

ENVIRONMENTAL PRODUCT DECLARATION



ENVIRONMENTAL PRODUCT DECLARATIONS



In accordance with ISO14025 and EN15804 + A2:2019 for
Brass Bathroom Mixers (Faucets)

from

Kaleseramik Çanakkale Kalebodur Seramik Sanayi A.Ş.

Programme :	The International EPD® System	EPD Turkey, fully aligned regional programme
Programme Operator :	EPD Turkey www.epdturkey.org	EPD International AB www.environdec.com

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Geographical Scope:	Global

 **Kale**



EPD Programme	The International EPD® System www.environdec.com
EPD Programme Operator	EPD Turkey, Istanbul - Turkey www.epdturkey.org
EPD Owner	Kaleseramik Çanakkale Kalebodur Seramik Sanayi A.Ş. www.kale.com.tr
Declared Unit	1 kg average brass bathroom mixers
CPC Code	42911
Product Category Rules (PCR)	2019:14 Version 1.0, 2019-12-20, Construction Products and CPC 54 Construction Services, EN 15804:2012 + A2:2019 Sustainability of Construction Works
PCR Review Conducted by	The Technical Committee on the International EPD ® System. Contact via www.environdec.com info@environdec.com
Independent Verification and data, according to ISO 14025:2006	<input type="checkbox"/> Internal <input checked="" type="checkbox"/> External <input type="checkbox"/> EPD® Process Certification
System Boundaries	<input checked="" type="checkbox"/> Cradle to gate with modules C1-C4 and module D <input type="checkbox"/> Cradle to gate with options, C1-C4 and module D <input type="checkbox"/> Cradle to Grave and module D
Approved and Verified by	Vladimír Kočí, PhD
LCA Report and EPD Prepared by	Metsims Sustainability Consulting www.metsims.com

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For more information about this Environmental Product Declaration or its contents, please contact customerservices@kale.com.tr

Founded in 1957 as Çanakkale Seramik Fabrikaları A.Ş. , Kale Group broadened its industrial journey that started with the production of ceramics to include building chemicals, logistics, and defence and aerospace over time. Today, Kale Group has 18 companies, all leaders in their fields, and over 5,000 employees operating in various regions in Turkey. Europe's fourth and the world's 15th biggest manufacturer of building materials, Kale Group ranks among the top five building chemicals producers in Europe. Kale Group boasts a large domestic and international market share, offering its products in more than 400 points of sale in 100 countries.

A leader with its industrial legacy and entrepreneurship, Kale Group continues its economic and social activities as a reputable group of companies that upholds respect to people and the environment above all, adding sustainable value to society.

Kaleseramik, a company of Kale Group, manufactures ceramic tiles, sanitaryware, taps and related accessories. and placed in the market under the brand names of Çanakkale Seramik, Kalebodur, Kalesinterflex and Kale Banyo.

Kaleseramik aiming always for continuous development has received the following certifications within the scope of the system standards; TS EN ISO 9001:2015, ISO 10002:2014, TS EN ISO 14001:2015, ISO 50001:2011, ISO 27001 and OHSAS 18001:2014.

About Kale Banyo

Kale Banyo (Bathroom) offers holistic solutions to places with a wide range of products from sanitaryware to bathroom furniture, tap, bathroom mixers, shower systems, shower and bathtub cabins. As a brand with the principle of being customer-oriented, efficiency, transformative and attaching importance to quality and design, Kale Banyo creates a difference in bathroom sector with high quality products, esthetic, functional and accessible designs, environment-friendly production and efficient after-sales service. Combining quality products and quality services, Kale Banyo continues its approach during sales and after-sales process.



Product Information

Kale products consist of bath, shower and sink mixers; concealed bath and shower mixers; taps and valves. Bathroom and sink mixers are separated to single lever and two handled models. Single lever mixers have only one cartridge. Users can adjust the temperature and the flow of hot or cold water using this mechanism. For two handle models, the temperature and the flow of hot and cold water must be regulated by using these separate headworks.

The outlet pipes of the sink mixers can rotate 360°. Visible surfaces of products are coated with nickel, chrome or PVD, against corrosion.

Built-in faucets are functionally the same as conventional mixers, but they have a difference in assembly operation due to the structure hidden inside the wall during installation.

Durable.



Ceramic Cartridges
Long-lasting and durable with ceramic interior material.



Stainless Steel Double-Braided Flexible Hose
Long-lasting stainless steel material in flexible hand shower hoses.



Chrome Plating
Shiny, durable chrome plating.

Useful



Comfort Zone
Extended spouts and height of mixers provide convenient use.



