

WaterSense® Notice of Sunset of the Specification for Pre-Rinse Spray Valves

I. Introduction

Pre-rinse spray valves—often used in commercial and institutional kitchens—are designed to remove food waste from dishes prior to dishwashing. In 2009, the U.S. Environmental Protection Agency (EPA) issued a Notice of Intent (NOI) to develop a WaterSense specification for water-efficient pre-rinse spray valves. The EPA began its product research with a field study in 2010 and worked with the American Society of Mechanical Engineers (ASME)/Canadian Standards Association (CSA) joint harmonized task force to develop a performance test methodology, ASTM F2324 *Standard Test Method for Prerinse Spray Valves* (herein after referred to as *ASTM F2324*)¹. At the same time, the EPA engaged industry stakeholders to develop performance and efficiency criteria. These collaborative processes culminated in the EPA's release of the *WaterSense Specification for Commercial Pre-Rinse Spray Valves* (herein after referred to as the WaterSense specification) on September 19, 2013².

The WaterSense specification requires the maximum flow rate of pre-rinse spray valves to be equal to or less than 1.28 gallons per minute (gpm) [4.8 liters per minute (Lpm)], and the minimum spray force must be at least 4.0 ounces-force (ozf) [113 grams-force (gramf)]. At the time, 1.28 gpm represented a 20 percent flow rate reduction from the federally allowable maximum flow rate of 1.6 gpm established by the Energy Policy Act (EPAct)³ of 2005, which is consistent with WaterSense's stated water efficiency goal. To date, 40 different pre-rinse spray valve models, made by six manufacturers, have earned the WaterSense label under this specification.

Since the release of the WaterSense specification, the US Department of Energy (DOE) has revised the federal energy conservation standards for commercial pre-rinse spray valves, codified in 10 CFR 431 Subpart O. The new regulations, effective January 28, 2019, classify pre-rinse spray valves into three product categories, differentiated by spray force, each with its own maximum allowable flow rate, as shown in Table 1. The regulation requires the flow rate and spray force to be determined in accordance with the *ASTM F2324* standard⁴. The revised federal regulations will require every pre-rinse spray valve sold in the United States to meet or exceed the efficiency criteria established in the WaterSense specification. For more information on these regulations see the DOE website

¹ ASTM International, 2013. *ASTM F2324-13 Standard Test Method for Prerinse Spray Valves*. West Conshohocken, PA, 2013, www.astm.org.

² EPA, 2013. *WaterSense Commercial Pre-Rinse Spray Valve Specification*. 19 September 2013. www.epa.gov/sites/production/files/2017-01/documents/ws-products-spec-prsv.pdf.

³ The Energy Policy and Conservation Act of 1975 (EPCA), as amended, prescribes energy conservation standards for various consumer products and certain commercial and industrial equipment, including commercial pre-rinse spray valves. EPCA also requires the DOE to periodically determine whether more stringent standards would be technologically feasible and economically justified and would save a significant amount of energy. In this final 2019 rule, DOE adopted more stringent energy conservation standards over the last revision in 2005. (DOE 2016)

⁴ DOE, 2016. *Energy Conservation Program: Energy Conservation Standards for Commercial Prerinse Spray Valves; Final Rule*. Energy Efficiency and Renewable Energy Office (EERE). 27 January 2016. www.regulations.gov/document?D=EERE-2014-BT-STD-0027-0050.

(www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=69&action=vi_ewcurrent).

