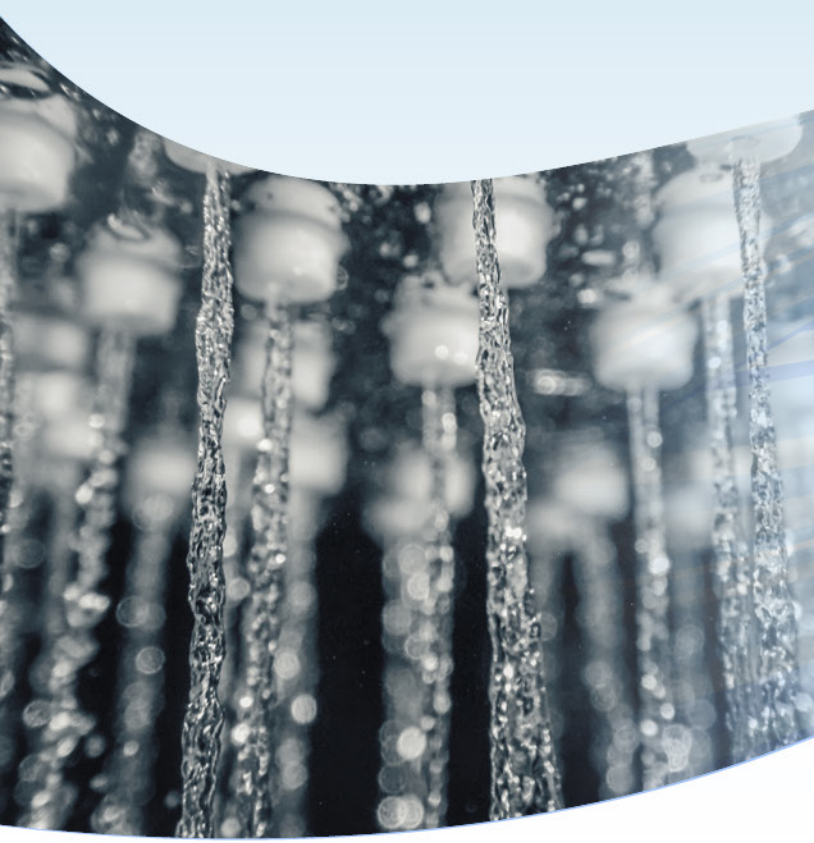
WaterSense® Public Meeting

Notice of Intent (NOI) to Revise the Specification for Tank-Type Toilets



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July 18, 2023

Housekeeping

- All attendees are muted to minimize background noise.
- Please type questions into the Zoom chat. We will have a dedicated time for Q&A at the end of each section and at the end of the presentation as time allows.
- These PowerPoint slides, a meeting summary, and a recording will be posted on the public website.
- Submit written comments to: watersense-products@erg.com
- This meeting is meant to be an open discussion.
- All questions, comments, and concerns are welcome!

Meeting Purpose

At this meeting, we will:

- Explain WaterSense's specification revision process
- Present the contents of the Notice of Intent (NOI) and solicit feedback
- Answer questions about the NOI so that interested parties can provide more precise comments

Generally, we do not:

- Provide resolution to comments or concerns
- Agree on specifics of a specification such as scope, criteria, or test methods
- Provide a guaranteed timeline for the revision completion

Agenda

- Introduction to WaterSense
- Tank-Type Toilet Specification Background
- NOI to Revise the Specification
  - Scope
  - General Requirements
  - Water Efficiency Criteria
  - Performance and Product Testing
  - Marking and Product Documentation
  - Appendix A: Requirements for Product Labeling
  - Transition Timing
- Next Steps
- Questions and Discussion

Part 1

Introduction to WaterSense

The WaterSense Vision

- WaterSense offers people a simple way to use less water
- Our vision is that all Americans will understand the importance of water efficiency and take actions to reduce their water use—in their homes, outdoors, and at work

How will we achieve it?

