# ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

| | |
|---|---|
| Owner of the Declaration | Dornbracht AG & Co. KG |
| Publisher | Institut Bauen und Umwelt e.V. (IBU) |
| Programme holder | Institut Bauen und Umwelt e.V. (IBU) |
| Declaration number | EPD-DOR-20230287-IBA1-EN |
| Issue date | 04.10.2023 |
| Valid to | 03.10.2028 |

## Sanitary fitting

## Dornbracht AG & Co. KG

Institut Bauen und Umwelt e.V.

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# 1. General Information

## Dornbracht AG & Co. KG

**Programme holder**

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

**Declaration number**

EPD-DOR-20230287-IBA1-EN

**This declaration is based on the product category rules:**

Fittings and showers, 01.08.2021
(PCR checked and approved by the SVR)

**Issue date**

04.10.2023

**Valid to**

03.10.2028

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

## Sanitary fitting

**Owner of the declaration**

Dornbracht AG & Co. KG
Köbbingser Mühle 6
58640 Iserlohn
Germany

**Declared product / declared unit**

1 basin fitting weighing 3.68 kg incl. packaging (as a representative product for sanitary fittings)

**Scope:**

Produced by Dornbracht AG & Co. KG at the German site. The results in the EPD apply for one fitting with a unit weight of 3.68 kg. To determine the LCA results of fittings with different unit weights, the data in the appendix to the EPD must be used.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

**Verification**

| |
|---|
| The standard EN 15804 serves as the core PCR |
| Independent verification of the declaration and data according to ISO 14025:2011 |
| ☐ internally ☒ externally |

Matthias Klingler,
(Independent verifier)

## 2. Product

### 2.1 Product description/Product definition

Sanitary fittings made of brass materials include basin fittings, bath fittings, shower fittings with and without shower head, bidet fittings and kitchen fittings. The fittings can be designed as single-lever mixers, two-handle taps, cold water valves or touchless taps. The user can adjust the flow rate and/or the temperature at the outlet using the control devices. The visible surfaces of the fittings are usually coated and finished using various galvanic processes.

The representative product is a basin fitting (single-lever mixer). Application of the products is subject to the respective national guidelines at the place of use.

EN 200
EN 817
EN 1111
EN 15091
EN 806
ISO 3822-ff
Evaluation criteria for metallic materials in contact with drinking water, UBA, version dated 11 January 2023
Evaluation criteria for plastics and other organic materials in contact with drinking water (KTW-BWGL), UBA, version dated 7 March 2022

### 2.2 Application

Basin fittings
Basin fittings are sanitary fittings that are used in washrooms and bathrooms for washing hands and similar activities.

Kitchen fittings
Kitchen fittings are used in kitchens for washing hands, preparing food or filling containers.

Bath fittings
Bath fittings are sanitary fittings that are used in washrooms and bathrooms for filling baths.

Shower fittings
Shower fittings are sanitary fittings that are used in washrooms and bathrooms in combination with hand-held and/or overhead sprays.

Bidet fittings
Bidet fittings are sanitary fittings that are used on bidets in washrooms and bathrooms. They differ from basin fittings in that they have a special joint at the end of the spout that allows the direction of the water jet to be individually adjusted.

### 2.3 Technical Data

**Technical construction data**

| Name | Value | Unit |
|---|---|---|
| Maximum load temperature permanent operation | 70 | °C |
| Maximum load temperature temporary operation | 90 | °C |
| Flow rate average | 2.26 | $m^3/h$ |
| Sound emissions <= | 20 | dB |

Performance values of the product in relation to its characteristics in accordance with the relevant technical regulation (no CE marking).

### 2.4 Delivery status

- Basin fittings: 1.5 - 5 kg (representative product: 3.68 kg)
- Kitchen fittings: 1.3 - 7 kg
- Bath fittings: 3.4 - 10 kg
- Shower fittings: 4 - 9 kg
- Bidet fittings: 1.5 - 5 kg

### 2.5 Base materials/Ancillary materials

The fittings are composed as follows:

Brass: approx. 70%
Aluminium: approx. 17%
Plastic: approx. 7%
Zinc alloy: < 5%
Rubber: < 5%
Stainless steel: < 5%

