Environmental Self-Declaration
Type II Environmental Declaration

Based on ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Damper Actuator

Self-declaration of multiple products, based on the average results of the product group

Covered Products:

GM Series

Products are specified on page 4

from

Belimo Automation AG

GENERAL INFORMATION

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *PCR 2019:14 Construction Products, Version 2.0.1, 2025-06-05 (valid until 2030-04-07).*
PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/contact

The self-declaration owner has the sole ownership, liability, and responsibility for the self-declaration.

For two Environmental Declarations, based on EN 15804+A2, to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); and apply identical impact assessment methods (including the same version of characterisation factors).

For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT THE DECLARANT

Owner of the Environmental Declaration:
Belimo Automation AG

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Description of the organisation:
Belimo is the global market leader in the development, production, and sales of field devices for the energy-efficient control of heating, ventilation, and air-conditioning (HVAC) systems. The focus of its core business is on damper actuators, control valves, sensors and meters. Belimo actuators control air dampers and valve positioning in HVAC systems, ensuring precise airflow and temperature control. The Company provides a wide range of control valves (e.g., pressure-independent valves) used for heating and cooling systems. Its sensors monitor air quality, temperature, humidity, and pressure, and are crucial for modern building automation. With decades of experience, Belimo is recognized as a leading innovator in HVAC control solutions with numerous patents and several industry-first proprietary technologies introduced to the market over the past 50 years. Belimo's product portfolio is designed to improve energy efficiency and longevity and is continuously optimized to this end.

Belimo's main markets are: Americas, EMEA (Europe, Middle East, and Africa) and Asia-Pacific.

Product-related or management system-related certifications:
Belimo is committed to maintaining its certifications in accordance with the international standards for environmental management (ISO 14001), quality management (ISO 9001), and occupational health and safety (ISO 45001). Belimo sites undergo regular audits from the Swiss Association for Quality and Management Systems (SQS) and the China Quality Certification Center (CQC) in China.

PRODUCT INFORMATION

Product name:

This Environmental Declaration contains information for the **average** of 26 models of the **GM series**, including the following:

GM24.13	GM24S.28	GM24SR.1B	GM230.18
GM24.14	GM24S.29	GM24SR.1D	GM230.1F
GM24.17	GM24S.2A	GM24SR.36	GM230.20
GM24.19	GM24SR.10	GM120.2C	GM230S.29
GM24.1A	GM24SR.11	GM120S.27	GM230S.2A
GM24.1E	GM24SR.12	GM230.13	
GM24.2D	GM24SR.15	GM230.14	

Since the declared products are newly launched and no sales volume data exist, they have been averaged with a simple (arithmetic) average.

Image of product:

The GM series products are similar in physical appearance. Here is an illustration example of GM

Illustration: GM24.13, GM24SR.12, GM230.13.

CONTENT DECLARATION

The mass (weight) of one unit of a product, as purchased or per declared unit:
1539 g or 1.54 kg (averaged over range 1420 - 1732 g)

Content of the product in the form of a list of materials and substances, and their mass:

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/ product or declared unit
Adhesive	1.0	0	0	0
Brass	1.7	50	0	0
Cable	80.0	0	0	0
Copper	0.3	50	0	0
Electronics	35.8	0	0	0
Motor	35.8	0	0	0
Other Plastics	14.5	0	0	0
Plastic (PA)	30.9	0	0	0
Plastic (PC)	205.7	0	0	0
Plastic (PE)	1.2	0	0	0
Plastic (POM)	20.1	0	0	0
Rubber, synthetic	0.3	0	0	0
Steel (alloy)	99.2	50	0	0
Steel (carbon)	52.9	50	0	0
Steel (galvanized)	453.7	50	0	0
Steel (sintered)	243.7	50	0	0
Steel (stainless)	44.7	50	0	0
Zinc	217.0	50	0	0
TOTAL	**1,539**	-	-	-

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
HDPE Plastic pallet, one-way	20	1.3	0
Corrugated board box	188	13	92
Kraft paper	180	12	88
TOTAL	**388**	-	**180**

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO_2.

The mass and the content of distribution and/or consumer packaging:
Displayed on the table above. The pallet is a one-way pallet as it is unknown where it ends downstream. Therefore, it is modelled as a single use in the LCA. It is assumed that 270 kg of products are transported on a 3.6 kg pallet.

