

Environmental Product Declaration

In accordance with ISO14025:2006 and EN15804:2012+A2:2019

BAS2 E16



BASTEC

Owner of the declaration:
BASTEC AB

Product name:
BAS2 E16

Declared unit:
1 Unit

Product category /PCR:
PCR EPDItaly011: ELECTRONIC AND ELECTRICAL PRODUCTS AND SYSTEMS – METERS. PCR EPDItaly007: Electronic and Electrical Products and Systems

Program holder and publisher:
The Norwegian EPD Foundation

Declaration number:
NEPD-5816-5104-EN

Registration number:
NEPD-5816-5104-EN

Issue date: 09.02.2024

Valid to: 09.02.2029

ver-160924

General information

Product:
BAS2 E16

Program operator:
The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Tlf: +47 23 08 80 00
e-mail: post@epd-norge.no

Declaration number:
NEPD-5816-5104-EN

This declaration is based on Product Category Rules:
PCR EPDItaly011: ELECTRONIC AND ELECTRICAL PRODUCTS AND SYSTEMS – METERS. PCR EPDItaly007: Electronic and Electrical Products and Systems

Statement of liability:
The owner of the declaration is liable for the underlying information and evidence. EPD Norway is not liable with respect to the manufacturer or life cycle assessment data and evidence.

Functional unit:
1 Unit of BAS2 E16

Verification:
Independent verification of the declaration and data, according to ISO14025:2010

internal external



Silvia Vilčeková
Independent verifier approved by EPD Norway

BASTEC AB
Contact person: Stefan Nilsson
Phone: +46 10 330 80 19
e-mail: stefan.nilsson@bastec.se

Manufacturer:
BASTEC AB
Hästvägen 4A, 21235 Malmö
Phone: +46 10 330 80 00
e-mail: info@bastec.se

Place of production:
Malmö, Sweden

Management system:
ISO14001, ISCC Plus, IQD128 standard, ISO 9001, ISO 22000, SINTEF

Organisation no:
556346-6738

Issue date:
09.02.2024

Valid to:
09.02.2029

Year of study:
2023

Comparability:
EPD of construction products may not be able to compare if they do not comply with EN 15804 and are seen in a building context.

The EPD has been worked out by:
Amit Lotan, CarbonZero AB

Approved



Manager of EPD Norway

Owner of the declaration:

Company

Company information:

Bastec develops systems used to control and monitor ventilation, heating, cooling and other technical systems in buildings. Our building automation system BAS2 is used in all types of buildings, ranging from offices and apartments to hospitals and science labs.

Product

Product description:

E16 is an expansion module for XE16-COM, based on the flexible and easy-to use BAS2 concept from Bastec. Connecting an E16 module to the existing system increases the number of input and outputs quickly, with ease and cost efficiently. A maximum of two modules can be connected to each XE16-COM.

BAS2 XE16-COM is a compact DDC based on the flexible and easy-to use BAS2 concept. An integrated mounting for DIN rail in combination with a shape that matches standard housings makes incorporation simple and inexpensive, even in small applications. The simplicity and flexibility of the BAS2 system keeps costs down and increases energy savings. BAS2 can also be integrated with other systems, e.g. an existing DHC system.

Product specification:

E16 is an expansion module for XE16-COM, based on the flexible and easy-to use BAS2 concept from Bastec.

| Materials (product) | Weight (g) | Percentage |
|-------------------------|----------------|-------------|
| Lid | 70.106 | 29.84% |
| A-B-S Cover | 51.029 | 21.72% |
| Bottom | 43.442 | 18.49% |
| PCB | 36.6 | 15.58% |
| Capacitors Other | 9.277 | 3.95% |
| Electro mechanics | 8.474 | 3.61% |
| Inductors | 4.807 | 2.05% |
| Integrated circuits | 4.607 | 1.96% |
| Locking Device | 4.144 | 1.76% |
| Semiconductors (not IC) | 1.043 | 0.44% |
| Resistors | 0.816 | 0.35% |
| Crystals | 0.545 | 0.23% |
| Capacitors 0603 | 0.03 | 0.01% |
| Resistors 0603 | 0.018 | 0.01% |
| Total | 183.909 | 100% |
| Materials (packaging) | | |
| Cardboard | 79.9 | |
| Total | 79.9 | 100% |

Technical data:

BAS2 E16: 1Unit – 235gr

Technical functions:

- Supply voltage: 24 V AC \pm 10%
- Power consumption: Max. 2 W (excl. externally connected objects such as actuators)
- Digital input: 12–30 V DC or 24 V AC, 5 mA input current
- Analogue input: Pt 100DIN, Ni1000 (L&G, L&S, Siemens), 12-bit resolution (approx. 0.07 °C). 0–10 V, 2–10 V, 0–20 mA, 4–20 mA (with external resistor 500 Ω)
- Communication: Expansion port (COM) for connection of 1–2 x E16 to one XE16-COM.
- Dimensions (WxHxD): 125 x 120 x 58 mm
- Mounting: DIN rail
- UN CPC code: 4621 “Electricity distribution or control apparatus”
- Certification: CE, SundaHus environmental classification

Market:

Sweden

Reference service life, product:

10 years

LCA: Calculation rules

Declared unit:

1 Unit

Cut-off criteria:

The following procedures were followed for the exclusion of inputs and output.

- All input and output flows in a unit process were considered i.e., considering the value of all flows in the unit process and the corresponding LCI where data was available.
- Data gaps were filled by conservative assumptions with average or generic data. Any assumptions in such cases were documented.
- The use of cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%).

All hazardous and toxic materials and substances are included in the inventory and the cut-off rules do not apply.

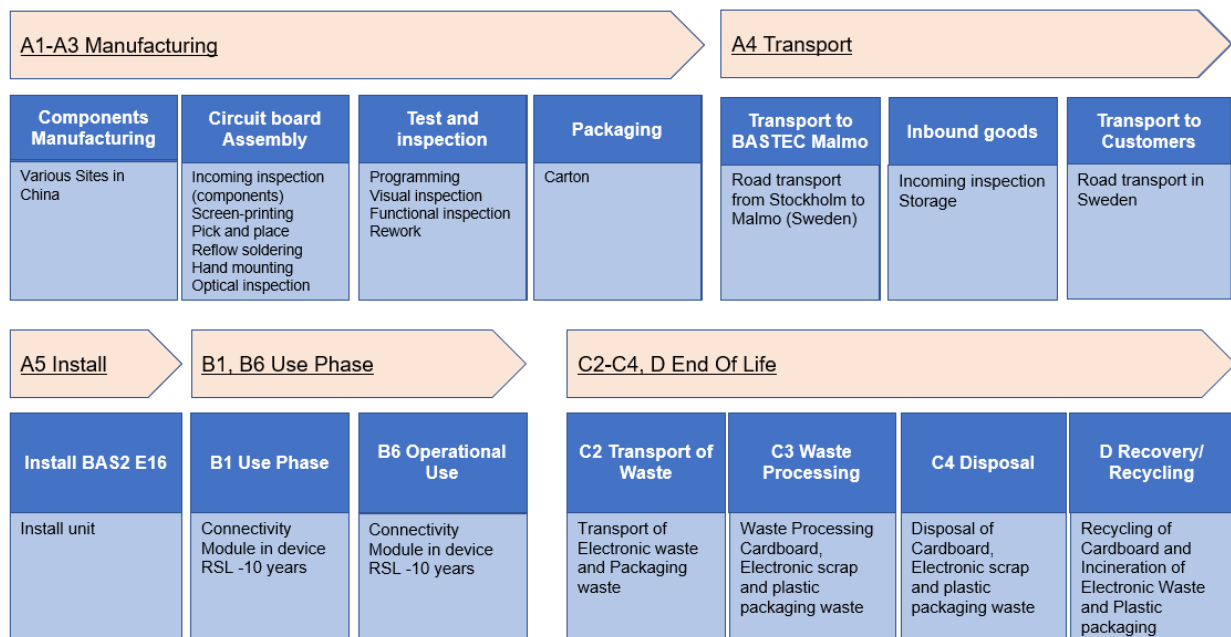
Allocation:

Allocation criteria is based on mass.

