



*NSF International Standard /  
American National Standard*

## NSF/ANSI 330 - 2021

### Glossary of Drinking Water Treatment Unit Terminology



NOT FOR DISTRIBUTION OR SALE

*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.*

NOT FOR  
DISTRIBUTION  
OR SALE

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, PO Box 130140  
Ann Arbor, Michigan 48113-0140 USA  
Phone: (734) 769-8010 Fax: (734) 769-0109  
Email: [info@nsf.org](mailto:info@nsf.org)  
Web: <[www.nsf.org](http://www.nsf.org)>

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

**Glossary of Drinking Water  
Treatment Unit Terminology**

NOT FOR  
DISTRIBUTION  
OR SALE

Standard Developer  
**NSF International**

**Designated as an ANSI Standard**  
September 28, 2021  
**American National Standards Institute**

Prepared by  
**The NSF Joint Committee on Drinking Water Treatment Units**

Recommended for adoption by  
**The NSF Council of Public Health Consultants**

Adopted by  
**NSF International**  
**February 2009**

Revised October 2012  
Revised October 2015  
Revised May 2021

Revised November 2013  
Revised May 2018  
Revised April 2022

Revised May 2015  
Revised February 2020

NOT FOR  
DISTRIBUTION  
OR SALE

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 330 – 2021.”

Copyright 2021 NSF International

Previous editions © 2020, 2019, 2018, 2015, 2014, 2013, 2012, 2009

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.

## Disclaimers<sup>1</sup>

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.

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, 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.

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.

---

<sup>1</sup> 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.

NOT FOR  
DISTRIBUTION  
OR SALE

This page is intentionally left blank.

## Contents

1	General .....	1
1.1	Purpose.....	1
1.2	Scope.....	1
2	Normative references .....	1
3	Definitions .....	1

NOT FOR  
DISTRIBUTION  
OR SALE

NOT FOR  
DISTRIBUTION  
OR SALE

This page is intentionally left blank.

## Foreword<sup>2</sup>

The purpose of this standard is to establish minimum requirements for materials, design, construction, and performance of drinking water treatment units that are designed to reduce specific aesthetic-related contaminants in public or private water supplies. This standard specifies the minimum product literature and labeling information that a manufacturer must supply to authorized representatives and system owners. Lastly, the standard provides minimum service-related obligations that the manufacturer must extend to system owners.

This edition of the standard contains the following revision:

### Issue 12

This revision adds the definition of microplastics to Section 3.

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](mailto:standards@nsf.org), or c/o NSF International, Standards Department, PO Box 130140, Ann Arbor, Michigan 48113-0140, USA.

NOT FOR  
DISTRIBUTION  
OR SALE

---

<sup>2</sup> 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.

NOT FOR  
DISTRIBUTION  
OR SALE

This page is intentionally left blank.

# NSF/ANSI Standard for Drinking Water Treatment Units –

## Glossary of Drinking Water Treatment Unit Terminology

### 1 General

#### 1.1 Purpose

This standard establishes definitions for drinking water treatment units and related components.

#### 1.2 Scope

Definitions covered by this standard consist of terminology related to drinking water treatment units including terms describing materials, design, construction, and performance testing. This standard includes definitions of terms used in NSF Drinking Water Treatment Unit standards.

### 2 Normative references

The following documents contain provisions that, through reference, constitute provisions of this Standard. At the time this Standard was balloted, the editions listed below were valid. All documents are subject to revision and the most recent published edition of the document shall be used for undated references.

NSF/ANSI 42, *Drinking Water Treatment Units – Aesthetic Effects*

NSF/ANSI 44, *Residential Cation Exchange Water Softeners*

NSF/ANSI 53, *Drinking Water Treatment Units – Health Effects*

NSF/ANSI 55, *Ultraviolet Microbiological Water Treatment Systems*

NSF/ANSI 58, *Reverse Osmosis Drinking Water Treatment Systems*

NSF/ANSI/CAN 61, *Drinking Water System Components – Health Effects*

NSF/ANSI 62, *Drinking Water Distillation Systems*

### 3 Definitions

**3.1 absorption:** The penetration of one substance into another substance.

**3.2 accessible:** Fabricated to be exposed for cleaning and inspection using simple tools (e.g., screwdriver, pliers, open-end wrench).

**3.2.1 readily accessible:** Fabricated to be exposed for cleaning and inspection without the use of tools.

**3.3 active agent:** A substance or medium added to or involved in a drinking water treatment process that requires direct or sacrificial release of the agent or its degradation product(s) to perform a specific function.

**3.4 additive:** A substance added to water, directly or indirectly, during a drinking water treatment process.

**3.5 adsorption:** The physical process occurring when liquids, gases, or dissolved or suspended matter adhere to the surface of or in the pores of a medium.

**3.6 aesthetic:** Pertaining to non-health-related factors that affect the acceptance of drinking water, such as taste, odor, color, and appearance.

**3.7 air gap:** A dedicated vertical air space designed to prevent the reverse flow of contaminated water into a potable water source (minimum of two pipe diameters or 25 mm [1 in] above the flood rim of the tank, whichever is larger).

**3.8 alarm set point:** See *UV light disinfection*.

**3.9 ambient temperature:** The temperature of a medium such as air, gas, or a liquid that surrounds items such as equipment, devices, instruments, and food.

**3.10 anion:** An atom or molecule that carries a negative charge.

**3.11 back flush:** The reversal of flow through a filter or ion exchange column to remove particles for cleaning purposes.

**3.12 backwash:** A reversed flow of water through a media which allows the expelling of collected matter to the drain.

**3.13 bacteriostasis:** An action or process designed to limit the growth of heterotrophic bacteria on the treatment media or in the unit so that the heterotrophic plate count of the product water is not larger than that of the influent water.

