Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2:2019

Gustavsberg Shower set 2.1

Registration number:	EPD-Kiwa-EE-239540-EN
Issue date:	27-04-2026
Valid until:	27-04-2031
Declaration owner:	Gustavsberg AB
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

Gustavsberg Shower set 2.1

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-239540-EN

1.3 VALIDITY

Issue date: 27-04-2026

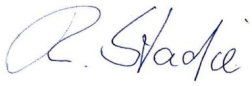
Valid until: 27-04-2031

1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts
Wattstraße 11-13
13355 Berlin
DE

Raoul Mancke

(Head of programme operations, Kiwa-Ecobility Experts)



Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: Gustavsberg AB

Address: Odelbergsväg 11, 13440 Gustavsberg, Sweden

E-mail: info@orasgroup.com

Website: https://www.gustavsberg.com/

Production location: Xiamen Delmei Sanitary Ware Co., Ltd.

Address production location: 700-702, Caotang Rd, Tongan District, 361100 Xiamen, China

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804+A2:2019 serves as the core PCR.

☐ Internal ☒ External

Max Laurén, Kiwa Sertifiointi Oy

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

Kiwa-EE GPI R.4.0
Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, SOP EE 1203_R. 4.0 (18.12.2025)

Kiwa-EE GPI R.4.0 Annex B1
Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, SOP EE 1203_R. 4.0 (18.12.2025)

PCR B
Institut Bauen und Umwelt e.V. - Part B: Requirements on the EPD for Fittings and showers - v11 (2024-08-01)

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2:2019.

1 General information

For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2:2019 and ISO 14025.

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

LCA software*: Simapro 9.6

Characterization method: RETHINK characterization method (see references for more details)

LCA database profiles: ecoinvent (for version see references)

Version database: v3.20e (2026-03-29)

** Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'Gustavsberg Shower set 2.1' with the calculation identifier ReTHiNK-139540.

2 Product

2.1 PRODUCT DESCRIPTION

This specific-EPD refers to Shower Set 2.1. The product features a Nordic design that is compatible with all faucet series. It includes a three-function hand shower equipped with an anti-calcification system that reduces calcium deposits and facilitates cleaning.

The set is supplied with a PVC-free shower hose measuring 1.75 meters. The wall bracket can be fixed using either screws or adhesive and offers an adjustable center-to-center (c-c) measurement for flexible installation.

Weight of the product: 1 kg

The product is delivered in packaging made of corrugated cardboard, which should be recycled.

The following articles are included in the EPD:

Article code	Name
GB41106250	Shower set 2.1
GB4110625010	Shower set 2.1, 10pcs/bundle

The composition of the product is shown as follows.

Material	Share (%)
Stainless steel	38.29
ABS (Acrylonitrile Butadiene Styrene)	21.09
EPDM (Ethylene Propylene Diene Monomer)	10.65
POM (Polyoxymethylene)	9.27
PMMA (Polymethyl Methacrylate)	9.21
Lead-free brass	4.49
Polyethylene	2.04
Nickel	1.92
TPE (Thermoplastic Elastomer)	1.44
NBR (Nitrile Butadiene Rubber)	0.78
Other materials	0.82

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

Shower set 2.1 is a system of bathroom components used to facilitate personal cleaning under a flow of water. Its primary application is to provide a sanitary and comfortable showering experience in a bathroom.

2 Product

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

The declaration of reference service life (RSL) is not mandatory as the use stage (Module B) is not included in this EPD. Spare parts are provided for the products for at least 10 years after the product has been discontinued. For the RSL, 10 years are used for Gustavsberg Shower set 2.1 in this EPD.

USED RSL (YR) IN THIS LCA CALCULATION:

10

2.4 TECHNICAL DATA

Max. tap capacity (at 300 kPa): 0.1 l/s

2.5 SUBSTANCES OF VERY HIGH CONCERN

The product does not contain any substances with particularly hazardous properties (Substances of Very High Concern, SVHC) that are included in the candidate list in a concentration exceeding 0.1% by weight.

2.6 DESCRIPTION PRODUCTION PROCESS

The manufacture of Gustavsberg Shower set 2.1 takes place in Tong'an, Xiamen (China).

The production includes following steps:

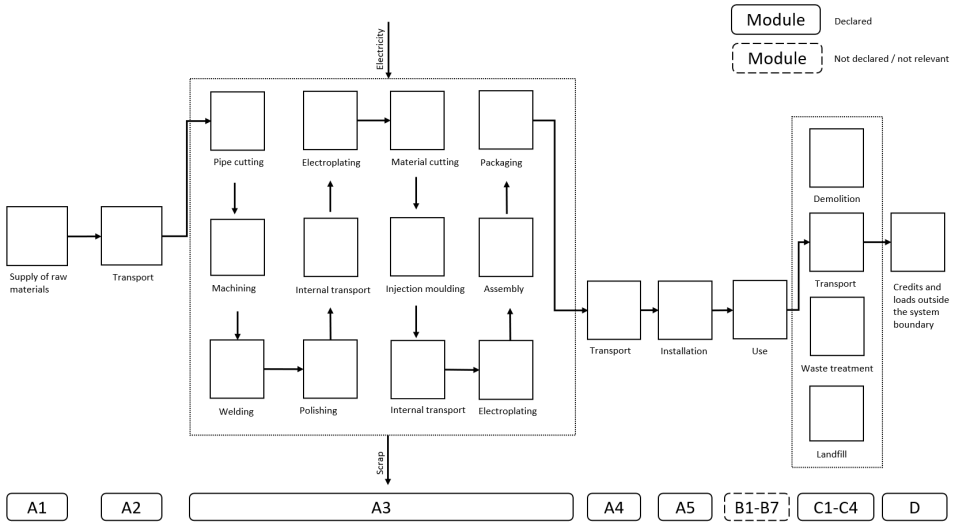
1. Manufacturing of plastic components: Injection moulding of ABS components

2. Manufacturing of stainless steel components: Cutting, machining, welding and polishing of stainless steel pipes

3. Surface treatment processes: Electroplating of selected plastic and metal components

4. Assembly

5. Packaging



2.7 CONSTRUCTION DESCRIPTION

The product is installed manually. Prior to installation the lines must be flushed up to the faucet. The faucet is connected with the cold water line on the right and the hot water line on the left. Water pressure: max 1000 kPa, min 50kPa. Hot water temperature: max 70°C, min 45°C.

