Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

Product group: **Garden valve** according to reference product 431015

from

Oras Group

Programme:	The International EPD® System, www.environdec.com
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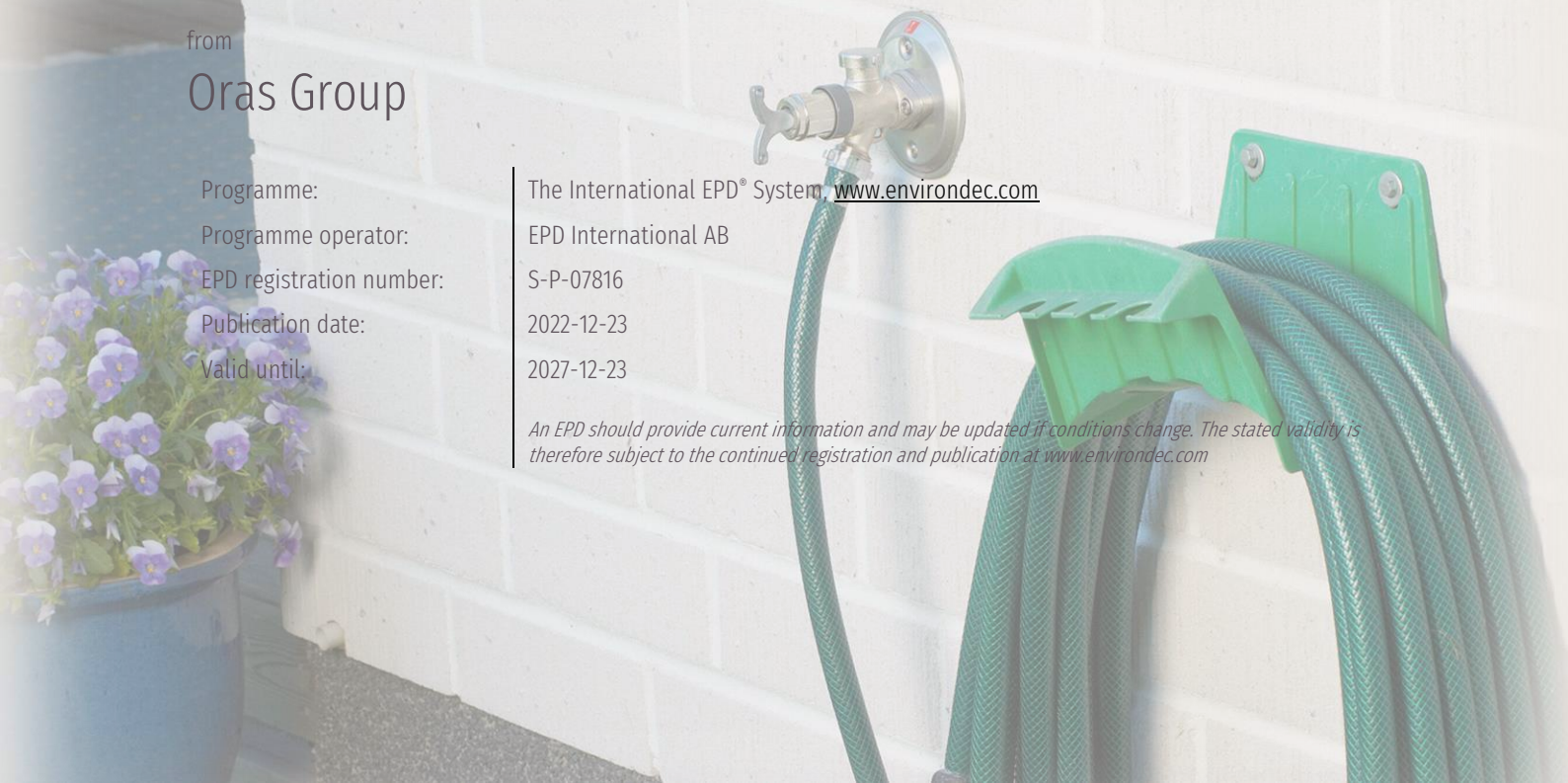
An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



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 and independent, third-party verification	
Product Category Rules (PCR)	CEN standard EN 15804 serves as the Core Product Category Rules (PCR) Product Category Rules (PCR): Construction products, 2019:14, version 1.2.5, UN CPC 42911 - Sinks, washbasins, baths and other sanitary ware and parts thereof, of iron, steel, copper or aluminium. 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.
Life Cycle Assessment (LCA)	LCA accountability: Aleksi Laurila, Environmental consultant. Organization: Ecobio Oy.
Third-party verification	Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Hannu Karppi, Ramboll Finland Oy  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