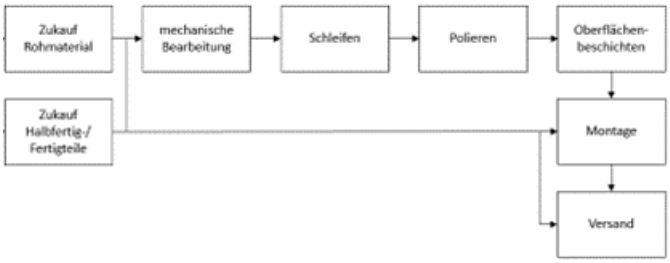
The product / At least one partial product contains substances from the ECHA list of candidates of Substances of Very High Concern (SVHC) (date: 02.12.2022) exceeding 0.1% by mass: no

The product / At least one partial product contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1% by mass in at least one partial product: no

Biocide products were added to this construction product, or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Regulation on Biocide Products No 528/2012): no

### 2.6 Manufacture

Production chain for fittings at Dornbracht AG & Co. KG:




| [Legende:] | [Legend:] |
|---|---|
| Zukauf Rohmaterial | Procurement of raw materials |
| Mechanische Bearbeitung | Mechanical working |
| Schleifen | Grinding |
| Polieren | Polishing |
| Oberflächenbeschichten | Surface coating |
| Montage | Assembly |
| Versan | Shipping |
| Zukauf Halbfertig-/Fertigteile | Procurement of semi-finished/finished parts |

Dornbracht AG & Co. KG is certified to the international ISO 9001 standard.

### 2.7 Environment and health during manufacturing

Due to the manufacturing conditions, no special health protection measures beyond the regulations of valid EU regulations as well as national legal and other regulations are

required.

Dornbracht AG & Co. KG is certified to the international ISO 14001 and ISO 50001 standards.

### 2.8 Product processing/Installation

There are no special requirements for machines or dust extraction systems to be used during installation.
The tools required or the use of other ancillary materials are listed in the installation instructions supplied with each product.

### 2.9 Packaging

Over 90% of the fittings' packaging consists of cardboard and paper. The proportion of plastic is constantly being reduced (target: 0%). Euro pallets from the Europool exchange system are used for shipping.

### 2.10 Condition of use

Sanitary fittings are given a surface coating (usually a galvanic coating such as chrome) to increase corrosion resistance. These surfaces should be cleaned and cared for in accordance with the care instructions supplied with the product.

### 2.11 Environment and health during use

The declared products do not have any impact on the environment and health during use.

### 2.12 Reference service life

According to VDI 2067, the reference service life for sanitary fitting is 20 years.

### 2.13 Extraordinary effects

**Fire**

Sanitary fittings do not fall under the scope of EN 13501-1. These are solid non-combustible products.

**Water**

If a room in which the products are installed is flooded with water, this does not impair the function or useful life of the products. No environmental impacts can be anticipated.

**Mechanical destruction**

No environmental hazards can be anticipated in the event of mechanical destruction.

### 2.14 Re-use phase

After dismantling and separation, metallic components can be returned to the cycle through material recycling.

### 2.15 Disposal

Sanitary fittings can be reused after dismantling and should be collected and recycled. The recyclable materials can be returned to any waste metal dealer for recycling. Plastics should be disposed of via the plastics recycling system.

Waste key (AVV): 17 04 01

### 2.16 Further information

Additional information available online at www.dornbracht.com.

## 3. LCA: Calculation rules

### 3.1 Declared Unit

This Declaration refers to a unit of one fitting as specified in PCR: Fittings and showers. Accordingly, the declared unit can be described as follows: manufacture of one fitting with a unit weight of 3.68 kg. The data and results also apply to the derivation of the mass of fittings with the same component proportions.

**Declared unit**

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | pce. |
| Ground reference | 3,68 | kg/Stk |

### 3.2 System boundary

Type of EPD: Cradle to factory gate, with options. The following modules were considered for calculating the LCA:

A1: Raw material supply
A2: Transporting the raw materials to Dornbracht
A3: Production

A1 covers all raw materials and packaging materials, while electricity and compressed air requirements are allocated to A3. Transport is allocated to A2. The waste generated during production is taken into account in the calculations under Module A3.
A4: Transporting the product to the customer
A5: Assembly

Installation of the product (A5) does not usually result in losses and is a manual process, which is why the effects of installation were not included in the analysis. Only the treatment of waste from product packaging (cardboard / corrugated cardboard) is taken into account.

