

ENVIRONMENTAL PRODUCT DECLARATION

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

Brass Mixers

by **Valfsel Armatür Sanayi A.Ş.**



TOGETHER FOR YEARS



ENVIRONMENTAL PRODUCT DECLARATIONS



Programme : EPD Turkey, fully aligned regional programme
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Programme Operator : EPD Turkey / SÜRATAM

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Programme Information

Programme	<p>EPD Turkey, managed and run by:</p> <p>SÜRATAM – Turkish Centre for Sustainable Production Research & Design www.suratam.org</p> <p>Nef 09 B Blok No:7/15 34415 Kagithane/Istanbul, TURKEY</p> <p>www.epdturkey.org info@epdturkey.org</p>	<p>The International EPD® System</p> <p>EPD International AB Box 210 60 SE-100 31 Stockholm Sweden</p> <p>www.environdec.com info@environdec.com</p>
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Product Category Rules (PCR):

2019:14 Version 1.0, 2019-12-20, Construction Products and CPC 54 Construction Services

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

EPD process certification

EPD verification

Third party verifier: Vladimír Kocí, PhD

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

Valfsel, foundations of which were laid in 1957 as ECA Pres Döküm Sanayi Ltd. Sti., gained its legal entity in 1978 in Istanbul Samatra as Valfsel Armatür Sanayi A.S.

New investments, which were deemed necessary in order to meet the heavy demand for armatures produced with the brand E.C.A. and for 'producing the top quality with advanced technology', which was determined as the indispensable mentality of Valfsel, were completed and Manisa Factory established in 1992 in Manisa Organized Industrial Zone was incorporated into the Company. On the other hand, integration was completed by incorporating Eltor A.S., which had been operating in Edirne since 1972, into Valfsel A.S. in 1992 for ensuring coordination in production and unity in quality.

Samandira factory was moved in 1995 and Edirne factory was moved in 2000 to Manisa in order to control costs effectively and increase planning and research-development productivity; and efficient control of costs within time, and optimum use of all company resources was ensured.

Today, Valfsel Armatür Sanayi A.S. employs 140 officials and 310 workers in 2 factories as Manisa 1 and Manisa 2, treat 4980 tons brass product annually in a closed area of 20 547 m2 located within a total area of 62 281 m², and manufactures 4 200 000 pieces of various armatures, inner mechanisms, siphons and accessories.

Main product range of the company is Single and Dual Flywheel Shower and Bath Armatures, Single and Dual Flywheel Sink, Washbasin and Bidet Faucets, Photocell Faucets, Time Adjusted Faucets, Built-in Bathroom Armatures as well as Inner Mechanisms, Siphons and Accessories compatible with armatures manufactured.

Along with its high capacity, Valfsel ranks among the important complete facilities when Casting, Forging, Multiple Shaft Automatic Machine, Multiple Station Processing, Polishing and Surface Coating starting from Design stage and Assembly Units finally, are taken into consideration.

The company has certifications such as TSE ISO EN 9000 Quality Management System, TSE ISO EN 14000 Environment Management System and TS ISO 45001 Occupational Health & Safety Management System Certification.

Please scan or click the QR code to see all company and product certificates.



2014
Good Design Award



Product Information

E.C.A. products include basin mixers, sink mixers, bath and shower mixers, concealed bath and shower mixers, bidet mixers, tap, drain system, shower systems, urinal taps and valves. These products are separated into 3 groups as Mechanical Mixing Valves, Combination Taps, and Technology series such as Automatic Shut-off Valves, Thermostatic Mixing Valves and Electronic Opening and Closing Sanitary Tapwares.

Mechanical Mixing Valves (single lever mixers):

Mechanical mixing valves which mix hot and cold water and which, by means of a control device (cartridge), allow the user to adjust between 'all cold water' and 'all hot water', which implies the flow rate of the mixture obtained may be adjusted between 'no flow' and 'maximum flow' using either the same control device or another separate control device.

Combination Taps:

There are two open-close control devices (headworks).

Automatic Shut-off Valves:

Tapwares in which opening is effected by operation of a device following which shut-off occurs automatically after a certain period.

Thermostatic Mixing Valves:

Valves, with one or more outlets, which mix hot and cold water and automatically control the mixed water to a user selected temperature. The flow rate between no flow and maximum flow conditions can be effected either by the same control device or a separate flow control device, where fitted.

Electronic Opening and Closing Sanitary Tapwares:

They are taps/mixers which turn the water on and off and can regulate the flow due to optical recognition by means of having a photocell unit as a result of an integrated solenoid valve function. Water temperature setting is performed mechanically.

Application

Basin mixer is a sanitary tapware used in lavatories and bathrooms, mixing hot and cold water. Sink mixer is a sanitary tapware used in the kitchen, mixing hot and cold water.