- By transforming the marketplace for products and services that use water
- By promoting a nationwide ethic of water efficiency to conserve water resources for future generations and reduce water infrastructure costs

WaterSense Can Help

WaterSense is a voluntary partnership program launched by EPA in 2006 that provides a simple way to identify water-efficient:

- Products
- Programs
- Practices
- Homes

Products are independently certified for water efficiency **and** performance

WaterSense Labeled Products

Lavatory Faucets
Labeled since 2007
20,300 labeled models

Tank-Type Toilets
Labeled since 2007
5,200 labeled models

Flushing Urinals
Labeled since 2009
800 labeled models

Flushometer-Valve Toilets
Labeled since 2015
1,700 labeled models

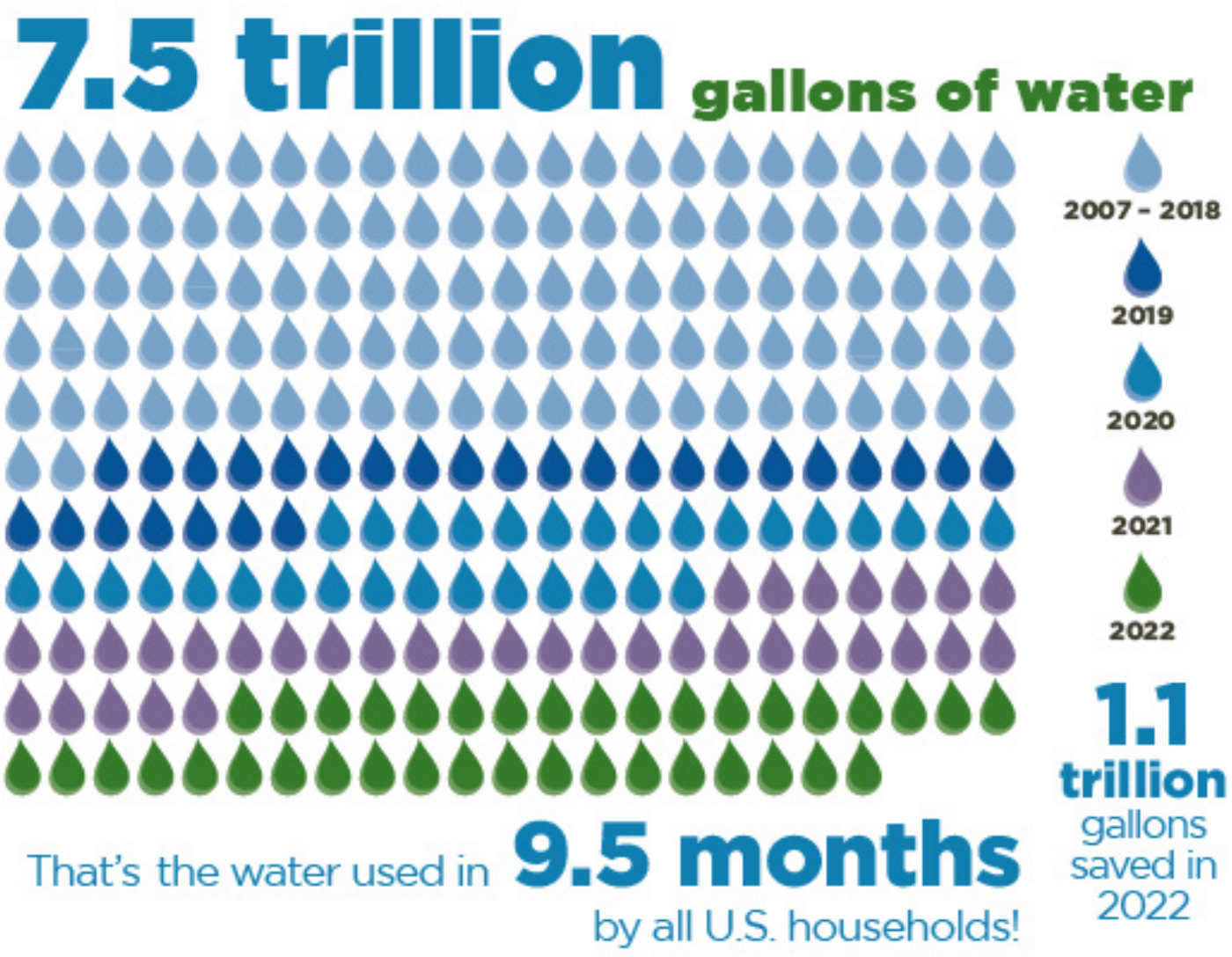
Showerheads
Labeled since 2010
13,700 labeled models

