LAUFEN

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH
EN 15804+A2
ISO 14025
ISO 21930

Ceramic sanitaryware

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Created with: One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer VP-001	Laufen
Address VP-002	indicate
Contact details VP-003	indicate
Website	indicate

EPD STANDARDS, SCOPE AND VERIFICATION

Reference standard	EN 15804+A2:2019+AC:2021 ISO 14025 ISO 21930
Sector	Construction product
Category of EPD	Third-party-verified EPD
EPD Author VP-004	Sustainability Department
EPD Verification	Independent verification of this carbon footprint and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier VP-055	Juan Miguel Gómez, LaIndustria

PRODUCT

Product name VP-007	Sanitaryware
Additional labels	-
Product reference	-
Place of production VP-008	Gmuden (AT), Kaspichan (BU), Bechyne (CZ), Znojmo (CZ), Gliwice (PL), Laufen (CH)
Period for data VP-013	2022
Averaging in EPD VP-024-C	Multiple factories
Variation in GWP-fossil for A1-A3 VP-025-C	50 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 kg sanitary ceramic
Declared unit mass	1 kg
GWP-fossil, A1-A3 (kgCO2e)	2.13
GWP-total, A1-A3 (kgCO2e)	1.22
Secondary material, inputs (%)	0.03
Secondary material, outputs (%)	0.00
Total energy use, A1-A3 (kWh)	10.90
Total water use, A1-A3 (m3e)	0.01

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

LAUFEN is dedicated to the production and sale of solutions that enrich people's everyday lives by creating unique spaces for wellbeing, personal care and health. LAUFEN is part of the Roca Group, an entity characterised by a long-term strategy based on growth. The group's Mission and Vision establish an approach based on creating shared value with the aim of producing a threefold positive impact in the areas of People, Planet and Prosperity. Our commitment to the promotion of sustainable development is spread throughout our organisation. It finds itself on a strategic level, as well as embedded within specific actions and initiatives that ensure our daily tasks contribute to the improvement of our impact in a tangible way.

PRODUCT DESCRIPTION VP-009

Sanitaryware appliances mainly include basins, bidets, WCs, urinals, cisterns and shower trays, including the accessories mentioned above. These products are made of materials such as clay, kaolin, quartz and feldspar. After the preparation of the slip, the mixture is cast, dried, glazed and then finished to obtain sanitaryware. To calculate the environmental impact, a representative average sanitaryware product based on the total volume manufactured in 2022 has been considered.

The products are available in different sizes, designs, and weights. In the following table are listed the sanitary products and their average weights.

Product	Weight (in kg)
Basins	16,0
Bidets	24,5
WC	38,0
Urinals	37,0
Cisterns	11,0
Shower trays	36,5

Further information can be found at www.laufen.com.

PRODUCT RAW MATERIAL MAIN COMPOSITION VP-010

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	100	Europe, Africa, Asia
Fossil materials	0	-
Bio-based materials	0	-

BIOGENIC CARBON CONTENT VP-028-C

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.052

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit VP-011	1 kg sanitary ceramic
Mass per declared unit VP-012	1 kg
Functional unit	-
Reference service life	Up to 40 years

REACH – SUBSTANCES OF VERY HIGH CONCERN (SVHC)

The product contain REACH SVHC substances in amounts greater than 0.1 % (1,000 ppm):
CAS: 7349-92-1 (Lead)
SCIP number: 1e66512c-f175-4822-9714-f172c3b4742d

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3) VP-018

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The product is made of a mixture of minerals like clay, feldspar, kaolin and quartz. The materials are transported to the manufacturers production facility, where the manufacturing includes material preparation, shaping, drying, followed by glazing/decoration, firing, and finally, polishing. The manufacturing process requires electricity and fuels for the different equipment as well as heating. In addition, waste heat is recycled from various parts of the furnaces to ensure that the heat inside the furnace remains efficient. The product is finally packaged and sent to the warehouse. Certain ancillary materials like water and moulds are also included. Production waste before firing is recycled internally. The product does not contain VOC as is fired at temperatures above 1000ºC. Production waste as wastewater, moulds, sludge and fired ceramics waste are included. Transport from suppliers is calculated according to the corresponding sales volumes. Packaging materials are modelled in.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Module not declared.