**3.14 batch treatment:** A method in which a fixed quantity of water is processed through a treatment device in a single treatment cycle.

**3.15 bed volume:** Total volume of the media including the void spaces between the media particles.

**3.16 blackwaste:** See *UV light disinfection*.

**3.17 breakthrough:** The point (measured as volume of water or time) in the test of a water treatment system when the concentration of a contaminant in the product water exceeds the limit established in the standard.

**3.18 brine:** See *salt*.

**3.19 bypass:** (*noun*) A valve system that allows water to flow around the water treatment system while a system is being regenerated or serviced. (*verb*) To cause water to flow around a water treatment system or its media.

**3.20 calibration:** The process of checking and correcting the accuracy of instrumentation within defined allowable tolerances by reference to a known standard.

**3.21 capacity:** The volume of water treated by a system before the system or components of the system must be cleaned, regenerated or replaced, as specified by the manufacturer.

- 3.22 cation:** An atom or molecule that carries a positive charge.
- 3.23 cation exchange:** See *water softener*.
- 3.24 challenge water:** See *water*.
- 3.25 check valve:** A device that allows liquid or gas to flow in only one direction.
- 3.26 chemical feeder:** A mechanism or device designed to add a controlled amount of chemical(s) to water.
- 3.27 chemical reduction:** The lowering of a chemical contaminant concentration in the influent water by a water treatment system or process.
- 3.28 Class A system:** See *UV System*.
- 3.29 Class B system:** See *UV System*.
- 3.30 clean system:** A system that has been conditioned in accordance with the manufacturer's instructions prior to commencing the test.
- 3.31 cleanable:** Able to be freed of residues and other soiling materials.
- 3.31.1 easily cleanable:** Fabricated of materials, designed, and constructed so soil is removed by normal (nonmechanical) cleaning methods.
- 3.32 cleaning:** Removal of residues and other soiling materials.
- 3.33 closed:** (As used in NSF/ANSI 62) Fabricated with no openings exceeding 0.8 mm ( $1/32$  in).
- 3.34 coating:** A layer of material applied to a surface.
- 3.35 commercial modular system:** A system consisting of multiple components attached to a manifold, produced specifically for food service applications, installed by an authorized plumber or authorized agent of the manufacturer, and not intended for use in residential applications.
- 3.36 component:** A separate or distinct part of a water treatment system including, but not limited to membranes, filters, housings, tubing, storage tanks, faucets, valves, and connectors.
- 3.37 condensing:** To change a gas or vapor to a liquid.
- 3.38 contaminant:** Any undesirable physical, chemical, radiological or microbiological substance in water.
- 3.39 corrosion resistant:** Capable of maintaining original surface characteristics under prolonged contact with the intended end use environment and exposure to cleaning or sanitizing procedures.
- 3.40 corrosion resistant material:** A material that maintains its original surface characteristics under prolonged exposure to the intended use environment and exposure to cleaning or sanitizing procedures.
- 3.41 critical level:** A point on a backflow prevention device, which determines the minimum elevation of the device above the flood level rim of the fixture or receptacle served.
- 3.42 cyanotoxins:** Intracellular toxins produced by actively growing freshwater cyanobacterial blooms and are released into the surrounding water as dissolved toxins primarily through cell death and lysis.

**3.43 cycle:** (As used in NSF/ANSI 62) See *distillation*.

**3.44 cyst:** The environmentally resistant stage in the life cycle of certain protozoa which are typically found in water. Cyst includes oocysts of *Cryptosporidium* and *Toxoplasma* and cysts of *Giardia* and *Entamoeba*.

**3.45 daily production rate:** See *reverse osmosis (RO)*.

**3.46 degradation product:** A substance produced from an active agent or additive by biological, chemical, or physical interaction.

**3.47 demand initiated regeneration (DIR) water softener:** (As used in NSF/ANSI 44) See *water softener*.

**3.48 disinfection:** The process that eliminates (removing, destroying, and inactivating) many or all pathogenic microorganisms with the exception of the bacterial endospore on inanimate objects and liquids.

**3.49 disposable component:** A component that requires periodic replacement.

**3.50 disposable pressure vessel:** A pressure vessel that is to be replaced at the end of each rated service cycle and has an estimated service life of one year or less.

**3.51 disposable system:** A system that is to be replaced at the end of each rated service cycle and has an estimated service life of one year or less.

**3.52 distillation:** A process that consists of vaporizing and condensing water.

**3.52.1 cycle:** (As used in NSF/ANSI 62) The period of operation of a distiller between a normal start with a properly filled evaporating chamber and the normal automatic shutoff of operation.

**3.52.2 evaporating chamber:** A part of a distillation system where water is converted into a vapor.

**3.53 distilled water (distillate):** See *water*.

**3.54 drain:** A conduit used to carry non-product water from a system to waste. Examples of nonproduct water includes filter backwash water, spent regenerant, rinse water, and reverse osmosis reject water.

**3.55 drinking water:** See *water*.

**3.56 easily cleanable:** See *cleanable*.

**3.57 efficiency rated (ER) water softener:** (As used in NSF/ANSI 44) See *water softener*.

**3.58 efficiency rating:** See *reverse osmosis (RO)*.

**3.59 effluent:** See *water*.

**3.60 endpoint device:** Any single device typically installed within the last 1 L (0.26 gal) of the water distribution system.