Bath and shower mixers are sanitary tapwares used to take showers by mixing hot and cold water. Tap is a sanitary tapware used to wash hands in lavatories, toilets, enabling flow of hot or cold water. Drain system is a sanitary tapware used to discharge waste water. Valve is a sanitary tapware used to control the flow of water to mixers, WC pans, and

bathrooms and kitchens systems.

Concealed bath and shower mixers are sanitary tapwares used to take showers by mixing hot and cold water.

Urinal tap is a sanitary tapware used to clean urinals. Shower Systems are sanitary tapwares used to take showers by mixing hot and cold water.

Bidet mixers are sanitary tapwares, mixing hot and cold water.



Technical Properties

Name	Value	Unit
Maximum load temperature permanent operation	65	°C
Maximum load temperature temporary operation)	90	°C
Flow rate (indications for pressure range of 1-3 bar)	0.11 - 1.2	m ³ /h
Sound emissions	≤ 20	dB

Main raw materials for brass mixers are as follows (by mass %) :

- Brass, 70-80
- Zamak, 15-25
- Stainless Steel, 15-25
- Plastic, 3-7
- Ceramic, 3-7

The raw materials used in the process:

For the casting process (%):

- Copper (Cu), 58-60
- Zinc (Zn), 37-40
- Lead (Pb), 1-2
- Aluminium (Al), 0-1

For the casting process (%):

- Copper (Cu), 57-59
- Zinc (Zn), 36-40
- Lead (Pb), 2-4
- Aluminium (Al), max 0.05

UN CPC code for brass mixers is 42911.

No substances included in the Candidate List of Substances of Very High Concern for authorisation under the REACH Regulations are present in the sanitaryware products manufactured by E.C.A., either above the threshold for registration with the European Chemicals Agency or above 0.1% (w/w).

Please scan or click the QR code to see all products and technical details.



System Boundary

A1 : Raw Material

This stage includes raw material extraction and pre-treatment processes before production. For brass mixers products, production starts with raw materials, mainly locally sourced but some transported from other parts of the world.

A2 : Transport

This stage is relevant for delivery of raw materials to the plant and forklift usage within the factory.

A3 : Manufacturing

The production process begins with preparing technical drawings and design of the 3-dimensional models, dies, fixtures and cutting tools using CAD/CAM/CAE programs. During the design stages, casting and flow analysis simulation programs are used. In Valfsel production, 3 different manufacturing processes are used including casting, forging and machining.

Casting Process: The casting method is used to shape the parts that have an intricate internal structure. Sand cores are manufactured with optimal heating time and temperature values in fully automatic sand core machines. These sand cores form the internal structure of products. By melting the brass ingot at 1000°C in low pressurized die casting machines and semi-automatic die casting machines, the manufacturing of the parts such as body and spout are performed.

Hot Forging Process: It is a method used in shaping simple parts that have a linear internal structure. Brass bars which are cut as billet are shaped by forging in 250-300 tons of eccentric and friction presses at 700- 750°C. Thereafter, they are forwarded into the next process for hydraulic trimming press.

Free-Machining Process: It is the process in which such parts as rosette, nipples, nut, and headwork parts as well as mechanism parts are manufactured by machining. Free-machining bars, in a very wide diameter range, are processed in multi spindle turning machines. Besides, complex parts are processed in flexible CNC machines.

Machining Process: Semi-products come from casting and hot forging processes and are subjected to such processes as threading, internal grooving, broaching, and turning on transfer machines, CNC

machining centres and flexible CNC machines. The parts that are processed in machining processes are subjected to grinding and polishing operations. Grinding and polishing operations are done by robots and manually-controlled machines. The polished parts are plated with nickel-chrome+6 or nickel-chrome+3, known as environmental friendly plating, in compliance with the /EN 248/ standard. Components and parts that are produced in the plant and supplied by suppliers are mounted. There are 3 main assembly lines, 3 support assembly lines, and 3 cellular production lines in the assembly workshop.

Products are tested in each assembly line by the required test devices. Final control is performed on products by the Quality Control Department before they are shipped to the customer.

A4 : Transport to Construction Site

This stage involves transportation of brass mixers products to the construction site. There is no loss of products during transportation as stated by the company.

C1 : De-construction at the end of RSL is usually conducted with a selective deconstruction/demolition. The environmental impacts generated during this phase are very low and therefore can be neglected.

