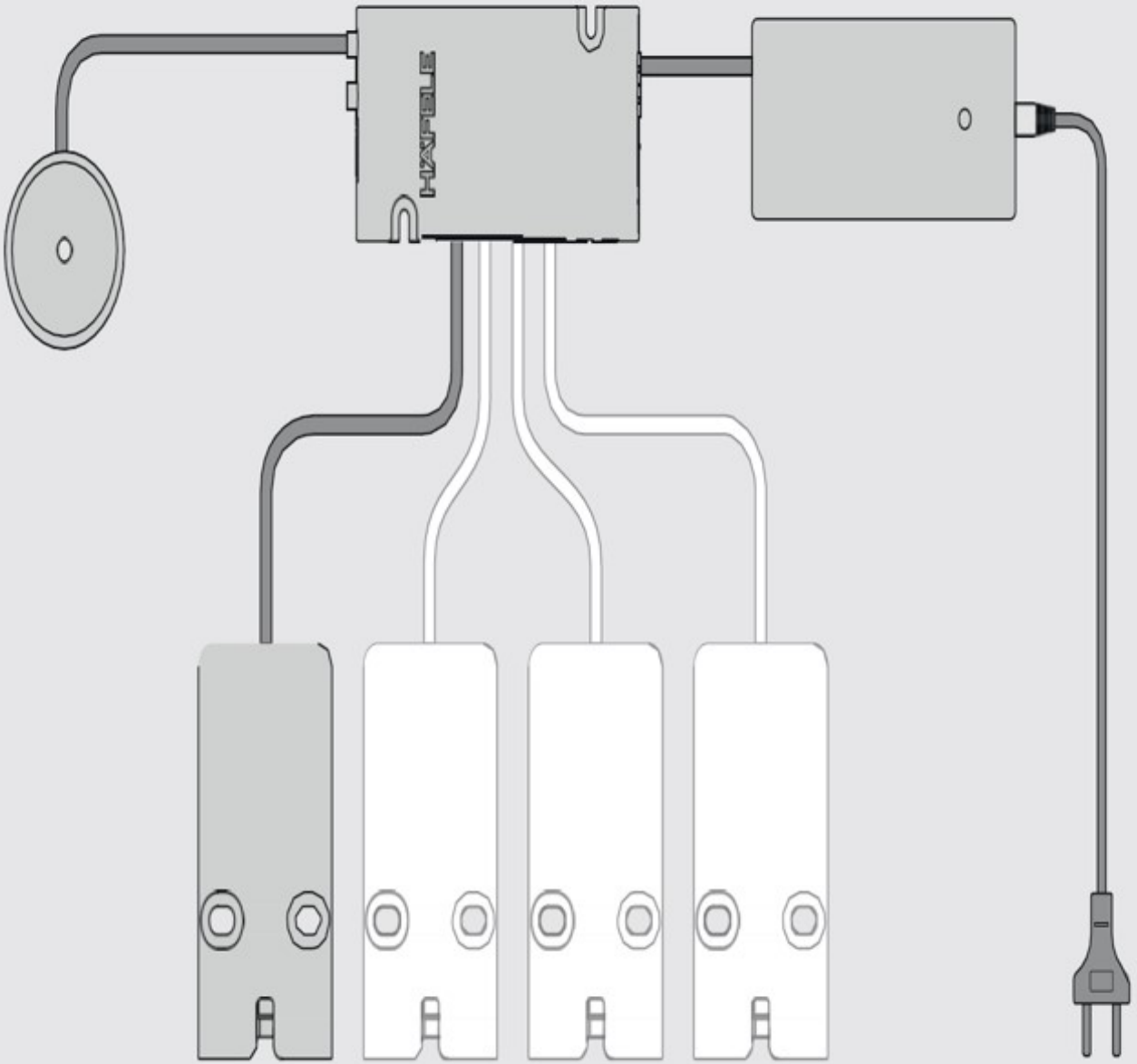
Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2:2019

FT 200 System / FT 200 CAP System



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Issue date:	05-06-2026
Valid until:	05-06-2031
Declaration owner:	Häfele SE & Co KG
Publisher:	Kiwa-Ecobility Experts
Programme operator:	Kiwa-Ecobility Experts
Status:	verified

1 General information

1.1 PRODUCT

FT 200 System / FT 200 CAP System

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-236217-EN

1.3 VALIDITY

Issue date: 05-06-2026

Valid until: 05-06-2031

1.4 PROGRAMME OPERATOR

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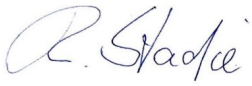


Dr. Ronny Stadie

(Verification body, Kiwa-Ecobility Experts)

1.5 OWNER OF THE DECLARATION

Declaration owner: Häfele SE & Co KG

Address: Adolf Häfele Straße 1, 72202 Nagold, Germany

E-mail: aline.leroy@haefele.com

Website: www.hafele.com

Production location: Häfele Technology Solutions GmbH & Co KG

Address production location: Tullastraße 3 , 79341 Kenzingen, Germany

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804+A2:2019 serves as the core PCR.