Owner of the EPD	Oras Group
Contact	Phone: +358 2 83 161 Email: info@orasgroup.com www.orasgroup.com
Description of the organisation	Oras Group is a significant European provider of sanitary fittings: the market leader in the Nordics and a leading company in Continental Europe. The company's mission is to create the smartest water experiences for everyone and its vision is to become the Perfect Flow Company. The Group has two strong brands, Oras and Hansa. Oras Group is owned by Oras Invest, a family company, and an industrial owner. The domicile of Oras Ltd, the parent company of the Group, is located in Rauma, Finland, and the Group has three manufacturing sites: Kralovice (Czech Republic), Olesno (Poland) and Rauma (Finland). The Group operates with its own staff in 17 markets. Oras Group's net sales were 233.5 million euros in 2021 and at the end of the period the company employed 1255 people.
Product-related or management system-related certifications	Designation according to standard EN 1111
Management system related certifications	ISO 9001:2015 ISO14001:2015 ISO 45001: 2018 ISO 50001:2018
Name and location of production sites	Oras Group Rauma production site Isometsäntie 2, FI 26101 Rauma, Finland Oras Group Olesno production site Ul. Leśna 2, PL 46-300 Olesno, Poland Oras Group Kralovice production site Zatecka 888, CZ 33141 Kralovice, Czech Republic

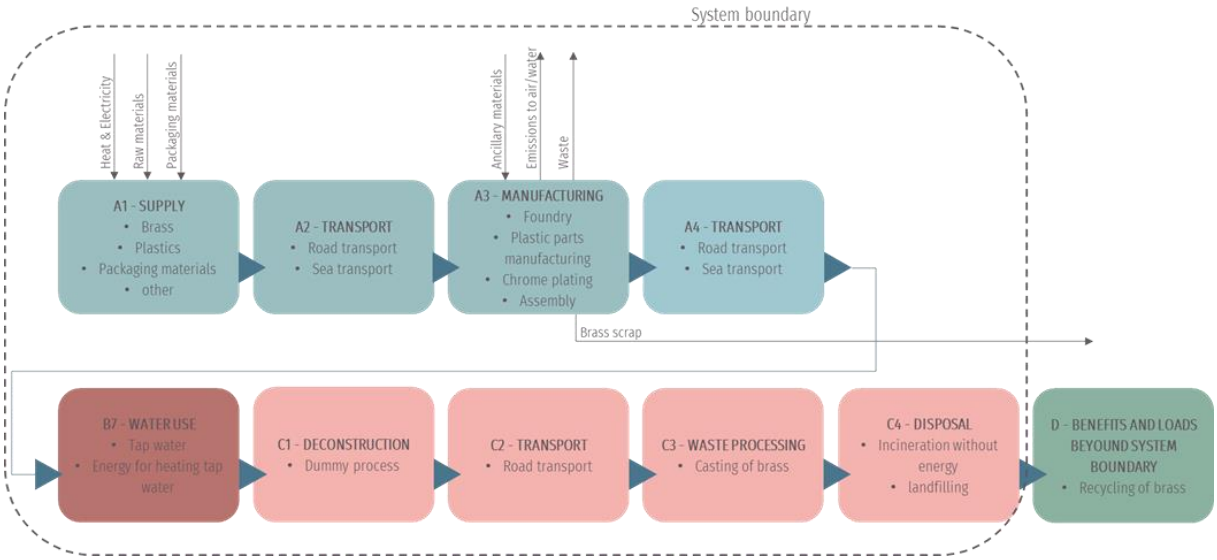
Product group information

Product group name	Garden valve
Product group EPD development criterion	This EPD covers garden valves product group. Worst-case scenario approach was applied while developing the EPD. Share of brass (%) from the net weight of the product was selected as the indicator for determining worst-case product within the product group. LCIA profile presented in this EPD is based on a product that has the highest share of brass (%) from mass perspective within the product group.
Product group identification	Frost resistant taps for outdoor use according to EN 17821
Product group description	Oras Group products are manufactured in our own European factories by focusing into sustainable energy sources, highly efficient processes and minimized material usage and waste. Faucets include built-in features for water flow and temperature limitation to ensure sustainable product life cycle with efficient use of energy.
UN CPC code	42911 - Sinks, washbasins, baths and other sanitary ware and parts thereof, of iron, steel, copper or aluminium
Geographical scope	Europe
Included products	Reference product is 431015. The EPD covers products listed at the end of the EPD document.

