Geberit Lavatory Taps

GEBERIT

Environmental Product Declaration

according to EN 15804

KNOW HOW INSTALLED

Certified Management System
SQS
Reg No 31142
ISO 9001 / 14001 / OHSAS 18001

1 General information

1.1 Declaration holder

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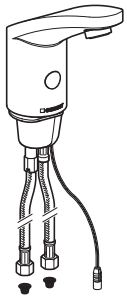
Geberit is one of the pioneers when it comes to sustainability in the sanitary industry. Sustainable development has formed part of the corporate strategy for more than 20 years. Most production sites are certified in accordance with ISO 9001 and 14001. In addition, all factories will be certified in accordance with OSHAS 18001 by 2018. 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/company/sustainability.

1.2 Declared product

Touchless electronic, mains, battery or generator-operated Geberit lavatory taps

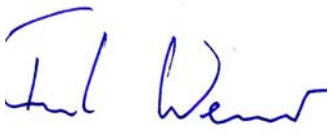
1.3 Verification and validity

Programme holder:	Geberit International AG
Declaration number:	GEB_EPD_D57210
Validity:	01/12/2012 to 30/11/2017
Data calculated by:	ESU-services GmbH www.esu-services.ch



EPDs for building products are probably not comparable if they do not conform to EN 15804.

European standard EN 15804:2012 serves as the core PCR.	
Independent verification of the declaration in accordance with EN ISO 14025:2010	
☐ Internal	☒ External



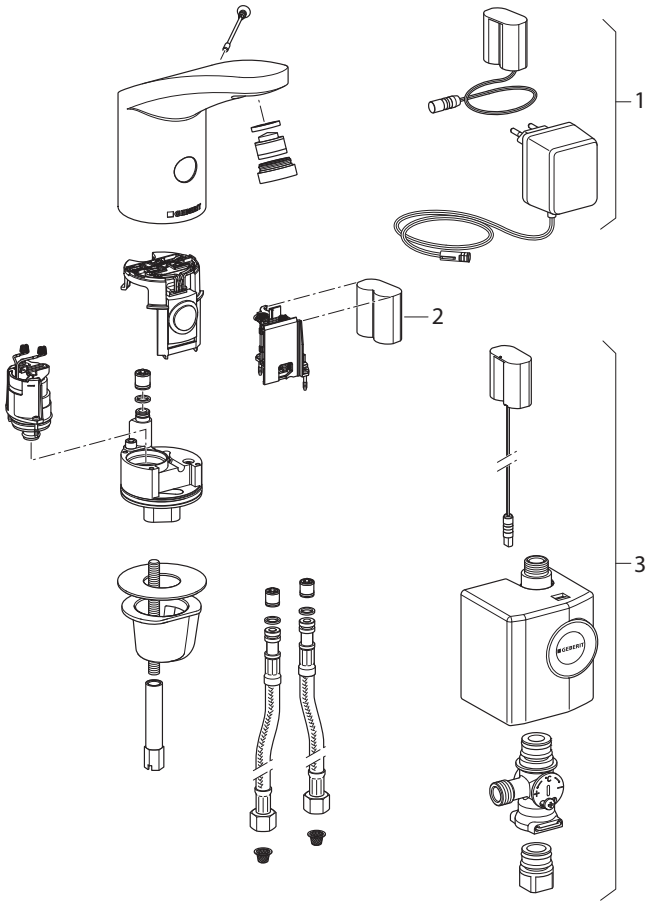
Dr. Frank Werner

2 Product

2.1 Description and application

The analysed products are touchless, electronic Geberit type 185 / 186 lavatory taps. They are used for washing hands in public and semi-public sanitary facilities and are controlled via an IR sensor. They are available with a hot water and cold water connection with and without mixer handle or with a cold water or mixed water connection. Their power requirement is very low and can be supplied via a mains, battery or self-sustaining generator unit. Sensor, electronics and solenoid valve ensure that water only flows when required.

Type	Mains	Battery	Generator
185	116.135.21.1	116.235.21.1	116.335.21.1
	116.145.21.1	116.245.21.1	116.365.21.1
	116.155.21.1	116.255.21.1	–
186	116.136.21.1	116.236.21.1	116.336.21.1
	116.146.21.1	116.246.21.1	116.366.21.1
	116.156.21.1	116.256.21.1	–



1 Mains
2 Battery
3 Generator

2.2 Characteristics

- Touchless activation
- Water saving due to quick-response 2-beam scanning technology
- Self-calibrating infrared control
- Water saving mode can be set
- Temperature limitation
- Volume flow control via tap aerator
- High-quality, track-proven solenoid valve
- Shut-off screw deactivates tap for safe maintenance work

2.3 Technical data

		Mains	Battery	Generator
Flow rate	l/min	6	6	6
Standby consumption of the PSU	W	0.25	–	–
Energy consumption of the PSU	kWh/a	2.19	–	–
Battery / rechargeable battery service life when used 100 times a day	a	–	2	10

To limit the flow rate further, tap aerators with a rate of 3.8 litres per minute (article number: 242.834.21.1) or 1.9 litres per minute (article number: 242.645.21.1) can be used.

