Hellsten
FLOORING

EPD Environmental Product Declaration Tuuli Flooring®

Program operator, publisher:	Rakennustietosäätiö RTS, The Building Information Foudation RTS Malminkatu 16 A 00100 Helsinki http://cer.rts.fi
Owner of the declaration:	Hellsten Flooring Ltd. Oy
Name of the product:	Tuuli Flooring®
Declaration number:	RTS_204_23
Registration number:	-
Issue date:	24.01.2023
Valid to:	24.01.2028
Scope of the declaration	This environmental product declaration covers the environmental impacts of Tuuli Flooring®. The declaration has been prepared in accordance with EN 15804:2019 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 26.8.2020). This declaration covers the life cycle stages from cradle-to-grave.
	Jukka Seppänen RTS EPD Committee Secretary Laura Apilo Managing Director

Verified according to the requirements of EN 15804:2019

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

☐ Internal	X External

Third party verifier:

19.01.2023
Heini Koutonen, Ramboll Finland Oy

GENERAL INFORMATION

1. Owner of the declaration, manufacturer

Hellsten Flooring Ltd. Oy
Lanssikuja 2
60800 ILMAJOKI
FINLAND

Vesa Hellsten
info@hellstenflooring.fi

2. Product name

Tuuli Flooring®

3. Place of production

Produced in Finland and Belgium.

4. Additional information

Additional information from Vesa Hellsten.

5. Product Category Rules and the scope of the declaration

The declaration has been prepared in accordance with EN 15804:2019 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 26.8.2020)

6. Author of the life-cycle assessment and declaration

Author of EPD: Develop Train Oy, Mikontie 15 60800 Ilmajoki, tel +358 (0)40 5800273, www.developtrain.fi. Compiler Tarja Pienimäki.
Author of LCA: University of Vaasa, Bening Mayanti, bening.mayanti@uwasa.fi. Evaluation made according to values in 2019.

7. Verification

The declaration has been prepared in accordance with EN 15804:2019 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 26.8.2020). The declaration was verified by Heini Koutonen, Ramboll Finland Oy according to abovementioned standards and PCR rules.
Third party verification on 19.01.2023. Verification is valid 19.01.2028.

8. Declaration issue date and validity

Declaration issue date 24.01.2023. The declaration in valid 5 years, 24.01.2023-24.01.2028

PRODUCT INFORMATION

9. Results of environmental information reported per kilogram

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP (total)	kg CO_2 eq/kg	1,84	9,46E-02	0,38	ND	0,11	ND	ND	ND	ND	ND	0	2,94E-03	0	1,18	-0,33
ADPE	kg Sb eq.	2,58E-05	3,152E-07	3,97E-06	ND	0,94E-06	ND	ND	ND	ND	ND	0	0,94E-08	0	1,64E-06	-3,71E-07
ADPF	MJ. Net calorific value	9,20	0,11	2,23	ND	0,71	ND	ND	ND	ND	ND	0	3,33E-03	0	0,73	-0,82
WDP	m^3 world eq. deprived	1,47	6,83E-03	0,65	ND	0,16	ND	ND	ND	ND	ND	0	0,21E-03	0	2,16	-0,13
Biogenic carbon content in product	kg C/kg	0,28E-03														
Use of secondary material	kg/kg	0,36	1,44E-03	7,61E-02	ND	5,74E-02	ND	ND	ND	ND	ND	0	4,33E-05	0	6,46E-02	-0,12

10. Description of product and its use

Woven vinyl flooring delivered as rolls with a total weight 3000 g/m², which is manufactured in Finland and Belgium. Backing based on PVC, yarn based on PVC/Polyester.

Application
The textile flooring can be used in commercial areas.

11. Content information

Raw material	quantity wt%	Origin of the raw materials
Filler ($CaCO_3$, $CaMg(CO_3)_2$)	38-42	EU
Polyvinylchloride (PVC)	30-40	EU, USA
Plasticizer	17-21	EU
Pigments	<2	EU
Glass fibre	<1	EU
Polyester	<1	USA

Product structure/composition/raw material	quantity wt%	Origin of the raw materials
Metals	0	
Stone-based materials (minerals)	38-42	EU
Fossil materials	58-62	EU, USA
Bio-based materials		

12. Substances under European Agency's REACH,SVHC restrictions

Name	**EC Number**	**CAS Number**
Does not include		

13. Reference service life

Reference service life is 1 year. Expected service life is 20-30 years.

