



**Rakennustietosäätiö RTS
Building Information
Foundation RTS**

**RTS EPD, No. 1
Finnfoam INFRA/Tulppa**

Scope of the declaration

This environmental product declaration covers the environmental impacts of the Finnfoam Tulppa and INFRA insulation panels. The declaration has been prepared in accordance with EN 15804:2012+A1:2013 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 2.6.2016). This declaration covers the life cycle stages from cradle-to-customer as well as the treatment and recovery of the product at its end-of-life.

RAKENNUSTIETO

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General information, declaration scope and verification (7.1)

1. Owner of the declaration, manufacturer

Finnfoam Oy
Satamakatu 5, 24100 Salo, Finland
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2. Product name and number

Finnfoam INFRA/Tulppa

3. Place of production

Salon, Finland

4. Additional information

www.finnfoam.fi

5. Product Category Rules and the scope of the declaration

This EPD has been prepared in accordance with EN 15804:2012+A1:2013 and ISO 14025 standards together with the RTS PCR (English version, 2.6.2016). Product specific category rules have not been applied in this EPD. EPD of construction materials may not be comparable if they do not comply with EN 15804 and seen in a building context.

6. Author of the life-cycle assessment and declaration

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7. Verification

This EPD has been verified according to the requirements of ISO 14025:2010, EN 15804:2012+A1:2013 and RTS PCR by a third party. The verification has been carried out by Bionova Ltd, MSc Tytti Bruce-Hyrkäs. Hämeentie 31, 00500 Helsinki, Finland, +358 500 655 020, www.bionova.fi.

8. Declaration issue date and validity

19.1.2017 - 18.1.2022

European standard EN 15804: 2014 A1 serves as the core PCR

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

☐ Internal

☒ External

Third party verifier:

Tytti Bruce-Hyrkäs, Bionova Ltd

Tytti Bruce-Hyrkäs

Product information

9. Product description

This EPD represents the Finnfoam Tulppa and INFRA insulation panels produced in Salo, Finland. Both insulation panels are manufactured from Finnfoam thermal insulation panels (XPS) by applying a special purpose cement plaster reinforced with glass-fibre mesh on both sides of the panel. The EPD studies an average insulation panel, which represents both Tulppa and INFRA products. The market area of the product is Scandinavia.

10. Technical specifications

Tulppa and INFRA are available as 600x2600 mm panels and the following conductivity/thickness combinations; Tulppa: 0.033 W/mK (20 and 30 mm), 0.035 W/mK (50 mm), 0.037 W/mK (80 mm) and INFRA: 0.035 W/mK (50mm) and 0.037 W/mK (80 and 100 mm). Tulppa wet room boards are used simultaneously as building boards and waterproofing materials. INFRA insulation panels are used in infrastructure applications such as dividing layers in low-speed roads and low-load-bearing grounds prone to freezing. Tulppa and INFRA products have been modeled as an average product with a thickness of 50 mm, of which 48 mm XPS-board and 2 mm cement plaster. The results of this EPD represent this average product thickness. The nominal density of the average product is 87 kg/m³ and thermal conductivity 0.035 W/mK.

11. Product standards

ETAG 022-3 Watertight covering kits for wet room floors and/or wall Part 3 – Kits based on inherently watertight boards. EN 13164:2012+A1:2015 Thermal insulation products for buildings. Factory made extruded polystyrene foam (XPS) products. Specification.

12. Physical properties

Detailed physical information can be found from the manufacturer's webpages:

Tulppa <http://www.finnfoam.fi/tuotteet/tulppa/>

INFRA (Finnfoam lämmöneriste FL-400); <http://www.finnfoam.fi/tuotteet/finnfoam-eristelevyt/levyn-mitat-ja-tyypit/infra-levyt/>

13. Raw-materials of the product

Product structure / composition / raw-material	Amount %
XPS-board (Finnfoam), non-renewable, Finland	35
Cement plaster, non-renewable, Denmark	58
Glass fibre mesh, non-renewable, Czech Republic	7

14. Substances under European Chemicals Agency's REACH, SVHC restrictions

Name	EC Number	CAS Number
The product does not contain REACH SVHC substances.		

