

# **ENVIRONMENTAL PRODUCT DECLARATION**

IN ACCORDANCE WITH EN 15804



# 1 General information

## 1.1 Note on this document

The original document was written in German. All other language versions are translations of the original document.

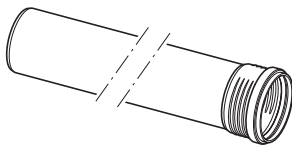
## 1.2 Declaration holder

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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/sustainability](http://www.geberit.com/sustainability).

## 1.3 Declared product


This declaration applies to all Geberit Silent-PP (polypropylene) pipes ("Range and conversion factor", page 3), the Geberit Silent-PP pipe with one socket in a length of 100 cm and d110 (art. no. 390.504.14.1) has been used as a reference article. The duration of use of the reference is not specified.



## 1.4 Verification and validity

Programme holder: Geberit International AG  
 Declaration number: GEB\_EPD\_6178737163  
 Validity: 01/02/2019 to 01/02/2024  
 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	
<input type="checkbox"/> Internal	<input checked="" type="checkbox"/> External
 Matthias Stucki, Zurich University of Applied Sciences (Switzerland)	

## 2 Product

### 2.1 Description and application purpose

The Geberit Silent-PP drainage system is a hydraulically and sound-optimised drainage plug-in system. It is comprised of robust, mineral-reinforced three-layer pipes. In combination with the Geberit Silent-Pro and Silent-db20 in a stack, the Geberit Silent-PP achieves very good sound insulation values.

Application purpose:

- For draining off waste water within buildings
- For buried discharge pipes within building structures
- For central vacuum cleaning systems in single family houses, use dimensions DN 40-50 exclusively
- Use dimensions DN 32–50 exclusively for pressurised pipes of faeces lifting systems in accordance with EN 12050-2 and EN 12050-3

### 2.2 Range and conversion factor

The reference product for this declaration is the Geberit Silent-PP pipe with one socket in a length of 100 cm and d110 (art. no. 390.504.14.1). The cycle assessment results in chapter 4 can be converted to the other pipe lengths listed using the net weight with the conversion factor in accordance with the following table.

Table 1: Geberit Silent-PP pipe with one socket

	d [mm]	L [cm]	Net weight [kg/pc]	Factor
390.000.14.1	32	15	0.04	0.03
390.100.14.1	40	15	0.05	0.04
390.200.14.1	50	15	0.07	0.05
390.300.14.1	75	15	0.14	0.10
390.400.14.1	90	15	0.21	0.14
390.500.14.1	110	15	0.32	0.22
390.600.14.1	125	15	0.44	0.30
390.700.14.1	160	15	0.74	0.50
390.001.14.1	32	25	0.06	0.04
390.101.14.1	40	25	0.08	0.05
390.201.14.1	50	25	0.10	0.07
390.301.14.1	75	25	0.21	0.14
390.401.14.1	90	25	0.31	0.21
390.501.14.1	110	25	0.45	0.31
390.601.14.1	125	25	0.62	0.42
390.701.14.1	160	25	1.03	0.70
390.002.14.1	32	50	0.11	0.08
390.102.14.1	40	50	0.14	0.10
390.202.14.1	50	50	0.18	0.12
390.302.14.1	75	50	0.37	0.25
390.402.14.1	90	50	0.54	0.37
390.502.14.1	110	50	0.79	0.54
390.602.14.1	125	50	1.08	0.73
390.702.14.1	160	50	1.77	1.20
390.004.14.1	32	100	0.21	0.14

