ENVIRONMENTAL PRODUCT DECLARATION

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

STYROPLAST EPS INSULATION

STYROPLAST OY

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Styroplast Oy
Address	Styroplast OY, Teollisuustie 1, 37600 Valkeakoski, Finland
Contact details	Timo Huuhtanen, CEO, timo.huuhtanen@styroplast.fi
Website	www.styroplast.fi

PRODUCT IDENTIFICATION

Product name	Styroplast EPS-insulation
Place(s) of production	Valkeakoski, Finland

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RTS EPD Committee secretary

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Managing Director

EPD INFORMATION

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.

EPD program operator	The Building Information Foundation RTS sr / Building Information Ltd Malminkatu 16 A, 00100 Helsinki, Finland http://cer.rts.fi
EPD standards	This EPD is in accordance with EN 15804 +A1, +A2 and ISO 14025 standards.
Product category rules (PCR)	The CEN standard EN 15804+A2 serves as the core PCR. In addition, the RTS PCR (English version, 26.8.2020) is used.
EPD author	Ipek Goktas, at Bionova Ltd Suvilahdenkatu 10 B 00500 Helsinki, Finland www.bionova.fi
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
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Publishing date	10.6.2021
EPD valid until	4.6.2026

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Styroplast's EPS is expanded polystyrene insulation, which is light weight and effective. EPS insulation is mostly used for as floor, wall, roof and ground frost insulation in building.

PRODUCT APPLICATION

Styroplast EPS thermal insulation boards are used for insulating floors, walls, ceilings and as ground frost insulation.

TECHNICAL SPECIFICATIONS

EPS insulation boards have a thermal conductivity of 0.031-0.036 W/(mK). The normal boards are available in nominal densities of 15, 17, 21 and 23 kg/m3, and thicknesses ranging from 20 and 1000 mm. As the product is homogeneous, the results represent all available thicknesses. The panels are used for heat insulation of floors, walls and roofs.

PRODUCT STANDARDS

EN 13163:2015 Thermal insulation products for buildings. Factory made expanded polystyrene (EPS) products.

PHYSICAL PROPERTIES OF THE PRODUCT

Detailed physical information can be found from the manufacturer's webpage (https://www.styroplast.fi).

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at www.styroplast.fi.

PRODUCT RAW MATERIAL COMPOSITION

Material	Weight, kg
Polystyrene	1.00

PRODUCT RAW MATERIAL MAIN COMPOSITION

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

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

MANUFACTURING AND PACKAGING (A1-A3)

The raw material expandable polystyrene already includes blowing agent pentane. This raw material is expanded with heat/steam and after that expanded EPS pearls are stored for a while. Then EPS pearls are put into mould (shape or block) and there with steam "glued" together. Styroplast EPS boards are produced with shape mould machine. If production is done with block mould, then after a while blocks are cut with hotwire to right dimensions.

The Styroplast EPS product is produced in Finland and grid mix energy is used. During the production the generated product-based waste is sent back to the melting process. Therefore, there is no waste from the product itself. The only generated waste derives from the packaging of the raw materials. Also, most of the pentane which is included in the raw material releases during the production.

As packaging material plastic film is used for the final product.

Manufacturing flow chart

TRANSPORT AND INSTALLATION (A4-A5)

Annual export rates are taken into consideration for delivery scenario. There is no significant weight loss due to the emission of the rest of the pentane in the product during transportation.

This EPD does not cover installation (Module A5). Air, soil and water impacts during installation have not been studied.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover use phase. Air, soil and water impacts during the use phase have not been studied. During the service life of the product, rest of the pentane is emitted, however it does not have any harmful impact; therefore, it is not taken into consideration.