15. Functional / declared unit

1 m²

16. System boundary

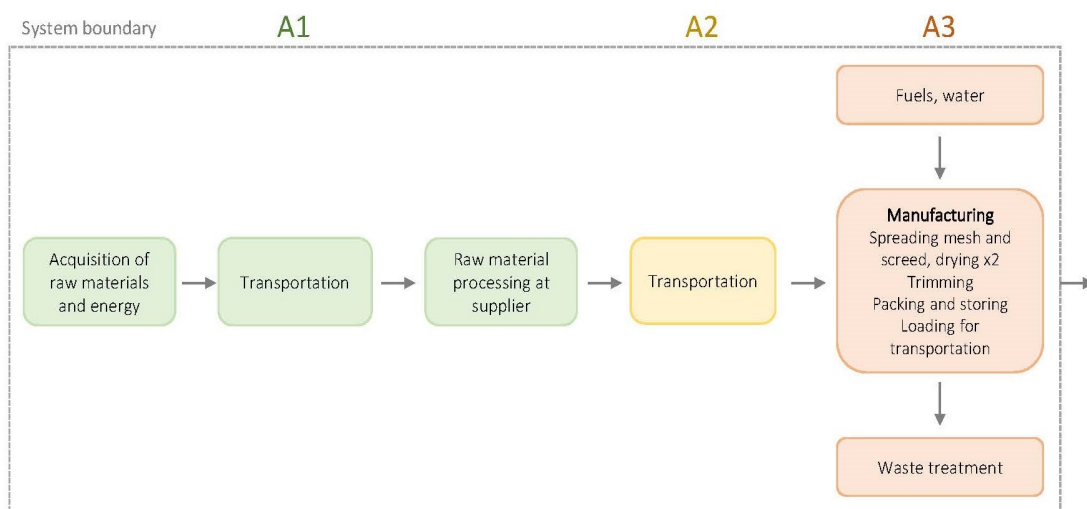
This EPD covers the following modules; A1 (Raw material supply), A2 (Transport), A3 (Manufacturing) and A4 (Transportation of the product to the building site) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary - have been included.

17. Cut-off criteria

A1 raw material supply, A2 transportation, A3 manufacturing. All main materials, energy, packing and transportation until the end-of-waste state have been included. Materials with negligible quantities have not been included, this concerns bolts and other connections. A4 transportation has been estimated to be 200 km, the return trip has not been considered. C1 and C2 have been included as a deconstruction scenario (C1) and the demolition waste transportation distance (C2) as per the requirements of the RTS PCR (point 25, environmental impacts not calculated). C3 includes the incineration of the XPS-board, including the landfilling of the formed slag and ash, and C4 the crushing and landfilling of the cement plaster (a conservative EoL treatment scenario; as per manufacturer the insulation can be fully incinerated). Module D considers the benefits of energy recovery which replaces district heat.

18. Production process

Tulppa and INFRA insulation panels are manufactured from Finnfoam thermal insulation (XPS) panels, which are covered on both sides with a fibre-glass mesh and a special cement plaster. The mesh and plaster are first applied on one side of the panel, after which it is dried in a drying tunnel. The panels are then collected and moved to the beginning of the production line, where the mesh reinforced plaster is applied to the other side of the panel. After the plaster has dried in the tunnel the product is trimmed, wrapped in plastic and piled on wooden pallets. The material loss (mesh and plaster) is considered in the material balance. The production related data represents 2015 as a one year average.



Scope of the Life-Cycle Assessment (7.2.1-2)

Mark all the covered modules of the EPD with X. Mandatory modules are marked with blue in the table below. This declaration covers "cradle-to-gate with options". For other fields mark MND (module not declared) or MNR (module not relevant)

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
x	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	MNR	x	MNR
A1	A2	A3	A4	A5	B2	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
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

Mandatory modules
 Scenario based optional modules

Environmental impacts and raw-material use (7.2.3-7.2.4)

19. Environmental impacts

The global warming potential of module A1-A3 is mainly caused by raw material manufacturing, of which the manufacturing of the Finnfoam XPS insulation has the highest impacts (68 % of A1). Due to the insulation consisting of different layers, the A1-A3 GWP impacts of the panel do not change linearly with its thickness. Panel with thickness of 30 mm is within 10 % variability of the GWP impacts of the 50 mm thick panel.

