



**WaterSense® Specification for Point-of-Use Reverse
Osmosis Systems**

Version 1.0

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WaterSense® Specification for Point-of-Use Reverse Osmosis Systems

1.0 Scope and Objective

This specification establishes the criteria for point-of-use reverse osmosis (RO) systems to earn a label under the U.S. Environmental Protection Agency's (EPA's) WaterSense program. It applies to point-of-use RO systems, as applicable under the NSF International (NSF)/American National Standards Institute (ANSI) 58 *Reverse Osmosis Drinking Water Treatment Systems*¹ standard, further defined below. Based on the scope of NSF/ANSI 58 and applicable definitions included in NSF/ANSI 330 *Glossary of drinking water treatment unit terminology* and ASSE International (ASSE) 1086 *Performance Requirements for Reverse Osmosis Water Efficiency—Drinking Water*, EPA is defining this product category as follows:

- Reverse osmosis system: A system that incorporates a water treatment process that removes undesirable materials from water by using pressure to force the water molecules through a semipermeable membrane.
- Point-of-use reverse osmosis system: A plumbed-in or faucet-mounted RO system 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 RO system or device not connected to the plumbing system is considered a point-of-use RO system.

The specification does not apply to:

- Components (e.g., replacement filters, membranes) that do not make up a complete RO system.
- Point-of-entry RO systems.
- RO system add-on devices, accessories, or aftermarket companion products (e.g., permeate pump).

This specification is designed to promote sustainable, efficient water use and a high level of user satisfaction with RO system performance.

2.0 General Requirements

2.1 The RO system shall be certified to NSF/ANSI 58.

2.2 The RO system shall be equipped with an automatic shut-off device.

3.0 Water Efficiency Criteria

3.1 For systems with a storage tank, the efficiency rating of the RO system shall be verified in accordance with the applicable procedures in NSF/ANSI 58 for determining the efficiency rating, as modified by Section 3.3 of this specification (if applicable).

¹ References to this and other standards apply to the most current versions of those standards.

- 3.2 For systems without a storage tank, the recovery rating of the RO system shall be verified in accordance with the applicable procedures in NSF/ANSI 58 for determining the recovery rating, as modified by Section 3.3 of this specification (if applicable). For the purposes of this specification, the recovery rating of an RO system without a storage tank shall be considered the system's efficiency rating.
- 3.3 If a system operates with automatic flushing and the flushing is not adjustable by the owner, the efficiency rating shall be determined during testing with that flushing scheme only. If the system has multiple flush schemes, the efficiency rating shall be determined during testing at the lowest and highest flush settings.
- 3.4 The efficiency rating tested in accordance with the requirements in this section shall be a minimum of 30 percent. If a system operates with automatic flushing and the system has multiple flush schemes, the efficiency rating must be a minimum of 30 percent for the lowest and highest flush settings.

4.0 Performance Criteria

- 4.1 Membrane Life: The RO system shall be tested in accordance with the Membrane Life Test for High Efficiency Membrane Systems procedures of ASSE 1086 and shall meet the following criteria:
 - 4.1.1 The percent total dissolved solids (TDS) reduction shall be a minimum of 75 percent each day.
 - 4.1.2 The flow rate shall not decrease by more than 50 percent of the Day 1 reading throughout the test.
 - 4.1.3 The percent recovery, as calculated according to the ASSE 1086 testing procedures, shall be on average a minimum of 30 percent. One tenth of the sample readings may be less than 30 percent but no less than 23 percent. The final percent recovery measurement shall be a minimum of 30 percent.
- 4.2 TDS Reduction: The RO system shall be tested in accordance with the NSF/ANSI 58 testing procedures for verifying TDS reduction claims and shall reduce the influent challenge level of TDS by at least 75 percent.
- 4.3 Elective Performance Claims: The manufacturer's elective performance (chemical reduction and mechanical filtration) claims for the RO system shall be verified according to the applicable test methods and requirements of NSF/ANSI 58.