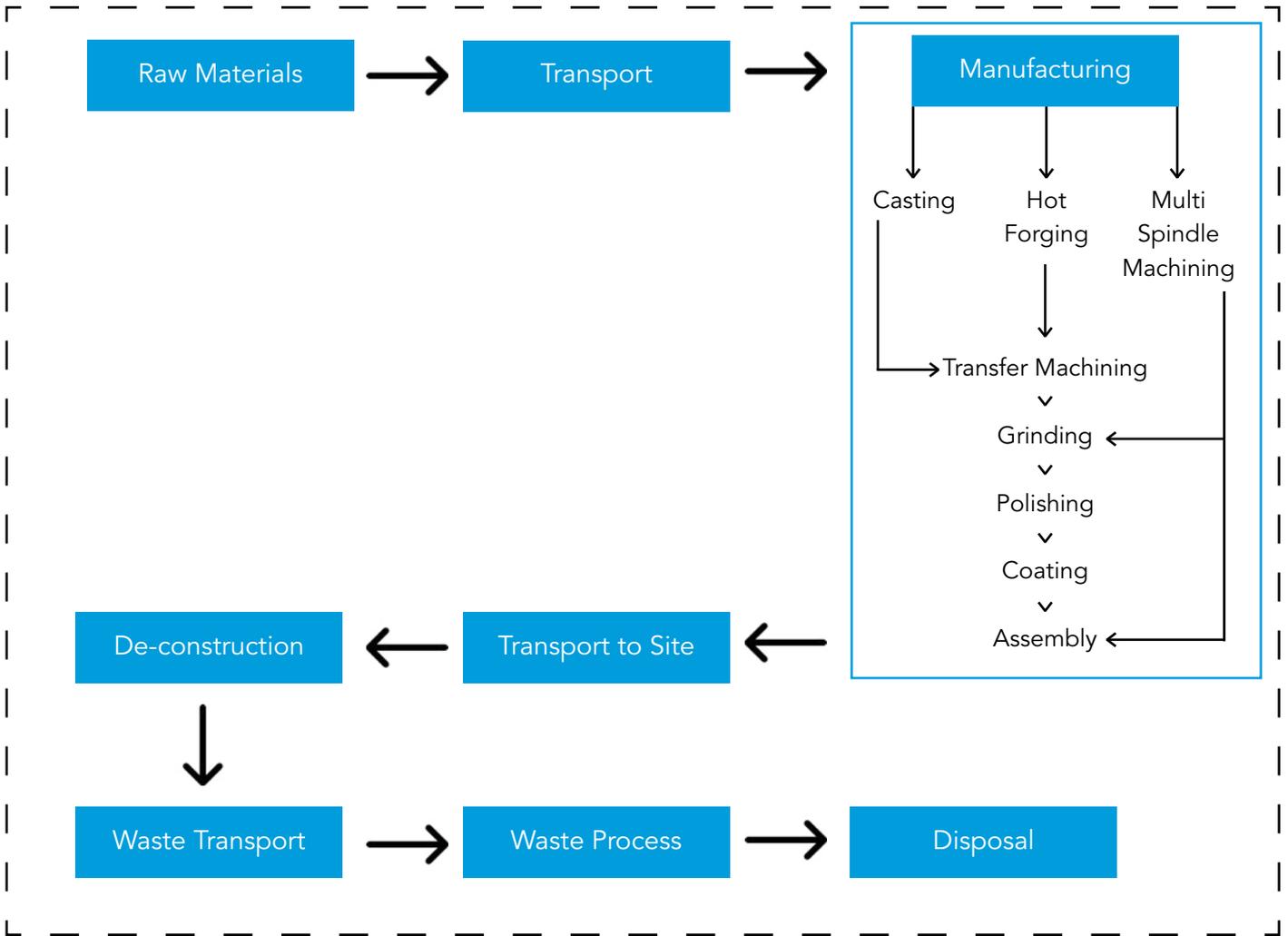
C2 : Waste Transport includes the transportation of the discarded products to final disposal. Average distance from demolition site to disposal area for final disposal is assumed to be 100 km.

C3 : Waste Processing involves the breaking down of discarded brass mixers products. It is assumed that the brass mixers are disassembled for the waste process and 1 kWh/kg electricity consumption for this.

C4 : Disposal is the final stage of product life. Brass mixers are generally recycled at the end of their life. However, some discarded products may go to landfills. Disposal scenario is modelled on this base.

D : Benefits and Loads

Disposed brass mixers waste without any loss during disassembly/disposal stage, the recycling rate was assumed to be 90%.



— — System Boundary



Life Cycle Assessment (LCA)

Information & Results

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw Materials Supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refaurbishment	Operational energy use	Operational water use	De-construction	Transport	Waste processing	Disposal	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

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

Declared Unit	1 kg of Brass Mixers
Time Representativeness	2019
Reference Service Life (RSL)	E.C.A's chrome plated mixers provide 5 years, other plating variations provide 2 years of warranty. According to E.C.A.'s Together for Years philosophy, products that are manufactured provide service over 4-5 times of these periods.
Database(s) and LCA Software used	Ecoinvent 3.6 and SimaPro 9.1
Description of system boundaries	Cradle to gate with options
Cut Off Rules	1% cut-off applied for transport calculations.
Data Quality	Raw materials, energy and water consumption, waste, material and product transport data is primary data collected from Valfsel.
Allocations	No allocation was performed for this EPD. There are no coproducts in the production of brass mixers. Hence, there is no need for co-product allocation. Transport is allocated according to tonnages for raw materials bought by Valfsel. Similarly, water consumption and energy consumption are also allocated according to the production figures.