SCOPE OF LIFE CYCLE ASSESMENT

14. Declared Unit

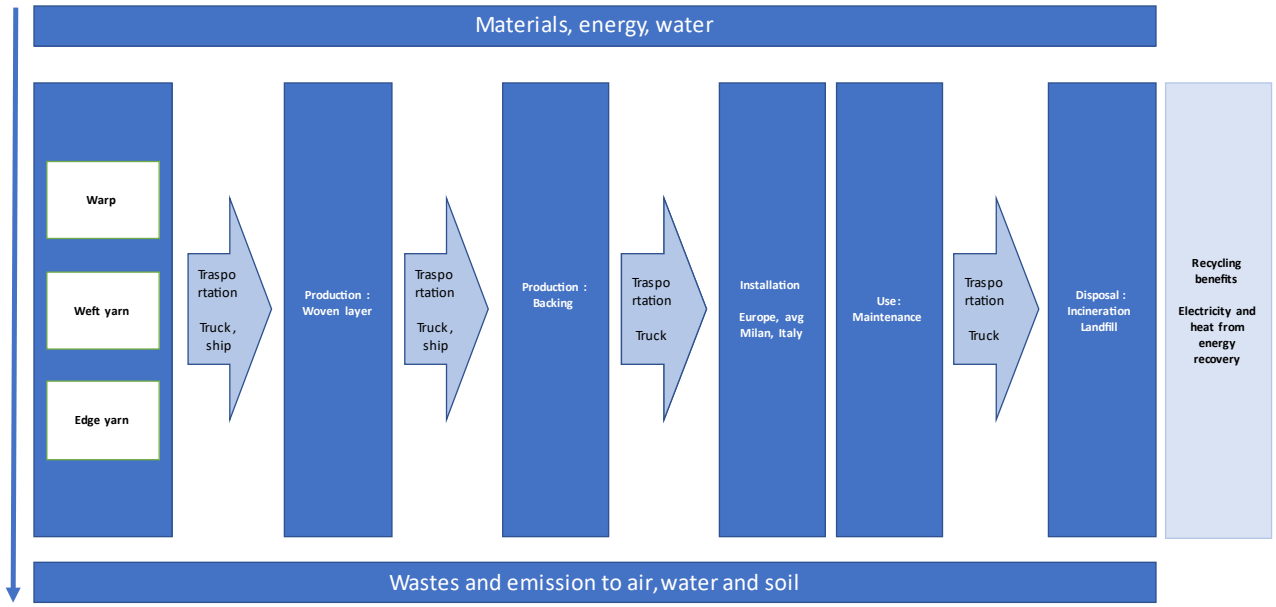
The declared unit refers to 1 m² produced textile floor covering (output A1-A3: 1m² produced flooring, output A5: 1m² installed flooring).

Conversion table for average product

Name	Value	Unit
Declared unit	1	m^2
Mass reference	3,0	kg/m^2
Conversion factor to 1 kg	0,33	m^2/kg

15. System Boundary

The system consists of processes described in the following diagram:



This declaration covers “cradle-to-grave. Non-relevant stages are marked with “ND”.

Product stage			Construction process stage		Use stage							End of life stage				Supplementary information beyond the life cycle		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	x	ND	x	ND	ND	ND	ND	ND	x	x	x	x	ND	x	ND
Raw material supply	Transport	Manufacturing	Transport	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

15.1 Product life cycle description

Modules A1-A3 Production

All used materials, energy, packing and transportation to the manufacturing site, until the end-of-waste state have been included and waste processing up to the landfill disposal of residual waste. The transportation of the intermediate product is included based on the average load of the trip calculated out of the total production volume.

Module A4 Transport

Transport of the packed textile floorcovering from factory gate to the place of installation.