The declared share of biogenic/recycled materials:
There is no biogenic content in the product. The product packaging is made of virtually 100% biogenic material neglecting the minor amount of tape and label. The packaging consists of corrugated cardboard box and kraft paper filler. There is no biogenic content in the plastic pallet. The biogenic content is declared in the content declaration table below.

CONTENT DECLARATION

Regarding the metals used in the product, suppliers provided documented data on the recycled content from their own suppliers, ranging from 0 - 50%. Of this, 100% is post-consumer recycled content. No other material has a documented recycled material content.

The content declaration applies for the average product which includes all relevant materials representative for the entire product group.

Information on the environmental and hazardous/toxic properties of substances contained in the product:
Some substances in the candidate list of Substances of Very High Concern (SVHCs), contained in the product exceed the limits for registration with the European Chemicals Agency, i.e. more than 0.1% of the weight of any component of the product, specifically electronic parts of the PCBA. Compared to the entire product weight the concentration of substances is negligible and does not pose any health risk to installers and users.

The table below displays an aggregated overview of the individual different substances found in each part of the product with an indication of their total share of the product. The amounts are averaged over all products studied. For further details please refer to the SCIP database: https://echa.europa.eu/de/scip-database.

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product or declared unit
Lead	231-100-4	7439-92-1	<< 0.1
Lead monoxide	215-267-0	1317-36-8	<< 0.1
Lead titanium dioxide	235-038-9	12060-00-3	<< 0.1
Diboron trioxide	215-125-8	1303-86-2	<< 0.1
Bis(2-ethylhexyl)tetrabromophthalate	247-426-5	26040-51-7	<< 0.1

Other information on substances with hazardous and toxic properties:
A granular overview of substances is provided in the table below. It explains the range of compounds within each component and for all grouped products. None of the substances can be a direct concern for human health and/or the environment, since they are an integral part of the parts sealed in the product. Thus, no safety instructions are necessary.

Product part	Unit mass (g)	Substance	CAS No.	Mass-% per product part
Electronics, Capacitor surface-mounted	0.00155	Lead titanium dioxide	12060-00-3	> 0.1
Electronics, Diodes	0.192	Lead	7439-92-1	> 0.1
Electronics, Resistors	0.002055385	Lead monoxide	1317-36-8	> 0.1
Electronics, Resistors	0.05308	Lead	7439-92-1	> 0.1
Electronics, Resistors	0.002963	Diboron trioxide	1303-86-2	> 0.1
Electronics, Transistors	0.03093	Lead	7439-92-1	> 0.1
Steel (carbon)	53.2	Lead	7439-92-1	> 0.1
Cable	115.6	Bis(2-ethylhexyl)tetrabromophthalate	26040-51-7	> 0.1

LCA INFORMATION

Declared unit:
1 piece of product

Conversion factor to mass:
1539 g or 1.54 kg (averaged over range 1420 - 1732 g)

Reference service life:
15 years

Time representativeness:
The data for the manufacture of the products is based on engineering bills of materials, since the product has not yet been marketed.

Geographical scope:
Purchased materials are sourced in Europe and globally, and manufacturing takes place in Switzerland. Baseline geographical scope for the use stage and end-of-life stages is defined as Global, to remain conservative. A European scenario is presented for the use-stage too.

Physical material properties of product:
Please refer to the table in chapter “Additional Environmental Information”, as well as our website https://www.belimo.com/ch/de_CH and the belonging technical data sheets.

Variation:
The minimum, maximum and average of core environmental results is calculated. The variation table can be seen at the end of the result chapter. The calculated variation is indicated in the module declaration table below.

Database(s) and LCA software used:
SimaPro Craft 10.2.0.2 with Ecoinvent v.3.11 database. EN 15804 reference package based on EF 3.1 has been used for all declared environmental performance indicators.

Description of system boundaries:
The type of Environmental Declaration is Cradle to gate (A1-A3) with options (A5 and B6), modules C1-C4, and module D. The system boundaries and modules are described below.
B6* and C3*/C4*/D* are introduced as scenarios mostly attributed to European practice and are presented further below.