C1: Deconstruction:
C2: Transport
C3: Waste processing
C4: Waste disposal

C1 is not included in the modelling, as the product does not yet have any empirical values for dismantling in reality due to its long service life. In addition, dismantling involves manual processes, therefore the impacts are entered as 0.

Information Module C3 includes waste treatment, e.g. collection of waste fractions from demolition and waste treatment of material streams destined for reuse, recycling and energy recovery. Fuels for energy recovery are identified on the basis of the efficiency of energy production, with an efficiency rate of more than 60% being the threshold, regardless of existing legislation.
Specifically, this EPD considers a mix of recycling, incineration and landfilling of the product at its end of life, with incineration including energy recovery (electricity and steam).

D: Reuse, recovery or recycling potential

Information Module D is intended to create transparency for the environmental benefits and loads associated with the reusable products, recycled materials and/or usable energy sources that leave the product system, e.g. as secondary materials or secondary fuels. All declared credits and loads from the net flows leaving the product system that are not considered co-products and that have reached the end-of-waste stage are allocated to Module D.

In Module D, credits for recycled metal and plastic content as well as for avoided generation of electricity and steam in another product system through the incineration of plastics at the end-of-life stage are taken into account.

### 3.3 Estimates and assumptions

For the preparation processes of a purchased brass body, assumptions were made regarding the energy input based on a data set for 'ingot casting'. According to information provided by Dornbracht AG & Co. KG, 75% of the brass is made from secondary materials.

Additional assumptions were made for Modules A2, A4 and C2: raw materials are transported by truck to the production site and to the end of life (EoL) (A2 and C2) within Europe (Euro 0-6 mix, 55% capacity utilisation). The product is transported to the customer (A4) by truck (see above), container ship (70% capacity utilisation) or aircraft (66% capacity utilisation).

The following rates were assumed for the end-of-life treatment of individual materials, based on reliable sources from Germany and Europe (EPRC, JRC, Statista, UNEP):

| Material | % share of recycling | % share of incineration | % share of landfilling |
|---|---|---|---|
| Zinc | 52% | 48% | - |
| Brass | 93% | 7% | - |
| Aluminium | 85% | 15% | - |
| Steel | 85% | 15% | - |
| Plastics | 33% | 43% | 25% |

### 3.4 Cut-off criteria

All data from the data collection of Dornbracht AG & Co. KG was taken into account. This primarily concerns data on the use of raw materials as well as data on water, electricity, natural gas, heating oil, diesel and compressed air consumption. Waste generated during production was categorised into residual waste (metals), hazardous waste and packaging waste based on the information provided by the manufacturer, and all production waste was stored with the corresponding eco-profiles for 100% incineration. It should also be noted that it is difficult to collect data on process emissions into air and water during production. As a result, these emissions were cut off. The neglected process emissions in water and air have an environmental impact of less than 5%.

Generic data was used for the input materials, as these are not produced by Dornbracht AG & Co. KG itself and no detailed information was available. It is possible that exclusion criteria were applied to this generic data; this is described in the respective documentation of data sets. Assumptions were made in some cases. In addition to the transport processes, this concerns, among other things, the casting of the brass body, which is purchased as a finished component by Dornbracht AG & Co. KG. According to information provided by Dornbracht AG & Co. KG, 75% of the brass is made from secondary materials.

The manufacture of machinery, plants and other infrastructure required for production of the products is not accounted for in the analysis. Polypropylene containers and insert boxes are used as packaging material for the raw materials. Containers were only taken into account if a single use was assumed. The use of pallets was not taken into account due to their multiple use.

### 3.5 Background data

The GaBi 10 (2022.2) software system developed by Sphera was used to model the LCA of the product. The data sets contained in the model originate either from the GaBi Professional database itself or from the Ecoinvent database (v 3.8).

### 3.6 Data quality

The data quality can be considered high, as suitable data sets were available for the majority of the primary products used, and a large volume of primary data (reference year 2021) could be taken into account. Only a few assumptions and estimates are included in the calculations. The technological background of the data collected corresponds to the state of the art. The data sets (age of data: 2018-2022) are complete and correspond with the system boundaries and the criteria for excluding inputs and outputs.

The production processes are outlined in section 2. Production takes place at the Dornbracht AG & Co. KG sites in Germany.

### 3.7 Period under review

2021 is the period under review. All of the company's own data was collected during this period and used for the LCA calculation.

