Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

Group EPD for Zinc Die Cast One-Hand Bathroom Mixers (middle position cold), based on reference product no. 32926003

from

GROHE AG

Programme:	The International EPD® System, www.environdec.com
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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
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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): *PCR 2019:14 Construction products and construction services (EN 15804:A2)*
PCR review was conducted by: *IVL Swedish Environmental Research Institute,* *Secretariat of the International EPD System*
Life Cycle Assessment (LCA)
LCA accountability: Susanne Dunschen, *TÜV Rheinland Energy GmbH, Am Grauen Stein 33, 51105 Cologne, Germany, carbon@de.tuv.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: *Prof. Ing. Vladimír Kočí, PhD., Prague, Czech Republic, vladimir.koci@lca.cz* 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 from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: GROHE AG
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Description of the organisation: GROHE is a global brand for complete bathroom solutions and kitchen fittings and has a total of over 7,000 employees. Since 2014 GROHE has been part of the brand portfolio of LIXIL, a manufacturer of water and housing products. In order to offer "Pure Freude an Wasser", every product is based on the brand values of quality, technology, design and sustainability.
With water at the core of its business, GROHE contributes to LIXIL's corporate responsibility strategy with a resource-saving value chain: from CO_2-neutral production (includes CO_2 compensation projects, more on green.grohe.com), water- and energy-saving product technologies, the removal of unnecessary plastic in the product packaging, all the way to the launch of Cradle to Cradle Certified® products.
GROHE has established structures worldwide to systematically comply with legal and regulatory requirements and to continuously improve in the areas of quality, environment, occupational health and safety and energy management. This claim is also served by the regular certification audits at all GROHE production sites worldwide by internal GROHE auditors as well as an independent external certification company (for more information see: https://www.grohe.com/en/corporate/about-company/products/certificates.html).

Product-related or management system-related certifications: The GROHE Group holds certifications for all essential Group facilities according to the international standards ISO 9001 (quality management), ISO 14001 (environmental management), ISO 45001 (health & safety management) and ISO 50001 (energy management).

Name and location of production site(s): LIXIL EMENA corporate functions are in Düsseldorf (D) and Hemer (D). LIXIL EMENA production sites, that exclusively produce for the GROHE brand, are in Hemer (D), Porta Westfalica (D), Lahr (D), Albergaria (Portugal), Klaeng (Thailand). Distribution centres in Hemer (D) und Porta Westfalica (D). The production site of the target product is a factory of GROHE AG situated in Klaeng, Thailand, so the primary activity data of the reference product in the manufacturing stage is inventoried from this factory.

Product information

The LCA project report covers a group of products of GROHE AG, produced at the Klaeng production site (Thailand):

- Start OHM basin "Click" S – Product no. 23551002
- Eurosmart OHM basin smth b M – Product no. 2339530E
- BauEdge OHM basin "Click" M – Product no. 119984
- Start OHM basin M – Product no. 23552002
- **Eurosmart OHM basin S – Product no. 32926003 (Reference Product)**

The reference product was chosen as the representative product based on sales volume. The products represented in this group are all similar in composition, with their weight varying in a range of 10% (between 1.68 and 1.83 kg).

Product name: Eurosmart OHM basin S
Product identification: 32926003
Product description: One-hand mixer for use in bathroom basin, with the following specifications

- single hole installation
- metal lever
- GROHE SilkMove ES 28 mm ceramic cartridge
- with energy saving function middle position cold
- adjustable flow rate limiter
- with temperature limiter
- GROHE StarLight chrome finish
- GROHE EcoJoy mousseur 5.7 l/min
- GROHE Zero isolated inner water ways - lead and nickel free within the faucet
- GROHE FastFixation rapid installation system
- pop-up waste set 1 1/4"
- lift rod in lateral position
- flexible connection hoses
- professional edition

UN CPC code: 42911
Geographical scope: Europe

LCA information

The intended application of LCA is for ISO 14025:2006 Environmental Product Declaration (EPD) and allows B2B communication for environmental assessments of buildings. The target group are customers of GROHE AG in the construction sector (B2B).

The purpose of the life cycle assessment is to use the life cycle assessment method to check the raw materials, energy/resource inputs and pollutant discharge data used in the life cycle of the product group, and systematically quantify the environmental impact related information.