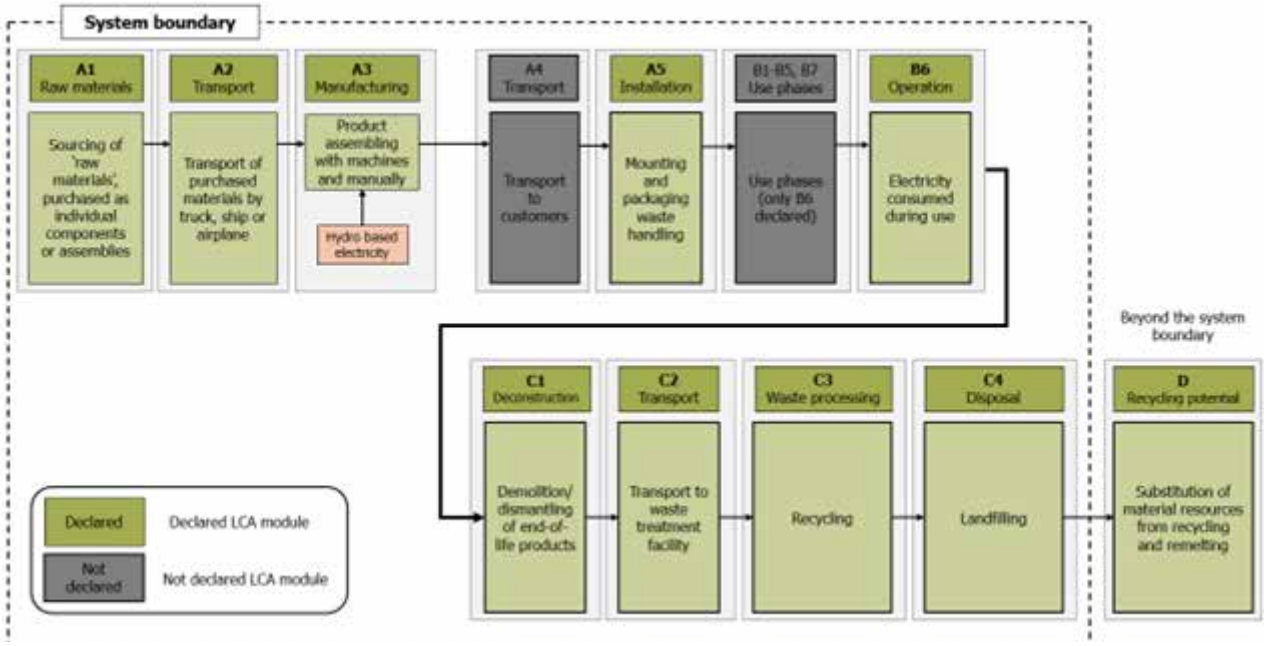
LCA INFORMATION

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	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	ND	x	ND	ND	ND	ND	ND	x	ND	x	x	x	x	x
Geography	GLO	GLO	CH	-	GLO	-	-	-	-	-	GLO	-	GLO	GLO	GLO	GLO	GLO
Share of primary data	>99%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	29%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

"X" = Declared Modules. "ND" = Not Declared modules/processes/life-cycle stages

Process flow diagram:



LCA INFORMATION

A1-A3 (Product stage):
Modules A1-A3 cover the supply of purchased materials, their transport to Belimo, and final manufacturing. Components are sourced globally and transported by road, sea, and air. Final assembly takes place at Belimo's production facility, mainly using manual labor and electricity certified as European hydropower (0.0124 kg CO_2e/kWh). Energy consumption (electricity and district heating) includes both production and office operations. Products are packed in corrugated cardboard boxes and kraft paper, stacked on one-way HDPE pallets, and prepared for shipment.

A5 (Construction stage):
Module A5 covers packaging waste generated during installation. Corrugated cardboard and kraft paper are assumed to be landfilled with construction waste, while plastic pallets are assumed to be recycled into higher-value products. Related flows are reported in Module D. Installation itself is excluded, as it is performed manually or with negligible-impact tools.

B6 / B6** (Use stage):
Module B6 accounts for electricity consumption during product operation. Impacts depend on the electricity mix, operating hours, and idle time. Calculations assume a 15-year service life but can be scaled for other lifetimes. For the products studied the operating time ranges between 2.0 - 5.5 W, 20% of the year (conservative), while the standby effect between 0.2 - 0.6 W, 80% of the year.
- **B6:** Global average electricity mix.
- **B6**:** European average electricity mix.

C1-C4 (End-of-life stage):
No incineration scenario is introduced as it is not relevant for the end-of-life treatment of such construction products. The waste management practice of Europe and other global markets (Americas, Africa, Middle East, Asia Pacific) may differ. Therefore, two scenarios are presented:

Global scenario (C1-C4):
- **C1:** Demolition with heavy machinery. Belimo products are negligible relative to building mass. Thus, impacts are declared as 0.
- **C2:** 100 km transport by 7.5-16 t EURO 5 lorry (50% load factor).
- **C3:** 0 (no recycling).
- **C4:** 100% landfill with mixed demolition waste.

