Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Wall-hung Toilet

from

TOTO Ltd

Multiple product EPDs, based on a representative product

CW552RY | CW522B | CW552RA | CW532RY | CW532RA | CW542B | CW553B | CW553Y | CW553A

The EPD product does not include the bowl lid as in the picture.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	EPD-IES-0015669
Publication date:	2024-11-11
Revision date	2025-02-06
Valid until:	2029-11-11

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *Construction products, 2019:14, version 1.3.4, UN CPC 37210*
PCR review was conducted by: *The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.*
Life Cycle Assessment (LCA)
LCA accountability: *Studio Fieschi & soci s.r.l. - C.so Vittorio Emanuele II, 18 10123 Torino, IT - www.studiofieschi.it*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by accredited certification body Third-party verification: *TUV SUD Italia srl, TUV SUD* is an approved certification body accountable for the third-party verification
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804 (EN 15804:2012+A2:2019), applicable PCRs (PCR 2019:14 V. 1.3.4) and JRC characterization factors (EF V. 3.1). The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Product information

Company information

Owner of the EPD: TOTO Ltd.
Contact: toto_epd@jp.toto.com
Description of the organisation: TOTO is the Japan-based company established in 1917 engaged in the manufacture and sale of restroom fixtures, bathroom fixtures, kitchen fixtures and others.

The Company operates in two business segments, Residential equipment segment and new business domain products segment.
The Residential equipment segment is engaged in the manufacture and sale of rest room products, such as sanitary chinaware, system toilets, toilet seat such as warm wash toilets; bath, kitchen and wash products, such as unit bathrooms, water faucet hardware, system kitchen, bathroom vanities, mar bright counters, plastic bathtubs; as well as tile architectural material and bathroom air infiltration/ heating driers among others.
The new business domain products segment is engaged in the manufacture of advanced ceramic products.

In fiscal 2023 the Company recorded the total turnover of JPY 702 billion yen, of which 473 billion yen was derived from the residential equipment for Japanese market, 192 billion yen from the residential equipment for other countries, and 36billion yen from the new business domain products segment.
The consolidated employees of TOTO group are 36188 as of 31 March 2023.

Product-related or management system-related certifications: ISO 9001:2015; ISO 14001:2015

Name and location of production site(s):

- [TOTO INDIA INDUSTRIES PVT. LTD. (TIN)
- TOTO (THAILAND)CO., LTD. (TTL)
- TOTO VIETNAM CO., LTD (TVN-DA and TVN-HY)]

Product description

Product name: Wall-hung toilet
Product identification: CW552RY

- Water-saving design with large and small flushes, with a large flush of 4.5L and a small flush of 3.0L.
- CEFIONTECT: *CEFIONTECT* is an ultra-smooth ceramic glaze at the nano level to make it less susceptible to dirt and keeping the ceramic surface clean and beautiful for years to come.
- TORNADO FLUSH: The tornado water flow efficiently washes the entire toilet bowl all the way around.
- Rimless toilets: The design has been perfected for ease of cleaning, making cleaning a breeze.
- A sleek design with the tank hidden inside the wall.

UN CPC code: 37210
Geographical scope: A1-A5: Global; B-C: Global

LCA information

Functional unit: 15 years of use of 1 piece of wall-hung toilet (without toilet seat and dual flush plate) with a large flush of 4,5 litres and a small flush of 3 litres in an average household.

Reference service life: 15 years

Time representativeness: all the manufacturer's primary data refer to the year 2022. The use scenario data refer to the years 2006 and 2005.

Database(s) and LCA software used: SimaPro 9, Ecoinvent 3.10
Description of system boundaries: Type c) Cradle to grave and module D (A + B + C + D). The infrastructure considered in Ecoinvent 3.10 were included in the boundaries.