Table 1. Conservation Standards for Commercial Pre-Rinse Spray Valves

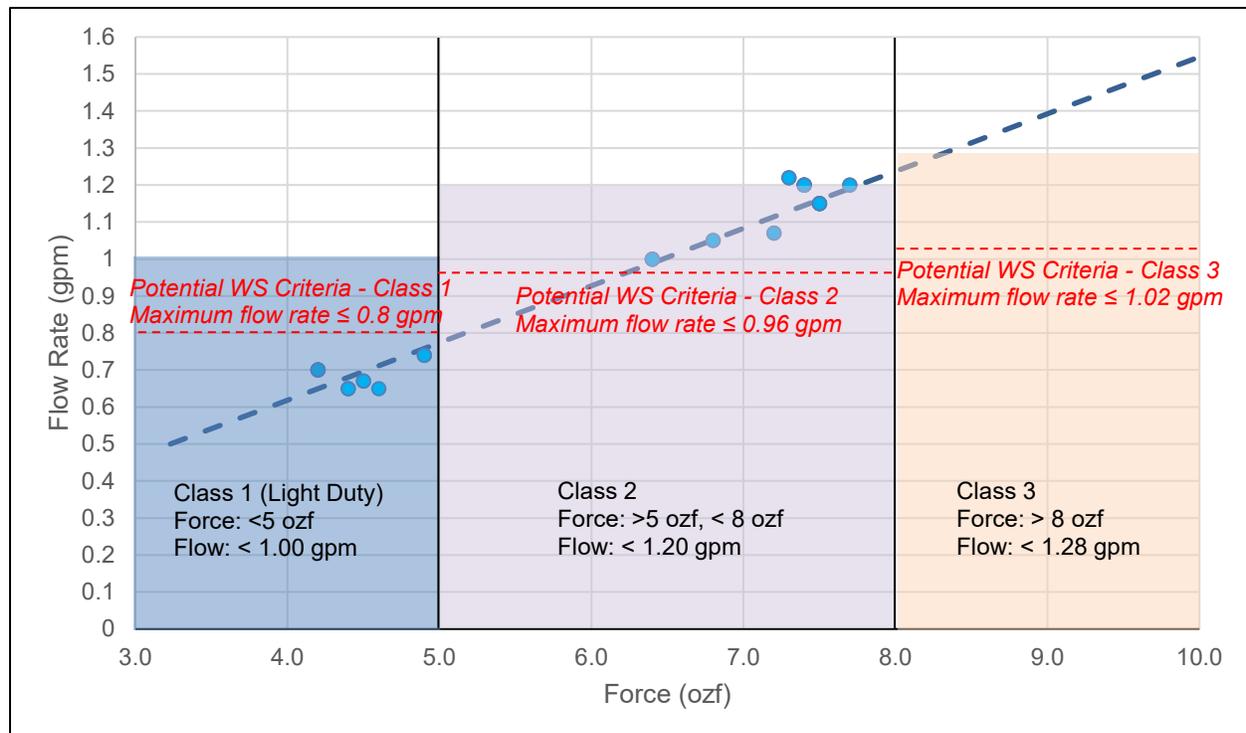
Product Class by Spray Force	Maximum Flow Rate (gpm)
Product Class 1 (≤ 5.0 ozf)	1.00
Product Class 2 (> 5.0 ozf and ≤ 8.0 ozf)	1.20
Product Class 3 (> 8.0 ozf)	1.28

Source: DOE, 2016

II. Options Considered by WaterSense

The EPA evaluated the new DOE regulation and its impact on the WaterSense specification to determine whether it is feasible to revise the specification's requirements to recognize a more efficient subset of products. Figure 1 shows the flow rate and spray force of current WaterSense-labeled pre-rinse spray valves, separated into the three new DOE product classes. The red dashed lines in Figure 1 show the potential revised flow rate and force criteria that would have allowed the program to continue to label pre-rinse spray valves that are at least 20 percent more efficient than the revised DOE regulations.

Figure 1. Spray Force Versus Flow Rate of WaterSense Labeled Pre-Rinse Spray Valves



Revising the WaterSense specification would allow WaterSense to continue to directly support water and energy efficiency within commercial kitchens and provide resources to the EPA's partners related to high-efficiency pre-rinse spray valves. However, as shown in Figure 1, there is a direct and linear relationship between water flow rate and resulting spray force. At constant flowing pressure (under which these products are tested to the *ASTM F2324* standard), greater flow rate is required to achieve a greater spray force. This relationship, further explained in Appendix A and shown in the blue dotted line on Figure 1, limits products that would be able to meet revised WaterSense criteria to only products in Class 1 (i.e., products intended for light-duty applications) and potentially a small band of products in Class 2. Because only a small number of products can achieve a greater level of efficiency, the anticipated programmatic water savings from revising the specification would be limited. Further, consumer choice for WaterSense labeled products would be limited to only those intended for light duty (low force) applications.

