

Summary of Revisions to the WaterSense® Specification for Tank-Type Toilets

The U.S. Environmental Protection Agency (EPA) is announcing the release of Version 2.0 of its *WaterSense Specification for Tank-Type Toilets*. The purpose of this document is to summarize the revisions made to the specification and share the reasoning behind the changes.

Within the revisions to the *WaterSense Specification for Tank-Type Toilets*, EPA has modified the water efficiency criteria for dual-flush toilets by eliminating the effective flush volume calculation and instead establishing the same maximum flush volume requirements for both single-flush toilets and the full-flush mode of dual-flush toilets. Additionally, EPA has improved readability throughout the specification by simplifying language, aligning language to maintain consistency with similar WaterSense specifications, and consolidating referenced standards to avoid redundancy. EPA has also incorporated multiple [technical clarifications](#) that have been made to the specification since its original publication.

EPA considers the updates referenced in this document to constitute a major revision, because the revisions affect the certification status of some existing WaterSense labeled tank-type toilets. These revisions ensure that tank-type toilets receiving the WaterSense label are certified, marked, and labeled consistently, in accordance with EPA's intent, and continue to meet consumer expectations for efficiency and performance.

I. Background

EPA released the *WaterSense Specification for Tank-Type Toilets* in 2007. EPA completed two minor revisions to the specification, releasing the latest version (Version 1.2) in June 2014. To date, dozens of manufacturer partners have produced more than 5,200 WaterSense labeled tank-type toilet models.

During the development of the initial *WaterSense Specification for Tank-Type Toilets* and in the years since, there has been debate over the expected water savings offered by dual-flush toilets. Dual-flush toilets are designed with two flushing modes: a “reduced flush” mode that uses a smaller volume of water to remove liquid waste; and a “full flush” mode for removing solid wastes. The choice as to which flush mode to activate is made by the user. As a result of its 2018 *Notice of Specification Review* and subsequent review of the specification, EPA received feedback from some stakeholders indicating that dual-flush toilets with a full flush volume of 1.6 gallons per flush (gpf) may not realize the 20 percent water savings when employed in real-world applications due to user confusion, user preference, or other factors. In light of this feedback, EPA reviewed available information on the use patterns of dual-flush toilets. In doing so, it concluded that a specification revision was necessary to modify the water efficiency criteria for dual-flush toilets to assure that all toilets that earn the WaterSense label use at least 20 percent less water than standard models.

EPA has also made other minor and editorial updates to better align the specification with current industry standards. EPA published its *WaterSense Notice of Intent (NOI) to Revise the Specification for Tank-Type Toilets* in June 2023, which formally initiated the specification revision process and identified intended revisions it was considering. EPA published its draft Version 2.0 of the *WaterSense Specification for Tank-Type Toilets* in December 2023, which included the proposed revisions and a proposed transition timeline. EPA accepted written comments and held a public meeting in order to discuss the draft specification and obtain

recommendations from interested parties. EPA considered this feedback when creating the final Version 2.0 of the *WaterSense Specification for Tank-Type Toilets*.

II. Summary of Specification Revisions

Section 1.0 Scope and Objective

EPA has explicitly included combination in-wall toilet carrier systems and wall-hung bowls within the scope of the revised specification. EPA previously published criteria for this type of toilet through technical clarifications; however, it has made clear that they are included in the scope of the specification. Otherwise, the scope of the revised specification remains the same as Version 1.2 of the specification. EPA has made minor editorial changes to the list of toilet types to which the specification is applicable, which improves readability and condenses the list of eligible toilet technologies without changing the content.

Within the scope, EPA has incorporated the clarification *TT-0507-1: Single-Flush Tank-Type Toilets With Multiple or Adjustable Flush Volume Settings*, which prohibits toilet tanks with adjustable water use settings that can be identified and activated by a user or plumbing professional to override the rated flush volume from earning the WaterSense label. This clarification was previously incorporated within Appendix A of Version 1.2 of the specification.

