NSF.ORG

NSF International Standard
American National Standard

NSF/ANSI 58-2023

Reverse Osmosis Drinking Water Treatment Systems

Approved American National Standard
ANSI

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 Drinking Water Treatment Units
c/o NSF International
789 North Dixboro Road, P.O. Box 130140
Ann Arbor, Michigan 48113-0140 U.S.A.
Phone: (734) 769-8010 Email: info@nsf.org
Web: <www.nsf.org>

NSF International Standard /
American National Standard
for Drinking Water Treatment Units –

Reverse Osmosis Drinking Water Treatment Systems

Standard Developer
NSF International

Designated as an ANSI Standard
September 19, 2023
American National Standards Institute

Prepared by
The NSF Joint Committee on Drinking Water Treatment Units

Recommended for adoption by
The NSF Public Health Council

Adopted by
NSF International
November 1986

Revised May 1990
Revised September 1996
Revised May 2000
Revised January 2002
Revised December 2003
Revised March 2006
Addendum May 2011
Revised December 2013
Revised November 2016
Revised December 2019
Revised February 2023

Revised November 1992
Revised September 1997
Revised November 2000
Addendum June 2002
Revised March 2004
Revised October 2007
Revised February 2012
Revised November 2014
Revised November 2017
Revised November 2020
Revised May 2024

Revised January 1996
Revised September 1999
Revised January 2001
Addendum October 2002
Revised June 2005
Revised August 2009
Revised December 2012
Revised October 2015
Revised March 2019
Revised February 2022

Published by
NSF International
P.O. Box 130140, Ann Arbor, Michigan 48113-0140, U.S.A

For ordering copies or for making inquiries regarding this standard, please reference the designation "NSF/ANSI 58 – 2023."

Disclaimers[1]

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. It is the responsibility of the user of this standard to judge the suitability of the ANS for the user's purpose.

Participation in NSF standards development activities by regulatory agency representatives (federal, state, or local) 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.

A dual-unit technical standard may use both non-SI (English System of Measurement) and SI units of measure (SI is the International System of Units, commonly known as the metric system). Unless stated otherwise, whichever system provided in the primary position is the official and normative unit value. Units may be provided in parentheses immediately following the primary units when required for clarity or informational purposes. As such, these values stated are not interchangeable, should be regarded separately, and used independently. Interchanging values from both unit systems may result in errors.

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.

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
	kilometer	km
liquid measure	milliliter	mL
	liter	L
	liters per day	LPD
	liters per minute	LPM
	ounce	oz
	pint	pt
	quart	qt
	gallon	gal
	gallons per minute	GPM
	gallons per day	GPD
weight	microgram	µg
	picogram	pg
	nanogram	ng
	milligram	mg
	centigram	cg
	gram	g
	kilogram	kg
	pound	lb
	ton	t
	metric ton	mt

miscellaneous	atomic mass unit	amu
	daltons	Da
	kilopascal	kPa
	m/z	mass-to-charge ratio
	nephelometric turbidity unit	NTU
	pCi	picocurie
	parts per million	ppm
	parts per bilion	ppb
	parts per trillion	ppt
	pounds per square inch	psi
	pounds per square inch gauge	psig
	microsecond	µs

Contents

Foreword[2]

The purpose of this standard is to establish minimum requirements for materials, design and construction, and performance of point-of-use (POU) reverse osmosis (RO) drinking water treatment systems. NSF/ANSI 58 also specifies minimum product literature requirements that manufacturers must provide to authorized representatives and owners. Minimum service-related obligations for manufacturers to extend to system owners are also specified in this standard.

Water contact materials in drinking water treatment units listed under NSF/ANSI 42, 44, 53, 55, 58, and 62 are tested and evaluated under a separate protocol from NSF/ANSI/CAN 61 with criteria that were developed specifically for the intended end-use. NSF/ANSI/CAN 61 listing should not be additionally required for acceptance of these listed units for water contact application.

This edition of the standard contains the following revisions:

Issue 94

This revision adds language to Sections 8.1.1 and 8.3.1 to allow installation, operation, and maintenance instruction manuals, as well as performance data sheets, to be provided online.

Issue 99

This revision updates the values in Tables 4.3 and 7.1 for maximum reporting limits and maximum effluent concentrations for ethylbenzene, toluene, and xylenes.

Issue 106

This revision adds language in Section N-1.2 to allow the use of a mechanical filter prior to the test unit that does not impact the chemistry requirements of the standard.

Issue 107

This revision standardizes water temperatures for hydrostatic structural integrity testing as well as chemical reduction testing, including POE (Sections 5.1.3.2, 6.8.5, 7.1.1.1.4, 7.1.1.2.4, and 7.1.3.4.1).

Issue 108

This revision updates the fluoride maximum effluent values in this standard from 1.5 mg/L to 1.0 mg/L in Tables 7.2 and 8.1 in order to be consistent with NSF/ANSI/CAN 600.

Issue 109

This revision corrects table, section, and document references (Sections 4.4 and 6.3) as well as the omission of a "<" symbol (Section 5.1.3.4.d); removes redundant wording (Sections 7.1.3.7 and 7.2.2.6); adds a missing subsection heading (Section 7.1.4.5.1); adds a missing section for countertop systems with storage tanks or reservoirs (Section 7.2.2.6.4); and corrects the definition of DPR (Section 7.3.2.1).

Issue 110

This revision clarifies treatment train options in Section N-2.1.

[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 standard was developed by the NSF Joint Committee on Drinking Water Treatment Units 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.

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, U.S.A.

NSF/ANSI Standard
for Drinking Water Treatment Units –

Reverse Osmosis Drinking Water Treatment Systems

1 General

1.1 Purpose

The purpose of this standard is to establish minimum requirements for materials, design and construction, and performance of reverse osmosis (RO) drinking water treatment systems. This standard also specifies the minimum product literature that manufacturers shall supply to authorized representatives and owners, as well as the minimum service-related obligations that manufacturers shall extend to system owners.

1.2 Scope

The point-of-use (POU) RO drinking water treatment 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 by this standard are intended for reduction of total dissolved solids (TDS) and other contaminants specified herein. They may be chemical or particulate (including filterable cysts) in nature. It is recognized that a system may be effective in controlling one or more of these contaminants, but systems are not required to control all, however, TDS testing is required. Systems with manufacturer claims that include components or functions covered under other NSF or NSF/ANSI standards or criteria shall conform to the applicable requirements therein. Systems covered by this standard are not intended to be used with drinking water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

> NOTE — Systems that are compliant with NSF/ANSI 55 Class A or other standards that cover technologies to treat microbiologically unsafe water (e.g., U.S. EPA Guide *Standard and Protocol for Testing Microbiological Water Purifiers* or NSF P231) are examples of demonstrating adequate disinfection before or after the system.

1.3 Chemical and mechanical reduction performance claims

1.3.1 All NSF/ANSI 58 performance claims shall be verified and substantiated by test data generated under the requirements of NSF/ANSI 58.

1.3.2 When performance claims are made for substances not specifically addressed in the scope of this standard or for those substances not specifically addressed but falling under the scope of NSF/ANSI 58, claims not specifically addressed in the standard shall be so identified.

1.4 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 N-2.