**3.61 evaporating chamber:** (As used in NSF/ANSI 62) See *distillation*.

**3.62 exhaustion point:** (As used in NSF/ANSI 44) See *water softener*.

- 3.63 exposure water:** See *water*.
- 3.64 extractant water:** See *water*.
- 3.65 fiber:** A particle with a length three or more times the width or diameter (excludes organisms).
- 3.66 filter:** (*noun*) A device for carrying out the process of filtration consisting of the medium and suitable hardware for constraining and supporting the medium in the path of the water. (*verb*) To pass water through a permeable medium to separate particles from the water.
- 3.67 filter area:** The effective area at which water first contacts the filter medium.
- 3.68 filter medium:** See *media*.
- 3.69 filtration:** The process by which particles are separated from water by passing water through a permeable material.
- 3.70 filtration media:** See *media*.
- 3.71 flow control:** A device for controlling the flow rate of a specified stream.
- 3.72 flow rate:** The volume of water that passes through a system in a specified time period.
- 3.73 gaskets and sealing materials:** Materials used to fill a void or joint to prevent leakage.
- 3.74 grains per gallon (GPG):** See *water softener*.
- 3.75 greywaste:** See *UV light disinfection*.
- 3.76 hardness:** See *water softener*.
- 3.77 hardness leakage:** See *water softener*.
- 3.78 health hazards:** Established health hazards are materials or contaminants for which maximum contaminant levels (MCLs) are listed in the US EPA Primary Drinking Water Regulations,<sup>3</sup> maximum acceptable concentrations (MACs) are listed by Health Canada's Guidelines for Canadian Drinking Water Quality, and microorganisms of health concern. *Potential* health hazards include materials or contaminants which may be suspected of adverse health effects but for which the MCL or MAC has not been established in the US EPA Primary Drinking Water Regulations<sup>3</sup> or Health Canada Guidelines for Canadian Drinking Water Quality,<sup>4</sup> respectively.
- 3.79 heterotrophic plate count (HPC):** Bacterial enumeration used to estimate bacterial density in water.
- 3.80 influent:** See *water*.
- 3.81 influent challenge:** The mixture of water and contaminants entering a water treatment system.
- 3.82 influent water zone:** See *zones (contact surfaces)*.
- 3.83 initial dynamic pressure:** See *pressure*.

---

<sup>3</sup> US Environmental Protection Agency. 1200 Pennsylvania Avenue NW, Washington, DC 20004. <[www.epa.gov](http://www.epa.gov)>

<sup>4</sup> Health Canada. Address Locator 0900C2, Ottawa, Ontario K1A 0K9, Canada. <[www.canada.ca/en/health-canada.html](http://www.canada.ca/en/health-canada.html)>

**3.84 in-line device:** Any device in contact with the water installed on a service line or distribution system downstream of the water main and upstream from endpoint devices.

**3.85 installation:** The act of connecting components including piping, structural support, and valving, and by which water treatment systems are connected to the water system and drain.

**3.86 integral:** Joined as one piece.

**3.87 intermittent flow rate:** (As used in NSF/ANSI 44) See *water softener*.

**3.88 ion:** An atom or molecule that carries a positive or negative electric charge.

**3.89 ion exchange:** See *water softener*.

**3.90 ion exchange media:** See *media*.

**3.91 ion exchange resins:** See *water softener*.

**3.92 irradiance:** (As used in NSF/ANSI 55) See *UV light disinfection*.

**3.93 joining material:** Any substance used to produce a fluid-tight joint (solvent cements, adhesive, sealant, etc.) between two or more components.

**3.94 joint:** A surface of contact between two bodies or masses of material of like or different character or composition.

**3.95 lifetime health advisory (LHA)<sup>5</sup>:** The concentration of a chemical in drinking water that is not expected to cause any adverse non-carcinogenic effects for a lifetime of exposure, incorporating a drinking water relative source contribution (RSC) factor of contaminant-specific data or a default of 20% of total exposure from all sources. For LHAs developed for drinking water contaminants before the LHA policy change to develop LHAs for all drinking water contaminants regardless of carcinogenicity status in the Drinking Water Standards and Health Advisories (DWSHA)<sup>6</sup> update, the LHA for Group C carcinogens (possible human carcinogen), as indicated by the 1986 Cancer Guidelines, includes an uncertainty adjustment factor of 10 for possible carcinogenicity.

**3.96 limit of detection (LOD):** The lowest quantity of a substance able to be distinguished from the absence of that substance (a blank value), but not necessarily quantified, under the conditions of the test method.

**3.97 limit of quantification (LOQ):** The lowest concentration at which the analyte is not only reliably detected but at which some predefined goals for bias and imprecision are met. The LOQ may be equivalent to the LOD, or it could be at a much higher concentration.

**3.98 line pressure (static pressure):** See *pressure*.

**3.99 maximum acceptable concentration (MAC):** The maximum permissible concentration of a contaminant in drinking water as established by Health Canada's Guidelines for Canadian Drinking Water Quality.

**3.100 maximum contaminant level (MCL):** The maximum permissible concentration of a contaminant in drinking water as established in the US EPA National Primary Drinking Water Regulations.<sup>3</sup>

<sup>5</sup> As defined by the US Environmental Protection Agency (US EPA), 822-S-12-001, 2012 Edition of the Drinking Water Standards and Health Advisories. Office of Water. 1200 Pennsylvania Avenue NW, Washington, DC 20460. <[www.epa.gov](http://www.epa.gov)>

<sup>6</sup> <[www.epa.gov/system/files/documents/2022-01/dwtable2018.pdf](http://www.epa.gov/system/files/documents/2022-01/dwtable2018.pdf)>

**3.101 maximum contaminant level goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG allow for a margin of safety and are nonenforceable public health goals.

**3.102 maximum drinking water level (MDWL):** The maximum concentration of a nonregulated contaminant that a system or component is allowed to contribute to the product water.