Multiple Products approach

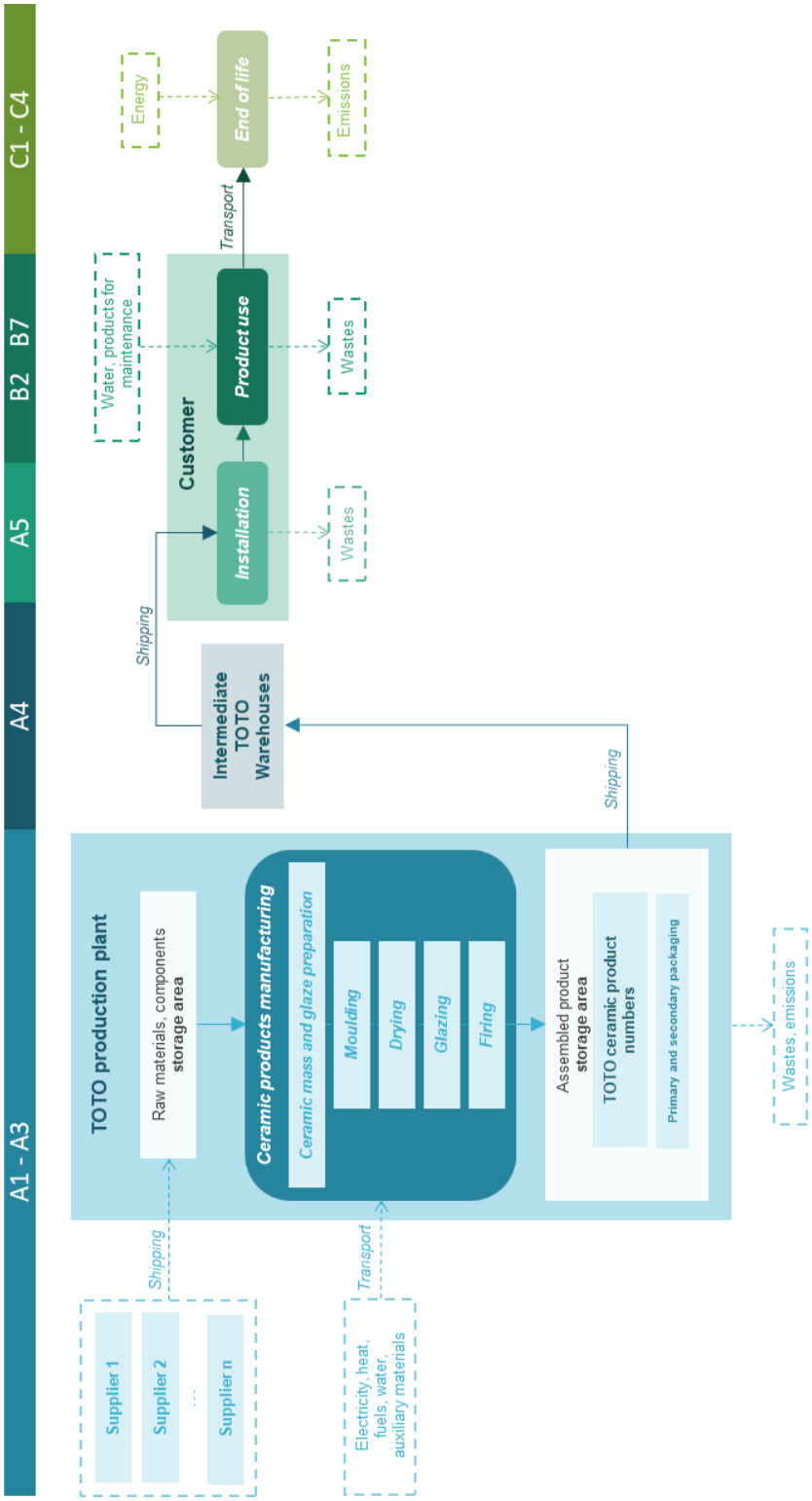
There are different product codes produced and marketed by TOTO that can be considered similar products among themselves. The differences recorded within each product family mainly concern the aesthetic design of the product and limited differences in the composition and type of materials used. The representative products selected represent the most produced product codes (in pieces) in 2022.

Representative Product Number	CW552RY
Reference market	Global

Represented Product Numbers	Reference market
CW553Y	Global
CW553B	China
CW522B	China
CW542B	China
CW532RY	Global
CW552RA	Global
CW532RA	Global
CW553A	Global

The representative products (as well as the represented ones) can be manufactured in different TOTO plants.
The environmental profile modelling of the representative products for the modules A1, A2 and A3 considered these differences making a weighted average for each module according to the share (%) of product numbers manufactured in 2022 in each plant in pieces.

System diagram:



More LCA methodological information

Types of data collected:

Primary data are used, where possible and as a priority, for the production processes of the product under study, for:

- Bill of materials for the product under study and their supply.
- Materials used for product packaging.
- Consumption of electricity, fuels, water, auxiliary materials, emissions, and waste for each facility involved in the production of the products under study.
- Logistics and distribution of the products.