### 3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

### 3.9 Allocation

**Allocation of energy, ancillary and operating materials used for individual products in a factory**The annual consumption for the production processes of Dornbracht AG & Co. KG were allocated to one produced item by specifying the total production quantity per year.

**Allocation method for reuse, recycling and recovery**
Credits for recycled metal and plastic content, avoided generation and of electricity and steam in another product system through the incineration of plastics at the end-of-life phase are taken into account in Module D.

### 3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account. As a general rule, EPD data can only be compared or evaluated when all of the data records to be compared have been drawn up in accordance with EN 15804 and the building context and/or product-specific characteristics are taken into consideration. Only background data from the GaBi 10 software (SP 2022.2) was considered in this LCA in order to guarantee the comparability of results.

## 4. LCA: Scenarios and additional technical information

**Characteristic product properties of biogenic carbon**
The content of biogenic carbon in the product is less than 5% and
according to PCR 7.1.6, if the mass of substances containing biogenic carbon inthe packaging is less than 5% of the total mass of the packaging, thedeclaration of the biogenic carbon content of the packaging may be omitted andis therefore not declared separately. The product packaging under considerationconsists of cardboard / corrugated cardboard, the biogenic carbon content ofwhich is shown below. The biogenic

carbon is taken into account in A5'Incineration of cardboard/paper'.

**Information describing the biogenic carbon content at the plant gate**

| Name | Value | Unit |
|---|---|---|
| Biogenic carbon content in accompanying packaging | 0.001 | kg C |

The following technical information forms the basis for the declared modules or can be used for developing specific scenarios in the context of a building evaluation if modules are not declared (MND).

Assembly (A5)
Module A5 takes into account the environmental impact of disposal of product packaging.

**End of life (C1–C4)**

The transport distance to the disposal site is 50 km. A mix of incineration with energy recovery, landfilling and recycling is considered forthe end of the life cycle. Under European conditions, recycling andincineration of the products results in credits which are considered in ModuleD.

| Name | Value | Unit |
|---|---|---|
| Recycling | 2.685 | kg |
| Energy recovery | 0.115 | kg |
| Landfilling | 0.064 | kg |

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## 5. LCA: Results

The results of the LCA for one sanitary fitting weighing 3.68 kg are shown below in tabular form for the declared modules.

**DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)**

| Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Benefits and loads beyond the system boundaries |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw material supply | Transport | Manufacturing | Transport from the gate to the site | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | X | X | MND | MND | MNR | MNR | MNR | MND | MND | X | X | X | X | X |

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 Stück Sanitärarmatur**

| Parameter | Unit | A1-A3 | A1 | A2 | A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP-total | kg $CO_2$ eq | 2.53E+01 | 1.06E+01 | 2.01E-02 | 1.47E+01 | 3.2E+00 | 8.5E-01 | 0 | 1.31E-02 | 3.25E-01 | 4.49E-03 | -3.93E+00 |
| GWP-fossil | kg $CO_2$ eq | 2.49E+01 | 1.07E+01 | 2.02E-02 | 1.42E+01 | 3.2E+00 | 2.01E-02 | 0 | 1.31E-02 | 3.25E-01 | 4.54E-03 | -4.04E+00 |
| GWP-biogenic | kg $CO_2$ eq | 2.91E-01 | -1.33E-01 | -2.82E-04 | 4.24E-01 | 1.81E-03 | 8.29E-01 | 0 | -4.8E-05 | 7.6E-05 | -5.19E-05 | 1.13E-01 |
| GWP-luluc | kg $CO_2$ eq | 7.52E-02 | 1.5E-02 | 1.85E-04 | 6E-02 | 1.37E-03 | 4.71E-06 | 0 | 7.79E-05 | 3.17E-05 | 3.62E-06 | -3.77E-03 |
| ODP | kg CFC11 eq | 3.08E-07 | 2.6E-07 | 1.75E-15 | 4.79E-08 | 1.78E-13 | 1.04E-13 | 0 | 2.28E-15 | 2.58E-13 | 7.4E-15 | -3.54E-08 |
| AP | mol $H^+$ eq | 3.04E-01 | 2.71E-01 | 4.05E-05 | 3.28E-02 | 1.73E-02 | 2.34E-04 | 0 | 2.48E-05 | 1.26E-04 | 1.32E-05 | -1.65E-02 |
| EP-freshwater | kg P eq | 1.93E-02 | 1.9E-02 | 7.28E-08 | 2.72E-04 | 1.02E-06 | 3.26E-08 | 0 | 3.04E-08 | 1.3E-07 | 8.47E-07 | -1.72E-04 |
| EP-marine | kg N eq | 2.74E-02 | 1.85E-02 | 1.71E-05 | 8.86E-03 | 6.82E-03 | 8.53E-05 | 0 | 1.07E-05 | 4.45E-05 | 3.02E-06 | -3.47E-03 |
| EP-terrestrial | mol N eq | 3.16E-01 | 2.26E-01 | 1.94E-04 | 9.02E-02 | 7.47E-02 | 1.07E-03 | 0 | 1.21E-04 | 5.39E-04 | 3.32E-05 | -3.17E-02 |
| POCP | kg NMVOC eq | 9.15E-02 | 6.24E-02 | 3.62E-05 | 2.9E-02 | 1.92E-02 | 2.26E-04 | 0 | 2.22E-05 | 1.21E-04 | 9.61E-06 | -8.52E-03 |
| ADPE | kg Sb eq | 6.74E-03 | 6.73E-03 | 1.29E-09 | 4.13E-06 | 3.95E-08 | 9.49E-10 | 0 | 9.23E-10 | 2.13E-09 | 1.16E-10 | -2.21E-04 |
| ADPF | MJ | 1.18E+03 | 1.6E+02 | 2.71E-01 | 1.02E+03 | 4.31E+01 | 2.68E-01 | 0 | 1.77E-01 | 7.67E-01 | 6.57E-02 | -5.93E+01 |
| WDP | $m^3$ world eq deprived | 7.22E+00 | 5.73E+00 | 2.3E-04 | 1.48E+00 | 5.97E-03 | 1.05E-01 | 0 | 6.78E-05 | 6.71E-02 | -6.21E-05 | -5.36E-01 |