3 Calculation rules

3.1 DECLARED UNIT

piece

According to the PCR, the declared unit is one piece shower set.

Reference unit: piece (p)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	p
Weight per reference unit	1.000	kg
Conversion factor to 1 kg	1.000030	p

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with options, modules C1-C4 and module D EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN 15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative for Gustavsberg Shower set 2.1, a product of Gustavsberg AB. The results of this EPD are representative for European Union. Input materials are representative for China.

3.5 CUT-OFF CRITERIA

For each unit process, the cut-off criteria of 1% of renewable and non-renewable primary energy usage and 1% of the total mass input of that unit process are complied with. The total neglected input flows do not exceed the limit of 5% of energy use and mass.

3 Calculation rules

Product stage (A1-A3)
All input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA.

Construction process stage (A4-A5)
All input flows (e.g. transportation to the construction site, additional raw material use for construction, installation energy (use) of energy use for assembly, etc.) and output flows (e.g. construction waste, packaging waste, etc.) are considered in this LCA.

End of life stage (C1-C4)
All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. Demolition of the product is accomplished using hand tools with no associated emissions and negligble impacts.

Benefits and loads beyond the system boundary (Module D)
All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

The following processes are excluded:

- Manufacturing of equipment used in production, buildings or any other capital asset
- Water and electricity consumption for the building
- Transportation of personnel to the plant
- Transportation of personnel within the plant
- Research and development activities
- Long-term emissions

3.6 ALLOCATION

The energy consumption is calculated based on the total consumption at the production site in 2024 (for all products manufactured) and are converted into the amount used solely for the production of the declared product. The amount of energy is given per piece of product manufactured.

No allocation is performed with regard to the use of secondary materials or fuels, co-products, plant-specific production processes or multi-input systems.

The polluter pays principle applies to the use of waste as a substitute for primary fuels or materials. Double counting is avoided.

3.7 DATA COLLECTION & REFERENCE PERIOD

All process-specific data are collected for the reference year 2024 (01.01.2024 - 31.12.2024).

3.8 ESTIMATES AND ASSUMPTIONS

For all raw materials used (raw materials, operating materials, packaging), a conservative approach for the transportation from suppliers (module A2) is applied. A distance of 3500 km by truck is considered for all components manufactured by the local suppliers in China. A payload factor of 50% is used for truck transports (suppliers, disposal transports and internal transports), which corresponds to a full delivery and empty return journey.

Excluded are the manufacturing of capital equipment, construction undertakings, and infrastructure development, along with the maintenance and operation of capital equipment. Additionally, activities related to personnel, as well as energy and water consumption associated with company management and sales, are also excluded.

For production waste in module A3, it is assumed that 5% of input raw materials are considered as production waste during the manufacturing process.

For module A4 (Transportation from the production gate to the construction site), it is estimated that the international transport includes 19000 km by ship and 1000 km by lorry (85% payload). The transport distances for all logistics stages in module A4 have been aggregated into a combined dataset for software compatibility.

The scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

3.9 DATA QUALITY

The data are based on the annual average. Generic datasets from the ecoinvent database V3.9.1 are used for the secondary data, which refers to reference year 2022. This database is regularly maintained and meets the requirements of EN 15804+A2 (background data not older than 10 years). All consistent datasets contained in the ecoinvent database are documented and can be viewed in the online ecoinvent documentation. In the operating data survey all relevant process-specific data could be collected. The quality of the data can be thus considered as good.

3 Calculation rules

The primary data are collected and provided by **Gustavsberg AB** and most of the datasets selected in the LCA for raw materials refer to **Rest-of-the-World** as the geographical reference, repesenting the average global production.

Aspect	Data quality assessment
Time-related coverage	The primary data represent the current situation of the date of study (2024) or as close as possible (<5 years). The secondary data are updated within last 10 years.
Geographical coverage	Most of the datasets selected for the LCA refer to Rest-of-the-World as the geographical reference, repesenting the average global production.
Technology coverage	The data are representative of the technology used in production processes.
Completeness	Specific data are benchmarked with literature data. Simple validation checks (e.g. mass or energy balances) are performed. As the primary data regarding transportation in China is not available, a conservative scenario is applied, assuming a transport distance of 3500 km by lorry.
Representativeness	The data fulfill the defined time-related, geographical, and technological scope.
Precision	The data used are as representative as possible. The data are derived from credible sources, and references are provided.
Reproducibility	Information about the method and data (reference source) are provided.
Sources of the data	The data are derived from credible sources, and references are provided.

3.10 POWER MIX

In this EPD, the national power mix of China is considered in the calculation of the environmental impacts, referring to the location-based approach. No CO2 certificates are considered. The GWP-total of the electricity is calculated as 0.97 kg CO2 eq./kWh.

4 Scenarios and additional technical information

4.1 TRANSPORT TO CONSTRUCTION SITE (A4)

For the transport from production place to assembly/user, the following scenario is assumed for module A4 of this EPD.