## 2 Product

	d [mm]	L [cm]	Net weight [kg/pc]	Factor
390.104.14.1	40	100	0.27	0.19
390.204.14.1	50	100	0.35	0.24
390.304.14.1	75	100	0.69	0.47
390.404.14.1	90	100	1.01	0.69
390.504.14.1	110	100	1.47	1.00
390.604.14.1	125	100	1.99	1.35
390.704.14.1	160	100	3.23	2.20
390.005.14.1	32	150	0.31	0.21
390.105.14.1	40	150	0.40	0.27
390.205.14.1	50	150	0.51	0.35
390.305.14.1	75	150	1.01	0.69
390.405.14.1	90	150	1.48	1.01
390.505.14.1	110	150	2.15	1.46
390.605.14.1	125	150	2.89	1.97
390.705.14.1	160	150	4.69	3.19
390.006.14.1	32	200	0.42	0.28
390.106.14.1	40	200	0.53	0.36
390.206.14.1	50	200	0.67	0.46
390.306.14.1	75	200	1.33	0.91
390.406.14.1	90	200	1.95	1.33
390.506.14.1	110	200	2.83	1.92
390.606.14.1	125	200	3.80	2.59
390.706.14.1	160	200	6.16	4.19
390.007.14.1	32	300	0.62	0.42
390.107.14.1	40	300	0.79	0.54
390.207.14.1	50	300	1.00	0.68
390.307.14.1	75	300	1.97	1.34
390.407.14.1	90	300	2.89	1.97
390.507.14.1	110	300	4.18	2.84
390.607.14.1	125	300	5.62	3.82
390.707.14.1	160	300	9.08	6.18

## 3 Life cycle assessment – calculation criteria

### 3.1 System boundaries

This environmental product declaration is a Cradle-to-gate-with-options declaration including transport and waste processing during the disposal phase. The use and demolition are not considered.

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 Inventory

The product consists of the following raw materials:

Raw material	Quantity
Plastics PP	1063 g
Talc	406 g
EPDM	20 g
Additives	0.1 g
<b>Total</b>	<b>1489 g</b>
Recycling portion of raw materials	0 %

The packaging includes: 140 g wood and 59 g plastic.

### 3.3 Assumptions and background information

**(A1)** For the raw material supply, the entire raw and recycled material input was modelled using corresponding data, including the losses of 1–6 % relating to material and production. Secondary raw materials comprise those environmental influences that arise from the collection of waste and from recycling. The following recycled content was recorded: 25 % for aluminium, 55 % for copper and steel, 33 % for brass and 100 % for cardboard.

**(A2)** For transportation from suppliers in Europe and Asia to Geberit, standard transport distances were assumed for each country and a capacity contained in the background data was used. Class Euro 4 diesel lorries are used as the means of transport within Europe. Intercontinental transportation consists of freighters and subsequent local distribution by lorry.

**(A3)** Products are manufactured in one or more Geberit factories within Europe, which are all certified in accordance with ISO 9001, 14001 and 45001. A current ISO certificate can be downloaded online. All suppliers sign the Geberit suppliers' code of conduct and undergo a detailed selection and inspection procedure.

The electricity consumption plays an important role in in-house production. Average values from the respective factories and a country-specific combination of power sources are expected. The consumption of additional auxiliary materials and water is negligible. Production waste is taken into account. Background data was used for outsourced components.

**(A4)** Transportation from Geberit to customers within Europe is done by logistics partners through the modern, efficient central warehouse in Pfullendorf (DE), which is certified in accordance with ISO 9001, 14001 and 45001. Class Euro 5 and 6 lorries are mainly used for the transport. Distribution in countries outside Europe is mainly done by means of freighters together with lorries to distribute the products locally. In the main market in Europe, the average transport distance is 800 km and the loading weight is 8 t/lorry.

**(A5)** The installation is easy and needs practically no energy or additional auxiliary materials. The packaging waste generated can be completely reused or converted into energy in the respective country depending on the disposal infrastructure.

100 % of metals are recycled. The energy is recovered from plastic and wood in an incineration plant. The assumed energy content of plastic is 16 MJ, while the assumed energy efficiency is 42 % for heat and 14 % for electricity.

**(B1-B7)** No further statements are made concerning the use.

**(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 production of such waste was avoided. With respect to disposal, it has been assumed that all waste is collected once it has been taken from the building site and is sorted appropriately. 100 % of all metal and electronics parts are recycled accordingly. The plastic parts are incinerated (with the assumptions already described). A transport distance of 20 km is assumed for both disposal options.