Weather-Based Irrigation Controllers
Labeled since 2011
970 labeled models

Soil Moisture-Based Irrigation Controllers
Labeled since 2021
4 labeled models

Spray Sprinkler Bodies
Labeled since 2017
570 labeled models

Accomplishments



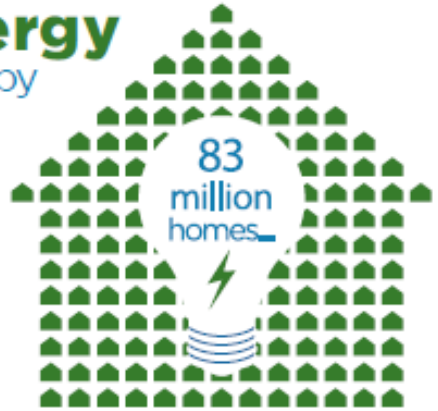
Accomplishments

WaterSense

has helped reduce the amount of **energy** needed to pump, treat, and heat water by

880 billion

kilowatt hours, enough to supply a year's worth of power to nearly

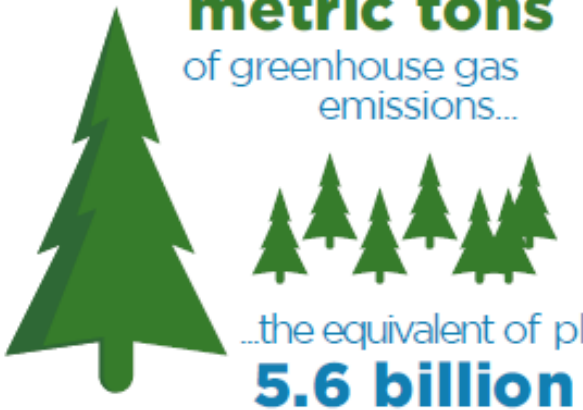


...eliminating

337 million

metric tons

of greenhouse gas emissions...



...the equivalent of planting

5.6 billion trees...

...and saving consumers

$171 billion

in **water** and **energy bills**

Specification Revision Process

We are here

Spec Review

- Updates product information through more recent technical and market research
- Engages with stakeholders on need to complete major or minor revisions

Notice of Intent to Revise

- Identifies intended revisions, outstanding data gaps, and research needs
- Invites participation and requests feedback/data from stakeholders

Draft Revised Spec

- Invites public comment on proposed revisions to the specification, including potentially updated water efficiency and performance criteria required for WaterSense label products
- Proposes transition process and timeline

Final Revised Spec

- Provides final specification criteria, including water efficiency and performance criteria for WaterSense labeled products
- Finalizes transition process and timeline

Part 2

Tank-Type Toilets Background

Specification Background

WaterSense Specification for Tank-Type Toilets

- Released January 24, 2007
- Last revised June 2, 2014 (Version 1.2)
- Includes water efficiency, performance, and marking criteria for tank-type toilets to earn the WaterSense label
- Specification is largely harmonized with high-efficiency requirements for tank-type toilets in ASME A112.19.2/CSA B45.1
- Currently, ~150 different brands/manufacturers offer more than 5,200 models of labeled toilets

