

Environmental Product Declaration



Of multiple products based on average results

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

Villeroy & Boch / Gustavsberg Thermoplast Toilet Seats

from

Villeroy & Boch AG



Programme:

Programme operator:

EPD registration number:

Publication date:

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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
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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): PCR 2019:14 Construction products (EN 15804:A2) (version 1.3.4)
Product Category Rules (PCR): Construction Products 2019:14, Version 1.3.4 and EN 15804:2012+A2:2019 Sustainability of Construction Works
PCR review was conducted by: The Technical Committee on the International EPD® System. Contact via www.environdec.com info@environdec.com
Life Cycle Assessment (LCA)
LCA accountability: Alexander Kyriakidis, AFRY, www.afry.com
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: <input checked="" type="checkbox"/> EPD verification by individual verifier Third-party verifier: Katrin Molina-Besch, Miljögiraff Approved by: The International EPD® System Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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.

Company information

Owner of the EPD:

Villeroy & Boch AG
Saaruferstraße
66693 Mettlach (Germany)
<https://www.villeroyboch-group.com/> [\[villeroyboch-group.com\]](https://www.villeroyboch-group.com/)

Contact:

Mattias Virsgård

Description of the organisation:

Since its foundation in 1748, the ceramic producer has developed into an international lifestyle brand. Like very few other premium brands, Villeroy & Boch is deeply rooted in European culture. And, in the way that only a great brand can do, it has understood how to preserve its identity while still moving with the times.

Villeroy & Boch produces innovative and stylish products to enhance people's lives, provide continuous inspiration and open up new horizons for truly personalised interior design.

Product-related or management system-related certifications:

Production facilities:
DIN EN ISO 9001

Villeroy & Boch AG organization:

SS-EN ISO 9001:2015 – Quality Management System
SS-EN ISO 14001:2015 – Environmental Management System
SS-EN ISO 45001:2018 – Occupational Health and Safety Management Systems
SS-EN ISO 50001:2018 – Energy Management System

Name and location of production site(s):

Rohrdorf, Germany
Sevlievo, Bulgaria
Kunshan, China

Product information

Product name:

Thermoplast Toilet Seats

Product list

Brand Villeroy & Boch
8M28S101 O.novo

Brand Gustavsberg
9M646101 Gustavsberg/Saval
9M649901 Nordic
9M648101 Saval
9M246101 Nautic

And others for Villeroy & Boch group, produced in the same material in the same production site.

Product identification:

Toilet seat set made of thermoplast material (PP)

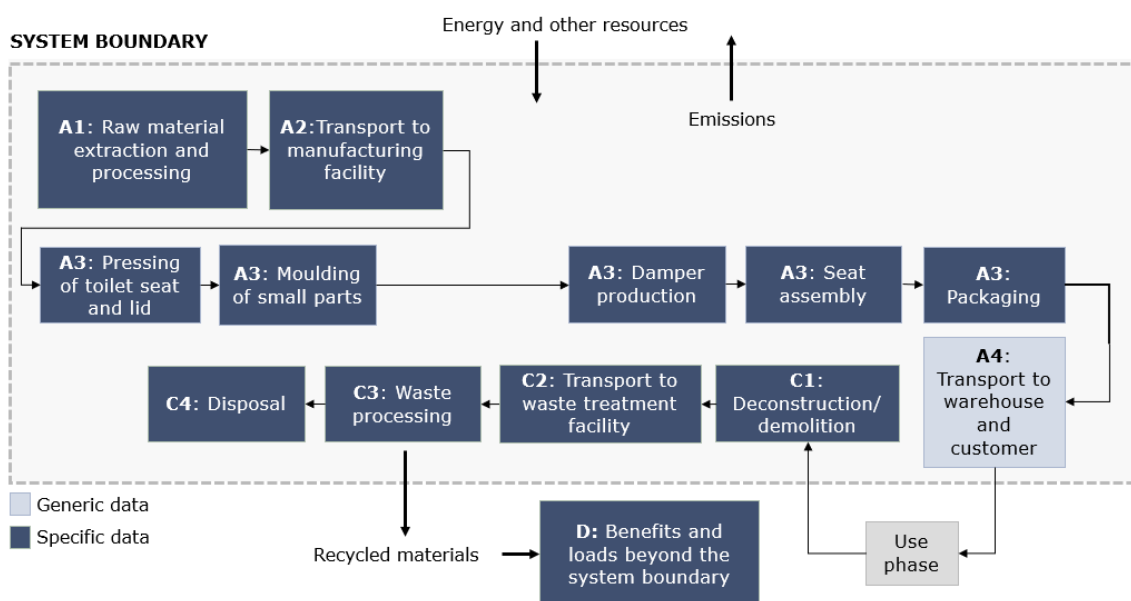
Product description:

Villeroy & Boch & Gustavsberg toilet seats are the perfect, custom-fit solution for each toilets. Their quick assembly and easy-clean benefits speak for themselves, and their designs create a harmonic unit with the ceramic bowl.

UN CPC code:

3693 - Baths, wash-basins, lavatory pans and covers, flushing cisterns and similar sanitary ware, of plastics.

