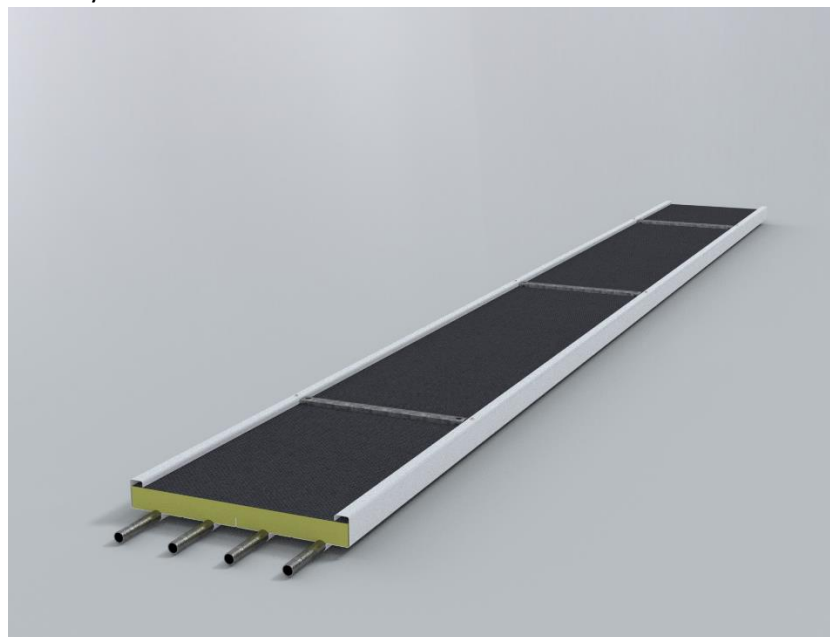


ENVIRONMENTAL PRODUCT DECLARATION

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

ItuString+
Itula Oy



EPD HUB, HUB-0410

Publishing date 30 April 2023, last updated on 30 April 2023, valid until 30 April 2028

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Itula Oy
Address	Raudustie 3 56510 Puntala
Contact details	sales@itula.com
Website	www.itula.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 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-A5, and modules C1-C4, D
EPD author	Susanna Kiviniemi
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal certification <input checked="" type="checkbox"/> External verification
EPD verifier	H.N, 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	ItuString+
Additional labels	-
Product reference	-
Place of production	Finland
Period for data	2021
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	3 %

ENVIRONMENTAL DATA SUMMARY

Declared unit	1 m
Declared unit mass	4.38 kg
GWP-fossil, A1-A3 (kgCO ₂ e)	13.7
GWP-total, A1-A3 (kgCO ₂ e)	13.6
Secondary material, inputs (%)	27.1
Secondary material, outputs (%)	85.3
Total energy use, A1-A3 (kWh)	56.9
Total water use, A1-A3 (m ³ e)	0.265

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

We offer the best expertise and energy-efficient solutions for optimal temperatures in both residential and commercial properties. Our operations are based on high-quality products and solutions, strong expertise, a trailblazing spirit and a desire to always do better. As a pioneer in the industry, we are constantly developing ever more energy-efficient solutions in our own laboratory. Our factory is the only one in Finland to manufacture radiant ceiling panel systems that save energy and the environment.

One of our guiding principles is our promise to be an expert who works closely with our customers. We are involved in most of our projects at every stage, from planning to finish. This means first-class product and system solutions that are sure to fit the site, as well as rapid responses, flexibility, reliability and technical support throughout the project.

PRODUCT DESCRIPTION

Hydronic ItuString+ radiant ceiling system is an economical solution in terms of both investment and running costs. Radiant ceiling panels heat surfaces and not the air itself. The thermal radiation in the room feels comfortable on the skin, even if the actual air temperature is lower. This allows for optimal conditions with lower air temperatures and increased energy savings. In large industrial halls and other production facilities, for example, radiant heating can lead to 40 per cent and even more energy savings compared to conventional fan coil heaters or “radiator systems. ItuString+ panels are manufactured from 100% recyclable materials and tested by an accredited testing laboratory in accordance with the EN14037 standard. ItuString+ panels have a CE marking and they are manufactured in Finland.

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

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	80-85 %	Europe
Minerals	15-20 %	Europe

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	-

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1 m
Mass per declared unit	4.38 kg
Functional unit	-
Reference service life	25 years

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		
X	X	X	X	X	MND							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. 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.

