Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

csNET Modular Power System

from

Caleidoscope Systems AB

Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of multiple products, based on worst-case results
EPD registration number:	EPD-IES-0028479:001
Version date:	2026-03-16
Validity date:	2031-03-15
	An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

EPD of multiple products, based on worst-case results: 170703-05 25-15-EU, 170703-05 25-18-EU, 170703-05 25-20-EU, 170703-05 25-30-EU, 170703-05 25-40-EU, 170703-05 25-15-UK, 170703-05 25-18-UK, 170703-05 25-20-UK, 170703-05 25-30-UK, 170703-05 25-40-UK

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:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *2019:14 Construction products (EN 15804+A2) 2.0.1; 2030-04-07* **Product category classification:** *UN CPC 46212*
PCR review was conducted by: *The Technical Committee of the International EPD® System.* **Chair of the PCR review:** *Rob Rouwette (Chair), Noa meron (co-chair). The review panel may be contacted via support@environdec.com*

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ **Individual EPD verification without a pre-verified LCA/EPD tool** Third-party verifier: < *Sunil Kumar, SIPL Pvt Ltd.*> Approved by: 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 published in different EPD programmes, may not be comparable. For two EPDs 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); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.
For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD:
Caleidoscope Systems AB
Address:
Östra Sandgatan 14 3tr, 252 27 Helsingborg, Sweden
Contact:
Phone: +46 702 80 40 88
Email: marcus@caleidoscope.se

Address and contact information of the LCA practitioner commissioned by the EPD owner:
Ivy Li, Solomon J. Zhou, Johny Wang, Fiona Wang, TÜV SÜD Certification and Testing (China) Co., Ltd., TÜV SÜD PSB PTE LTD

Description of the organisation:
Caleidoscope Systems AB is a manufacturer of high-quality products in the field of grid ceilings, lighting, electrical power systems and energy saving solutions with nearly 40 years of experience as a supplier and installer to both national and international customers.

Product-related or management system-related certifications:
SEMKO

PRODUCT INFORMATION

Product name:
csNET Modular Power System

Product identification:
Construction product

Visual representation of the product:

UN CPC code:
UN CPC code: 46212, Electrical apparatus for switching or protecting electrical circuits, for making connexions to or in electrical circuits, for a voltage not exceeding 1000 V

Product description:

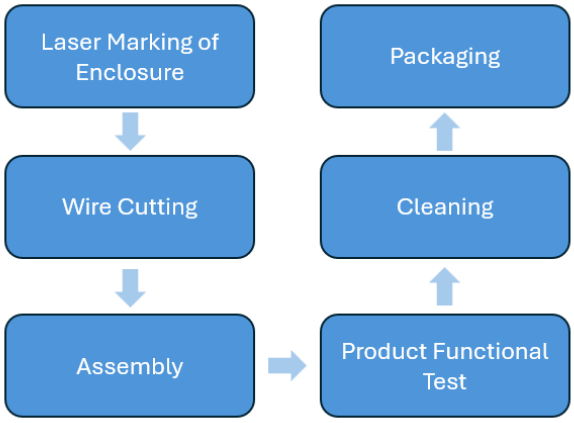
The product assessed in the report is power system, which is divided into 10 models: 170703-05 25-15-EU, 170703-05 25-18-EU, 170703-05 25-20-EU, 170703-05 25-30-EU, 170703-05 25-40-EU, 170703-05 25-15-UK, 170703-05 25-18-UK, 170703-05 25-20-UK, 170703-05 25-30-UK, 170703-05 25-40-UK.

Caleidoscope's csNET Modular Power System is a modular power solution referring to EU/UK sockets (e.g., model 170703-05 25-15-EU).It is designed for use with Caleidoscope's luminaires, featuring halogen-free 5 x 2.5 mm² cables for 3-phase connections and standard 4-way sockets that enable easy connection of lighting products equipped with EU or UK plugs. Widely applied in large commercial building lighting and other indoor/outdoor commercial lighting scenarios, the csNET Modular Power System serves as an essential and independent electrical component for lamps—ensuring stable power supply and reliable operation while providing additional power protection. Intended for commercial building and interior/exterior commercial lighting applications, it is classified as both an electrical and electronic product and a construction product.

