# Product Environmental Profile

## KNX secure line coupler




## Company information

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## References covered

TYFS130

## Methodology

PEP has been performed according to the PCR version PEP-PCR-ed4-2021 09 06 and PSR version PSR-0005-ed3-2023 06 06 issued by the PEP ecopassport program.
For further information, please see the website of the program www.pep-ecopassport.org

## Reference product

**Reference product identification**
TYFS130

**Use scenario based on :**
**PSR product Category : PSR-0005-ed3-2023 06 06**
PSR5 - 3.15. Passive product continue operation

## Functional unit

The area/line coupler interconnects two KNX lines into a logical function area ensuring the electrical separation between these lines. Each bus line of a KNX installation can thus be operated electrically independently from other bus lines. This function is provided during the reference service life of the product of 10 years.

The functional unit is based on the use scenario recommended by the PCR for the category of the reference product.

## Materials and substances

All useful measures have been adopted to ensure that the materials used in the composition of the product do not contain any substances banned by the legislation in force at the time of marketing.

| Plastics | | | Metals | | | Others | | |
|---|---|---|---|---|---|---|---|---|
| | g | % | | g | % | | g | % |
| PA6 | 20.48 | 30.1% | Copper | 2.49 | 3.6% | Paper | 14.75 | 21.7% |
| PC | 12.12 | 17.8% | Brass | 1.61 | 2.4% | Glass | 3.28 | 4.8% |
| Epoxy resin | 1.89 | 2.8% | Aluminium | 1.37 | 2.0% | Wood | 1.62 | 2.4% |
| Polyester resin | 0.99 | 1.5% | Nickel | 0.18 | 0.3% | Cardboard | 1.30 | 1.9% |
| PBT | 0.98 | 1.4% | Tin | 0.12 | 0.2% | POM | 0.93 | 1.4% |
| Other | 1.29 | 1.9% | Other | 0.19 | 0.3% | Other | 2.52 | 3.7% |
| **Total mass of reference product with raw material packaging :** | | | **68.11 g** | | | | | |

| | |
|---|---|
| **Total mass of reference product (Product + packaging)** | **64.829 g** |

## System Boudaries

The environmental information included in the PEP covers all the stages of the life cycle, from "cradle to grave".

| Manufacturing | | | Distribution | Installation | Use | | | | | | | End of life | | | | Module D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Raw material extraction and processing | Transport to the manufacturer | Manufacturing | Distribution to the place of operation | Installation on the place of operation | Use or application of the product installed | Maintenance | Repair | Replacement | Restoration | Energy requirements during the use stage | Water requirements during the use stage | Deinstallation | Transport to the waste treatment site | Treatment of waste in view of its reuse, recovery and/or recycling | Disposal | Benefits and loads beyond the system boundaries |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Life cycle stages | | | | | | | | | | | | | | | | |

## Manufacturing

These products are manufactured by a site that has received an environmental certification ISO 14001.

This phase takes into account raw materials, manufacturing processes, production offcuts and their end-of-life treatment, upstream transport of materials and sub-assemblies to the manufacturing site, and transport from the manufacturing site to the final logistics platform.

## Distribution

The packaging has been designed in accordance with current regulations. In particular, the European directive 94/62/CE relative to packaging and packaging waste.

The used packaging is 100% recyclable or recoverable.
Packaging and logistic flows are continuously improved in order to reduce their impact.

This phase taken into account the transport of the finished product, including packaging, to its place of use.

## Installation

**Installation processes**

The processes to install the product are not considered in this study because of their weak impact compared to the other life cycles steps.

This phase only take into account the impact of the the packaging waste treatment is taken into account.

**Installation elements (non delivered with the product)**

Elements non delivered with the product and needed to install the product are not considered.

## Use

For the considered scenario, the product has no energy consumption.

**Energy model of the use phase :**
Europe

**Consumables and maintenance :**
None

## End of life

Considering the complexity of the recycling channels for electric and electronic equipment impacts, we rely mainely on ESR modules (datasets for WEEE product end of life).

The recycling potential of the product is: 21%. The calculation of this rate is based on the method of the IEC/TR 62635.

## Environmental impacts

Evaluation of the environmental impact covers the following life cycle stages: raw materials + manufacturing (RMM), distribution (D), installation (I), use (U) and end of life (EoL).

All calculations are done with EIME software version 6.0.0 with the database versionVersion  CODDE® 2023-02 .