Hydronic ItuString+ radiant ceiling system is an economical solution in terms of both investment and running costs. Radiant ceiling panels heat

surfaces and not the air itself. The thermal radiation in the room feels comfortable on the skin, even if the actual air temperature is lower. This allows for optimal conditions with lower air temperatures and increased energy savings. In large industrial halls and other production facilities, for example, radiant heating can lead to 40 per cent and even more energy savings compared to conventional fan coil heaters or “radiator” systems. ItuString+ panels are manufactured from 100% recyclable materials and tested by an accredited testing laboratory in accordance with the EN14037 standard. ItuString+ panels have a CE marking and they are manufactured in Finland.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The panels are mostly delivered to the Helsinki region, which is used as a calculation basis. The panels are transported by lorry 16-32 t. The installation doesn't need heavy machinery and the use of electricity is minimal. There is no installation loss as the product is made by order to size. The packaging waste are treated at this stage.

PRODUCT USE AND MAINTENANCE (B1-B7)

The product is a heat and cool distribution device which itself does not use energy and is maintenance free. The product is compatible with all energy sources.

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

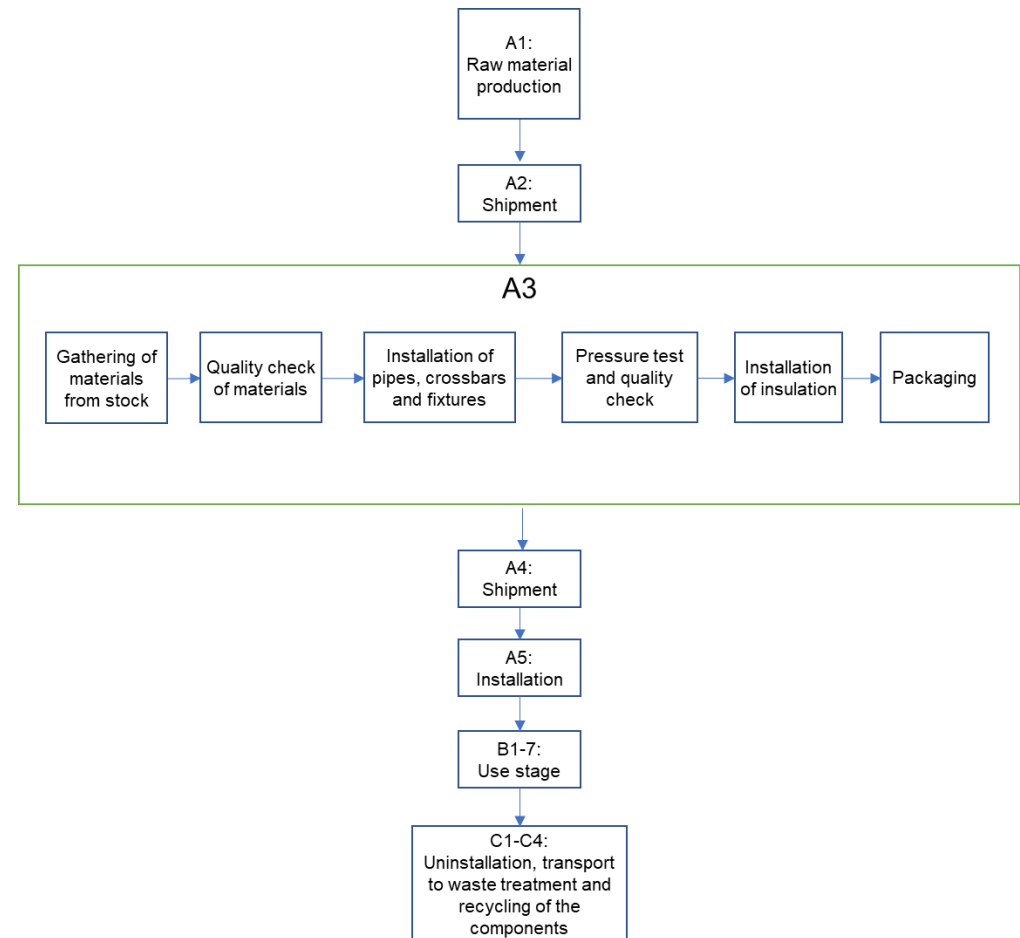
PRODUCT END OF LIFE (C1-C4, D)

100% product at EoL is collected and sorted for recycling. Insulation material assumed to have 50% recycling rate and 50% is landfilled. The metal components are assumed to be fully recycled as material. The end of life is assumed to take place in the EU area. The benefits and loads of the recycling of the raw materials replacing virgin material are counted as a benefit in the study. Also the benefits from the avoided energy

production due to the incineration of packaging wood and the benefits and load of packaging film recycling are taken into account.