	Value and unit
Vehicle type used for transport	International transport (19000 km by ship and 1000 km by lorry (85% payload))
Fuel type and consumption of vehicle	
Distance	1 km
Capacity utilisation (including empty returns)	
Bulk density of transported products	
Volume capacity utilisation factor	

4.2 ASSEMBLY (A5)

The following information describes the scenarios for flows entering the system and flows leaving the system at module A5.

FLOWS ENTERING THE SYSTEM

There are no significant environment impacts as a result of materials or energy used in the construction stage (A5).

FLOWS LEAVING THE SYSTEM

The following output flows leaving the system at module A5 are assumed.

Description	Value	Unit
Output materials as result of loss during construction	0	%
Output materials as result of waste processing of materials used for installation/assembly at the building site	0.000	kg
Output materials as result of waste processing of used packaging	0.240	kg

4.3 DE-CONSTRUCTION, DEMOLITION (C1)

No inputs are needed for the product at the de-construction / demolition phase

4.4 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

4 Scenarios and additional technical information

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) plastics, via residue (NMD ID 43)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.5 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables.
First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

4 Scenarios and additional technical information

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	NL	0	5	5	90	0
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	NL	0	0	100	0	0
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	NL	0	10	85	5	0
(ei3.9.1) plastics, via residue (NMD ID 43)	NL	0	20	80	0	0
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	NL	0	5	0	95	0
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	NL	0	10	85	5	0
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	NL	0	5	5	90	0

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	0.000	0.019	0.019	0.345	0.000
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	0.000	0.211	0.000	0.000
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.000	0.013	0.109	0.006	0.000
(ei3.9.1) plastics, via residue (NMD ID 43)	0.000	0.038	0.154	0.000	0.000
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	0.000	0.002	0.000	0.043	0.000
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.000	0.002	0.017	0.001	0.000
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	0.000	0.001	0.001	0.017	0.000
Total	**0.000**	**0.076**	**0.512**	**0.412**	**0.000**

4.6 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	0.191	0.000
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	7.424
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.006	3.054
(ei3.9.1) plastics, via residue (NMD ID 43)	0.000	3.586
Total	**0.257**	**14.461**

4 Scenarios and additional technical information

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	0.041	0.000
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.001	0.398
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	0.017	0.000
Total	**0.257**	**14.461**

5 Results

For the impact assessment long-term emissions (>100 years) are not considered. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER PIECE

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	6.31E+0	5.21E-1	1.77E+0	8.59E+0	3.74E-1	4.09E-1	0.00E+0	1.56E-2	1.31E+0	6.40E-3	-1.21E+0
GWP-f	kg CO_2 eq.	6.24E+0	5.19E-1	2.13E+0	8.89E+0	3.74E-1	1.54E-2	0.00E+0	1.56E-2	1.31E+0	6.40E-3	-1.21E+0
GWP-b	kg CO_2 eq.	6.20E-2	1.69E-4	-3.69E-1	-3.07E-1	1.77E-4	3.94E-1	0.00E+0	5.08E-6	2.64E-4	3.64E-6	-1.99E-4
GWP-luluc	kg CO_2 eq.	5.92E-3	1.85E-3	4.13E-3	1.19E-2	5.27E-4	1.44E-5	0.00E+0	5.56E-5	5.19E-5	5.47E-7	-5.82E-4
ODP	kg CFC 11 eq.	6.79E-8	9.24E-9	1.76E-8	9.47E-8	5.45E-8	5.43E-10	0.00E+0	2.77E-10	1.30E-8	2.17E-11	-4.87E-8
AP	mol H+ eq.	8.38E-2	2.49E-3	1.24E-2	9.87E-2	7.32E-3	9.00E-5	0.00E+0	7.46E-5	3.07E-4	6.18E-6	-3.37E-2
EP-fw	kg P eq.	3.11E-4	5.17E-6	6.39E-5	3.80E-4	5.58E-6	2.15E-7	0.00E+0	1.55E-7	1.62E-6	1.18E-8	-6.39E-5
EP-m	kg N eq.	6.34E-3	9.45E-4	2.68E-3	9.96E-3	1.53E-3	3.60E-5	0.00E+0	2.84E-5	9.81E-5	4.43E-6	-1.41E-3
EP-T	mol N eq.	7.08E-2	1.01E-2	2.66E-2	1.08E-1	1.71E-2	3.84E-4	0.00E+0	3.02E-4	1.09E-3	2.52E-5	-2.10E-2
POCP	kg NMVOC eq.	2.84E-2	3.44E-3	7.85E-3	3.96E-2	4.67E-3	1.29E-4	0.00E+0	1.03E-4	3.02E-4	1.03E-5	-8.21E-3
ADP-mm	kg Sb-eq.	3.51E-4	1.63E-6	1.59E-6	3.54E-4	3.98E-7	6.12E-8	0.00E+0	4.88E-8	3.21E-7	1.93E-9	-4.62E-4
ADP-f	MJ	9.48E+1	7.44E+0	2.33E+1	1.25E+2	5.38E+0	1.70E-1	0.00E+0	2.23E-1	4.78E-1	1.92E-2	-1.59E+1
WDP	m3 world eq.	2.83E+0	4.06E-2	3.62E-1	3.23E+0	3.28E-2	1.65E-3	0.00E+0	1.22E-3	2.23E-2	6.02E-4	-9.63E-1