**3.103 maximum service flow rate:** (As used in NSF/ANSI 44) See *water softener*.

**3.104 maximum working pressure:** See *pressure*.

**3.105 mechanical filtration system:** A system that physically separates particulate matter from water.

**3.106 media:** Material in a system that forms a water-permeable barrier to the passage of certain contaminants or otherwise contributes to the reduction of contaminants in water. Medium is the singular form of media.

**3.107 media migration:** The release of a fraction of the media into the product water.

**3.107.1 filter medium:** The permeable material used to separate particulate matter from water.

**3.107.2 filtration media:** Process materials through which a liquid is passed for the purpose of filtration.

**3.107.3 ion exchange media:** A material possessing reversible exchange properties for ions.

**3.107.4 oxidative media:** Process media that facilitates chemical oxidation on the media surface.

**3.107.5 reductive media:** Process media that facilitates chemical reduction on the media surface.

**3.108 membrane:** A semi-permeable barrier that allows the passage of water, and depending on membrane type and characteristics, may restrict the passage of microorganisms, particles, molecules, and ions.

**3.109 microbiologically safe water:** See *water*.

**3.110 microbiologically unsafe water:** See *water*.

**3.111 microcystins:** A class of cyanotoxins produced by certain freshwater cyanobacteria that consist of over 100 different variants, or congeners, that share a common structure, but have chemical variations that affect their toxicity and may affect their ability to be removed by filtration technologies. Microcystin LR is the most studied and highly toxic form of microcystin to date and is used as the benchmark microcystin in establishing the recommended drinking water limits as well as reduction performance under NSF/ANSI 53.

**3.112 microplastics:** Solid polymeric materials that are greater than 1 and less than 5,000 micrometers ( $\mu\text{m}$ ).

**3.113 minimum working pressure:** See *pressure*.

**3.114 modular element:** A replaceable treatment element designed and sold as a component for use in commercial modular systems.

**3.115 multiple fixture pump:** See *pump*.

**3.116 nominal pipe size:** Approximate inside diameter of a pipe.

**3.117 nonregulated contaminant:** A substance in water that may have an adverse health effect but that has not been regulated by the US EPA National Primary Drinking Water Regulations.<sup>3</sup>

**3.118 normal output (Class B system):** See *UV light disinfection*.

**3.119 open discharge system:** A system that is subject to only atmospheric pressure during the off mode.

**3.120 operating temperature:** Feedwater or inlet water temperature to a system.

**3.121 oxidation:** A chemical process in which a molecule, atom, or ion loses electrons.

**3.122 oxidative media:** See *media*.

**3.123 parts per million (ppm):** A unit of concentration, 1 ppm = 1 milligram per kilogram (mg/kg). For dilute aqueous solution it is typically represented as 1 milligram per liter (mg/L).

**3.124 permeate:** See *reverse osmosis (RO)*.

**3.125 personal handheld device:** A small, portable apparatus designed to treat water for consumption by a single user and to be carried on their person.

**3.125.1 mouth drawn drinking water treatment unit:** A personal handheld device that is designed to treat water for consumption by drawing water through the device (unit) with suction generated by the user's mouth.

**3.125.2 squeeze bottle drinking water treatment unit:** A personal handheld device having a single outlet and a flexible liquid-holding bottle in which the contents can be forced out by squeezing.

**3.126 pH:** The negative log of the hydrogen ion concentration. A measure of the degree of acidity or alkalinity of an aqueous solution.

**3.127 point-of-entry (POE) system:** A drinking water treatment unit used to treat the water supply at the entry of a building or facility for drinking and for washing, flushing, or for other non-consumption use. A POE system has a minimum initial clean-system flow rate of not less than 15 liters per minute (LPM) at 103 kilopascals (kPa) pressure drop and  $18 \pm 5$  °C water temperature (not less than 4 gallons per minute (GPM) at 15 psig pressure drop and  $65 \pm 10$  °F water temperature).

**3.128 point-of-use (POU) system:** A plumbed-in or faucet-mounted drinking water treatment unit used to treat the drinking and/or cooking water at a single tap or multiple taps but not used to treat the majority of water used for washing and flushing or other non-consumption purposes at a building or facility. Any batch system or device not connected to the plumbing system is considered a point-of-use system.

**3.129 potable water:** See *water*.

**3.130 pressure:** The force applied to a unit area. Water pressure is normally measured in pounds per square inch (lb/in<sup>2</sup>), kilopascals (kPa), or feet (ft) or meters (m) of head.

**3.130.1 initial dynamic pressure:** The pressure measured by a pressure measuring instrument installed immediately preceding the connection to a clean system being tested when the system is filled with water and flowing.

**3.130.2 line pressure:** The pressure applied to a system that originates from the plumbing connected to the inlet of the system.

**3.130.3 static pressure:** The pressure measured by a pressure measuring instrument installed preceding the connection to a system being tested when the system is filled with water and not flowing.

**3.130.4 working pressure:** Feedwater or inlet water pressure to a system.

**3.130.4.1 maximum working pressure:** The maximum operating pressure recommended by the manufacturer.

**3.130.4.2 minimum working pressure:** The minimum operating pressure recommended by the manufacturer.

**3.131 pressure drop:** The difference between the pressure at the inlet of a system and the pressure at the outlet of the system at a specific flow rate.

**3.132 pressure vessel:** A component of the system, intended to hold water under pressure higher than atmospheric pressure.

**3.133 product rate:** The volume of product water produced by a system per day or unit of time.

**3.134 product water:** See *water*.

**3.135 product water zone:** See *water*.

**3.136 public health goal (PHG):** A level of drinking water contaminant, as determined by the State of California, at which adverse health effects are not expected to occur from a lifetime of exposure. PHGs are not regulatory standards.

