

Environmental Product Declaration



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

New Nautic washbasin mixers

from

Villeroy & Boch Gustavsberg AB



Programme:	The International EPD® System, www.environdec.com
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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
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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR) Construction Products 2019:14, Version 1.1 and EN 15804:2012 + A2:2019 Sustainability of Construction Works.
PCR review was conducted by: <i>The Technical Committee on the International EPD® System.</i> Contact via www.environdec.com info@environdec.com
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Third party verifier: <i>Marcus Wendin, Miljögiraff AB</i> Approved by: The International EPD® System
LCA report and EPD prepared by: AFRY, www.afry.com
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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 & Contact of the EPD:

Villeroy & Boch Gustavsberg AB
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 www.gustavsberg.se

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 as well. 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:

Villeroy & Boch Gustavsberg AB, Vårgårda, Sweden

Product information

Product name:

Washbasin mixer New Nautic

The results and content information in this EPD is calculated based on Washbasin mixer New Nautic (GB41216047) which is considered a representative product since it is the product with largest production volumes within the product group. The article numbers below are very similar and are included in the same EPD. The difference in GWP-GHG results (modules A1-A3) is less than 10%.

Product name	Article number	RSK	EAN-number	Article weight (kg/piece)	Energy class
Washbasin mixer New Nautic	GB41216047	8278500	7393792234788	0.98	A
Washbasin mixer New Nautic, multipack 60 pieces	GB4121604760	8278504	7393792235037	0.98	A
Washbasin mixer New Nautic, 150mm spout	GB41216045	8278511	7393792235082	1.28	A
Washbasin mixer New Nautic, 150mm spout, G3/8 connection	GB41216045R	8278512	7393792235099	1.28	A
Washbasin mixer New Nautic, with strainer plug	GB41216043	8278501	7393792234795	1.33	A
Washbasin mixer New Nautic, G3/8 connection	GB41216047R	8278503	7393792234856	0.98	A
Washbasin mixer New Nautic	GB41216051	8278499	7393792234771	0.98	C
Washbasin mixer New Nautic, G3/8 connection	GB41216051R	8278502	7393792234849	0.98	C

Product description:

New Nautic washbasin mixer is an Energy A classified product that helps saving energy and water during the usage phase. It has soft move technology for smooth and precise handling with cold-start, only cold water when the lever is in straight forward position.

UN CPC code:

42911 - Sinks, wash-basins, baths and other sanitary ware and parts thereof, of iron, steel, copper or aluminum.

LCA information

Declared unit:

1 kg of brass mixer

Reference service life:

No RSL is declared. This EPD is based on a cradle-to-gate assessment

Time representativeness:

The LCA is based on production data from 2020, which is considered to be an average year of production.

Cut-off criteria:

More than 95% of total inflows of mass and energy are included in the study.

Database(s) and LCA software used:

Ecoinvent 3.8 and SimaPro 9.3

Description of system boundaries:

Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).

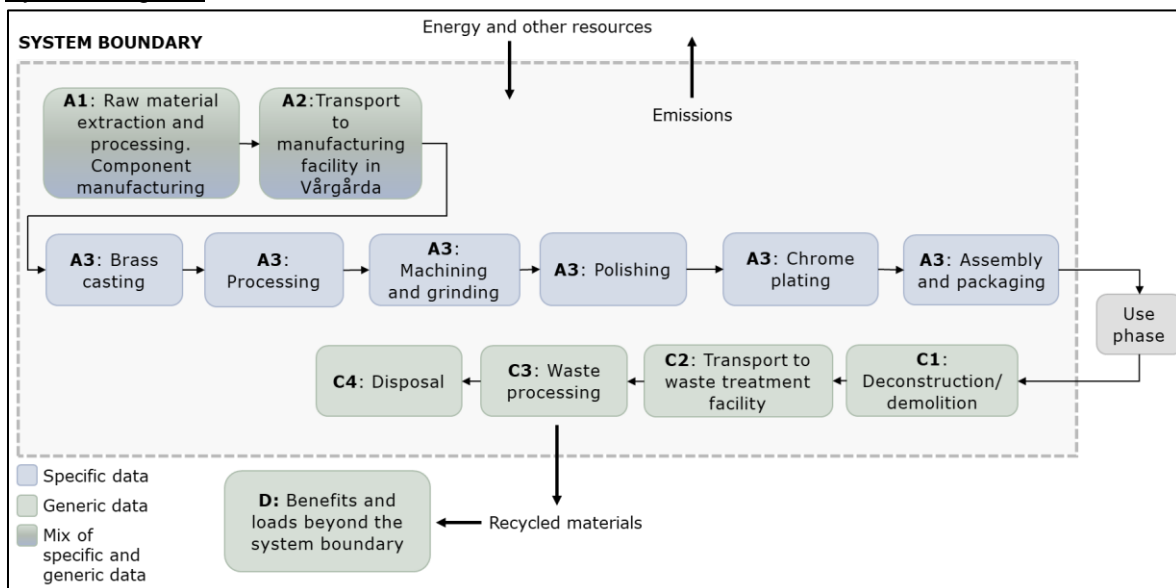
Data quality:

Raw material input, energy, water and chemical consumption from manufacturing and waste in manufacturing is primary data collected from Villeroy & Boch. A mix of specific and general data is used for extraction and refining of raw materials and components, and for transportation.

LCA practitioner:

AFRY Sweden, www.afry.com

System diagram:



	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/EU	GLO/EU	EU										EU	EU	EU	EU	EU	
Specific data used	10% of the total GWP-GHG impact stems from specific data (A2 and A3)					-	-	-	-	-	-	-	-	-	-	-	-	-

A1: Raw Material

This stage includes raw material extraction, including melting and forming of brass. 70% of brass is produced from recycled metals. Also, production of raw materials for components as well as component manufacturing is included. Transportation of inputs to brass production and component manufacturing is included in this module.

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 production of the brass housings for the faucets, surface treatment of the housings and assembly of the finished product. It also includes treatment of waste generated from the manufacturing processes up to the end-of-waste state. The manufacturing processes at Villeroy & Boch includes casting, machining, grinding, polishing and chrome plating. The electricity used in manufacturing is the residual electricity mix of the Swedish energy supplier Vattenfall and consists of 54% hydropower and 46% nuclear power. The climate impact of the electricity mix is 17 g CO2 eq./kWh.

C1: Deconstruction

This stage includes impacts related to removing

the mixers at product end-of-life. The environmental impacts generated during this phase are very low and therefore can be neglected.

C2: Waste Transport

Includes the transportation of the discarded product to a waste treatment facility. The transport distance was assumed to be 100 km.

C3: Waste Processing

This stage includes sorting and recycling processes. An Ecoinvent process for sorting of waste iron has been used as proxy for these processes. 95% of the brass in the product is assumed to be recycled.

C4: Waste disposal

This stage includes waste disposal processes such as landfilling or incineration. Brass mixers are generally recycled at the end of their life. However, some of the non-brass metals, plastics and rubbers in the product are assumed to be landfilled or incinerated.

D: Benefits and loads outside the system boundary

This stage includes benefits and burdens associated with recovery/recycling that affects previous or future life cycles. For this product it includes benefits from the recycling of brass and from waste incineration.

Content information

The main material in the washbasin mixer is brass. Zinc is used in the lever and other materials are used in different components.

Product components	Weight-%	Post-consumer material, weight-%	Renewable material, weight-%
Brass	71%	70%	0
Zinc	11%	0	0
Stainless steel	5%	49%	0
Polyamide	5%	0	0
Ceramics	2%	0	0
Polyoxymethylene (POM)	2%	0	0
Soft PEX	2%	0	0
ABS	2%	0	0
EPDM	0.4%	0	0
TPE	0.4%	0	0
NBR	0.2%	0	0
PTFE	0.02%	0	0
Lead	<0.8	0	0
TOTAL	1 kg mixer		
Packaging materials	Weight, kg	Weight-% (versus the product)	
Cardboard	0.12 kg	11%	
TOTAL	0.12 kg	11%	