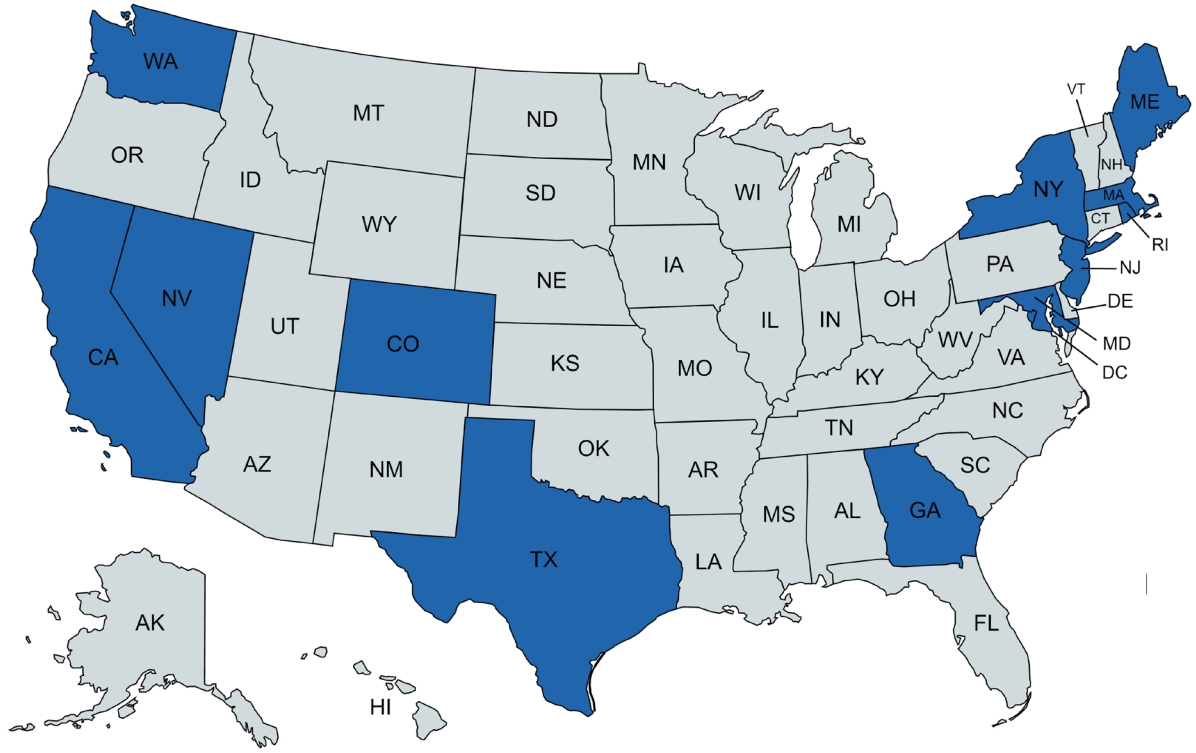
Tank-Type Toilets Currently Labeled

Effective Flush Volume	≤1.28 and >1.1 gpf	≤1.1 gpf and >1.0 gpf	≤1.0 gpf	Total	Percentage of Total
Single-Flush Models	2,752	49	455	3,256	62.4%
Dual-Flush Models	1,051	573	335	1,959	37.6%
Total	3,803	622	790	5,215	
Percentage of Total	72.9%	11.9%	15.2%		

State Specific Adoption

At least 12 states and multiple municipalities have adopted toilet efficiency standards that require products to use no more than 1.28 gpf, consistent with the WaterSense specification.

- California
- Colorado
- Georgia
- Maine
- Maryland
- Massachusetts
- Nevada
- New Jersey
- New York
- Rhode Island
- Texas
- Washington
- Washington, DC



Other Standards that Reference WaterSense

- LEED
- International Green Construction Code (IgCC)
- ASHRAE 189.1 *Standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings*
- IAPMO's Water Efficiency and Sanitation Standard (WE●Stand)
- Green Globes

Part 3

WaterSense Notice of Intent (NOI)