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

**RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 Stück Sanitärarmatur**

| Parameter | Unit | A1-A3 | A1 | A2 | A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ | 5.86E+01 | 3.95E+01 | 1.92E-02 | 1.91E+01 | 2.72E-01 | 6.48E-02 | 0 | 1.14E-02 | 1.19E-01 | 5.93E-03 | -1.78E+01 |
| PERM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 5.86E+01 | 3.95E+01 | 1.92E-02 | 1.91E+01 | 2.72E-01 | 6.48E-02 | 0 | 1.14E-02 | 1.19E-01 | 5.93E-03 | -1.78E+01 |
| PENRE | MJ | 1.18E+03 | 1.61E+02 | 2.72E-01 | 1.02E+03 | 4.32E+01 | 2.68E-01 | 0 | 1.77E-01 | 7.67E-01 | 6.57E-02 | -5.94E+01 |
| PENRM | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 1.18E+03 | 1.61E+02 | 2.72E-01 | 1.02E+03 | 4.32E+01 | 2.68E-01 | 0 | 1.77E-01 | 7.67E-01 | 6.57E-02 | -5.94E+01 |
| SM | kg | 1.75E+00 | 1.75E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | $m^3$ | 2.02E-01 | 2.12E-05 | 4.2E-02 | 3.4E-04 | 2.48E-03 | 2.49E-03 | 0 | 1.04E-05 | 1.64E-03 | 6.48E-07 | -3.3E-02 |

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 = Use of net fresh water

**RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 Stück Sanitärarmatur**

| Parameter | Unit | A1-A3 | A1 | A2 | A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HWD | kg | 4E-06 | 3.93E-06 | 1.01E-12 | 7.34E-08 | 8.92E-11 | 8.48E-12 | 0 | 3.09E-13 | 4.52E-11 | 5.54E-12 | -3.36E-07 |
| NHWD | kg | 1.79E+00 | 1.46E+00 | 3.92E-05 | 3.23E-01 | 3.99E-03 | 2.67E-02 | 0 | 1.06E-05 | 1.76E-01 | 6.37E-02 | -7.35E-01 |
| RWD | kg | 1.08E-02 | 4.44E-03 | 3.52E-07 | 6.36E-03 | 3.93E-05 | 1.42E-05 | 0 | 6.73E-08 | 5.71E-05 | 7.78E-07 | -3.21E-03 |
| CRU | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MFR | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.06E+00 | 0 | 0 |
| MER | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.15E-01 | 0 | 0 |
| EEE | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.22E-01 | 0 | 0 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EET | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9.34E-01 | 0 | 0 |