Functional unit / declared unit: The declared unit is the use of one Zinc die cast bathroom mixer over a period of 15 years. The weight of the reference product is 1.8 kg (excluding packaging material).

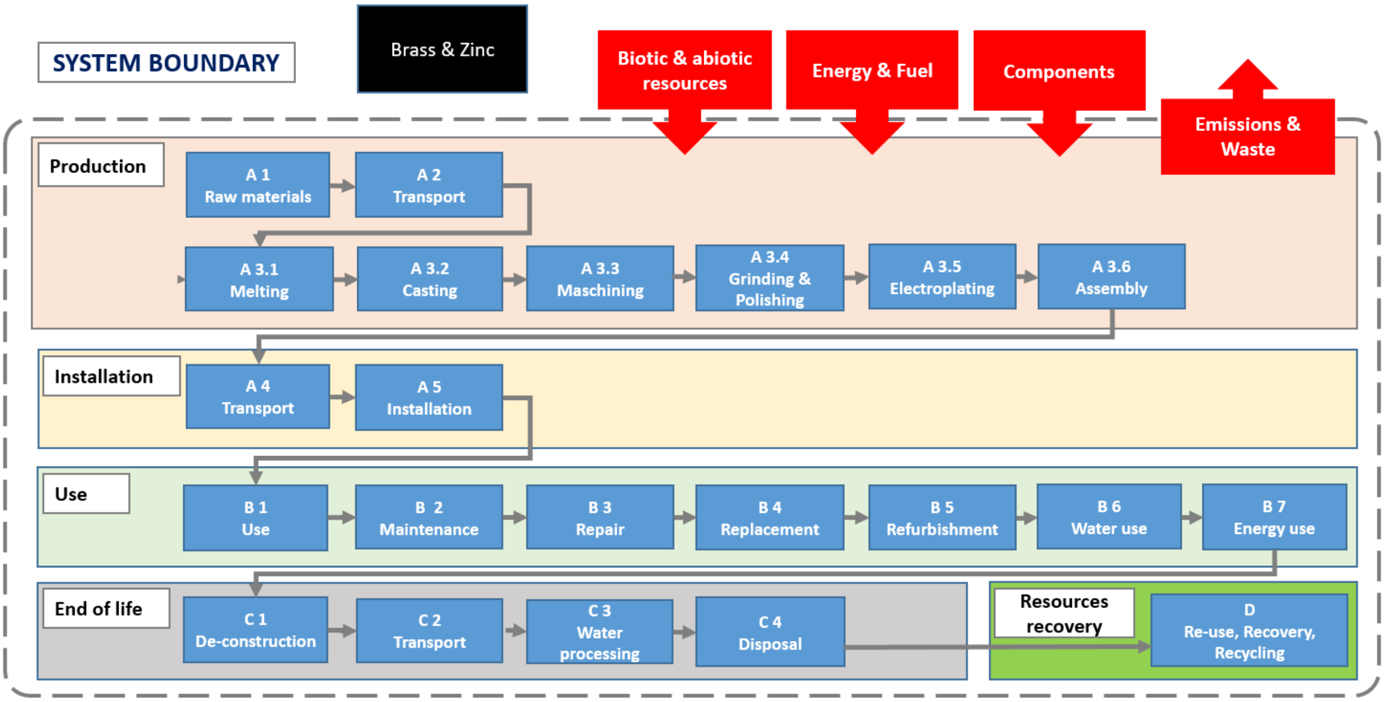
Reference service life: The RSL for the reference product is 15 years, based on GROHE warranties and literature data on household appliances in general, and fauctes (mixers specifically)[1].

Time representativeness: The inventory period of the reference product is from April 2020 to March 2021.

Database(s) and LCA software used: For the calculation of environmental impacts, the database GaBi Professional, 2022 Edition was used, which also contains data from Ecoinvent Database, Version 3.8, 2021.

Description of system boundaries:

Cradle to grave and module D (A + B + C + D)



[1] JRC (2014); NAHB (2007)

A1: This module describes raw material supply including raw material extraction/preparation and pre-treatment processes.

A2: This module describes the transport of raw materials to the production site in Klaeng, Thailand. Calculation is based on actual transported weights and distances. Assumptions on average load capacity etc. are described in section 3.5.

A3: This module describes the environmental impacts from energies and utilities used for manufacturing the zinc die cast mixers, in the production steps shown in Figure 1.

