

**RTS EPD ENVIRONMENTAL PRODUCT
DECLARATION, No. RTS_27_19**
Finnish sawn dried timber of spruce or pine
In accordance with EN 15804 and ISO 14025

25.2.2019
Rakennustietosäätiö RTS sr
The Building Information Foundation RTS
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General information

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This environmental product declaration presents the average performance of Finnish sawn timber by the members of the Finnish organization Puutuoteteollisuus ry. Puutuoteteollisuus ry represents the Finnish wood products industry and is an integral part of the Finnish forest industry. Puutuoteteollisuus ry is an industry association of the Finnish Forest Industries Federation. It acts as the trustee of the Finnish wood products industry and related businesses in Finland, promoting the position of the wood products industry as a major player in bio-economy. Puutuoteteollisuus ry serves the industry by promoting industrial policy conditions, the competitiveness and end-use of wood products, and by coordinating research activities in the field.

The following companies have contributed to this branch EPD by providing data: Metsä Fibre Oy, Stora Enso Wood Products Oy Ltd, UPM Kymmene Oyj, Versowood Oy.

Conductor of the Life Cycle Assessment (LCA) and Environmental Product Declaration (EPD)

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Product Category Rules

RTS PCR protocol: EPDs published by the Building Information Foundation RTS sr (2.6.2016)

SFS-EN 15804:2012+A1:2013: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

SFS-EN 16485:2014. Round and sawn timber. Environmental product declarations. Product category rules for wood and wood-based products for use in construction.

Date of publication and validity of the EPD

The EPD is approved on 25.2.2018. The EPD is valid for 5 years, 13.12.2018-13.12.2023.

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Verification

The EPD is verified by an independent external party according to the EN 15804:2012 standard. The EPD is verified by Vahanen Environment Oy, B. Eng. Teija Käpynen according to the product category rules presented above. Tampellan Esplanadi 2, 33100 Tampere, +358 40 7148 253, www.vahanen.com.

CEN standard EN 15804 serves as the core PCR ^a
Independent verification of the declaration and data, according to EN ISO 14025:2010 <input type="checkbox"/> internal <input checked="" type="checkbox"/> external
(Where appropriate ^b)Third party verifier: Vahanen Environment Oy, B. Eng. Teija käpynen
^a Product category rules ^b Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4).

Product description

Description of the product and its use

The product covered by this declaration is sawn, dried timber produced in Finland by members of Puutuoteteollisuus ry. The sawn dried timber is used for construction and as raw material for further processed wood products. The raw material used in the production is spruce and pine logs from Finland, Russia and Sweden. The dried sawn timber has an average density of 474 kg/m³ and a moisture content of 18 %.

Sawn dried timber of spruce has an average density of 472 kg/m³ and 475 kg/m³ for pine. The moisture content for the dried wood ranges between 15-18%.

Wood from certified sources is used to produce the sawn dried timber.

Main product components and materials

The sawn dried timber is made purely of spruce and pine wood logs. The sawn dried timber does not include Substances of Very High Concern (SVHC).

	Component/Substance	Amount	CAS-nr	Classification
Sawn dried timber	Wood (spruce/pine)	100 %	-	UN CPC code: 311

LCA calculation information

According to EN 15804, an EPD of construction products may not be comparable if they do not comply with this standard and are seen in a building context. An EPD might not be comparable if different functional unit or reference thickness is used.

Declared unit

This EPD describes the environmental effect of 1m³ of sawn dried timber throughout the product's life cycle.

The average density of the sawn dried timber is 474 kg/m³ with an average moisture content of 18 %.

System boundaries

Cradle-to-Gate with options;

- product stage (A1-A3),
- construction process stage: transports (A4),
- end-of-life stage (C1-C4),

- impacts outside the life cycle (D).

Cut-off rules

In the inventory of the input flows a 1 % cut-off rule has been applied. The 1 % cut-off rule is based on the assumption that these input flows do not have a major impact on the environmental impacts as a whole (EN 15805 6.3.5).

Machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

Reference service life (RSL)

Sawn dried timber is used as raw material in planed wood production. If properly installed, the service life time of the planed wood is equal to the lifetime of the building, and 50 years as a default.

Year of study

Raw materials, transports and manufacturing data: 2017.