MANUFACTURING PROCESS AND SYSTEM BOUNDARY

The ItuString+ manufacturing process is described in the flow chart below. The materials arrive to the factory stock where the materials are quality checked. The product consists of the panel made from pre-painted metal sheet, metal piping and insulation. In the manufacturing the pipes, crossbars and fixtures are installed. The product is then pressure tested, and quality tested. After the testing the insulation is installed. The readymade product is quality controlled and transported to packaging. The final product is packed in the wooden box, which is repurposed from the raw material shipments, and shipped to the customer. The manufacturing process in total is included in the calculation.



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	Allocated by mass or volume
Packaging materials	Allocated by mass or volume
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by mass or volume

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	-
Variation in GWP-fossil for A1-A3	-

The EPD is an average of the different sizes of ItuString products, which are tailor made to customer lengths.

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. Ecoinvent and One Click LCA databases were used as sources of environmental data.

ENVIRONMENTAL IMPACT DATA

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
GWP – total ¹⁾	kg CO ₂ e	1,14E1	8,94E-1	1,32E0	1,36E1	2,26E-1	3,05E-1	MND	0E0	6,69E-2	2,24E-1	2,53E-4	-5,32E0
GWP – fossil	kg CO ₂ e	1,14E1	8,93E-1	1,44E0	1,37E1	2,28E-1	4,1E-3	MND	0E0	6,69E-2	2,24E-1	2,51E-4	-5,36E0
GWP – biogenic	kg CO ₂ e	-3,09E-3	4,69E-4	-1,27E-1	-1,3E-1	1,22E-4	3,01E-1	MND	0E0	2,57E-5	1,23E-4	1,37E-6	4,08E-2
GWP – LULUC	kg CO ₂ e	1,26E-2	3,26E-4	7,59E-3	2,05E-2	8,23E-5	1,62E-6	MND	0E0	2,48E-5	4,23E-5	1,23E-7	1,55E-4
Ozone depletion pot.	kg CFC-11e	8,26E-7	2,03E-7	1,95E-7	1,22E-6	5,18E-8	3,19E-10	MND	0E0	1,45E-8	4,65E-8	6,83E-11	-1,42E-7
Acidification potential	mol H ⁺ e	3,1E-1	3,02E-3	3,79E-3	3,17E-1	6,54E-4	2,79E-5	MND	0E0	2,78E-4	2,28E-3	1,91E-6	-2,07E-2
EP-freshwater ²⁾	kg Pe	3,6E-5	7,53E-6	3,96E-5	8,32E-5	1,94E-6	6,18E-8	MND	0E0	6,53E-7	1,46E-6	4,11E-9	-2,15E-4
EP-marine	kg Ne	2,02E-2	6,25E-4	7,22E-4	2,15E-2	1,3E-4	1,2E-5	MND	0E0	8,09E-5	9,94E-4	6,57E-7	-4,07E-3
EP-terrestrial	mol Ne	1,24E0	6,97E-3	8,68E-3	1,25E0	1,45E-3	1,28E-4	MND	0E0	8,93E-4	1,09E-2	7,24E-6	-4,3E-2
POCP (“smog”) ³⁾	kg	5,5E-2	2,5E-3	2,76E-3	6,02E-2	5,55E-4	3,31E-5	MND	0E0	2,72E-4	3E-3	2,08E-6	-2,81E-2
ADP-minerals &	kg Sbe	3,89E-2	2,43E-5	4,08E-6	3,89E-2	6,28E-6	5,39E-8	MND	0E0	1,76E-6	3,69E-7	3,91E-9	-5,34E-6
ADP-fossil resources	MJ	1,41E2	1,35E1	3,35E1	1,88E2	3,44E0	3,83E-2	MND	0E0	9,86E-1	3,07E0	5,07E-3	-3,98E1
Water use ⁵⁾	m ³ e depr.	5,96E0	4,38E-2	2,3E-1	6,24E0	1,13E-2	-1,02E-3	MND	0E0	3,79E-3	8,06E-3	1,66E-4	-7,68E-1