PRODUCT END OF LIFE (C1-C4, D)

The rest of the pentane is assumed to be emitted during the service life of the product; therefore, the mass loss due to this blowing agent is taken into consideration in end-of-life stage. Consumption of energy and natural resources in demolition process assumed to be negligible. (C1) The distance for transportation to disposal is assumed as 50 km and the transportation method is assumed to be lorry. (C2) Considering the manufacturer's information, 100% of end-of-life EPS product is assumed to be recovered to energy in incineration plant as it is easy to collect and qualified for energy recovery. (C3) The environmental impacts of disposal are zero since 100% of the end-of-life product is considered to be recovered to energy. (C4) Thanks to the energy recovery process end-of-life EPS replaces heat and electricity. (D)

LIFE CYCLE ASSESSMENT

LIFE CYCLE ASSESSMENT INFORMATION

Period for data	year 2019

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 kg (produced EPS)
Mass per declared unit	1 kg

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

SYSTEM BOUNDARY

The scope of the EPD is "cradle to gate with modules A4, C1-C4 and D". The modules A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport) as well as C1 (Deconstruction/ demolition), C2 (Transport at end-of-life), C3 (Waste processing), C4 (Disposal) and D (benefits and loads beyond the system boundary) are included in the study.

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	D	D
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the *EN 15804A1:2012+A2:2019* and *RTS 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 which data are available for are included in the calculation. There is no neglected unit process more than 1% of total mass and energy flows. The total neglected input and output flows do also not exceed 5% of energy usage or mass. The life cycle analysis includes all industrial processes from raw material acquisition to production, distribution, and end-of-life stages.

The modules A5, B1-B7 have not been calculated nor included in the LCA calculations.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy, and water use related to company management and sales activities are excluded.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is based on annual production rate and made with high accuracy and precision. The values for 1 kg of the produced product which is used within this study are calculated by considering the total product weight per annual production. The product output is fixed to 1 kg and the corresponding amount of product is used in the calculations.

In the production plant, several kinds of products are produced; since the production processes of these products are similar, the annual production percentages are taken into consideration for allocation. According to the ratio of the annual production of the declared product to the total annual production at the factory, the annual total energy consumption, packaging materials and the generated waste per the declared product are allocated. Subsequently, the produced product output fixed to 1 kg and the corresponding amount of product is used in the calculations.

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. All estimations and assumptions are given below.

- Module A2, A4 & C2: Vehicle capacity utilization volume factor is assumed to be 1 which means full load. In reality it may vary but as the role of transportation emission in total results is small and so the variety in load assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by transportation companies to serve the needs of other clients.
- Module A4: Transportation doesn't cause losses as products are packaged properly. Additionally, it is assumed that there is no significant weight loss due to the emission of the rest of the blowing agent in the product during transportation. Also, volume capacity utilisation factor is assumed to be 1 for the nested packaged products. Additionally, transportation distances and vehicle types are assumed according to the exports in the last year.
- Module C1: The impacts of the disassembly stage are assumed zero, since the consumption of energy and natural resources for disassembling the end-of-life product is negligible.
- Module C2: Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is assumed as lorry which is the most common.
- Module C3, C4, D: 100% of the end-of-life product is assumed to be recovered to energy. According to the manufacturer's information, Module C3 includes the incineration of the product, including the landfilling of the formed slag and ash. Module C4 impacts are zero as the products are considered to be 100 % collected for incineration. Module D considers the benefits of energy recovery which replaces district heat and electricity.

AVERAGES AND VARIABILITY

Since there is only one production plant, there is no average result.

ENVIRONMENTAL IMPACT DATA

The LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

Note: "ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930" and "ENVIRONMENTAL IMPACTS - TRACI 2.1" are presented in ANNEX-1 and ANNEX-2 respectively.

