GEBERIT MAPRESS
STAINLESS STEEL SYSTEM PIPES

GEBERIT

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804 + A1

KNOW HOW INSTALLED

Zertifiziertes Managementsystem SQS ISO 9001 / 14001 / 45001

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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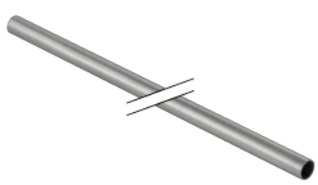
Geberit is one of the pioneers when it comes to sustainability in the sanitary industry. Sustainable has formed an integral component of the corporate strategy for around 30 years. The Geberit Group has a group certificate in accordance with ISO 9001 (quality), ISO 14001 (environment) und ISO 45001 (occupational health and safety). Life cycle assessments were produced for key products from an early stage and Ecodesign has been an integral component of the product development process since 2008.
You can find current and comprehensive information on sustainability in the current annual report or at www.geberit.com/nachhaltigkeit.

1.3 Declared product

This declaration applies to all Geberit Mapress Stainless Steel system pipes (bare of with PP jacketing), see chapter "Range and conversion factors", page 4. A piece of Geberit Mapress Stainless Steel system pipe made of CrNiMo (art. no. 39004) with a length of 6 m and an outer diameter of 22 mm has been used as a reference article.



1.4 Verification and validity

Programme holder:	Geberit International AG
Declaration number:	GEB_EPD_8914345227
Validity:	01/02/2022 to 31/01/2027
Data calculated by:	Intep, www.intep.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 + A1 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	

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2 Product

2.1 Description and application purpose

Geberit Mapress Stainless Steel is a supply system made of austenitic or ferritic stainless steel, in which pipes and fittings are pressed into piping systems.

The system pipes are made of three different alloys:

- Chromium-nickel-molybdenum steel (CrNiMo, stainless steel 1.4401)
- Chromium-molybdenum titanium steel (CrMoTi, stainless steel 1.4521)
- Chromium-nickel steel (CrNi, stainless steel 1.4301)

The pipes are connected by means of stainless steel fittings (stainless steel 1.4401). Fittings with a thread and/or plain end are used for the connection to various connections. Articles with parts made of gunmetal or brass are not covered by this declaration.

Different seal rings are inserted in the fittings depending on the system:

- Geberit Mapress Stainless Steel: seal ring made of chlorobutyl rubber (CIIR)
- Geberit Mapress Stainless Steel (gas): seal ring made of hydrogenated acrylonitrile-butadiene rubber (HNBR)
- Geberit Mapress Stainless Steel (FKM, blue): seal ring made of fluoro rubber (FKM)

The Geberit Mapress Stainless Steel fitting with the CIIR seal ring is also available as a LABS-free version, i.e. free of paint-wetting impairment substances, e.g. Free of silicone.

Application purpose:

The seal ring has a decisive influence on the application purpose. Due to the wide range of possible combinations of pipes, fittings and seal rings, the system covers a wide range of applications in technical building systems, industry and shipbuilding.

2.1.1 Geberit Mapress Stainless Steel system pipes

The Geberit Mapress Stainless Steel system pipes are laser or WIG welded, smoothed on the inside and heat treated (normalised). A detailed description of the individual system pipes is given in the following table.

	Description
Geberit Mapress Stainless Steel system pipe 1.4401 	• Thin-walled pipe made of high-alloy austenitic, rustproof CrNiMo steel • Bare or with PP plastic jacketing for gas installations • Pipe ends are closed with protection plugs made of PE-LD
Geberit Mapress Stainless Steel system pipe 1.4521 	• Thin-walled pipe made of high-alloy ferritic, rustproof CrMoTi steel • Pipe ends are closed with protection plugs made of PE-LD
Geberit Mapress Stainless Steel system pipe 1.4301 	• Thin-walled pipe made of high-alloy austenitic, rustproof CrNi steel

For the composition by raw materials, see chapter "Product composition", page 6.

2.2 Range and conversion factors

The reference product for this declaration is the Geberit Mapress Stainless Steel system pipe made of CrNiMo (art. no. 39004) with a length of 6 m and an outer diameter of 22 mm. This article was chosen as a reference because it is the most commonly used solution for drinking water systems. The life cycle assessment results in chapter 4 can be converted to the other sales articles listed using the net weight with the conversion factor in accordance with the following table.