A4: This module describes the transport of the product from the production site in Klaeng, Thailand to the main target markets in Europe via ship and truck and is based on actual transport weights and distances. Assumptions on average load capacity etc. are described in section 3.5.

A5: This module describes impacts related to installing the mixer in the wash basin. Since this is a manual process, the environmental impacts are negligible.

B1: Environmental impacts resulting from the use of the product are described in modules B6 and B7.

B2-B5: Maintenance, repair, replacement and/or refurbishment were not deemed relevant within the Reference Service Life (RSL).

B6: This module describes the environmental impacts resulting from the energy use during use of the product. Energy is needed to heat the water running through the mixer. Assumptions made on the average energy consumption are described in section 3.5.

B7: This module describes the environmental impacts resulting from the water running through the product when in use. Assumptions made on the average water consumption are described in section 3.5.

C1: This module describes impacts related to removing the mixer at the product end-of-life. Since this is a manual process, the environmental impacts are negligible.

C2: This module describes the transport of the discarded mixers to final disposal. Average distance from demolition site to waste processing site for final disposal is assumed to be 100 km.

C3: This module describes the disassembly of the zinc die cast product at the end-of-life. No data on the energy requirements for this stage was available and reference studies show that the energy input is very low. Environmental impacts coming from this stage were therefore neglected.

C4: This module describes the disposal of the mixer at the product end-of-life. A combination of recycling and incineration is assumed based on literature data, see section 3.5 for further details.

D: This module describes benefits and burdens associated with recovery/recycling that affects previous or future life cycles. For this product it includes benefits from the recycling of plastic, zinc and other metal parts as well as energy recovery from incineration processes. Assumed recycling rates were based on literature data (see C4).

Background information

The following assumptions were made for the LCA calculation:

- For recycled input materials (brass), only the energy needed for processing the materials before reuse was considered. An existing dataset for secondary brass was used. Secondary zinc was considered burden free, as processing is already considered in the production module (A3, internal processing).
- Information on the amount energies and utilities needed for manufacturing the mixers (A3) was available on a production facility level, per year. Allocation to each mixer was done by dividing the overall annual consumption values by the amount of pieces manufactured in the Klaeng facility per year. The same approach was chosen for emissions to air and water occurring during production.
- For the electricity used during the production process (A3), the electricity grid mix for Thailand was used. CO_2e emissions from energy consumption are offset by GROHE AG for all major production facilities.

Energy Source	Share Thailand
Natural gas	63.4 %
Hard coal	11.3 %
Lignite	8.7 %
Biomass	7.9 %
Hydro	4.2 %
Photovoltaics	2.5 %
Rest (Biogas, wind, fuel oil, waste)	2.0 %

- For the energy consumption during the use phase of the mixers (B6), the average energy mix for heat generation in Europe[2] was considered, and two scenarios were calculated, using the electricity grid mix for Europe and the French grid mix. For the use of products with a middle position cold function, an energy consumption of 0.29 MWh per year was assumed.

Energy Source	Share Energy Mix EU-28	Share Electricity EU-28 (Scenario)	Share Electricity France (Scenario)
Natural gas	43.4 %	19.1 %	5.3 %
Lignite	19.7 %	9.1 %	-
Biofuels / Bio gas	18.6 %	2.1 %	0.4 %
Waste	8.6 %	-	-
Oil	2.6 %	-	-
Geothermal	1.4 %	-	-
Nuclear	0.4 %	25.3 %	71.0 %
Solar thermal / PV	0.1 %	3.8 %	1.8 %
Hydro	-	11.6 %	12.2 %
Wind	-	11.6 %	4.9 %
Hard coal	-	9.7 %	1.5 %
Biomass	-	3.1 %	0.7 %
Rest	5.3%	4.6 %	2.2 %

[2] IEA (2019)

- For the water consumption during the use phase of the product (B7), an average water consumption of 125 liters per day was assumed, with 20% falling on faucet use[3]. This value was extrapolated to the RSL of 15 years.
- For transports to the end of life treatment (C2), an average distance of 100 km was assumed.
- For the end of life scenarios, the following waste treatment quotas were assumed for the different materials, based on literature values available for Europe[4]:

Material	Recycling	Incineration	Landfilling
Zinc	52%	48%	-
Brass	52%	48%	-
Nickel	60%	40%	-
Steel	78%	22%	-
Plastic	33%	43%	25%
Rubber	-	100%	-
Paper	74%	26%	-

- Credits for recycling were given only for recycling as well as for recovered energy from incineration were given for all materials listed above.