LCA software

SimaPro 8.5.0.0, EcolInvent 3.4.

Life cycle stages

Product stage			Construct-ion process		Use stage							End-of-life				Benefits and loads beyond the system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	NR	x
Raw material supply	Transports	Manufacturing	Transports	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Energy use	Water use	De-construction	Transports	Waste processing	Disposal	Reuse, Recovery, Recycling

 Mandatory modules

 Mandatory in accordance with the provisions of section 6.2.1 of the RTS EPD protocol

 Optional modules based on scenarios

X = included in the assessment

NR = Not relevant

ND = Not determined

Product stage; A1-A3

A1; Raw-material supply

The raw material supply covers sourcing and production of all raw materials, water, fuels and energy used. The supply of packaging materials is also included in module A1.

The emission factor used for the electricity is (Ecolnvent database):

- FI: Electricity grid mix 64,7 g CO₂eq/MJ

A2; Transports

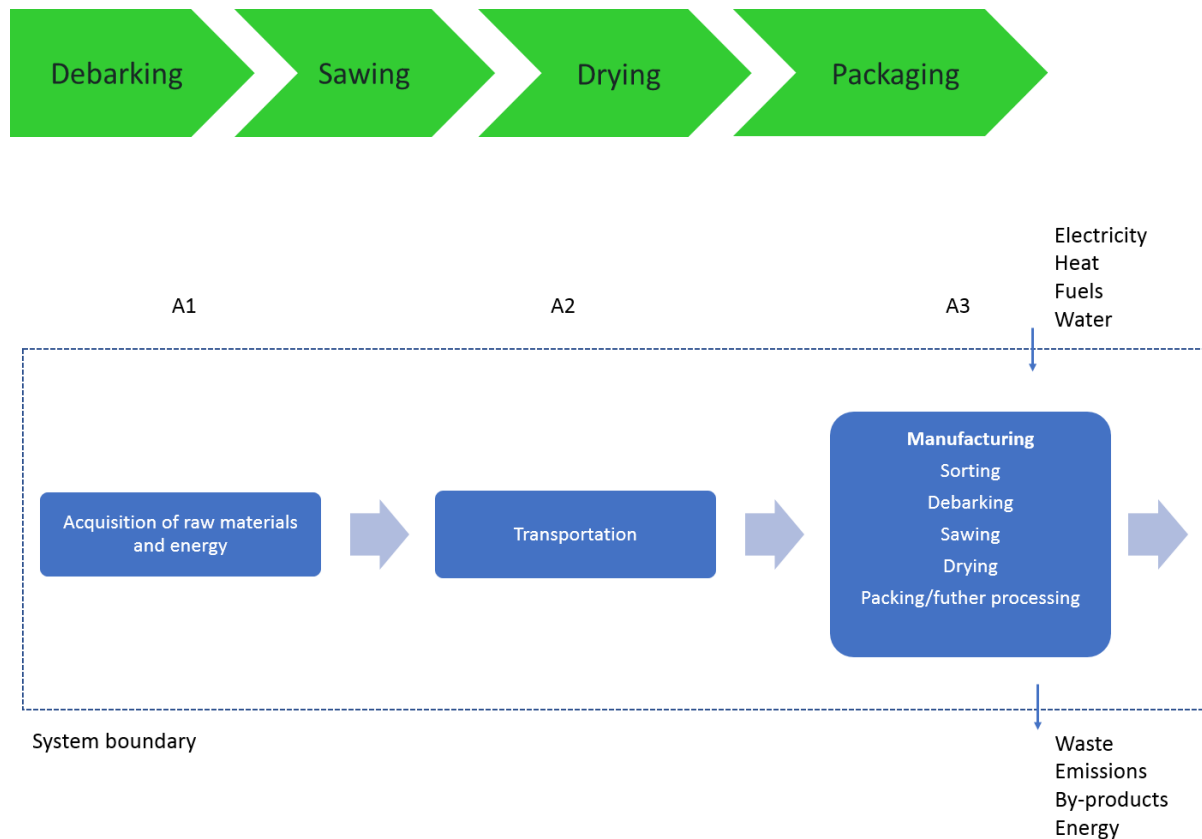
The transportation of the different raw materials to the sawmill as well as internal transportation at the sawmill are taken into account.