Geberit Mapress Stainless Steel system pipe CrNiMo

Art. no.	DN	d [mm]	L (m)	Net weight [g/item]	Conversion factor
39012	10	12	6	1644	0.44
39002	12	15	6	2106	0.56
39003	15	18	6	2550	0.68
39004	20	22	6	3750	1
39005	25	28	6	4830	1.29
39006	32	35	6	7548	2.01
39007	40	42	6	9126	2.43
39008	50	54	6	11832	3.16
39009	65	76.1	6	22266	5.94
39010	80	88.9	6	26112	6.96
39011	100	108	6	31848	8.49

Geberit Mapress Stainless Steel system pipe, CrNiMo, small bundle

Art. no.	DN	d [mm]	L (m)	Net weight [g/item]	Conversion factor
39209	65	76.1	6	22056	5.88
39210	80	88.9	6	25902	6.91
39211	100	108	6	31536	8.41

Geberit Mapress Stainless Steel system pipe CrNiMo, plastic-jacketed (gas)

Art. no.	DN	d [mm]	L (m)	Net weight [g/item]	Conversion factor
39112	12	15	6	2094	0.56
39113	15	18	6	2544	0.68
39114	20	22	6	3726	0.99
39115	25	28	6	4800	1.28
39116	32	35	6	7512	2
39117	40	42	6	9120	2.43
39118	50	54	6	11826	3.15

Geberit Mapress Stainless Steel system pipe CrMoTi

Art. no.	DN	d [mm]	L (m)	Net weight [g/item]	Conversion factor
39012	10	12	6	1644	0.44
39002	12	15	6	2106	0.56
39003	15	18	6	2550	0.68
39004	20	22	6	3750	1
39005	25	28	6	4830	1.29

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Art. no.	DN	d [mm]	L (m)	Net weight [g/ item]	Conversion factor
39006	32	35	6	7548	2.01
39007	40	42	6	9126	2.43
39008	50	54	6	11832	3.16
39009	65	76.1	6	22266	5.94
39010	80	88.9	6	26112	6.96
39011	100	108	6	31848	8.49

Geberit Mapress Stainless Steel system pipe CrNi

Art. no.	DN	d [mm]	L (m)	Net weight [g/ item]	Conversion factor
39102	12	15	6	2100	0.56
39103	15	18	6	2550	0.68
39104	20	22	6	3744	1
39105	25	28	6	4824	1.29
39106	32	35	6	7542	2.01
39107	40	42	6	9120	2.43
39108	50	54	6	11826	3.15
39609	65	76.1	6	16806	4.48
39610	80	88.9	6	19692	5.25
39611	100	108	6	31842	8.49

Geberit Mapress Stainless Steel system pipe, CrNi, small bundle

Art. no.	DN	d [mm]	L (m)	Net weight [g/ item]	Conversion factor
39602	12	15	6	2004	0.53
39603	15	18	6	2346	0.63
39604	20	22	6	3504	0.94
39605	25	28	6	4638	1.24
39606	32	35	6	7278	1.94
39607	40	42	6	8790	2.34
39608	50	54	6	11520	3.07
39109	65	76.1	6	16602	4.43
39110	80	88.9	6	19488	5.2
39111	100	108	6	29946	7.99

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	Manufac-turing	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 Product composition

The reference article consists of the following raw materials:

Raw material	Quantity [g]
Stainless steel	3 750
Total	3 750
Recycled content (post-consumer)	22 %

The packaging contains 9 g of metal and 10 g of plastic (incl. protection plugs)

The articles shown in this environmental product declaration do not contain PVC or halogen compounds.

List of substances contained in the product, which are included in the "Candidate List of Substances of Very High Concern for Authorisation" if the content exceeds the limits for their registration by the European Chemicals Agency:

- none

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 materials comprise those environmental influences that arise from the collection of waste and from recycling. The following recycled content was recorded: 22 % for stainless steel.

(A2) For transportation from suppliers in Europe and Asia to Geberit, standard transport distances were assumed for each country and load factors contained in the background data were used. Class Euro 5 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 assumed.

The production and provision of packaging materials and means of production (technical lubricants) were also modelled in phase A3. The consumption of additional auxiliary materials and water is negligible. Production waste is taken into account. However, the scrap flows associated with the production flows are not listed in A3 as they are handled with a conservative allocation factor of 0.

Background data from the ecoinvent database was used for the third-party 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 650 km and the loading weight is 8 t/lorry.

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

The energy is recovered from plastic in the packaging in an incineration plant. The assumed energy content per kg is 43.9 MJ. The energy efficiency is 42 % for heat and 14 % for electricity. Metal from packaging is recycled.