Environmental impact									
Parameter	Unit	A1	A2	A3	A1-A3	A4	C3	C4	D
Global warming potential	kg CO ₂ -eqv	6,99E0	4,06E-1	4,39E-1	7,83E0	3,3E-2	3,65E0	2,48E-2	-3,67E0
Depletion of stratospheric ozone layer	kg CFC11-eqv	4,18E-7	7,53E-8	6,52E-8	5,58E-7	6,57E-9	8,44E-9	6,78E-9	-2,32E-7
Formation of photochemical ozone	kg C ₂ H ₄ -eqv	1,23E-1	8,45E-5	1,1E-4	1,23E-1	3,3E-6	1,37E-5	7,13E-6	-1,01E-3
Acidification	kg SO ₂ -eqv	6,59E0	3,63E-3	2,67E-3	6,6E0	1,54E-4	6,13E-3	1,31E-4	-2,1E-2
Eutrophication	kg PO ₄ 3--eqv	1,69E-2	6,09E-4	2,79E-4	1,77E-2	3,26E-5	4,29E-4	2,77E-5	-3,21E-3
Abiotic depletion of non fossil resources	kg Sb-eqv	6,98E-6	2,23E-8	7,57E-8	7,08E-6	1,94E-9	1,46E-7	1,89E-8	-7,55E-7
Abiotic depletion of fossil resources	MJ	1,6E2	1,04E1	5,12E0	1,76E2	9,12E-1	6,03E-1	5,62E-1	-4,08E1

21. End of life - Waste

22. End of life - Output flow

Output flow									
Parameter	Unit	A1	A2	A3	A1-A3	A4	C3	C4	D
Components for reuse	kg	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	2,99E-3	0E0	0E0	2,99E-3	0E0	0E0	0E0	0E0
Materials for energy recovery	kg	1,82E-3	0E0	8,99E-2	9,18E-2	0E0	1,54E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	0E0	0E0

Scenarios and additional technical information (7.3)

23. Electricity in the manufacturing phase (7.3.A3)

A3 data quality of electricity and CO2 emission kg CO2 eq. / kWh	0,185	The emissions of Finnish electricity are based on electricity production fuel mix from Statistics Finland for the year 2014. The benefit sharing method has been used in the calculation. The emissions of the fuels are based on ecoinvent 3.3 (cut-off allocation).
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*The most recent country electricity mix has been used instead of supplier specific data for the production year. This is a reasonable estimation as the impacts of electricity are only a few percentages of A3, and the impacts of A3 are minor compared to A1.

24. Transport from production place to user (7.3.2A4)

Variable	Amount	Data quality
Fuel type and consumption in liters / 100 km	50	Trailer combination, diesel
Transportation distance km	200	FI average
Transport capacity utilization %	100	Transportation of a full load to production site
Bulk density of transported products kg/m³	87	Manufacturer product information
Volume capacity utilisation factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaged products)	1	

25. End-of-life process description(7.3.4)

Processes	Unit (expressed per functional unit or per declared unit of components products or materials and by type of material)	Amount kg/kg Data quality
Collection process specified by type	kg collected separately	1*
	kg collected with mixed construction waste	-
Recovery system specified by type	kg for re-use	-
	kg for recycling	-
	kg for energy recovery	0.35*
Disposal specified by type	kg product or material for final deposition	0.65*
Assumptions for scenario development, e.g. transportation	units as appropriate	Transportation distance estimation 200 km based on incinerator locations

*These values are based on a conservative scenario for the end-of-life treatment of the product.

26. Additional technical information

Detailed technical information available from Finnfoam's websites:

Tulppa http://www.finnfoam.fi/files/5414/6554/1208/Finnfoam_tekniset_tiedot_2016060

INFRA (Finnfoam lämmöneriste FL-400): <http://www.finnfoam.fi/tuotteet/finnfoam-eristelevyt/ominaisuudet/>

27. Product data sheet

	Tulppa	Infra
Board size (mm)	600 x 2600	600 x 2600
Board thickness (mm)	20, 50 and 80	50, 80 and 100
Compression strength	250 kPa	180 kPa
Thermal conductivity λ Declared 20 mm	0,033 W/mK	0,033 W/mK
Thermal conductivity λ Declared 50 mm	0,035 W/mK	0,035 W/mK
Thermal conductivity λ Declared 80 mm	0,037 W/mK	0,037 W/mK
Thermal conductivity λ Declared 100 mm	0,037 W/mK	0,037 W/mK
Water absorption (Finnfoam core)	< 0,7 t%	< 0,7 t%
Vapour permeability kg/(m s Pa)	<1,5 x 10 ⁻¹²	<1,5 x 10 ⁻¹²
Capillarity	0	0
Fire resistance class	F	F
Thermal expansion coefficient	0,07	0,07
Usage temperature	-50 ... +75 C°	-50 ... +75 C°

28. Additional information (7.4)

Air, soil and water impacts during the use phase have not been studied

29. Bibliography

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

EN 15804:2012+A1 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

RTS PCR 2.6.2016 RTS PCR protocol: EPDs published by the Building Information Foundation RTS sr. PT 18 RT EPD Committee. (English version).