European scenario (C1-C4*):
- **C1:** Selective dismantling with source separation, manually or with tools. Impacts negligible, thus declared as 0.
- **C2:** Same as above (100 km lorry transport).
- **C3*:** Modern recycling facility.
  - Metals (ferrous/non-ferrous): 100% recycled.
  - Plastics: sorted; complex plastics (e.g. glass-reinforced) incinerated.
  - Cables: recycled, with metals recovered (60%), plastic incinerated (40%).
  - PCBAs: recycled, with metals recovered (40%), resin incinerated (60%).
  - Motor: recycled, with metals recovered (~65%), magnet and rare earths are not recovered and become slag (~30%) (cut-off), eject incinerated (~5%) (cut-off).
  - Other ejects are incinerated with energy recovery and reported in C3*.
- **C4*:** 0 (no landfill).

Both scenarios are declared separately. Users may apply either one or combine them into an average, depending on the regional context.

LCA INFORMATION

D / D* (Benefits and loads beyond system boundary):

Scope:

- Declares net flows of secondary materials and energy leaving the product system that fulfil end-of-waste.
- **D:** credits from pallet recycling in A5
- **D*:** credits from pallet recycling in A5 + fractions recycling in C3*.

Materials recovered in C3*, credited in D*:

- **Metals (ferrous, non-ferrous, cable metals, PCBA metals):**
  - Supplier data: **0 - 50% recycled content**.
    - Conservative assumption: **50% recycled content**.
  - Substitution is limited to virgin fraction only.
  - **100% substitution rate** for virgin fraction.
- **Plastics:**
  - **100% virgin**.
  - **90% substitution rate** due to downgrading (to achieve functional equivalence).
- **Cables:** 60% metals recycled; 40% plastics incinerated.
- **PCBAs:** 40% metals recycled; 60% resin eject incinerated.

Processing burdens added in D*:

- Recovery requires further treatment after recycling and before functional equivalence.
  - Polymers: regranulation to flakes
  - Metals: remelting/smelting in steelworks

Energy recovery from incineration (C3* ejects):

- Ejects: non-recyclable plastics + PCBA resin fractions.
- Credit based on calorific value of polymers and resins.
- Substitution: **global average electricity mix + district heat**.
- Conservative energy recovery efficiencies applied:
  - **0.2** (electricity).
  - **0.5** (heat).

Credit calculation principle (for each material fraction):

- Virgin equivalent mass = recovered mass × (1 – recycled content).
- Substituted mass = virgin equivalent mass × substitution rate.
- Credit = substituted mass × impact of virgin production.
- Burden = recovered mass × processing burden.
- Net credit = credit – burden + incineration energy credit.

More information:

Recycled material is not directly used in Belimo products during manufacturing. No co-products or significant waste flows arise during production. The only known recycled material that enters the production system is partly recycled metal parts from the global market, whose burden has already been accounted for during LCA modelling.

LCA INFORMATION

Data quality:
In general, most datasets used are applied as generic Ecoinvent datasets. Belimo has invested effort into collecting meticulous data and refining certain generic datasets.

Overall:

- **A1:** Detailed bills of material for all used PCBA types were acquired, and Belimo's specific PCBAs have been modelled with accurate data, in terms of PCB composition, assembly composition (soldered parts), IC chip composition and energy used to produce the IC and wafer as its main component. The quality of this data is high.

- **A2:** Known transport distances and modes for all articles in the reference year are collected, and some estimations of long-haul transport mixes are made for first-leg transport. Second-leg transport is not included as it requires much effort, though it would enable a more accurate emission profile. However, this was not prioritized as vast majority of the impacts are in A1 and especially B6 modules.

- **A3:** Exact mix of the types of hydro power technologies from the country of origin, and exact data on product packaging and their characteristics make this data high quality, although the impact is minimal.

The product composition and calculation data are provided by engineering bills of materials. Mass balance checks are performed between weighted products and calculated component masses. All deviations range between 0.6 - 3.3% across the studied products. This is considered robust data quality in terms of certainty.

No EPDs have been available for direct use as third party verified supplier data inputs in this study. Nevertheless, in the given situation, the customized datasets provide a high level of accuracy and thereby quality.