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

(C1-C4) 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. The stainless steel pipes are recycled and leave the product system without any environmental impact from the first life cycle. No credits are accounted for cases where production of such waste was avoided. A transport distance of 20 km is assumed.

3.4 Data basis and data quality

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. Inventory data is based predominantly on data that was provided by Geberit International AG in 2021. ecoinvent data (version 3.4, 2017, 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 a piece of the declared product.

4.1 Environmental impact

Due to the different elements that make up the various stainless steel alloys, the system pipes made of stainless steel 1.4301 have a least 8 % less impact in all categories of the following table, while system pipes made of stainless steel 1.4521 have at least 12 % less impact.

	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4
Global warming (GWP)	kg CO_2-eq	1.27E+01	4.08E-02	4.50E+00	1.73E-01	1.95E-02	0	6.52E-03	1.21E-02	0
Ozone depletion (ODP)	kg CFC-11-eq	2.27E-11	8.03E-09	2.19E-07	3.40E-08	2.00E-11	0	1.28E-09	1.24E-11	0
Photochemical ozone creation (POCP)	kg C_2H_4-eq	2.51E-06	6.49E-06	1.34E-03	2.75E-05	2.88E-08	0	1.04E-06	1.79E-08	0
Acidification (AP)	kg SO_2-eq	6.23E-02	1.32E-04	2.04E-02	5.58E-04	1.80E-06	0	2.10E-05	1.11E-06	0
Eutrophication (EP)	kg PO_4^3-eq	4.35E-03	2.90E-05	9.29E-03	1.23E-04	1.56E-06	0	4.64E-06	9.66E-07	0
Depletion of abiotic resources (ADP), fossil fuels	MJ	1.89E+02	6.80E-01	4.76E+01	2.88E+00	2.34E-03	0	1.09E-01	1.45E-03	0
Depletion of abiotic resources (ADP), elements	kg Sb-eq	7.09E-04	7.95E-08	2.01E-05	3.37E-07	2.29E-10	0	1.27E-08	1.42E-10	0

A1	Raw material	C1	Demolition
A2	Transport to the manufacturer	C2	Transport to waste processing
A3	Manufacturing	C3	Reuse, recovery, recycling
A4	Distribution	C4	Disposal
A5	Installation		

4.2 Resource use

	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4
Use of primary energy, renewable, w/o raw material use	MJ	3.30E+01	1.16E-02	4.93E+00	4.90E-02	4.22E-05	0	1.85E-03	2.62E-05	0
Use of primary energy, renewable, raw material use	MJ	0	0	0	0	0	0	0	0	0
Use of primary energy, renewable, total	MJ	3.30E+01	1.16E-02	4.93E+00	4.90E-02	4.22E-05	0	1.85E-03	2.62E-05	0
Use of primary energy, non-renewable, w/o raw material use	MJ	2.10E+02	7.00E-01	5.27E+01	2.97E+00	2.39E-03	0	1.12E-01	1.48E-03	0
Use of primary energy, non-renewable, raw material use	MJ	1.85E-01	0	7.17E-01	0	0	0	0	0	0
Use of primary energy, non-renewable, total	MJ	2.10E+02	7.00E-01	5.34E+01	2.97E+00	2.39E-03	0	1.12E-01	1.48E-03	0
Use of secondary materials	kg	8.25E-01	0	0	0	1.98E-03	0	0	0	0
Use of renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	0	0	0	0	0	0	0	0
Use of net fresh water	m^3	1.16E-03	6.13E-06	4.92E-01	5.19E-03	2.41E-05	0	1.95E-04	1.49E-05	0

4.3 Output flows and waste

	Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4
Hazardous waste	kg	1.82E-04	3.35E-07	1.17E-04	1.42E-06	2.01E-08	0	5.35E-08	1.24E-08	0
Radioactive waste	kg	8.66E-03	4.64E-06	1.30E-04	1.97E-05	4.47E-09	0	7.41E-07	2.77E-09	0
Non-hazardous waste	kg	1.28E+00	5.74E-02	8.69E-01	2.43E-01	3.21E-04	0	9.17E-03	1.99E-04	0
Components for re-use	kg	0	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	0	0	0	0	0	3.76E+00	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0
Exported energy – electricity	MJ	0	0	0	0	6.78E-02	0	0	0	0
Exported energy – heat	MJ	0	0	0	0	2.03E-01	0	0	0	0

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