On August 14, 2018, the EPA held a meeting with its partners that manufacturer pre-rinse spray valves to gauge interest in revising the WaterSense specification, with the potential water efficiency criteria shown in Figure 1 presented as an option. Participants in the meeting expressed overwhelming preference for canceling the WaterSense specification, indicating limited potential for further efficiency and a preference to forego further involvement by the WaterSense program in this product category.

The EPA, therefore, has decided to sunset the WaterSense specification, as signified by this Notice of Sunset. The EPA intends to sunset the WaterSense specification on January 1, 2019, before the DOE regulations take effect.

WaterSense recognizes that strides have been made to improve the water efficiency of commercial pre-rinse spray valves. WaterSense, its partners, and other stakeholders worked diligently during the specification development process to develop an industry-accepted water efficiency and performance testing protocol, which was adopted in *ASTM F2324* and now serves the basis for the DOE requirements for commercial pre-rinse spray valves. Although WaterSense will forgo future direct involvement with this product category, the program considers the revisions of the federal requirements to improve the efficiency of all commercial pre-rinse spray valves as a step forward for water and energy efficiency. The DOE's new rule helps increase nationwide water savings within commercial kitchens in the future, helping the WaterSense program fulfil its mission to transform the marketplace and promote a nationwide ethic of water efficiency. By sunseting the WaterSense specification, WaterSense can dedicate program resources to developing other specifications for new products and water-using systems, further extending the reach of the program.

III. Sunset Process

In order to make sunseting the WaterSense specification a smooth process, WaterSense is outlining the steps below to close out the program's involvement with this product category and minimize impact to program partners.

Manufacturer Partners and Partnership Agreements

WaterSense currently partners with approximately 20 pre-rinse spray valve manufacturers, some of which make WaterSense labeled pre-rinse spray valves and/or other WaterSense

labeled products. The EPA intends to follow up with its pre-rinse spray valve manufacturer partners to provide additional information and recommendations, depending on how the WaterSense specification sunset will affect their partnership status.

If the affected partners manufacture or privately label other types of WaterSense labeled products, they may remain WaterSense partners. If the affected partners do not manufacture or privately label other types of WaterSense labeled products, in summer 2019, the EPA will begin assessing their intent to remain partners. Manufacturers must label at least one product as a requirement of WaterSense partnership. WaterSense may allow current manufacturer partners to change their designation to that of a promotional partner in order to maintain a connection with the program, but WaterSense will not take on any new manufacturers as partners.

WaterSense is no longer accepting partnership agreements from manufacturers who apply based solely on their manufacture of commercial pre-rinse spray valves.

Product Certification and Notification

Manufacturers may continue to certify pre-rinse spray valves to the WaterSense specification and licensed certifying bodies (LCBs) may continue to submit Product Notification Templates (PNTs) for WaterSense labeled pre-rinse spray valves through the end of 2018. Beginning January 1, 2019, LCBs may no longer certify pre-rinse spray valves to meet the WaterSense specification, and the WaterSense label may no longer be provided for pre-rinse spray valves that meet the WaterSense specification.

Use of the WaterSense Label

As soon as possible starting January 1, 2019, manufacturers and private labelers must stop printing the WaterSense label on any new pre-rinse spray valve packaging, product documentation, and marketing materials and begin removing the WaterSense label from associated web pages and online materials. The EPA will allow an 18-month grace period, concluding on July 1, 2020, for pre-rinse spray valve manufacturers and private labelers who currently display the label on their existing product packaging and other printed materials. This grace period will allow time for products and packaging already on the market or in manufacturers' inventories to be distributed and sold. Manufacturers are not required to destroy existing products, product packaging, or other printed materials that bear the WaterSense label and do not need to track down products already in the marketplace. WaterSense will suspend brand monitoring of pre-rinse spray valves during this grace period. If notified of an issue after the grace period, the EPA will follow normal brand monitoring procedures and follow up as appropriate.

