



Environmental Product Declaration



Programme	The International EPD® System						
Programme Operator	EPD International AB						
EPD Registration Number	S-P-07822						
Publication Date	2023-02-24						
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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

In accordance with ISO 14025;2006 & EN 15804;2012+A2;2019/AC;2021 for Shower sets, FM Mattsson 9000XE

FM Mattsson Group

General information

Programme information

Programme	The International EPD® System
Address	EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden
Website	www.environdec.com
E-mail	info@environdec.com

Accountabilities for PCR, LCA & independent, third-party verification

Procedure for follow-up of data during EPD validity involves third party verifier	Yes No
	Approved by: The International EPD® System
Third-party verification	Third-party verifier: Hannu Karppi, Ramboll Finland Oy
Third and and in the same	EPD verification by individual verifier
	Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
Life Cycle Assessment (LCA)	LCA accountability: Uniben Tettey Organization: RISE Research Institutes of Sweden
	PCR review was conducted by: The Technical Committee of the International EPD® System. Chair of the PCR review: Claudia A. Peña. The review panel may be contacted via info@environdec.com
Product Category Rules (PCR)	Product Category Rules (PCR): Construction products, 2019:14, version 1.2.5
	CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

The EPD owner has the sole ownership, liability, and responsibility for the EPD

EPDs within the same product category but from different programmers 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

Owner Of The EPD	FM Mattsson Group
Contact	Phone: +46 250 59 60 00 Email: info@fmmattssongroup.com www.fmmattsson.com
Description Of The Organisation	FM Mattsson Group conducts the sale, manufacturing and product development of water mixers and related products under the established brands of FM Mattsson, Mora, Damixa, Hotbath, Aqualla and Adamsez. Our vision is to become customer's first choice in the bathroom and kitchen. In 2021 the business generated sales of more than 1.8 billion SEK from its companies in Sweden, Norway, Denmark, Finland, Benelux, UK, Germany and Italy and had 532 employees. FM Mattsson Group is listed on Nasdaq Stockholm.
Product/Management System Related Certifications	ISO 9001:2015 ISO 14001:2015
Address Production Site	FM Mattsson Group Östnorsvägen 95 792 95 Mora, Sweden

Sustainable flows

Responsible use of water is about protecting vital resources and all our futures. At FM Mattsson, we are constantly working to identify new solutions that use and distribute water in ways that are sustainable both for the environment and for people.

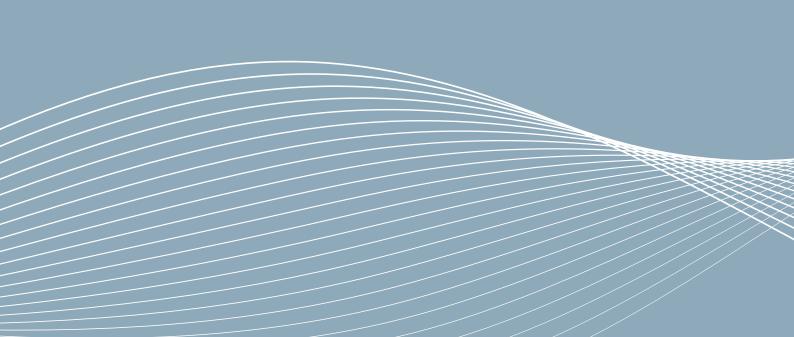
Consumers, architects, property owners, builders, companies, municipalities, and governments – we all benefit from saving water and energy. And we all have a responsibility to protect our shared resources for future generations.

FM Mattsson develops energy-efficient products for the future - continuing over 150 years of development and a passion fo sustainable solutions. The Research Institute of Sweden, RISE, carried out a two-year project analysing different energy-efficient mixers from multiple brands, including FM Mattsson, in an apartment building (Folkeson et al., 2017). It was found that considerable savings can be made in both newly constructed and existing buildings – and that energy-efficient mixers offer hot water savings of up to 28 percent.

FM Mattsson also works to drive change in people's habits and their relationship with water, both privately and professionally. It is about simple changes, such as not wasting drinking water and reducing the amount of water being heated and hot water being consumed unnecessarily. Minor adjustments and new habits reduce energy consumption and create positive change –for people's personal finances and our planet.

The average person in Sweden consumes around 140 litres of water per day at home, of which approximately 60 litres is hot water. Therefore, FM Mattsson has developed the concept of sustainable water habits – a collection of tips and advice to save water and energy in day-to-day life.

A sustainable flow of water for the future, that's our mission.