Note: Environmental performance results are presented per declared unit, defined as 1 kg of EPS insulation product. Environmental impacts per 1 m^2 of EPS insulation product with different thicknesses can be calculated by multiplying the environmental impact results by the scaling factors presented in ANNEX-3.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change – total	kg CO_2e	2.43E+00	1.22E-01	9.14E-02	2.64E+00	9.13E-03	MND	MND	0.00E+00	6.28E-03	1.82E+00	0.00E+00	-2.16E+00
Climate change – fossil	kg CO_2e	2.43E+00	1.22E-01	8.82E-02	2.64E+00	9.21E-03	MND	MND	0.00E+00	6.27E-03	1.82E+00	0.00E+00	-2.16E+00
Climate change – biogenic	kg CO_2e	2.29E-03	8.88E-05	2.37E-03	4.75E-03	6.69E-06	MND	MND	0.00E+00	3.84E-06	6.28E-05	0.00E+00	-1.04E-03
Climate change – LULUC	kg CO_2e	0.00E+00	3.68E-05	8.26E-04	8.62E-04	2.77E-06	MND	MND	0.00E+00	2.21E-06	7.99E-06	0.00E+00	-8.98E-05
Ozone depletion	kg CFC11e	1.81E-08	2.88E-08	1.46E-08	6.15E-08	2.16E-09	MND	MND	0.00E+00	1.44E-09	4.61E-09	0.00E+00	-4.47E-07
Acidification	mol H^+e	6.78E-03	5.14E-04	1.22E-03	8.52E-03	3.87E-05	MND	MND	0.00E+00	2.58E-05	3.33E-04	0.00E+00	-1.94E-02
Eutrophication, aquatic freshwater [1]	kg Pe	4.09E-06	9.95E-07	1.86E-05	2.37E-05	7.49E-08	MND	MND	0.00E+00	5.42E-08	2.91E-07	0.00E+00	-4.23E-06
Eutrophication, aquatic marine	kg Ne	1.32E-03	1.55E-04	3.41E-04	1.82E-03	1.17E-05	MND	MND	0.00E+00	7.65E-06	1.60E-04	0.00E+00	-1.83E-03
Eutrophication, terrestrial	mol Ne	1.46E-02	1.71E-03	5.27E-03	2.16E-02	1.29E-04	MND	MND	0.00E+00	8.45E-05	1.59E-03	0.00E+00	-1.79E-02
Photochemical ozone formation	kg NMVOCe	5.08E-03	5.50E-04	1.05E-03	6.68E-03	4.14E-05	MND	MND	0.00E+00	2.65E-05	4.72E-04	0.00E+00	-5.91E-03
Abiotic depletion, minerals & metals [2]	kg Sbe	9.62E-07	2.09E-06	9.95E-07	4.05E-06	1.57E-07	MND	MND	0.00E+00	1.57E-07	4.99E-07	0.00E+00	-1.27E-06
Abiotic depletion of fossil resources [2]	MJ	8.62E+01	1.90E+00	2.46E+00	9.05E+01	1.43E-01	MND	MND	0.00E+00	9.57E-02	3.65E-01	0.00E+00	-2.76E+01
Water use [2]	m^3e deprived	4.22E-01	7.07E-03	4.56E-02	4.74E-01	5.33E-04	MND	MND	0.00E+00	3.40E-04	6.50E-03	0.00E+00	-4.04E-01

[1] The required characterisation method and data are in kg P-eq; to get PO_4e, multiply the result by 3.07.

[2] EN 15804+A2 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."

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	Incidence	4.60E-08	1.11E-08	1.45E-08	7.15E-08	8.33E-10	MND	MND	0.00E+00	4.84E-10	5.35E-09	0.00E+00	-1.79E-07
Ionizing radiation, human health [3]	kBq U235e	5.39E-01	8.31E-03	3.34E-02	5.81E-01	6.26E-04	MND	MND	0.00E+00	4.18E-04	1.15E-03	0.00E+00	-1.21E-01
Eco-toxicity (freshwater) [2]	CTUe	1.03E+01	1.45E+00	1.01E+01	2.18E+01	1.09E-01	MND	MND	0.00E+00	7.47E-02	2.55E+00	0.00E+00	-1.41E+01
Human toxicity, cancer effects [2]	CTUh	3.85E-10	3.72E-11	2.07E-10	6.29E-10	2.80E-12	MND	MND	0.00E+00	2.12E-12	3.41E-10	0.00E+00	-8.90E-10
Human toxicity, non-cancer effects [2]	CTUh	1.93E-08	1.72E-09	5.20E-09	2.63E-08	1.30E-10	MND	MND	0.00E+00	8.57E-11	5.80E-09	0.00E+00	-7.96E-09
Land use related impacts/soil quality [2]	-	0.00E+00	2.87E+00	2.77E-01	3.15E+00	2.16E-01	MND	MND	0.00E+00	1.07E-01	5.12E-01	0.00E+00	-4.73E-01

[2] EN 15804+A2 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."