5.0 Packaging and Documentation Requirements

- 5.1 The RO system shall conform to applicable instructions and information requirements in NSF/ANSI 58, in addition to the requirements included in this section.

5.2 The RO system’s packaging (where product packaging contains information for the prospective purchaser) and/or other point-of-purchase documentation (e.g., specification sheet, manufacturer web page, distributor brochure) shall, at a minimum, include the following information and messaging:

5.2.1 A statement indicating the following: “This system has a [XX] percent efficiency rating in the production of treated water. Efficiency rating means the percentage of the water going into the system that is available to the user as RO treated water. This means that the system will send [Y.Y gallons or liters] of water down the drain for every [gallon or liter] of treated water it produces.”

Where:

XX percent is the system’s efficiency rating in two- or three-digit resolution (e.g., 30 percent or 30.0 percent) as verified by testing in accordance with NSF/ANSI 58, with the modifications for determining efficiency rating provided in this specification; and

Y.Y is the system’s waste-to-product ratio (also referred to as the waste-to-treated water ratio) expressed in at least two-digit resolution (e.g., 2.3 gallons or 2.3 liters) and calculated based on:

$$\text{Waste-to-product ratio (Y.Y)} = \frac{100\%}{\text{verified efficiency rating}} - 1$$

5.2.2 The contaminant removal rates, as verified according to NSF/ANSI 58, for the following contaminants:

- TDS
- Arsenic (pentavalent) at a concentration of 50 or 300 parts per billion (ppb)
- Chromium (hexavalent)
- Chromium (trivalent)
- Lead
- Nitrate/nitrite
- Total per- and polyfluoroalkyl substances (PFAS)

If the system does not have verified reduction claims for any of the above contaminants, the packaging and documentation shall clearly indicate that the product has not been certified to remove these contaminants. All systems must report verified TDS removal at a minimum. Manufacturers may choose to also list verified reduction claims for additional contaminants besides those listed above.

5.2.3 The information required in Sections 5.2.1 and 5.2.2 shall be marked on system packaging and/or on documentation at the point-of-purchase in a manner consistent with Table 1 on the next page. Bracketed text (e.g., [Y.Y gallons]) within the table is indicative of placeholder information that should be completed based on system-specific testing and performance claims.

Table 1. Water Efficiency and Performance at a Glance Table Template

Water Efficiency and Performance at a Glance			
<i>This system has been tested according to NSF/ANSI 58 for daily production rate, efficiency, and contaminant reduction. A system without verified reduction claims for a listed contaminant has not been verified to remove that contaminant under NSF/ANSI 58.</i>			
Daily Production Rate (DPR)			
[DPR Placeholder in gallons per day or liters per day]			
Efficiency and Water Use			
This system has a [XX] percent efficiency rating in the production of treated water. Efficiency rating means the percentage of the water going into the system that becomes available to the user as reverse osmosis treated water. This means that the system will send [Y.Y gallons or liters] of water down the drain for every [gallon or liter] of treated water it produces.		<p>[Y.Y]:1 Waste-to-Treated Water Ratio</p>	
Contaminant Reduction			
Contaminant	Is this system verified to remove the listed contaminant?		
	YES	If yes, what is the verified reduction?	NO
Total Dissolved Solids (TDS)	✓	[% Reduction]	
Arsenic (Pentavalent) at [50 or 300 parts per billion]	[✓] or [Blank]	[% Reduction] or [Blank]	[✓] or [Blank]
Chromium (Hexavalent)	[✓] or [Blank]	[% Reduction] or [Blank]	[✓] or [Blank]
Chromium (Trivalent)	[✓] or [Blank]	[% Reduction] or [Blank]	[✓] or [Blank]
Lead	[✓] or [Blank]	[% Reduction] or [Blank]	[✓] or [Blank]
Nitrate/nitrite	[✓] or [Blank]	[% Reduction] or [Blank]	[✓] or [Blank]
Total Per- and Polyfluoroalkyl Substances (PFAS)	[✓] or [Blank]	[% Reduction] or [Blank]	[✓] or [Blank]
More Information on System Claims			
All contaminants reduced by this system are listed in the performance data sheet. Scan the QR code or visit [manufacturer website or product URL] to view the system's performance data sheet.			
<div style="border: 1px solid black; background-color: #e0e0e0; padding: 10px; width: fit-content; margin: 0 auto;"> <p>Placeholder for optional QR code to performance data sheet.</p> </div>			