Production diagram:



LCA information

Declared unit:

1 piece average Toilet seat set made of thermoplast material (PP) (1.10 kg).

Reference service life:

RSL is not considered in the LCA. PP WC seats have an average lifespan of 3 years.

Time representativeness:

Production data was collected for the year 2022.

Database(s) and LCA software used:

LCA for Experts (Version 10.7) and Sphera LCA content (Content Version 2023.1).

For module A4 only: SimaPro 9.6.1 and Ecoinvent 3.10.
Environmental impact was assessed according to EN 15804:2012+A2:2019 using EF 3.1 characterization factors

LCA scenarios:

In module A5, the waste treatment of the packaging materials is modelled. Cardboard is recycled and polyethylene foil is incinerated. For waste treatment in module C3, incineration is modelled for plastic components and recycling for metal components. Loads and benefits resulting from recycling and incineration in modules A5 and C3 are assigned to module D. For transports to waste treatment, a distance of 100 km is assumed.

Description of system boundaries:

Cradle to gate with options, modules A1–A5, C1–C4 and module D.

Cut-off criteria:

Infrastructure, capital goods and personnel-related processes were excluded. Nucleating agent was cut-off (0.75% of mass of product). It is assumed that the cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%) are met.

Allocation:

Energy was allocated between Thermoplast and other toilet seats (Duroplast) based on the number of seats produced at each site.

Assumptions:

As Thermoplast toilet seats are predominantly sold with plastic hinges, a plastic hinge was modelled.

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	N D	N D	N D	N D	N D	N D	N D	X	X	X	X	X
Geography	DE, BG, CN	DE, BG, CN	DE, BG, CN	EU R	EU R	-	-	-	-	-	-	-	EU R	EU R	EU R	EU R	-
Specific data used	-19% to +44% for GWP-GHG indicator					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-1% to +109% for GWP-GHG indicator compared to declared average					-	-	-	-	-	-	-	-	-	-	-	-

Variability in the LCIA results is mainly due to the different weights of the products. In general, the lighter the product, the lower the LCIA results. The weight of the unpackaged product varies between 1.4 and 3.5 kg.

A1: Raw Material

This stage includes raw material extraction and production of bought components.

A2: Transport

This stage includes transportation of raw materials to production sites and of components to final site of assembly.

A3: Manufacturing

This stage includes resource use in the manufacturing facility in Vårgårda such as use of energy. It also includes treatment of waste generated from the manufacturing processes. The manufacturing includes casting, chrome plating, assembling, and packing. Data from the full year of 2022 have been used in the calculations.

Site electricity mixes were the following (GWP-GHG/kWh):

- Germany: Green electricity (3 g)
- Bulgaria: Residual electricity mix (441 g)
- China: Electricity mix (811 g)

A4

This stage includes the transportation of the finished product to its installation location. 1000 km transportation is assumed.

A5

This stage includes the installation of the product, materials needed and waste generated as an result of installation.

C1: Deconstruction

No impacts are assumed to be associated with the deconstruction phase.

C2: Waste Transport

Includes the transportation of the discarded product to a waste treatment facility. 100 km transportation is assumed.

C3: Waste Processing

This stage includes sorting of waste.

C4: Waste disposal

This stage includes waste disposal processes, such as landfill or incineration. Incineration is assumed for plastics, with metals assumed to have a recycling rate of 90%

D: Benefits and loads outside the system boundary

This stage includes benefits and burdens associated with recovery/recycling that affects future life cycles. For this product it includes benefits from the recycling of brass and metals, as well as energy recovery from waste incineration

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Thermoplast (polypropylene)	1.027	0%	0
Injection Molding (polyethylene - ethylene vinyl acetate, pigment)	0.043	0%	0
Other (polyamide)	0.030	0%	0
TOTAL	1.1	0%	0
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Polyethylene foil	0.017	1.5%	-
Cardboard box	0.272	24.7%	0.112
TOTAL	0.29	26.2%	0.112

No substances that appear in the REACH Candidate List of Substances of Very High Concern (SVHC) are present or used in the product.

