



*NSF International Standard /
American National Standard*

NSF/ANSI 41 - 2022

Non-Liquid Saturated Treatment Systems



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Chair, Joint Committee on Wastewater Technology
c/o NSF International
789 North Dixboro Road, P.O. Box 130140
Ann Arbor, Michigan 48113-0140 U.S.A.
Phone: (734) 769-8010 Fax: (734) 769-0109
Email: info@nsf.org
Web: <www.nsf.org>

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for Wastewater Technology –
Non-Liquid Saturated Treatment Systems

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Abbreviations

The following table is provided as a reference for unit abbreviations for common forms of measurement used within NSF documents.

time	second	s
	minute	min
	hour	h
	day	d
	week	wk
	month	mo
	year	yr
length	inch	in
	foot	ft
	yard	yd
	micrometer	μm
	nanometer	nm
	millimeter	mm
	centimeter	cm
	meter	m
liquid measure	kilometer	km
	milliliter	mL
	liter	L
	liters per day	LPD
	liters per minute	LPM
	ounce	oz
	pint	pt
	quart	qt
	gallon	gal
	gallons per minute	GPM
weight	gallons per day	GPD
	microgram	μg
	picogram	pg
	nanogram	ng
	milligram	mg
	centigram	cg
	gram	g
	kilogram	kg
	pounds	lb
	tons	t
	metric tons	mt
miscellaneous	A-weighted decibel	dBA
	decibel	dB
	most probable number	MPN

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Foreword²

NSF/ANSI 41 is intended for devices that do not utilize a liquid saturated medium as a primary means of storing or treating human excreta or human excreta mixed with other organic household materials. Its purpose is to establish minimum materials, design and construction, and performance testing and evaluation requirements for these devices. Minimum literature requirements to be supplied by manufacturers to authorized representatives and owners are also specified.

This edition of the standard contains the following revisions:

Issue 10

This revision adds noise correction chart in Section 5.3: *Noise*.

Issue 11

This revision adds language regarding commercial applications in Section 1.3: *Systems classification* and adds a new Section 11.1.2: *Commercial use systems*.

Issue 13

This revision removes the definitions from Section 3: *Definitions* and instead references the newly adopted NSF/ANSI 437: *Glossary of Wastewater Technology Terminology*.

This revision also includes an editorial update to the names of the annexes within. The annexes are being changed from alpha characters to numeric, preceded by a 'Normative' or 'Informative'. The annexes have also been reordered so the Normative Annexes appear first, followed by the Informative Annexes. The table below shows the previous name of the annex with the corresponding new name of the annex:

Annexes	
Previously known as:	Now known as:
Annex A	Informative Annex 1 (I-1)
Annex B	Informative Annex 2 (I-2)
Annex C	Normative Annex 1 (N-1)

This standard was developed by the NSF Joint Committee on Wastewater Technology using the consensus process described by the American National Standards Institute.

This standard and the accompanying text are intended for voluntary use by certifying organizations, regulatory agencies, and/or manufacturers as a basis of providing assurances that adequate health protection exists for covered products.

ANSI prohibits the inclusion of commercial terms and conditions, such as manufacturers' warranties and guarantees, in product standards. However, the NSF Joint Committee on Wastewater Technology has historically believed strongly that all certifiers of NSF/ANSI 41 systems should have certification program policies that contain several key elements, including requirements for warranties. It is the Joint Committee's belief that these key elements provide valuable assurance of long-term performance as well as protection of public health and the environment. To emphasize the Joint Committee's convictions on this issue, two

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annexes, which are not part of this Standard, are included for informational purposes and guidance. These annexes are intended to establish a uniform program by which products meeting the scope of this standard should be certified. Annex I-1 provides the key elements of a certification program, and Annex I-2 is a sample warranty. At NSF, both annexes have been adopted as NSF/ANSI 41 certification program policies.

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 Wastewater Technology at standards@nsf.org, or c/o NSF International, Standards Department, P.O. Box 130140, Ann Arbor, Michigan 48113-0140, U.S.A.

