are more stringent than the requirements contained herein. In such cases, local regulations supersede the requirements of this standard. Where local, municipal, county, or state government requirements exist, such requirements are to govern and this standard should be interpreted to supplement them.

It is the purchaser's responsibility to supplement or modify this standard for compliance with these local requirements. In addition, the purchaser is to provide clarification of the governing codes where they do not clearly refer to roofs, but where the purchaser intends such stipulations to apply to the tank roof under contract. As an example, if a governing code stipulates a building roof snow load of 40 lb/ft^2 (1,915 N/m^2) and it is intended that the tank roof be designed for this load, the purchaser is to include this as a clarification.

The details of design and construction covered by this standard are minimum requirements. At a minimum, it is important that all of the design conditions in this standard be met. An aluminum dome roof cannot be represented as an ANSI/AWWA D108 roof if it does not meet the minimum requirements of this standard.

III.A.1 Information to be Provided by Purchaser for an Aluminum Dome Roof. This standard provides minimum requirements for the design, construction, inspection, and testing of an aluminum dome roof without any designation of which party must perform these tasks. For this reason, the following information should be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA D108, Aluminum Dome Roofs for Water Storage Facilities, of latest revision.
2. Type of tank—whether bolted, welded, or concrete.
3. Tank details—that is, the diameter, height, and details of the top of tank to which the aluminum dome roof is to attach.
4. Site location.
5. Desired time for completion.
6. Name of town and distance to the nearest town.
7. Type of road access available to the site.
8. Roof design loads (wind, live, and snow loads) and the applicable building code if it is different from the AWWA standard for the type of tank being covered by the aluminum dome roof.
9. Locations of all required roof accessories including hatches, vents, and other accessories.
10. Whether roof handrails, walkways, or other safety devices are required and whether requirements in excess of OSHA CFR Part 1910 are required.
11. Details of federal, state, and local requirements (Sec. 4.1).
12. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.

III.B. *Information to Be Provided With Bid*

1. Dimensions of the aluminum dome roof and design basis.
2. The number, names, and sizes of all accessories.
3. Appearance coatings or finish information if one is specified.

III.C. *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 made to this standard in this edition include the following:

1. Definitions for *conventionally threaded fastener* and *lockbolt-type fastener* have been added (Sec. 3).

2. The material requirements for bolts and fasteners have been modified (Sec. 4.4). Specific provisions for conventionally threaded aluminum fasteners, aluminum lockbolts, stainless steel lockbolts, and austenitic stainless-steel fasteners have been added.

3. The design requirements for bolts and fasteners have been modified extensively (Sec. 5.4.3 and Table 1).

4. Provisions for roof attachment details have been modified to address submerged bolts that connect aluminum members to carbon steel members (Sec. 6.2).

5. Requirements for fabrication and design of welded aluminum parts have been updated (Sec. 9.2).

6. Requirements for coatings and other finishes have been updated (Sec. 10).

7. Appendix A, Commentary for Aluminum Dome Roofs for Water Storage Facilities, has been added to provide additional guidance on the provisions contained in the body of the standard.

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services 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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Aluminum Dome Roofs for Water Storage Facilities

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard establishes minimum criteria for the design, fabrication, and erection of structurally supported aluminum dome roofs. Aluminum dome roofs can be used on any size tank erected in accordance with AWWA standards. When this standard is specified, in the case of conflict between this standard and any other standard, the requirements of this standard shall govern.

Sec. 1.2 Description

The dome shall be a spherical structure conforming to the dimensions of the tank. The dome structure shall be a fully triangulated space truss complete with noncorrugated closure panels. The dome shall be clear span and designed to be self-supporting from the tank structure. The dome surface paneling shall be designed as a watertight system under all design load conditions. All raw edges of the aluminum panels shall be covered, sealed, and firmly clamped in an interlocking manner to prevent slipping or disengagement under all load conditions and temperature changes.