Historical Pre-Rinse Spray Valve Product Information

WaterSense will retain information and background materials on its website related to development of the WaterSense specification, along with some information on the DOE regulations. WaterSense will also retain potential water and energy savings information to encourage consumers to replace existing, inefficient pre-rinse spray valves with models that meet the new DOE requirements.

There will also be changes made to the WaterSense Product Search Tool and WaterSense Rebate Finder. WaterSense recognizes that there will be a period of transition for utilities that offer rebates and will maintain pre-rinse spray valves in the Product Search Tool and Rebate Finder for a period of 6 months after the specification sunset, until July 1, 2019. After July 1, 2019, WaterSense will include an archived list of previously labeled pre-rinse spray valves on the WaterSense website.

Market Surveillance

Every year, LCBs are required to retest 15 percent of eligible WaterSense labeled models in each product category. This process is outlined in the *WaterSense Product Certification System*. For the current product surveillance period (October 2018 – October 2019), pre-rinse spray valves are not included in the LCB's universe of eligible products and are not required to undergo product retesting.

Annual Reporting

Manufacturer partners submit data about water-efficient product shipments through the WaterSense Annual Reporting process to help the EPA track the accomplishments and impact made by the program.

WaterSense will continue to collect information on pre-rinse spray valve shipments for the 2018 annual reporting period, which will kick off in early 2019 and cover shipments made through the end of 2018. Pre-rinse spray valves will not be included in any future annual reporting periods for 2019 or beyond.

Certifying Body Licensing and Accreditation

All product certifying bodies must be either approved or accredited to certify products for the WaterSense label in accordance with the *WaterSense Product Certification System*. Certifying bodies sign a general licensing agreement⁵ with the EPA to provide certification services for WaterSense, which is amended to cover each individual specification. WaterSense will work with the relevant LCBs to modify the specific licensing agreement amendments that cover commercial pre-rinse spray valves. All [other licensing agreements](#) will remain in place as is.

Once the licensing agreement amendments are updated, the EPA will work with ANSI, the accrediting body (AB) for the LCBs who certify pre-rinse spray valves, to remove pre-rinse spray valves from the Certificates of Accreditation for the appropriate LCBs.

LCBs will work with affected manufacturers on any specific procedures for cancelling product certifications and authorizations for use of WaterSense labeled artwork.

⁵ A licensing agreement is the official document that grants the LCB permission to certify WaterSense labeled products and provide the WaterSense label artwork to manufacturer partners with products that meet WaterSense specification criteria.

IV. Conclusion

The EPA intends to sunset the *WaterSense Specification for Commercial Pre-Rinse Spray Valves* on January 1, 2019. As of this date, no pre-rinse spray valve products will be certified for the WaterSense label, and no new packaging shall be marked with the WaterSense label. WaterSense thanks its program partners and stakeholders for their help in developing and promoting the WaterSense specification. Implementing rigorous water efficiency and performance criteria across this product category is a major accomplishment for WaterSense, its stakeholders, and water efficiency advocates nationwide.

Questions from all interested parties on the issues presented in this notice may be submitted to watersense@epa.gov.

V. References

ASTM International, 2013. *ASTM F2324-13 Standard Test Method for Prerinse Spray Valves*. West Conshohocken, PA, 2013, www.astm.org.

U.S. Department of Energy, Energy Efficiency and Renewable Energy Office (EERE), 2017. *Energy Conservation Program: Energy Conservation Standards for Commercial Prerinse Spray Valves; Final Rule*. Regulations.gov. January 27, 2016. <https://www.regulations.gov/document?D=EERE-2014-BT-STD-0027-0050>.