The table below indicates the difference of primary and secondary data used in the study. In accordance with PCR 2019:14, *primary data* refers to activity data collected directly from the manufacturer or suppliers (e.g. amounts of raw materials, energy use, transport distances and modes, waste streams). *Secondary data* refers to generic datasets used where no site- or supplier-specific information was available. Background LCI datasets (e.g. from Ecoinvent) are always applied, but when based on measured activity data they are considered **primary** in this table. Only processes for which no primary activity data exist are classified as secondary.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Purchase of materials	Collected data	Belimo	2025	Primary data	96%
Transport of materials to manufacturing site	Collected data	Belimo	2025	Primary data	4%
Packaging use	Collected data	Belimo	2025	Primary data	~0%
Energy used in manufacturing	Collected data	Belimo / Certifying company	2025	Primary data	~0%
Total share of primary data, of GWP-GHG results for A1-A3					100%

The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between Environmental Declarations. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per declared unit													
Indicator	Unit	A1-A3	A5	B6	B6*	C1	C2	C3	C4	D	C3*	C4*	D*
GWP-total	kg CO_2 eq.	9.26E+00	2.97E+00	8.36E+01	4.00E+01	0.00E+00	3.90E-02	0.00E+00	9.63E-03	-4.57E-02	3.34E-01	0.00E+00	-2.64E+00
GWP-fossil	kg CO_2 eq.	9.90E+00	2.31E+00	8.34E+01	3.99E+01	0.00E+00	3.90E-02	0.00E+00	9.63E-03	-4.57E-02	3.34E-01	0.00E+00	-2.64E+00
GWP-biogenic	kg CO_2 eq.	-6.61E-01	6.61E-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
GWP-luluc	kg CO_2 eq.	2.54E-02	1.33E-03	1.78E-01	1.18E-01	0.00E+00	1.70E-05	0.00E+00	5.52E-06	-2.20E-05	1.29E-04	0.00E+00	-3.50E-03
ODP	kg CFC 11 eq.	2.86E-07	6.42E-08	5.91E-07	7.41E-07	0.00E+00	4.81E-10	0.00E+00	2.68E-10	-2.29E-09	4.58E-10	0.00E+00	-9.52E-08
AP	mol H^+ eq.	1.19E-01	1.61E-02	4.43E-01	2.30E-01	0.00E+00	1.30E-04	0.00E+00	6.74E-05	-1.27E-04	3.71E-04	0.00E+00	-2.36E-02
EP-freshwater	kg P eq.	1.14E-02	2.04E-04	4.23E-02	3.83E-02	0.00E+00	4.26E-06	0.00E+00	8.42E-07	-7.25E-06	3.14E-05	0.00E+00	-7.62E-03
EP-marine	kg N eq.	2.43E-02	6.20E-03	8.51E-02	3.66E-02	0.00E+00	4.03E-05	0.00E+00	2.59E-05	-2.79E-05	1.08E-04	0.00E+00	-5.24E-03
EP-terrestrial	mol N eq.	1.57E-01	6.77E-02	8.57E-01	3.24E-01	0.00E+00	4.38E-04	0.00E+00	2.83E-04	-2.85E-04	9.75E-04	0.00E+00	-6.38E-02
POCP	kg NMVOC eq.	5.06E-02	2.44E-02	2.55E-01	1.04E-01	0.00E+00	1.73E-04	0.00E+00	1.02E-04	-2.48E-04	2.70E-04	0.00E+00	-1.72E-02
ADP-minerals&metals*	kg Sb eq.	2.34E-03	3.39E-06	5.08E-04	5.38E-04	0.00E+00	1.27E-07	0.00E+00	1.40E-08	-2.42E-07	6.89E-08	0.00E+00	-4.14E-04
ADP-fossil*	MJ	1.40E+02	5.65E+01	1.12E+03	9.19E+02	0.00E+00	5.31E-01	0.00E+00	2.36E-01	-1.53E+00	8.61E-01	0.00E+00	-4.52E+01
WDP*	m^3	5.32E+00	2.51E+00	1.91E+01	2.23E+01	0.00E+00	2.88E-03	0.00E+00	1.05E-02	-9.67E-03	1.89E-02	0.00E+00	-1.85E+00

**Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*

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

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.
The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

If biogenic carbon leaving the product system in module A5 (see Annex 2 of PCR) or recovered energy leaving the product system in modules A5 or C (see Annex 3 of PCR) have been balanced out already in modules A1-A3, a statement in this regard shall be included.