PRODUCT USE AND MAINTENANCE (B1-B7) VP-043-C

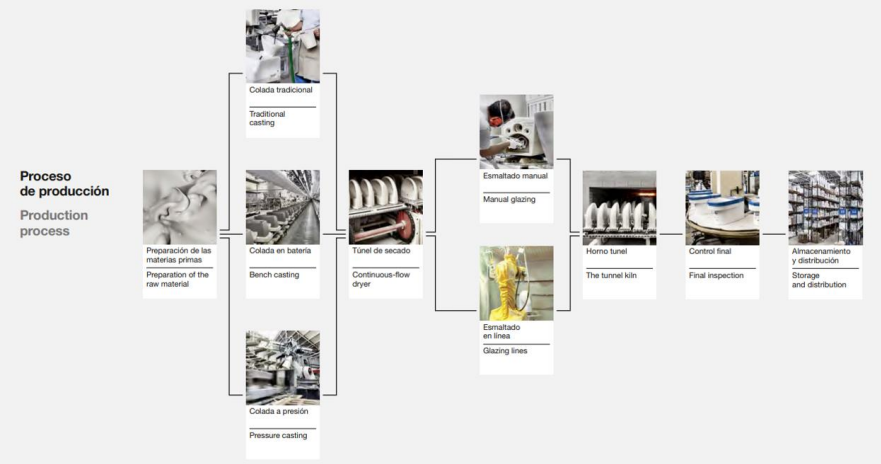
Air, soil, and water impacts during the use phase have not been studied. Module not declared.

PRODUCT END OF LIFE (C1-c4, D) VP-049-C

Energy consumption and natural resources of the disassembling end-of-life product and the impacts of demolition process are assumed to be zero due to the negligible consumptions (C1). Concerning to the end-of-life product, it is assumed to be sent to the closest waste disposal facility by lorry, estimated to be 50km away (C2). Although the product, fully mineral material, is suitable for reuse and recycling, it is conservatively assumed to be disposed of in an inert landfill.
The benefits and loads of recycling of packaging waste are included in Module D.

MANUFACTURING PROCESS

VP-019



The raw materials supplied are mainly stored in silos. A small percentage of the raw materials used is supplied in sacks and/or big-bags.

The stages of the production process are as follow:

1. Unloading of raw materials

Mineral raw materials (clay, kaolin, feldspar and silica) are unloaded from trucks in the areas marked for this purpose.

2. Preparation of the slip

The raw materials are taken to the mixer, where they are blended with osmotic water. The resulting mixture is sieved and pumped into the storage tanks and kept in suspension with the help of agitators.

The paste resulting from this operation is known as slip.

3. Casting

Once the quality of the desired mixture has been obtained and controlled by the laboratory, the slip is pumped into the overhead casting tanks. From there, it feeds the casting lines by gravity, where it is injected into hermetically sealed plaster moulds, moulds in which the piece is formed.
Other pieces are also produced using plastic moulds with medium pressure slip injection, although to a lesser extent. The plaster moulds used are produced in the same plant and are manufactured by filling a mixture of plaster and water into araldite master moulds. After setting, the master moulds are separated and the plaster moulds are removed and transported to the dryers for their first dehydration prior to their use.

4. Drying

Once the piece has achieved a mechanical consistency within the plaster mould, it is removed manually or automatically, depending on the line or its difficulty. These pieces are placed on trolleys and transported to the different dryers, where they are dried with hot air. Once dry, they are transported again by trolleys, this time to the polishing and enamelling line.

5. Enamelling

The enamel applied is prepared in an adjoining room where the raw materials, which are stored in silos, are weighed before being dissolved with osmotic water. The product obtained is fed into ball mills that reduce the base particles and pigments to the desired fineness.

6. Firing

The enamelled pieces are then transported to the kiln area for their firing. The process of heating, firing, enamel vitrification and cooling takes place inside the kiln.

7. Inspection and control

The pieces leaving the kiln are sent to the inspection and control area, where the defective pieces are separated from the conforming ones. Those that pass the final inspection are packed up and palletised for their transport to the dispatch warehouse. The complete cycle for the manufacturing of sanitary ware lasts approximately two to three days.

LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA VP-020

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS VP-050-C

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No allocation
Packaging materials	No allocation
Ancillary materials	No allocation
Manufacturing energy and waste	No allocation

AVERAGES AND VARIABILITY VP-026-C

Type of average	Multiple factories
Averaging method	Averaged by shares of total mass
Variation in GWP-fossil for A1-A3	50 %

Primary data represents the manufacturers manufacturing sites of Bechyne (CZ), Gliwice (PL), Gmunden (AT), Laufen (CH), Kaspichan (BU) and Znojmo (CZ). The data was used to calculate average impacts for the product. The primary data was averaged by calculating a weighed average of the sites consumption of raw materials and energy, and production of wastes. The share of production volume per each site was used in the weighting. GWP Variation is caused by different share of product types produced and share of renewable electricity consumed per manufacturing site.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent v3.8 and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF VP-

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Section	Result category	Global Warming Potential total kg CO2e	Global Warming Potential fossil kg CO2e	Global Warming Potential biogenic kg CO2e	Global Warming Potential, LULUC kg CO2e	Depletion potential of the stratospheric ozone layer kg CFC11e	Acidification potential, Accumulated Exceedance mol H+ eq.	Eutrophication aquatic freshwater kg Pe	Eutrophication aquatic marine kg N eq.	Eutrophication terrestrial mol N eq.	Formation potential of tropospheric ozone kg NMVOC eq.	Abiotic depletion potential (ADP-elements) for non fossil resources (+A2) kg Sbe	Abiotic depletion potential (ADP-fossil fuels) for fossil resources (+A2) MJ	Water use m3 deprived
A1	Raw material extraction and processing	5,63E-02	5,62E-02	0,00E+00	6,18E-05	8,04E-09	3,15E-04	2,80E-06	4,89E-05	5,63E-04	1,59E-04	7,96E-07	9,57E-01	4,18E-02
A2	Transport to the manufacturer	5,05E-02	5,05E-02	9,07E-08	1,88E-05	1,16E-08	2,25E-04	4,11E-07	6,62E-05	7,31E-04	2,32E-04	1,18E-07	7,57E-01	3,38E-03
A3	Manufacturing	2,88E+00	5,09E+00	-2,22E+00	6,32E-03	4,68E-07	4,06E-02	5,56E-03	1,24E-01	1,11E-01	1,97E-02	4,35E-05	7,13E+01	2,67E+01
A1-A3	Product stage	2,98E+00	5,20E+00	-2,22E+00	6,40E-03	4,87E-07	4,12E-02	5,56E-03	1,24E-01	1,13E-01	2,01E-02	4,44E-05	7,30E+01	2,67E+01
A4	Transport to the building site	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
A5	Installation into the building	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B1	Use or application of the product	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B2	Maintenance	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B3	Repair	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B4	Replacement	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B5	Refurbishment	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B6	Operational energy use	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B7	Operational water use	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
C1	Deconstruction	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
C2	Waste transportation	4,69E-03	4,69E-03	0,00E+00	1,73E-06	1,08E-09	1,99E-05	3,84E-08	5,90E-06	6,51E-05	2,08E-05	1,10E-08	7,05E-02	3,15E-04
C3	Waste processing	2,69E-01	0,00E+00	2,69E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
C4	Waste disposal	6,39E-01	1,05E-02	6,28E-01	1,07E-05	3,20E-09	8,88E-05	1,63E-07	3,03E-05	3,33E-04	9,64E-05	3,54E-08	2,43E-01	1,42E-03
D	External impacts (excluded from totals)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

9-C

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

USE OF NATURAL RESOURCES

Section	Result category	Use of renewable primary energy resources as energy MJ	Use of renewable primary energy resources as raw materials MJ	Total use of renewable primary energy MJ	Use of non renewable primary energy as energy MJ	Use of non renewable primary energy as raw materials MJ	Total use of non renewable primary energy MJ	Use of secondary materials kg	Use of renewable secondary fuels MJ	Use of non renewable secondary fuels MJ	Use of net fresh water m3
A1	Raw material extraction and processing	9,49E-02	0,00E+00	9,49E-02	9,56E-01	0,00E+00	9,56E-01	2,59E-04	1,60E-06	0,00E+00	1,82E-03
A2	Transport to the manufacturer	8,50E-03	0,00E+00	8,50E-03	7,57E-01	0,00E+00	7,57E-01	2,11E-04	2,11E-06	0,00E+00	9,77E-05
A3	Manufacturing	1,02E+01	7,86E+00	1,80E+01	6,91E+01	5,19E-01	6,96E+01	1,48E-01	2,67E-01	0,00E+00	-5,15E+00
A1-A3	Product stage	1,03E+01	7,86E+00	1,81E+01	7,08E+01	5,19E-01	7,13E+01	1,48E-01	2,67E-01	0,00E+00	-5,15E+00
A4	Transport to the building site	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
A5	Installation into the building	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B1	Use or application of the product	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B2	Maintenance	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B3	Repair	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B4	Replacement	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B5	Refurbishment	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B6	Operational energy use	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
B7	Operational water use	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
C1	Deconstruction	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
C2	Waste transportation	7,94E-04	0,00E+00	7,94E-04	7,05E-02	0,00E+00	7,05E-02	1,96E-05	1,97E-07	0,00E+00	9,13E-06
C3	Waste processing	0,00E+00	-2,36E+00	-2,36E+00	0,00E+00	-1,56E-01	-1,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00
C4	Waste disposal	4,22E-03	-5,50E+00	-5,50E+00	2,43E-01	-3,63E-01	-1,20E-01	8,75E-05	3,37E-06	0,00E+00	2,62E-04
D	External impacts (excluded from totals)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