Module A5 Installation

Installation of the textile floor covering, production and transport of auxiliary material, waste from the installation loss and packaging go to the incineration, the production of the amount of carpet that occurs as installation waste incl. its transport to the place of installation. The place of installation is assumed to occur in Milan, Italy which represents geographically an average market place in Europe.

Module B2 Maintenance

Provision of cleaning agent, energy and water consumption for the cleaning of the floor covering including waste water treatment. The LCA results in this EPD are declared for a one year usage.

Module C1-C4

The flooring is de-constructed manually and transported to a waste treatment facility (according to our estimation 46% landfill, 54% incineration), location EU. Because of the manual de-construction no impacts are caused by module C1. As well no impacts are followed from the module C3 since no treatment is needed before disposal.

Module D Benefits and loads outside system boundary

D-A5: Energy credits from energy recovery of packaging and installation waste
D-2: Energy credits from energy recovery of carpet waste at the end-of-life
Incineration with CHP with 80% efficicency (65% heat, 15% electricity), credits accounted according to average energy source mix in Italy according to Ecoinvent database.

The majority of used secondary materials is related to bioenergy production.

15.2 Assumptions about energy production and other relevant background data

Energy sources in core module (A3) are based on supplier specific data:
Electricity (Finland): 85,13% hydro, 10,62% solar, 4,25% wind
Electricity (Belgium): 71.42% mix, 28.57% solar
Heat (Belgium): 100% natural gas
In other modules the source of electricity mix in associating country according to Ecoinvent database.

15.3 Data quality

All the site-specific data has been collected from Hellsten Flooring Ltd. Oy and it is representative of the production practices under 2019. In the cases where no specific data could be used, available generic data was used mainly provided by Ecoinvent 3.8. None of the inputs or outputs are defined out of the analysis and no data is found missing. All the inputs and outputs are allocated to this product because it covers 95-98% of the production.

Geographical coverage	Upstream data: Good (Country specific) Core module (A3): Very good (site-specific) Downstream data: Good (country specific)
Technological representativeness	Upstream data: Good (Generic data based on plant averages) Core module (A3): Very good (site-specific) Downstream data: Good (Generic data based on plant averages)
Time-related coverage	Upstream data: Very good Core module (A3): Very good (2019 data) Downstream data: Good

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to EN 15804 and the building context, respectively the product-specific characteristics of performance, are taken into account. For the calculation of the LCA software OpenLCA 1.10.2 and Ecoinvent 3.8 database were used.

16 Cut-off criteria

Module B1 and B3-B7

The modules are not relevant and therefore not declared. The use or operation of the product do not need any material or energy inputs or produce any outputs. The product does not need any repairing, replacement or refurbishment when used according to manufacturers instructions in commercial areas.

In the declared modules (A1-A5, B2, C1-C4, D) none of the inputs or outputs are defined out of the analysis and no data is found missing.

LCA RESULTS

17 Environmental impacts

Environmental impacts are announced per functional unit, e.g. kg/m^2 floor covering except A5 kg/m^2 installed flooring.

Product stage			Construction process stage		Use stage							End of life stage				Supplementary information beyond the life cycle		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	x	ND	x	ND	ND	ND	ND	ND	x	x	x	x	ND	x	ND

