# ENVIRONMENTAL PRODUCT DECLARATION

## IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

**Insuplast Insulating Material**

Insuplast Finland Oy

**EPD HUB, HUB-2258**

Published on 22.11.2024, last updated on 22.11.2024, valid until 22.11.2029

Created with One Click LCA

# GENERAL INFORMATION

## MANUFACTURER

| | |
|---|---|
| Manufacturer | Insuplast Oy |
| Address | Annalankankaantie 18, 90830 Haukipudas |
| Contact details | sami.luhtaanmaki@insuplast.fi |
| Website | https://www.insuplast.fi/ |

## EPD STANDARDS, SCOPE AND VERIFICATION

| | |
|---|---|
| Program operator | EPD Hub, hub@epdhub.com |
| Reference standard | EN 15804+A2:2019 and ISO 14025 |
| PCR | EPD Hub Core PCR Version 1.1, 5 Dec 2023 |
| Sector | Construction product |
| Category of EPD | Third party verified EPD |
| Parent EPD number | - |
| Scope of the EPD | Cradle to gate with modules C1-C4, D |
| EPD author | Jori Jokela, Macon Oy |
| EPD verification | Independent verification of this EPD and data, according to ISO 14025:<br>☐ Internal verification ☑ External verification |
| EPD verifier | Imane Uald lamkaddam, as an authorized verifier acting for EPD Hub Limited |

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

## PRODUCT

| | |
|---|---|
| Product name | Insuplast Insulating Material |
| Additional labels | Insuplast |
| Product reference | - |
| Place of production | Oulu, Finland |
| Period for data | 2023 |
| Averaging in EPD | No averaging |

## ENVIRONMENTAL DATA SUMMARY

| | |
|---|---|
| **Declared unit** | 1 kg |
| **Declared unit mass** | 1 kg |
| **GWP-fossil, A1-A3 ($kgCO_2e$)** | 2,55 |
| **GWP-total, A1-A3 ($kgCO_2e$)** | 1,98 |
| **Secondary material, inputs (%)** | 63,7 |
| **Secondary material, outputs (%)** | 82,3 |
| **Total energy use, A1-A3 (kWh)** | 13,2 |
| **Net freshwater use, A1-A3 ($m^3$)** | 0,04 |

# PRODUCT AND MANUFACTURER

## ABOUT THE MANUFACTURER

Recognized as a pioneer in sustainable development, Insuplast Oy produces high-quality, recycled, and allergy-free insulation solutions in new Haukipudas factory in Finland. Insuplast Oy makes the creation of advanced spaces pleasant, easy, and fast. Our commitment to sustainable development, product safety, and ease of use guides all of our operations.

## PRODUCT DESCRIPTION

Insuplast is a safe and lightweight insulating material whose fiber raw material is pure, up to 50% recycled polyester. The Insuplast product range includes all insulation parts for ventilation ducts from Ø100mm ducts up to Ø200mm. The product selection includes 45° and 90° angles, T-joints, and straight insulation parts with the respective diameters.

The used fiber material does not release harmful substances into the environment even over an extended period. Insuplast's raw material (EWONA polyester fiber material) is allergy-safe and have been approved by The Finnish Allergy, Skin and Asthma Federation.

Further information can be found at https://www.insuplast.fi/.

## PRODUCT RAW MATERIAL MAIN COMPOSITION

| Raw material category | Amount, mass % | Material origin |
|---|---|---|
| Metals | - | - |
| Minerals | - | - |
| Fossil materials | 100 | EU |
| Bio-based materials | - | - |

## BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

| | |
|---|---|
| Biogenic carbon content in product, kg C | 0 |
| Biogenic carbon content in packaging, kg C | 0,05 |

## FUNCTIONAL UNIT AND SERVICE LIFE

| | |
|---|---|
| Declared unit | 1 kg |
| Mass per declared unit | 1 kg |

## SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

# PRODUCT LIFE-CYCLE

## SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

| Product stage | | | Assembly stage | | Use stage | | | | | | | End of life stage | | | | Beyond the system boundaries | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D | | |
| × | × | × | MND | MND | MND | MND | MND | MND | MND | MND | MND | × | × | × | × | × | | |
| Raw materials | Transport | Manufacturing | Transport | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction/ demolition | Transport | Waste processing | Disposal | Reuse | Recovery | Recycling |

*Modules not declared = MND. Modules not relevant = MNR*

## MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

The environmental impacts of raw material supply (A1) include emissions generated when raw materials are taken from nature, transported to industrial units for processing and processed, along with waste handling from the various production processes. All major upstream processes are taken into consideration, including infrastructure. This stage includes all the aforementioned for the raw materials which end up in the final product (i.e. polyester fibers, recycled polyester fibers, polyester fabric and packaging) as well as the electricity and heat production which are consumed during the manufacturing at the plant.