Additional mandatory and voluntary impact category indicators

Results per declared unit													
Indicator	Unit	A1-A3	A5	B6	B6*	C1	C2	C3	C4	D	C3*	C4*	D*
GWP-GHG	kg CO_2 eq.	9.92E+00	2.31E+00	8.36E+01	4.00E+01	0.00E+00	3.90E-02	0.00E+00	9.63E-03	-4.57E-02	3.34E-01	0.00E+00	-2.64E+00

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 CO_2 is set to zero.

ENVIRONMENTAL PERFORMANCE

Resource use indicators

Results per declared unit													
Indicator	Unit	A1-A3	A5	B6	B6*	C1	C2	C3	C4	D	C3*	C4*	D*
PERE	MJ	2.61E+01	5.43E-01	1.77E+02	2.48E+02	0.00E+00	7.77E-03	0.00E+00	2.20E-03	-3.12E-02	1.09E-01	0.00E+00	-5.35E+00
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	0.00E+00	0.00E+00
PERT	MJ	2.61E+01	5.43E-01	1.77E+02	2.48E+02	0.00E+00	7.77E-03	0.00E+00	2.20E-03	-3.12E-02	1.09E-01	0.00E+00	-5.35E+00
PENRE	MJ	1.40E+02	5.65E+01	1.12E+03	9.19E+02	0.00E+00	5.31E-01	0.00E+00	2.36E-01	-1.53E+00	8.61E-01	0.00E+00	-4.52E+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	0.00E+00	0.00E+00
PENRT	MJ	1.40E+02	5.65E+01	1.12E+03	9.19E+02	0.00E+00	5.31E-01	0.00E+00	2.36E-01	-1.53E+00	8.61E-01	0.00E+00	-4.52E+01
SM	kg	5.22E-01	1.40E-02	1.65E-01	1.48E-01	0.00E+00	2.22E-04	0.00E+00	5.86E-05	-2.21E-04	1.26E-04	0.00E+00	3.39E-01
RSF	MJ	2.10E-02	2.93E-04	1.13E-03	1.27E-03	0.00E+00	2.70E-06	0.00E+00	1.22E-06	-1.17E-06	1.45E-06	0.00E+00	-4.06E-04
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	0.00E+00	0.00E+00
FW	m^3	1.34E-01	5.86E-02	5.24E-01	6.00E-01	0.00E+00	7.04E-05	0.00E+00	2.45E-04	-2.37E-04	4.98E-04	0.00E+00	-4.62E-02

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

Waste indicators

Results per declared unit													
Indicator	Unit	A1-A3	A5	B6	B6*	C1	C2	C3	C4	D	C3*	C4*	D*
Hazardous waste disposed	MJ	1.78E+00	6.45E-02	7.95E+00	2.23E+00	0.00E+00	1.21E-03	0.00E+00	2.68E-04	-1.34E-03	1.05E-02	0.00E+00	5.20E-02
Non-hazardous waste disposed	MJ	4.28E+01	1.50E+00	2.04E+02	1.88E+02	0.00E+00	2.36E-02	0.00E+00	6.20E-03	-3.92E-01	2.41E-01	0.00E+00	-1.04E+01
Radioactive waste disposed	MJ	5.88E-04	8.65E-06	2.87E-03	6.60E-03	0.00E+00	1.06E-07	0.00E+00	3.44E-08	-8.07E-07	2.08E-06	0.00E+00	-7.21E-05

Output flow indicators

Results per declared unit													
Indicator	Unit	A1-A3	A5	B6	B6*	C1	C2	C3	C4	D	C3*	C4*	D*
Components for re-use	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	0.00E+00	0.00E+00
Material for recycling	kg	5.11E-02	1.52E-02	1.31E-01	1.57E-01	0.00E+00	6.04E-06	0.00E+00	2.55E-06	-1.97E-05	5.42E-05	0.00E+00	-2.51E-03
Materials for energy recovery	kg	4.05E-05	1.09E-06	1.01E-04	1.32E-05	0.00E+00	4.44E-08	0.00E+00	4.54E-09	-2.62E-08	7.81E-08	0.00E+00	-1.51E-05
Exported energy, electricity	MJ	1.25E-01	3.94E-03	1.29E+00	4.39E+00	0.00E+00	4.34E-05	0.00E+00	1.53E-05	-5.31E-04	9.48E-04	0.00E+00	-4.20E-02
Exported energy, thermal	MJ	1.41E+00	1.95E-03	5.37E-02	6.04E-02	0.00E+00	4.83E-05	0.00E+00	8.12E-06	-1.42E-04	5.40E-05	0.00E+00	-2.84E-02