Indicators set : Indicators for PEF EF 3.0 (Compliance: PEP ed.4, EN15804+A2) v2.0

PEP representative of the covered products marketed in: Europe

Energy models considered for each phase

| Manufacturing A1-A3 | Distribution A4 | Installation A5 | Use B1-B7 | End Of Life C1-C4 |
|---|---|---|---|---|
| Europe | - | Europe | Europe | Europe |

**Environmental impact indicators**

| Indicators | Unit | Manufacturing A1-A3 | Distribution A4 | Installation A5 | Use B1-B7 | End Of Life C1-C4 | GLOBAL | Module D |
|---|---|---|---|---|---|---|---|---|
| Acidification (PEF-AP) | mole H+ eq | 1.37E-02 | 1.18E-04 | 1.70E-05 | 0.00E+00 | 2.05E-04 | 1.40E-02 | 1.96E-04 |
| Climate change - Total (PEF-GWP) | kg CO2 eq. | 2.22E+00 | 1.87E-02 | 1.78E-02 | 0.00E+00 | 1.07E-01 | 2.36E+00 | 9.03E-02 |
| Climate change-Biogenic (PEF-GWPb) | kg CO2 eq. | 1.52E-02 | 0.00E+00 | 8.16E-03 | 0.00E+00 | 1.07E-02 | 3.40E-02 | 6.31E-04 |
| Climate change-Fossil (PEF-GWPf) | kg CO2 eq. | 2.20E+00 | 1.87E-02 | 9.69E-03 | 0.00E+00 | 9.68E-02 | 2.33E+00 | 8.97E-02 |
| Climate change-Land use and land use change (PEF-GWPlu) | kg CO2 eq. | 2.13E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.13E-05 | 0.00E+00 |
| Ecotoxicity, freshwater (PEF-CTUe) | CTUe | 3.24E+02 | 1.26E-02 | 2.23E+01 | 0.00E+00 | 2.82E+01 | 3.74E+02 | 1.88E-01 |
| EF-particulate Matter (PEF-PM) | Incidence of diseases | 7.56E-08 | 9.63E-10 | 8.74E-11 | 0.00E+00 | 1.54E-09 | 7.82E-08 | 1.51E-09 |
| Eutrophication, freshwater (PEF-Epf) | kg P eq. | 1.26E-05 | 7.01E-09 | 4.39E-07 | 0.00E+00 | 5.47E-07 | 1.36E-05 | 6.53E-08 |
| Eutrophication marine (PEF-Epm) | kg N eq. | 1.50E-03 | 5.55E-05 | 8.08E-06 | 0.00E+00 | 6.55E-05 | 1.63E-03 | 6.16E-05 |
| Eutrophication, terrestrial (PEF-Ept) | mole of N eq. | 1.60E-02 | 6.09E-04 | 5.98E-05 | 0.00E+00 | 7.71E-04 | 1.74E-02 | 7.32E-04 |
| Human toxicity, cancer (PEF-CTUh-c) | CTUh | 2.20E-07 | 3.28E-13 | 4.65E-10 | 0.00E+00 | 3.51E-11 | 2.21E-07 | 1.52E-11 |
| Human toxicity, non-cancer (PEF-CTUh-nc) | CTUh | 5.78E-08 | 3.55E-11 | 7.35E-11 | 0.00E+00 | 2.99E-10 | 5.82E-08 | 2.28E-10 |
| Ionising radiation, human health (PEF-IR) | kg U235 eq. | 1.03E+01 | 4.55E-05 | 6.10E-04 | 0.00E+00 | 1.18E-03 | 1.03E+01 | 1.18E-03 |
| Land use (PEF-LU) | No dimension | 7.09E-02 | 0.00E+00 | 1.09E-05 | 0.00E+00 | 4.68E-02 | 1.18E-01 | 4.68E-02 |
| Ozone depletion (PEF-ODP) | kg CFC-11 eq. | 2.59E-07 | 2.87E-11 | 8.10E-11 | 0.00E+00 | 3.06E-09 | 2.63E-07 | 3.02E-09 |
| Photochemical ozone formation - human health (PEF-POCP) | kg of NMVOC eq. | 5.35E-03 | 1.54E-04 | 1.39E-05 | 0.00E+00 | 1.81E-04 | 5.70E-03 | 1.71E-04 |
| Resource use, fossils (PEF-ADPf) | Incidence of diseases | 2.95E+01 | 2.61E-01 | 4.26E-02 | 0.00E+00 | 3.16E-01 | 3.01E+01 | 3.09E-01 |
| Resource use, minerals and metals (PEF-ADPe) | kg Sb eq | 4.44E-04 | 7.36E-10 | 1.06E-10 | 0.00E+00 | 7.51E-08 | 4.44E-04 | 7.50E-08 |
| Water use (PEF-WU) | m3 eq. | 2.85E-01 | 7.10E-05 | 7.89E-04 | 0.00E+00 | 2.31E+00 | 2.59E+00 | 2.31E+00 |