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

| Product stage | | | Assembly stage | | Use stage | | | | | | | | End of life stage | | | | Benefits & loads beyond system boundary |
|---------------|-----------|---------------|----------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-------------------|------------------|----------|------------------------------------|---|
| Raw materials | Transport | Manufacturing | Transport | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential | |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D | |
| X | X | X | X | X | X | MNR | MNR | MNR | MNR | X | MNR | MNR | X | X | X | X | |

System boundary:



LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to assembly/user (A4)

| Transport from production place to assembly/user (A4) | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy consumption |
|---|---------------------------------------|---------------|-------------------------|
| Truck | 61 | 660 | 1,95 l/tkm diesel |

End of Life (C1, C3, C4)

The average waste rates from Sweden and Norway has been used as these are the largest markets for this product.

| | Value | Unit |
|---------------|-------|------|
| Recycling | 43 | % |
| Incineration* | 53 | % |
| Landfill | 4 | % |

*Note that the incineration includes energy recovery in module D.

Transport to waste processing (C2)

| Transport from production place to assembly/user (C2) | Capacity utilisation (incl. return) % | Distance (km) | Fuel/Energy consumption |
|---|---------------------------------------|---------------|-------------------------|
| Truck | 61 | 100 | 1,95 l/tkm |

LCA: Results

Core environmental impact indicators

| Indicator | Unit | A1-A3 | A4 | A5 | B1 | B6 | C2 | C3 | C4 | D |
|-------------------------|-----------------------|----------|-----------|----------|----------|----------|-----------|----------|-----------|-----------|
| GWP - total | kg CO ₂ eq | 1.76E+01 | 8.27E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.96E-06 | 0.00E+00 | 6.96E-06 | -2.37E-04 |
| GWP - fossil | kg CO ₂ eq | 1.76E+01 | 8.32E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E-06 | 0.00E+00 | 7.00E-06 | -2.37E-04 |
| GWP - biogenic | kg CO ₂ eq | 3.61E-02 | -1.22E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.04E-07 | 0.00E+00 | -1.04E-07 | -1.43E-08 |
| GWP - luluc | kg CO ₂ eq | 1.02E-02 | 7.69E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.50E-08 | 0.00E+00 | 6.50E-08 | -2.45E-09 |
| ODP | kg CFC11 eq | 2.38E-04 | 1.08E-15 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.15E-19 | 0.00E+00 | 6.15E-19 | -6.43E-17 |
| AP | molc H+ eq | 8.56E-02 | 1.29E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.31E-09 | 0.00E+00 | 9.31E-09 | -1.71E-07 |
| EP- freshwater | kg P eq | 6.89E-05 | 3.04E-08 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.56E-11 | 0.00E+00 | 2.56E-11 | -2.76E-11 |
| EP -marine | kg N eq | 1.28E-02 | 4.78E-06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.29E-09 | 0.00E+00 | 3.29E-09 | -8.29E-08 |
| EP - terrestrial | molc N eq | 1.39E-01 | 5.64E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.96E-08 | 0.00E+00 | 3.96E-08 | -9.42E-07 |
| POCP | kg NMVOC eq | 3.89E-02 | 1.14E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.04E-09 | 0.00E+00 | 8.04E-09 | -2.13E-07 |
| ADP-M&M ² | kg Sb-Eq | 1.62E-03 | 5.51E-10 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.56E-13 | 0.00E+00 | 4.56E-13 | -1.65E-13 |
| ADP-fossil ² | MJ | 2.57E+02 | 1.13E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.55E-05 | 0.00E+00 | 9.55E-05 | -1.44E-04 |
| WDP ² | m ³ | 3.36E+00 | 1.00E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.09E-08 | 0.00E+00 | 8.09E-08 | -4.32E-05 |

GWP-total: Global Warming Potential; **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; See "additional Norwegian requirements" for indicator given as PO₄ eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009

Voluntary environmental impact indicators

| Indicator | Unit | A1-A3 | A4 | A5 | B1 | B6 | C2 | C3 | C4 | D |
|-----------|-----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| GWP-GHG | kg CO ₂ eq | 1.68E+01 | 8.07E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.79E-06 | 0.00E+00 | 6.79E-06 | 2.36E-04 |