☐ Internal ☒ External



Elisabeth Amat Guasch, Greenize

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, SOP EE 1201_R.3.0 (03.06.2025)

Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930 , SOP EE1203_R. 3.0 (03.06.2025)

Locks and building hardware - Environmental product declarations - Product category rules in addition to EN 15804 for locks and building hardware; German version EN 17610:2022

1 General information

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2:2019. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2:2019 and ISO 14025.

1.10 CALCULATION BASIS

LCA method R<THINK: Ecobility Experts | EN15804+A2

LCA software*: Simapro 9.6

Characterization method: RETHINK characterization method (see references for more details)

LCA database profiles: ecoinvent (for version see references)

Version database: v3.20f (20260507)

** Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'FT 200 System / FT 200 CAP System' with the calculation identifier ReTHiNK-136217.

2 Product

2.1 PRODUCT DESCRIPTION

The "FT 200 System / FT 200 CAP System" is an electromechanical locking device for furniture. It is an intelligent furniture terminal designed by Häfele for controlling electronic furniture locks. It connects up to two FAN 200 antennas and supports direct connection of up to four EFL 3 furniture locks. The FT 200 CAP version includes an energy storage capacity (CAP) that powers an integrated real-time clock for up to six days, ensuring continued operation even during brief power interruptions.

Key features include:

1. Bluetooth Low Energy (BLE) for wireless communication
2. Integration with Dialock software or Häfele My Dialock Manager App for convenient configuration and management of lock points and access rights
3. Support for additional functions via individual add-ons
4. Acoustic feedback via sound signals and optional visual indicators
5. Operation by authorized user keys such as RFID transponders
6. Various lock control functions such as spring bolt and deadbolt locking with adjustable opening times
7. The ability to control multiple locks simultaneously or selectively.
8. Connections for power supply, signal generators, and expansion options

The terminal is housed in a black plastic casing and comes with a main lead. It is intended for intelligent, electronic control of furniture locks, used primarily in secure furniture applications like cabinets and drawers, enabling keyless, user-friendly access control.

FT200 CAP is an advanced furniture control terminal designed to integrate and manage Häfele's EFL 3 / EFL 3C furniture locks using Dialock software. It features Bluetooth Low Energy (BLE) for wireless communication, supports connection to multiple antennas and locks, and includes power storage capacity for real-time clock operation lasting six days. It facilitates configuration, management, and access control for furniture locking points, suitable for various furniture types and installation environments.

EFL 3 / EFL 3C is typically mounted within furniture and electronically controlled via the FT200 terminal. It is designed to lock and unlock furniture components, a main operated electric lock for indoor use, for hinged doors, flaps, sliding doors, drawers or tambour doors in furniture, office and shopfitting using RFID transponders.

PS 4 power supply units that provide the necessary electrical power for the FT200 terminal and related system components ensuring stable operation for the electronic locking system.

The CC 200 connection cable is used to connect the EFL 3 series locks with the FT200 control terminal.

The RFID transponder works as an access key within the Häfele Dialock system. Users present their RFID transponders to the antenna to unlock furniture locks securely and conveniently.

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

With the FT 200 / FT 200 CAP furniture terminal, up to four EFL 3 / EFL 3C furniture interlocks can be switched in parallel with simultaneous locking and / or different locking.

Additional MLA 6P / MLA 8 distributor strips can be used to implement further furniture locks.

In the event of a power failure, the locks retain the locking status existing at the time of the power interruption.

2.3 REFERENCE SERVICE LIFE

RSL PRODUCT

According to the manufacturer, the service life is estimated at 5 years. However, this reference service life of 5 years is a theoretical value intended exclusively for calculation and comparison purposes. In practice, the actual service life can often exceed 5 years, depending on operating conditions, maintenance, and other factors.

USED RSL (YR) IN THIS LCA CALCULATION:

5

RSL PARTS

Product parts have a 5-year lifespan, according to the manufacturer. However, the 5-year reference service life is merely a theoretical figure meant for computation.

2.4 TECHNICAL DATA

System Overview:

Base Component	Description
	· Reader unit with integrated LED

2 Product

Antenna FAN 200	· LED red/green red: in operation, locked/ unlocked: green
FT 200 / FT 200 CAP	· Control unit of the system · Connections for max. 4 furniture locks EFL 3 / EFL 3C
Furniture lock EFL 3	· Mains-operated electronic lock for indoor use: for hinged doors, flaps, sliding doors, drawers or tambour doors in furniture, office and shopfitting
PS 4 power supply unit	· Power supply

Accessories:

Accessories	Description
Programming key card	· Card for granting access rights
Erase key card	· Card for deleting access rights
Userkey	· Electronic key · different versions possible: Key Card, Key Tag, Key Fob, Key Bracelet

The technical details of the individual components are mentioned below:

Furniture terminal FT 200 / FT 200 CAP

Feature	Value
Supply voltage	12 V DC,+ 20 %
Max. current consumption (incl. 4x EFL 3)	1900 mA
Ambient temperature	0 - 55 °C
relative humidity	10 - 95 %, non-condensing
Protection class	IP 20
Relay output NO, NC, COM	125 V AC / 60 V DC, 1 A max.
Transponder technology	Tag-It, Mifare Classic EV1, Mifare DESFire EV3 For Dialock software applications, the transponders used must be qualified and coded by Häfele.
Approvals	CE, FCC / IC, Japan Radio Law
Connections	
Connection cable (150 mm) with plug	Micro AMP WR MPC3-3.00 mm
Antenna socket	SMB coaxial
Socket MLA 8	RJ 11
Socket EFL 3 / EFL 3C	RJ 10
Optical signal transmitter socket (LED)	SM02B-SFHRS-TF
Acoustic signal transmitter socket	SM02B-SFHRS-TF
AUX socket	Term Block Plug WR-TBL
OUT socket (supply voltage)	Micro Power Connector WR-MPC3
IN socket (supply voltage)	Micro Power Connector WR-MPC3
BLE frequency (ETSI EN 300 328 V2.2.2)	2400 MHz - 2483.5 MHz

2 Product

Radiated power (dBm)	-6.7

Antenna FAN 200

Feature	Value
Protection class	IP 67
Reading range	a 25 mm
Surroundings	not suitable for mounting: · in metal · in metal-coated furniture · behind mirror surfaces
Minimum distance between two antennas	250 mm
RFID frequency (ETSI EN 300 330 V2.1.1)	13.56 MHz ISO 14443 and ISO 15693; Tag-it, MIFARE Classic EV1, MIFARE DESFire EV3.
Transmitter field strength / (dbpA/m) @3m	22.1

Furniture locking device EFL 3 / EFL 3C

Feature	Value
Supply voltage	12 V DC
Continuous current consumption	18 mA
Power consumption max.	468 mA/ 50 ms
Operating temperature	0 - 50 °C
relative humidity	10 - 95 %, non-condensing
Protection class	IP 20
Tensile strength	1000 N
Lifespan	100000 cycles

PS 4 power supply unit

Feature	Value
Supply voltage	100 - 240 V AC, 50-60 Hz
Output voltage	12 V DC, regulated
Output current	2500 mA
Operating temperature	0 - 45 °C
relative humidity	10 - 95 %, non-condensing
Length of mains cable	2100 mm
Output cable length	1350 mm
Approvals	MM, CE, FCC, UL, Level VI, Approved Medical Device

CC 200 Powerbank

Feature	Value
Supply voltage	12 V DC
Operating temperature	0 - 55 °C
relative humidity	10 - 95 %, non-condensing
Connections	
(1x) Plug for PS 4	AMP Micro, male

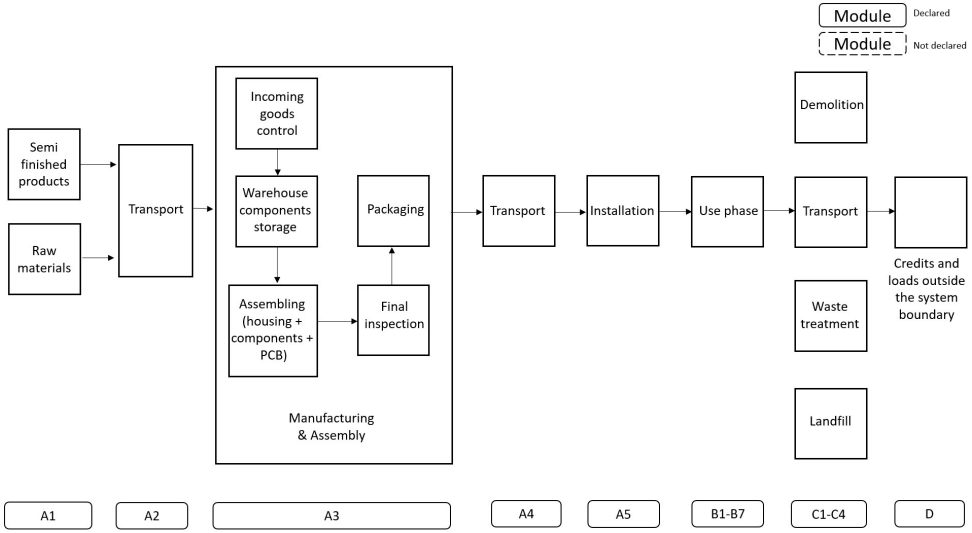
2 Product

(2x) Socket for FT 200 / MLA x	AMP Mate-N-Lock, female
(1x) Jack plug for power bank	J210
Powerbank connection cable	L= 3000 mm
Connection cable FT 200 / MLA x / PS 4	L= 200 mm

2.5 DESCRIPTION PRODUCTION PROCESS

The basic components of the system are: power supply PS4, electronic furniture lock EFL3 / EFL 3C, furniture terminal FT 200, connecting cable CC 200, antenna FAN 200, RFID card. The components EFL3 / EFL 3C and FT 200/ FT200 CAP are assembled in the production location, the remaining components are manufactured by the suppliers.