LCA Results

Environmentals Impacts for 1 kg of Brass Mixers

Impact Category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - Fossil	kg CO ₂ eq	7.43	0.049	0	0.009	0.059	0.005	-1.66
GWP - Biogenic	kg CO ₂ eq	24.6E-3	34.5E-6	0	6.60E-6	537E-6	74.5E-3	-35.0E-3
GWP - Luluc	kg CO ₂ eq	34.2E-3	14.7E-6	0	2.65E-6	561E-6	1.54E-6	-3.06E-3
GWP - Total	kg CO ₂ eq	7.49	0.049	0	0.009	0.060	0.080	-1.70
ODP	kg CFC-11 eq	453E-9	11.5E-9	0	2.14E-9	1.66E-9	339E-12	-103E-9
AP	mol H+ eq	240E-3	237E-6	0	38.2E-6	387E-6	15.9E-6	-149E-3
EP - Freshwater	kg PO ₄ eq	28.2E-3	3.43E-6	0	643E-9	62.1E-6	1.38E-6	-17.6E-3
EP - Marine	kg N eq	17.8E-3	69.8E-6	0	11.6E-6	63.0E-6	149E-6	-8.06E-3
EP - Terrestrial	mol N eq	221E-3	766E-6	0	127E-6	571E-6	44.2E-6	-112E-3
POCP	kg NMVOC	59.3E-3	240E-6	0	41E-6	156E-6	30.3E-6	-29.6E-3
ADPE	kg Sb eq	33.0E-3	825E-9	0	155E-9	142E-9	13.3E-9	-14.7E-3
ADPF	MJ	91.1	0.759	0	0.141	0.647	0.031	-19.5
WDP	m ³ depriv.	4.28E+0	2.44E-3	0	459E-6	27.5E-3	1.00E-3	-1.56E+0
PM	disease inc.	647E-9	4.36E-9	0	822E-12	1.65E-9	193E-12	-322E-9
IR	kBq U-235 eq	527E-3	3.86E-3	0	720E-6	874E-6	193E-6	-203E-3
ETP - FW	CTUe	2.27E+3	602E-3	0	113E-3	566E-3	952E-3	-1.51E+3
HHP - C	CTUh	45.2E-9	15.2E-12	0	2.77E-12	10.4E-12	2.71E-12	-22.1E-9
HHP - NC	CTUh	2.58E-6	683E-12	0	128E-12	501E-12	134E-12	-1.76E-6
SQP	Pt	43.0	0.855	0	0.162	0.037	0.057	-15.3
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, A4: Transport to Site, 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 Brass Mixers

Impact Category	Unit	A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	19.5	0.009	0	0.002	0.155	0.001	-4.61
PERM	MJ	0	0	0	0	0	0	0
PERT	MJ	19.5	0.009	0	0.00	0	0.00	-5
PENRE	MJ	91.1	0.759	0	0.141	0.647	0.031	-19.5
PENRM	MJ	0	0	0	0	0	0	0
PENRT	MJ	91.1	0.759	0	0.141	0.647	0.031	-19.5
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m ³	0.236	0.0002	0	29.4E-6	247E-6	29.1E-6	-0.111

Waste&Output for 1 kg of Brass Mixers

Impact Category	Unit	A1-A3	A4	C1	C2	C3	C4	D
HWD	kg	0.324	0	0	0	0	0	0
NHWD	kg	0.030	0	0	0	0	0	0
RWD	kg	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0.900	0
MER	kg	0	0	0	0	0	0	0
EE (Electrical)	MJ	0	0	0	0	0	0	0
EE (Thermal)	MJ	0	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, A4: Transport to Site, C1: De-Construction, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.



A new future with E.C.A.

As E.C.A., we work every day with unique designs, developed functions, and solutions providing water and energy saving complying with the purpose of sustainability in order to live next generations a more liveable world, and include also you in being a part of sustainable life.



References

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

/ TSE ISO EN 9000/ Quality management systems – Requirements

/ TSE ISO EN 14000/ Environment Management System- Requirements

/EN15804-A2:2019/ Sustainability of construction works - Environmental Product Declarations — Core rules for the product category of construction products

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

/ISO 14025/ ISO 14025:2006 Preview Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures

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

/TS ISO 45001/ Occupational Health & Safety Management System Certification - Requirements

/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

/Ecoinvent/ Ecoinvent Centre, www.ecoinvent.org

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

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