[3] EN 15804+A2 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."

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renewable PER used as energy	MJ	5.40E-01	2.39E-02	8.25E+00	8.81E+00	1.80E-03	MND	MND	0.00E+00	1.36E-03	6.22E-03	0.00E+00	-7.77E-02
Renewable PER used as materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable PER	MJ	5.40E-01	2.39E-02	8.25E+00	8.81E+00	1.80E-03	MND	MND	0.00E+00	1.36E-03	6.22E-03	0.00E+00	-7.77E-02
Non-renewable PER used as energy	MJ	3.56E+01	1.90E+00	1.84E+00	3.93E+01	1.43E-01	MND	MND	0.00E+00	9.57E-02	3.65E-01	0.00E+00	-2.76E+01
Non-renewable PER used as materials	MJ	5.06E+01	0.00E+00	6.21E-01	5.12E+01	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable PER	MJ	8.62E+01	1.90E+00	2.46E+00	9.05E+01	1.43E-01	MND	MND	0.00E+00	9.57E-02	3.65E-01	0.00E+00	-2.76E+01
Use of secondary materials	kg	0.00E+00	0.00E+00	2.03E-04	2.03E-04	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+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	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	1.15E-02	3.96E-04	5.91E-04	1.25E-02	2.98E-05	MND	MND	0.00E+00	1.81E-05	4.81E-04	0.00E+00	-3.30E-03

PER abbreviation stands for primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	kg	0.00E+00	1.85E-03	9.49E-03	1.13E-02	1.39E-04	MND	MND	0.00E+00	9.96E-05	0.00E+00	0.00E+00	-9.03E-03
Non-hazardous waste	kg	1.41E-02	2.04E-01	1.07E-01	3.26E-01	1.54E-02	MND	MND	0.00E+00	8.28E-03	0.00E+00	0.00E+00	-1.32E-01
Radioactive waste	kg	1.67E-05	1.31E-05	1.62E-05	4.59E-05	9.83E-07	MND	MND	0.00E+00	6.54E-07	0.00E+00	0.00E+00	-2.00E-04

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	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	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	0.00E+00	9.84E-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	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change – total	kg CO_2e	2.43E+00	1.22E-01	9.14E-02	2.64E+00	9.22E-03	MND	MND	0.00E+00	6.28E-03	1.82E+00	0.00E+00	-2.16E+00
Abiotic depletion. minerals & metals [2]	kg Sbe	9.62E-07	2.09E-06	9.95E-07	4.05E-06	1.57E-07	MND	MND	0.00E+00	1.57E-07	4.99E-07	0.00E+00	-1.27E-06
Abiotic depletion of fossil resources [2]	MJ	8.62E+01	1.90E+00	2.46E+00	9.05E+01	1.43E-01	MND	MND	0.00E+00	9.57E-02	3.65E-01	0.00E+00	-2.76E+01
Water use [2]	m^3e deprived	4.22E-01	7.07E-03	4.56E-02	4.74E-01	5.33E-04	MND	MND	0.00E+00	3.40E-04	6.50E-03	0.00E+00	-4.04E-01
Use of secondary materials	kg	0.00E+00	0.00E+00	2.03E-04	2.03E-04	0.00E+00	MND	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content in product	kg C	N/A	N/A	0.00E+00	0.00E+00	N/A	MND	MND	N/A	N/A	N/A	N/A	N/A
Biogenic carbon content in packaging	kg C	N/A	N/A	0.00E+00	0.00E+00	N/A	MND	MND	N/A	N/A	N/A	N/A	N/A

[2] EN 15804+A2 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."