NSF/ANSI Standard for Wastewater Technology – Non-Liquid Saturated Treatment Systems

1 General

1.1 Purpose

The purpose of this standard is to establish minimum materials, design and construction, and performance requirements for non-liquid saturated treatment systems. It is intended to protect public health and the environment as well as minimize nuisance factors. This standard also specifies the minimum literature that manufacturers shall supply to authorized representatives and owners.

1.2 Scope

This standard contains minimum requirements for treatment systems that do not utilize a liquid saturated media as a primary means of storing or treating human excreta or human excreta mixed with other organic household materials. It addresses treatment systems that treat both solid and liquid waste, as well as those that only treat solid waste. Management methods for the end products of these systems are not addressed by this standard.

System components covered under other NSF or NSF/ANSI standards or criteria shall also comply with the requirements contained in those other standards. This standard shall in no way restrict new system designs, provided such designs meet the minimum specifications described herein.

1.3 Systems classification

For the purpose of this standard, systems are classified according to the use environment for which they are intended to be installed. The systems classifications identified in this standard are residential systems, commercial systems, day-use systems, and cottage systems. Performance testing and evaluation requirements for each of these systems classifications are described herein.

2 Normative references

The following documents contain provisions that, through reference in this text, constitute provisions of this standard. At the time of publication, the indicated editions were valid. All standards are subject to revision, and parties are encouraged to investigate the possibility of applying the recent editions of the standards indicated below.

American Public Health Association (APHA), American Water Works Association (AWWA) & Water Environment Federation (WEF): *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition, 2012 (hereinafter referred to as Standard Methods)³

³ American Public Health Association, American Water Works Association, and Water Environment Federation.
<www.standardmethods.org>

NFPA 70®: *National Electrical Code*® (NEC®), 2014⁴

NSF/ANSI 437, *Glossary of Wastewater Technology Terminology*

U.S. EPA, *Code of Federal Regulations (CFR)*. Title 40: *Protection of Environment*. July 1, 2015⁵

U.S. EPA, *Code of Federal Regulations (CFR)*. Title 40, Part 141: *National Primary Drinking Water Regulations*, July 1, 2015⁵

U.S. EPA, *Code of Federal Regulations (CFR)*. Title 40, Part 143: *National Secondary Drinking Water Regulations*, July 1, 2015⁵

3 Definitions

Terms used in this standard that have a specific technical meaning are defined in NSF/ANSI 437.

4 Materials

Materials shall be durable and capable of withstanding stresses and wear during shipping, assembly, installation, and operation. System materials shall not be adversely affected when subjected to the use environment. Any portion of the system that requires cleaning shall be smooth and easily cleanable.

NOTE — Because there are numerous design criteria suitable for the manufacture of non-liquid saturated treatment systems, manufacturers should acquire appropriate engineering expertise in evaluating the design of the system.

4.1 Interior surfaces

Interior surfaces shall show no visible signs of structural change following performance testing and evaluation including, but not limited to, flaking, pitting, or the formation of structurally significant cracks.

4.2 Exposed surfaces

Exposed surfaces shall show no visible signs of structural change following performance testing and evaluation including, but not limited to, flaking or pitting of exposed surfaces or the formation of structurally significant cracks.

Small surface cracks exhibited by concrete tanks are normally expected in some circumstances and shall not be considered structural deterioration.

4.3 Maintenance tools

Systems shall be supplied with all of the specialized tools required for emptying and maintaining the normal operation of the system.

4.4 Dissimilar metals

Dissimilar metal materials, considered noncompatible at the electromotive level, shall not be in direct contact with each other. An electrically nonconductive insulating fitting shall be provided at the junction

⁴ National Fire Protection Association. 1 Batterymarch Park, Quincy, MA 02169-7471. <www.nfpa.org>

⁵ National Archives and Records Administration, Office of the Federal Register. 7 G Street NW, Suite A-734, Washington, DC 20401. <www.ecfr.gov>