**3.137 pump:** Mechanical device for driving fluid flow, raising or lifting, or for applying pressure to a fluid.

**3.137.1 multiple fixture pump:** A pump to deliver water to two or more fixtures.

**3.137.2 single fixture pump:** A pump to deliver water to a single fixture other than a toilet.

**3.138 rated salt efficiency:** See *water softener*.

**3.139 rated service flow:** Flow rate at which a system will deliver treated water of acceptable quality, as claimed by the manufacturer. Flow rate is expressed as liters (gallons) per minute or liters (gallons) per day.

**3.140 rated softening capacity:** See *water softener*.

**3.141 raw water:** See *water*.

**3.142 readily accessible:** See *accessible*.

**3.143 readily removable:** See *removable*.

**3.144 readily visible:** Capable of being readily accessible and clearly visible on the exterior of the system in the normal operating position.

**3.145 recovery rating:** See *reverse osmosis (RO)*.

**3.146 reduction:** (1) The decrease of concentration in the product water as related to the concentration of the substance in the influent water; (2) The counter part of oxidation. Reduction may involve acceptance of one or more electrons by an atom or ion, removal of oxygen from a compound, or addition of hydrogen to a compound.

**3.147 reductive media:** (As used in NSF/ANSI/CAN 61) See *media*.

**3.148 refrigerator filter:** A filter system incorporated into a residential refrigerator appliance.

**3.149 regeneration:** The maintenance process that restores a medium (media) in a system so that it can continue to perform its water treatment function(s).

**3.150 reject volume:** See *reverse osmosis (RO)*.

**3.151 reject water:** See *water*.

**3.152 removable:** Fabricated to be taken away from the system using simple tools (such as a screwdriver, pliers, open-end wrench).

**3.152.1 readily removable:** Fabricated to be taken away from the system without the use of tools.

**3.153 reporting limit (RL):** The minimum concentration, for an undiluted sample, to which a laboratory may report a value for a particular analyte.

**3.153.1 method detection limit (MDL):** (As defined in 40 CFR 136, Appendix B) The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

**3.154 residential water softener:** See *water softener*.

**3.155 resin:** See *water softener*.

**3.156 reverse osmosis (RO):** A process that reverses, by the application of pressure, the flow of water in a natural process of osmosis so that water passes from a more concentrated solution to a more dilute solution through a semi-permeable membrane.

**3.156.1 daily production rate:** The volume of product water produced by the system per day under defined conditions.

**3.156.2 efficiency rating:** (As used in NSF/ANSI 58) The percentage of the influent water to reverse osmosis system that is available to the user as treated water under operating conditions that approximate typical use.

**3.156.3 permeate:** Water that is treated by passage through a membrane.

**3.156.4 recovery rating:** (As used in NSF/ANSI 58) The percentage of the influent water to the membrane portion of the system that is available to the user as reverse osmosis treated water when the system is operated without a storage tank or when the storage tank is bypassed and the permeate is open to atmosphere.

**3.156.5 reject volume:** The volume of influent challenge water that is introduced to a system that does not become permeate.

**3.157 rinse:** See *water softener*.

**3.158 salt:** See *water softener*.

**3.159 salt dosage:** See *water softener*.

**3.160 salt efficiency:** See *water softener*.

**3.161 scale:** A deposit on the surface of materials in contact with water resulting from the precipitation of salts from the water.

**3.162 secondary maximum contaminant level (SMCL):** The maximum permissible level of a contaminant in drinking water as established in the US EPA National Secondary Drinking Water Regulations.

**3.163 service cycle:** The time of operation of a system or component between servicing or replacement, or regeneration of media.

**3.164 shelf life:** The length of time that a material, substance or product can be stored under specified environmental conditions and continue to meet applicable specifications and perform its intended function.

**3.165 shower water:** See *water*.

**3.166 single fixture pump:** See *pump*.

**3.167 soft water:** See *water softener*.

**3.168 storage tank capacity:** (As used in NSF/ANSI 58) The volume of water available from a storage tank under defined conditions.

**3.169 system:** A complete water treatment device, including all components needed to connect it to a potable water supply.

**3.170 target compound (targets):** An analyte for which the analytical system has been specifically validated, and for the sample in question specifically calibrated in accordance with the referenced analytical procedure. Through this validation, the target compound has well defined method recovery (accuracy) and reproducibility (precision) data.

**3.171 tentatively identified compound (TIC):** An analyte which has been detected by mass spectrometry and identified without the use of an authentic standard for the compound.

NOTE — Identification can be supported through matching library spectra or through spectral interpretation, but verification can only be performed through the analysis of an authentic standard; verifying the retention time, spectrum, and concentration. If no authentic standard exists and there is no relevant spectrum to compare to and the spectrum is not sufficient enough to provide an identification through interpretation, then only a class of compound can be provided (e.g., alkane, hydrocarbon, etc.) as the identification.

**3.172 total allowable concentration (TAC):** The maximum concentration of a non-regulated contaminant permitted in a public drinking water supply as defined by Annex A of NSF/ANSI/CAN 61.

**3.173 total dissolved solids (TDS):** The solids remaining when a solution is filtered through a 0.45 µm glass filter and the filtrate is evaporated and dried to constant weight at 180 °C (356 °F). TDS is expressed as mg solids per liter of filtrate as described in *Standard Methods* 2540.

**3.174 toxic:** Having an adverse physiological effect on humans.

**3.175 treatment train:** A sequential series of two or more contaminant reduction technologies applied within a system to achieve a final water quality goal.