- **Component Sourcing and SMT Assembly**: The process begins with sourcing electronic components such as microcontrollers, Bluetooth Low Energy modules, connectors, capacitors (including the CAP energy storage capacitor for FT 200 CAP), RFID interfaces, and other circuitry parts. Surface Mount Technology (SMT) is commonly used to place these components on printed circuit boards (PCBs) with high precision.
- **PCB Testing and Quality Control**: After assembly, the PCBs undergo automated optical inspection and functional testing to ensure correct operation of the digital circuits, communication protocols (Bluetooth, RFID), and power management systems.
- **Mechanical Assembly**: Electronic boards are then integrated into the plastic, black housing of the furniture terminal. Connectors for lock cables, antenna connections (FAN 200), power supply, and signal outputs are installed and secured.
- **Final Testing**: Complete system tests validate the terminal's ability add-ons to four EFL 3 or EFL 3C locks, communicate with FAN 200 antennas, handle macro functions, and retain lock status during power failures.
- **Packaging and Distribution**: Each fully tested unit is then packaged with necessary accessories such as the mains lead and prepared for shipment.



2.6 CONSTRUCTION DESCRIPTION

During installation the client should carefully follow the instructions provided in the installation guide attached with this EPD. It is assumed that a minimal amount of energy is required for the installtion or a manual installation takes place!

Here are the simplified steps for the installation of Häfele FT 200 / FT 200 CAP furniture terminal:

1. **Prepare the Site**: Choose a secure, accessible location near the furniture that needs locking control and ensure the mounting surface is suitable.
2. **Mount the Device**: Securely fix the FT 200 / FT 200 CAP terminal to the selected surface, making sure it is stable and properly aligned.
3. **Connect Power**: Plug in the provided main lead and connect the power supply unit (PS 4) to provide stable electrical power. During installation, ensure the system is not live—never connect the power during assembly.
4. **Make Mechanical and Signal Connections**: Connect the furniture locks (up to four EFL 3/EFL 3C locks) using the CC 200 connection cable.

2 Product

5. **Connect Antennas and Accessories**: Attach the FAN 200 RFID antennas for transponder communication. Additional accessories like acoustic signal generators or relay modules can be connected using the appropriate plug connectors.
6. **Configure the System**: Use Dialock software or the Häfele Dialock app to program user keys, assign access rights, and set lock parameters such as open duration. Enroll RFID transponders or key cards for user access.
7. **Test Operation**: Ensure all connections work correctly by testing RFID keys, lock responses, and system features. Verify that the locks retain their status during power interruptions.
8. **Final Checks**: Confirm that all installation steps are completed, all connections are secure, and the system responds correctly for secure and reliable operation.

Important: Always follow the official Häfele installation guide and manuals carefully to ensure correct, safe, and efficient installation of the FT 200 / FT 200 CAP system.

3 Calculation rules

3.1 FUNCTIONAL UNIT

1 Piece of the system

Controlling or enabling door opening by electromechanical hardware integrated with electronic control systems such as access cards or app-based control over the reference service life of 5 years.

Reference unit: piece (p)

3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	p
Weight per reference unit	0.629	kg
Conversion factor to 1 kg	1.589668	p

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to grave EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The modules of the EN 15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative for {{productName}}, a product of {{owner}}. The results of this EPD are representative for the {{wasteScenarioSet}}.

3.5 CUT-OFF CRITERIA

Product stage (A1-A3)

All input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

3 Calculation rules

Construction process stage (A4-A5)

All input flows (e.g. transportation to the construction site, additional raw material use for construction, installation energy, energy use for assembly , etc.) and output flows (e.g. construction waste, packaging waste, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

Use stage (B1-B3)

All (known) input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. emissions to soil, air and water, construction waste, packaging waste, end-of-life waste, etc.) related to the building fabric are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

End of life stage (C1-C4)

All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

Benefits and loads beyond the system boundary (Module D)

All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

3.6 ALLOCATION

The allocation is carried out in accordance with the provisions of EN 15804+A2. Whenever possible, allocation is avoided by subdividing the unit process or by expanding the product system. Where allocation cannot be avoided, inputs and outputs are allocated based on physical relationships such as mass, energy content, or other relevant parameters. For the allocation of background data (energy and materials) at the end of life, the 'allocation limit by classification' model is applied in accordance with the ISO standard. Specific details on the allocations within the background data can be found in the documentation of the ecoinvent data sets.

The transport of parts and materials to the assembly site was modeled based on the geographical repartition of suppliers and corresponding transport hypotheses.

3.7 DATA COLLECTION & REFERENCE PERIOD

All primary data were collected by the product manufacturer for the calendar year 2025. The quantities of raw materials and suppliers used, as well as energy consumption, were recorded and averaged over the entire operating period.