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

5 Results

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease incidence	4.58E-7	5.13E-8	1.67E-7	6.77E-7	1.90E-8	1.57E-9	0.00E+0	1.54E-9	2.63E-9	1.35E-10	-9.04E-8
IR	kBq U235 eq.	1.52E-1	2.90E-3	3.40E-2	1.89E-1	1.78E-2	2.05E-4	0.00E+0	8.71E-5	1.51E-3	1.55E-5	-7.82E-3
ETP-fw	CTUe	5.54E+1	5.49E+0	1.00E+1	7.09E+1	2.17E+0	2.27E-1	0.00E+0	1.65E-1	5.99E+0	2.27E-1	-2.34E+1
HTP-c	CTUh	1.99E-8	2.75E-10	1.61E-9	2.18E-8	1.43E-10	3.00E-11	0.00E+0	8.26E-12	7.22E-10	6.33E-13	-1.96E-9
HTP-nc	CTUh	3.16E-7	5.98E-9	1.80E-8	3.40E-7	2.41E-9	2.11E-10	0.00E+0	1.79E-10	3.04E-9	3.27E-11	-4.67E-7
SQP	Pt	2.65E+1	5.87E+0	2.34E+1	5.57E+1	1.82E+0	6.49E-2	0.00E+0	1.76E-1	1.83E-1	4.39E-2	-2.48E+1

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality index (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

5 Results

ILCD classification	Indicator	Disclaimer
	Potential Soil quality index (SQP)	2

Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1.31E+1	1.05E-1	2.49E+0	1.56E+1	1.10E-1	6.20E-3	0.00E+0	3.16E-3	5.04E-2	6.21E-4	-3.43E+0
PERM	MJ	0.00E+0	0.00E+0	3.09E+0	3.09E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	1.31E+1	1.05E-1	5.58E+0	1.87E+1	1.10E-1	6.20E-3	0.00E+0	3.16E-3	5.04E-2	6.21E-4	-3.43E+0
PENRE	MJ	7.85E+1	7.45E+0	2.25E+1	1.08E+2	5.39E+0	1.70E-1	0.00E+0	2.24E-1	4.78E-1	1.92E-2	-1.56E+1
PENRM	MJ	1.63E+1	0.00E+0	8.03E-1	1.71E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-2.12E-1
PENRT	MJ	9.48E+1	7.45E+0	2.33E+1	1.26E+2	5.39E+0	1.70E-1	0.00E+0	2.24E-1	4.78E-1	1.92E-2	-1.59E+1
SM	Kg	1.55E-1	0.00E+0	7.33E-3	1.62E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-8.41E-3
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	7.74E-2	1.80E-3	1.01E-2	8.93E-2	1.16E-3	8.23E-5	0.00E+0	5.40E-5	1.12E-3	2.09E-5	-2.05E-2

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 resources | **SM**=Use of secondary material | **RSF**=Use of renewable secondary fuels | **NRSF**=Use of non-renewable secondary fuels | **FW**=Net use of fresh water

5 Results

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	Kg	2.89E-4	4.74E-5	4.72E-5	3.84E-4	1.21E-5	1.04E-6	0.00E+0	1.42E-6	2.60E-6	9.30E-8	-1.09E-4
NHWD	Kg	3.04E+0	4.92E-1	5.01E-1	4.03E+0	1.09E-1	6.60E-2	0.00E+0	1.48E-2	5.38E-1	7.59E-2	-9.58E-2
RWD	Kg	9.33E-5	1.70E-6	2.35E-5	1.18E-4	2.54E-5	1.51E-7	0.00E+0	5.11E-8	1.09E-6	8.98E-9	-4.41E-6

HWD=Hazardous waste disposed | **NHWD**=Non-hazardous waste disposed | **RWD**=Radioactive waste disposed

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	2.06E-2	2.06E-2	0.00E+0	1.80E-1	0.00E+0	0.00E+0	4.12E-1	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	2.24E-1	2.24E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.72E+0
EEE	MJ	0.00E+0	0.00E+0	1.30E-1	1.30E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.74E+0

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy, Thermic | **EEE**=Exported Energy, Electric

5 Results

5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER PIECE

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per piece:

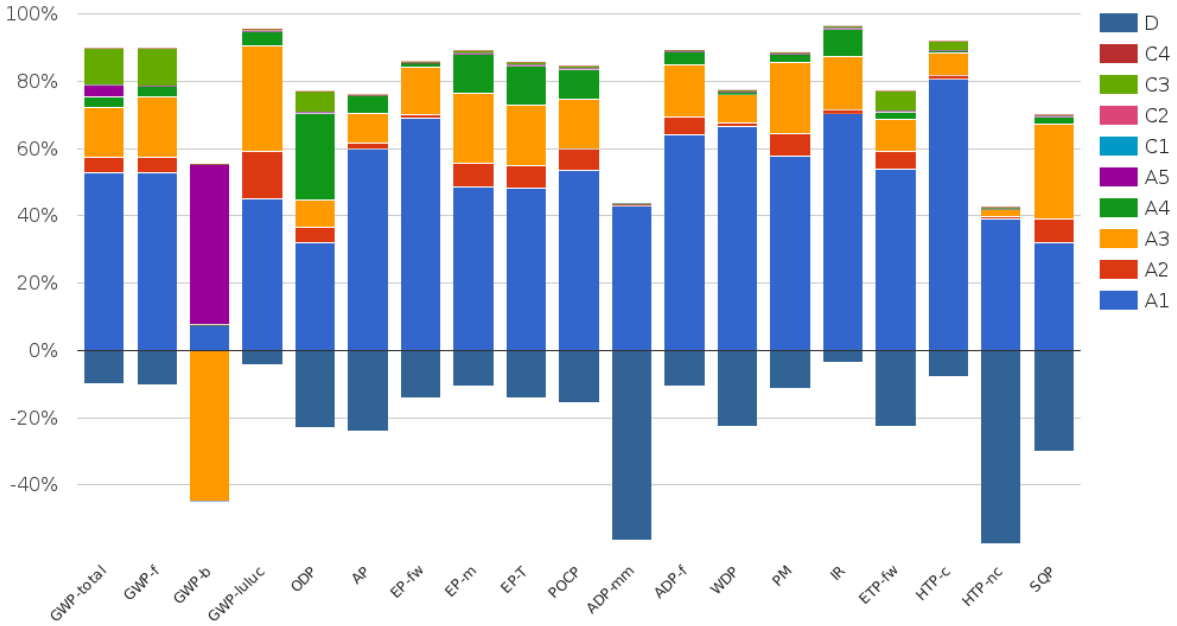
Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.1091	kg C

UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount of carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic Carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

Uptake Biogenic Carbon dioxide	Amount	Unit
Packaging	0.4	kg CO2 (biogenic)

6 Interpretation of results



In most impact categories, the environmental impact of Gustavsberg Shower set 2.1 is predominantly determined by the extraction and processing of raw materials (module A1), followed by the manufacturing processes (module A3). Among the raw materials (module A1), stainless steel results in the largest environmental impact, accounting for 47.7% of the GWP-total.

7 References

ISO 14040
ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044
ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006

ISO 14025
ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804+A2
EN 15804:2012+A2:2019/AC:2021, Sustainability of Buildings - Environmental Product Declarations - Framework Development Rules by Product Category

Kiwa-EE GPI R.4.0
Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, SOP EE 1203_R. 4.0 (18.12.2025)

Kiwa-EE GPI R.4.0 Annex B1
Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, SOP EE 1203_R. 4.0 (18.12.2025)

PCR B
Institut Bauen und Umwelt e.V. - Part B: Requirements on the EPD for Fittings and showers - v11 (2024-08-01)

Ecoinvent
ecoinvent Version 3.9.1 (December 2022)

R<THINK characterization method
ecoinvent 3.9.1: EN 15804+A2 indicators (EF 3.1)

8 Contact information

Publisher	Operator	Owner of declaration
Kiwa-Ecobility Experts Wattstraße 11-13 13355 Berlin, DE	**Kiwa-Ecobility Experts** Wattstraße 11-13 13355 Berlin, DE	**Gustavsberg AB** Odelbergsväg 11 13440 Gustavsberg, Sweden, SE
E-mail: DE.Ecobility.Experts@kiwa.com	**E-mail:** DE.Ecobility.Experts@kiwa.com	**E-mail:** info@orasgroup.com
Website: https://www.kiwa.com/de/en-de/areas-of-expertise/sustainable-solutions/ecobility-experts-epd-program/	**Website:** https://www.kiwa.com/de/en-de/areas-of-expertise/sustainable-solutions/ecobility-experts-epd-program/	**Website:** https://www.gustavsberg.com/

Kiwa-Ecobility Experts is established member of the ECO PLATFORM

Environmental Product Declaration

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

Gustavsberg Thermostatic bath and shower mixers

This EPD covers multiple products, bath and shower mixers of various collections from

Villeroy & Boch Gustavsberg AB

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-09174
Publication date:	2023-06-26
Valid until:	2028-06-22

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
E-mail:	info@environdec.com

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): Construction Products 2019:14, Version 1.2.5 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: Kristin Fransson, AFRY, www.afry.com
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☐ EPD verification by individual verifier Third-party verifier: Daniel Böckin, Miljögiraff AB, daniel@miljogiraff.se Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ 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 Gustavsberg AB
Odelbergs väg 11
134 40 Gustavsberg
Tel: +46 8-570 391 00
Contact:
Mattias Virsgård

Description of the organisation:
Villeroy & Boch Gustavsberg's head office is situated on Värmdö, just outside Stockholm, Sweden, and we have production facilities in Gustavsberg and Vårgårda, Sweden. In addition to our production facilities in Sweden, we also have sales offices around the Nordic countries and in the Baltics. The company is a wholly owned subsidiary of the German Villeroy & Boch AG Group and thus belongs to one of the largest manufacturers of bathroom furnishing solutions in Europe.

Product-related or management system-related certifications
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
EMAS, Eco Management and Audit Scheme – register, Site Vårgårda

Name and location of production site(s):
Villeroy & Boch Gustavsberg AB, Vårgårda, Sweden

Product information

Product name:
Gustavsberg Thermostatic bath and shower mixers

Product identification:
The following products are included in the EPD, see table for information on product names, article numbers and weights.

Product name	Article number	EAN-Number	Article weight (kg/piece)
Shower mixer Atlantic - thermostat, with shower connection up and down, 160 c-c	GB41201302	7391530081359	1.61
Shower mixer Atlantic - thermostat, with shower connection down, 160 c-c	GB41201304	7391530075785	1.54
Shower mixer Atlantic - thermostat, with shower connection down, lead-free, 160 c-c	GB412013040	7391530075792	1.57
Shower mixer Atlantic - thermostat 40 c-c, with shower connection up and down, 40 c-c	GB41201402	7391530075778	1.87
Shower mixer Atlantic - thermostat 40 c-c, with shower connection down, 40 c-c	GB41201404	7391530076423	1.79
Shower mixer Nordic - thermostat, With shower connection up and down, 160 c-c	GB41201702	7391530076508	1.60