Scope

Current Specification Scope

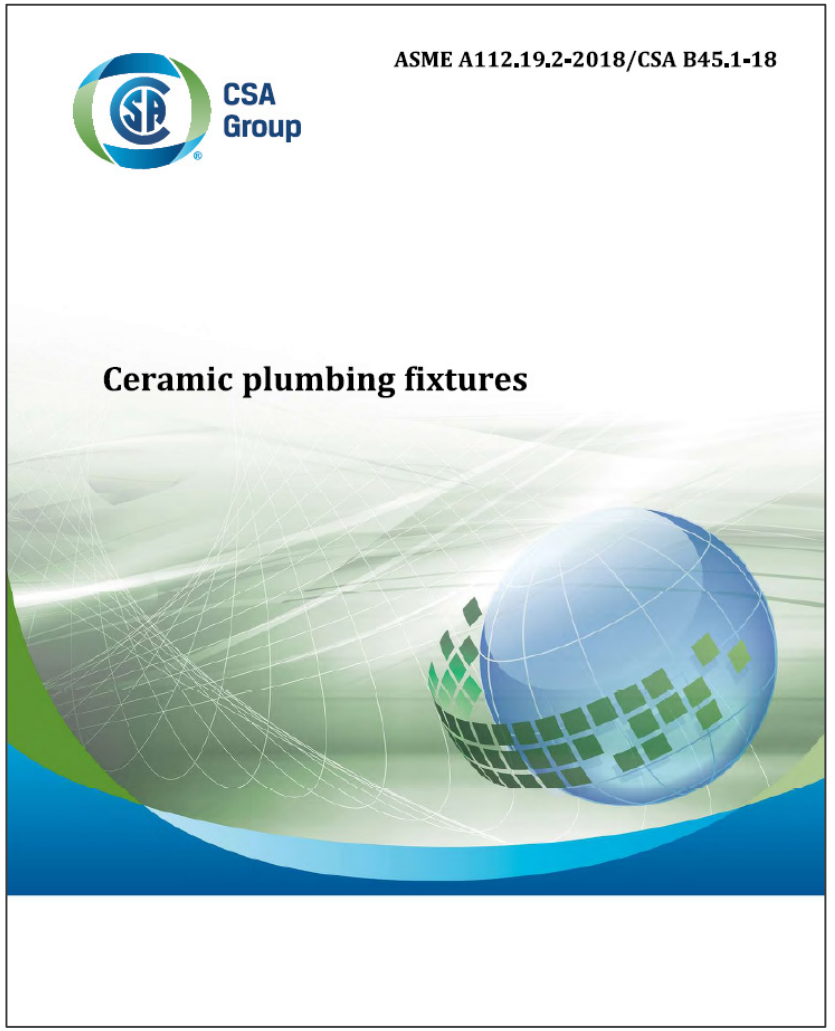
- Single-flush and dual-flush tank-type toilets
  - Gravity
  - Flushometer tank (pressure-assist)
  - Electrohydraulic toilets
  - Any other tank-type technologies that meet these performance specifications
- Tanks and bowls are not independently eligible

EPA intends to keep the scope of the specification the same.

General Requirements

Current Specification Requirements

- Toilets are required to conform to requirements in the ASME A112.19.2/CSA B45.1 *Ceramic Plumbing Fixtures*
- Dual-flush toilets are required to conform to requirements in the ASME A112.19.14 *Six-Liter Water Closets Equipped with a Dual Flushing Device*



General Requirements

EPA intends to remove the reference to ASME A112.19.14

- Applicable requirements from ASME A112.19.14 are being incorporated within ASME A112.19.2/CSA B45.1
- Consistent with *WaterSense Specification for Flushometer-Valve Water Closets*

Water Efficiency Criteria

Current Specification Requirements

- Single-flush toilets: Flush volume shall not exceed 1.28 gallons (4.8 liters).
- Dual-flush toilets: Effective flush volume shall not exceed 1.28 gallons (4.8 liters).
  - Effective flush volume is the average flush volume of two reduced flushes and one full flush (2:1 ratio).
- Flush volumes shall be tested in accordance with ASME A112.19.2/CSA B45.1 and ASME A112.19.14.
- Samples with an average flush volume in excess of 0.1 gallons greater than their rated flush volume are deemed to fail.
- Samples with average flush volumes less than or equal to 0.1 gallon can adjusted to their rated flush volume.

Water Efficiency Criteria

EPA intents to eliminate the effective flush volume calculation and instead establish a singular maximum flush volume requirement for both single-flush toilets and the full-flush mode of dual-flush toilets

Background

- Dual-flush toilets are designed with two flushing modes that vary by make and model:
  - Reduced-flush volume can range from 0.5 to 1.1 gpf
  - Full-flush volume can have a maximum of 1.6 gpf, consistent with federal maximum
- During specification review, some comments expressed concerns about dual-flush toilets
  - Anticipated savings may not be achieved based on user behavior