ENVIRONMENTAL PERFORMANCE

Variation information for grouped products:

For Global scenario (A1-A3, A5, B6, C1, C2, C3, C4, D):

LCA result of one declared unit product (A-C)	Unit	Min	Average	Max
GWP-total	kg CO_2 eq.	6.17E+01	9.61E+01	1.59E+02
GWP-fossil	kg CO_2 eq.	6.15E+01	9.57E+01	1.58E+02
GWP-biogenic	kg CO_2 eq.	4.80E-02	2.43E-01	5.98E-01
GWP-luluc	kg CO_2 eq.	1.32E-01	2.05E-01	3.37E-01
ODP	kg CFC 11 eq.	6.84E-07	9.42E-07	1.42E-06
AP	mol H+ eq.	3.40E-01	5.78E-01	9.99E-01
EP-freshwater	kg P eq.	3.39E-02	5.39E-02	8.91E-02
EP- marine	kg N eq.	7.67E-02	1.16E-01	1.86E-01
EP-terrestrial	mol N eq.	7.03E-01	1.08E+00	1.77E+00
POCP	kg NMVOC eq.	2.16E-01	3.30E-01	5.37E-01
ADP-minerals & metals*	kg Sb eq.	2.08E-03	2.85E-03	4.12E-03
ADP-fossil*	MJ	8.59E+02	1.32E+03	2.16E+03
WDP*	m^3	1.86E+01	2.69E+01	4.18E+01

For European scenario (A1-A3, A5, B6**, C1, C2, C3*, C4*, D*):

LCA result of one declared unit product (A-C)	Unit	Min	Average	Max
GWP-total	kg CO_2 eq.	3.58E+01	5.36E+01	8.62E+01
GWP-fossil	kg CO_2 eq.	3.52E+01	5.25E+01	8.40E+01
GWP-biogenic	kg CO_2 eq.	5.28E-01	1.03E+00	1.95E+00
GWP-luluc	kg CO_2 eq.	9.58E-02	1.45E-01	2.34E-01
ODP	kg CFC 11 eq.	7.75E-07	1.09E-06	1.68E-06
AP	mol H+ eq.	2.11E-01	3.65E-01	6.34E-01
EP-freshwater	kg P eq.	3.15E-02	4.99E-02	8.22E-02
EP- marine	kg N eq.	4.72E-02	6.73E-02	1.03E-01
EP-terrestrial	mol N eq.	3.80E-01	5.50E-01	8.55E-01
POCP	kg NMVOC eq.	1.24E-01	1.79E-01	2.79E-01
ADP-minerals & metals*	kg Sb eq.	2.10E-03	2.88E-03	4.17E-03
ADP-fossil*	MJ	7.35E+02	1.12E+03	1.81E+03
WDP*	m^3	2.05E+01	3.01E+01	4.73E+01

ABBREVIATIONS

General Abbreviations	
Abbreviation	Definition
EN	European Norm (Standard)
EF	Environmental Footprint
ISO	International Organization for Standardization
CEN	European Committee for Standardization
SVHC	Substances of Very High Concern
ND	Not Declared
EC No.	European Community number
CAS No.	Chemical Abstracts Service number
WEEE Directive	Waste Electrical and Electronic Equipment Directive
PCB	Printed Circuit Board
PCBA	Printed Circuit Board Assembly

REFERENCES

a) General Programme Instructions of International EPD System. Version 5.0.1
b) PCR 2019:14. Construction Products. Version 2.0.1
c) EN 15804:2019+A2: – “Sustainability in construction and civil engineering - Environmental product declarations - Basic rules for the product category construction products”
d) EN 1594:2011 – “Sustainability in construction and civil engineering - Environmental product declarations (EPD) - Communication format: business-to-business (B2B)”
e) ISO 14025:2010 – “Ecolabels and declarations - Type III environmental product declarations - Principles and procedures
f) ISO 14040:2008 – “Environmental management - Life cycle assessment - Principles and framework”
g) ISO 14044:2008 – “Environmental management - Life cycle assessment - Requirements and guidance”