Indicators	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP (total)	kg CO_2 eq	5,52	0,28	1,13	ND	0,34	ND	ND	ND	ND	ND	0	0,01	0	3,54	-0,98
GWP (fossil)	kg CO_2 eq	5,40	0,28	1,13	ND	0,36	ND	ND	ND	ND	ND	0	0,01	0	3,41	-0,96
GWP(biogenic)	kg CO_2 eq	3,81E-02	0,05E-02	-1,94E-03	ND	-2,19E-02	ND	ND	ND	ND	ND	0	1,54E-05	0	7,05E-03	-1,83E-02
GWP (luluc)	kg CO_2 eq	8,05E-02	0,11E-03	0,52E-03	ND	9,40E-02	ND	ND	ND	ND	ND	0	3,46E-06	0	5,09E-04	-7,91E-05
ODP	kg CFC 11 eq	2,02E-06	6,56E-08	6,45E-08	ND	4,88E-08	ND	ND	ND	ND	ND	0	2,04E-09	0	1,12E-07	-1,67E-07
AP	mol H^+ eq	2,80E-02	1,15E-03	4,82E-03	ND	1,94E-03	ND	ND	ND	ND	ND	0	3,57E-05	0	2,66E-03	-2,76E-03
EP-fresh water	kg PO_4^- eq	1,73E-03	1,84E-05	0,22E-03	ND	9,64E-05	ND	ND	ND	ND	ND	0	5,71E-07	0	1,52E-04	-1,14E-04
EP-marine	kg N eq	5,38E-03	0,35E-03	0,1E-02	ND	0,45E-03	ND	ND	ND	ND	ND	0	1,08E-05	0	1,29E-03	-0,49E-03
EP-terrestrial	mol N eq	5,33E-02	3,78E-03	1,04E-02	ND	3,73E-03	ND	ND	ND	ND	ND	0	0,12E-03	0	7,22E-03	-5,33E-03
POCP	kg NMVOC eq.	1,79E-02	1,13E-03	2,55E-03	ND	0,97E-03	ND	ND	ND	ND	ND	0	3,52E-05	0	1,92E-03	-1,59E-03
ADPE	kg Sb eq.	7,73E-05	9,46E-07	1,19E-05	ND	2,82E-06	ND	ND	ND	ND	ND	0	2,94E-08	0	4,91E-06	-1,11E-06
ADPF	MJ. Net calorific value	27,6	0,32	6,68	ND	2,12	ND	ND	ND	ND	ND	0	1,00E-02	0	2,20	-2,45
WDP	m^3 world eq. deprived	4,41	2,05E-02	1,96	ND	0,49	ND	ND	ND	ND	ND	0	0,64E-03	0	6,47	-0,40

Caption	GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP =Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for nonfossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

18 Use of natural resources

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	4,91	4,54E-02	0,041	ND	0,89	ND	ND	ND	ND	ND	0	1,41E-03	0	0,33	-1,70
PERM	MJ	2,68	1,49E-02	0,17	ND	0,73	ND	ND	ND	ND	ND	0	0,46E-03	0	0,16	-0,21
PERT	MJ	7,59	6,03E-02	0,21	ND	1,62	ND	ND	ND	ND	ND	0	1,87E-03	0	0,49	-1,91
PENRE	MJ	44,96	0,41	6,88	ND	2,80	ND	ND	ND	ND	ND	0	1,28E-02	0	2,59	-3,62
PENRM	MJ	96,84	3,90	8,68	ND	3,67	ND	ND	ND	ND	ND	0	0,12	0	3,83	-13,26
PENRT	MJ	141,89	4,31	15,56	ND	6,49	ND	ND	ND	ND	ND	0	0,13	0	6,42	-16,88
SM	kg	1,08	4,43E-03	0,23	ND	0,17	ND	ND	ND	ND	ND	0	0,13E-03	0	1,94E-02	-0,36
RSF	MJ	0,55	1,29E-03	-2,16E-02	ND	9,72E-02	ND	ND	ND	ND	ND	0	0,04E-03	0	3,71E-03	-0,21
NRSF	MJ	0,21	5,23E-03	7,03E-03	ND	1,19E-02	ND	ND	ND	ND	ND	0	0,16E-03	0	6,81E-03	-1,15E-02
FW	m^3	0,11	0,49E-03	4,61E-02	ND	1,30E-02	ND	ND	ND	ND	ND	0	1,52E-05	0	0,15	-9,34E-03
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