3.8 ESTIMATES AND ASSUMPTIONS

- Due to the large number of suppliers and the limited availability of detailed data, generic transport profiles representative of typical supply chains were used whenever specific information was missing. A company-specific transport profile was included to better reflect actual sourcing practices. The following assumptions were applied.
- For the end-of-life stage, EU-specific scenarios were chosen because the product is marketed within the European Union.
- **Module A4 (Transport):**
  Transport impacts were calculated assuming a transport distance of 250 km using the profile *(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO).*
- **Module A5 (Installation):**
  In general, no material losses are anticipated during product installation; however, a small amount of energy, assumed to be 0.02 kWh per cabinet or installation location, will be required to account for the use of an electric screwdriver or any drilling carried out on the door where the component is assembled.
- Among the **B modules**, only **B6 (Operational energy use)** is considered relevant. All other B modules were deemed not significant due to minimal expected impacts. Repairs are assumed to be rarely needed and were therefore excluded.
- End-of-life scenarios follow the default recommendations in **IEC/TR 62635 (Annex D.3)**. The selected waste treatment pathways are those currently in use and represent one of the most likely alternatives.
- Based on historical sales data, the following components were included in the EPD: **EFL3, FT200, FAN 200 (1.5 m), CC200, PS4**, and the **three transponder cards (red, green, and white)**.
  However, various alternative versions exist, such as addition of **MLA 6** or **MLA 8** in order to add more number of locks as per customer requests , **PS2** can be used as a replacement for PS4, and **CC200** (with different lengths 0.5, 1, and 1.5 m) but these were not included.

3 Calculation rules

3.9 DATA QUALITY

Both primary and secondary data have been used. All primary data were collected by the product manufacturer for the reference year 2024-2025, covering the period from January to December. The main source of primary data is the bill of materials, supplemented by factory-specific data provided by the manufacturing facility in Kenzingen.

For the data, which was needed for modelling but was not provided by the manufacturer and could not be influenced by the manufacturer, generic data was used. Secondary data were sourced from the regularly updated ecoinvent database (version 3.9.1), aligning with EN 15804+A2 standards.

R<THINK EPD web application was used to model the life cycle for the production and disposal of the declared product systems. To ensure that the results are comparable, consistent background data from the international database ecoinvent was used in the LCA (e.g. data records on energy, transport, auxiliary materials, and suppliers). Almost all consistent data sets contained in the ecoinvent database are documented and can be viewed online.

The scenarios included are currently in use and are representative for one of the most likely scenario alternatives. The data quality for all three representativeness categories (geographical, technical and time) can be described as good.

3.10 POWER MIX

With regard to the energy consumption of production, the market-based approach was used in the LCA: Electricity supply is based on the German residual grid mix , using the dataset "Electricity, low voltage {DE} | electricity, low voltage, residual mix (ecoinvent - 3.9.1-2022). This mix has a total Global Warming Potential (GWP) of **0.7253 CO_2** eq. per kWh

4 Scenarios and additional technical information

4.1 TRANSPORT TO CONSTRUCTION SITE (A4)

For the transport from production place to assembly/user, the following scenario is assumed for module A4 of this EPD.

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Distance	250 km
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.2 ASSEMBLY (A5)

The following information describes the scenarios for flows entering the system and flows leaving the system at module A5.

FLOWS ENTERING THE SYSTEM

For flows entering the system at A5 the following scenario is assumed for module A5.

	Value	Unit
Energy consumption for installation/assembly		
(ei3.9.1) Electricity (EU) - low voltage (max 1kV)	0.02	kWh

FLOWS LEAVING THE SYSTEM

The following output flows leaving the system at module A5 are assumed.

Description	Value	Unit
Output materials as result of loss during construction	0	%
Output materials as result of waste processing of materials used for installation/assembly at the building site	0.000	kg
Output materials as result of waste processing of used packaging	0.123	kg

4.3 USE STAGE (B1)

No significant environment impact in the use stage modules, because there is no (significant) emission to air, soil or water.

4 Scenarios and additional technical information

4.4 MAINTENANCE (B2)

For maintenance no input or output flows are modelled.

4.5 REPAIR (B3)

Repairs are not applicable within the functional unit and to achieve the reference service life.