**3.176 turbidity:** A condition caused by the presence of suspended matter, colloidal matter, or both, which results in the scattering and absorption of light.

**3.177 unit void volume:** Total water-holding volume with the medium (media) and internal components in place as determined by measuring the volume of water required to completely fill a dry system.

**3.178 unit volume:** Total water-holding volume without the medium (media) or internal components.

**3.179 unknown compound:** An analyte for which an identification cannot be determined. Information on chemical class, functional group(s), and chemical structure may be determined by spectral interpretation.

**3.180 UV absorbance:** See *UV light disinfection*.

**3.181 UV dose:** See *UV light disinfection*.

**3.182 UV light disinfection:** Process for inactivating microorganisms by irradiating them with UV light. The UV light waves that disrupt the metabolic activities of the organisms, rendering them inactive and incapable of reproduction. The UV light does not leave a disinfectant residual.

**3.182.1 alarm set point:** (As used in NSF/ANSI 55) The conditions under which a UV sensor activates an alarm.

**3.182.2 blackwaste:** Human and/or animal body waste, toilet paper, and any other material intended to be deposited in and discharged from a receptacle designed to receive urine and/or feces.

**3.182.3 greywaste:** Materials, exclusive of urine, feces, or industrial waste, deposited in and discharged from plumbing fixtures found in residences, commercial buildings, industrial plants, and institutions.

**3.182.4 irradiance:** The measure of light intensity at a surface. The radiant power arriving at a point on a surface per unit area. A common unit for irradiance is mW/cm<sup>2</sup> or mJ/cm<sup>2</sup>.

NOTE — 40 mJ/cm<sup>2</sup> is equal to 4.0 × 10<sup>4</sup> μW-sec/cm<sup>2</sup>.

**3.182.5 normal output (Class B system):** (As used in NSF/ANSI 55) The UV irradiance delivered by the UV lamp after a 100-hour conditioning period.

**3.182.6 UV absorbance:** (As used in NSF/ANSI 55) The fraction of irradiance at 254 nm that is absorbed or scattered in a solution. UV absorbance is expressed as a fraction per cm.

**3.182.7 UV dose:** (As used in NSF/ANSI 55) The product of irradiance within the UV wavelengths from 240 nm to 300 nm and time over a given area expressed as mJ/cm<sup>2</sup>.

**3.182.8 UV sensitivity:** A measurement of organism inactivation at a specified ultraviolet radiation dose. The measurement is expressed as the negative logarithm base 10 (log<sub>10</sub>) of the fraction of the challenge organism remaining after the UV dose.

**3.182.9 UV sensor:** A device used to measure the UV irradiance.

**3.182.10 UV system:** A system capable of delivering a UV dose.

**3.182.10.1 Class A system:** (As used in NSF/ANSI 55) A system capable of delivering a UV dose equivalent to 40 mJ/cm<sup>2</sup> or greater at a wavelength of 254 nm or that achieves a minimum 4.00 log reduction of Qβ coliphage at the alarm set point.

**3.182.10.2 Class B system:** (As used in NSF/ANSI 55) A system capable of delivering a UV dose equivalent to 16 mJ/cm<sup>2</sup> or greater at a wavelength of 254 nm or that achieves a minimum of 1.5 log

reduction of Q $\beta$  coliphage at 70% of the UV lamp normal output or at the alarm set point, or that achieves a minimum of 2.14-log reduction of Q $\beta$  coliphage with UV source irradiance at 100% normal output.

**3.183 UV sensitivity:** See *UV light disinfection*.

**3.184 valve:** A device used to regulate flow of liquids or gases.

**3.185 wastewater:** See *water*.

**3.186 water:** A transparent, odorless, tasteless compound of hydrogen and oxygen (H<sub>2</sub>O or HOH). At a pressure of 1 atmosphere (001.3 kPa), freezes at 0 °C (32 °F) and boils at 100 °C (212 °F). CAS# 007732-18-5. Water, in a more or less impure state, constitutes rain, oceans, lakes, rivers, and subsurface water bodies as well as ground water.

**3.186.1 challenge water:** The mixture of water and contaminants used to test a system for contaminant reduction claims.

**3.186.2 distilled water (distillate):** Effluent water from a distillation unit.

**3.186.3 drinking water:** Water that is intended for human consumption.

**3.186.4 effluent:** The treated water from the outlet of a unit, system, component, or process.

**3.186.5 exposure water:** Water having definitive characteristics prior to contact with a system or component(s) in extraction procedures.

**3.186.6 extractant water:** Exposure water that has been in contact with a system or component(s) for a specified duration.

**3.186.7 influent:** The water entering a system.

**3.186.8 microbiologically safe water:** Drinking water deemed acceptable for human consumption by a health or regulatory agency having jurisdiction.

**3.186.9 microbiologically unsafe water:** Water that (1) is known to contain disease causing bacteria, viruses, protozoa or other disease-causing microbiological agents or, (2) shows a positive test for an indicator organism, or (3) is determined unsafe by a health or regulatory agency having jurisdiction or, (4) has not been shown to meet appropriate health agency microbiological guidelines.

**3.186.10 potable water:** Water that is satisfactory for drinking, culinary, and domestic purposes.

**3.186.11 product water:** Water that has been treated by the system.

**3.186.12 raw water:** Untreated water or any influent water before it enters a specific water treatment component or system.

**3.186.13 reject water:** The portion of the influent not converted to product water.

**3.186.14 shower water:** Water that is used for the purpose of bathing or showering.

**3.186.15 wastewater:** The water that discharges to the drain such as backwash or reject water.

**3.187 water softener:** (As used in NSF/ANSI 44) A pressurized water treatment device in which hard water is passed through a bed of cation exchange media (either inorganic or synthetic organic) for the purpose of exchanging calcium and magnesium ions for sodium or potassium ions, thus producing a softened water that is more desirable for laundering, bathing, and dishwashing.