Section 2.0 General Requirements

Version 1.2 of the specification required a toilet to conform to applicable water closet requirements in American Society of Mechanical Engineers (ASME) A112.19.2/Canadian Standards Association (CSA) B45.1 *Ceramic Plumbing Fixtures*. If the toilet has dual-flush capabilities, the previous version of the specification required it to conform to requirements in ASME A112.19.14 *Six-Liter Water Closets Equipped with a Dual Flushing Device*. The American National Standards Institute (ANSI) has approved both of these standards as American National Standards.

In the revised WaterSense specification, EPA no longer explicitly references the ASME A112.19.14. This is consistent with the general requirements of the *WaterSense Specification for Flushometer-Valve Water Closets*.

Currently, ASME A112.19.14 is explicitly referenced within ASME A112.19.2/CSA B45.1 *Ceramic Plumbing Fixtures* and applies to dual-flush toilets. Additionally, an effort by the ASME/CSA Technical Committee for Plumbing Fixtures aims to incorporate the applicable requirements of ASME A112.19.14 within ASME A112.19.2/CSA B45.1. This change is likely to take effect during the 2024 publication of that standard.

Therefore, while this is a text change in the specification, it has no impact on how toilets are required to be tested and marked, both before and after the anticipated change to ASME A112.19.2/CSA B45.1.

Section 3.0 Water Efficiency Criteria

EPA has modified the specification criteria to eliminate the effective flush volume calculation and instead establish the same maximum flush volume requirement of 1.28 gpf for both single-flush toilets and the full-flush mode of dual-flush toilets. EPA has also aligned language of the

water efficiency criteria with that of the *WaterSense Specification for Flushometer-Valve Water Closets*.

Under Version 1.2 of the specification, the effective flush volume was calculated by averaging two reduced flush volumes and one full flush volume. This effective flush volume was specified to not exceed 1.28 gpf. With the effective flush volume calculation, dual-flush toilets can have a full flush volume of 1.6 gpf (commensurate with a toilet meeting the federal standard established by the Energy Policy Act of 1992) and still meet the effective flush volume requirement of the specification. Based on feedback from program partners and an investigation of studies that evaluated the frequency at which users select the reduced flush compared to the full flush, EPA determined that users may choose the full-flush mode more than once every three flushes. Therefore, the potential exists for WaterSense labeled toilets to not realize their predicted 20 percent water savings, which is WaterSense's stated goal. Additional background discussion and justification for EPA's decision to revisit the effective flush volume calculation is included in the NOI.

Therefore, to ensure WaterSense labeled toilets deliver on their expected savings in real-world applications, EPA has established the same maximum flush volume requirements of 1.28 gpf for both single-flush toilets and the full-flush mode of dual-flush toilets. The evaluation and testing criteria for verifying the rated flush volume remains the same.

EPA has not established water efficiency criteria for the reduced-flush mode of dual-flush toilets. However, ASME A112.19.2/CSA B45.1, through reference to ASME A112.19.14, requires that the reduced-flush mode of a dual-flush toilet have a maximum flush volume of 1.1 gpf.

This change in water efficiency criteria affects the certification status of some WaterSense labeled tank-type toilets certified under Version 1 of the specification.

Section 4.0 Flush Performance Criteria

EPA has not revised the flush performance criteria of the specification.

Section 5.0 Product Marking and Documentation

EPA has removed from the specification the clarifying language that prohibited the use of the words "or less" in toilet bowl markings to indicate compatibility with tanks of varying consumption levels. As of the 2018 publication of ASME A112.19.2/CSA B45.1, the use of "or less" is no longer permitted in toilet bowl markings. Therefore, while this clarifying language has been removed from the specification, the application of this requirement has not changed because EPA explicitly requires toilet fixtures to be marked in accordance with the requirements in ASME A112.19.2/CSA B45.1.

EPA has incorporated multiple existing clarifications within Section 5.3. *TT-0410-2: Tank and Bowls Manufactured and Sold by Different Companies* was previously incorporated within Appendix A of Version 1.2 of the specification and stipulated certification and product marking and documentation requirements associated with tanks and bowls manufactured by different companies. The product marking and documentation requirements of this clarification have instead been incorporated within Section 5.3, whereas the certification requirements have been incorporated within Appendix A. In *TT-0617-1: Marking and Labeling Requirements for Tank-Type Toilets With Components Made by Different Manufacturers*, EPA clarifies that only the

manufacturer that maintains the toilet tank and bowl combination's certification listing is permitted to use the WaterSense label. In *TT-0617-2: Bowl Packaging Requirements for Tank-Type Toilets Made by Different Manufacturers*, EPA clarifies that when only a bowl manufacturer has chosen to certify a tank-type toilet combination with components from different manufacturers, toilet bowl packaging is not required to list all the specific brand names, model names, and model numbers that are compatible to form a WaterSense labeled toilet.