4.6 OPERATIONAL ENERGY USE (B6)

Description	Service cycle (yr)	Number of cycles (n)	Amount per cycle	Total Amount	Unit
Operational Energy use	5	1.00	1.96	1.96	kWh

4.7 OPERATIONAL WATER USE (B7)

Description	Service cycle (yr)	Number of cycles (n)	Amount per cycle	Total Amount	Unit

4.8 DE-CONSTRUCTION, DEMOLITION (C1)

No inputs are needed for the product at the de-construction / demolition phase

4.9 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
EoL electronic - components (3.9.1)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	0
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41) | benefits Copper, cathode 100% primary (GLO)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
		0	100	150	50	50

4 Scenarios and additional technical information

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)					
(ei3.9.1) plastics, via residue (NMD ID 43)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50
(ei3.9.1) Steel, reinforcement (NMD ID 74)	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)	0	100	150	50	50

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

	Value and unit
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) | market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

4.10 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables.
First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

4 Scenarios and additional technical information

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
EoL electronic - components (3.9.1)	EU	0	5	35	60	0
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41) | benefits Copper, cathode 100% primary (GLO)	NL	0	5	0	95	0
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	NL	0	0	100	0	0
(ei3.9.1) plastics, via residue (NMD ID 43)	NL	0	20	80	0	0
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	NL	0	5	5	90	0
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	NL	0	5	5	90	0
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	NL	0	5	0	95	0
(ei3.9.1) Steel, reinforcement (NMD ID 74)	NL	0	5	0	95	0

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
EoL electronic - components (3.9.1)	0.000	0.022	0.154	0.264	0.000
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41) | benefits Copper, cathode 100% primary (GLO)	0.000	0.000	0.000	0.001	0.000
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	0.000	0.004	0.000	0.000
(ei3.9.1) plastics, via residue (NMD ID 43)	0.000	0.007	0.027	0.000	0.000
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	0.000	0.007	0.007	0.130	0.000
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	0.000	0.000	0.000	0.003	0.000
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	0.000	0.000	0.000	0.002	0.000
(ei3.9.1) Steel, reinforcement (NMD ID 74)	0.000	0.000	0.000	0.000	0.000
Total	**0.000**	**0.036**	**0.192**	**0.400**	**0.000**

4.11 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

4 Scenarios and additional technical information

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
EoL electronic - components (3.9.1)	0.264	0.000
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41) | benefits Copper, cathode 100% primary (GLO)	0.001	0.000
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	0.141
(ei3.9.1) plastics, via residue (NMD ID 43)	0.000	0.743
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	0.130	0.000
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	0.001	0.000
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	0.002	0.000
(ei3.9.1) Steel, reinforcement (NMD ID 74)	0.000	0.000
Total	**0.399**	**0.884**

5 Results

For the impact assessment long-term emissions (>100 years) are not considered. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER PIECE

CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1.68E+1	2.24E-1	3.09E-1	1.73E+1	2.80E-2	2.23E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.10E-1	0.00E+0	0.00E+0	7.82E-3	4.59E-1	3.42E-3	5.11E-1
GWP-f	kg CO_2 eq.	1.67E+1	2.23E-1	4.87E-1	1.74E+1	2.79E-2	3.83E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.05E-1	0.00E+0	0.00E+0	7.79E-3	4.59E-1	3.41E-3	5.08E-1
GWP-b	kg CO_2 eq.	5.24E-2	1.10E-4	-1.79E-1	-1.26E-1	9.09E-6	1.85E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.86E-3	0.00E+0	0.00E+0	2.54E-6	5.56E-5	2.06E-6	1.86E-3
GWP-luluc	kg CO_2 eq.	2.47E-2	2.04E-4	1.33E-3	2.62E-2	9.95E-5	2.78E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.76E-3	0.00E+0	0.00E+0	2.78E-5	3.63E-5	2.83E-7	1.37E-3
ODP	kg CFC 11 eq.	9.18E-7	3.65E-9	8.02E-8	1.00E-6	4.97E-10	1.04E-9	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.34E-8	0.00E+0	0.00E+0	1.39E-10	2.26E-9	1.03E-11	1.21E-9
AP	mol H+ eq.	3.05E-1	1.19E-3	6.91E-3	3.13E-1	1.34E-4	9.47E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.04E-3	0.00E+0	0.00E+0	3.73E-5	1.97E-4	3.07E-6	3.75E-3
EP-fw	kg P eq.	2.49E-3	2.42E-6	6.42E-5	2.56E-3	2.78E-7	8.86E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.97E-5	0.00E+0	0.00E+0	7.75E-8	9.79E-7	8.52E-9	1.87E-4
EP-m	kg N eq.	2.62E-2	3.92E-4	7.99E-4	2.74E-2	5.08E-5	2.54E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.07E-4	0.00E+0	0.00E+0	1.42E-5	6.92E-5	7.04E-6	9.65E-4
EP-T	mol N eq.	3.17E-1	4.26E-3	8.73E-3	3.30E-1	5.42E-4	2.76E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.90E-3	0.00E+0	0.00E+0	1.51E-4	7.27E-4	1.25E-5	1.16E-2
POCP		9.20E-2	1.50E-3	2.59E-3	9.61E-2	1.85E-4	9.07E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.90E-3	0.00E+0	0.00E+0	5.16E-5	1.89E-4	5.03E-6	2.28E-3

