



*NSF International Standard /
American National Standard*

NSF/ANSI 350 - 2018

Onsite Residential and Commercial Water Reuse Treatment Systems



NSF International, an independent, not-for-profit, nongovernmental 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 350 – 2018

NSF International Standard /
American National Standard
for Wastewater Technology –

Onsite Residential and Commercial Water Reuse Treatment Systems

Standard Developer
NSF International

Designated as an ANSI Standard
September 5, 2018
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 Trustees
July 2011

Revised December 2012
Revised December 2014
Revised February 2017
Revised February 2018
Revised March 2019

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 350 – 2018."

Copyright 2019 NSF International

Previous editions ©2017a, 2017, 2015, 2014, 2012

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 International (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 public health and the environment. 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.

At the time of this publication, examples of programs and processes were provided for general guidance. This information is given for the convenience of users of this standard and does not constitute an endorsement by NSF International. Equivalent programs and processes may be used.

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 is a preview of "NSF/ANSI 350-2018". [Click here to purchase the full version from the ANSI store.](#)

This page is intentionally left blank.

Contents

1	General	1
1.1	Purpose.....	1
1.2	Scope.....	1
1.3	Alternate materials, design, and construction	2
1.4	Performance classification.....	2
2	Normative references	2
3	Definitions	4
4	Materials	5
4.1	Interior surfaces	5
4.2	Exterior surfaces.....	5
4.3	Welding.....	5
4.4	Dissimilar metals.....	5
5	Design and construction	6
5.1	Exposed surfaces	6
5.2	Structural integrity.....	6
5.3	Water tightness.....	6
5.4	Noise.....	6
5.5	Mechanical components.....	6
5.6	Electrical components.....	6
5.7	Access ports	7
5.8	Failure sensing and signaling equipment	7
5.9	Flow design.....	8
5.10	Dataplate and service label	8
6	Product literature	9
6.1	Owner's manual.....	9
6.2	Additional product literature.....	10
7	Other documentation	12
8	Performance testing and evaluation	12
8.1	Greywater treatment systems with capacities up to 5,678 L/day (1,500 gal/day).....	12
8.2	Residential wastewater treatment systems with capacities up to 5,678 L/day (1,500 gal/day) ..	21
8.3	Commercial treatment systems with combined wastewater flows and commercial laundry water of any capacity, and greywater capacities exceeding 5,678 L/day (1,500 gal/day)	24
8.4	Sample collection.....	24
8.5	Analyses (applicable to all reuse systems evaluated in accordance with Sections 8.1, 8.2, and 8.3).....	25
8.6	Criteria (applicable to all reuse systems evaluated in accordance with Sections 8.1, 8.2, and 8.3).....	26
9	Final report.....	30
Annex A	Key elements for a field evaluation of a commercial (C) onsite treatment system.....	31
A.1	General description.....	31
A.2	Test plan	31
A.3	Quality assurance / quality control.....	34
A.4	Statistical evaluation of data	38
A.5	Reporting	39

Annex B	Key elements of a maintenance / management plan for onsite treatment systems.....	41
B.1	Purpose.....	41
B.2	Manufacturer’s requirements.....	41
B.3	Owner’s requirements.....	41
B.4	Service provider’s qualifications	41
B.5	Service contract provisions.....	41
B.6	Regulatory provisions	42
Annex C.....		43
Annex D	Basis for greywater test water	45
D.1	General use volumes.....	45
D.2	Laundry water related ingredient loading rates: liquid laundry detergent and liquid fabric softener.....	45
D.3	Laundry water related ingredient loading rates: other	46
D.4	Bathing water related ingredient loading rates: bath and shower	46
D.5	Bathing water related ingredient loading rates: other	47
D.6	Secondary effluent.....	47
D.7	Cleaning compound loading rate: Trisodium phosphate (TSP).....	48
Annex E.....		49

Foreword²

This American National Standard, NSF/ANSI 350 *Onsite Residential and Commercial Water Reuse Treatment Systems*, has been developed as part of the ongoing efforts of interested parties to establish minimum material, design and construction, and performance requirements for onsite residential and commercial water treatment systems. 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 a manufacturer shall extend to owners. This Standard is intended to address public health and environmental issues. Actual performance for any site or system may vary, depending on variations in raw water supply (such as in alkalinity and hardness), greywater constituents, and patterns of use. The end use of the effluent is the responsibility of the owner, design professionals, and regulatory officials.

Management methods and end uses appropriate for the treated effluent discharged from onsite residential and commercial treatment systems meeting Class R (single family residential) or Class C (multi family and commercial facilities) requirements of this Standard include indoor restricted urban water use, such as toilet and urinal flushing, and outdoor unrestricted urban water use, such as surface irrigation.