The characteristics of the products are show in the table below:

Product model	Cable Length(mm)	Rated Current (A)	Input Voltage (V)	Service life (h)
170703-05 25-15-EU	800	16	250	100,000
170703-05 25-18-EU	950	16	250	100,000
170703-05 25-20-EU	1050	16	250	100,000
170703-05 25-30-EU	1550	16	250	100,000
170703-05 25-40-EU	2050	16	250	100,000
170703-05 25-15-UK	800	13	250	100,000
170703-05 25-18-UK	950	13	250	100,000
170703-05 25-20-UK	1050	13	250	100,000
170703-05 25-30-UK	1550	13	250	100,000
170703-05 25-40-UK	2050	13	250	100,000

The manufacturing process of the products:



Name and location of production site(s):
NO.2 North Lane 6, Middle FuLe Road, LianFeng Industrial Zone Xiaolan Town, Zhongshan City, Guangdong, China.
Name of manufacturer(s), if different from the EPD owner:
ZHONGSHAN MINKWONG ELECTRICAL CO.,LTD

For more information, please contact website: www.caleidoscope.se

CONTENT DECLARATION

The mass (weight) of the product:

Models	Product weight (kg)	Packaging weight (kg)
170703-05 25-15-EU	0.86	0.10
170703-05 25-18-EU	1.00	0.10
170703-05 25-20-EU	1.05	0.10
170703-05 25-30-EU	1.20	0.12
170703-05 25-40-EU	1.58	0.15
170703-05 25-15-UK	0.87	0.10
170703-05 25-18-UK	0.92	0.10
170703-05 25-20-UK	0.99	0.10
170703-05 25-30-UK	1.24	0.12
170703-05 25-40-UK	1.53	0.15

Content of the product:

Product component (weight, kg/p)	Plastics	Iron / steel	Connector ports	Copper	Silicone product	Solder Wire	Cable	Electric connector
170703-05 25-15-EU	0.3411	0.0223	0.0360	0.0838	0.0120	0.0040	0.3600	0.0000
170703-05 25-18-EU	0.3411	0.0223	0.0360	0.0838	0.0120	0.0040	0.5000	0.0000
170703-05 25-20-EU	0.3411	0.0223	0.0360	0.0838	0.0120	0.0040	0.5500	0.0000
170703-05 25-30-EU	0.3411	0.0223	0.0360	0.0838	0.0120	0.0040	0.7000	0.0000
170703-05 25-40-EU	0.3411	0.0223	0.0360	0.0838	0.0120	0.0040	1.0800	0.0000
170703-05 25-15-UK	0.3104	0.0197	0.0360	0.0490	0.0120	0.0040	0.4300	0.0099
170703-05 25-18-UK	0.3104	0.0197	0.0360	0.0490	0.0120	0.0040	0.4800	0.0099
170703-05 25-20-UK	0.3104	0.0197	0.0360	0.0490	0.0120	0.0040	0.5500	0.0099
170703-05 25-30-UK	0.3104	0.0197	0.0360	0.0490	0.0120	0.0040	0.8000	0.0099
170703-05 25-40-UK	0.3104	0.0197	0.0360	0.0490	0.0120	0.0040	1.0880	0.0099

The declared share of biogenic/recycled materials:

In accordance with the PCR, claims for biogenic carbon content are omitted as the biogenic carbon contained in the product is significantly less than 5 % of the total mass. In addition, no post-consumer material was used for the production of product. And since the share of biobased materials of packages are unknown, this part of the content declaration is declared as 0% as a conservative estimation.

Information on the environmental and hazardous/toxic properties of a substances contained in the product:

Hazardous substances from the candidate list of SVHC	EC No.	CAS No.	Mass-% per product
N/A	N/A	N/A	N/A

LCA INFORMATION

Declared unit:

A piece of EU/UK socket with 800~2050mm connecting cable for safe power supply connection of electrical equipment, with 16A/13A rated current capacity, 250V input voltage and a service life of 100,000 hours..The conversion factor to mass from declared unit is 0.8592~1.5792 kg/p, among them, the conversion factor of 170703-05 25-40-EU (worst case) is 1.5792 kg/p.