A3; Manufacturing

The sawn dried timber production consists of sorting and debarking the wood, sawing it, drying it, and after quality sorting, packaging it; or further processing the sawn dried timber (out of the scope of this EPD).

The emissions to air and water and the disposal of generated waste are taken into account in the manufacturing phase. There are no emissions to ground in the manufacturing process.

Manufacturing process flow diagram



Construction process stage; A4

A4; Transports

From the sawmills the sawn dried timber is transported to customers within Finland, or to national harbors for international customers. The transport distances are based on sawmill specific logistics from 2017.

The bulk density of the sawn dried timber is 474 kg/m^3 . The average transport distance is 191 km, as weighted by production volumes.

End-of-life stage; C1-C4

C1; De-construction

The de-construction and/or demolition of the product is part of the demolition of the entire construction. The deconstruction is considered to be done by excavation.

C2; Transports

Transport distance to waste processing is estimated to be 100 km by road.

C3; Waste processing

The collected waste is sent either to energy recovery (95 %) or material recovery (5 %).

C4; Disposal

No generated waste is disposed to landfill.

Benefits and loads beyond the system boundary; D

The environmental impacts of the benefits and loads beyond the system boundary are assessed in the life cycle assessment for this environmental product declaration based on the waste processing options of module C3. Module D therefore considers the avoided energy use as a result of the incineration of sawn timber ending up as waste from the demolition of a building, as well as the avoided material use as a result of using the sawn timber from the demolition waste as material.

A lower calorific value of 7 MJ/kg is used to assess the energy content of the wood used as energy fuel. The environmental impacts of the benefits are assessed in comparison to average district heat production using energy sources other than natural gas.

LCA results

Environmental impacts

Declared unit = 1m³ of sawn dried timber. The density of the sawn dried timber is 474 kg/m³.

Impact category	unit	A1	A2	A3	A1-A3	A4
Global warming	kg CO ₂ eq	-1 289	18,51	615	-656	8,83
	Range	-1 521	13,98	475	-	7,78
		-1 174	20,59	819	-	10,60
- Global warming, excluding biogenic impacts	kg CO ₂ eq	54,34	18,51	-0,40	72,45	8,83
	Range	36,98	13,98	-2,05	-	7,78
		84,73	20,59	0,47	-	10,60
- Global warming, biogenic impacts	kg CO ₂ eq	-1 343	0	615	-728	0
	Range	-1 583	-	476	-	-
		-1 211	-	819	-	-
Ozone depletion	kg CFC-11 eq	9,33E-06	2,90E-06	-4,20E-08	1,22E-05	1,62E-06
	Range	6,94E-06	2,19E-06	-1,05E-07	-	1,42E-06
		1,22E-05	3,22E-06	2,64E-08	-	2,01E-06
Acidification	kg SO ₂ eq	3,65E-01	5,88E-02	-5,05E-03	0,42	0,03
	Range	2,09E-01	3,83E-02	-1,41E-02	-	0,03
		5,42E-01	7,15E-02	1,36E-03	-	0,04
Eutrophication	kg (PO ₄) ³⁻ eq	8,25E-02	1,47E-02	5,50E-03	0,10	0,01
	Range	5,67E-02	8,36E-03	-1,89E-03	-	0,01
		1,14E-01	1,94E-02	1,23E-02	-	0,01
Photochemical ozone creation	kg Ethene eq	2,98E-02	2,73E-03	-2,48E-04	0,03	0,002
	Range	2,00E-02	1,89E-03	-6,39E-04	-	0,001
		4,06E-02	3,21E-03	1,76E-04	-	0,002
Depletion of abiotic resources – elements	kg Sb eq	2,92E-05	1,93E-05	-2,49E-08	4,85E-05	1,26E-05
	Range	2,60E-05	1,49E-05	-3,08E-07	-	1,21E-05
		3,25E-05	2,11E-05	2,71E-07	-	1,37E-05
Depletion of abiotic resources – fossil fuels	MJ	959	247	-6,8	1 199	137
	Range	559	180	-28,5	-	119
		1390	280	2,45	-	166

