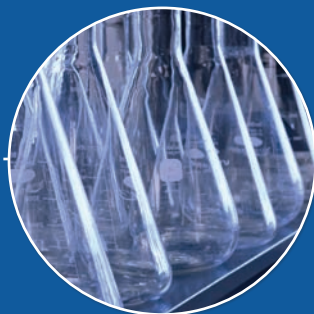




*NSF International Standard /
American National Standard*

NSF/ANSI 245 - 2010

Wastewater Treatment Systems - Nitrogen Reduction



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 245-2010

NSF International Standard/
American National Standard
for Wastewater Technology —

Nitrogen reduction

Standard Developer

NSF International

NSF International Board of Directors

Designated as an ANSI Standard

June 30, 2010

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
March 2007

Revised June 2010

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 245-2010."

Copyright 2011 NSF International

Previous editions © 2007

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 requirement.

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. Therefore, 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 left intentionally blank.

Contents

1	General	1
1.1	Purpose	1
1.2	Scope	1
1.3	Alternate materials, design, and construction	1
1.4	Performance classification	1
2	Normative references	2
3	Definitions	2
4	Materials	3
4.1	Interior surfaces.....	3
4.2	Exterior surfaces	3
4.3	Welding	3
4.4	Dissimilar metals	4
5	Design and construction	4
5.1	Exposed surfaces.....	4
5.2	Structural integrity	4
5.3	Infiltration and exfiltration resistance	4
5.4	Noise	4
5.5	Mechanical components.....	4
5.6	Electrical components	4
5.7	Access ports.....	4
5.8	Failure sensing and signaling equipment.....	5
5.9	Flow design	5
5.10	Data plate and service label	6
6	Product literature	6
6.1	Owner's manual	6
6.2	Additional product literature.....	7
7	Other documentation	8
8	Performance testing and evaluation	8
8.1	Preparations for testing and evaluation.....	9
8.2	Testing conditions, hydraulic loading and schedules	9
8.3	Sample collection	11
8.4	Criteria.....	12
8.5	Final report	12
Annex A	A1
A.1	Biological nitrification.....	A1
A.2	Biological denitrification.....	A2
A.3	Calculation example.....	A3

This page is intentionally left blank.

Foreword²

The purpose of this Standard is to establish minimum materials, design and construction, and performance requirements for residential wastewater treatment systems providing for nitrogen reduction. This Standard also specifies the minimum literature that manufacturers shall supply to authorized representatives and owners, as well as the minimum service-related obligations that manufacturers shall extend to owners.

The Joint Committee on Wastewater Technology granted NSF International the authority to proceed with the evaluation and development of a stand-alone Nutrient Reduction Standard. A task group of Joint Committee members was formed to do the evaluation and bring recommendations to the Joint Committee. After evaluating the scope of the Standard, the task group decided to narrow the focus to nitrogen reduction and revisit the issue of reduction of other nutrients at a later time.

Issue 4

The purpose of this ballot is to update the table in Section **8.3.3 Analyses** which requires treated effluent analysis for TKN, NO₂ and NO₃. However, this same section requires the raw influent to be analyzed for TKN and not NO₂ or NO₃, thus not meeting the definition of total nitrogen. The result is a potential discrepancy in calculating the total nitrogen reduction performance.

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

Suggestions for improvements of this Standard are welcome. Comments should be sent to Chair, Joint Committee on Wastewater Technology, c/o NSF International, Standards Department, P. O. 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. Therefore, 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 left blank.

NSF/ANSI Standard for Wastewater Treatment Systems —

Nitrogen Reduction

1 General

1.1 Purpose

The purpose of this Standard is to establish minimum materials, design and construction, and performance requirements for residential wastewater treatment systems providing for nitrogen reduction. This Standard also specifies the minimum literature that manufacturers shall supply to authorized representatives and owners, as well as the minimum service-related obligations that manufacturers shall extend to owners.

1.2 Scope

This Standard contains minimum requirements for residential wastewater treatment systems having rated treatment capacities of 1514 L/d (400 gal/d) to 5678 L/d (1500 gal/d) that are designed to provide reduction of nitrogen in residential wastewater. Management methods for the treated effluent discharged from these systems are not addressed by this Standard. A system, in the same configuration, must either be demonstrated to have met the Class I requirements of NSF/ANSI 40 or must meet the Class I requirements of NSF/ANSI 40 during concurrent testing for nutrient removal.

The water chemistry of a site for installation and use of these systems is critical to achieve expected water quality results. Before these systems are installed at a location, the water used within the residence must be analyzed to verify that there is sufficient alkalinity to achieve the system's performance. Refer to Annex A for further explanation.

Natural systems involving features such as vegetation, wetlands, free access or buried sand filters, and soil systems may be evaluated using this protocol as long as effluent samples are representative of all treated effluent discharged from the system, as sampled from a central point of collection of all treated effluent.

1.3 Alternate materials, design, and construction

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

1.4 Performance classification

For the purpose of this Standard, systems are classified according to the chemical, biological, and physical characteristics of their effluents as determined by the performance testing and evaluations described herein.

All systems within a manufacturer's model series may be classified according to the performance testing and evaluation of the system with the smallest hydraulic capacity within the series. Performance testing and evaluation of larger systems within the series (having hydraulic treatment capacities within the scope of this Standard) may not be necessary provided that the dimensions, hydraulics, mixing, filtering and biological treatment capabilities, and other applicable design characteristics are proportionately equivalent to the evaluated system.