Product information

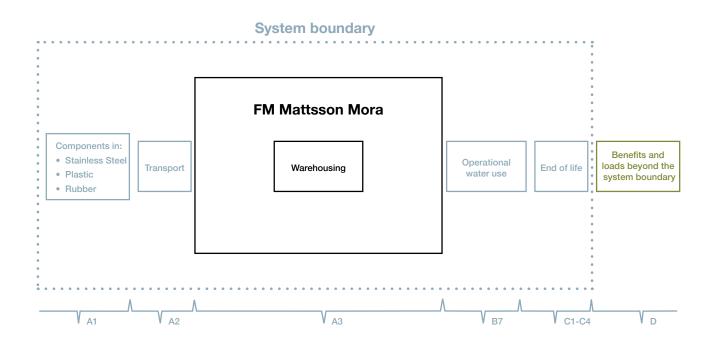
Product Name	Shower sets, FM Mattsson 9000XE
Reference Product	The reference product Shower set 86700000 was chosen as the representative product based on high sales volume.
Product Identification	Shower Set consisting of hand shower according to EN 1112 and shower hose according to EN 1113
Product Description	FM Mattsson 9000XE Shower sets include built-in features for limitation of water flow to ensure a sustainable product life cycle with efficient use of water and energy during the usage phase and fulfills e.g. the flow rate requirements of the EU Taxonomy.
UN CPC Code	42911 - Sinks, washbasins, baths and other sanitary ware and parts thereof, of iron, steel, copper or aluminium
Geographical Scope	Europe

LCA information

Functional Unit/Declared Unit	One shower set, FM Mattsson 9000XE
Reference Service Life¹	10 years
Time Representativeness	Bill-of-material from 2022. Operations in Mora represented with data from 2021.
Cut-Off Criteria	All materials and energy used to manufacture the bath/shower mixer are included.
Databases and LCA Software Used	Ecoinvent 3.8 SimaPro 9.4.0.2
Description of System Boundaries	Cradle to gate (A1-A3) with options, i.e., also operational water use module B7, waste management modules C1–C4 and beyond end-of-life module D.

¹ The reference service life is defined based on (Cordella M. et al., 2014).

System diagram



More information

LCA Practitioner	Uniben Tettey, RISE Research Institutes of Sweden
Additional information	Modelling of all components from production bill-of-material. Supplier specific electricity mixes and corresponding GWP impact: China, Fujian province 860 g CO2/kWh; European average 392 g CO2/kWh).
Information about scenarios and additional technical information	Information about the scenario for operational water use for this product is provided under "Additional Information" below.

Modules declared

Geographical scope, share of specific data (in GWP-GHG indicator) & data variation

	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	АЗ	A4	A5	B1	B2	В3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	×	×	×	×	Х	X
Geography	Global /EU	Global /EU	SE										EU	EU	EU	EU	EU
Specific data used	90% for GWP in A1-A3			-	-	-	-	-	-	1	-	-	-	-	-		
Variation – products	<10% for GWP in A1-A3				-	-	-	-	-	-	-	-	-	-	-	-	
Variation – sites		0%, a	ıll A3 in or	ne site		-	-	-	-	-	-	-	-	-	-	-	-

Modules explained

LCA modules

A1 Raw material supply

This module relates to raw material extraction and processing, processing of secondary material input (e.g. recycling processes), transport to component manufacturing and component manufacturing.

A2 Transportation

This module relates to transport from raw material extraction and processing, and component manufacturing to FM Mattsson Mora.

A3 manufacturing

This module covers the relevant production processes for the 9000XE shower sets at FM Mattsson Mora. Since the processes for the shower sets only include warehousing, zero environmental impact have been assigned.

B7 Operational

This module covers the production, heating and wastewater treatment of tap water use over the reference service life of one shower set used by one person. Further details on the scenario for operational water use are given in "Additional Information" below.

C1 De-construction This module relates to the dismantling of the shower set at the end-of-life. It is assumed that the dismantling is done manually and the related impacts are assumed to be negligible.

C2 Waste Transport

This module relates to the transport of the dismantled shower set to final waste disposal. An average distance of 100 km from demolition site to waste processing site is assumed.

C3 Waste processing

This module covers impacts related to sorting and recycling processes for the relevant material components of the shower set. It is assumed that 90% of the stainless steel and other metal components as well as 74% of the packaging wastes are recovered for recycling.

C4 Waste disposal

This module relates to waste disposal processes such as landfilling or incineration. For the shower set it is assumed that the remaining material components i.e. plastics, rubber, etc. as well as the remaining 10% of the metal components and 26% of the packaging wastes are incinerated.

D Benefits and loads beyond system boundary

This module covers benefits and loads associated with recovery/ recycling beyond the defined system boundary for the shower set. This includes benefits from recycling and waste incineration.