Reference service life: 100000 h

Time representativeness: 2024.10.01~2025.09.30

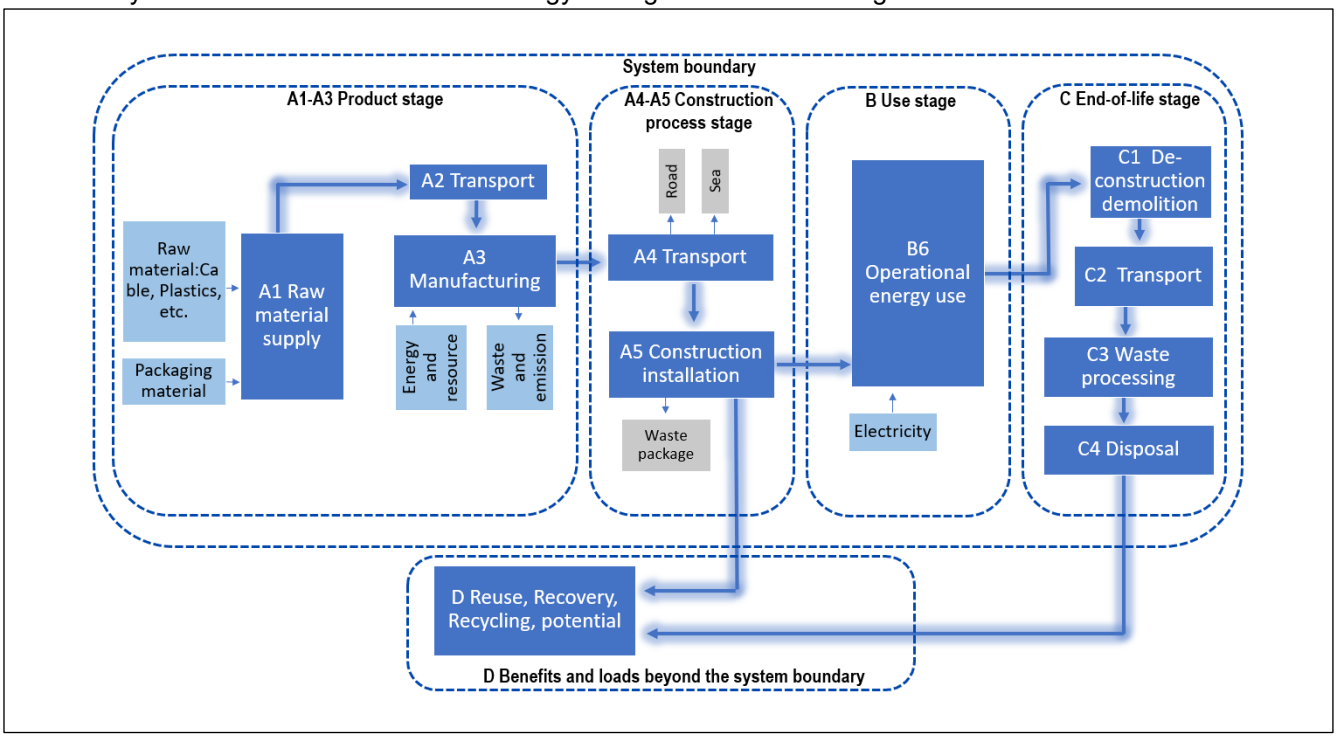
Geographical scope:

The study reflects production (A1-A3 stage) of the studied product in Zhongshan City, Guangdong Province, China. Distribution (A4 stage) in global, installation (A5 stage) to usage and disposal in Sweden according to the sales situation.

Database(s) and LCA software used:
Ecoinvent (EN15804) 3.11 Database, Simapro 10.2.0.0 software.
EN 15804 reference package based on EF 3.1 has been used.

Description of system boundaries:
This study serves for type b), cradle-to-gate with options, modules C1-C4, module D and optional modules, namely A1-A3 + C+ D and additional modules A4-A5, B6.
No life-cycle stage is omitted. B use stage includes module B6 operational energy use, when modules B1 use or application of the installed product, B2 maintenance, B3 repair, B4 replacement, B5 refurbishment and B7 operational water use are omitted. In such cases the irrelevant module shall be declared as "not relevant".

Process flow diagram:
Process flow diagram of the product system, divided into the life-cycle stages and modules (or other division of the product life cycle, if defined in the PCR), showing the main processes included and the system boundary of the LCA. The diagram shall make it clear when the end-of-waste state is reached for main input flows of reused/recycled materials and recovered energy, and for output flows of reused/recycled materials and recovered energy exiting the end-of-life stage.



