Part B: Product group definition | Residential toilets

Initiators	**TOTO USA** Visit an SM Transparency Report for residential toilets: http://www.sustainableminds.com/showroom/toto/
Other company(s) and organization(s) involved	**TOTO USA, Kohler, and Sloan**

Product group

Name	**Residential Toilets**	**CSI MasterFormat® #(s) or UNCPC(s)**	22 41 13.13
Description Define the types of products included under this Part B	Residential toilets intended for use with a flushometer valve to supply water volume and pressure necessary for proper function. Because toilets are used in conjunction with a flushometer valve, only one use phase per valve-toilet combination should be used.		
New Part B request? Yes / No	No	**Is this an update to an existing Part B?** Yes / No	Yes
Validity date	07/03//2018 – 07/03/2023		
Existing PCRs, EPDs, SM TRs or LCAs This information will be used to identify additional rules for comparability and to substantiate the rationale for creating a Part B.	This Part B is an update to: http://www.sustainableminds.com/files/transparency/pgds/Part_B_Product_Group_Definition_Residential_Toilets_09132017.pdf **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.		
Any relevant literature and/or published material	Updated according to new product cleaning assumptions in the PMI Product Category Rule (PCR) Guidance for Kitchen and Bath Vessel Fixtures v1.1 [1].		

Functional performance

Standard/certification	URL
Dual flush performance - **Watersense**	https://www.epa.gov/sites/production/files/2017-01/documents/ws-products-spec-toilets.pdf
Flow rate - **EPAct 1992**	http://www.ferc.gov/legal/maj-ord-reg/epa.pdf

Functional / declared unit

Unit	**20 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 • 20 years is an industry accepted average lifespan for residential tanks and their associated components; this is more limited due to changes in consumer preferences and innovations in water usage than the technical lifespan of the product. The vessel is assumed to be replaced at the same time as the tank.

Additional rules for comparability

1. Clarification More product group specificity as needed	None

2. Additional 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 (B1) scenario:
The toilet is assumed to be used in an average US household over a 20-year time period with an average of 2.67 persons per household and 5.05 flushes per day per person, equating to 13 uses per day over 365 days per year [1]. The toilet bowl is assumed to be cleaned weekly, 52 weeks per year, with 10mL of a 1% sodium lauryl sulfate solution [1]. Any electricity used in flushometer valve operation is included. The volume of water per flush varies and depends on the specific product to which this Part B applies.

Transportation assumptions:
Primary data should be used for the transportation distances between the manufacturer and the distributor. Unless otherwise known, assume transportation distances of 500km from the distributor to the installation site and 100km from the installation site to waste processing, via diesel-powered truck/trailer [1].

Electricity consumption for water supply and treatment:
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. Use this table to calculate the electricity used for water supply and treatment:

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] Plumbing Manufacturers International (PMI), Product Category Rule (PCR) Guidance for Kitchen and Bath Vessel Fixtures v1.1 https://www.safeplumbing.org/files/safeplumbing.org/documents/resources/PMI-Kitchen-and-Bath-Vessel-PCR-Guidance-Document-1-1.pdf.

Additional LCA calculation rules

N/A	Optional	Required	*Indicate whether compliance is the manufacturer's choice or required for SM TRs/EPDs. Refer to Part A: Compatibility appendices for content requirements.*
	X		**ISO 21930**