Secondary data were used for:

- Extraction and production of raw materials used for manufacturing the product and its packaging.
- Production of electricity, fuels, water, and auxiliary materials used in the production sites involved.
- Filling the gaps necessary for an accurate definition of the product distribution scenario and raw material supply.
- Defining the usage and routine maintenance scenario of the products.
- Means of transport used for the procurement of materials used in production, where necessary.
- Disposal and treatment of waste, including the means of transport used.

Materials

The supplier of a material or component may vary depending on the plant considered. Depending on the type of material, regionalized emission factors were created according to the countries of the suppliers. If this operation was carried out for that material, the assigned emission factor is a weighted average of the regionalized emission factors according to the production share of the TOTO's plants.

Every plant that produces the wall-hung toilet makes the ceramic in-house.
The impacts related to the production of the moulds for the casting of TOTO products were considered.

Some components of the product are purchased from suppliers ready to be assembled to the final product or are its sub-components ordered and assembled within the factories.
The modelling of the pallet and wood materials for packaging took into account the reuse.

Manufacturing

The production of ceramics is a process involving several stages. Here's a brief description of the main stages of the process:

1. Fine Grinding: The materials are finely ground to ensure a smooth mixture.
2. Mature: The mixture is allowed to mature, which may involve aging or curing.
3. Casting: The matured mixture is then cast into moulds to form the desired shapes.
4. Glazed: The cast ceramics are glazed to add a shiny finish and to make them more durable.
5. Drying: The glazed ceramics are dried to remove any remaining moisture.
6. Firing: The dried ceramics are fired in a kiln at high temperatures to harden them.
7. Inspection: The fired ceramics are inspected for quality and any defects.

After the inspection all the components are assembled to complete the finished product number and then packed for the shipping.

Cut-off criteria
Cut-off has not been applied.

Allocation procedures
All the inputs and outputs of the plants were allocated according to the respective total mass production of the plant. For ceramic manufacturing, the inputs and outputs of the plants were allocated according to the respective mass production of the material. The production of brass by suppliers considers an economic allocation for the distribution of impacts between the main product and its co-product (pre-consumption scraps).
For streams that leave system boundaries, the polluter pays principle applies.
For waste to recycling, only the impacts of transport to the recycling preparation plant and preparation for recycling have been attributed to TOTO as the waste producer.
Consequently, recycled materials enter the system together with the impact of recycling (not of the preparation for recycling phase).

Biogenic Carbon flow management
The percentages of biogenic C contained in the only biogenic material (cardboard) compared to the total weight of the product are less than 5%. Therefore, absorptions and emissions are balanced in A1 and have no effect on the total results.

Electricity mix
The suppliers in their energy mix have the following sources and percentages:

Source	Amount
Coal	71%
Gas	2%
Oil	2%
Nuclear	3%
Renewables	22%
Others	0%

The modelling follows the production share of each factory and the resulting impact of climate change per kWh consumed is equal to 1,13 kg CO_2-eq/kWh.

More LCA additional information on scenarios assumed

Construction process (A4-A5)
The construction process includes the transport of the products from the manufacturing plant to the installation site (module A4) and the environmental impacts related to the installation of the product and the disposal of the packaging.

The transport from each manufacturing site to installation sites, is modelled according to distribution and logistics data for 2022.
The following were calculated:

- The average km travelled by sea and by land from the production site to the distribution centre, weighted according to the number of pieces produced by each plant and shipped to each distribution centre.

- The average km travelled by sea and by land, from the distribution centre, weighted according to the number of products shipped from each distribution centre and according to the number of products shipped to each destination.

The weight of the packaged product was considered for the transport.

In module A5, the disposal of the packaging was considered, assuming that it was removed at the time of installation.
Finally, energy for installation of the toilet was considered. The same energy consumption assumptions made by JRC 2018 for concrete demolition scenario has been adopted (0.07 MJ/kg) as proxy.

Use scenario (B2, B7)

The use scenarios of the representative products were made using Japanese literature data provided directly by TOTO. The use scenarios were modelled respecting the geography defined by the distribution scenario reported in A4.
The use scenario of the wall-hung toilet is made for a household of 4 people, and for a total duration of use of the product of 15 years.