Dual-Flush Studies

Report	Authors	Reduced : Full Ratio
Seattle Home Water Conservation Study (2000)	Peter Mayer et al. (Aquacraft, Inc.)	0.77:1
Canada Mortgage and Housing Corporation Dual-Flush Toilet Project (2002)	Veritec Consulting	1.6:1 (single-family) 1.1:1 (office male) 2.7:1 (office female) 1.7:1 (office overall) 1.3:1 (coffee shop)
Residential Ultra-Low-Flush Toilet Replacement Program (2003)	Paula Mohadjer, Jordan Valley Water Conservation District	1.48:1
Resident Indoor Water Conservation Study: Evaluation of High Efficiency Indoor Plumbing Fixture Retrofits in Single-Family Homes in the East Bay Municipal Utility District Service Area (2003)	Peter Mayer et al. (Aquacraft, Inc.)	0.48:1
Yarra Valley Water Residential End Use Measurement Study (2004)	Peter Roberts (Yarra Valley Water)	0.75:1
South East Queensland Residential End Use Study: Final Report (2011)	Cara Beal and Rodney A. Stewart (Urban Water Security Research Alliance)	1.16:1 (Gold Coast) 1.16:1 (Brisbane) 1.72:1 (Ipswich) 1.37:1 (Sunshine Coast)
Melbourne Residential Water Use Studies (2013)	Kein Gan and Michael Redhead	1.50:1 (Summer) 1.08:1 (Winter)

User Confusion

- **Thames Water:** 75 percent of users identified the incorrect flush mode
- **SES Water:** 28 percent of customers said they knew which button on their own toilet produced a reduced flush.
- **Water Regulations Approval Scheme (WRAS):**
  - Zero out of 18 dual-flush button designs tested achieved 100 percent recognition
  - The most recognized dual-flush button designs only achieved 92 percent recognition
  - One dual-flush button design only had 19.5 percent recognition

Changing Requirements

- **ASHRAE 189.1 and IgCC**: Sets a max flush volume of 1.28 gpf for the full flush of both tank-type and flushometer-valve dual-flush toilets.
- **MaP PREMIUM***:* Sets a 1:1 ratio for the effective flush calculation and requires the volume of the full-flush mode to be 1.28 gpf or less.
- **City of Vancouver, British Columbia**: Requires all dual-flush toilets sold to achieve a maximum flush volume of 1.28 gpf, regardless of whether the toilet has dual-flush capabilities.

Additional Rationale and Summary

Additional Rationale

- Consistent with U.S. Department of Energy rulemaking
- Consistent with *WaterSense Specification for Flushometer-Valve Water Closets*

Summary of Intended Changes

- Eliminate effective flush volume calculation
- Establish a singular maximum flush volume requirement for single-flush toilets and the full-flush mode of dual-flush toilets
- Remove reference to ASME A112.19.14 (as discussed previously)

Impact on Labeled Models

- Impact of Intended Revision

Full-Flush Volume	≤1.6 and >1.3 gpf	≤1.3 gpf and >1.1 gpf	≤1.1 gpf	Total
Dual-Flush Models	1,453	419	87	1,959
Percentage of Total	74.2%	21.4%	4.4%	

Approximately 74 percent of currently labeled models would no longer be eligible

Additional Considerations: Leaks from Dual-Flush Toilets

- **Thames Water**: Water loss from leaks and continuously flowing toilets is exceeding the amount of water the dual-flush toilet design should be saving.
- **Bathroom Manufacturers Association**: Drop valve systems are more prone to leakage.
- EPA is interested in feedback on whether there are design concerns related to dual-flush toilets in the U.S.

Additional Considerations: Reduce Flush Volume Criteria

- Marketplace for tank-type toilets has largely shifted towards 1.28 gpf
- Many models operate at an effective flush volume of less than 1.28 gpf.
- Some utilities are now only rebating for toilets that operate at lower flush volume (e.g., 1.1 gpf or less)
- EPA is only aware of one municipality (West Hollywood, CA) that now requires 1.1 gpf or less models

Additional Considerations: Reduce Flush Volume Criteria

Effective Flush Volume	≤1.28 and >1.1 gpf	≤1.1 gpf and >1.0 gpf	≤1.0 gpf	Total	Percentage of Total
Single-Flush Models	2,752	49	**455**	3,256	62.4%
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Additional Considerations: Reduce Flush Volume Criteria

- Significant opportunity for replacement within the stock of installed toilets throughout the U.S.
- Very few municipalities are now mandating 1.1 gpf
- Feedback that expressed performance concerns associated with lowering the flush volume

Water Efficiency Criteria

Summary of Requested Feedback

- EPA's intention to eliminate the effective flush calculation and establish a maximum flush volume criteria for both single-flush toilets and the full-flush mode of dual-flush toilets.
- EPA's intent to remove the reference to ASME A112.19.14 within the water efficiency section of its specification and otherwise align the requirements of the specification, to the extent practicable, with the *WaterSense Specification for Flushometer-Valve Water Closets*.