Content information

Product components	Weight, g	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg		
Stainless steel	397.1	50	0		
Plastic	376.4	0	0		
Rubber	7.2	0	0		
Nickel	71.3	35	0		
Copper	12.4	15	0		
Chrome	0.9	15	0		
Total	865.3		<u>-</u>		
Packaging materials	Weight, g	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg product		
Corrugated board	641.0	74.1	0.41		
Paper	28.0	3.2	0.02		
Total	669.0	77.3	0.43		

the candidate list of SVHC EC No. CAS No. declared unit			CAS No.	Weight-% per functional of declared unit
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This product do not contain substances which exceed the limits for registration at the European Chemicals Agency regarding the Candidate List of Substances of Very High Concern for authorization.

Environmental information

Potential environmental impact - mandatory indicators according to EN 15804

	Results per shower set, FM Mattsson 9000XE										
Indicator	Unit	A1	A2	А3	A1-A3	B7	C1	C2	СЗ	C4	D
GWP- fossil	kg CO ₂ eq.	2.56E+01	4.29E-01	0.00E+00	2.60E+01	1.56E+03	0.00E+00	1.49E-02	7.39E-02	8.88E-01	-1.73E+00
GWP- biogenic	kg CO ₂ eq.	-2.89E-01	2.35E-04	0.00E+00	-2.88E-01	7.41E+01	0.00E+00	1.05E-05	1.34E-02	2.43E-01	1.51E-01
GWP-	kg CO ₂ eq.	1.50E-02	2.25E-04	0.00E+00	1.53E-02	9.20E-01	0.00E+00	6.09E-06	1.16E-04	1.77E-05	-4.86E-03
GWP- total	kg CO ₂ eq.	2.53E+01	4.29E-01	0.00E+00	2.57E+01	1.64E+03	0.00E+00	1.49E-02	8.80E-02	1.13E+00	-1.59E+00
ODP	kg CFC 11 eq.	5.57E-06	9.39E-08	0.00E+00	5.66E-06	1.18E-04	0.00E+00	3.34E-09	6.15E-09	6.43E-09	-1.44E-07
AP	mol H+ eq.	2.85E-01	6.01E-03	0.00E+00	2.91E-01	8.02E+00	0.00E+00	4.31E-05	3.89E-04	3.01E-04	-1.51E-02
EP- freshwater	kg P eq.	6.93E-03	2.28E-05	0.00E+00	6.95E-03	7.01E-01	0.00E+00	1.05E-06	4.89E-05	7.30E-06	-1.09E-03
EP- marine	kg N eq.	3.02E-02	1.45E-03	0.00E+00	3.17E-02	4.55E+00	0.00E+00	8.76E-06	1.01E-04	1.55E-04	-3.16E-03
EP- terrestrial	mol N eq.	3.13E-01	1.61E-02	0.00E+00	3.29E-01	1.25E+01	0.00E+00	9.54E-05	9.24E-04	1.41E-03	-2.82E-02
POCP	kg NM- VOC eq.	9.37E-02	4.37E-03	0.00E+00	9.80E-02	4.79E+00	0.00E+00	3.63E-05	2.91E-04	3.47E-04	-8.12E-03
ADP- minerals & metals*	kg Sb eq.	4.20E-04	1.16E-06	0.00E+00	4.21E-04	2.73E-03	0.00E+00	5.23E-08	2.94E-07	1.49E-07	-5.99E-05
ADP- fossil*	MJ	2.60E+02	6.12E+00	0.00E+00	2.66E+02	1.99E+04	0.00E+00	2.23E-01	1.26E+00	2.24E-01	-3.16E+01
WDP*	m ³	8.17E+01	3.73E-02	0.00E+00	8.17E+01	3.09E+03	0.00E+00	7.27E-04	1.26E-02	3.25E-01	-8.73E-01
Acronyms	land use an Exceedance potential, free = Formation	nd land use che; EP-freshwa action of nutring potential of the	nange; ODP = ater = Eutroph ents reaching tropospheric o	Depletion poi ication potent marine end c ozone; ADP- r	tential of the stial, fraction of compartment; minerals & me	stratospheric f nutrients rea EP-terrestrial etals = Abiotic	arming Potent ozone layer; A ching freshwa = Eutrophica depletion pot al, deprivation	AP = Acidificat ster end comp tion potential, cential for non	tion potential, partment; EP-I Accumulated -fossil resourd	Accumulated marine = Eutro I Exceedance ces; ADP-foss	ophication ; POCP

^{*} 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.

