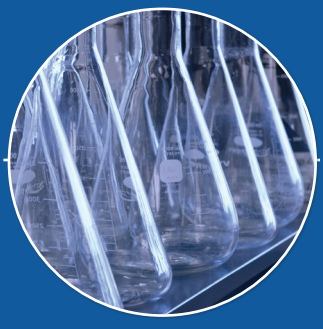
NSF International Standard /
American National Standard

NSF/ANSI 401 - 2017

Drinking Water Treatment Units - Emerging Compounds/Incidental Contaminants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NSF International Standard/
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for Drinking Water Treatment Units –

Drinking water treatment units – Emerging compounds/incidental contaminants

Standard Developer

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Contents

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Foreword[2]

The purpose of this Standard is to establish minimum requirements for materials, design and construction, and performance of drinking water treatment systems that are designed to reduce emerging compounds in public or private water supplies, such as pharmaceutical, personal care products (PPCPs), and endocrine disrupting compounds (EDCs).

While standards have existed to evaluate treatment products designed to reduce a wide range of potential compounds and contaminants in drinking water, there have been none for emerging compounds. These compounds have an increasing awareness among consumers and a desired demonstration of reduction among product manufacturers causing the need for proper methods of test and criteria.

In 2008, a task group was formed and charged with making recommendations to the Joint Committee regarding the feasibility of producing a standard (or standards) for EDCs and PPCPs. A subtask group was also formed in 2008 and charged with surveying data on target compounds and classes of compounds and to evaluate the state of analytical capabilities for these compounds.

The initial list of contaminants included in this Standard represent identified pharmaceutical, personal care and EDC compounds that have been identified in published studies as occurring with the highest frequency, and/or at the highest levels of those compounds identified and studied. While occurring at levels well below any known or measured health effect, the mere presence of these compounds in drinking water has resulted in increased concern on the part of consumers. It is anticipated that with the advancement of science additional compounds or classes of compounds will be identified that will result in similar levels of concern for consumers. It is envisioned that NSF/ANSI 401 can become the repository for these contaminants.

It has been discussed that should future toxicological studies and/or research determine that any of the compounds in this Standard pose health risks at the concentrations in this Standard, that the claims should be removed from this Standard and re-established in the appropriate health effects standard (e.g., NSF/ANSI 53).

This version includes the following revisions:

Issue 5:

This issue incorporated potential chemical grouping information to Table 7.1.

Issue 8:

An update was made to the Normative References.

This Standard was developed by the NSF Joint Committee on Drinking Water Treatment Units using the consensus process described by the American National Standards Institute.

Suggestions for improvement of this Standard are welcome. This Standard is maintained on a Continuous Maintenance schedule and can be opened for comment at any time. Comments should be sent to Chair, Joint Committee on Drinking Water Treatment Units at standards@nsf.org, or c/o NSF International, Standards Department, P.O. Box 130140, Ann Arbor, Michigan 48113-0140, USA.

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NSF/ANSI Standard
for Drinking Water Treatment Units –

Drinking water treatment units – Emerging compounds/incidental contaminants

1 General

1.1 Purpose

It is the purpose of this Standard to establish minimum requirements for materials, design and construction, and performance of drinking water treatment systems that are designed to reduce specific emerging compounds/incidental contaminants in public or private water supplies, such as pharmaceutical, personal care products, and endocrine disrupting compounds. This Standard also specifies the minimum product literature and labeling information that a manufacturer shall supply to authorized representatives and system owners as well as the minimum service-related obligations that the manufacturer shall extend to system owners.

1.2 Scope

The point-of-use and point-of-entry systems addressed by this Standard are designed to be used for the reduction of specific substances that may be present in drinking water (public or private) considered to be microbiologically safe and of known quality. Systems covered under this Standard are intended to reduce substances that are at very low, yet measurable concentrations but not at definitive concentrations of known health concern. These substances may be soluble or particulate in nature but their presence, even at very low concentrations, may influence public acceptance/perception of the drinking water quality. The systems addressed by this Standard are not intended for reducing these specific substances at higher concentrations that may have a known acute or chronic health effect. It is recognized that a system may be effective in reducing one or more of the emerging compounds/incidental contaminants listed in this Standard. It is not necessary that a device be able to reduce all the Emerging Compounds/Incidental Contaminants listed in order to meet the requirements of this Standard. Systems with components or functions covered under other NSF or NSF/ANSI standards or criteria shall conform to the applicable requirements therein.

1.3 Alternate materials, designs, and construction

While specific materials, designs, and construction may be stipulated in this Standard, systems that incorporate alternate materials, designs, and construction may be acceptable when it is verified that such systems meet the applicable requirements stated herein.

1.4 Chemical and mechanical reduction performance claims

1.4.1 All NSF/ANSI 401 performance claims shall be verified and substantiated by test data generated under the requirements of NSF/ANSI 401.

1.4.2 When performance claims are made for substances not specifically addressed in the scope of this Standard or for substances not specifically addressed but falling under the scope of NSF/ANSI 401, such claims shall be identified as not specifically addressed in the Standard.

1.5 Minimum requirements

This Standard establishes minimum requirements.

A system as defined in this Standard shall meet the applicable requirements of 4, 5, 6, and 8, and at least one performance claim as described in 7.

A component as defined in this Standard shall meet the requirements of 4 and 8. If the component is pressure-bearing, it shall also meet the applicable requirements of 5.

A commercial modular system as defined in this Standard shall meet the applicable requirements of 4, 5, 6, and 8, and at least one performance claim as described in 7. Manifolds of commercial modular systems shall meet the requirements of 4, 5 (if pressure bearing), and 8, and shall be evaluated as stand-alone components. Manifolds shall have a minimum internal diameter such that the water velocity in the manifold will not exceed 3 m (10 ft) per second (which can be calculated based upon the system flow rate and the manifold internal diameter). Individual modular elements evaluated as a manifold and modular element combination shall meet the applicable requirements of 4, 5, 6, and 8, and at least one performance claim as described in 7.

1.6 Treatment train

A system that contains multiple, sequential treatment technologies for a performance claim under this Standard shall meet the applicable requirements as described in Annex D.

2 Normative references

The following documents contain requirements that, by reference in this text, constitute requirements of this Standard. At the time of publication, the indicated editions were valid. All of the documents are subject to revision and parties are encouraged to investigate the possibility of applying the recent editions of the documents indicated below. The most recent published edition of the document shall be used for undated references.

ANSI/NFPA 70, 2011, *National Electrical Code*[3]

APHA, *Standard Methods for the Examination of Water and Wastewater*, twentieth edition[4]

NSF/ANSI 51, *Food Equipment Materials*

NSF/ANSI 53, *Drinking water treatment units – Health effects*

NSF/ANSI 60, *Drinking water treatment chemicals – Health effects*

NSF/ANSI 61, *Drinking water system components – Health effects*

NSF/ANSI 330, *Glossary of Drinking Water Treatment Unit Terminology*

USEPA-600/4-79-020, *Methods for the Chemical Analysis of Water and Wastes*, March 1983[5]

[3] National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02269 <www.nfpa.org>.

[4] American Public Health Association (APHA), 800 I Street, NW, Washington, DC 20001 <www.ahpa.org>.

[5] USEPA, Environmental Monitoring and Support Laboratory, Cincinnati, OH 45268 <www.epa.gov>.