More information:

Product representativeness:
This EPD follows additional requirements for construction products considered as Electronic or Electric Equipment.
In accordance with the PCR, similar products from a single or several manufacturing sites covered by the same PCR and manufactured by the same company with the same major steps in the core processes may be grouped and thereby included in the same EPD. For the EPDs referring to the LCA

report, the option 3 is chosen, i.e. declaring the worst-case result of the included products, for the included modules from A to C, per declared environmental performance indicator. For EPD does not claim compliance with ISO 21930, variations above 10% are allowed, if justified in the LCA report and the EPD declares the variation of each impact indicator results for which the variation is above 10%The LCA report lists all results of different types of products.
For the EPDs referring to the LCA report, the products includes 10 different types (170703-05 25-15-EU, 170703-05 25-18-EU, 170703-05 25-20-EU, 170703-05 25-30-EU, 170703-05 25-40-EU, 170703-05 25-15-UK, 170703-05 25-18-UK, 170703-05 25-20-UK, 170703-05 25-30-UK, 170703-05 25-40-UK), all of them are manufactured from same factory with same steps, and the LCA results variation between these thicknesses are above 10%. Therefore, the worst-case result, i.e. the LCA result of 170703-05 25-40-EU is chosen to represent all 10 types of products.

Cut-off rules:
In this life cycle assessment, 0% of total energy usage and less than 1% of total mass input of A1-A5, B6, C1-C4 and D modules are cut-off, and B1-B4, B5, B7 modules are not relevant, which conforms to EN15804:2012. In addition, the consumption and emissions of roads and plants infrastructure, equipment of each process, personnel and living facilities in the plants were ignored.

Allocation rules:
The manufacturing energy use are allocated according to theoretical yield of product of production line. Packaging materials are allocated according to the quantity of product.

Data quality:
A data quality assessment was conducted in accordance with EN 15941 and PCR 2019:14. Primary data for the manufacturing processes were collected based on annual production data from 2024.10.01 to 2025.09.30, covering a 12-month operational period. No deviations from the one-year data collection requirement occurred. No dataset rated as "Fair", "Poor" or "Very poor" contributed more than 30% to any core environmental impact indicator.

Declaration of sources and share of primary data are as blow (taking 170703-05 25-40-EU as the example as it is the worst-case product):

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Manufacturing-grid electricity use	Database	Ecoinvent 3.11	2024	Primary Data	0.66%
Transport-Raw material	Database	Ecoinvent 3.11	2024	Primary Data	0.86%
Manufacturing-raw material- PC	Database	Ecoinvent 3.11	2024	Secondary Data	0%
Manufacturing-raw material- Cable	Database	Ecoinvent 3.11	2024	Secondary Data	0%
Other processes	Database	Ecoinvent 3.11	2024	Secondary Data	0%
Total share of primary data, of GWP-GHG results for A1-A3					1.52%

Referring to EN 15804:2012+A2:2019/AC:2021, datasets for which at least 80% of the absolute impact of the core environmental indicator contributes, shall be analyzed for data quality. The data quality assessment was conducted in accordance with Table E.1 in Annex E of EN 15804:2012+A2:2019/AC:2021. The quality of the collected data was assessed for the use stage (more than 80% of the total stages), see results in the following table:

Life cycle stages	Unit process	Source	Reference Year	Data Category	Geographical representativeness	Technical representativeness	Time representativeness
A1	Raw material supply-PC	Ecoinvent 3.11	2024	Secondary Data	Good	Good	Very good
A1	Raw material supply-Cable	Ecoinvent 3.11	2024	Secondary Data	Good	Good	Very good
B6	Operational electricity use	Ecoinvent 3.11	2024	Primary Data	Very good	Good	Very good

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 EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

Energy resource:
The data for the production of electricity applied in A3 module is the China Southern Power Grid in the Ecoinvent 3.11 (EN15804) database, which is chosen according to Residual electricity mix on the market in the electricity modelling hierarchy of PCR 2019:14 as no specific electricity mix or electricity mix of supplier is applicable. Its climate impact is 0.602 $kgCO_2eq/kWh$. The reference year of electricity dataset is 2021~2024.
The data for the production of electricity applied in B6 module is the Sweden electricity market in the Ecoinvent 3.11 (EN15804) database, which is chosen according to residual electricity mix on the market in the electricity modelling hierarchy of PCR 2019:14 as no specific electricity mix or electricity mix of supplier is applicable. Its climate impact is 0.0434 $kgCO_2eg/kWh$. The reference year of electricity dataset is 2020~2024.