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	3.18E+00	1.33E+00	4.67E-01	0.00E+00	1.08E-02	3.34E+00	0.00E+00	-1.54E+00
GWP-fossil	kg CO ₂ eq.	3.59E+00	1.33E+00	5.61E-02	0.00E+00	1.07E-02	3.34E+00	0.00E+00	-1.54E+00
GWP-biogenic	kg CO ₂ eq.	-4.11E-01	9.86E-04	4.11E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GWP-luluc	kg CO ₂ eq.	1.91E-03	4.34E+00	2.63E-05	0.00E+00	9.77E-05	3.13E-06	0.00E+00	-9.91E-05
ODP	kg CFC 11 eq.	1.99E-11	2.58E-08	2.89E-15	0.00E+00	1.37E-15	1.69E-13	0.00E+00	-1.19E-11
AP	mol H ⁺ eq.	7.76E-03	2.70E-03	1.74E-05	0.00E+00	4.18E-05	4.56E-04	0.00E+00	-1.91E-03
EP-freshwater	kg P eq.	1.19E-05	8.78E-05	1.10E-08	0.00E+00	3.86E-08	4.18E-08	0.00E+00	-2.47E-06
EP-marine	kg N eq.	2.28E-03	6.48E-04	6.81E-06	0.00E+00	1.94E-05	1.35E-04	0.00E+00	-5.58E-04
EP-terrestrial	mol N eq.	2.37E-02	7.00E-03	8.86E-05	0.00E+00	2.18E-04	2.27E-03	0.00E+00	-5.97E-03
POCP	kg NMVOC eq.	7.06E-03	4.49E-03	1.43E-05	0.00E+00	3.79E-05	3.74E-04	0.00E+00	-1.55E-03
ADP-minerals&metals*	kg Sb eq.	5.35E-07	4.22E-06	2.10E-10	0.00E+00	6.95E-10	1.51E-09	0.00E+00	-1.09E-07
ADP-fossil*	MJ	1.04E+02	1.52E+00	4.49E-02	0.00E+00	1.44E-01	4.34E-01	0.00E+00	-2.81E+01
WDP*	m ³	3.51E-01	7.68E-02	4.94E-03	0.00E+00	1.27E-04	3.12E-01	0.00E+00	-1.45E-01
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.

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	3.59E+00	1.33E+00	5.61E-02	0.00E+00	1.07E-02	3.34E+00	0.00E+00	-1.54E+00

In order to calculate the results for module A1-A3 for a toilet seat with another weight, the following formula can be applied:
Average Thermoplast toilet seat GWP-GHG emissions in kg CO₂e = 1.67 + Product weight (without packaging) in kg * 1.75

Resource use indicators

Results per functional or declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1.14E+01	7.16E-01	4.57E+00	0.00E+00	1.05E-02	1.08E-01	0.00E+00	-8.16E+00
PERM	MJ	4.57E+00	0.00E+00	4.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	1.60E+01	7.16E-01	4.42E-03	0.00E+00	1.05E-02	1.08E-01	0.00E+00	-8.16E+00
PENRE	MJ	5.89E+01	9.82E+00	7.95E-01	0.00E+00	1.44E-01	4.48E+01	0.00E+00	-2.81E+01
PENRM	MJ	4.52E+01	0.00E+00	-7.50E-01	0.00E+00	0.00E+00	4.44E+01	0.00E+00	0.00E+00
PENRT	MJ	1.04E+02	9.82E+00	4.51E-02	0.00E+00	1.44E-01	4.35E-01	0.00E+00	-2.81E+01
SM	kg	2.42E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	2.26E-02	7.84E-04	1.18E-04	0.00E+00	1.15E-05	7.31E-03	0.00E+00	-6.62E-03
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								

¹ 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 CO₂ is set to zero.

Waste indicators

Results per functional or declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	9.06E-08	0.00E+00	2.62E-13	0.00E+00	4.47E-13	1.45E-11	0.00E+00	-1.49E-09
Non-hazardous waste disposed	kg	3.89E-02	0.00E+00	2.17E-04	0.00E+00	2.20E-05	1.52E-02	0.00E+00	-1.39E-02
Radioactive waste disposed	kg	4.60E-03	0.00E+00	4.53E-07	0.00E+00	2.70E-07	2.45E-05	0.00E+00	-2.16E-03

Output flow indicators

Results per functional or declared unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	2.72E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	1.70E-02	0.00E+00	0.00E+00	1.10E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	1.14E-01	0.00E+00	0.00E+00	7.09E+00	0.00E+00	7.20E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	2.02E-01	0.00E+00	0.00E+00	1.28E+01	0.00E+00	1.30E+01

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. The results of the end-of-life stage (module C) should be considered when using the results of the production stage (modules A1-A4).

Other environmental performance indicators

Additional environmental information

- the existence of a quality or environmental management system or any type of organised environmental activity, and
- information on where interested parties may find more details about the organisation's environmental work.

Additional environmental information can also include information on carbon offset, carbon storage and delayed emissions, or on release of dangerous substances to indoor air, soil and water during the use stage.

References

EPD International (2021): General Programme Instructions of the International EPD® System. Version 4.0.

EPD International (2023): PCR 2019:14. Construction products 2019:14. Version 1.3.4.

EPD International (2025): General Programme Instructions of the International EPD® System. Version 5.0.1

Ecoinvent v.3. Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., and Weidema, B. (2016): The ecoinvent database version 3 (part I): overview and methodology. The International Journal of Life Cycle Assessment, [online] 21(9), pp.1218–1230. Available at: <<http://link.springer.com/10.1007/s11367-016-1087-8>>

Hamberger Sanitary GmbH (2023). *Environmental Product Declaration for Thermoplast Toilet Seats (Urea)*. EPD No. S-P-09401. EPD International. Available at: [EPD-IES-0009401:001 \(S-P-09401\) - Thermoplast Toilet Seats](#)

Kyriakidis, A. (2025): Life Cycle Assessment of Villeroy-Boch toilet seats

SimaPro. SimaPro LCA Package, Pré Consultants, the Netherlands, www.pre-sustainability.com