[3] WRF (2016)
[4] UNEP (2011); Statista (2021); EPRC (2020)

Modules declared, geographical scope, share of specific data (in GWP-GHG indicator) and data variation:

	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	x	x	x	x	x	x	x	x	x	x	x	x	x	X
Geography	GLO	GLO	TH	GLO	-	-	-	-	-	-	EU	EU	-	EU	-	EU	EU
Specific data used	100%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	<10%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-					-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Zinc	1.1	0%	0%
Secondary Zinc	0.2	0%	0%
Secondary Brass	0.2	0%	0%
Steel	0.1	0%	0%
Plastic parts (ABS, PA, POM, PPE, PPS)	0.1	0%	0%
Rubber parts (EPDM, NBR)	0.1	0%	0%
Nickel	< 0.1	0%	0%
Brass	< 0.1	0%	0%
Other materials	< 0.1	0%	0%
TOTAL	1.8	0%	0%
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	
Cardboard	0.2	11%	
Paper	0.05	3%	
TOTAL	0.25	14%	

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per functional or declared unit
Brass can contain between 0.1 and 3.5% of lead [5].			

[5] For current regulation, please see 4MSI (2021), to be found at https://www.umweltbundesamt.de/en/topics/water/drinking-water/distributing-drinking-water/approval-harmonization-4ms-initiative#undefined

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per functional or declared unit																			
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot. A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-fossil	kg CO_2 eq.	4,57 E+00	8,33 E-02	5,20 E+00	9,85 E+00	1,45 E+00	0	0	0	0	0	0	8,54 E+02	1,10 E+01	0	1,44 E-02	0	1,26 E-01	-2,24 E+00
GWP-biogenic	kg CO_2 eq.	2,12 E-02	-4,18 E-05	1,78 E-02	3,90 E-02	4,74 E-03	0	0	0	0	0	0	3,17 E+01	1,39 E+00	0	-1,41 E-04	0	7,60 E-02	-5,57 E-02
GWP-luluc	kg CO_2 eq.	4,77 E-03	8,68 E-05	2,29 E-02	2,78 E-02	1,87 E-04	0	0	0	0	0	0	7,26 E-01	3,02 E-03	0	9,74 E-05	0	1,69 E-05	-2,72 E-03
GWP-total	kg CO_2 eq.	4,59 E+00	8,33 E-02	5,24 E+00	9,92 E+00	1,45 E+00	0	0	0	0	0	0	8,86 E+02	1,23 E+01	0	1,43 E-02	0	2,02 E-01	-2,29 E+00
ODP	kg CFC 11 eq.	1,19 E-07	5,28 E-15	1,85 E-08	1,37 E-07	6,23 E-13	0	0	0	0	0	0	5,04 E-11	4,88 E-11	0	1,42 E-15	0	-2,74 E-13	-5,18 E-08
AP	mol H^+ eq.	8,21 E-02	2,62 E-03	4,79 E-02	1,33 E-01	1,79 E-02	0	0	0	0	0	0	1,78 E+00	1,96 E-02	0	2,81 E-05	0	4,98 E-05	-4,37 E-02
EP-freshwater	kg P eq.	9,86 E-04	6,13 E-08	1,13 E-04	1,10 E-03	9,23 E-07	0	0	0	0	0	0	1,01 E-02	1,57 E-03	0	5,16 E-08	0	3,33 E-07	-7,28 E-04
EP-marine	kg N eq.	9,67 E-03	6,96 E-04	7,60 E-03	1,80 E-02	4,44 E-03	0	0	0	0	0	0	5,35 E-01	1,14 E-02	0	1,15 E-05	0	2,64 E-05	-4,79 E-03
EP-terrestrial	mol N eq.	1,03 E-01	7,62 E-03	8,06 E-02	1,91 E-01	4,86 E-02	0	0	0	0	0	0	5,96 E+00	6,00 E-02	0	1,31 E-04	0	3,34 E-04	-5,03 E-02
POCP	kg NMVOC eq.	2,89 E-02	1,94 E-03	2,08 E-02	5,16 E-02	1,36 E-02	0	0	0	0	0	0	1,21 E+00	1,59 E-02	0	2,50 E-05	0	6,85 E-05	-1,41 E-02
ADP-minerals& metals*	kg Sb eq.	9,44 E-04	3,83 E-09	2,79 E-06	9,47 E-04	3,25 E-07	0	0	0	0	0	0	1,67 E-04	1,31 E-06	0	1,46 E-09	0	-5,73 E-09	-4,74 E-04
ADP-fossil*	MJ	5,90 E+01	1,01 E+00	6,46 E+01	1,25 E+02	1,11 E+02	0	0	0	0	0	0	8,49 E+03	1,57 E+02	0	1,90 E-01	0	-7,52 E-01	-2,76 E+01
WDP	m^3	3,57 E+01	2,68 E-04	6,67 E+00	4,24 E+01	5,45 E-02	0	0	0	0	0	0	9,84 E+01	5,89 E+03	0	1,62 E-04	0	7,07 E-02	-1,02 E+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 functional or declared unit																			
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot. A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[6]	kg CO_2 eq.	4,57 E+00	8,34 E-02	5,22 E+00	9,88 E+00	1,45 E+00	0	0	0	0	0	0	8,54 E+02	1,10 E+01	0	1,45 E-02	0	1,26 E-01	-2,24 E+00

