

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804



1 General information

1.1 Declaration holder

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Geberit is one of the pioneers when it comes to sustainability in the sanitary industry. Sustainable development has formed a fixed part of the corporate strategy for more than 25 years. Most production sites are certified in accordance with ISO 9001 and 14001. In addition, all factories will be certified in accordance with OSHAS 18001. Life cycle assessments were produced for key products from an early stage and Ecodesign has been an integral part of the product development process since 2008. As a member of the United Nations Global Compact, Geberit has shown its commitment to the ten principles of sustainable development. Current and comprehensive information regarding sustainability strategy and performance with respect to Geberit and Geberit products can be found in the current Annual Report. Furthermore, additional information can be found under www.geberit.com/nachhaltigkeit.

1.2 Declared product

This declaration applies to a metric ton of sanitary ceramic (average value from all Geberit sanitary ceramic plants).

1.3 Verification and validity

Programme holder:	Geberit International AG
Declaration number:	GEB_EPD_4558759947
Validity:	01/06/2018 to 01/06/2023
Data calculated by:	Quantis www.quantis-intl.com

Environmental declarations for construction products may not be comparable if they do not comply with the EN 15804. It is only possible to make a limited comparison of life cycle assessment results which are based on different background databases.

The European standard EN 15804 is used as the core PCR.	
Independent verification of the declaration and information in accordance with EN ISO 14025:2010	
☐ Internal	☒ External
 Dr. Frank Werner	

2 Product

2.1 Description and application purpose

The Bathroom Ceramics product line belongs to the Bathroom Systems product area which comprises virtually all the relevant facilities in a bathroom. The sanitary ceramic product range includes washbasins, bidets, urinals, toilets, shower trays and cisterns.

2.2 Properties

The sanitary ceramic material is characterised by its robustness, hygienic and cleaning properties, as well as its durability. Combined with other materials, sanitary ceramic can be both useful and resource-saving.

2.3 Technical data

The different sanitary ceramic products are available in various dimensions and designs, e.g. wall-hung, floor-standing, fully enclosed, and therefore weigh different amounts.

The following table lists the average weights of typical sanitary ceramic products:

Product		Weight
Washbasin	Width 60 cm	17 kg
Bidet	Wall-hung	16 kg
	Floor-standing	20 kg
WC	Wall-hung	20 kg
	Floor-standing	24 kg
Shower tray	90 x 90 cm	35 kg
Urinal		16 kg
Exposed cistern		12 kg

2.4 Conformity and label

2.4.1 Standards and laws

Geberit sanitary ceramic products fulfil the requirements of the following standards and laws, among others:

Table 1: European standards and laws

Standard/law	Title
EN 997:2012 + A1:2015	WC pans and WC suites with integral trap
EN 13310:2015	Kitchen sinks - Functional requirements and test methods
EN 13407:2006	Wall-hung urinals - Functional requirements and test methods
EN 14296:2015	Sanitary appliances - Communal washing troughs
EN 14527:2006 + A1:2010	Shower trays for domestic purposes
EN 14528:2015	Bidets - Functional requirements and test methods
EN 14688:2006	Sanitary appliances - Wash basins - Functional requirements and test methods
Regulation (EU) No 305/2011	Regulation laying down harmonised conditions for the marketing of construction products (Construction Products Regulation)
Regulation (EC) No 1907/2006	Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Table 2: French standards

Standard	Title
NF D11-101:2009	Appareils sanitaires – Lavabos en céramique sanitaire
NF D11-107:2009	Appareils sanitaires – Bidets en céramique sanitaire
NF D11-124:2018	Appareils sanitaires – Receveurs de douche en matériaux émaillés
NF D11-130:2017	Appareils sanitaires – Produits en matériaux émaillés pour collectivités
NF D12-101:2017	Appareils sanitaires – Cuvettes de WC en céramique sanitaire
NF D12-203:2012	Appareils sanitaires – Réservoirs de chasse pour cuvette de W.C
NF D13-101:2015	Appareils sanitaires – Éviers en matériaux émaillés
NF D14-601:2015	Appareils sanitaires : matériaux émaillés – Spécifications générales

For undated references, the latest edition of the reference document applies.

Relevant declarations of conformity and/or declarations of performance can be downloaded from the websites of Geberit local sales companies.

2.4.2 International approvals

Geberit sanitary ceramic products feature the following international approvals, among others:

Table 3: Scandinavian approvals

Approval	Title
INSTA SBC 0402	Specific rules for Nordic certification of WC pans and WC suites with integral trap
INSTA SBC 14688	Specific rules for Nordic certification of Wash basins

Table 4: Saudi Arabian approvals

Approval	Title
SASO 1473	Ceramic Sanitary Appliances - Western Water Closets
SASO 1474.1	Ceramic Sanitary Appliances - Methods of Test for Western Water Closets

Table 5: Australian approvals

Approval	Title
AS 1172.1	Water Closets – Part 1 Pans
AS 1172.2	Water Closets – Part 2 Flushing devices and cistern inlet and outlet valves

2.5 Raw material and auxiliary materials

Geberit primarily manufactures sanitary ceramic products from vitreous china. Smaller quantities of sanitary ceramic products are also made of fine fireclay. Both materials have a different composition. For this environmental product declaration, a mixed value from all sanitary ceramic plants was taken into account in the composition.