LCA information

Functional unit / declared unit	1 kg of Garden valve
Reference service life	The reference service life for garden valve is 10 years. The technical service life for garden valve is 15 years.
Time representativeness	The data was collected covering production year 2020, which is considered to represent average production year for garden valves. The material declarations used as a basis for modelling the raw material supply are compiled in 2022.
Databases and LCA software	Ecoinvent 3.8 and SimaPro (Version 9.4.0.2).
Description of system boundaries	Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and additional modules). The additional modules are A4 and B7.

System diagram



LCA practitioner	Ecobio Oy, www.ecobio.fi
Allocation	Co-product allocation was applied for the brass scrap that is produced from the foundry process. Economic co-product allocation was applied based on the hierarchy presented for co-product allocation on the EN 15804:2012+A2:2019.
Electricity used in module A3	The electricity used in module A3 accounts for more than 30 % of the total energy consumption in modules A1-A3. Therefore, the used energy sources for electricity production and climate change impact of the electricity mix are stated. At Rauma production site the electricity is 100 % based on hydropower. GWP-GHG impact of the used electricity mix is 5,4 g CO_2-eq/kWh. At Olesno manufacturing facility the electricity is based on biomass and biogas 5,90 %, hydropower 1,72 %, wind 11,85 %, solar (PV) 0,45 %, coal 47,61 %, lignite 23,59 % and natural gas 8,88 %. GWP-GHG impact of the used electricity mix is 694,0 g CO2-eq/kWh. At Kralovice manufacturing facility the electricity is based on coal 40,83 %, nuclear 42,06 %, natural gas 10,35 %, biomass 4,43 %. GWP-GHG impact of the used electricity mix is 850,0 g CO2-eq/kWh.
Information about scenarios and additional technical information	The scenario for operational water use is described on chapter “Additional Information”.

Modules declared

Geographical scope, share of specific data (in GWP-GHG indicator) and 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	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	x	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x	x
Geography	EU27	EU27	EU27	EU27	-	-	-	-	-	-	-	EU27	EU27	EU27	EU27	EU27	EU27
Specific data used	> 90 %					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	< 10 %					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	47 %					-	-	-	-	-	-	-	-	-	-	-	-

Modules explained

LCA Modules	
A1 Raw material supply	**C1 De-construction**
This module contains the supply of raw materials including brass, stainless steel, plastics, rubbers and other materials in smaller quantities.	This module is assumed to not cause environmental impacts as the de-construction of garden valve can be done with manual labour and does not require external energy sources.
A2 Transportation	**C2 Transport**
This module contains the transportation of raw materials and prefabricated components from suppliers to Oras Group's production facilities. Average transportation route covering all the relevant raw materials was developed as there is wide range of possible supply locations even for single raw materials and components. Transportation takes place by road and sea.	This module contains the transportation of product for waste processing to nearest waste processing facility. Transportation is done by road and the distance is assumed to be 50 km.
A3 Manufacturing	**C3 Waste processing**
This module contains the relevant production processes for garden valves. The most relevant processes are casting in foundry, production of plastic parts and chrome-plating of brass and plastic parts. Treatment of waste and wastewater are also included. The used electricity mix for manufacturing stage is stated on chapter "LCA Information".	This module contains the waste processing related to material recycling of brass. It is assumed that 90 % of the brass is headed for material recycling process, which includes casting of brass into brass ingots.
A4 Transport	**C4 Disposal**
This module contains the transportation of the final product to warehouses from where further distribution takes place. Both truck and ferry transportation are included. Transportation distance is 486-1 074 km by road and 0-123 km by sea depending on the location of the warehouse. The scenario does not included transportation to construction site.	This module contains final disposal of materials that are not headed for material or energy recovery. Stainless steel, plastic components, rubber components, packaging materials of the final product and 10 % of brass are assumed to be headed for incineration without energy recovery. Other components in smaller quantities are assumed to be headed to landfill.
B7 Operational water use	**D Benefits and loads beyond system boundary**
This module contains the production and wastewater treatment of tap water related to the use of garden valve. The scenario for operational water use is described more precisely on chapter "Additional Information".	This module contains the benefits related to material recycling of brass. Brass is recycled through casting process, and it is assumed to substitute virgin brass production from the market