Use of resources

Results per functional or declared unit																			
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot. A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2,04 E+01	1,49 E-02	4,58 E+01	6,62 E+01	4,84 E-01	0	0	0	0	0	0	1,14 E+04	2,77 E+01	0	1,31 E-02	0	-1,99 E-01	-9,10 E+00
PERM	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0	0	0	0	0	0	0,00 E+00	0,00 E+00	0	0,00 E+00	0	0,00 E+00	0,00 E+00
PERT	MJ	2,04 E+01	1,49 E-02	4,58 E+01	6,62 E+01	4,84 E-01	0	0	0	0	0	0	1,14 E+04	2,77 E+01	0	1,31 E-02	0	-1,99 E-01	-9,10 E+00
PENRE	MJ	5,91 E+01	1,01 E+00	6,46 E+01	1,25 E+02	1,12 E+02	0	0	0	0	0	0	8,49 E+03	1,57 E+02	0	1,90 E-01	0	-7,51 E-01	-2,77 E+01
PENRM	MJ.	3,05 E-03	0,00 E+00	1,97 E-03	5,02 E-03	0,00 E+00	0	0	0	0	0	0	2,00 E-10	1,02 E-12	0	0,00 E+00	0	-8,99 E-15	-2,03 E-03
PENRT	MJ	5,91 E+01	1,01 E+00	6,46 E+01	1,25 E+02	1,12 E+02	0	0	0	0	0	0	8,49 E+03	1,57 E+02	0	1,90 E-01	0	-7,51 E-01	-2,77 E+01
SM	kg	4,55 E-01	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0	0	0	0	0	0	0,00 E+00	0,00 E+00	0	0,00 E+00	0	0,00 E+00	0,00 E+00
RSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0	0	0	0	0	0	0,00 E+00	0,00 E+00	0	0,00 E+00	0	0,00 E+00	0,00 E+00
NRSF	MJ	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0,00 E+00	0	0	0	0	0	0	0,00 E+00	0,00 E+00	0	0,00 E+00	0	0,00 E+00	0,00 E+00
FW	m^3	8,34 E-01	1,85 E-05	1,70 E-01	1,00 E+00	1,40 E-03	0	0	0	0	0	0	3,69 E+00	1,37 E+02	0	1,52 E-05	0	1,56 E-03	-2,38 E-01
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																		

[6] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per functional or declared unit																			
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot. A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1,84 E-07	4,37 E-12	4,51 E-08	2,29 E-07	2,30 E-10	0	0	0	0	0	0	1,30 E-06	1,43 E-08	0	1,01 E-12	0	-1,28 E-10	-7,34 E-08
Non-hazardous waste disposed	kg	6,58 E-01	1,06 E-04	6,69 E-02	7,25 E-01	4,42 E-03	0	0	0	0	0	0	5,95 E+01	3,89 E+01	0	3,10 E-05	0	2,36 E-01	-3,06 E-01
Radioactive waste disposed	kg	2,95 E-03	1,28 E-06	1,52 E-04	3,10 E-03	5,29 E-05	0	0	0	0	0	0	2,37 E-02	5,27 E-03	0	3,54 E-07	0	-6,44 E-05	-1,34 E-03