Scenarios:
The products assessed in the present report relate to scenario assumptions.

For the waste packaging in the A5 module, 100 km by truck transport from final client to final disposal site is assumed referring to *Product Environmental Footprint Category Rules Guidance Version 6.3.*

In the C2 module, the end-of-life transport distance of the product is assumed to be 100 km, referring to *Product Environmental Footprint Category Rules Guidance Version 6.3.*

In the C3 module, waste processing including shredding is assumed.

In C4 module, the end-of-life disposal of the product after shredding is assumed to be landfill of waste plastics, waste steel and other residues. The material recovery rates (referred to as R2 rates in this report) are primarily based on the default data from the PEF method specified in PCR 2019:14 Construction Products (version 2.0.1). For other solid waste materials where specific recovery rates are not defined in the relevant standards, the R2 rate is conservatively assumed to be 0. Meanwhile, as the product distribution for module A4-Transport is limited to the Swedish market, the corresponding Energy Recovery Rate (R3) adopts the value applicable to Sweden (consistent with the regional scope of this EPD). Among them, incineration is considered with energy recovery according to the PEF method.

Material	R2/ Material recovery rate	Energy recovery rate	Final disposal rate
Steel	93%	6.93%	0.07%
Plastic PC	70%	29.7%	0.3%
Plastic PP	0%	99%	1%
Copper	93%	6.93%	0.07%
Cables	24%	0%	76%
Other waste	0%	99%	1%
Packaging plastics	34%	65.34%	0.66%
Corrugated board	75%	24.75%	0.25%

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	X	X	ND	ND	ND	ND	ND	X	ND	X	X	X	X	X
Geography	CN	CN	CN	Sweden	Sweden	-	-	-	-	-	Sweden	-	Sweden	Sweden	Sweden	Sweden	Sweden
Share of primary data	1.42%~1.63%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-27.09%~0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

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**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	6.2677E+00	4.1811E-01	2.7964E-03	3.5854E+01	0.0000E+00	2.3211E-02	7.6747E-02	3.8023E-01	-3.8133E+00
GWP-fossil	kg CO_2 eq.	6.2071E+00	4.1782E-01	2.2503E-03	3.2162E+01	0.0000E+00	2.3197E-02	7.6401E-02	6.4243E-02	-3.8007E+00
GWP-biogenic	kg CO_2 eq.	4.7527E-02	7.7441E-05	5.4526E-04	5.6390E-01	0.0000E+00	5.1149E-06	1.8818E-04	3.1595E-01	-8.0958E-03
GWP-luluc	kg CO_2 eq.	1.3058E-02	2.1852E-04	7.8997E-07	3.1277E+00	0.0000E+00	8.1087E-06	1.5823E-04	3.4186E-05	-4.5584E-03
ODP	kg CFC 11 eq.	1.1111E-06	5.9128E-09	4.9368E-11	1.0982E-06	0.0000E+00	5.0906E-10	5.1269E-10	3.2990E-10	-7.9139E-08
AP	mol H^+ eq.	1.2463E-01	1.0310E-02	9.1621E-06	3.7628E-01	0.0000E+00	9.3877E-05	4.3121E-04	1.7191E-04	-6.2135E-02
EP-freshwater	kg P eq.	9.8559E-03	2.0482E-05	1.6020E-07	2.7565E-02	0.0000E+00	1.6461E-06	3.8954E-05	6.4514E-05	-4.1041E-02
EP-marine	kg N eq.	9.9768E-03	2.6026E-03	3.6492E-06	5.8978E-02	0.0000E+00	3.5055E-05	8.0519E-05	2.5524E-03	-1.7562E-02
EP-terrestrial	mol N eq.	1.2303E-01	2.8881E-02	3.7132E-05	6.2716E-01	0.0000E+00	3.8206E-04	8.6368E-04	5.1825E-04	-2.5107E-01
POCP	kg NMVOC eq.	3.9287E-02	7.9581E-03	1.3911E-05	1.5963E-01	0.0000E+00	1.4135E-04	2.4235E-04	2.4546E-04	-5.2566E-02
ADP-minerals&metals*	kg Sb eq.	1.6105E-03	5.5973E-07	7.3217E-09	3.3836E-03	0.0000E+00	7.5575E-08	7.4202E-07	2.6217E-08	-7.5362E-04
ADP-fossil*	MJ	9.6475E+01	5.2848E+00	3.2542E-02	3.9601E+03	0.0000E+00	3.3521E-01	1.0102E+00	2.5980E-01	-5.7181E+01
WDP*	m^3	3.2568E+00	1.9460E-02	1.1270E-04	1.0760E+02	0.0000E+00	1.8008E-03	1.7236E-02	-4.8029E-02	-1.0112E+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 on these results are high or as there is limited experienced with the indicator.*

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.

