

SM Transparency Report™ Program

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Product Group Definition (PGD)

Part B: Commercial Flush Valves

PGDs describe baseline functional and environmental attributes of products that compete for/deliver the SAME function or purpose.

Product group

Name	Commercial Flush Valves
Initiators:	TOTO USA, Inc. Visit an SM Transparency Report for residential toilets: http://www.sustainableminds.com/showroom/toto/
Validity date:	September 1, 2014 – August 31, 2017
Any existing PCRs, EPDs or SM TRs?	Institut Bauen und Umwelt e.V.: PCR Guidance-Texts for Building-Related Products and Service From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU), Part B: Requirements on the EPD for Bathroom fittings and showers. October 2013 www.bau-umwelt.de This European guidance document applies to bathroom fittings and showers. It does not contain any relevant additional rules specific to this product group.

Functional performance

Standard/certification	URL
1. Water consumption - EPA Act 1992	http://www.ferc.gov/legal/maj-ord-reg/epa.pdf
2. Water consumption - Watersense - urinal only	http://www.epa.gov/WaterSense/docs/urinal_finalspec508.pdf
3. Water consumption - Watersense - toilet in development	http://www.epa.gov/watersense/products/flushometer-valve-toilets.html
4. Functional performance – ASSE 1037	http://stores.assewebstore.com/asse-standard-1037-1990/

Declared/Functional unit

Declared/Functional unit	10 years of use of a flush valve for toilets and urinals in an average US commercial environment
Rationale	<ul style="list-style-type: none"> • Products are available and used in the US market • 10 years is an industry accepted average lifespan that is based on the economic lifespan of a product; this is more limited due to changes in consumer preferences and innovations in water usage than the technical lifespan of the product. The valve lifespan is much greater with proper maintenance. Electrical and other hardware components, especially related to rubbers for water tight connections and moving parts, will require replacement beyond this timeframe. • Flush valves are intended for use with a toilet or urinal fixture as the dispensing unit for the water supplied

Additional rules for comparability

1. Clarification(s)	None
2. Add rules to Part A	Water and wastewater infrastructure are excluded.
3. Default life cycle stage scenario(s)	<p><u>Default use phase scenario in flush valves – toilet combination:</u></p> <p>The flush valve with a toilet is assumed to be used in an average US commercial environment over a 10-year time period with an average of 133 flushes per day*. The volume of water per flush varies and depends on the specific product to which this PGD applies.</p> <p><u>Default use phase scenario in flush valves – urinal combination:</u></p>

The flush valve with a urinal is assumed to be used in an average US commercial environment over a 10-year time period with an average of 18 flushes per day, 260 days per year [1]. The volume of water per flush varies and depends on the specific product to which this PGD applies.

Water usage in a commercial facility would also include electricity usage for acquisition, treatment and distribution of water to facilities and collection, conveyance and wastewater treatment of domestic wastewater. The Electric Power Research Institute (EPRI) published this type of data in a study on water and sustainability. EPA's data were used to establish weighted average composite factors, to obtain an electricity usage per gallon of water consumed:

Table: Average National Electricity Usage Factors

Activity	EPRI factors: kWh / MMgal ^{Note 1}	Weighted avg composite factors: kWh / MMgal
Acquisition, treatment and distribution of surface water by a Public Water System (PWS)	1,406	1,540 ^{Note 2}
Acquisition, treatment and distribution of ground water by a PWS	1,824	
Self-supply of drinking water (typically pumping from private wells)	700	700
Collection, conveyance and < secondary treatment of domestic wastewater	661	1,399 ^{Note 3}
Collection, conveyance and secondary treatment of domestic wastewater	1,212	
Collection, conveyance and advanced treatment of domestic wastewater	1,726	
Collection, conveyance and zero discharge/other treatment of domestic wastewater	400	
Total electricity per million gallons →		3,639
Total kWh electricity per 1 gallon →		0.0036

Note 1: Source: EPRI, Water & Sustainability (Volume 4): U.S. Electricity Consumption for Water Supply & Treatment -- The Next Half Century, March 2002.

Note 2: Source: U.S. Environmental Protection Agency (EPA), Office of Water (4606) Drinking Water Treatment, June 2004
http://water.epa.gov/lawsregs/guidance/sdwa/upload/2009_08_28_sdwa_fs_30ann_treatment_web.pdf. This document cites 68% of population served by PWSs relies on surface water while 32% relies on ground water.

Note 3: Source: U.S. Environmental Protection Agency (EPA), Clean Watersheds Needs Survey 2008 Report to Congress <http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf>. This report cites 1.7% of POTW-served population receives < secondary treatment, 40.9% receives secondary treatment, 49.9% receives advanced treatment, and 7.5% receives zero discharge or other treatment.

* The average usage number is estimated by the TOTO R&D team in Japan based on data from buildings in different cities.

[1] U.S. Environmental Protection Agency (EPA) WaterSense® *Specification for Flushing Urinals Supporting Statement* (Washington, DC, October 8, 2009)
http://www.epa.gov/WaterSense/docs/urinal_suppstat508.pdf. This document cites 18 flushes per day, 260 days per year. Vickers, A, 2001.