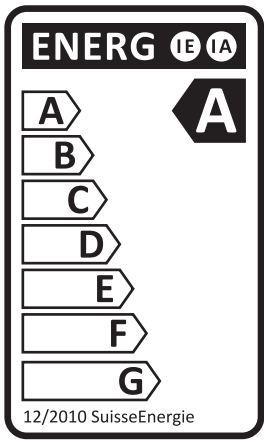
2.4 Conformity and label

The product complies with the following standards, among others:

DIN EN 15091	2006	Sanitary tapware - Electronic opening and closing sanitary tapware
DIN EN 60730-1	2005	Automatic electrical controls for household and similar use Part 1: General requirements; modification AB
DIN EN ISO 3822	2010	Acoustics – Laboratory tests on noise emission from appliances and equipment used in water supply installations
DIN 50930-6	2001	Corrosion of metals - Corrosion of metallic materials under corrosion load by water inside of tubes, tanks and apparatus Part 6: Influence of the composition of drinking water
DIN EN 248	2003	Sanitary tapware – General specification for electrodeposited coatings of Ni-Cr
EN 61000-6-1	2007	Electromagnetic compatibility (EMC) – Part 6-1: Generic standards; Immunity for residential, commercial and light-industrial environments
EN 61000-6-3	2007	Electromagnetic compatibility (EMC) – Part 6-3: Generic standards; Emission standard for residential, commercial and light-industrial environments
EC no. 2011/65	2011	Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS)
EC no. 1907/2006	2006	Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
EC no. 2012/19	2012	Directive on Waste Electrical and Electronic Equipment (WEEE)

Relevant declarations of conformity can be downloaded from the homepage of our national subsidiaries. A warranty period of at least 24 months applies if there are no country-specific contracts.

The product carries the following labels and awards:
- WELL public – Water Efficiency Label: awarded the highest efficiency rating – Class A (reg. no.: WA10102-20101028, WA10101-20101028)
- Energy label (Switzerland): awarded the highest efficiency rating – Class A (www.energieetikette.ch)
- iF Product Design Award 2011 (DE) for the generator-operated tap



2.5 Raw material

The product consists of the following materials:

[g]	Mains	Battery	Generator
Copper	37	–	3
Brass	1833	1833	2148
Steel	236	177	205
Plastics	147	77	256
Electronics	28	18	35
Batteries	–	37	78
Total [kg]	**2.3**	**2.1**	**2.7**
Recycled content [%]	33	34	31

The product is supplied in a cardboard box (90 x 237 x 337 mm) weighing 319 g. Within this are approx. 245 g of paper and 15 g of plastic foil, giving a total weight of 2.9 kg (mains).

Remark: Since the background report was created, the amount of paper was able to be reduced from 441 g to 245 g. This adjustment has only a minor impact on the life cycle assessment results and has therefore been disregarded.

2.6 Manufacturing

The plastic parts were manufactured and the lavatory tap was assembled at the Geberit sites certified in accordance with ISO 14001– mainly in Shanghai (CN) and to a lesser extent in Rapperswil-Jona (CH). The other components are purchased parts. All suppliers sign the Geberit suppliers' code of conduct and undergo a detailed selection and inspection procedure.

2.7 Distribution

Transportation from Geberit to the customer within Europe is made via the state-of-the-art and efficient central warehouse in Pfullendorf (DE) using lorries and outside of Europe mainly by means of freighters together with lorries to distribute the products locally. This is handled by logistics partners who have fleets of modern lorries.

2.8 Installation

Installation is simple and does not require any additional energy consumption or use of materials. All paper and cardboard waste can be recycled.

2.9 Use

Touchless lavatory taps allow for economical water consumption thanks to efficient electronic controls and have been awarded the highest efficiency rating (Class A) from WELL (Water Efficiency Label). However, the actual amount of water and energy that is consumed during use predominantly depends on user behaviour. Consumption of this nature has therefore not been included in this environmental product declaration. Relevant technical operating data is nevertheless available in chapter 2.3. For a service life of ten years, maintenance work is only required for the battery-operated Geberit lavatory tap, resulting in negligible costs to replace the battery.