- For the B2 module, for which the environmental impacts related to the maintenance operations of the product are included, the TOTO recommendation for an optimal cleaning and maintenance were used. The maintenance operations were assumed once per week. Module B2 include the use of one meter of toilet paper (12,76 g/m were assumed), a minimum amount of disinfectant and one large flush of water for the ordinary cleaning of the toilet. The B2 module also considers the impact for the relative disposal of wastewater which include the toilet paper, disinfectant and water weights.
- Within the B7 module, the impacts related to the water consumption during the use phase of the product are instead included. It is assumed that daily each member of the family uses 3 flushes of 3 liters each, and one flush of 4.5 liters. The B7 module also considers the impact for the relative disposal of wastewater.

End of life stage (Modules C1-C4)

For this stage all materials were considered, except for the category “other materials” considered negligible.

- Module C1: the assumptions made by JRC 2018[1] for concrete demolition scenario have been adopted, i.e. diesel consumption for excavators, 0.070 MJ/kg for concrete products.
- Module C2: 100 km by truck was assumed for the transport of materials to waste processing or disposal. The bulk weight considered is the net weight of one piece of Wall-hung toilet (28,04 kg).
- Modules C3 and C4: For the modelling of modules C3 and C4, the geographical distribution of TOTO representative products installed in 2022 was considered. All sanitary wares are treated as industrial waste and no component was judged separable during end of life; therefore, the toilets were considered 100% disposed in landfill. For the disposal of ceramic, the electricity consumption related to its disposal was regionalized to the country of disposal. The disposal of steel was used for the disposal of brass as proxy.

Module D

The module D is zero for all the impact categories, because the product was assumed to be entirely disposed of in landfill.

[1] Gervasio, H., Dimova, S., 2018, *Model for Life Cycle Assessment (LCA) of buildings*, EC JRC technical reports

Content information

Product components	Weight, kg	Post-consumer recycled material, % on total product weight		
Ceramic	26,66 - 30,59	0%		
Plastic	0,07 - 0,09	0%		
Steel	0,19 - 0,22	0%		
TOTAL	**26,98 - 30,9**	**0%**		
Packaging materials	Weight, kg	Weight, % (versus the product weight)	Weight biogenic carbon, kg C/product weight	Post-consumer recycled material, % on packaging material category weight
Cardboard	1,92 - 2,52	6%-9%	0,03-0,04	76%-100%
TOTAL	**1,92 - 2,52**			

The product does not contain the substances included in the "Candidate List of SVHC" document issued by the European Chemicals Agency (http://echa.europa.eu/candidate-list-table).

Modules declared

Geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	IN	GLO	GLO	-	GLO	-	-	-	-	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	76%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-6%/+26%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%[2]			-	-	-	-	-	-	-	-	-	-	-	-	-	-

The difference between the declared GWP-GHG result and the other products included in the EPD could be higher than 10% for modules A1-A3.

