SM Transparency Report™ Program
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Sustainable Minds

Product Group Definition (PGD)

Part B: Residential Toilets

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

Product group

Name	**Residential toilets**
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 Sanitary Ceramics. November 2011** www.bau-umwelt.de This European guidance document applies to vitreous china and fine fire clay ceramic sanitary ware. It does not contain any relevant additional rules specific to this product group.

Functional performance

Standard/certification	URL
1. Single flush performance - **DOE EPAct 1992**	http://www.ferc.gov/legal/maj-ord-reg/epa.pdf
2. Dual flush performance - **Watersense**	http://www.epa.gov/watersense/docs/revised_het_specification_v1.1_050611_final508.pdf

Declared/Functional unit

Declared/Functional unit	**10 years of use of a single or dual flush toilet in an average US household**
Rationale	• Residential use and commercial use are very different • 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 the product. This is more limited due to changes in consumer preferences as well as innovations in water usage more than the technical lifespan of the product. The ceramic will easily outlive the 10 years timeframe. Some parts, especially related to rubbers for watertight connections and moving parts, however, require replacement beyond this timeframe.

Additional rules for comparability

1. Clarification(s)	None
2. Add rules to Part A	• Water and wastewater infrastructure are excluded • Dual flush toilets are assumed to be 1 solid flush per day, others are assumed to be liquid
3. Default life cycle stage scenario(s)	**Default use phase scenario:** The toilet is assumed to be used in an average US household over a 10-year time period with an average of 2.6 persons per household, 5.1 flushes per day per person [1]. The volume of water per flush varies and depends on the specific product to which this PGD applies. Water usage in a household would also include electricity usage for acquisition, treatment, and distribution of water to households in addition to collection, conveyance and domestic wastewater treatment. The Electric Power Research Institute (EPRI) published this type of data in a study on water and sustainability. Data from the U.S. Environmental Protection Agency (EPA) 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 cites1.7% 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.

[1] U.S. Environmental Protection Agency (EPA) Watersense, Water-Efficient Single-Family New Home Specification (Washington, DC, May 14, 2008) http://www.epa.gov/watersense/docs/home_suppstat508.pdf. This document cites 5.1 flushes/day/person per Mayer. P, DeOreo, W. et al 2000 and 2003, and 2.6 persons per household per U.S. Department of Housing and Urban Development 2005.