Product name	Article number	EAN-Number	Article weight (kg/piece)
Shower mixer Nordic - thermostat, with shower connection down, 160 c-c	GB41201704	7391530076997	1.51
Shower mixer New Nautic - thermostat, outlet up & down, 160 c-c, lead free	GB412023020	7391530076331	1.67
Shower mixer New Nautic - thermostat, outlet downward, 160 c-c	GB41202304	7391530075747	1.50
Shower mixer New Nautic - thermostat, outlet downward, 160 c-c, lead free	GB412023040	7391530075754	1.54
Shower mixer New Nautic - thermostat, outlet downward, 160 c-c, lead free, grip-friendly knobs	GB41202304066	7391530075761	1.54
Tub faucet New Nautic - thermostat, downward shower connection and fixed bathtub spout, 160 c-c	GB41202333	7391530075945	1.90
Shower mixer New Nautic - thermostat, connection can be shifted, outlet up & down, 40 c-c, lead-free	GB412024020	7391530076362	1.79
Shower mixer New Nautic - thermostat, with pipe connection downwards, 40 c-c	GB41202404	7391530075815	1.78
Shower mixer New Nautic - thermostat, with pipe connection upwards, can be shifted, 40 c-c	GB41202427	7391530075839	1.76
Shower mixer Atlantic - thermostat, with shower connection up and down, 150 c-c	GB41211302	7391530076393	1.65
Shower mixer Atlantic - thermostat, with shower connection down, 150 c-c	GB41211304	7391530076430	1.56
Shower mixer Atlantic - thermostat, with shower connection down, lead-free, 150 c-c	GB412113040	7391530076447	1.61
Shower mixer Nordic - thermostat, with shower connection up and down, 150 c-c	GB41211702	7391530077024	1.64
Shower mixer Nordic - thermostat, with shower connection down, 150 c-c	GB41211704	7391530077031	1.55
Shower mixer New Nautic - thermostat, lead-free, outlet up & down, 150 c-c	GB412123020	7391530076379	1.71
Shower mixer New Nautic - thermostat, outlet downward, 150 c-c	GB41212304	7391530076270	1.55
Shower mixer New Nautic - thermostat, lead free mixer with outlet downward, 150 c-c	GB412123040	7391530075860	1.58
Shower mixer New Nautic - thermostat, lead free mixer with outlet downward, 150 c-c, grip-friendly knobs	GB41212304066	7391530075877	1.60
Shower mixer New Nautic - thermostat, outlet downward, 150 c-c, 60p	GB4121230460	7391530075884	1.55
Tub faucet New Nautic - thermostat, downward shower connection and fixed bathtub spout, 150 c-c	GB41212333	7391530075938	1.94
Shower mixer Skandic - thermostat Shower connection up and down, 160 c-c	GB41203602	7391530075976	1.81

Product name	Article number	EAN-Number	Article weight (kg/piece)
Shower mixer Skandic - thermostat, Black with shower connection up and down, 160 c-c	GB4120360253	7391530081069	1.81
Shower mixer Skandic - thermostat, Shower connection downwards 160 c-c	GB41203604	7391530075983	1.74
Shower mixer Skandic - thermostat, Black with downward shower connection 160 c-c	GB4120360453	7391530081076	1.74
Tub faucet Skandic - thermostat, With fixed bathtub spout, downward shower connection, 160 c-c	GB41203633	7391530076072	2.13
Tub faucet Skandic - thermostat, Black with fixed bath spout, downward shower connection, 160 c-c	GB4120363353	7391530081427	2.13
Shower mixer Skandic - thermostat, Shower connection up and down, 40 c-c	GB41203802	7391530076010	2.05
Shower mixer Skandic - thermostat, Shower connection downwards 40 c-c	GB41203804	7391530076027	1.98
Shower mixer Estetic - thermostat, Chrome with shower connection up and down, 160 c-c	GB41208402	7391530076096	1.88
Shower mixer Estetic - thermostat, Black with shower connection up and down, 160 c-c	GB4120840253	7391530076102	1.88
Shower mixer Estetic - thermostat, Chrome with shower connection down, 160 c-c	GB41208404	7391530076119	1.80
Shower mixer Estetic - thermostat, Black with shower connection down, 160 c-c	GB4120840453	7391530076126	1.80
Tub faucet Estetic - thermostat, Chrome with fixed bath spout, downward shower connection, 160 c-c	GB41208433	7391530076225	2.20
Tub faucet Estetic - thermostat, Black with fixed bath spout, downward shower connection, 160 c-c	GB4120843353	7391530076232	2.20
Shower mixer Skandic - thermostat, Shower connection up and down, 150 c-c	GB41213602	7391530075969	1.85
Shower mixer Skandic - thermostat, Black with shower connection up and down, 150 c-c	GB4121360253	7391530081052	1.85
Shower mixer Skandic - thermostat, Shower connection downwards 150 c-c	GB41213604	7391530076041	1.78
Tub faucet Skandic - thermostat, With fixed bathtub spout, downward shower connection, 150 c-c	GB41213633	7391530076089	2.17
Tub faucet Skandic - thermostat, Black with fixed bath spout, downward shower connection, 150 c-c	GB4121363353	7391530081434	2.17
Shower mixer Estetic - thermostat, Chrome with shower connection up and down, 150 c-c	GB41218402	7391530076164	1.92
Shower mixer Estetic - thermostat, Black with shower connection up and down, 150 c-c	GB4121840253	7391530076171	1.92
Shower mixer Estetic - thermostat, Chrome with shower connection down, 150 c-c	GB41218404	7391530076188	1.84

Product name	Article number	EAN-Number	Article weight (kg/piece)
Shower mixer Estetic - thermostat, Black with shower connection down, 150 c-c	GB4121840453	7391530076195	1.84
Tub faucet Estetic - thermostat, Chrome with downward shower connection and fixed bathtub spout, 150 c-c	GB41218433	7391530076249	2.24
Tub faucet Estetic - thermostat, Black with downward shower connection and fixed bath spout, 150 c-c	GB4121843353	7391530076256	2.24

Product description:
The product comes in three versions, 160 cc, 150 cc and 40 cc. These different measurements are to accommodate different markets where the standardized distance between warm- and cold-water pipes differs. The product has safe touch to prevent scalding from touching the thermostat.