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Ecoinvent v3.6 is used as a background data. Electricity emissions have been calculated on the basis of the average distribution
Electricity CO2e / kWh	0.0579 kg CO2e / kWh
District heating data source and quality	Ecoinvent v3.6 is used as a background data. District heating emissions have been calculated on the basis of the average resource use
District heating CO2e / kWh	0.0031 kg CO2e / kWh

Transport scenario documentation

Scenario parameter	Value
A4 specific transport CO2e emissions, kg CO_2e / tkm	0.0901
A4 average transport distance, km	100

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	0.9843
Collection process – kg collected with mixed waste	0
Recovery process – kg for re-use	0
Recovery process – kg for recycling	0
Recovery process – kg for energy recovery	0.9843
Disposal (total) – kg for final deposition	0
Scenario assumptions for transportation	End-of-life product is transported 50 km with an average lorry

* The values are based on the manufacturer's information regarding the end-of-life treatment of the product.

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Styroplast EPS LCA Report 20.05.2021

ANNEX-1: ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Global warming potential	kg CO_2e	2.33E+00	1.21E-01	8.61E-02	2.53E+00	9.13E-03	MND	MND	0.00E+00	6.22E-03	1.80E+00	0.00E+00	-2.15E+00
Depletion of stratospheric ozone	kg CFC11e	1.81E-08	2.29E-08	1.60E-08	5.70E-08	1.72E-09	MND	MND	0.00E+00	1.14E-09	3.81E-09	0.00E+00	-3.53E-07
Acidification	kg SO_2e	5.64E-03	2.49E-04	7.99E-04	6.69E-03	1.87E-05	MND	MND	0.00E+00	1.28E-05	2.56E-04	0.00E+00	-1.70E-02
Eutrophication	kg $(PO_4)^{3-}e$	4.69E-04	5.03E-05	3.21E-04	8.40E-04	3.78E-06	MND	MND	0.00E+00	2.66E-06	5.20E-03	0.00E+00	-8.50E-04
Photochemical ozone formation	kg C_2H_4e	8.90E-04	1.58E-05	4.37E-05	9.50E-04	1.19E-06	MND	MND	0.00E+00	8.26E-07	5.00E-05	0.00E+00	-6.54E-04
Abiotic depletion of non-fossil resources	kg Sbe	9.62E-07	2.09E-06	9.95E-07	4.05E-06	1.57E-07	MND	MND	0.00E+00	1.57E-07	4.99E-07	0.00E+00	-1.27E-06
Abiotic depletion of fossil resources	MJ	8.62E+01	1.90E+00	2.46E+00	9.05E+01	1.43E-01	MND	MND	0.00E+00	9.57E-02	3.65E-01	0.00E+00	-2.76E+01

ANNEX-2: ENVIRONMENTAL IMPACTS - TRACI 2.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Global warming potential	kg CO_2e	2.34E+00	1.21E-01	8.62E-02	2.55E+00	9.11E-03	MND	MND	0.00E+00	6.21E-03	1.80E+00	0.00E+00	-2.15E+00
Ozone depletion	kg CFC11e	1.81E-08	3.05E-08	1.95E-08	6.81E-08	2.29E-09	MND	MND	0.00E+00	1.52E-09	4.89E-09	0.00E+00	-4.71E-07
Photochemical smog formation	kg O_3e	5.67E-03	4.48E-04	9.98E-04	7.12E-03	3.37E-05	MND	MND	0.00E+00	2.25E-05	3.15E-04	0.00E+00	-1.54E-02
Acidification	kg SO_2e	2.09E-04	6.29E-05	1.01E-04	3.74E-04	4.74E-06	MND	MND	0.00E+00	3.17E-06	9.92E-05	0.00E+00	-1.02E-03
Eutrophication	kg Ne	8.40E-02	9.81E-03	2.10E-02	1.15E-01	7.39E-04	MND	MND	0.00E+00	4.85E-04	9.30E-03	0.00E+00	-1.04E-01
Depletion of non-renewable energy	MJ	1.32E+01	2.72E-01	2.06E-01	1.37E+01	2.05E-02	MND	MND	0.00E+00	1.37E-02	5.15E-02	0.00E+00	-4.17E+00