END OF LIFE – WASTE

Section	Result category	Hazardous waste disposed kg	Non hazardous waste disposed kg	Radioactive waste disposed kg
A1	Raw material extraction and processing	3,22E-03	1,37E-01	4,34E-06
A2	Transport to the manufacturer	1,00E-03	1,64E-02	5,07E-06
A3	Manufacturing	4,75E-01	4,09E+01	2,08E-04
A1-A3	Product stage	4,79E-01	4,11E+01	2,17E-04
A4	Transport to the building site	MND	MND	MND
A5	Installation into the building	MND	MND	MND
B1	Use or application of the product	MND	MND	MND
B2	Maintenance	MND	MND	MND
B3	Repair	MND	MND	MND
B4	Replacement	MND	MND	MND
B5	Refurbishment	MND	MND	MND
B6	Operational energy use	MND	MND	MND
B7	Operational water use	MND	MND	MND
C1	Deconstruction	0,00E+00	0,00E+00	0,00E+00
C2	Waste transport	9,34E-05	1,54E-03	4,71E-07
C3	Waste processing	0,00E+00	0,00E+00	0,00E+00
C4	Waste disposal	0,00E+00	1,00E+00	0,00E+00
D	External impacts (excluded from totals)	0,00E+00	0,00E+00	0,00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Section	Result category	Global warming kg CO2e	Ozone Depletion kg CFC11e	Acidification kg SO2e	Eutrophication kg PO4e	Formation of ozone of lower atmosphere kg Ethenee	Abiotic depletion potential (ADP-elements) for non fossil resources kg Sbe	Abiotic depletion potential (ADP-fossil fuels) for fossil resources MJ
A1	Raw material extraction and processing	5,54E-02	7,24E-09	2,63E-04	1,08E-04	1,13E-05	3,00E-07	9,56E-01
A2	Transport to the manufacturer	4,99E-02	9,18E-09	1,75E-04	3,87E-05	6,70E-06	1,14E-07	7,57E-01
A3	Manufacturing	5,06E+00	4,00E-07	3,03E-02	8,34E-02	1,31E-03	4,06E-05	7,12E+01
A1-A3	Product stage	5,16E+00	4,17E-07	3,07E-02	8,35E-02	1,33E-03	4,10E-05	7,29E+01
A4	Transport to the building site	MND	MND	MND	MND	MND	MND	MND
A5	Installation into the building	MND	MND	MND	MND	MND	MND	MND
B1	Use or application of the product	MND	MND	MND	MND	MND	MND	MND
B2	Maintenance	MND	MND	MND	MND	MND	MND	MND
B3	Repair	MND	MND	MND	MND	MND	MND	MND
B4	Replacement	MND	MND	MND	MND	MND	MND	MND
B5	Refurbishment	MND	MND	MND	MND	MND	MND	MND
B6	Operational energy use	MND	MND	MND	MND	MND	MND	MND
B7	Operational water use	MND	MND	MND	MND	MND	MND	MND
C1	Deconstruction	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
C2	Waste transport	4,64E-03	8,55E-10	1,54E-05	3,52E-06	6,03E-07	1,07E-08	7,05E-02
C3	Waste processing	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
C4	Waste disposal	1,03E-02	2,54E-09	6,73E-05	2,15E-05	2,74E-06	3,42E-08	2,43E-01
D	External impacts (excluded from totals)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of
the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Juan Miguel Gómez