**Resource use indicators**

| Indicators | Unit | Manufacturing A1-A3 | Distribution A4 | Installation A5 | Use B1-B7 | End Of Life C1-C4 | GLOBAL | Module D |
|---|---|---|---|---|---|---|---|---|
| Net use of fresh water | $m^3$ | 6.89E-03 | 1.65E-06 | 1.84E-05 | 0.00E+00 | 7.04E-02 | 7.73E-02 | 7.04E-02 |
| Total use of primary energy | MJ | 3.08E+01 | 2.61E-01 | 4.78E-02 | 0.00E+00 | 3.34E-01 | 3.14E+01 | 3.26E-01 |
| Total use of non renewable primary energy resources | MJ | 2.95E+01 | 2.61E-01 | 4.26E-02 | 0.00E+00 | 3.16E-01 | 3.01E+01 | 3.09E-01 |
| Total use of renewable primary energy resources | MJ | 1.23E+00 | 3.48E-04 | 5.16E-03 | 0.00E+00 | 1.71E-02 | 1.26E+00 | 1.71E-02 |
| Use of non-renewable primary energy, excluding non renewable primary energy resources used as raw materials | MJ | 2.80E+01 | 2.61E-01 | 4.26E-02 | 0.00E+00 | 3.16E-01 | 2.87E+01 | 3.09E-01 |
| Use of non-renewable primary energy resources as raw materials | MJ | 1.49E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.49E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of renewable primary energy, excluding renewable primary energy resources used as raw materials | kg | 1.00E+00 | 3.48E-04 | 5.16E-03 | 0.00E+00 | 1.71E-02 | 1.03E+00 | 1.71E-02 |
| Use of renewable primary energy resources as raw materials | MJ | 2.31E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.31E-01 | 0.00E+00 |
| Use of renewable secondary fuels | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of secondary materials | kg | 3.74E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.74E-03 | 0.00E+00 |

**Waste category indicators**

| Indicators | Unit | Manufacturing A1-A3 | Distribution A4 | Installation A5 | Use B1-B7 | End Of Life C1-C4 | GLOBAL | Module D |
|---|---|---|---|---|---|---|---|---|
| Hazardous waste disposed | kg | 7.24E+00 | 0.00E+00 | 1.01E-04 | 0.00E+00 | 2.14E-06 | 7.24E+00 | 1.33E-20 |
| Non-hazardous waste disposed | kg | 5.49E-01 | 6.56E-04 | 1.27E-02 | 0.00E+00 | 1.39E-02 | 5.76E-01 | 5.07E-20 |
| Radioactive waste disposed | kg | 2.72E-04 | 4.67E-07 | 2.09E-07 | 0.00E+00 | 1.54E-08 | 2.73E-04 | 0.00E+00 |

**Output flow indicators**

| Indicators | Unit | Manufacturing A1-A3 | Distribution A4 | Installation A5 | Use B1-B7 | End Of Life C1-C4 | GLOBAL | Module D |
|---|---|---|---|---|---|---|---|---|
| Components for re-use | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Exported energy | MJ | 5.46E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.46E-04 | 0.00E+00 |
| Materials for energy recovery | kg | 7.40E-04 | 0.00E+00 | 3.35E-04 | 0.00E+00 | 0.00E+00 | 1.07E-03 | 0.00E+00 |
| Materials for recycling | kg | 6.36E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.36E-04 | 0.00E+00 |

**Biogenic carbon content**

| Packaging | Unit | Cardboard | Paper | Wood | Sum |
|---|---|---|---|---|---|
| Biogenic carbon content (ratio) | % | 2.80E+01 | 3.78E+01 | 3.95E+01 | |
| Mass | kg | 1.30E-03 | 1.50E-02 | 1.62E-03 | 1.79E-02 |
| Biogenic carbon content (declared unit) | kg of C | 3.63E-04 | 5.67E-03 | 6.41E-04 | 6.67E-03 |
| Biogenic carbon content (functional unit) | kg of C | 3.63E-04 | 5.67E-03 | 6.41E-04 | 6.67E-03 |
| Source | | ADEME | APESA/RECORD | EN 16485 | |

Note : The product does not content biogenic carbon

## Extrapolation rules

No extrapolation rules

## Verification

| | | |
|---|---|---|
| Registration N°: HAGE-00819-V01.01-EN | Drafting Rules | PEP-PCR-ed4-2021 09 06 |
| | Supplemented by | PSR-0005-ed3-2023 06 06 |
| Verifier accreditation N°: VH37 | Information and reference documents: www.pep-ecopassport.org | |
| Date of issue: 12-2023 | Validity period: | 5 years |
| Independent verification of the declaration and data, in compliance with ISO 14025 : 2006 | | |
| Internal ● External ○ | | |
| The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain) | | |
| PEPs are compliant with XP C08-100-1:2016 or EN 50693:2019<br>The elements of the present PEP cannot be compared with elements from another program. | | |
| Document in compliance with ISO 14025 : 2006 « Environmental labels and declarations. Type III environmental declarations » | | |

**Nota :**

The picture has no contractual value.

All numerical values indicated in this document may vary and depend of many factors such as the tolerance related to materials, the usage and environment conditions of the products, installation characteristics ... , real values for a product in a concrete application may therefore change.

The usage time mentioned in this document is an average duration chosen for the need of the calculations. This value cannot be assimilated to the minimum, average or real life time.

The responsibility of the company, issuing this document, can never be engaged if differences would be noticed between the values given by this document and real ones, whatever the causes and/or consequences would be.