2.10 End-of-life

The lavatory taps contain electronics and must therefore be disposed of separately. When they are disposed of appropriately, they are fully recyclable.

2.11 Green building information

Geberit provides system solutions for sustainable building and is an active member of the following associations:
- German Sustainable Building Council, DGNB (DE)
- Minergie for sustainable building (CH)
- Green Building Council – USGBC (USA)
- Greenbuild, sustainable building (AU)

Certain information in this environmental product declaration can be used for the assessment and verification of the various certification systems for sustainable building.

DGNB

Relevant criteria for the German Sustainable Building Council (DGNB), scheme for new residential buildings, version 2012 on designing and assessing sustainable buildings:

Topic	Criterion		EPD chapter
Ecological quality	Environmental impacts	ENV 1.1	4.1, 4.2
	Risks for local environment	ENV 1.2	2.5
	Primary energy	ENV 2.1	4.2
	Potable water, waste water	ENV 2.2	2.3, 2.9
Economic quality	Life cycle costs	ECO 1.1	2.9
Technical quality	Ease of cleaning	TEC 1.5	2.9
	Ease of demolition / dismantling	TEC 1.6	2.10, 4.3

The topics and criteria that have not been listed for this product are not directly relevant. With respect to process quality requirements, Geberit makes detailed information available in planning manuals and competence brochures as well as in technical data sheets on the homepages of the respective sales companies.

Minergie-ECO

The Minergie-ECO quality label specifies criteria for new and refurbished buildings in its "New buildings requirements specification 2011".

With regard to the constituents criterion, the product does not contain any materials that would exclude it from the Minergie-ECO certification. The additional requirements concerning the materials and construction processes, building concept, sound insulation and indoor climate areas are either not relevant or the product completely complies with them. The requirements for outlet taps on the checklist "Efficient use of potable water" have been met (GN09, GN10).

LEED

Relevant topics and criteria of the US Green Building Council for the design, construction, operation and maintenance of green buildings in accordance with the Rating System for New Construction and Major Renovations, 2009:

Topic	Criterion		EPD chapter
Water Efficiency (WE)	Water Use Reduction	Prerequisite 1 Credit 3	2.3
Energy and Atmosphere (EA)	Optimize Energy Performance	Credit 1	2.3
Materials and Resources (MR)	Construction Waste Management	Credit 2	2.8
	Recycled Content	Credit 4	2.5
Innovation in Design (D)	Innovation in Design	Credit 1	2.4

(WE) Geberit electronic lavatory taps meet the water efficiency requirement of 0.8 litres per cycle for public areas and 6.8 litres per minute for private buildings. By adjusting the cycle time or using suitable tap aerators, the maximum number of points can be achieved for credit 3 (see chapter 2.3).

(EA) The product can be operated by a self-sustaining generator unit.

The topics and criteria that have not been listed for this product are not directly relevant.

3 Life cycle assessment – Calculation criteria

3.1 Declared unit

The declared unit is an electronic lavatory tap, which is a complete sales article including power supply and packaging.

With respect to the main impact categories, the top-selling type 185 mains-operated tap for cold water and hot water connection without mixer handle (article number: 116.145.21.1) generally demonstrates the highest values and can therefore be considered as being representative for all of the models listed in chapter 2.1. The 185 and 186 types differ only slightly in terms of design. This has no significant impact on the calculated input or output flows. The differences between the operating modes also result in only slight differences in the life cycle assessment results.

3.2 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 stage and the demolition stage are not included, as the former depends on the user and the latter is not relevant. The study covers the European market situation in 2010.

Product			Construction process		Use	End-of-life			
Raw material	Transport to the manu-facturer	Manu-facturing	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

– not considered / not relevant

3.3 Technical scenario information and assumptions

(A1) For the raw material supply, the entire raw and recycled material input was modelled using corresponding European data, including the losses of 1 to 6% relating to material and production. Secondary raw materials comprise those environmental impacts that arise from the collection of waster and from recycling. The following recycled content was recorded: 80% for aluminium, 55% for copper and steel, 33% for brass and 100% for cardboard.

(A2) For transportation from the suppliers in Europe and Asia to Geberit, standard transport distances were assumed for each country and average values for the fleet mix and capacity that were provided in the background data were used. For transport between Geberit plants, however, actual capacity figures were used. Diesel lorries are used as the means of transport within Europe. Intercontinental transportation consists of freighters and subsequent local distribution by lorry. Electronic components are transported by plane.

