ANSI/AWWA D130-02
(Revision of ANSI /AWWA D130-96)

American Water Works Association

The Authoritative Resource for Safe Drinking Water℠

AWWA Standard

Flexible-Membrane Materials for Potable Water Applications

ANSI American National Standards Institute

Effective date: Feb. 1, 2003.
First edition approved by AWWA Board of Directors Jan. 26, 1987.
This edition approved June 16, 2002.
Approved by American National Standards Institute Nov. 20, 2002.

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AWWA Standard

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Science and Technology

AWWA unites the drinking water community by developing and disributing authoritative scientific and technological knowledge. Through its members, AWWA develops industry standards for products and processes that advance public health and safety. AWWA also provides quality improvement programs for water and wastewater utilities.

Committee Personnel

The AWWA Standards Committee on Flexible Reservoir Covers and Liners for Potable Water Storage, which developed and revised this standard, had the following personnel at the time of approval:

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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 part of AWWA D130.

I. Introduction.

I.A. *Background.* The purpose of ANSI/AWWA D130 is to provide direction and guidance in selecting and purchasing flexible-membrane materials used to line or cover potable water reservoirs. The standard is based on the accumulated knowledge and experience of owners, consulting engineers, manufacturers, fabricators, and installers of flexible-membrane liners and floating covers. The standard should be used in conjunction with AWWA Manual M25, *Flexible-Membrane Covers and Linings for Potable Water Reservoirs,* to define suitable application for use of these materials.

I.B. *History.* In 1975, AWWA appointed a committee to study and report on the adaptability of flexible-membrane liners and floating covers for use within the water industry. The committee presented its report at the 1975 AWWA Annual Conference. This report included a recommendation to appoint a task group to prepare a standard to describe the use of flexible-membrane linings and floating covers. Subsequently, the AWWA Standards Committee on Flexible Reservoir Covers and Linings for Potable Water Storage was established in June 1976. The initial goal of the committee was to prepare a manual with guidelines for design, installation, and maintenance of a flexible-membrane floating cover or lining, or both. The committee completed a first draft of the manual in February 1983 and submitted it for consideration by the AWWA Standards Council later that same year. The first edition of the standard, designated ANSI/AWWA D130-87, was approved by the AWWA Board of Directors on Jan. 26, 1987, and by ANSI on May 28, 1987. The second edition contained minor technical revisions and was approved by the AWWA Board of Directors on Feb. 4, 1996. This third edition was approved by the AWWA Board of Directors on June 16, 2002.

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 all direct and indirect drinking water additives. Other members of the original consortium included the American Water Works Association Research Foundation (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.

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, ANSI†/NSF‡ 60, Drinking Water Treatment Chemicals—Health Effects, and ANSI/NSF 61, Drinking Water System Components—Health Effects.
4. 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 ANSI/NSF 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 ANSI/NSF 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 in Canada, Mexico, and non-North American countries should contact the appropriate authority having jurisdiction.

†American National Standards Institute, 25 W. 43rd St., Fourth Floor, New York, NY 10036.

‡NSF International, 789 N. Dixboro Rd., Ann Arbor, MI 48105.

§Both publications available from National Academy of Sciences, 2101 Constitution Ave. N.W., Washington, DC 20418.

AWWA D130 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 all 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. *Operation, Inspection, and Maintenance Guidelines for Floating Covers.* Water industry experience has clearly established the critical need for a well-defined, regularly executed, site-specific inspection and maintenance program with written documentation of procedures. See chapter 3 of AWWA Manual M25.

III. Use of This Standard. AWWA has no responsibility for the suitability or compatibility of the provisions of this standard to any intended application by any user. Accordingly, each user of this standard is responsible for determining that the standard's provisions are suitable for and compatible with that user's intended application.

III.A. *Purchaser Options and Alternatives.* The following items should be covered in the purchaser's project specifications, as applicable:

1. Standard used—that is, ANSI/AWWA D130, Standard for Flexible-Membrane Materials for Potable Water Applications, of latest edition.
2. The following items are common to all projects:
   a. General site conditions: temperature, wind, and precipitation extremes; snow loadings; exposure to sunlight; and susceptibility to flooding.
   b. Soil and foundation conditions: test hole data, depth and seasonal variation of groundwater level; soil gradation, densities, and bearing values; slope stability indices, and soil organic content.
   c. Project conditions: description of existing or proposed facilities, physical dimensions and spatial relationships; volume, capacity, and operating range; overflow elevation; grade of side slopes; size and location of appurtenances, such as valves, inlet–outlet piping, sumps, underdrains, air–gas vents, and leakage monitoring system; general condition of construction materials; and other related information.
   d. Material properties.
   e. Material installation and warranty requirements.

3. The following items are specific to flexible membrane lining projects:

a. Provisions for membrane anchorage: mechanical or buried membrane termination system.

b. Provisions for liner sealing at underwater terminations, such as inlet, outlet, and overflow structures.

c. Provisions for soil sterilization to prevent vegetative growth and gas generation beneath the liner membrane.

d. Leakage permitted and the method for determining leakage.

4. The following items are specific to floating reservoir cover projects:

a. Number and location of access hatches in the floating cover for internal maintenance and repair.

b. Details of the rainwater removal system and of the sump and float layout for the floating cover membrane.

c. Provisions for floating cover protection at structures that will support the cover in the dewatered condition, such as inlets, outlets, and overflows.

d. Provisions for inflation of a floating cover if an operational requirement.

5. The purchaser should state whether compliance with ANSI/NSF 61 Drinking Water System Components–Health Effects, is to be required, in addition to the requirements of the Safe Drinking Water Act.

6. Fabrication experience requirements and qualifications (Sec. 4.5.3).

7. Field installation experience requirements and qualification (Sec. 4.6.3).

8. Material and installation warranty requirements.

9. Quality control record requirements (Sec. 5.1.3.2).

10. Production code identification requirements (Sec. 5.1.3.3).

11. Quality assurance and inspection (Sec. 5.2)

12. Whether an affidavit of compliance is required (Sec. 6.3).

III.B. *Modification to Standard.* Any modification to the provisions, definitions, or terminology in this standard must be provided in the purchaser's specifications.

IV. Major Revisions. Major revisions made to the standard in this edition include the following:

1. Use of NSF 54: Previous editions of this standard contained references to NSF 54. NSF 54 has since been rescinded, necessitating a revision to this document. Material previously incorporated by reference to NSF 54 has been added with this revision.

2. This standard has been rewritten in its entirety to incorporate current industry practice and newly developed materials.

V. Comments. If you have any comments or questions about this standard, please call the AWWA Volunteer and Technical Support Group (303) 794-7711, FAX (303) 795-7603, or write to the group at 6666 West Quincy Avenue, Denver, CO 80235-3098, or by e-mail to standards@awwa.org.

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AWWA Standard

Flexible-Membrane Materials for Potable Water Applications

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard pertains to flexible-membrane materials supplied in sheet form for lining, covering, or lining and covering potable water reservoirs. The successful application of this standard is dependent on an appropriate site evaluation, design, material selection, construction, as well as operations and maintenance. This standard includes requirements for material properties, fabrication, and installation.

AWWA Manual M25, *Flexible-Membrane Covers and Linings for Potable Water Reservoir*, complements this standard by providing supplemental definitions of terms, as well as design, installation, operation, and maintenance considerations for flexible membrane systems.

Sec. 1.2 Purpose

The purpose of this standard is to provide purchasers, manufacturers, suppliers, fabricators, and installers with the minimum requirements for flexible-membrane lining and floating-cover materials for potable water storage, including minimum requirements for materials, fabrication, and installation and quality assurance.