ANNEX-3: SCALING FACTORS PER 1M^2 OF EPS INSULATION PRODUCT WITH DIFFERENT THICKNESSES

Product Code	Thickness	Scaling factor
Lattia 100	20 mm	0.35
Lattia 100	30 mm	0.53
Lattia 100	40 mm	0.70
Lattia 100	50 mm	0.88
Lattia 100	60 mm	1.05
Lattia 100	70 mm	1.23
Lattia 100	80 mm	1.40
Lattia 100	90 mm	1.58
Lattia 100	100 mm	1.75
Lattia 100	110 mm	1.93
Lattia 100	120 mm	2.10
Lattia 100	130 mm	2.28
Lattia 100	140 mm	2.45
Lattia 100	150 mm	2.63
Lattia 100	160 mm	2.80
Lattia 100	170 mm	2.98
Lattia 100	180 mm	3.15
Lattia 100	190 mm	3.33
Lattia 100	200 mm	3.50
Lattia 100	210 mm	3.68
Lattia 100	220 mm	3.85
Lattia 100	230 mm	4.03
Lattia 100	240 mm	4.20

Product Code	Thickness	Scaling factor
Lattia 100	250 mm	4.38
Lattia 100	260 mm	4.55
Lattia 100	270 mm	4.73
Lattia 100	280 mm	4.90
Lattia 100	290 mm	5.08
Lattia 100	300 mm	5.25
Lattia 100	310 mm	5.43
Lattia 100	320 mm	5.60
Lattia 100	330 mm	5.78
Lattia 100	340 mm	5.95
Lattia 100	350 mm	6.13
Lattia 100	360 mm	6.30
Lattia 100	370 mm	6.48
Lattia 100	380 mm	6.65
Lattia 100	390 mm	6.83
Lattia 100	400 mm	7.00
Lattia 100	410 mm	7.18
Lattia 100	420 mm	7.35
Lattia 100	430 mm	7.53
Lattia 100	440 mm	7.70
Lattia 100	450 mm	7.88
Lattia 100	460 mm	8.05
Lattia 100	470 mm	8.23

Product Code	Thickness	Scaling factor
Lattia 100	480 mm	8.40
Lattia 100	490 mm	8.58
Lattia 100	500 mm	8.75
Lattia 100	510 mm	8.93
Lattia 100	520 mm	9.10
Lattia 100	530 mm	9.28
Lattia 100	540 mm	9.45
Lattia 100	550 mm	9.63
Lattia 100	560 mm	9.80
Lattia 100	570 mm	9.98
Lattia 100	580 mm	10.15
Lattia 100	590 mm	10.33
Lattia 100	600 mm	10.50
Lattia 100	610 mm	10.68
Lattia 100	620 mm	10.85
Lattia 100	630 mm	11.03
Lattia 100	640 mm	11.20
Lattia 100	650 mm	11.38
Lattia 100	660 mm	11.55
Lattia 100	670 mm	11.73
Lattia 100	680 mm	11.90
Lattia 100	690 mm	12.08
Lattia 100	700 mm	12.25

Product Code	Thickness	Scaling factor
Lattia 100	710 mm	12.43
Lattia 100	720 mm	12.60
Lattia 100	730 mm	12.78
Lattia 100	740 mm	12.95
Lattia 100	750 mm	13.13
Lattia 100	760 mm	13.30
Lattia 100	770 mm	13.48
Lattia 100	780 mm	13.65
Lattia 100	790 mm	13.83
Lattia 100	800 mm	14.00
Lattia 100	810 mm	14.18
Lattia 100	820 mm	14.35
Lattia 100	830 mm	14.53
Lattia 100	840 mm	14.70
Lattia 100	850 mm	14.88
Lattia 100	860 mm	15.05
Lattia 100	870 mm	15.23
Lattia 100	880 mm	15.40
Lattia 100	890 mm	15.58
Lattia 100	900 mm	15.75
Lattia 100	910 mm	15.93
Lattia 100	920 mm	16.10
Lattia 100	930 mm	16.28