19 Waste and output flows

Indicators	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	7,70	9,47E-02	1,25	ND	0,43	ND	ND	ND	ND	ND	0	2,94E-03	0	1,09	-0,57
NHWD	kg	0,72	0,22	0,26	ND	2,04E-02	ND	ND	ND	ND	ND	0	6,67E-03	0	3,06	-2,31E-02
RWD	kg	9,91E-03	8,52E-05	0,14E-03	ND	0,41E-03	ND	ND	ND	ND	ND	0	2,65E-06	0	2,67E-04	-7,28E-04
CRU	kg	0	0	0	ND	0	ND	ND	ND	ND	ND	0	0	0	0	0
MFR	kg	0,92	3,59E-03	-3,18E-02	ND	0,17	ND	ND	ND	ND	ND	0	0,11E-03	0	8,02E-03	-0,34
MER	kg	1,13E-02	0,99E-03	2,11E-03	ND	0,59E-03	ND	ND	ND	ND	ND	0	3,07E-05	0	1,28E-03	-1,08E-03
EE	MJ	0	0	0	ND	0	ND	ND	ND	ND	ND	0	0	0	0	0
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy															

20 Biogenic carbon content

Biogenic carbon content*	Unit	A3
Biogenic carbon content in product	kg C	0,85E-03
Biogenic carbon content in packaging	kg C	0,46E-05

* Note: 1 kg biogenic carbon is equivalent to 44,12 kg CO_2. Packaging weight 0,77E-03 kg/m2.

SCENARIOS AND TECHNICAL INFORMATION

21 Energy in the manufacturing phase

Parameter	Quantity	Quality
A3 Electricity information and CO_2 emission kg CO_2 eq./kWh	0,04338	Finland, supplier specific: 85,13% hydro, 10,62% solar, 4,25% wind
A3 Electricity information and CO_2 emission kg CO_2 eq./kWh	0,23094	Belgium, supplier specific: 71.42% mix, 28.57% solar
A3 Heat energy information and CO_2 emission kg CO_2 eq./kWh	0,27851	Belgium, supplier specific: 100% natural gas, central or small-scale

22 Transport to the construction site (A4)

Parameter	Quantity	Unit
Truck (Euro 5 truck 16-32t)	0,03747	kg low-sulphur diesel/ton-km
CO_2 emission	0,1665	kg CO2 eq./ton-km
Distance (average distance of the transportation)	966	km
Capacity utilisation % (including empty returns)	85	%
Bulk density of transported products kg/m3	1000	kg/m^3
Volume capacity utilisation factor (factor = 1 or <1 tai ≥ 1 for compressed or nested packaged products)	1	

23 Installation in the building (A5)

Parameter	Quantity	Unit
Auxiliary (adhesive)	0,3	kg
Material loss (installation waste)	6	%

The installation waste is transported to a waste treatment facility (according to our estimation 46% landfill, 54% incineration), location EU. Packaging waste made of polypropylene leaves the system for recycling/incineration.

24 Maintenance (B2)

Parameter	Quantity	Unit
Water consumption	0,003	m^3
Auxiliary (detergent)	0,04	kg
Electricity consumption	0,55	kWh
Maintenance cycle (vacuum cleaning & wet cleaning)	156	Times per year

The values are indicated per m² floor covering and per year.

25 End-of-life process description

Process flow	Unit expressed per declared unit	Quantity
Collection process specified by type	kg collected separately	-
	kg collected with mixed construction waste	3
Recovery system specified by type	kg for re-use	-
	kg for recycling	-
	kg for energy recovery	1,62
Disposal specified by type	kg product or material for final deposition	1,38
Assumptions for transportation	distance in km by Euro 5 truck	30 km

26 Reuse, recovery and/or recycling potentials (D)

Module D includes energy credits from waste incineration of packaging and installation waste from module A5 as well as energy credits from waste incineration of carpet waste at the end-of-life.

27 Additional information

Emissions to soil
The information is not available
Emissions to water
The information is not available
Emissions to indoor air
The product has emission class M1.

28 Reference of the common information

The Building Information Foundation RTS (RTS EPD Product Category Rules). Rakennustietosäätiö RTS sr (RTS EPD PCR menetelmäohje 15804:2019)
ISO 14025
ISO 14025:2011-10 Environmental labels and declarations. Type III environmental declarations. Principles and procedures
EN 15804
EN15804:2019 Sustainability of construction works. Environmental Product Declarations. Core rules for the product category of construction products
EN 1307
EN 1307:2014 Textile floor coverings - Classification