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:**
**1 Stück Sanitärarmatur**

| Parameter | Unit | A1-A3 | A1 | A2 | A3 | A4 | A5 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | Disease incidence | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| IR | kBq U235 eq | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| ETP-fw | CTUe | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| HTP-c | CTUh | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| HTP-nc | CTUh | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| SQP | SQP | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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 or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

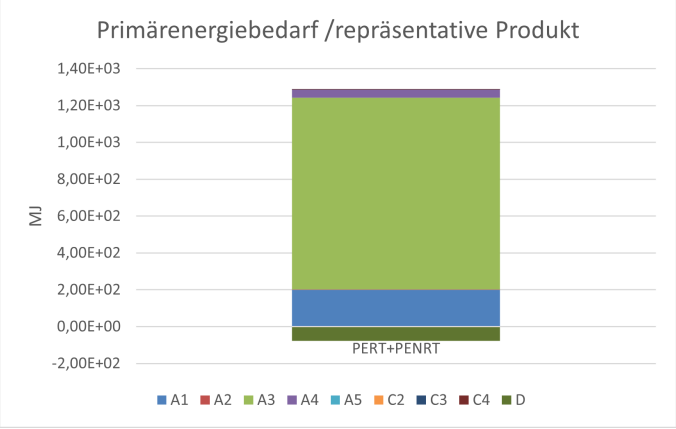
Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

## 6. LCA: Interpretation

The results are analysed below for a basin fitting weighing 3.68 kg. In addition, the results per kg are shown in tabular form in the appendix and an indication of the range of results for the products represented by the LCA / EPD is given.

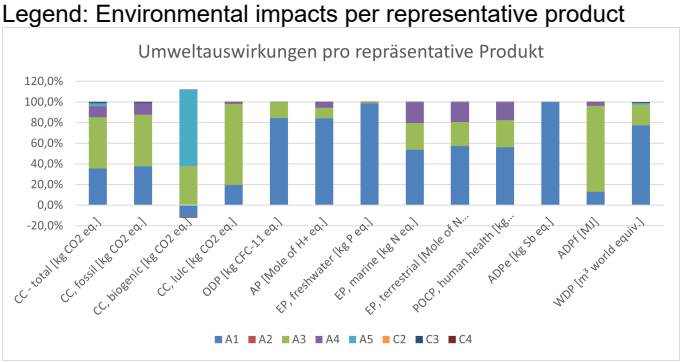
The largest share of the gross energy demand (total non-renewable primary energy (PENRT) + total renewable primary energy (PERT)) of 1.240 MJ is attributed to the production phase (modules A1 - A3). The production processes at Dornbracht (Module A3) are particularly decisive here, accounting for 84%. Approx. 77 MJ are credited for energy recovery (Module D) during the incineration process of the product materials.

Legend: Primary energy requirements /representative product




In terms of environmental impacts, the impact categories Ozone Depletion Potential (ODP), Acidification Potential (AP), Abiotic Depletion Potential – mineral and metal (ADPe), all categories of Eutrification Potential (EP-freshwater, marine, terrestrial), Photochemical Ozone Creation Potential (POCP), and Water Depletion Potential (WDP) are largely characterised by the provision of raw materials (Module A1). The main driver within the raw materials used (Module A1) is brass in all impact categories.
In the impact categories of climate change, total, fossil, land use and land use change (CC total, fossil, luluc), Module A3 is the main driver of environmental impacts. The production processes (A3) have the greatest influence on the potential for the Abiotic Depletion Potential – fossil fuels (ADPf).
Transport processes (modules A2, A4 and C2) and the disposal of packaging materials (Module A5) have a minor influence on the impact categories compared to the other modules. The only exception here is the category of biogenic climate change (CC-biogenic), where Module A5 accounts for the main share of the environmental impacts. Furthermore, the separate evaluation of energy recovery and recycling (Module D) leads to credits in all impact categories.

Legend: Environmental impacts per representative product



## 7. Requisite evidence

No proof needs to be provided for this EPD as no hazardous substances in accordance with the CLP Regulation are used.

## 8. References


**Normen**

**EN 15804**
EN 15804:2012+A2:2019+AC:2021, Nachhaltigkeit von Bauwerken – Umweltproduktdeklarationen – Grundregeln für die Produktkategorie Bauprodukte.