Output flows

Results per functional or declared unit																			
Indicator	**Unit**	**A1**	**A2**	**A3**	**Tot. A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Material for recycling	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Materials for energy recovery	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Exported energy, electricity	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Exported energy, thermal	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA

Information on biogenic carbon content

Results per functional or declared unit		
BIOGENIC CARBON CONTENT	**Unit**	**QUANTITY**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0,06

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

Remarks on LCA results

The main driver in all impact categories, with the exception of Ozone depletion, Resource use (minerals and metals) and Water use, is module B6, the energy consumption during the use phase of the product.

It shall be noted that the impact resulting from energy consumption during the use phase of the product over a period of 15 years varies greatly, depending on the energy mix being considered. Generally, the following can be stated: The higher the share in renewable energies in the energy mix, the lower will be the impacts in module B6.

For example: The calculated scenarios show that the greenhouse gas emissions resulting from the use of the product over a period of 15 years with the assumed annual energy consumption for water heating with the EU-28 energy mix are 30% lower than the emissions from a use of the EU-28 electricity grid mix. However, when comparing the two electricity scenarios, a use of the French electricity grid mix leads to a decrease of 79 % compared to the use of the EU-28 electricity grid mix for water heating.

In order to generate results per year, please divide all results by 15.

Results per kg of packed product for the system boundaries “cradle to gate” are shown in the table below.

	A1	A2	A3	Tot.A1-A3
Climate Change, fossil [g CO2 eq.]	2,19E+00	4,00E-02	2,50E+00	4,73E+00
Climate Change, biogenic [kg CO2 eq.]	1,02E-02	-2,01E-05	8,56E-03	1,87E-02
Climate Change, land use and land use change [kg CO2 eq.]	2,29E-03	4,17E-05	1,10E-02	1,33E-02
Climate Change - total [kg CO2 eq.]	2,21E+00	4,00E-02	2,52E+00	4,76E+00
Ozone depletion [kg CFC-11 eq.]	5,71E-08	2,54E-15	8,87E-09	6,60E-08
Acidification [Mole of H+ eq.]	3,94E-02	1,26E-03	2,30E-02	6,37E-02
Eutrophication, freshwater [kg P eq.]	4,74E-04	2,94E-08	5,41E-05	5,28E-04
Eutrophication, marine [kg N eq.]	4,65E-03	3,34E-04	3,65E-03	8,63E-03
Eutrophication, terrestrial [Mole of N eq.]	4,93E-02	3,66E-03	3,87E-02	9,17E-02
Photochemical ozone formation, human health [kg NMVOC eq.]	1,39E-02	9,31E-04	9,98E-03	2,48E-02
Resource use, mineral and metals [kg Sb eq.]	4,54E-04	1,84E-09	1,34E-06	4,55E-04
Resource use, fossils [MJ]	2,84E+01	4,83E-01	3,10E+01	5,99E+01
Water use [m^3 world equiv.]	1,72E+01	1,29E-04	3,20E+00	2,04E+01

Additional information

The GROHE brand stands for quality, technology, design and sustainability. Thus, sustainability also means responsibility – responsibility towards people and the environment. The various aspects of responsibility range from energy-saving technologies and production processes to resource efficiency, customer service and social and societal responsibility.

Therefore, environmental protection and resource conservation as well as occupational health and safety requirements are integral and important components of our business strategy.

Products

We encourage our customers and end users to make benefit of our sustainable technologies, like the energy saving faucets, and products with reduced water flow. But also – to choose their source of energy wisely whenever possible – to reduce the CO_2 emissions driven by the need to heat water.

Maintenance & Repair

All products benefit from careful cleaning and from regular motion of moving parts. In some areas, limescale can have a negative effect on performance and it is therefore recommended to clean mosseurs and shower outlets from time to time. GROHE warranty includes a spare part guarantee of 15 years to secure a long life span of the products.

Re-use and recycle

Our products have a long lifespan thanks to their durable design and quality materials. Still, at the very end of their lifecycle we encourage end users and installers to follow the local recommendations and secure that metal and plastic parts are recycled in the best possible way, and that packaging is collected and can become new packaging material.

If you want to read more about the multiple sustainability initiatives of GROHE and access our sustainability report – please visit green.grohe.com

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