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%
Aramide	0,0028	0 %	0 %
Brass	0,6832	0 %	0 %
Copper	0,2570	0 %	0 %
Ethylene propylene diene monomer	0,0025	0 %	0 %
Polypropylene	0,0009	0 %	0 %
Stainless steel	0,0094	0 %	0 %
Svhc	0,0091	0 %	0 %
Zinc	0,0351	0 %	0 %
TOTAL	1,0000	0 %	0 %
Packaging materials	**Weight, kg**	**Weight-% (versus the product)**	
Carton	0,0049	0,49 %	
Polyamide	0,0019	0,19 %	
Paper	0,0076	0,76 %	
Polyethylene	0,0181	1,81 %	
Sharp tear	0,0001	0,01 %	
TOTAL	0,0325	3,25 %	

The products do not contain substances which exceed the limits for registration with the European Chemicals Agency regarding the “Candidate List of Substances of Very High Concern for authorization”. The products contain one substance of the “list of substances of very high concern (SVHC)”. The substance is lead as a composition in brass alloys up to 3,5% while still complying to the EU Drinking Water Directive (DWD) and 4 MSI positive list for metallic materials.

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results per 1 kg of Garden valve												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	B7	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	4,34E+00	2,48E-01	8,63E-02	4,67E+00	1,29E-01	6,99E+01	0,00E+00	1,07E-02	9,82E-03	5,60E-02	-3,40E+00
GWP-biogenic	kg CO2 eq.	4,83E-02	1,64E-04	-1,36E-02	3,49E-02	1,11E-04	1,45E+00	0,00E+00	1,03E-05	1,24E-03	5,69E-02	-2,19E-02
GWP-luluc	kg CO2 eq.	1,27E-02	1,16E-04	1,29E-04	1,29E-02	5,21E-05	1,21E-01	0,00E+00	5,04E-06	3,10E-06	4,87E-06	-7,52E-03
GWP-total	kg CO2 eq.	4,40E+00	2,48E-01	7,28E-02	4,72E+00	1,29E-01	7,14E+01	0,00E+00	1,07E-02	1,11E-02	1,13E-01	-3,42E+00
ODP	kg CFC 11 eq.	2,62E-07	5,54E-08	2,69E-09	3,21E-07	2,97E-08	4,67E-06	0,00E+00	2,41E-09	1,20E-09	1,64E-09	-1,92E-07
AP	mol H+ eq.	2,90E-01	2,57E-03	3,77E-04	2,93E-01	6,85E-04	3,90E-01	0,00E+00	4,26E-05	2,30E-05	5,48E-05	-2,47E-01
EP-freshwater	kg P eq.	8,24E-03	5,32E-06	1,03E-05	8,25E-03	3,00E-06	1,87E-02	0,00E+00	2,98E-07	7,12E-07	6,17E-07	-7,27E-03
EP-marine	kg N eq.	1,85E-02	6,75E-04	8,48E-05	1,92E-02	1,97E-04	7,51E-02	0,00E+00	1,24E-05	6,50E-06	9,29E-05	-1,27E-02
EP-terrestrial	mol N eq.	2,62E-01	7,45E-03	8,61E-04	2,71E-01	2,16E-03	7,13E-01	0,00E+00	1,35E-04	7,61E-05	2,17E-04	-1,74E-01
POCP	kg NMVOC eq.	6,63E-02	2,05E-03	3,19E-04	6,86E-02	6,37E-04	2,33E-01	0,00E+00	4,16E-05	2,14E-05	7,09E-05	-4,77E-02
ADP-minerals&metals *	kg Sb eq.	7,91E-03	7,45E-07	3,69E-07	7,91E-03	4,36E-07	3,46E-04	0,00E+00	4,88E-08	4,43E-08	2,92E-08	-6,14E-03
ADP-fossil*	MJ	6,07E+01	3,62E+00	1,94E+00	6,63E+01	1,94E+00	1,20E+03	0,00E+00	1,60E-01	1,54E-01	1,10E-01	-4,23E+01
WDP	m3	5,11E+00	1,00E-02	2,84E-02	5,15E+00	5,70E-03	9,13E+03	0,00E+00	5,30E-04	7,46E-04	-2,24E-03	-4,30E+00
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption											

** 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 and voluntary indicators

Results per 1 kg of Garden valve												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	B7	C1	C2	C3	C4	D
GWP-GHG[1]	kg CO2 eq.	4,46E+00	2,48E-01	8,69E-02	4,79E+00	1,29E-01	7,03E+01	0,00E+00	1,07E-02	9,88E-03	8,72E-02	-3,42E+00