Additional environmental impact indicators

| Indicator | Unit | A1-A3 | A4 | A5 | B1 | B6 | C2 | C3 | C4 | D |
|-----------|------|-------|----|----|----|----|----|----|----|---|
|-----------|------|-------|----|----|----|----|----|----|----|---|

| | | | | | | | | | | |
|---------------------|-------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PM | Disease incidence | 8.59E-07 | 1.09E-10 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.74E-14 | 0.00E+00 | 7.74E-14 | -1.29E-12 |
| IRP ¹ | kBq U235 eq. | 1.41E+00 | 3.17E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.79E-08 | 0.00E+00 | 1.79E-08 | -1.01E-06 |
| ETP-fw ² | CTUe | 1.23E+02 | 8.10E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.73E-05 | 0.00E+00 | 6.73E-05 | -9.73E-05 |
| HTP-c ² | CTUh | 4.23E-09 | 1.64E-12 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.36E-15 | 0.00E+00 | 1.36E-15 | -9.08E-15 |
| HTP-nc ² | CTUh | 2.03E-07 | 7.32E-11 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.99E-14 | 0.00E+00 | 5.99E-14 | -6.08E-13 |
| SQP ² | Dimensionless | 4.05E+01 | 4.73E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.98E-05 | 0.00E+00 | 3.98E-05 | -3.98E-05 |

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

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.

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

Resource use

| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B6 | C2 | C3 | C4 | D |
|-----------|----------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| RPEE | MJ | 5.57E+01 | 8.23E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.76E-06 | 0.00E+00 | 6.76E-06 | -3.61E-05 |
| RPEM | 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 |
| TPE | MJ | 5.57E+01 | 8.23E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.76E-06 | 0.00E+00 | 6.76E-06 | -3.61E-05 |
| NRPE | MJ | 2.58E+02 | 1.14E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.57E-05 | 0.00E+00 | 9.57E-05 | -1.44E-04 |
| NRPM | 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 |
| TRPE | MJ | 2.58E+02 | 1.14E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.57E-05 | 0.00E+00 | 9.57E-05 | -1.44E-04 |
| SM | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 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 |
| W | m ³ | 1.24E-01 | 9.02E-06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.45E-09 | 0.00E+00 | 7.45E-09 | -1.01E-06 |

RPEE Renewable primary energy resources used as energy carrier; **RPEM** Renewable primary energy resources used as raw materials; **TPE** Total use of renewable primary energy resources; **NRPE** Nonrenewable primary energy resources used as energy carrier; **NRPM** Nonrenewable primary energy resources used as materials; **TRPE** Total use of non-renewable primary energy resources; **SM** Use of secondary materials; **RSF** Use of renewable secondary fuels; **NRSF** Use of non-renewable secondary fuels; **W** Use of net fresh water.

End of life – Waste

| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B6 | C2 | C3 | C4 | D |
|-----------|------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| HW | kg | 6.54E-05 | 3.52E-13 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.54E-16 | 0.00E+00 | 3.54E-16 | -5.79E-15 |

| | | | | | | | | | | |
|-----|----|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| NHW | kg | 4.69E-01 | 1.73E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.38E-08 | 0.00E+00 | 1.38E-08 | -5.02E-05 |
| RW | kg | 1.36E-02 | 2.13E-07 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.24E-10 | 0.00E+00 | 1.24E-10 | -6.68E-09 |

HW Hazardous waste disposed; NHW Non-hazardous waste disposed; RW Radioactive waste disposed.

End of life – output flow

| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B6 | C2 | C3 | C4 | D |
|-----------|------|----------|----------|----------|----------|----------|----------|-----------|----------|----------|
| CR | 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 |
| MR | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 4.52E-03 | 0,00E+00 | 0,00E+00 |
| MER | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 5.06E-02 | 0,00E+00 | 0,00E+00 |
| EEE | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | -2,73E-01 | 0,00E+00 | 0,00E+00 |
| ETE | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | -4,12E-01 | 0,00E+00 | 0,00E+00 |

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy.

Information describing the biogenic carbon content at the factory gate

| Biogenic carbon content* | Unit | Value |
|---|------|----------|
| Biogenic carbon content in product | kg C | 3.22E-10 |
| Biogenic carbon content in the accompanying packaging | kg C | 2,57E-06 |