The following table lists the average composition of sanitary ceramic.

Raw material/auxiliary material	Share in %
Kaolin	27
Clay	26
Chamotte and Feldspar	26
Quartz	18
Other materials	3
Total	100

2.6 Manufacturing

Sanitary ceramic products are only manufactured in the following European countries: Germany, Italy, France, Portugal, Sweden, Finland, Poland and Ukraine.

The manufacturing process is comprised of the following steps:

- Preparing the ceramic
The mineral raw materials are mixed with water, strained and processed.
- Preparing the glaze
The raw materials are stirred with water, ground and strained.
- Making the moulds
The moulds are made of plaster or epoxy resin depending on the casting process used.
- Casting
The mass is cast into the moulds using static pressure or the die casting process.
- Drying
The cast shapes are dried in several steps.
- Glazing
Using the injection process, the glaze is applied to the dried blanks.
- Firing
The glazed blanks are fired in special tunnel kilns at over 1200 °C for up to 24 hours.

- **Testing**

After firing, each individual sanitary ceramic product is tested and sorted into usable goods, broken goods or goods to be re-fired.

- **Re-firing**

If required, the sanitary ceramic products are re-fired in chamber kilns.

- **Packaging**

Depending on the market requirements, the finished sanitary ceramic products are packaged in cardboard boxes and foil for delivery on pallets.

2.7 Distribution

Geberit sells most of its sanitary ceramic products in Europe. The products are transported by lorry via regional warehouses and are handled by logistics partners.

2.8 Installation

Installation is simple and does not entail any relevant energy consumption or use of materials. The packaging waste produced (cardboard, paper) can be fully reused while the PE foil is converted into energy.

2.9 Use

Although use is not covered by the system scope of this environmental product declaration, the following information is provided:

- In general, sanitary ceramics have a service life of several decades. However, people tend to renovate their bathroom every 20–25 years. This therefore determines the duration of use of installed sanitary ceramic products.
- Using sanitary ceramic products does not directly impact the environment. Energy and/or water consumption is indirectly related to the product type and additionally installed components or products. For example, in the case of a WC consisting of a WC pan (sanitary ceramic) and a cistern, water is consumed through the flush. An optimised WC pan hydraulic system can reduce the flush volume in the cistern without impairing the flushing-out performance. For rimless toilets, it reduces the amount of cleaning needed and therefore also the consumption of cleaning agents.

2.10 End-of-life

In Europe – depending on the legislation and existing disposal facilities – sanitary ceramic can either be disposed of in a landfill for inert matter or reused as a secondary material in road construction, for example.

3 Life cycle assessment – calculation criteria

3.1 System boundaries

This environmental product declaration is a Cradle-to-gate-with-options declaration and includes the construction process and end-of-life. The use and demolition stages are not included, as the former depends on the user and the latter is not relevant.

Product			Construction process		Use	End-of-life			
Raw material	Transport to the manufacturer	Manufacturing	Distribution	Installation within the building		Demolition	Transport to waste processing	Reuse, recovery, recycling	Disposal
A1	A2	A3	A4	A5	B1-B7	C1	C2	C3	C4
x	x	x	x	x	–	–	x	x	x

x Considered/relevant

– Not considered/not relevant

3.2 Technical scenario information and assumptions

(A1) The raw material supply was based on an average composition and the total raw material input for the moulds, the ceramic slip and the glaze.

(A2) For transportation from the suppliers in Europe (the majority of cases) and overseas to Geberit, standard transport distances were assumed for each country and a capacity contained in the background data was used. Diesel lorries fulfilling the requirements of the Euro 5 emission standard are used as the means of transport within Europe. Intercontinental transportation consists of freighters and subsequent local distribution by lorry.

(A3) For the manufacture of sanitary ceramics, weighted average values for energy and water consumption as well as waste water and waste from all ceramic plants were used. Process emissions can be considered as insignificant compared to combustion emissions. The average packaging per metric ton of sanitary ceramic includes 7.2 kg of foil and 32.8 kg of cardboard. Taking into account that the pallets are reused, 12 kg of pallets and 3 kg of chipboard per metric ton were also accounted for as input.

(A4) The sanitary ceramic products are mainly intended for the European market and are transported an average of 900 km to the customer by lorry.