Use of resources

Results per 1 kg of Garden valve												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	B7	C1	C2	C3	C4	D
PERE	MJ	1,87E+01	4,53E-02	4,79E-01	1,92E+01	2,67E-02	1,65E+02	0,00E+00	2,70E-03	4,08E-02	4,26E-03	-1,11E+01
PERM	MJ	0	0	0	0	0	0	0	0	0	0	0
PERT	MJ	1,87E+01	4,53E-02	4,79E-01	1,92E+01	2,67E-02	1,65E+02	0,00E+00	2,70E-03	4,08E-02	4,26E-03	-1,11E+01
PENRE	MJ	6,07E+01	3,62E+00	1,94E+00	6,63E+01	1,94E+00	1,20E+03	0,00E+00	1,60E-01	1,54E-01	1,10E-01	-4,23E+01
PENRM	MJ.	0	0	0	0	0	0	0	0	0	0	0
PENRT	MJ	6,07E+01	3,62E+00	1,94E+00	6,63E+01	1,94E+00	1,20E+03	0,00E+00	1,60E-01	1,54E-01	1,10E-01	-4,23E+01
SM	kg	0	0	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	m3	1,29E-01	3,66E-04	6,97E-04	1,30E-01	2,12E-04	2,13E+02	0,00E+00	2,02E-05	1,41E-04	1,31E-05	-1,06E-01
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water											

[1] The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

Waste production and output flows

Waste production

Results per 1 kg of Garden valve												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	B7	C1	C2	C3	C4	D
Hazardous waste disposed	kg	1,93E-03	8,27E-06	1,33E-04	2,07E-03	4,93E-06	2,11E-03	0,00E+00	4,29E-07	1,96E-07	2,70E-07	-1,73E-03
Non-hazardous waste disposed	kg	1,59E+00	1,52E-01	6,65E-03	1,74E+00	9,60E-02	1,58E+01	0,00E+00	6,78E-03	1,27E-02	4,57E-02	-1,33E+00
Radioactive waste disposed	kg	3,13E-04	2,45E-05	1,73E-06	3,39E-04	1,31E-05	7,19E-03	0,00E+00	1,07E-06	6,67E-07	6,10E-07	-1,56E-04

Output flows

Results per 1 kg of Garden valve												
Indicator	Unit	A1	A2	A3	Tot.A1-A3	A4	B7	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0	0
Material for recycling	kg	0	0	0	0	0	0	0	0	0,615	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0	0	0	0	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0	0	0	0	0	0	0	0

Information on biogenic carbon content

Results per 1 kg of Garden valve		
BIOGENIC CARBON CONTENT	**Unit**	**QUANTITY**
Biogenic carbon content in product	kg C	0,0000
Biogenic carbon content in packaging	kg C	0,0063

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

Additional information

The scenario for module B7 “Operational water use” is based on expert analysis of Oras Group regarding the use pattern of garden valve. This approach was applied as there is currently no use stage scenario available for garden valve by Unified Water Label (UWL), which is a product label developed by European bathroom industry to demonstrate water and energy efficiency of bathroom products. The following parameters were applied when developing the scenario related to operational water use.

Parameter	Amount	Unit
Reference flow	12	l/min
Use cycles per day	1	use cycles/day
Length of use cycle	10	min
Use cycles per year	180	days
Cold water temperature	15	ºC
Hot water temperature	No use of hot water	ºC
Heat coefficient of water	4,18	kJ/kgK
Density of water	0,981	kg/l
Length of the use stage	10	years

The annual water consumption according to the parameters stated above is 21 600 l. It is assumed that the garden valve only uses cold water. The scenario for operational water use covers 10 years which is the reference service life for garden valves.

Operational water use scenario

The scenario for operational water use covers the water consumption related to use of garden valve for 10 years. The scenario presented in this EPD is an estimation of the potential environmental impacts related to the use stage of garden valve and the scenario aims to emphasize the significance of the use stage in relation to the products life cycle. In reality, the environmental impacts arising from the use stage of the product are very dependent on behavior of the user and nominal flow of the product.

Differences versus previous versions

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

References

Ecobio LCA report – Faucet products. Oras Group. 2022.
General Programme Instructions of the International EPD® System. Version 4.0.
MEErP Preparatory Study on Taps and Showers. European Comission. 2014.
PCR 2019:14. Construction products. Version 1.2.5.

EPD®

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Included products

431415	Garden valve, DN15
431520	Garden valve, DN20
69509101	Garden valve
431420	Garden valve, DN20
431015	Garden valve, DN15
431515	Garden valve, DN15