### 3.4 Data basis

This environmental product declaration is based on a comprehensive life cycle assessment according to ISO 14044:2006. A detailed background report (Background Report EPD Generator, Version 30/01/2019), 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 2019. Ecoinvent data (version 3.3, 2016, [www.ecoinvent.org](http://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

The following tables contain the results based on the declared product.

### 4.1 Environmental impacts

	Unit	A1	A2	A3	A4	A5	C2	C3	C4
Global warming (GWP)	kg CO <sub>2</sub> -eq	2.36E+00	9.87E-02	5.41E-01	8.72E-02	1.51E-01	2.58E-03	0	2.78E+00
Ozone depletion (ODP)	kg CFC-11-eq	1.70E-08	1.94E-08	5.41E-08	1.71E-08	1.32E-10	5.07E-10	0	3.58E-09
Photochemical ozone creation (POCP)	kg C <sub>2</sub> H <sub>4</sub> -eq	5.01E-04	1.57E-05	9.93E-05	1.39E-05	2.70E-07	4.11E-07	0	6.40E-06
Acidification (AP)	kg SO <sub>2</sub> -eq	7.39E-03	3.18E-04	2.81E-03	2.81E-04	1.41E-05	8.31E-06	0	2.89E-04
Eutrophication (EP)	kg PO <sub>4</sub> <sup>3-</sup> -eq	9.40E-04	7.03E-05	1.15E-03	6.21E-05	1.22E-05	1.84E-06	0	2.32E-04
Depletion of abiotic resources (ADP), fossil fuels	MJ	8.02E+01	1.64E+00	6.20E+00	1.45E+00	1.61E-02	4.30E-02	0	4.06E-01
Depletion of abiotic resources (ADP), elements	kg Sb-eq	1.92E-06	1.92E-07	9.93E-07	1.70E-07	1.83E-09	5.03E-09	0	4.01E-08

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	6.60E-01	2.80E-02	1.83E+00	2.47E-02	3.21E-04	7.31E-04	0	9.30E-03
Use of primary energy, renewable, raw material use	MJ	2.28E+00	0	0	0	0	0	0	0
Use of primary energy, renewable, total	MJ	2.94E+00	2.80E-02	1.83E+00	2.47E-02	3.21E-04	7.31E-04	0	9.30E-03
Use of primary energy, non-renewable, w/o raw material use	MJ	3.54E+01	1.69E+00	7.05E+00	1.49E+00	1.64E-02	4.42E-02	0	4.14E-01
Use of primary energy, non-renewable, raw material use	MJ	5.26E+01	0	0	0	0	0	0	0
Use of primary energy, non-renewable, total	MJ	8.79E+01	1.69E+00	7.05E+00	1.49E+00	1.64E-02	4.42E-02	0	4.14E-01
Use of secondary fuels	kg	0	0	0	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 <sup>3</sup>	3.90E-01	2.96E-03	1.17E-01	2.61E-03	1.98E-04	7.74E-05	0	6.48E-03

### 4.3 Output flows and waste

	Unit	A1	A2	A3	A4	A5	C2	C3	C4
Hazardous waste	kg	1.79E-06	8.10E-07	2.08E-05	7.15E-07	1.54E-07	2.12E-08	0	2.91E-06
Radioactive waste	kg	1.09E-05	1.12E-05	1.70E-05	9.90E-06	3.10E-08	2.93E-07	0	1.21E-06
Non-hazardous waste	kg	4.70E-02	1.39E-01	8.23E-02	1.23E-01	2.53E-03	3.63E-03	0	4.54E-01
Components for re-use	kg	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0
Exported energy – electricity	MJ	0	0	0	0	3.81E-01	0	0	7.00E+00
Exported energy – heat	MJ	0	0	0	0	1.14E+00	0	0	2.10E+01



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