[2] The representative product is manufactured in one plant

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per functional unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	5,88 E+01	4,79 E+01	3,25 E-01	0,00 E+00	2,02 E+01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,32 E+02	1,97 E-01	2,99 E-01	0,00 E+00	1,81 E-01	0,00 E+00
GWP-biogenic	kg CO_2 eq.	1,98 E+00	8,64 E-03	1,45 E+00	0,00 E+00	7,01 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,08 E+01	1,75 E-05	5,45 E-05	0,00 E+00	5,95 E-05	0,00 E+00
GWP-luluc	kg CO_2 eq.	6,17 E-02	1,94 E-02	9,14 E-05	0,00 E+00	5,19 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,09 E-01	1,71 E-05	1,06 E-04	0,00 E+00	9,05 E-05	0,00 E+00
GWP-total	kg CO_2 eq.	6,09 E+01	4,79 E+01	1,78 E+00	0,00 E+00	2,14 E+01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,54 E+02	1,97 E-01	2,99 E-01	0,00 E+00	1,81 E-01	0,00 E+00
ODP	kg CFC 11 eq.	5,14 E-07	7,48 E-07	4,79 E-09	0,00 E+00	6,25 E-07	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,50 E-05	3,01 E-09	5,78 E-09	0,00 E+00	5,08 E-09	0,00 E+00
AP	mol H^+ eq.	3,10 E-01	2,00 E-01	2,52 E-03	0,00 E+00	1,00 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,31 E+00	1,77 E-03	1,20 E-03	0,00 E+00	1,24 E-03	0,00 E+00
EP-freshwater	kg P eq.	1,96 E-03	4,38 E-04	2,20 E-06	0,00 E+00	1,07 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,66 E-01	6,92 E-07	2,42 E-06	0,00 E+00	1,75 E-06	0,00 E+00
EP-marine	kg N eq.	6,52 E-02	7,19 E-02	2,13 E-03	0,00 E+00	8,91 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	5,53 E+00	8,22 E-04	4,44 E-04	0,00 E+00	4,77 E-04	0,00 E+00
EP-terrestrial	mol N eq.	7,36 E-01	7,92 E-01	1,17 E-02	0,00 E+00	2,35 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,24 E+00	9,01 E-03	4,88 E-03	0,00 E+00	5,18 E-03	0,00 E+00
POCP	kg NMVOC eq.	2,33 E-01	2,90 E-01	4,13 E-03	0,00 E+00	6,64 E-02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	8,20 E-01	2,69 E-03	1,87 E-03	0,00 E+00	1,85 E-03	0,00 E+00
ADP-minerals& metals*	kg Sb eq.	1,03 E-04	1,31 E-04	5,45 E-07	0,00 E+00	7,50 E-05	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,18 E-03	7,02 E-08	8,13 E-07	0,00 E+00	2,75 E-07	0,00 E+00
ADP-fossil*	MJ	7,82 E+02	6,99 E+02	4,13 E+00	0,00 E+00	3,06 E+02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,30 E+03	2,57 E+00	4,36 E+00	0,00 E+00	4,30 E+00	0,00 E+00
WDP*	m^3	1,02 E+01	3,58 E+00	0,00 E+00	0,00 E+00	1,58 E+02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,27 E+04	5,57 E-03	2,11 E-02	0,00 E+00	1,76 E-01	0,00 E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption															

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator. The results of modules A1-A3 should not be used without considering the results of module C. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.*

Variation of each environmental impact indicator results for which the variation, aggregated over all included modules (from A to C), is above 10%:

- GWP100-total: Global Warming Potential fossil fuels, biogenic and LULUC
- GWP-fossil: Global Warming Potential fossil fuels
- AP: Acidification potential
- EP-terrestrial: Eutrophication potential, Accumulated Exceedance
- POCP: Formation potential of tropospheric ozone
- ADP-fossil : Abiotic depletion for fossil resources potential
- PM: Particulate matter
- SQP: Land use

Additional mandatory and voluntary impact category indicators

Results per functional unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[3]	kg CO_2 eq.	6,09 E+01	4,79 E+01	1,78 E+00	0,00 E+00	2,14 E+01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	2,54 E+02	1,97 E-01	2,99 E-01	0,00 E+00	1,81 E-01	0,00 E+00

[3] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Resource use indicators

Results per functional unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	6,45 E+01	9,23 E+00	9,50 E-02	0,00 E+00	7,47 E+01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,79 E+02	1,58 E-02	6,72 E-02	0,00 E+00	3,94 E-02	0,00 E+00
PERM	MJ	3,15 E+01	0,00 E+00	- 1,85 E+01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
PERT	MJ	9,59 E+01	9,23 E+00	- 1,84 E+01	0,00 E+00	7,47 E+01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	4,79 E+02	1,58 E-02	6,72 E-02	0,00 E+00	3,94 E-02	0,00 E+00
PENRE	MJ	2,32 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
PENRM	MJ	7,79 E+02	6,99 E+02	4,13 E+00	0,00 E+00	3,06 E+02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,30 E+03	2,57 E+00	4,36 E+00	0,00 E+00	4,30 E+00	0,00 E+00
PENRT	MJ	7,82 E+02	6,99 E+02	4,13 E+00	0,00 E+00	3,06 E+02	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,30 E+03	2,57 E+00	4,36 E+00	0,00 E+00	4,30 E+00	0,00 E+00
SM	kg	1,86 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
FW	m^3	4,53 E+00	7,34 E-01	1,02 E-05	0,00 E+00	7,38 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,20 E+02	1,50 E-03	4,53 E-03	0,00 E+00	7,65 E-03	0,00 E+00
RSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
NRSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