+/-7° Swivel Flow Regulators
Regulation of water flow for ease of use.



Honeycomb and Cascade Flow Regulators
Mixes water with air to conserve. Moreover, lime-proof and doesn't require frequent cleaning.



Locked Diverter
Operates even under 0,5 bar pressure thanks to locking feature.



Silicone Water Flow Inlets
Prevents calcification in hand showers and provides flexible and easy cleaning.

Practical.



KaleBox
Flexible and convenient with common body compatible with all built-in parts. Easy to clean and no damage on cartridge since the cartridge is built-in.

Stylish.



Waterfall Flow
Natural water flow form with stylish look.

Water-Conserving



Water Saving Mixers
Thanks to its special aerator, washbasins and sink mixers operate with only 7 lt of instead of TSE-standard 12 liters, saving 40%.

Guaranteed.



5-Year Guarantee
Mixers have 5-year guarantee.



2-Year Guarantee
Technology series products have 2-year guarantee.

Content of Product

Raw and auxiliary materials and additives:

- Brass
- Plastic parts
- Steel
- Ceramic
- Polishing materials
- Lubricants
- Liquid sealing

Brass Alloy:

- Copper : 55-65%
- Zinc : 35-40%
- Lead : <2%
- Aluminium : <1%

Technical Properties

The following checks are performed by Quality Department.

- Chemical analysis
- Leakage tests
- Flow smoothness control
- Flow rate test
- Headwork group control and cartridge movement control
- Visual cosmetic control
- Dimensional control
- Life cycle test
- Measurement of coating thickness
- Neutral salt spray test
- Acoustic test
- Marking control
- Packaging control



The main operating range for the mixers is defined as below.

Water pressure operating range	0.5 bar (Dynamic Pressure) -10 bar (Static Pressure)
Recommended working pressure	1-5 bar (Dynamic Pressure)
Temperature operating range	+5 °C , +80 °C
Recommended maximum temperature	+60 °C



For detailed product information and catalogues:

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LCA Information

Declared Unit	1 kg of brass bathroom mixers with weight between 1 and 2 kg.
System Boundary	Cradle to gate with modules C1-C4 and module D
Cut-Off Rules	For this LCA study, 1% cut-off criteria was applied.
Database(s) and LCA Software Used	TLCID ver. 1.0 (Turkish Lifecycle Inventory Database), Ecoinvent 3.6, SimaPro 9.1
Data Quality	Data for raw material usage, energy consumption, water consumption and transport data for products, materials and waste are collected from Kale.
Period Under Review	All primary data collected from Kale is for the period year of 2019.

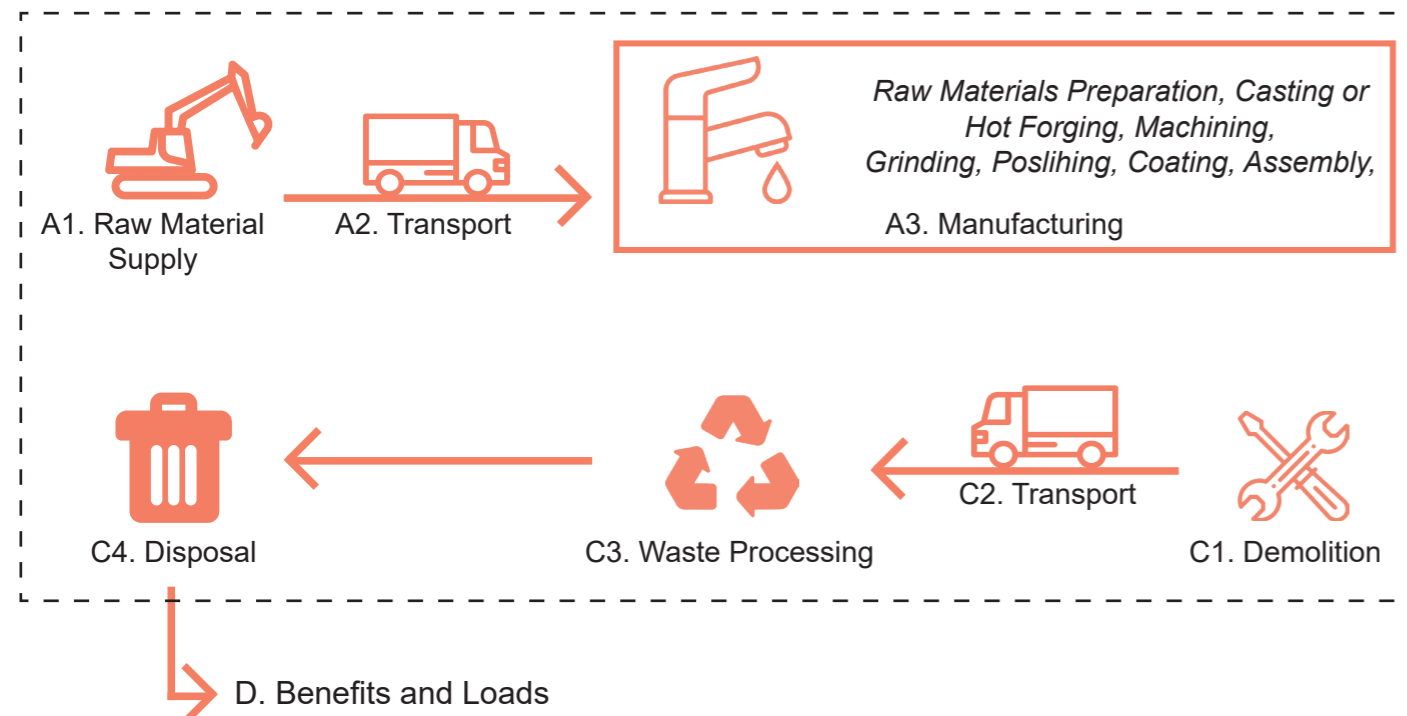
Adapted methodology in SimaPro called EN15804-A2 method was used to calculate the environmental impact. This method has all the required indicators readily available for the relevant standard. All energy calculations were obtained using Cumulative Energy Demand (LHV) methodology, while fresh water use is calculated with selected inventory flows in SimaPro according to the PCR.