**3.187.1 cation exchange:** A process involving the reversible exchange of cations in solution with cations in a solid (cation exchange media).

**3.187.2 demand initiated regeneration (DIR) water softener:** (As used in NSF/ANSI 44) A water softener equipped with a flow meter or sensing control system that automatically initiates the regeneration process after determining the depletion, or impending depletion, of softening capacity

**3.187.3 efficiency rated (ER) water softener:** (As used in NSF/ANSI 44) A water softener that complies with specific performance specifications intended to minimize the amount of regenerant brine and water used in its operation.

**3.187.4 exhaustion point:** (As used in NSF/ANSI Std 44) A point marking completion of useful ion exchange when 1 grains per gallon (GPG) (17.1 mg/L) of hardness is first measured due to the depletion of the initial supply of available exchangeable ions in the ion exchanger bed. A unit that is "exhausted" requires regeneration to restore its capacity to treat water.

**3.187.5 grains per gallon (GPG):** A unit of concentration equal to 17.1 mg/L as calcium carbonate equivalence, usually used to express the hardness of water.

**3.187.6 hardness:** A measurement of the concentration of divalent and trivalent cations, primarily calcium and magnesium, in drinking water. Hardness is typically expressed as GPG or mg/L as calcium carbonate equivalent.

**3.187.7 hardness leakage:** (As used in NSF/ANSI 44) Hardness present in the effluent from a water softener.

**3.187.8 intermittent flow rate:** (As used in NSF/ANSI 44) A flow rate higher than the maximum service flow rate that would be expected to occur rarely, and for a brief period of time. An intermittent flow rate may cause a pressure drop of greater than 103 kPa (15 psig) through a water softener.

**3.187.9 ion exchange:** A process in which ions are reversibly interchanged between a liquid and a solid.

**3.187.10 ion exchange resins:** Process media consisting of insoluble polymers having functional groups capable of exchanging ions.

**3.187.11 maximum service flow rate:** (As used in NSF/ANSI 44) The highest flow rate (regardless of its descriptive title) listed in manufacturer's literature at which a softener will deliver water containing 1 GPG or less hardness repetitively with a pressure drop of 103 kPa (15 psig) or less through the softener.

**3.187.12 rated salt efficiency:** The allowable claimed salt efficiency that may be made for a specific water softener model determined in accordance with NSF/ANSI 44. See *water softener*.

**3.187.13 rated softening capacity:** (As used in NSF/ANSI 44) The quantity of hardness removed by a water softener at a specified salt dosage during the production of softened water including any softened water used for regeneration, commencing at the completion of a regeneration cycle, and ending at breakthrough. The quantity is expressed in grains (mg) as  $\text{CaCO}_3$ .

**3.187.14 residential water softener:** (As used in NSF/ANSI 44) A cation exchange water softener that is connected to the water system with conventional plumbing fittings not exceeding 1.25 in NPS (nominal pipe size), that is designed for residential use, and that is regenerated in place. All operations of the regeneration process, which may include maintenance of the water supply to the residence, backwashing, brining, rinsing, and returning the system to service, are performed by the manual or automatic controls of the system. Salt brine is used for regeneration.

**3.187.15 resin:** A synthetic organic ion exchange material.

**3.187.16 rinse:** (As used in NSF/ANSI 44) The step in the regeneration process for a softener or ion exchanger in which freshwater is passed through the bed of resin to remove any excess or spent regenerate prior to the unit being placed back into service.

**3.187.17 salt:** (As used in NSF/ANSI 44) A water soluble compound that ionizes when dissolved in water such as sodium chloride or potassium chloride used for regenerating water softeners.

**3.187.17.1 brine:** (As used in NSF/ANSI 44) A salt solution used for regeneration of ion exchange units.

**3.187.18 salt dosage:** (As used in NSF/ANSI 44) The amount of salt per unit volume of ion exchange media used in unit or system and expressed in lb/ft<sup>3</sup> or g/m<sup>3</sup>.

**3.187.19 salt efficiency:** (As used in NSF/ANSI 44) The hardness removal capacity of a water softener divided by the weight of salt that is utilized to achieve that amount of hardness removal. In US units, the efficiency is expressed in grains of hardness per pound of salt based on sodium chloride equivalence. In metric units, the efficiency is expressed in grams of hardness per kilogram of salt based on sodium chloride equivalence.

**3.187.20 soft water:** (As used in NSF/ANSI 44) Water containing less than 1 GPG calcium carbonate equivalent of dissolved hardness.

**3.187.21 water softening:** (As used in NSF/ANSI 44) The reduction or removal of dissolved hardness ions from water. See *water softener*.

**3.188 watertight:** A condition existing in equipment and material of such precision of construction and fit as to be impermeable to water.

**3.189 weepage (from tanks):** The formation of bubbles or droplets of water on the outside of a fiber glass tank during the initial phase of a pressure test due to the expression of water that was trapped between the tank liner and the fiber glass wrap during the tank manufacturer's testing.

**3.190 working pressure:** See *pressure*.

**3.191 zones (contact surfaces)**

**3.191.1 product water zone:** (As used in NSF/ANSI 62) Surfaces that normally come into contact with drinking water, including but not limited to, condenser tubing, dispensing valves, storage tanks, etc.