(A3) With respect to manufacturing at Geberit, electricity consumption from injection moulding and assembly plays the most important role; this consumption is modelled with the Chinese energy mix. The consumption of additional substances or water is negligible. Reliable background data was used for purchased parts. In addition, processes for casting and chrome-plating with a 10.3-µm layer were modelled for the tap housing made from brass.

(A4) Distribution to the customer is based on the current Geberit market situation, where approximately half of the company's products are distributed to Europe and overseas respectively. In addition to the current fleet mix consisting predominantly of Euro-5 vehicles, this also takes into account average vehicle loads of 5 t and actual distances. Products are distributed using diesel lorries (on average over 590 km) within Europe or by freighters (approx. 10,000 km) and lorries (approx. 800 km) when transporting overseas.

(A5) Apart from packaging waste from paper, cardboard and PE foil, no additional material flows are generated during installation. Cardboard and paper are recycled and PE foil is incinerated.

(C1–C4) Waste that is recycled 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 construction site and is sorted appropriately. 100% of all metal parts are recycled. In line with the European average, only 40% of electronic components, cables and batteries are recycled and 60% are incinerated. It is also assumed that all plastic parts are incinerated.

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, which meets the requirements of EN 15804, is used for verification.

The inventory data are based predominantly on average annual production data, which were provided by Geberit AG for 2010. ecoinvent data (version 2.2; www.ecoinvent.org) were used for all other data. The quality of the data can therefore be considered to be good.

Modelling and all calculations were carried out with the aid of SimaPro life cycle assessment software. [1]

1. PRe Consultants (2011) SimaPro 7.3, Amersfoort, NL

4 Life cycle assessment – results

4.1 Environmental impacts

	Unit	Product A1–A3	Distribution A4	Installation A5	Transport C2	Reuse, recycling C3	Disposal C4
Global warming (GWP)	kg CO_2-eq	25.3	0.762	0.044	< 0.01	1.0	0
Ozone depletion (ODP)	kg CFC-11-eq	5.12E-07	2.58E-08	1.52E-11	9.30E-12	2.91E-09	0
Acidification (AP)	kg SO_2-eq	3.92E-03	1.17E-05	5.67E-08	2.63E-09	5.45E-06	0
Eutrophication (EP)	kg PO_4 3-eq	0.174	0.0	0.0	0.0	3.31E-04	0
Photochemical ozone creation (POCP)	kg C_2H_4	1.39E-02	2.08E-04	1.35E-07	2.98E-08	1.38E-05	0
Depletion of abiotic resources, elements (ADPE)	MJ-eq	3.01E-03	3.13E-06	6.10E-10	1.28E-09	3.60E-07	0
Depletion of abiotic resources, fossil fuels	kg Sb-eq	270.6	11.1	< 0.01	< 0.01	0.6	0

4.2 Resource use

	Unit	Product A1–A3	Distribution A4	Installation A5	Transport C2	Reuse, recycling C3	Disposal C4
Use of primary energy, renewable, total	MJ	40.1	0.2	< 0.1	< 0.1	< 0.1	0
Use of primary energy, renewable, w/o raw material use	MJ	40.1	0.2	< 0.1	< 0.1	< 0.1	0
Use of primary energy, renewable, raw material use	MJ	0	0	0	0	0	0
Use of primary energy, non-renewable, total	MJ	308.2	11.8	< 0.1	< 0.1	0.9	0
Use of primary energy, non-renewable, w/o raw material use	MJ	302.7	11.8	< 0.1	< 0.1	< 0.1	0
Use of primary energy, non-renewable, raw material use	MJ	5.5	0	0	0	0	0
Use of secondary materials	kg	11.2	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	0	0	0	0	0
Use of net fresh water	m^3	0.05	< 0.01	< 0.01	< 0.01	< 0.01	0

4.3 Output flows and waste

	Unit	Product A1–A3	Distribution A4	Installation A5	Transport C2	Reuse, recycling C3	Disposal C4
Hazardous waste	kg	1.8E-03	1.1E-05	1.4E-08	4.0E-09	5.3E-06	0
Non-hazardous waste	kg	4.45	< 0.1	< 0.1	< 0.1	< 0.1	0
Radioactive waste	kg	8.5E-04	1.8E-05	8.8E-09	4.9E-09	8.3E-06	0
Components for re-use	kg	0	0	0	0	0	0
Materials for recycling	kg	0.13	0	0.76	0	2.25	0
Materials for energy recovery	kg	< 0.1	0	< 0.1	0	0.2	0
Exported energy – electricity	MJ	< 0.1	0	0	0	0.8	0
Exported energy – heat	MJ	< 0.1	0	0	0	2.3	0

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