There are no co-products in the production. Hence, there is no need for co-product allocation. Energy consumptions and transports datasets were allocated based on the production figures in 2019 and weighted averaged of environmental impacts for the composite poles were presented.

Accordingly, hazardous and non-hazardous waste amounts were also allocated from 2019 total waste arisings.

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in brass mixers, either above the threshold for registration with the European Chemicals Agency or above 0.1 % (wt/wt).

System Boundary



Description of System Boundary

This EPD's system boundary is cradle to gate with modules C1-C4 and module D.

Upstream	Core														Downstream	Other Environmental Information
	Raw Material Supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction, demolition	Transport		
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

Description of the system boundary (X = Included in LCA, MND= Module Not Declared)

A1: Raw Material Supply

Raw material supply includes raw material extraction/preparation and pre-treatment processes before production.

A2: Transportation

Transport is relevant for delivery of raw materials and other materials to the plant and the transport of materials within the plant. Transport of raw materials to production site is taken as the weight average values for transport from raw materials supplier in 2019.

A3: Manufacturing

Brass mixers can be produced with hot forging or casting. Both productions methods starts with the preparation of brass alloys. After the hot forging or casting process, production continues with machining, grinding, polishing, and coating. This follows by assembly with auxiliary materials, then final products are quality checked and packaged for delivery.

C1 : Deconstruction, Demolition

For demolition of brass mixers, no electrical tools or energy is necessary.

C2 : Transport

This stage includes the transportation 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 : Waste Processing

Energy consumption of 0.1 kWh is assumed to be consumed during processing.

C4 : Disposal

Disposal is the final stage of product life. Brass mixers end up at recycling plant after their useful life. It is assumed that 90% of the products are collected and the rest is not recovered and end up at landfill.

D : Benefits and Loads

Considering the possibility that the waste can be collected at the source for recycling, the recycling rate was assumed to be 90%.