Note: The use of the results of modules A1-A3 without considering the results of module C is discouraged.

Additional mandatory and voluntary impact category indicators

Results per declared unit										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	6.2202E+00	4.1803E-01	2.2511E-03	3.5290E+01	0.0000E+00	2.3205E-02	7.6559E-02	6.4278E-02	-3.8052E+00

Resource use indicators

Results per declared unit										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1.2870E+01	4.7374E-02	5.4092E-04	2.5101E+03	0.0000E+00	5.5591E-03	1.4602E-01	2.5385E-02	-1.2565E+01
PERM	MJ	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PERT	MJ	1.2870E+01	4.7374E-02	5.4092E-04	2.5101E+03	0.0000E+00	5.5591E-03	1.4602E-01	2.5385E-02	-1.2565E+01
PENRE	MJ	9.6519E+01	5.2851E+00	3.2544E-02	3.9602E+03	0.0000E+00	3.3523E-01	1.0102E+00	2.5982E-01	-5.7187E+01
PENRM	MJ	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PENRT	MJ	9.6519E+01	5.2851E+00	3.2544E-02	3.9602E+03	0.0000E+00	3.3523E-01	1.0102E+00	2.5982E-01	-5.7187E+01
SM	kg	2.1948E-01	2.4472E-03	1.4402E-05	7.3197E-01	0.0000E+00	1.4850E-04	2.7834E-04	7.3242E-05	-1.7873E-02
RSF	MJ	2.7195E-02	1.0454E-05	1.8476E-07	3.8461E-03	0.0000E+00	1.9028E-06	4.5516E-05	1.2270E-06	-2.2568E-04
NRSF	MJ	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
FW	m^3	8.0049E-02	4.7496E-04	2.8716E-06	4.2560E+00	0.0000E+00	4.4472E-05	4.7066E-04	-1.1009E-03	-3.4685E-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**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	8.9172E-01	7.9907E-03	4.7208E-05	4.0122E+00	0.0000E+00	4.8522E-04	7.6156E-03	4.0151E-04	-5.9905E-01
Non-hazardous waste disposed	kg	4.1914E+01	1.2744E-01	2.0473E-03	1.4692E+02	0.0000E+00	1.0402E-02	1.8961E-01	2.0917E+00	-9.8752E+00

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Radioactive waste disposed	kg	1.0306 E-04	6.7592 E-07	9.8979 E-09	6.0067E-02	0.0000E+00	1.0176 E-07	2.4775 E-06	5.9872E-07	-6.3255E-05

Output flow indicators

Results per declared unit										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0.0000 E+00	0.0000 E+00	0.0000E +00	0.0000E +00	0.0000E +00	0.0000E +00	0.0000E +00	0.0000E +00	0.0000E +00
Material for recycling	kg	6.6193 E-02	3.8780 E-03	4.0244E -07	9.7145E -01	0.0000E +00	4.1334E -06	1.5889E -04	9.3160E -06	5.0481E-01
Materials for energy recovery	kg	2.8223 E-05	1.3218 E-07	1.6032E -09	5.5064E -05	0.0000E +00	1.6489E -08	1.1279E -07	6.4957E -09	-1.0159E-05
Exported energy, electricity	MJ	3.5663 E-02	2.9720 E-04	6.4799E -06	8.5822E +01	0.0000E +00	6.6731E -05	1.1227E -03	8.3079E -04	-3.3699E-02
Exported energy, thermal	MJ	4.1149 E-02	2.3766 E-04	1.2841E -05	1.2072E -01	0.0000E +00	1.3261E -04	6.2696E -05	1.7977E -04	-2.5339E-02

Additional indicators

Results per declared unit										
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B6**	**C1**	**C2**	**C3**	**C4**	**D**
Potential incidence of disease due to PM emissions	disease inc.	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potential Human exposure efficiency relative to U235	kBq U235 eq	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potential Comparative Toxic Unit for ecosystems	CTUe	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potential Comparative Toxic Unit for humans	CTUh	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potential Comparative Toxic Unit for humans	CTUh	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potential Soil quality index	dimensionless	ND	ND	ND	ND	ND	ND	ND	ND	ND

** Disclaimer: The results of these 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.*

Additional LCA results

This EPD contains multiple products. The variations of each impact indicator results are shown below. The variation mainly comes from the difference of the product resistance and raw material, which mainly affects the A1 and B6 stage.