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

5 Results

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	kg NMVOC eq.																		
ADP-mm	kg Sb-eq.	5.59E-3	1.25E-6	1.25E-4	5.71E-3	8.74E-8	1.27E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.41E-6	0.00E+0	0.00E+0	2.44E-8	1.70E-7	1.02E-9	6.35E-4
ADP-f	MJ	2.11E+2	3.06E+0	6.68E+0	2.21E+2	4.00E-1	2.64E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.59E+1	0.00E+0	0.00E+0	1.12E-1	2.91E-1	9.21E-3	6.90E+0
WDP	m3 world eq.	1.04E+1	1.39E-2	2.63E-1	1.07E+1	2.18E-3	3.73E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.80E-1	0.00E+0	0.00E+0	6.10E-4	1.16E-2	3.19E-4	1.22E-2

GWP-total=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratosperic ozon layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprication potential, deprivation-weighted water consumption (WDP)

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	disease incidence	1.47E-6	1.77E-8	3.97E-8	1.53E-6	2.76E-9	9.79E-10	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.28E-8	0.00E+0	0.00E+0	7.69E-10	1.39E-9	6.53E-11	2.83E-8
IR	kBq U235 eq.	6.65E-1	1.75E-3	1.96E-2	6.87E-1	1.56E-4	1.62E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.42E-1	0.00E+0	0.00E+0	4.35E-5	8.90E-4	6.76E-6	3.68E-2
ETP-fw	CTUe	5.36E+2	1.67E+0	1.24E+1	5.50E+2	2.95E-1	4.08E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.68E+0	0.00E+0	0.00E+0	8.24E-2	4.76E+0	9.53E-2	3.99E+1
HTP-c	CTUh	3.93E-8	2.35E-10	9.02E-10	4.05E-8	1.48E-11	2.19E-11	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.29E-10	0.00E+0	0.00E+0	4.13E-12	8.08E-11	3.78E-13	1.52E-9
HTP-nc	CTUh	2.45E-6	2.44E-9	5.12E-8	2.51E-6	3.21E-10	2.81E-10	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.31E-8	0.00E+0	0.00E+0	8.97E-11	9.42E-9	1.93E-11	2.23E-8

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality index (SQP)

5 Results

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
SQP	Pt	1.36E+2	1.17E+0	1.79E+1	1.55E+2	3.16E-1	7.14E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.12E+0	0.00E+0	0.00E+0	8.81E-2	9.53E-2	2.11E-2	-1.41E+0

PM=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality index (SQP)

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2
	Potential Soil quality index (SQP)	2

Disclaimer 1 – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – 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.

5 Results

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	2.95E+1	5.87E-2	1.84E+0	3.14E+1	5.65E-3	4.07E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.49E+0	0.00E+0	0.00E+0	1.58E-3	3.03E-2	2.67E-4	-1.04E-1
PERM	MJ	0.00E+0	0.00E+0	1.60E+0	1.60E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	2.95E+1	5.87E-2	3.44E+0	3.30E+1	5.65E-3	4.07E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.49E+0	0.00E+0	0.00E+0	1.58E-3	3.03E-2	2.67E-4	-1.04E-1
PENRE	MJ	2.10E+2	3.06E+0	6.29E+0	2.19E+2	4.00E-1	2.64E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.59E+1	0.00E+0	0.00E+0	1.12E-1	2.91E-1	9.21E-3	6.90E+0
PENRM	MJ	1.07E+0	0.00E+0	3.85E-1	1.46E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-8.56E-3
PENRT	MJ	2.11E+2	3.06E+0	6.68E+0	2.21E+2	4.00E-1	2.64E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.59E+1	0.00E+0	0.00E+0	1.12E-1	2.91E-1	9.21E-3	6.90E+0
SM	Kg	1.79E-3	0.00E+0	3.69E-5	1.83E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.20E-5
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	3.81E-1	5.07E-4	9.42E-3	3.91E-1	9.66E-5	2.01E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.26E-2	0.00E+0	0.00E+0	2.70E-5	3.92E-4	9.89E-6	2.93E-3

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 resources | **SM**=Use of secondary material | **RSF**=Use of renewable secondary fuels | **NRSF**=Use of non-renewable secondary fuels | **FW**=Net use of fresh water

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	Kg	5.81E-3	5.13E-5	1.28E-4	5.99E-3	2.55E-6	8.57E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.81E-5	0.00E+0	0.00E+0	7.12E-7	9.79E-7	4.55E-8	-2.79E-5
NHWD	Kg	2.24E+0	8.87E-2	7.75E-2	2.41E+0	2.64E-2	4.25E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.39E-2	0.00E+0	0.00E+0	7.38E-3	4.83E-2	3.64E-2	6.63E-2
RWD	Kg	5.02E-4	1.13E-6	1.51E-5	5.18E-4	9.15E-8	1.29E-6	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.14E-4	0.00E+0	0.00E+0	2.55E-8	5.81E-7	3.96E-9	2.37E-5

HWD=Hazardous waste disposed | **NHWD**=Non-hazardous waste disposed | **RWD**=Radioactive waste disposed