## TRANSPORT AND INSTALLATION (A4-A5)

This EPD does not cover the transportation impacts occurred from final products delivery to construction site (A4). Installation (A5) contains only packaging waste impacts and have been declared in C-phase. Wooden packing materials will be recycled as materials for energy recovery and plastics will be recycled as materials for plastics recycling (C3).

## PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil, and water impacts during the use phase have not been studied.

## PRODUCT END OF LIFE (C1-C4, D)

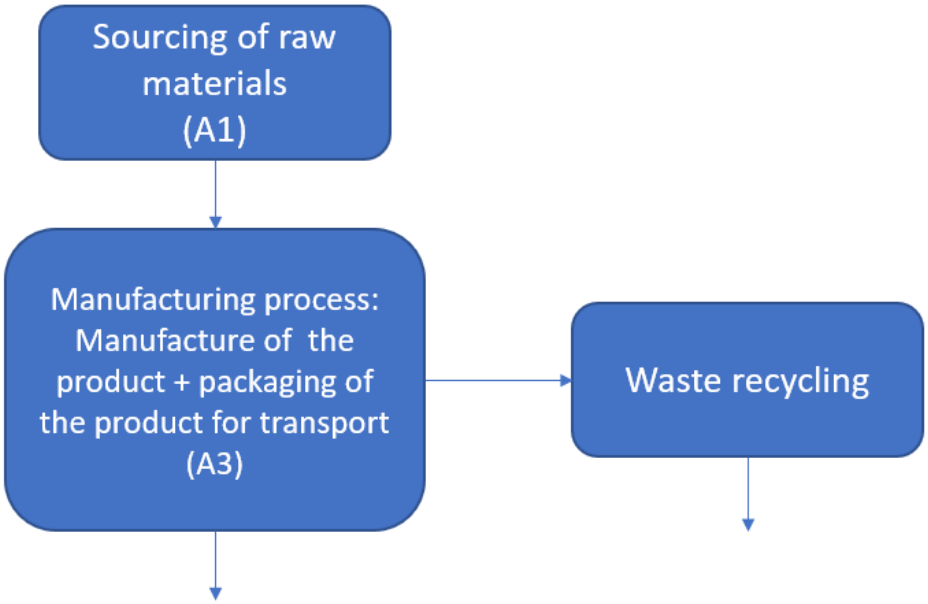
Demolition is assumed to have only small effects due to easy dismantling. It is assumed that 100 % of the Insuplast products are collected (C1). Distance for transportation to treatment is assumed as 50 km and the transportation method is assumed to be lorry (C2). Insuplast products are assumed to be reused or recycled as rawmaterial for new products or to be utilized in energy production (C3). Due to the recycling process the end-of-life product is converted into recyclable raw materials or reused as it is (D).

# MANUFACTURING PROCESS

Raw material is Ewona Base Material and it is manufactured in the same site.

In the manufacturing process raw material is rolled onto a mold and then heated in an electric oven, when it gets its characteristic shape.

The next step is cutting the product to the desidered size. After the shaping phases readymade products are packed for transport to customers.



# LIFE-CYCLE ASSESSMENT

## CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

## ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

| Data type | Allocation |
|---|---|
| Raw materials | No allocation |
| Packaging material | No allocation |
| Ancillary materials | No allocation |
| Manufacturing energy and waste | Allocated by mass or volume |

## AVERAGES AND VARIABILITY

| | |
|---|---|
| Type of average | No averaging |
| Averaging method | Not applicable |

This EPD is product and factory specific and does not contain average calculations.

## LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses Ecoinvent v3.8, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data.