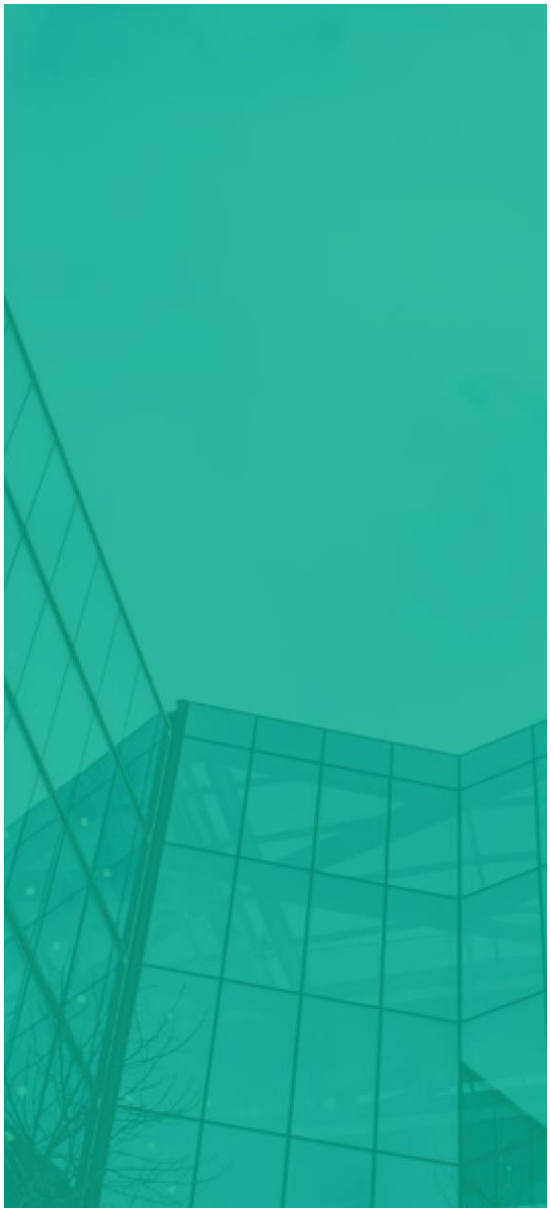
Product Code	Thickness	Scaling factor
Lattia 100	940 mm	16.45
Lattia 100	950 mm	16.63
Lattia 100	960 mm	16.80
Lattia 100	970 mm	16.98
Lattia 100	980 mm	17.15
Lattia 100	990 mm	17.33
Lattia 100	1000 mm	17.50
ProRouta 120	20 mm	0.41
ProRouta 120	30 mm	0.62
ProRouta 120	40 mm	0.82
ProRouta 120	50 mm	1.03
ProRouta 120	60 mm	1.23
ProRouta 120	70 mm	1.44
ProRouta 120	80 mm	1.64
ProRouta 120	90 mm	1.85
ProRouta 120	100 mm	2.05
ProRouta 120	110 mm	2.26
ProRouta 120	120 mm	2.46
ProRouta 120	130 mm	2.67
ProRouta 120	140 mm	2.87
ProRouta 120	150 mm	3.08
ProRouta 120	160 mm	3.28
ProRouta 120	170 mm	3.49

Product Code	Thickness	Scaling factor
ProRouta 120	180 mm	3.69
ProRouta 120	190 mm	3.90
ProRouta 120	200 mm	4.10
ProRouta 120	210 mm	4.31
ProRouta 120	220 mm	4.51
ProRouta 120	230 mm	4.72
ProRouta 120	240 mm	4.92
ProRouta 120	250 mm	5.13
ProRouta 120	260 mm	5.33
ProRouta 120	270 mm	5.54
ProRouta 120	280 mm	5.74
ProRouta 120	290 mm	5.95
ProRouta 120	300 mm	6.15
ProRouta 120	310 mm	6.36
ProRouta 120	320 mm	6.56
ProRouta 120	330 mm	6.77
ProRouta 120	340 mm	6.97
ProRouta 120	350 mm	7.18
ProRouta 120	360 mm	7.38
ProRouta 120	370 mm	7.59
ProRouta 120	380 mm	7.79
ProRouta 120	390 mm	8.00
ProRouta 120	400 mm	8.20