Water Efficiency Criteria

Summary of NOI Questions

- Whether there are design and/or leakage concerns specific to dual-flush toilets in the United States, similar to those reported in the United Kingdom.
- Whether EPA should consider reducing the maximum allowable effective flush volume criteria to improve water efficiency beyond the current WaterSense specification and potentially further transform the market. If so, what threshold should EPA consider?

Questions and Discussion

Performance and Product Testing

Performance Requirement	Purpose
Granule and Ball	Assesses a toilet's ability to flush media of different sizes and density (i.e., floating versus sinking media).
Surface Wash	Evaluates a toilet's ability to clean the surface of the bowl.
Drainline Transport Characterization	Assesses a toilet's ability to transport waste media through a drainline.
Overflow	Ensures toilet tank does not leak or permit water to otherwise escape.
Waste Extraction	Determines a toilet's ability to clear soybean paste test media and toilet paper (meant to be representative of human waste) from the bowl.
Adjustability Tests	Limits the allowed adjustability of features in the toilet tank that might increase the flush volume.

Waste Extraction Test

Current Requirement

- Toilet must clear 350 grams of cased or uncased media and four balls of crumpled, single-ply toilet paper in four of five tests
- Must clear waste on at least four out of five attempts

EPA intends to keep the performance criteria of the specification the same.

Marking and Product Documentation

Current Specification Requirements

- Toilet fixtures shall be marked in accordance with requirements in ASME A112.19.2/CSA B45.1 with the exception identified in the following statement:
    - Toilet bowls intended to be used with tanks of varying consumption levels (e.g., 1.6 and 1.28 gpf) can be marked with a dual consumption marking or a consumption range, as indicated in ASME A112.19.2/CSA B45.1*; however, toilet bowls shall not be marked with the words "or less" to indicate compatibility with tanks of varying consumption levels.*

EPA intends to remove language pertaining to "or less" from its specification. This is no longer permitted in ASME A112.19.2/CSA B45.1.

Appendix A: Requirements for WaterSense Labeling

EPA intends to incorporate the following clarifications into Appendix A, Section 3 of the specification

- TT-1216-1: Certification of Tank-Type Toilets With Components Made by Different Manufacturers
- TT-0617-1: Marking and Labeling Requirements for Tank-Type Toilets With Components Made by Different Manufacturers
- TT-0617-2: Bowl Packaging Requirements for Tank-Type Toilets Made by Different Manufacturers

Questions and Discussion

Transition Timing

- As part of the draft revised specification release, EPA will discuss with industry which products are applicable to the transition process and an appropriate transition period.
- EPA anticipates the following activities being required by licensed certifying bodies and manufacturers
  - Reviewing product listings and updating certification files
  - Submitting updated product notification templates
  - Updating product packaging and documentation

EPA is considering establishing a transition period of six to 12 months before Version 2 of the specification will become effective.

Grace Period for Delisted Products

- Current Process
  - Products delisted from a certification file remain on the WaterSense Product Search Tool for **6 months**
  - Models are still considered WaterSense labeled while inventory exits the market
- Related to Version 2 Specification for Tank-Type Toilets
  - Toilets certified under Version 1.0 would remain on WaterSense's Product Search Tool for 6 months beyond the effective date of the specification

Transition Timeline

- *America's Water Infrastructure Act* requires EPA to "provide an appropriate transition time prior to the applicable effective date of any changes, taking into account the timing necessary for the manufacture, marketing, training, and distribution of the specific product."

Summary of NOI Questions

EPA is seeking feedback on an appropriate transition period before Version 2 of the specification takes effect. What factors should EPA consider in setting an appropriate transition time? What, if any, transition guidance should EPA develop for retailers and distributors?

Next Steps

- NOI can be reviewed at www.epa.gov/watersense/residential-toilets
- Submit written comments or additional information and data to watersense-products@erg.com
- Comment Deadline: **August 14, 2023**
- EPA will review comments and data submission prior to developing the draft revised specification.

Contact Us

General E-mail: watersense@epa.gov

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Website: www.epa.gov/watersense

Helpline: (866) WTR-SENS (987-7367)