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	1,09E1	1,91E-1	6,43E0	1,75E1	4,93E-2	1,44E-3	MND	0E0	1,1E-2	3,26E-2	9,86E-5	5,16E-1
Renew. PER as material	MJ	0E0	0E0	2,39E0	2,39E0	0E0	-2,39E0	MND	0E0	0E0	0E0	0E0	-5,29E-3
Total use of renew. PER	MJ	1,09E1	1,91E-1	8,82E0	1,99E1	4,93E-2	-2,39E0	MND	0E0	1,1E-2	3,26E-2	9,86E-5	5,11E-1
Non-re. PER as energy	MJ	1,41E2	1,35E1	3,32E1	1,87E2	3,44E0	3,83E-2	MND	0E0	9,86E-1	3,07E0	5,07E-3	-3,96E1
Non-re. PER as material	MJ	0E0	0E0	2,72E-1	2,72E-1	0E0	2,72E-1	MND	0E0	0E0	0E0	0E0	-2,68E-1
Total use of non-re. PER	MJ	1,41E2	1,35E1	3,35E1	1,88E2	3,44E0	3,1E-1	MND	0E0	9,86E-1	3,07E0	5,07E-3	-3,98E1
Secondary materials	kg	1,19E0	0E0	8,88E-5	1,19E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	2,51E0
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m ³	2,57E-1	2,31E-3	6,35E-3	2,65E-1	5,95E-4	3,98E-5	MND	0E0	1,7E-4	3,1E-4	4,33E-6	-3,55E-2

8) PER = 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	2,1E0	1,39E-2	5,25E-2	2,17E0	3,54E-3	8,27E-4	MND	0E0	1,29E-3	0E0	8,71E-6	-6,42E-1
Non-hazardous waste	kg	3,8E1	9,44E-1	1,41E0	4,04E1	2,44E-1	1,33E-1	MND	0E0	7,18E-2	0E0	1,46E-2	-7,24E0
Radioactive waste	kg	3,4E-4	9,23E-5	2,22E-4	6,55E-4	2,36E-5	1,21E-7	MND	0E0	6,52E-6	0E0	3,15E-8	2,89E-5

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0
Materials for recycling	kg	0E0	0E0	2,8E-3	2,8E-3	0E0	5,69E-3	MND	0E0	0E0	3,74E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	7,39E-2	7,39E-2	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	3,83E-1	MND	0E0	0E0	0E0	0E0	0E0

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 Pot.	kg CO ₂ e	1,13E1	8,64E-1	1,41E0	1,36E1	2,26E-1	4,02E-3	MND	0E0	6,62E-2	3,5E-2	0E0	-5,1E0
Ozone depletion Pot.	kg CFC-11e	7,93E-7	1,57E-7	2,02E-7	1,15E-6	4,12E-8	2,67E-10	MND	0E0	1,15E-8	9,11E-9	0E0	-1,26E-7
Acidification	kg SO ₂ e	1,83E-1	2,13E-3	3,09E-3	1,88E-1	4,6E-4	1,9E-5	MND	0E0	2,05E-4	1,28E-4	0E0	-1,62E-2
Eutrophication	kg PO ₄ ³ e	4,55E-2	4,02E-4	1,19E-3	4,71E-2	9,5E-5	2,13E-5	MND	0E0	4,7E-5	2,94E-5	0E0	-8,96E-3
POCP ("smog")	kg C ₂ H ₄ e	5,39E-3	1,14E-4	1,89E-4	5,69E-3	2,75E-5	6,92E-7	MND	0E0	8,81E-6	8,32E-6	0E0	-4,19E-3
ADP-elements	kg Sbe	3,89E-2	2,37E-5	4,08E-6	3,89E-2	6,28E-6	5,39E-8	MND	0E0	1,76E-6	5E-7	0E0	-5,34E-6
ADP-fossil	MJ	1,41E2	1,31E1	3,35E1	1,87E2	3,44E0	3,83E-2	MND	0E0	9,86E-1	7,94E-1	0E0	-3,98E1

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.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited
30.04.2023