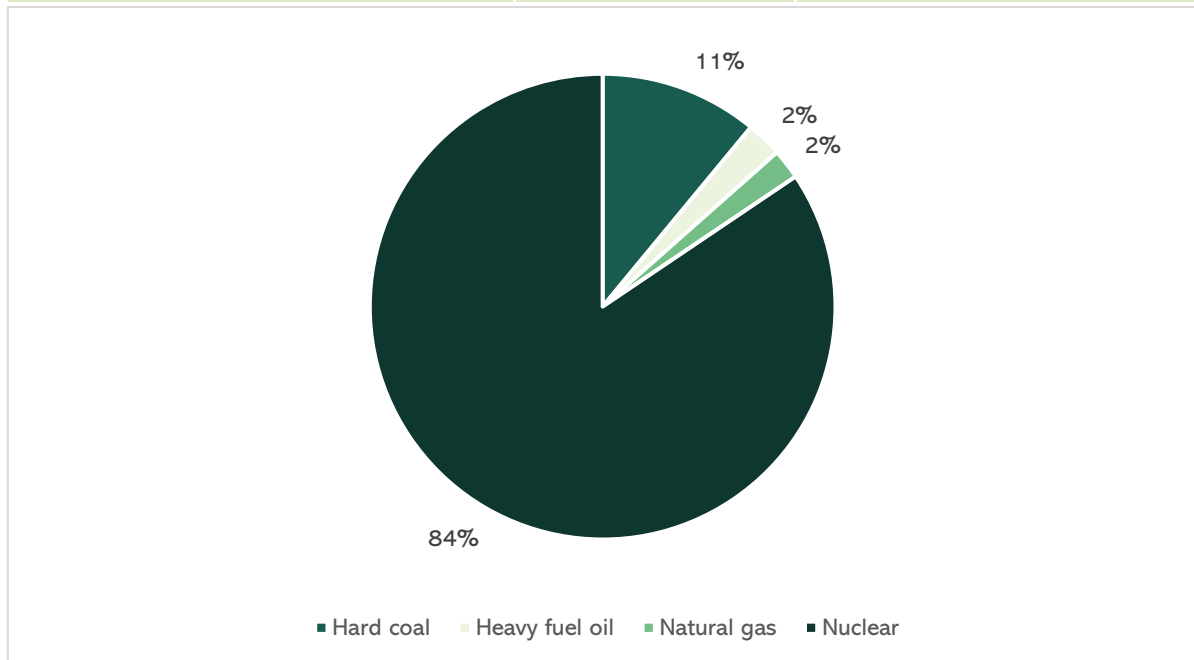
*44/12 is the ratio between the molecular mass of CO₂ and C molecules

Additional requirements

Location based electricity mix from the use of electricity in manufacturing

The manufacturing process has been modelled and calculated according to the national residual mix with data retrieved from the Association of Issuing Bodies (2022).

| National electricity grid | Data source | GWP excl. biogenic [kg CO ₂ -eq/kWh] |
|-----------------------------|-------------|---|
| <i>Swedish residual mix</i> | AIB (2020) | 0,037 |



Indoor Environment

BASTEC have done emission measurements according to ISO 160000–9:2006 for volatile organic compounds (VOC). The test results are in compliance with the requirements.






Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- The product contains no substances given by the REACH Candidate list.
- The product contains substances given by the REACH Candidate list that are less than 0,1 % by weight.
- The product contains dangerous substances, more then 0,1% by weight, given by the REACH Candidate List, see table.
- The product contains no substances given by the REACH Candidate list.
- The product is classified as hazardous waste, see table.

Bibliography

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- EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
- ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures
- ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines
- ISO 21930:2007 Sustainability in building construction - Environmental declaration of building products
- PCR 011/007 PCR EPDIItaly011: ELECTRONIC AND ELECTRICAL PRODUCTS AND SYSTEMS – METERS. PCR EPDIItaly007: Electronic and Electrical Products and Systems
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| | | | |
|--|--|------------|--|
|  Global Program Operator | Program Operator | | |
| | The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway | tlf | +47 23 08 80 00 |
| | | e-post: | post@epd-norge.no |
| | | web | www.epd-norge.no |
|  Global Program Operator | Publisher | | |
| | The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norway | tlf | +47 23 08 80 00 |
| | | e-post: | post@epd-norge.no |
| | | web | www.epd-norge.no |
|  | Owner of the declaration | | |
| | Stefan Nilsson BASTEC AB Hästvägen 4A SE-212 35 Malmö Sweden | tlf | +46 10 330 80 00 |
| | | e-post: | info@bastec.se |
| | | web | www.bastec.se |
|  | Author of the life cycle assessment | | |
| | Amit Lotan CarbonZero AB Tåstrupsgatan 2, 262 32, Ängelholm, Sweden | tlf | +46 431 70 70 7 |
| | | e-post: | info@eando.se |
| | | web | www.eando.se |
|  | ECO Platform ECO Portal | web web | www.eco-platform.org ECO Portal |