(A5) Apart from packaging waste, no additional waste is generated during installation. At the end of their life cycle, the pallets are recycled as waste wood, the chipboard and PE foil are incinerated and the cardboard is recycled.

(C1-C4) Waste that is reused is removed from the product system without causing any environmental impact from the first life cycle. No credits are accounted for cases where products of such waste were avoided. For disposal, it is assumed that the sanitary ceramic is disposed of in a landfill for inert matter and the average transport distance is 10 km.

3.3 Data basis

This environmental product declaration is based on a comprehensive life cycle assessment according to ISO 14044:2006. A detailed background report, which meets the requirements of EN 15804, is used for verification. The stock data is based predominantly on data that was provided by Geberit AG in 2017. ecoinvent data (version 3.3, 2016, www.ecoinvent.org) and the system model "cut-off by classification" were used for all further data. The quality of the data can therefore be considered to be good.

4 Life cycle assessment – results

4.1 Environmental impacts

	Unit	A1	A2	A3	A4	A5	C2	C3	C4
Global warming (GWP)	kg CO ₂ -eq	1.50E+02	8.15E+01	1.38E+03	8.87E+01	1.72E+01	8.69E-01	0	5.37E+00
Ozone depletion (ODP)	kg CFC-11-eq	1.99E-05	1.61E-05	1.50E-04	1.77E-05	4.31E-08	1.73E-07	0	1.79E-06
Photochemical ozone creation (POCP)	kg C ₂ H ₄ -eq	3.08E-02	1.45E-02	3.12E-01	1.44E-02	7.28E-05	1.40E-04	0	1.97E-03
Acidification (AP)	kg SO ₂ -eq	7.06E-01	3.11E-01	5.49E+00	2.94E-01	3.12E-03	2.82E-03	0	4.02E-02
Eutrophication (EP)	kg PO ₄ ³⁻ -eq	2.92E-01	6.07E-02	1.61E+00	6.33E-02	2.22E-03	6.06E-04	0	8.54E-03
Depletion of abiotic resources (ADP), fossil fuels	MJ	2.03E+03	1.35E+03	2.31E+04	1.48E+03	3.43E+00	1.45E+01	0	1.60E+02
Depletion of abiotic resources (ADP), elements	kg Sb-eq	1.45E-03	1.53E-04	5.72E-04	1.72E-04	4.95E-07	1.68E-06	0	5.98E-06

A1 Raw material

A2 Transport to the manufacturer

A3 Manufacturing

A4 Distribution

A5 Installation

C2 Transport to waste processing

C3 Reuse, recovery, recycling

C4 Disposal

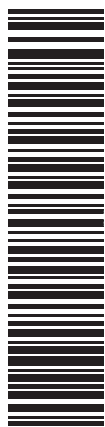
4.2 Resource use

	Unit	A1	A2	A3	A4	A5	C2	C3	C4
Use of primary energy, renewable, w/o raw material use	MJ	1.90E+02	2.11E+01	2.45E+03	2.29E+01	1.40E-01	2.23E-01	0	3.97E+00
Use of primary energy, renewable, raw material use	MJ	0	0	1.67E+02	0	0	0	0	0
Use of primary energy, renewable, total	MJ	1.90E+02	2.11E+01	2.62E+03	2.29E+01	1.40E-01	2.23E-01	0	3.97E+00
Use of primary energy, non-renewable, w/o raw material use	MJ	2.42E+03	1.40E+03	2.51E+04	1.54E+03	3.57E+00	1.50E+01	0	1.62E+02
Use of primary energy, non-renewable, raw material use	MJ	0	0	3.23E+02	0	0	0	0	0
Use of primary energy, non-renewable, total	MJ	2.42E+03	1.40E+03	2.54E+04	1.54E+03	3.57E+00	1.50E+01	0	1.62E+02
Use of secondary fuels	kg	0	0	3.28E+01	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	0	0	0	0	0	0	0
Use of net fresh water	m ³	IND	IND	IND	IND	IND	IND	IND	IND

IND indicator cannot be declared, as the ecoinvent background data does not enable accounting

4.3 Output flows and waste

	Unit	A1	A2	A3	A4	A5	C2	C3	C4
Hazardous waste	kg	5.46E-03	6.39E-04	1.76E-02	6.98E-04	1.03E-05	6.80E-06	0	1.05E-04
Radioactive waste	kg	9.43E-03	9.43E-03	6.54E-02	1.04E-02	1.16E-05	1.01E-04	0	1.01E-03
Non-hazardous waste	kg	5.00E+01	1.10E+02	9.76E+01	1.25E+02	4.77E-01	1.22E+00	0	1.00E+03
Components for re-use	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	2.59E+02	0	4.48E+01	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy – electricity	MJ	0	0	0	0	5.22E+01	0	0	0
Exported energy – heat	MJ	0	0	0	0	1.57E+02	0	0	0



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