Product Code	Thickness	Scaling factor
ProRouta 120	410 mm	8.41
ProRouta 120	420 mm	8.61
ProRouta 120	430 mm	8.82
ProRouta 120	440 mm	9.02
ProRouta 120	450 mm	9.23
ProRouta 120	460 mm	9.43
ProRouta 120	470 mm	9.64
ProRouta 120	480 mm	9.84
ProRouta 120	490 mm	10.05
ProRouta 120	500 mm	10.25
ProRouta 120	510 mm	10.46
ProRouta 120	520 mm	10.66
ProRouta 120	530 mm	10.87
ProRouta 120	540 mm	11.07
ProRouta 120	550 mm	11.28
ProRouta 120	560 mm	11.48
ProRouta 120	570 mm	11.69
ProRouta 120	580 mm	11.89
ProRouta 120	590 mm	12.10
ProRouta 120	600 mm	12.30

Product Code	Thickness	Scaling factor
ProRouta 120	610 mm	12.51
ProRouta 120	620 mm	12.71
ProRouta 120	630 mm	12.92
ProRouta 120	640 mm	13.12
ProRouta 120	650 mm	13.33
ProRouta 120	660 mm	13.53
ProRouta 120	670 mm	13.74
ProRouta 120	680 mm	13.94
ProRouta 120	690 mm	14.15
ProRouta 120	700 mm	14.35
ProRouta 120	710 mm	14.56
ProRouta 120	720 mm	14.76
ProRouta 120	730 mm	14.97
ProRouta 120	740 mm	15.17
ProRouta 120	750 mm	15.38
ProRouta 120	760 mm	15.58
ProRouta 120	770 mm	15.79
ProRouta 120	780 mm	15.99
ProRouta 120	790 mm	16.20
ProRouta 120	800 mm	16.40

Product Code	Thickness	Scaling factor
ProRouta 120	810 mm	16.61
ProRouta 120	820 mm	16.81
ProRouta 120	830 mm	17.02
ProRouta 120	840 mm	17.22
ProRouta 120	850 mm	17.43
ProRouta 120	860 mm	17.63
ProRouta 120	870 mm	17.84
ProRouta 120	880 mm	18.04
ProRouta 120	890 mm	18.25
ProRouta 120	900 mm	18.45
ProRouta 120	910 mm	18.66
ProRouta 120	920 mm	18.86
ProRouta 120	930 mm	19.07
ProRouta 120	940 mm	19.27
ProRouta 120	950 mm	19.48
ProRouta 120	960 mm	19.68
ProRouta 120	970 mm	19.89
ProRouta 120	980 mm	20.09
ProRouta 120	990 mm	20.30
ProRouta 120	1000 mm	20.50



ABOUT THE MANUFACTURER

As part of the Finnfoam Group, in January 2018, Styroplast Oy was transferred to the ownership of Finnfoam Oy in Salo. Over nearly forty-year-long history, Finnfoam has become one of the leading manufacturers of plastic-based thermal insulation solutions. The roots of Finnfoam's thermal insulation competence are embedded into the frozen Finnish soil. Today, the group is known for quality, product development, and reliability. Finnfoam's product range includes XPS, EPS and PIR thermal insulation and the Tulppa - wet room boards. The entire Finnfoam (XPS) thermal insulation product range is suitable for use as frost insulation and for insulating floors, ceilings, and walls, as well as for various types of supplementary thermal insulation. As frost and floor insulation, Finnfoam is highly resistant to moisture, freezing, and load. FF-EPS is best suited for use as thermal insulation for walls and ceilings, where it provides a safe and highly cost-effective solution. It can also be used in floors that are not subjected to significant loads. The applications of FF-PIR polyurethane insulation products include the thermal insulation of walls and ceilings as well as saunas. FF-PIR insulation products have a very high thermal insulation capacity, which allows for lower structural thickness.

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EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
EPD program	RTS EPD
Background data	Ecoinvent 3.6 (cut-off) & Plastics Europe 2012
LCA software	One Click LCA Pre-Verified Generator for Plastic Products