5 Results

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	2.73E-3	2.73E-3	0.00E+0	8.47E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.37E-1	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	5.48E-3	5.48E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.88E-1
EEE	MJ	0.00E+0	0.00E+0	3.18E-3	3.18E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.83E-1

CRU=Components for re-use | **MFR**=Materials for recycling | **MER**=Materials for energy recovery | **EET**=Exported Energy, Thermic | **EEE**=Exported Energy, Electric

5 Results

5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER PIECE

BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per piece:

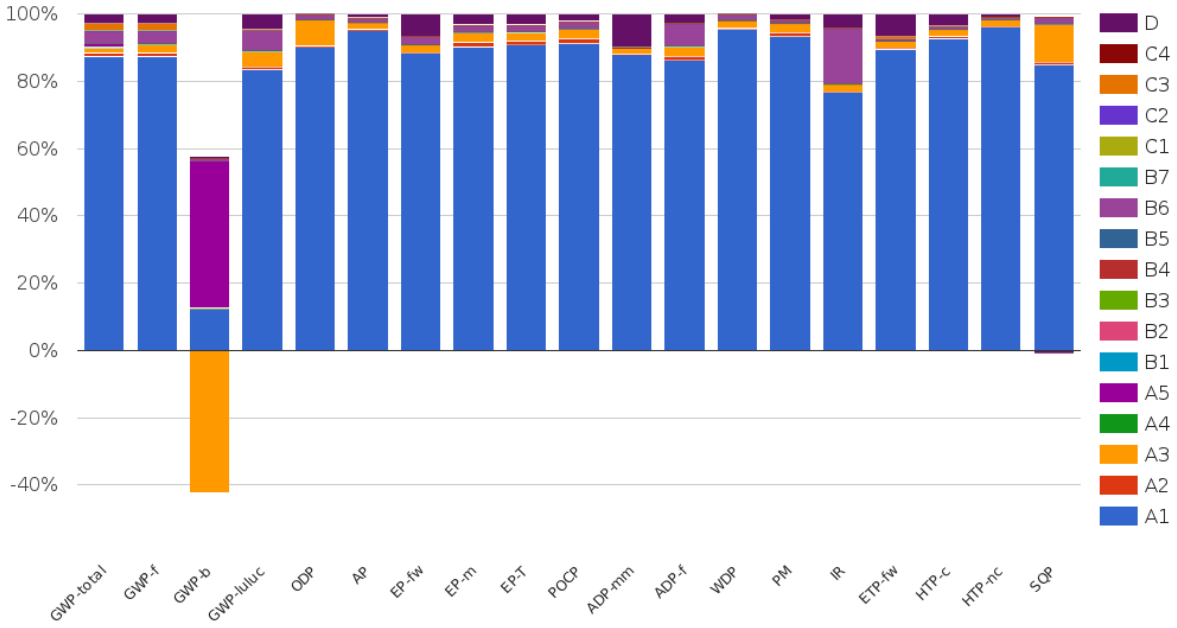
Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.05038	kg C

UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount of carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic Carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

Uptake Biogenic Carbon dioxide	Amount	Unit
Packaging	0.1847	kg CO2 (biogenic)

6 Interpretation of results



Dominance of A1 and A3 Stages: Across all environmental impact categories, stages A1 (Raw materials) and A3 (Manufacturing) emerge as the main contributors, together accounting for the majority of the product's total impacts.

Raw Material Extraction (A1): The A1 stage is heavily driven by the sourcing and processing of raw materials, which involve significant resource depletion and upstream energy consumption, especially for electronic-grade metals and polymers.

Energy-Intensive Manufacturing (A3): The A3 stage reflects extensive energy use during component fabrication, assembly, and finishing processes, often relying on electricity from fossil-based grids, which amplifies emissions and resource burdens.

6 Interpretation of results

High Abiotic Depletion Potential (ADP): In the ADP category, A1 contributes the dominant share, indicating substantial use of non-renewable resources such as copper and rare metals essential for electronic components, highlighting the product's dependence on finite mineral reserves.

7 References

ISO 14040
ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044
ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006

ISO 14025
ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

EN 15804+A2
EN 15804:2012+A2:2019/AC:2021, Sustainability of Buildings - Environmental Product Declarations - Framework Development Rules by Product Category

Kiwa-EE GPI R.3.0 (2025)
Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, SOP EE 1201_R.3.0 (03.06.2025)

Kiwa-EE GPI R.3.0 Annex B1 (2025)
Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930 , SOP EE 1203_R.3.0 (03.06.2025)

PCR B

Locks and building hardware - Environmental product declarations -Product category rules in addition to EN 15804 for locks and building hardware; version EN 17610:2022

ecoinvent
ecoinvent Version 3.9.1 (December 2022)

R<THINK characterization method
ecoinvent 3.9.1: EN 15804+A1 indicators (CML-IA Baseline v3.09), EN 15804+A2 indicators (EF 3.1)

IEC/TR 62635

Guidelines for end-of-life information provided by manufacturers and recyclers and for recyclability rate calculation of electrical and electronic equipment

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