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	<0.8%

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per 1 kg of brass mixer										
Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	4.53E+00	1.17E-01	4.08E-01	5.05E+00	0.00E+00	1.63E-02	9.75E-04	2.74E-01	-2.21E+00
GWP-biogenic	kg CO ₂ eq.	8.03E-02	1.14E-04	4.09E-02	1.21E-01	0.00E+00	4.37E-05	5.50E-05	4.01E-05	-2.59E-02
GWP-luluc	kg CO ₂ eq.	6.69E-03	7.18E-05	2.09E-02	2.77E-02	0.00E+00	6.51E-06	2.09E-06	3.40E-06	-4.62E-03
GWP-total	kg CO ₂ eq.	4.62E+00	1.18E-01	4.70E-01	5.20E+00	0.00E+00	1.63E-02	1.03E-03	2.74E-01	-2.24E+00
ODP	kg CFC 11 eq.	9.08E-07	2.53E-08	8.01E-08	1.01E-06	0.00E+00	3.77E-09	6.15E-11	1.06E-09	-1.38E-07
AP	mol H ⁺ eq.	1.79E-01	2.65E-03	5.26E-03	1.87E-01	0.00E+00	4.63E-05	5.88E-06	7.38E-05	-1.52E-01
EP-freshwater	kg P eq.	1.31E-02	5.13E-06	1.57E-04	1.32E-02	0.00E+00	1.07E-06	8.96E-07	9.17E-07	-1.13E-02
EP-freshwater	kg PO ₄ eq.	4.02E-02	1.58E-05	4.81E-04	4.07E-02	0.00E+00	3.28E-06	2.75E-06	2.82E-06	-3.47E-02
EP-marine	kg N eq.	1.07E-02	6.49E-04	6.69E-04	1.20E-02	0.00E+00	9.40E-06	1.19E-06	3.92E-05	-7.44E-03
EP-terrestrial	mol N eq.	1.38E-01	7.21E-03	5.18E-03	1.51E-01	0.00E+00	1.02E-04	1.13E-05	3.43E-04	-1.02E-01
POCP	kg NMVOC eq.	3.88E-02	1.91E-03	1.80E-03	4.25E-02	0.00E+00	3.94E-05	3.16E-06	8.54E-05	-2.85E-02
ADP-minerals&metals*	kg Sb eq.	4.43E-03	2.02E-07	1.11E-05	4.44E-03	0.00E+00	5.77E-08	9.15E-09	2.20E-08	-3.84E-03
ADP-fossil*	MJ	5.71E+01	1.64E+00	3.47E+01	9.35E+01	0.00E+00	2.47E-01	1.98E-02	8.29E-02	-2.93E+01
WDP*	m ³	6.55E+00	3.72E-03	1.02E+00	7.57E+00	0.00E+00	7.28E-04	2.23E-04	1.43E-02	-2.62E+00
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.

Use of resources per 1 kg of brass mixer

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
PERE	MJ	9.96E+00	1.50E-02	1.10E+01	2.10E+01	0.00E+00	3.53E-03	3.73E-03	2.26E-03	-6.94E+00
PERM	MJ	0.00E+00	0.00E+00	1.67E+00	1.67E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	9.96E+00	1.50E-02	1.27E+01	2.26E+01	0.00E+00	3.53E-03	3.73E-03	2.26E-03	-6.94E+00
PENRE	MJ	6.10E+01	1.74E+00	3.51E+01	9.78E+01	0.00E+00	2.62E-01	2.08E-02	8.93E-02	-3.13E+01
PENRM	MJ.	4.28E+00	0.00E+00	2.26E+00	6.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	6.52E+01	1.74E+00	3.74E+01	1.04E+02	0.00E+00	2.62E-01	2.08E-02	8.93E-02	-3.13E+01
SM	kg	4.72E-01	0	0	4.72E-01	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0
FW	m ³	1.97E-01	2.24E-04	2.35E-02	2.20E-01	0.00E+00	4.13E-05	5.78E-06	4.89E-04	-7.38E-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 = Net use of fresh water									

Potential environmental impact – additional mandatory and voluntary indicators

Results per 1 kg of brass mixer

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	4.54E+00	1.18E-01	4.29E-01	5.08E+00	0.00E+00	1.63E-02	9.77E-04	2.74E-01	-2.21E+00

Waste production and output flows

Waste production* per 1 kg of brass mixer

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0	0	1.15E-01	1.15E-01	0	0	0	0	0
Non-hazardous waste disposed	kg	0	0	2.03E-01	2.03E-01	0	0	0	2.97E-01	0
Radioactive waste disposed	kg	0	0	0	0	0	0	0	0	0

¹ 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.

*These indicators are presented according to Environdec's guidelines on resource use and waste indicators (<https://www.environdec.com/resources/indicators>).

Output flows

Indicator	Unit	A1	A2	A3	Tot.A1-A3	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	4.36E-01	4.36E-01	0	0	0	6.41E-01	1.08E+00
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Results per per 1 kg of brass mixer		
BIOGENIC CARBON CONTENT	Unit	QUANTITY
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.02

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

Additional 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 (Folkesson 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.

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.

References

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