# ENVIRONMENTAL IMPACT DATA

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| GWP – total[1)] | kg $CO_2e$ | 2,26E+00 | 1,15E-01 | -3,91E-01 | 1,98E+00 | 3,31E-03 | 6,13E-03 | 1,41E+00 | 2,44E-01 | -5,80E-01 |
| GWP – fossil | kg $CO_2e$ | 2,26E+00 | 1,15E-01 | 1,83E-01 | 2,55E+00 | 3,31E-03 | 6,13E-03 | 1,06E+00 | 2,54E-02 | -5,98E-01 |
| GWP – biogenic | kg $CO_2e$ | 0,00E+00 | 6,08E-06 | -5,74E-01 | -5,74E-01 | 6,06E-07 | 0,00E+00 | 3,56E-01 | 2,18E-01 | 1,94E-02 |
| GWP – LULUC | kg $CO_2e$ | 2,66E-03 | 6,04E-05 | 5,34E-04 | 3,25E-03 | 3,30E-07 | 2,36E-06 | 3,30E-05 | 3,53E-06 | -9,41E-04 |
| Ozone depletion pot. | kg $CFC\text{-}_{11}e$ | 7,97E-06 | 2,59E-08 | 1,69E-08 | 8,01E-06 | 7,07E-10 | 1,48E-09 | 2,07E-09 | 9,58E-10 | -3,29E-08 |
| Acidification potential | mol $H^+e$ | 9,83E-03 | 1,76E-03 | 1,31E-03 | 1,29E-02 | 3,44E-05 | 1,88E-05 | 2,83E-04 | 2,78E-05 | -4,60E-03 |
| EP-freshwater[2)] | kg Pe | 1,01E-04 | 6,49E-07 | 2,28E-05 | 1,25E-04 | 1,10E-08 | 4,45E-08 | 9,08E-07 | 5,92E-08 | -2,44E-05 |
| EP-marine | kg Ne | 2,18E-03 | 4,27E-04 | 2,47E-04 | 2,85E-03 | 1,52E-05 | 4,02E-06 | 1,38E-04 | 4,12E-05 | -5,52E-04 |
| EP-terrestrial | mol Ne | 1,93E-02 | 4,74E-03 | 3,68E-03 | 2,77E-02 | 1,67E-04 | 4,46E-05 | 1,31E-03 | 1,03E-04 | -6,46E-03 |
| POCP ("smog")[3)] | kg NMVOCe | 9,86E-03 | 1,29E-03 | 9,67E-04 | 1,21E-02 | 4,59E-05 | 1,74E-05 | 3,32E-04 | 3,61E-05 | -1,80E-03 |
| ADP-minerals & metals[4)] | kg Sbe | 2,13E-05 | 2,48E-07 | 1,24E-06 | 2,28E-05 | 1,68E-09 | 1,76E-08 | 3,08E-07 | 1,13E-08 | -5,76E-07 |
| ADP-fossil resources | MJ | 4,52E+01 | 1,65E+00 | 4,53E+00 | 5,14E+01 | 4,45E-02 | 9,53E-02 | 2,85E-01 | 7,45E-02 | -7,82E+00 |
| Water use[5)] | $m^3e$ depr. | 1,22E+00 | 6,66E-03 | 3,44E-01 | 1,57E+00 | 1,20E-04 | 4,41E-04 | 4,25E-02 | 4,66E-04 | -9,77E-02 |

*1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.*

## ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| Particulate matter | Incidence | 1,02E-07 | 8,74E-09 | 1,28E-08 | 1,24E-07 | 9,22E-10 | 6,32E-10 | 2,65E-09 | 5,45E-10 | -4,45E-08 |
| Ionizing radiation[6)] | kBq U235e | 1,93E-01 | 8,22E-03 | 9,55E-02 | 2,97E-01 | 2,05E-04 | 4,91E-04 | 1,95E-03 | 3,68E-04 | -1,51E-01 |
| Ecotoxicity (freshwater) | CTUe | 4,00E+01 | 1,26E+00 | 3,56E+00 | 4,48E+01 | 2,68E-02 | 7,98E-02 | 2,15E+00 | 1,14E-01 | -1,40E+01 |
| Human toxicity, cancer | CTUh | 1,31E-09 | 5,23E-11 | 7,16E-10 | 2,08E-09 | 1,03E-12 | 2,19E-12 | 1,07E-10 | 2,41E-12 | -1,91E-10 |
| Human tox. non-cancer | CTUh | 2,68E-08 | 1,13E-09 | 3,18E-09 | 3,11E-08 | 1,94E-11 | 7,98E-11 | 3,54E-09 | 5,03E-11 | -5,88E-09 |
| SQP[7)] | - | 5,74E+00 | 1,21E+00 | 4,62E+01 | 5,31E+01 | 5,79E-03 | 9,61E-02 | 2,97E-01 | 1,77E-01 | -5,32E+00 |