Potential environmental impact - additional mandatory & voluntary indicators

	Results per shower set, FM Mattsson 9000XE										
Indicator	Unit	A1	A2	А3	A1-A3	В7	C1	C2	СЗ	C4	D
GWP- GHG ¹	kg CO ₂ eq.	2.56E+01	4.29E-01	0.00E+00	2.60E+01	1.56E+03	0.00E+00	1.49E-02	7.41E-02	8.88E-01	-1.74E+00

Use of resources

	Results per shower set, FM Mattsson 9000XE										
Indicator	Unit	A1	A2	A 3	A1-A3	В7	C1	C2	СЗ	C4	D
PERE	MJ	5.70E+01	7.25E-02	0.00E+00	5.71E+01	2.34E+03	0.00E+00	2.92E-03	1.77E-01	1.72E-02	-1.04E+01
PERM	MJ	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
PERT	MJ	5.70E+01	7.25E-02	0.00E+00	5.71E+01	2.34E+03	0.00E+00	2.92E-03	1.77E-01	1.72E-02	-1.04E+01
PENRE	MJ	2.60E+02	6.12E+00	0.00E+00	2.66E+02	1.98E+04	0.00E+00	2.23E-01	1.26E+00	2.24E-01	-3.16E+01
PENRM	MJ	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
PENRT	MJ	2.60E+02	6.12E+00	0.00E+00	2.66E+02	1.98E+04	0.00E+00	2.23E-01	1.26E+00	2.24E-01	-3.16E+01
SM	kg	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
RSF	MJ	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
NRSF	MJ	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
FW	m ³	1.36E-01	8.38E-04	0.00E+00	1.36E-01	1.72E+02	0.00E+00	2.78E-05	2.53E-04	2.08E-04	-1.25E-02
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources; PENRE = Use of non-renewable primary energy resources; PENRE = Use of 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; FW = Use of net fresh water										

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Waste production & output flows

Waste production

Results per shower set, FM Mattsson 9000XE											
Indicator	Unit	A1	A2	А3	A1-A3	В7	C1	C2	СЗ	C4	D
Hazardous waste disposed	kg	0.00E+00									
Non-hazardous waste disposed	kg	0.00E+00									
Radioactive waste disposed	kg	0.00E+00									

Output flows

Results per shower set, FM Mattsson 9000XE											
Indicator	Unit	A1	A2	А3	A1-A3	В7	C1	C2	СЗ	C4	D
Components for re-use	kg	0.00E+00									
Material for recycling	kg	0.00E+00	8.52E-01	0.00E+00	0.00E+00						
Materials for energy recovery	kg	0.00E+00									
Exported energy, electricity	MJ	0.00E+00									
Exported energy, thermal	MJ	0.00E+00									

Additional information

Overall, the results for the entire life cycle indicate that the use phase (B7) related to operational water use is by far the most significant contributor to the environmental impacts of this product. It illustrates the importance of the use phase in reducing environmental impacts associated with sanitary fitting products. Design of energy-efficient products, choice of renewable energy sources during the use phase as well as appropriate user behaviour can play a significant role in this regard. Studies have shown that up to 40% energy savings can be realized through energy-efficient taps and showers (Dodoo et al. 2017; Folkeson et al., 2017).

Operational water use scenario

For this product, the scenario for operational water use has been modelled based on average performance parameters for shower sets derived from a study by Cordella M. et al. (2014), on different sanitary products within the EU and information from the European Water Label (EWL, 2022). The parameters used to estimate the water use for the shower set as well as the energy mix for water heating are given in the tables below. Based on the given parameters and assumptions, the annual average water consumption for this product is 17 885 liters per person. About 90% of this is assumed to be hot water use and the corresponding annual energy use to heat the water is estimated to 422 kWh. Note that the corresponding climate impact in B7, 1640 kg CO2-eq for 10 years of use by one person also includes water production and distribution, and waste water treatment.

Parameters for operational water use modelling for shower sets, FM Mattsson 9000XE									
Parameter	Value	Unit							
Reference flow	7	l/minute							
Use cycles	1	cycles/person/day							
Duration of use cycle	7	Minute							
Share of hot water use	90	%							
Cold water inlet temperature	15	°C							
Outlet mixed water temperature	38	°C							
Specific heat capacity of water	4.18	kJ/(kg·K)							
Density of water	0.981	kg/l							
Reference service life	10	years							

The energy mix for the operational water use scenario is modelled based on data for different fuel mixes for water heating in EU households for 2020 (Eurostat, 2022). In 2020, 15% of the total final energy use in the EU was for water heating in the residential sector.

Energy mix for operational water heating modelling							
Energy source	Share, %						
Solid fossil fuels and peat	8.97						
Natural gas	22.18						
Oil and petroleum products	16.78						
Renewables and biofuels	11.84						
Electricity	13.79						
Heat	26.44						
Total	100						
Corresponding GWP	346 g CO ₂ -eq/kWh						

Differences versus previous versions

This is the first version of the EPD so there are no differences versus previous versions of the EPD.

References

Cordella Mauro, Garbarino Elena, Calero Maria, Mathieux Fabrice, Wolf Oliver. (2014) MEErP preparatory study on taps and Showers. Final report EUR 26939 EN. European Commission Joint Research Centre.

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