LCA result	Unit	Representative	Min	Max
GWP-total	kg CO_2 eq.	3.9209E+01	1.1654E+01	3.9209E+01
GWP-fossil	kg CO_2 eq.	3.5152E+01	1.0545E+01	3.5152E+01
GWP-biogenic	kg CO_2 eq.	9.2010E-01	2.9800E-01	9.2010E-01
GWP-luluc	kg CO_2 eq.	3.1366E+00	8.1184E-01	3.1366E+00
ODP	kg CFC 11 eq.	2.1375E-06	1.2417E-06	2.1375E-06
AP	mol H^+ eq.	4.4979E-01	1.4228E-01	4.4979E-01
EP-freshwater	kg P eq.	-3.4937E-03	-1.0643E-02	-4.0154E-04
EP-marine	kg N eq.	5.6667E-02	1.5729E-02	5.6667E-02
EP-terrestrial	mol N eq.	5.2980E-01	1.3770E-01	5.2980E-01
POCP	kg NMVOC eq.	1.5495E-01	4.4785E-02	1.5495E-01
ADP-minerals &metals	kg Sb eq.	4.2419E-03	1.4769E-03	4.2419E-03
ADP-fossil	MJ	4.0064E+03	1.0533E+03	4.0064E+03
WDP	m^3 world eq. deprived	1.0983E+02	2.9121E+01	1.0983E+02
GWP-GHG	kg CO_2 eq.	3.8289E+01	1.1356E+01	3.8289E+01

In modules C1-C4, according to the PCR 2019:14 Construction products (version 2.0.1), If any of the declared scenarios is a mix of end-of-life alternatives (reuse, recycling, incineration with energy recovery, landfill, etc.), also the corresponding 100% scenarios (100% reuse, 100% recycling, 100% incineration with energy recovery, 100% landfill, etc.) shall be declared. Since the LCA results for Module C1 - C3 are identical for this product, the results presented in this table correspond only to Module C4 for reference. Taking 170703-05 25-40-EU as an example as it is the worst-case product, the LCA results of 100% scenarios are shown in the following table:

LCA results of C Module (C4)					
LCA result	**Unit**	**Scenario assumptions**	**100% recycling**	**100% incineration with energy recovery**	**100% landfill**
GWP-total	kg CO_2 eq.	3.8023E-01	0.0000E+00	1.3390E+00	2.1855E+00
GWP-fossil	kg CO_2 eq.	6.4243E-02	0.0000E+00	1.2022E+00	1.7499E+00
GWP-biogenic	kg CO_2 eq.	3.1595E-01	0.0000E+00	1.3677E-01	4.3547E-01
GWP-luluc	kg CO_2 eq.	3.4186E-05	0.0000E+00	2.4911E-06	5.1357E-05
ODP	kg CFC 11 eq.	3.2990E-10	0.0000E+00	1.7234E-10	6.1711E-10
AP	mol H^+ eq.	1.7191E-04	0.0000E+00	9.5290E-03	2.7439E-04
EP-freshwater	kg P eq.	6.4514E-05	0.0000E+00	6.1719E-05	9.0147E-05
EP-marine	kg N eq.	2.5524E-03	0.0000E+00	4.3295E-03	3.5330E-03
EP-terrestrial	mol N eq.	5.1825E-04	0.0000E+00	4.7413E-02	8.6394E-04
POCP	kg NMVOC eq.	2.4546E-04	0.0000E+00	1.4338E-02	8.3395E-04
ADP-minerals &metals	kg Sb eq.	2.6217E-08	0.0000E+00	1.5976E-08	4.8975E-08
ADP-fossil	MJ	2.5980E-01	0.0000E+00	1.0013E-01	4.8606E-01
WDP	m^3 world eq. deprived	-4.8029E-02	0.0000E+00	6.2897E-03	-1.0229E-01
GWP-GHG	kg CO_2 eq.	6.4278E-02	0.0000E+00	1.2022E+00	1.7500E+00