UN CPC code:
42911 - Sinks, wash-basins, baths and other sanitary ware and parts thereof, of iron, steel, copper or aluminium.

Geographical scope:
N – Northern Europe and the Baltic region

LCA information

The EPD pertains to a “worst-case” scenario related to the products listed above.

Functional unit / declared unit:
1 kg

Reference service life:
No RSL is declared. This EPD is based on a cradle-to-gate assessment

Allocation
Allocations have been made for several input factors. To summarise the allocation method energy use, chemicals and wastes have been allocated based on physical aspects, in this case, mass. The energy, wastes, water, emissions, and chemicals used as cutting fluids are allocated based on total mass of production at Villeroy & Boch’s manufacturing facility in Vårgårda 2022. The chemicals used in the chromium processing and as casting fillers are allocated based on the total mass casted at Villeroy & Boch’s manufacturing facility in Vårgårda in 2022. I.e., one kg mixer is allocated 0.00032% of the chemicals used for casting and chroming and 0.000006% of the wastes and emissions generated, and energy and water used.

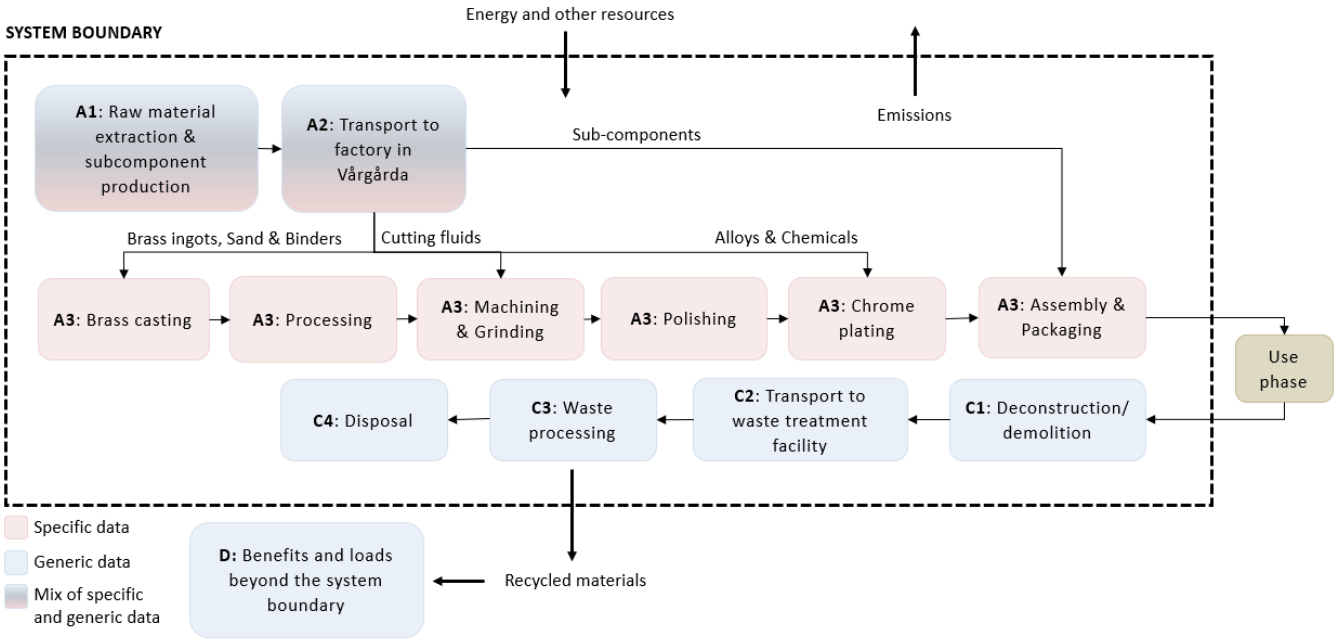
The "polluter pays principle" has been used to allocate recycled materials in accordance with the standards used. The recycling of materials does not imply benefits for the system, and the effects of using recycled materials do not have a negative impact on the results, but rather an environmental gain.

Time representativeness:
The information underlying this EPD is taken from the reference year 2022, taking into account inputs and outputs for the whole calendar year.

Database(s) and LCA software used:
Ecoinvent 3.8.1, Industry Data 2.0, ELCD and SimaPro 9.4.0.2

Description of system boundaries:
Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D)

System diagram:



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	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO/ EUR	GLO/ EUR	SE										EUR	EUR	EUR	EUR	
Specific data used	16% of the total GWP-GHG impact stems from specific data			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Range ratio GWP-GHG	60%	66%	0%										0%	0%	0%	36%	73%

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 has been used in the calculations.

The climate impact of the electricity mix is 12.1 gCO2-eq/kWh.

C1: Deconstruction
This stage includes impacts from energy use related to deconstruction of the fire damper.