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

## USE OF NATURAL RESOURCES

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| Renew. PER as energy[8)] | MJ | 2,53E+00 | 1,81E-02 | 3,87E+00 | 6,41E+00 | 2,54E-04 | 1,27E-03 | 2,05E-02 | 1,52E-03 | -1,73E+00 |
| Renew. PER as material | MJ | 0,00E+00 | 0,00E+00 | 5,03E+00 | 5,03E+00 | 0,00E+00 | 0,00E+00 | -3,12E+00 | -1,91E+00 | 1,20E-01 |
| Total use of renew. PER | MJ | 2,53E+00 | 1,81E-02 | 8,90E+00 | 1,14E+01 | 2,54E-04 | 1,27E-03 | -3,10E+00 | -1,91E+00 | -1,61E+00 |
| Non-re. PER as energy | MJ | 3,55E+01 | 1,65E+00 | 3,78E+00 | 4,09E+01 | 4,45E-02 | 9,53E-02 | 2,85E-01 | 7,45E-02 | -7,68E+00 |
| Non-re. PER as material | MJ | 2,16E+01 | 0,00E+00 | 1,28E-01 | 2,17E+01 | 0,00E+00 | 0,00E+00 | -1,66E+01 | -5,15E+00 | 4,10E-02 |
| Total use of non-re. PER | MJ | 5,70E+01 | 1,65E+00 | 3,91E+00 | 6,26E+01 | 4,45E-02 | 9,53E-02 | -1,63E+01 | -5,07E+00 | -7,63E+00 |
| Secondary materials | kg | 6,37E-01 | 5,85E-04 | 1,88E-02 | 6,57E-01 | 1,74E-05 | 2,87E-05 | 1,12E-03 | 2,63E-05 | 2,91E-03 |
| Renew. secondary fuels | MJ | 9,80E-05 | 3,64E-06 | 1,70E-01 | 1,70E-01 | 5,70E-08 | 2,81E-07 | 7,96E-06 | 1,01E-06 | -3,82E-06 |
| Non-ren. secondary fuels | 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 |
| Use of net fresh water | $m^3$ | 3,07E-02 | 1,77E-04 | 4,59E-03 | 3,55E-02 | 2,70E-06 | 1,24E-05 | 1,25E-04 | 7,91E-05 | -6,08E-03 |

*8) PER = Primary energy resources.*

## END OF LIFE – WASTE

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| Hazardous waste | kg | 1,23E-01 | 1,96E-03 | 1,09E-02 | 1,36E-01 | 5,96E-05 | 1,06E-04 | 3,05E-03 | 0,00E+00 | -4,63E-02 |
| Non-hazardous waste | kg | 4,80E+00 | 2,67E-02 | 2,93E-01 | 5,12E+00 | 4,19E-04 | 1,85E-03 | 5,95E-01 | 2,97E-01 | -1,89E+00 |
| Radioactive waste | kg | 7,28E-05 | 1,15E-05 | 3,82E-05 | 1,23E-04 | 3,13E-07 | 6,56E-07 | 6,88E-07 | 0,00E+00 | -4,31E-05 |

## END OF LIFE – OUTPUT FLOWS

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| Components for re-use | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Materials for recycling | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 3,22E-01 | 0,00E+00 | 0,00E+00 |
| Materials for energy rec | kg | 0,00E+00 | 0,00E+00 | 3,00E-02 | 3,00E-02 | 0,00E+00 | 0,00E+00 | 5,00E-01 | 0,00E+00 | 0,00E+00 |
| Exported energy | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 8,64E+00 | 0,00E+00 | 0,00E+00 |

## ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

| Impact category | Unit | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|
| Global Warming Pot. | kg $CO_2e$ | 2,18E+00 | 1,14E-01 | 1,83E-01 | 2,48E+00 | 3,27E-03 | 6,07E-03 | 1,06E+00 | 2,48E-02 | -5,87E-01 |
| Ozone depletion Pot. | kg $CFC_{-11}e$ | 5,34E-06 | 2,05E-08 | 1,41E-08 | 5,37E-06 | 5,60E-10 | 1,17E-09 | 1,79E-09 | 7,60E-10 | -2,69E-08 |
| Acidification | kg $SO_2e$ | 8,16E-03 | 1,41E-03 | 9,96E-04 | 1,06E-02 | 2,45E-05 | 1,53E-05 | 2,04E-04 | 2,11E-05 | -3,92E-03 |
| Eutrophication | kg $PO_4^3e$ | 3,15E-03 | 1,74E-04 | 3,90E-04 | 3,72E-03 | 5,69E-06 | 3,27E-06 | 2,13E-04 | 1,62E-03 | -8,81E-04 |
| POCP (“smog”) | kg $C_2H_4e$ | 4,59E-04 | 3,99E-05 | 9,10E-05 | 5,90E-04 | 5,36E-07 | 7,33E-07 | 8,92E-06 | 4,75E-06 | -1,72E-04 |
| ADP-elements | kg Sbe | 2,11E-05 | 2,42E-07 | 1,22E-06 | 2,26E-05 | 1,65E-09 | 1,71E-08 | 3,01E-07 | 1,09E-08 | -5,78E-07 |
| ADP-fossil | MJ | 4,52E+01 | 1,65E+00 | 4,53E+00 | 5,14E+01 | 4,45E-02 | 9,53E-02 | 2,85E-01 | 7,45E-02 | -7,67E+00 |

# VERIFICATION STATEMENT

## VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online
This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

## THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Imane Uald lamkaddam, as an authorized verifier acting for EPD Hub Limited
22.11.2024