Waste indicators

Results per functional unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,75 E-02	2,35 E-02	1,21 E-03	0,00 E+00	2,16 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	3,10 E+00	3,68 E-05	1,45 E-04	0,00 E+00	7,68 E-05	0,00 E+00
Non-hazardous waste disposed	kg	1,72 E+01	6,05 E+01	1,05 E+00	0,00 E+00	4,95 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,00 E+02	4,09 E-03	3,78 E-01	0,00 E+00	2,80 E+01	0,00 E+00
Radioactive waste disposed	kg	5,59 E-04	1,51 E-04	1,61 E-06	0,00 E+00	6,52 E-04	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	1,29 E-02	2,83 E-07	1,24 E-06	0,00 E+00	6,85 E-07	0,00 E+00

Output flow indicators

Results per functional unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
Material for recycling	kg	0,00 E+00	0,00 E+00	1,44 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
Materials for energy recovery	kg	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
Exported energy, electricity	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00
Exported energy, thermal	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00

Additional environmental information

Attention on transportation

The sustainability group of the Sanitaryware division has implemented several initiatives to reduce the environmental impact of its activities. Among these, we can mention the choice of packaging materials, the optimization of transport routes and the increase of loading efficiency. For example, we have replaced plastic pallets with sheet metal ones, which take up less space and allow us to make transportation more efficient.

Water saving

We are continuously working to conserve water at our manufacturing plants as one way to reduce environmental impact.
For instance, the water contained in raw materials (slip) is separated, recovered, and recycled. In addition, production wastewater is treated at our on-site wastewater treatment plant, and reuse some of the treated water in production processes and flushing toilets.

Additional social and economic information

To develop sustainable local communities and a society that uses water effectively into the future, not only are the business activities of corporations important but the role of civic activities is also essential. Accordingly, the TOTO Group established the TOTO Water Environment Fund in 2005 and continues aiding groups that are engaging in water-related environmental activities. Through this fund, we are supporting the activities of citizens and organizations that work to secure water sources and water quality, create ecosystems, and plant trees. At the same time, our employees participate voluntarily in such activities. Additionally, overseas, we are subsidizing initiatives to create an environment that encourages hygienic lifestyles, such as installing water supply systems and toilets to respond to issues in local communities and educating children about hygiene. These information as of Oct. 2024.

Toilet construction workshop in Vietnam
(Foundation for International Development / Relief)

Installation of water pipes in Mozambique
(Bridge for Lives in Mozambique)

Differences versus previously published versions

Editorial errors detected in the results tables: the PERE and PERM rows have been repositioned according to the template's order.

References

ISO 14025:2010 *Environmental labels and declarations – Type III environmental declarations – Principles and procedures*
ISO 14040:2006 *Environmental management – Life cycle assessment – Principles and framework*

ISO 14044:2006 *Environmental management – Life cycle assessment - Requirements and guidelines*

International EPD® System, *General Programme Instructions*, 4.0

EN 15804:2012 + A2:2019 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

PCR 2019:14 Product category rules for construction products, Version 1.3.4

Ecoinvent 3.10

European Commission. (2021, 12 16). Commission Recommendation on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations. Brussels.

Ministry of the Environment of Japan (2023) 24 Edition, White Paper on the Environment, Recycling-Oriented Society, Biodiversity (Ministry of the Environment 24 White Paper on the Environment, Recycling-Oriented Society, and Biodiversity Situation Part 1, Chapter 4, Section 3 Excavation and Utilization of Terrestrial Resources Sleeping in Japan)

Japan Construction Material & Housing Equipment Industries Federation, Approach Book for Promoting Energy Conservation and Crime Prevention in Housing, October 2006.

Japan Ministry of Economy, Report of the Research Committee on Energy Conservation and Crime Prevention Information Provision in Detached Houses, March 2005.

Japan Valve Manufacturers' Association, Applied Values for Calculating the Eco-Effect of Water-Saving Faucets, April 2024.

“Carta igienica Classic – 2 veli – 16 gr – 10 cm x 52,5 mt – diametro 11,5 cm – 500 strappi – BulkySoft – pacco 4 rotoli”. Tecnoffice. Data accesso 16/07/2024. https://www.tecnoffice.org/prodotto/carta-igienica-classic-2-veli-16-gr-10-cm-x-525-mt-diametro-115-cm-500-strappi-bulkysoft-pacco-4-rotoli/

ICO. (2020). Environmental Product Declaration Corrugated Paperboard Boxes (EPD).

Other references and databases:

Gervasio, H., Dimova, S., 2018, Model for Life Cycle Assessment (LCA) of buildings, EC JRC technical reports

Product Environmental Footprint, Annex C V2.1, May 2020

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