LCA Results

Environmental Impacts for 1 kg of Kale Brass Bathroom Mixers

Impact Category	Unit	A1-A3	C1	C2	C3	C4	D
GWP - Fossil	kg CO ₂ eq	4.76	0	0.009	0	0.006	-1.62
GWP - Biogenic	kg CO ₂ eq	-254E-3	0	6.60E-6	0	121E-3	-33.9E-3
GWP - Luluc	kg CO ₂ eq	14.6E-3	0	2.65E-6	0	2.02E-6	-2.87E-3
GWP - Total	kg CO ₂ eq	4.52	0	0.009	0	0.127	-1.65
ODP	kg CFC-11 eq	295E-9	0	2.14E-9	0	414E-12	-100E-9
AP	mol H ⁺ eq	194E-3	0	38.2E-6	0	21.1E-6	-152E-3
EP - Freshwater	kg PO ₄ eq	22.7E-3	0	643E-9	0	1.49E-6	-18.0E-3
EP - Marine	kg N eq	13.4E-3	0	11.6E-6	0	184E-6	-8.12E-3
EP - Terrestrial	mol N eq	171E-3	0	127E-6	0	55.6E-6	-113E-3
POCP	kg NMVOC	46.1E-3	0	40.8E-6	0	44.0E-6	-29.9E-3
ADPE	kg Sb eq	34.9E-3	0	155E-9	0	16.5E-9	-13.9E-3
ADPF	MJ	61.2	0	0.141	1	0.039	-19.0
WDP	m ³ depriv.	3.23	0	459E-6	0	0.001	-1.55
PM	disease inc.	528E-9	0	822E-12	0	241E-12	-325E-9
IR	kBq U-235 eq	0.490	0	0.001	0	244E-6	-0.197
ETP - FW	CTUe	1989	0	0.113	0	1.29	-1533
HTTP - C	CTUh	39.0E-9	0	2.77E-12	0	3.11E-12	-22.3E-9
HTTP - NC	CTUh	2.22E-6	0	128E-12	0	203E-12	-1.79E-6
SQP	Pt	65.4	0	0.162	0	0.069	-15.4
Acronyms	GWP-total: Climate change. GWP-fossil: Climate change- fossil. GWP-biogenic: Climate change - biogenic. GWP-luluc: Climate change - land use and transformation. ODP: Ozone layer depletion. AP: Acidification terrestrial and freshwater. EP-freshwater: Eutrophication freshwater. EP-marine: Eutrophication marine. EP-terrestrial: Eutrophication terrestrial. POCP: Photochemical oxidation. ADPE: Abiotic depletion - elements. ADPF: Abiotic depletion - fossil resources. WDP: Water scarcity. PM: Respiratory inorganics - particulate matter. IR: Ionising radiation. ETP-FW: Ecotoxicity freshwater. HTP-c: Cancer human health effects. HTP-nc: Non-cancer human health effects. SQP: Land use related impacts. soil quality.						
Legend	A1: Raw Material Supply. A2: Transport. A3: Manufacturing. A1-A3: Sum of A1, A2, and A3. C1: De-Construction. C2: Waste Transport. C3: Waste Processing. C4: Disposal. D: Benefits and Loads Beyond the System Boundary.						



Resource Use for 1 kg of Kale Brass Bathroom Mixers

Impact Category	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	15.9	0	0.002	0.123	0.002	-4.60
PERM	MJ	0	0	0	0	0	0
PERT	MJ	15.9	0	0.002	0	0.002	-4.60
PENRE	MJ	61.2	0	0.141	0.123	0.039	-19.0
PENRM	MJ	0	0	0	0	0	0
PENRT	MJ	61.2	0	0.141	0.123	0.039	-19.0
SM	kg	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0

Waste & Output Flows for 1 kg of Kale Brass Bathroom Mixers

Impact Category	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	0.053	0	0	0	0	0
NHWD	kg	0.023	0	0	0	0	0
RWD	kg	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0
MER	kg	0	0	0	0	0	0
EE-Electrical	MJ	0	0	0	0	0	0
EE-Thermal	MJ	0	0	0	0	0	0

Acronyms
 PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding 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, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water, HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy, Thermal.

Legend
 A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A1-A3: Sum of A1, A2, and A3, C1: De-Construction, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.



References

/GPI/ General Programme Instructions of the International EPD® System. Version 3.0.

/TS EN ISO 9001:2015/ Quality management systems - Requirements

/ISO 10002:2014/ Quality management - Customer Satisfaction - Requirements

/ISO 14001:2015/ Environment Management System- Requirements

/ISO 50001:2011/ Energy Management System - Requirements

/ISO 27001/ Information technology - Security techniques - Requirements

/OHSAS 18001:2014/ Occupational Health and Safety- Requirements

/ISO 14020:2000/ Environmental labels and declarations — General principles

/EN 15804:2012+A2:2019/ Sustainability of construction works - Environmental Product Declarations — Core rules for the product category of construction products

/ISO 14025/ DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

/ISO 14040/44/ DIN EN ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework (ISO14040:2006) and Requirements and guidelines (ISO 14044:2006)

/PCR for Construction Products and CPC 54 Construction Services/ Prepared by IVL Swedish Environmental Research Institute, Swedish Environmental Protection Agency, SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB, The International EPD System, 2019:14 Version 1.1, Date 2019-12-20


/The International EPD® System/ The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD®s as well as keeping a library of EPD®s and PCRs in accordance with ISO 14025. www.environdec.com

/Ecoinvent / Ecoinvent Centre, www.ecoinvent.org

/SimaPro/ SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com

/TLCID/ Turkish Life Cycle Inventory Database, www.tlclid.org, developed by Turkish Center for Sustainable Production Research and Design (SURATAM), www.suratam.org

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