U.S. Environmental Protection Agency (EPA), 2013. *WaterSense Commercial Pre-Rinse Spray Valve Specification*. September 19, 2013. <https://www.epa.gov/sites/production/files/2017-01/documents/ws-products-spec-prsv.pdf>.

Appendix A: Explanation of Direct, Physical Relationship Between Flow Rate and Spray Force

The below set of equations show the relationship between flow rate and force, based on water flowing through an orifice and striking a plate, as is representative of the spray force testing requirements from the ASTM F2324 standard.

$$Force(F) = \frac{Change\ in\ Momentum(\Delta P)}{Change\ in\ Time\ (\Delta t)}$$

$$Change\ in\ Momentum\ (\Delta P) = Mass\ (m) \times Change\ in\ Velocity\ (\Delta V) = m \times (V_1 - V_2)$$

Where,

Mass (m) is variable based on flow rate

$$Velocity\ (V_1) = [2 \times gravitational\ acceleration\ (g) \times pressure\ head\ (h)]^{0.5} \text{ (spray exit velocity, assuming no friction loss)}^6$$

$$Velocity\ (V_2) = 0\ meters/second \text{ (water at rest after hitting the force plate)}^7$$

$$g = 9.81\ meters/second^2$$

$$h = 60\ psig \times \frac{0.690\ meters\ of\ water\ head}{1\ psig} = 41.4\ meters\ of\ water\ head \text{ (based on pressure in ASTM F2324 standard, assumes constant flowing pressure)}$$

Therefore,

$$F = \frac{m \times [(2 \times g \times h)^{0.5} - V_2]}{\Delta t} = \frac{m \times [(2 \times 9.81 \frac{meters}{second^2} \times 41.4\ meters)^{0.5} - 0 \frac{meters}{second}]}{\Delta t}$$

$$F = 28.5 \frac{meters}{second} \times \frac{m}{\Delta t}$$

Where $\frac{m}{\Delta t}$ is the mass rate of the PRSV, based on its flow rate at 60 psig.

Example

A PRSV has a flow rate of 0.6 gallons per minute (gpm).

$$0.6 \frac{gallons}{minute} \times \frac{1\ minute}{60\ seconds} \times 3.785 \frac{liters}{gallon} \times 1 \frac{kilogram(kg)}{liter} = 0.038\ kg/second$$

$$F = 28.5 \frac{meters}{second} \times 0.038 \frac{kg}{second} = 1.08 \frac{kg \times meter}{second^2} = 1.08\ Newtons\ (N)$$

⁶ Torricelli's Law.

⁷ When the spray stream strikes the force measuring plate, assumes forward momentum drops to zero and all force is transferred to the plate.

$$F = 1.08 \text{ Newtons} \times 3.597 \frac{\text{Ounces} - \text{Force (ozf)}}{N} = 3.88 \text{ ozf}$$

Therefore, a PRSV with a flow rate of 0.6 gpm will have a theoretical maximum force of 3.88 ozf.

Table A-1, below, summarizes the theoretical maximum force at different flow rates, assuming a constant pressure of 60 psig.⁸

Table A-1. Theoretical Maximum Force Based on Pre-Rinse Spray Valves Flow Rate

PRSV Flow Rate (gpm)	Mass Rate ($\frac{m}{\Delta t}$) (kg/second)	Force (N)	Force (ozf)
0.5	0.032	0.90	3.23
0.6	0.038	1.08	3.88
0.7	0.044	1.26	4.53
0.8	0.050	1.44	5.17
0.9	0.057	1.62	5.82
1.0	0.063	1.80	6.47
1.1	0.069	1.98	7.11
1.2	0.076	2.16	7.76
1.28	0.081	2.31	8.30
1.3	0.083	2.34	8.41
1.4	0.088	2.52	9.05
1.5	0.095	2.70	9.70
1.6	0.101	2.88	10.35

This direct and linear relationship is shown as the dashed blue line in Figure 1 of this Notice of Sunset.

⁸ Based on ASTM F2324.