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EPD	Environmental Product Declaration
EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
LCA	Life Cycle Assessment
Environmental Impact Indicators	
GHG	Greenhouse gas
GWP	Global Warming Potential (kg CO_2 eq.)
GWP - fossil	Global Warming Potential from fossil sources (kg CO_2 eq.)
GWP - biogenic	Global Warming Potential from biogenic sources (kg CO_2 eq.)
GWP - LULU	Global Warming Potential from land use and land use change (kg CO_2 eq.)
GWP - total	Total Global Warming Potential (kg CO_2 eq.)
GWP - GHG	Global Warming Potential for greenhouse gases (kg CO_2 eq.)
ODP	Ozone Depletion Potential (kg CFC - 11 eq.)
AP	Acidification Potential (mol H^+ eq.)
EP	Eutrophication Potential
EP - freshwater	Freshwater eutrophication potential (kg P eq.)
EP - marine	Marine eutrophication potential (kg N eq.)
EP - terrestrial	Terrestrial eutrophication potential (kg N eq.)
POCP	Photochemical Ozone Creation Potential (kg NMVOC eq.)
ADP	Abiotic Depletion Potential
ADP - minerals&metals	Abiotic depletion potential for non - fossil resources (kg Sb eq.)
ADP - fossil	Abiotic depletion potential for fossil resources (MJ)
WDP	Water Deprivation Potential (m^3)
Resource Use Indicators	
PERRE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)
PERT	Total use of renewable primary energy resources (MJ)
PENRE	Use of non - renewable primary energy excluding non - renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non - renewable primary energy resources used as raw materials (MJ)
PENT	Total use of non - renewable primary energy resources (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non - renewable secondary fuels (MJ)
FW	Use of net fresh water (m^3)
PERRE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)
PERM	Use of renewable primary energy resources used as raw materials (MJ)
PERT	Total use of renewable primary energy resources (MJ)
PENRE	Use of non - renewable primary energy excluding non - renewable primary energy resources used as raw materials (MJ)
PENRM	Use of non - renewable primary energy resources used as raw materials (MJ)
PENT	Total use of non - renewable primary energy resources (MJ)
SM	Use of secondary material (kg)
RSF	Use of renewable secondary fuels (MJ)
NRSF	Use of non - renewable secondary fuels (MJ)
FW	Use of net fresh water (m^3)
Waste Indicators	
HW	Hazardous Waste (disposed) (kg)
MHW	Non - Hazardous Waste (disposed) (kg)

RW	Radioactive Waste (disposed) (kg)
Output Flow Indicators	
CFR	Components for Reuse (kg)
MFR	Materials for Recycling (kg)
MER	Materials for Energy Recovery (kg)
EEE	Exported Energy: Electricity (MJ)
EET	Exported Energy: Thermal (MJ)
Lifecycle Stages / Module	
A1	Raw material supply
A2	Transport
A3	Manufacturing
A4	Transport to site
A5	Construction/Installation
B1	Use
B2	Maintenance
B3	Repair
B4	Replacement
B5	Refurbishment
B6	Operational energy use
B7	Operational water use
C1	Deconstruction/Demolition
C2	Transport to waste processing
C3	Waste processing
C4	Disposal
D	Reuse - Recovery - Recycling potential
Other Relevant Terms	
SVHC	Substances of Very High Concern
CAS No.	Chemical Abstracts Service Number
MJ	Megajoule
kg	Kilogram
m^3	Cubic Meter
NMVOC	Non - Methane Volatile Organic Compounds
Sb eq.	Antimony Equivalents
P eq.	Phosphorus Equivalents
N eq.	Nitrogen Equivalents
CFC - 11 eq.	Chlorofluorocarbon - 11 Equivalents
CO_2 eq.	Carbon Dioxide Equivalents
kg C	Kilograms of Carbon
kg CO_2 eq.	Kilograms of Carbon Dioxide Equivalent
ND	Not Declared

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6) Product Environmental Footprint Category Rules Guidance, Version 6.3, May 2018.
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8) BS EN 50693:2019, Product category rules for life cycle assessments of electronic and electrical products and systems.
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11) R2 values available within the PEF Guidance document and supporting documentation (Annex_C_V2.1_May2020): https://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml

VERSION HISTORY

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