Systems may include:

- greywater treatment systems having a rated treatment capacity up to 5,678 L/day (1,500 gal/day): this applies to onsite residential and commercial treatment systems that treat greywater, those that treat laundry water from residential laundry facilities, and those that treat bathing water.
- residential wastewater treatment systems having a rated treatment capacity up to 5,678 L/day (1,500 gal/day): this applies to onsite residential treatment systems that treat combined wastewater generated by the occupants of residence(s). A reuse system treating 1,514 L/day (400 gal/day) to 5,678 L/day (1,500 gal/day) shall either be demonstrated to have met the Class I requirements of NSF/ANSI 40 *Residential Wastewater Treatment Systems*, or shall meet these requirements during concurrent testing to this Standard. A treatment system treating less than 1,514 L/day (400 gal/day) shall not be required to have met the Class I requirements of NSF/ANSI 40.
- commercial treatment systems: this applies to onsite commercial treatment systems that treat combined commercial facility wastewater and commercial facility laundry water of any capacity, and those treatment systems that treat greywater from commercial facilities with capacities exceeding 5,678 L/day (1,500 gal/day). These systems shall be performance tested and evaluated at the location of the reuse system installation, using the wastewater generated onsite from the facility serving the treatment system. See Section 8.3 for performance testing and evaluation. The key elements of a field evaluation of a commercial onsite treatment system are described in Annex A.

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 edition of the Standard contains the following revisions:

Issue 28

Added clarity to language in Section 1.4 regarding 100 gal/day systems

Issue 29

Removed a reference to a specific strain of *E. coli* from the table regarding greywater challenge water in NSF/ANSI 350.

Issue 30

Added language to Section 5 (Design and construction) and Section 8 (Performance testing and evaluation) to harmonize with recently approved language in NSF/ANSI 40 and 245 regarding blowers.

Issue 31

Revised wash day surge stress testing language in Section 8.

Issue 32

Modified language regarding 30-day average and 30-day geometric mean sample numbers.

Issue 34

Added clarity to recently incorporated language in Section 5 regarding noise measurements.

Issue 35

Changed language regarding stress dose volumes of small systems.

Issue 36

Revised language regarding dose volumes for small systems.

Issue 37

Clarified language in multiple NOTES.

Issue 38

Incorporated language regarding influent parameters.

This Standard was developed by the NSF Joint Committee on Wastewater Technology using the consensus process described in 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 on this Standard 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, USA.

NSF/ANSI Standard For Wastewater Technology –

Onsite Residential and Commercial Water Reuse Treatment Systems

1 General

1.1 Purpose

The purpose of this Standard is to establish minimum material, design, and construction, and performance requirements for onsite residential and commercial water treatment systems. 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 a manufacturer shall extend to owners.

1.2 Scope

This Standard contains minimum requirements for onsite residential and commercial water treatment systems. Systems may include the following:

- greywater treatment systems having a rated treatment capacity up to 5,678 L/day (1,500 gal/day). This applies to onsite residential and commercial treatment systems that treat greywater, those that treat laundry water from residential laundry facilities, and those that treat bathing water. See Section 8.1 for performance testing and evaluation;
- residential wastewater treatment systems having a rated treatment capacity up to 5,678 L/day (1,500 gal/day). This applies to onsite residential treatment systems that treat combined wastewater generated by the occupants of residence(s). A reuse system treating 1,514 L/day (400 gal/day) to 5,678 L/day (1,500 gal/day) shall either be demonstrated to have met the Class I requirements of NSF/ANSI 40, or must meet these requirements during concurrent testing to this Standard. A treatment system treating less than 1,514 L/day (400 gal/day) is not required to have met the Class I requirements of NSF/ANSI 40. See Section 8.2 for performance testing and evaluation; or
- commercial treatment systems – this applies to onsite commercial treatment systems that treat combined commercial facility wastewater and commercial facility laundry water of any capacity, and those treatment systems that treat greywater from commercial facilities with capacities exceeding 5,678 L/day (1,500 gal/day). These systems shall be performance tested and evaluated at the location of the reuse system installation, using the wastewater generated onsite from the facility serving the treatment system. See Section 8.3 for performance testing and evaluation. The key elements of a field evaluation of a commercial treatment system are described in Annex A.

Management methods and end uses appropriate for the treated effluent discharged from onsite residential and commercial treatment systems meeting Class R (single family residential) or Class C (multi family and commercial facilities) requirements of this Standard include indoor restricted urban water use, such as toilet and urinal flushing, and outdoor unrestricted urban water use, such as surface irrigation. Effluent quality criteria consistent with these uses are described in Section 8.6, Criteria.