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, 95% of the conventional brass is assumed to be recycled, other metals are 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 for worst case product

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Brass	0.001	94%	
Lead free brass	0.89	75%	
Plastic	0.09	0%	
Stainless steel	0.01		
Aluminium	0.01		
TOTAL	1		
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	**Weight biogenic carbon, kg C/kg**
Cardboard	0.053	3.1%	0.011
Paper	0.002	0.1%	0.006
TOTAL	0.055		

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
Lead	231-100-4	7439-92-1	0.05 - <0.8*

* Lead free products contain maximum 0.1% lead while products with conventional brass contain <0.8% lead.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per kg thermostatic mixer							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	5.50E+00	0.00E+00	1.63E-02	9.75E-04	2.29E-01	-4.54E-01
GWP-biogenic	kg CO_2 eq.	8.32E-02	0.00E+00	1.41E-05	2.69E-05	2.45E-05	-2.90E-03
GWP-luluc	kg CO_2 eq.	2.21E-02	0.00E+00	6.51E-06	2.09E-06	3.22E-06	-2.65E-03
GWP-total	kg CO_2 eq.	5.60E+00	0.00E+00	1.63E-02	1.00E-03	2.29E-01	-4.60E-01
ODP	kg CFC 11 eq.	3.05E-07	0.00E+00	3.77E-09	6.15E-11	9.94E-10	-2.54E-08
AP	mol H^+ eq.	2.52E-01	0.00E+00	4.63E-05	5.88E-06	6.44E-05	-2.93E-02
EP-freshwater	kg P eq.	1.84E-02	0.00E+00	1.07E-06	8.96E-07	9.15E-07	-2.31E-03
EP-marine	kg N eq.	1.44E-02	0.00E+00	9.40E-06	1.19E-06	3.58E-05	-1.58E-03
EP-terrestrial	mol N eq.	1.85E-01	0.00E+00	1.02E-04	1.13E-05	2.95E-04	-2.15E-02
POCP	kg NMVOC eq.	5.42E-02	0.00E+00	3.94E-05	3.16E-06	7.46E-05	-5.85E-03
ADP-minerals&metals*	kg Sb eq.	3.19E-03	0.00E+00	5.77E-08	9.15E-09	2.32E-08	-7.11E-04
ADP-fossil*	MJ	1.04E+02	0.00E+00	2.47E-01	1.98E-02	7.90E-02	-8.60E+00
WDP*	m^3	6.01E+00	0.00E+00	7.52E-04	2.24E-04	1.04E-02	-5.50E-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.*

Potential environmental impact – additional mandatory and voluntary indicators

Results per kg thermostatic mixer							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	5.51E+00	0.00E+00	1.63E-02	9.78E-04	2.29E-01	-4.57E-01

Use of resources

Results per kg thermostatic mixer							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2.11E+01	0.00E+00	3.53E-03	3.73E-03	2.25E-03	-2.89E+00
PERM	MJ	4.87E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	2.12E+01	0.00E+00	3.53E-03	3.73E-03	2.25E-03	-2.89E+00
PENRE	MJ	1.09E+02	0.00E+00	2.62E-01	2.08E-02	8.48E-02	-8.81E+00
PENRM	MJ	4.04E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	1.13E+02	0.00E+00	2.62E-01	2.08E-02	8.48E-02	-8.81E+00
SM	kg	4.17E-01	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
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.91E-01	0.00E+00	4.13E-05	5.78E-06	2.48E-04	-1.33E-02
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 CO_2 is set to zero.

Waste production and output flows

Waste production

Results per kg thermostatic mixer							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Radioactive waste disposed	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Output flows

Results per kg thermostatic mixer							
Indicator	**Unit**	**A1-A3**	**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
Material for recycling	kg	5.73E-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	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Other environmental performance indicators

The table below shows results for total climate impact from modules A1-A3 (Cradle-to-gate) for all included product variations.

Results per kg thermostatic mixer	
Product	**GWP-total (A1-A3) [kg CO2-eq]**
GB41213602	3.78
GB4121360253	3.66
GB412123020	5.58
GB41212304	3.34
GB412123040	5.45
GB41212304066	5.39
GB4121230460	3.34
GB41212333	3.83
GB41213604	3.62
GB41213633	4.02
GB4121363353	4.02
GB41211702	3.51
GB41211704	3.33
GB41218402	3.87
GB4121840253	3.75
GB41218404	3.72
GB4121840453	3.60
GB41218433	4.08
GB4121843353	4.08
GB41211304	3.38
GB412113040	5.48
GB41211302	3.56
GB412023020	5.47
GB41202304	3.20
GB412023040	5.36
GB41202304066	5.36
GB41202333	3.72
GB41203602	3.68
GB4120360253	3.53
GB41203604	3.49
GB4120360453	3.36
GB41203633	3.93
GB4120363353	3.92
GB41201702	3.39
GB41201704	3.16
GB41208402	3.77
GB4120840253	3.64
GB41208404	3.59
GB4120840453	3.47
GB41208433	4.00
GB4120843353	3.99
GB41201304	3.23
GB412013040	5.39
GB41201302	3.44
GB41201402	3.10
GB41202404	2.71
GB41202427	2.89
GB412024020	5.39
GB41203802	3.26
GB41203804	3.10
GB41201404	2.93

Additional environmental information

Drinking water is by far our most important natural resource and fundamental for our health. Worldwide the limitations regarding materials and their influences on drinking water quality are increasingly getting stricter. Therefore, the proper choice of suitable alloys for drinking water installations is one of the most crucial aspects. Technical, economic, and – with growing interest – hygienical characteristics have to be considered. More than 20 percent of Sweden's energy use comes from heating and production of hot water. In a two-year project, RISE has shown that large savings are possible by using energy-efficient mixers (Folkeson et al., 2017). Researchers at RISE have carried out measurements in apartment buildings with mixers in different energy classes from Villeroy & Boch Gustavsberg & others. Good energy-rated mixers have functions that reduce hot water use, such as cold start or resilient controls. The results show that it is possible to save about 28% of the hot water used.

For Showermixers with Energyclass mixers above are combined with showerset or showercolumnkits, more information about this on the homepage www.gustavsberg.com

These products are designed and constructed to enable reuse, by in future change components and thereby reach new and updated functionality and flowrates, this to enhance their lifetime and reduce use of material and resources.

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www.environdec.com