- 5.3 For a system with multiple flush schemes, the manufacturer must report the efficiency rating determined when tested at the highest flush scheme (i.e., the lowest efficiency). The manufacturer may also report the efficiency rating determined when tested at the lowest flush scheme (i.e., the highest efficiency).

- 5.4 If a system requires the use of components or companion products (e.g., a permeate pump) to meet the requirements of this specification, all components and/or companion products shall be packaged and sold along with the system.
- 5.5 Within the installation, operation, and maintenance instructions, the manufacturer shall specify replacement parts for all system components the consumer is expected to replace during the life of the system (e.g., RO membrane, pre-filters, post-filters, automatic shut-off device, storage tank), along with their recommended replacement frequencies.
- 5.6 A system shall not be packaged, marked, nor provided with instructions directing the user to an operational setting that would override the system's efficiency, as established by this specification and verified through testing. Any instruction related to the maintenance of the system shall direct the user on how to maintain the system's efficiency.

6.0 Effective Date

This specification's effective date is November 14, 2024.

7.0 Future Specification Revisions

EPA reserves the right to revise this specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. Revisions to the specification shall be made following discussions with industry partners and other interested stakeholders.

8.0 Definitions

Definitions within NSF/ANSI 330 are included by reference.

Automatic shut-off device: A device that prevents reject water being discharged from an RO system when the system is not treating water.

Point-of-entry RO system: An RO system used to treat the water supply at the entry of a building or facility for drinking and for washing, flushing, or other non-consumption use. A point-of-entry RO system has a minimum initial clean-system flow rate of not less than 4.0 gallons per minute at 15 pounds per square inch gauge pressure drop and 65 ± 10 °F water temperature (not less than 15 liters per minute at 103 kilopascals pressure drop and 18 ± 5 °C water temperature).

Point-of-use RO system: A plumbed-in or faucet-mounted RO system 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 RO system or device not connected to the plumbing system is considered a point-of-use RO system.

Reverse osmosis system: A system that incorporates a water treatment process that removes undesirable materials from water by using pressure to force the water molecules through a semipermeable membrane.

Waste-to-product ratio: A ratio that expresses the number of gallons (or liters) of water an RO system wastes for every gallon (or liter) of treated water it produces. It is expressed as a full ratio (i.e., 2.3:1) and may also be referred to as the waste-to-treated water ratio.

Appendix A: Informational Annex for WaterSense Labeling

The following requirements must be met for products to bear the WaterSense label.

1.0 WaterSense Partnership

The manufacturer of the product must have a signed WaterSense partnership agreement in place with EPA.

2.0 Conformity Assessment

Conformance to this specification must be certified by a licensed certifying body accredited in accordance with the *WaterSense Product Certification System*.

3.0 WaterSense Label Use

Per the *WaterSense Program Mark Guidelines*, for all products certified to meet this specification, manufacturers must include the WaterSense label on product packaging and in online and printed specification sheets. Manufacturers should also display the WaterSense label in association with any labeled products listed on the organization's website.

4.0 Testing and Certification Clarifications

- 4.1 At the determination of the licensed certifying body, the requirements included in Section 2.0 (General Requirements), Section 3.0 (Water Efficiency Criteria), and Section 4.0 (Performance Criteria) of this specification may be satisfied through an RO system's testing and certification to ASSE 1086 *Performance Requirements for Reverse Osmosis Water Efficiency—Drinking Water*.
- 4.2 RO systems are permitted to achieve verified contaminant reduction claims using the treatment train options prescribed in NSF/ANSI 58 Normative Annex 2 (Evaluation methods for systems with multiple technologies—Treatment train).