



*NSF International Standard /
American National Standard*

NSF/ANSI 41 - 2016

Non-liquid Saturated
Treatment Systems



NSF International, an independent, not-for-profit, non-governmental organization, is dedicated to being the leading global provider of public health and safety-based risk management solutions while serving the interests of all stakeholders.

*This Standard is subject to revision.
Contact NSF to confirm this revision is current.*

Users of this Standard may request clarifications and interpretations, or propose revisions by contacting:

Chair, Joint Committee on Wastewater Technology
c/o NSF International
789 North Dixboro Road, P.O. Box 130140
Ann Arbor, Michigan 48113-0140 USA
Phone: (734) 769-8010 Telex: 753215 NSF INTL
FAX: (734) 769-0109 E-mail: info@nsf.org
Web: <http://www.nsf.org>

NSF/ANSI 41 - 2016

NSF International Standard/
American National Standard
for Wastewater Technology —

**Non-liquid saturated
treatment systems**

Standard Developer

NSF International

NSF International

Designated as an ANSI Standard

March 20, 2016

American National Standards Institute

Prepared by
The NSF Joint Committee on Wastewater Technology

Recommended for Adoption by
The NSF Council of Public Health Consultants

Adopted by
The NSF Board of Directors
November 1978

Revised December 1980
Revised May 1983
Revised May 1998
Revised November 1999
Revised March 2005
 Addendum May 2007
Revised February 2011
Revised August 2016

Published by

NSF International
PO Box 130140, Ann Arbor, Michigan 48113-0140, USA

For ordering copies or for making inquiries with regard to this Standard, please reference the designation "NSF/ANSI 41-2016."

Copyright 2016 NSF International
Previous Editions © 2011, 2007, 2005, 1998, 1983, 1980, 1978 NSF

Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from NSF International.

Printed in the United States of America.

Disclaimers¹

NSF, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. The opinions and findings of NSF represent its professional judgment. NSF shall not be responsible to anyone for the use of or reliance upon this Standard by anyone. NSF shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Standard.

NSF Standards provide basic criteria to promote sanitation and protection of the public health. Provisions for mechanical and electrical safety have not been included in this Standard because governmental agencies or other national standards-setting organizations provide safety requirements.

Participation in NSF Standards development activities by regulatory agency representatives (federal, local, state) shall not constitute their agency's endorsement of NSF or any of its Standards.

Preference is given to the use of performance criteria measurable by examination or testing in NSF Standards development when such performance criteria may reasonably be used in lieu of design, materials, or construction criteria.

The illustrations, if provided, are intended to assist in understanding their adjacent standard requirements. However, the illustrations may not include **all** requirements for a specific product or unit, nor do they show the only method of fabricating such arrangements. Such partial drawings shall not be used to justify improper or incomplete design and construction.

Unless otherwise referenced, the annexes are not considered an integral part of NSF Standards. The annexes are provided as general guidelines to the manufacturer, regulatory agency, user, or certifying organization.

¹ The information contained in this Disclaimer is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Disclaimer may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

This page is intentionally blank.

Contents

1	General	1
1.1	Purpose	1
1.2	Scope	1
1.3	Systems classification	1
2	Normative references	1
3	Definitions	2
4	Materials	2
4.1	Interior surfaces	3
4.2	Exposed surfaces	3
4.3	Maintenance tools	3
4.4	Dissimilar metals	3
4.5	Impact resistance	3
4.6	Burn resistance	3
4.7	Additives	4
5	Design and construction	4
5.1	Exposed surfaces	4
5.2	Structural integrity	4
5.3	Noise	5
5.4	Component accessibility	5
5.5	Agitators	5
5.6	Electrical components	5
5.7	Access ports	5
5.8	Failure sensing and signaling equipment	5
5.9	Flow design	6
5.10	Data plate and service label	6
5.11	Pest control	6
6	Product literature	7
6.1	Owner's manual	7
6.2	Additional product literature	7
7	Other documentation	9
8	Replacement parts	9
8.1	Parts availability	9
8.2	Stand-by parts	9
9	General performance testing and evaluation requirements	9
10	Mature systems ("field") performance testing and evaluation	10
10.1	System selection criteria	10
10.2	Sample collection and analysis	10
10.3	Performance criteria	10
11	New system ("controlled") performance testing and evaluation	11
11.1	Loading patterns	11
11.2	Schedule for performance testing and evaluation	14
11.3	Sample collection and analysis	15
11.4	Performance criteria	15

12	Sample collection.....	15
13	Analyses of end products	15
14	Performance criteria	15
14.1	Liquid containment	15
14.2	Odors	15
14.3	Solid end products	16
14.4	Liquid end products	16
Annex A	A1
Annex B	B1
Annex C	C1

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.

In this edition of NSF/ANSI 41, the following was revised:

Issue 7: Normative References were reviewed and updated through the ballot of this issue.

ANSI/NSF 41 was developed by the NSF Joint Committee on Wastewater Technology using the consensus process described by the American National Standards Institute (ANSI).

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 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 A provides the key elements of a certification program, and annex B 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, PO Box 130140, Ann Arbor, Michigan 48113-0140, USA.

² The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

This page is intentionally blank.

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, day-use park 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 Standard Methods for the Examination of Water and Wastewater <www.standardmethods.org>.