## Standards<sup>7</sup>

The following standards established and adopted by NSF as minimum voluntary consensus standards are used internationally:

Std. #	Standard title
2	Food Equipment
3	Commercial Warewashing Equipment
4	Commercial Cooking, Rethermalization, and Powered Hot Food Holding and Transport Equipment
5	Water Heaters, Hot Water Supply Boilers, and Heat Recovery Equipment
6	Dispensing Freezers
7	Commercial Refrigerators and Freezers
8	Commercial Powered Food Preparation Equipment
12	Automatic Ice Making Equipment
13	Refuse Processors and Processing Systems
14	Plastics Piping System Components and Related Materials
18	Manual Food and Beverage Dispensing Equipment
20	Commercial Bulk Milk Dispensing Equipment
21	Thermoplastic Refuse Containers
24	Plumbing System Components for Recreational Vehicles
25	Vending Machines for Food and Beverages
29	Detergent and Chemical Feeders for Commercial Spray-Type Dishwashing Machines
35	High Pressure Decorative Laminates for Surfacing Food Service Equipment
37	Air Curtains for Entrancesways in Food and Food Service Establishments
40	Residential Wastewater Treatment Systems
41	Non-liquid Saturated Treatment Systems
42	Drinking Water Treatment Units – Aesthetic Effects
44	Residential Cation Exchange Water Softeners
46	Evaluation of Components and Devices Used in Wastewater Treatment Systems
49	Biosafety Cabinetry – Design, Construction, Performance, and Field Certification
50	Equipment and Chemicals for Swimming Pools, Spas, Hot Tubs, and Other Recreational Water Facilities
51	Food Equipment Materials
52	Supplemental Flooring
53	Drinking Water Treatment Units – Health Effects
55	Ultraviolet Microbiological Water Treatment Systems
58	Reverse Osmosis Drinking Water Treatment Systems
59	Mobile Food Carts
60	Drinking Water Treatment Chemicals – Health Effects
61	Drinking Water System Components – Health Effects
62	Drinking Water Distillation Systems
140	Sustainable Carpet Assessment
169	Special Purpose Food Equipment and Devices
170	Glossary of Food Equipment Terminology
173	Dietary Supplements

<sup>7</sup> The information contained in this list of standards 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 standards page 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.

Std. #	Standard title
177	Shower Filtration Systems – Aesthetic Effects
184	Residential Dishwashers
223	Conformity Assessment Requirements for Certification Bodies that Certify Products Pursuant to NSF/ANSI/CAN 60: Drinking Water Treatment Chemicals – Health Effects
244	Drinking Water Treatment Units Supplemental Microbiological Water Treatment Systems – Filtration
245	Wastewater Treatment Systems – Nitrogen Reduction
305	Personal Care Products Containing Organic Ingredients
330	Glossary of Drinking Water Treatment Unit Terminology
332	Sustainability Assessment for Resilient Floor Coverings
336	Sustainability Assessment for Commercial Furnishings Fabric
342	Sustainability Assessment for Wallcovering Products
347	Sustainability Assessment for Single-Ply Roofing Membranes
350	Onsite Residential and Commercial Water Reuse Treatment Systems
350-1	Onsite Residential and Commercial Greywater Treatment Systems for Subsurface Discharge
358-1	Polyethylene Pipe and Fittings for Water-Based Ground-Source “Geothermal” Heat Pump Systems
358-2	Polypropylene Pipe and Fittings for Water-Based Ground-Source “Geothermal” Heat Pump Systems
358-3	Cross-linked Polyethylene (PEX) Pipe and Fittings for Water-based Ground-Source (Geothermal) Heat Pump Systems
358-4	Polyethylene of Raised Temperature (PE-RT) Tubing and Fittings for Water-based Ground-Source (Geothermal) Heat Pump Systems
359	Valves for Cross-linked Polyethylene (PEX) Water Distribution Tubing Systems
360	Wastewater Treatment Systems – Field Performance Verification
363	Good Manufacturing Practices (GMP) for Pharmaceutical Excipients
372	Drinking Water Treatment System Components – Lead Content
375	Sustainability Assessment for Water Contact Products
385	Disinfection Mechanics
391.1	General Sustainability Assessment Criteria for Professional Services
401	Drinking Water Treatment Units – Emerging Compounds / Incidental Contaminants
416	Sustainability Assessment for Water Treatment Chemical Products
418	Effluent Filters – Field Longevity Testing
419	Public Drinking Water Equipment Performance – Filtration
426	Environmental Leadership and Corporate Social Responsibility Assessment of Servers
437	Glossary of Wastewater Technology Terminology
455-1	Terminology for the NSF 455 Portfolio of Standards
455-2	Good Manufacturing Practices for Dietary Supplements
455-3	Good Manufacturing Practices for Cosmetics
455-4	Good Manufacturing Practices for Over-the-Counter Drugs
456	Vaccine Storage
457	Sustainability Leadership Standard for Photovoltaic Modules and Photovoltaic Inverters
505	Conformity Assessment Requirements for Certification Bodies that Certify Pool Chemicals Pursuant to NSF/ANSI/CAN 50: Equipment and Chemicals for Swimming Pools, Spas, Hot Tubs, and Other Recreational Water Facilities
600	Health Effects Evaluation and Criteria for Chemicals in Drinking Water
14159-1	Hygiene Requirements for the Design of Meat and Poultry Processing Equipment
14159-2	Hygiene Requirements for the Design of Hand-held Tools Used in Meat and Poultry Processing Equipment
14159-3	Hygiene Requirements for the Design of Mechanical Belt Conveyors Used in Meat and Poultry Processing Equipment

NOT FOR  
DISTRIBUTION  
OR SALE



***THE HOPE OF MANKIND rests in the  
ability of man to define and seek out  
the environment which will permit him  
to live with fellow creatures of the  
earth, in health, in peace, and in  
mutual respect.***