**ISO 14025**
EN ISO 14025:2011, Umweltkennzeichnungen und -deklarationen – Typ III Umweltdeklarationen – Grundsätze und Verfahren.

**Weitere Literatur**

**AVV**
Abfallverzeichnis-Verordnung vom 10. Dezember 2001 (BGBl. I S. 3379), die zuletzt durch Artikel 2 der Verordnung vom 17. Juli 2017 (BGBl. I S. 2644) geändert worden ist

**EPRC**
European Paper Recycling Council (EPRC) (2020), Monitoring Report 2020 – European Declaration on Paper Recycling 2016 – 2020

**Gabi 10**
Gabi Professional10 (SP 2022.2), Ökobilanzierungs-Software von Sphera

**Ecoinvent Datenbank (v 3.8)**
Ecoinvent Datenbank version 3.8

**IBU 2021**
Allgemeine Anleitung für das EPD-Programm des Institut Bauen und Umwelt e.V. (IBU), Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 http://www.ibu-epd.com

**JRC**
European Commission, Joint Research Centre (JRC) (2020), European Platform on Life Cycle Assessment, Annex C V2.1, abgerufen am 01.03.23, unter https://eplca.jrc.ec.europa.eu/permalink/Annex_C_V2.1_May2020.xlsx

**PCR Teil A**
Produktkategorie-Regeln für gebäudebezogene Produkte und Dienstleistungen. Teil A: Rechenregeln für die Ökobilanz und Anforderungen an den Projektbericht nach EN 15804+A2:2019, Version 1.3. Berlin: Institut Bauen und Umwelt e.V. (Hrsg.).

**PCR Teil B: Armaturen und Brausen**
Produktkategorie-Regeln für gebäudebezogene Produkte und Dienstleistungen. Teil B: Anforderungen an die EPD für Armaturen und Brausen, Version 1.1 / 2022. Berlin: Institut Bauen und Umwelt e.V. (Hrsg.).

**EN 200**
DIN EN 200:2008-10, Sanitärarmaturen -Auslaufventile und Mischbatterien für Wasserversorgungssysteme vom Typ 1 und Typ 2 - Allgemeine technische Spezifikation.

**EN 817**
DIN EN 817:2008-09, Sanitärarmaturen - Mechanisch einstellbare Mischer (PN 10) - Allgemeine technische Spezifikation

**EN1111**
DIN EN 1111:2017-10, Sanitärarmaturen - Thermostatische Mischer (PN 10) - Allgemeine technische Spezifikation

**EN15091**
DIN EN 15091:2014-03, Sanitärarmaturen - Sanitärarmaturen mit elektronischer Öffnungs- und Schließfunktion

**EN806**
DIN EN 806 ff., Technische Regeln für Trinkwasser-Installationen

**ISO 3822**
DIN EN ISO 3822:2018-04, Akustik - Prüfung des Geräuschverhaltens von Armaturen und Geräten der Wasserinstallation im Laboratorium

**Statista**
Statista (2021), Plastics post-consumer waste treatment in the European Union (EU-27)* in 2020, by type; abgerufen am 01.03.23, unter https://www.statista.com/statistics/869617/plastics-post-consumer-treatment-european-union/

**UNEP**
United Nations Environment Programme (UNEP) (2011), Recycling Rates of Metals – A Status Report, A Report of the Working Group on the Global Metal Flows to the International Resource Paenel. Graedel, T.E.; Allwood, J.; Birat, J.-P.; Reck, B.K.; Siley, S.F.; Sonnemann, G.; Buchert, M.; Hagelüken, C.

**Bewertungsgrundlage für metallene Werkstoffe im Kontakt mit Trinkwasser**, Umwelt Bundesamt, Version vom 11. Januar 2023

**Bewertungsgrundlage für Kunststoffe und andere organische Materialien im Kontakt mit Trinkwasser,** Umwelt Bundesamt**,** Version vom 7. März 2022

**ISO 9001**
ISO 9001:2015-09, Qualitätsmanagementsysteme - Anforderungen

**ISO14001**
ISO 14001:2015-09, Umweltmanagementsysteme - Anforderungen mit Anleitung zur Anwendung

**ISO 50001**
ISO 50001:2018-08, Energiemanagementsysteme - Anforderungen mit Anleitung zur Anwendung

**VDI 2067**
VDI 2067 Blatt 1:2012-09, Wirtschaftlichkeit gebäudetechnischer Anlagen - Grundlagen und Kostenberechnung

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