Appendix A: Requirements for WaterSense Labeling

EPA has modified Appendix A to maintain consistency with the current *WaterSense Program Guidelines* and incorporate technical clarifications that EPA has made since the original publication of the specification. In addition, Section 4.0 of Appendix A of Version 1.2 of the specification, which dealt mainly with issues related to wall hung bowls and in-wall carrier systems made by different manufacturers, has been divided and incorporated within appropriate sections of the specification. There is no change to any of the requirements.

WaterSense Partnership

EPA has removed footnote 4, which defined the term "manufacturer" with reference to the *WaterSense Program Guidelines*. EPA has removed this definition from recent versions of the *WaterSense Program Guidelines* and instead defines the roles and responsibilities of a manufacturer, rendering the reference in footnote 4 unnecessary.

Conformity Assessment

EPA has incorporated two clarifications within Section 2.2 of Appendix A. In *TT-0410-2: Tanks and Bowls Manufactured and Sold by Different Companies*, EPA clarifies that every combination tank and bowl, if tested and certified for conformance to this specification, can earn the WaterSense label. EPA outlines applicable requirements if both the tank and the bowl manufacturer submit a toilet combination for testing and certification. In *TT-1216-1: Certification of Tank-Type Toilets With Components Made by Different Manufacturers*, EPA clarifies that only one manufacturer, either the tank manufacturer or the bowl manufacturer, is required to submit a toilet combination to obtain a certification listing.

WaterSense Label Use

EPA has added requirements for WaterSense label use to clarify marking guidelines for product packaging and online and printed specification sheets. This language aligns with requirements included in more recent WaterSense specifications and ensures consistent application of the *WaterSense Program Mark Guidelines* across product categories.

Clarifications

EPA has modified the clarifications previously included in Appendix A of Version 1.2 of the specification as necessary and incorporated them within appropriate sections of the specification. Therefore, under the Version 2.0 specification, EPA has removed this section from Appendix A.

III. Opportunities for Additional Research and Future Revisions

EPA acknowledges that the *America's Water Infrastructure Act* of 2018 limits the allowed frequency of revisions of specification performance criteria to no more than once every six years after a major revision, such as the development of Version 2.0 of this specification. The revisions included in Version 2.0 of this specification will reinforce the existing specification to realize EPA's goal of 20 percent water savings in tank-type toilets that bear the WaterSense label.

EPA received feedback from interested parties on the NOI that offer opportunities for research that may facilitate future revisions to the WaterSense specification for tank-type toilets. There is a broad desire among WaterSense program partners and interested parties to lower the maximum flush volume requirement below 1.28 gpf to increase water efficiency. However, many commenters urged EPA to thoroughly research the impacts this may have on drainline transport, wastewater treatment system performance, and public health. As less water is used to flush toilets, less water is available to transport waste through existing building- and community-level sewer piping systems. Further, the change in flow and waste concentrations may impact current wastewater treatment infrastructure. Interested parties recommended that EPA investigate how reduced flush volumes may impact these conditions, taking into consideration potential differences in residential versus commercial applications, as residential waste systems may incorporate more diverse wastewater sources that support drainline transport even with reduced flush volumes.

Following the release of this revised specification, EPA intends to coordinate with its program partners to collect data and otherwise facilitate research that investigates how greater toilet water efficiency impacts user satisfaction, wastewater transport, and other related issues. There are numerous program partners who have experience operating water conservation programs (e.g., rebates, incentives, direct installs) that require the installation of ultra-high efficiency toilets flushing at 1.1 gpf or less. EPA aims to collaborate with these partners to analyze customer or property owner experience and understand whether concerns with drainline performance have been realized in real-world scenarios.

In the meantime, moving forward with Version 2.0 of the specification will bolster water efficiency while upholding the importance of thorough research to identify potential for future revisions and water savings.