Impact category	unit	C1	C2	C3	C4	D
Global warming	kg CO ₂ eq	0,54	4,27	728	0	-218
- Global warming, excluding biogenic impacts	kg CO ₂ eq	0,54	4,27	0	0	-218
- Global warming, biogenic impacts	kg CO ₂ eq	0	0	728	0	0
Ozone depletion	kg CFC-11 eq	9,44E-08	8,10E-07	0	0	-1,13E-05
Acidification	kg SO ₂ eq	0,0040	0,0142	0	0	-1,461
Eutrophication	kg (PO ₄) ³⁻ eq	0,0009	0,0031	0	0	-0,2162
Photochemical ozone creation	kg Ethene eq	0,0001	0,0007	0	0	-0,0673
Depletion of abiotic resources – elements	kg Sb eq	1,45E-07	5,51E-06	0	0	-1,07E-05
Depletion of abiotic resources – fossil fuels	MJ	7,7	66,9	0	0	-2 975

Resource use

Resource use	unit	A1	A2	A3	A1-A3	A4
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	13 297	5,3	-30,1	16 642	2,57
	Range	12 047	2,6	-98,4	-	1,97
		14 891	7,5	0,16		3,44
Use of renewable primary energy resources used as raw materials	MJ	6 597	0	0	3 227	0
	Range	5 993	-	-	-	-
		7 859	-	-		-
Total use of renewable primary energy resources	MJ	19 894	5,3	-30,1	19 869	2,57
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	1 379	257	-6,8	1 629	141
	Range	833	184	-28,5	-	124
		1970	297	2,73		169
Use of non-renewable primary energy resources used as raw materials	MJ	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ	1 379	257	-6,8	1 629	141
Use of secondary material	kg	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	0	0	0	0
Net use of fresh water	m ³	1,15	0,06	-0,04	1,17	0,03
		0,48	0,04	-0,15	-	0,028
		2,65	0,08	-0,01		0,036

Resource use	unit	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	0,06	0,98	0	0	-3 152
Use of renewable primary energy resources used as raw materials	MJ	0	0	0	0	-166
Total use of renewable primary energy resources	MJ	0,06	0,98	0	0	-3 318
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	7,8	68,2	0	0	0
Use of non-renewable primary energy resources used as raw materials	MJ	0	0	0	0	0
Total use of non-renewable primary energy resources	MJ	7,8	68,2	0	0	0
Use of secondary material	kg	0	0	0	0	0
Use of renewable secondary fuels	MJ	0	0	0	0	0
Use of non-renewable secondary fuels	MJ	0	0	0	0	0
Net use of fresh water	m ³	0,001	0,01	0	0	-1,5

Waste categories:

Waste categories	unit	A1	A2	A3	A1-A3	A4
Hazardous waste disposed	kg	0	0	0,04	0,04	0
Non-hazardous waste disposed	kg	0	0	4,27	4,27	0
Radioactive waste disposed	kg	0	0	0	0	0

Waste categories	unit	C1	C2	C3	C4	D
Hazardous waste disposed	kg	0	0	0	0	0
Non-hazardous waste disposed	kg	0	0	0	0	0
Radioactive waste disposed	kg	0	0	0	0	0

Other output flows

Other output flows	unit	A1	A2	A3	A1-A3	A4
Components for re-use	kg	0	0	0	0	0
Materials for recycling	kg	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0
Exported energy, Thermal	MJ	0	0	0,02	0,02	0
Exported energy, Electric	MJ	0	0	4,00E-07	4,00E-07	0

Other output flows	unit	C1	C2	C3	C4	D
Components for re-use	kg	0	0	0	0	0
Materials for recycling	kg	0	0	0	0	23,7
Materials for energy recovery	kg	0	0	0	0	0
Exported energy, Thermal	MJ	0	0	0	0	3 152
Exported energy, Electric	MJ	0	0	0	0	0

Additional information

There is no harmful substance released to air, water or ground during the use of the product.

References

1. RTS. PCR protocol: EPDs published by the Building Information Foundation RTS sr (2016)
2. ISO 14025: Environmental labels and declarations - Type III environmental declarations - Principles and procedures (2006)
3. ISO 14040: Environmental management - Life Cycle Assessment - Principles and framework (2006)
4. ISO 14044: Environmental management - Life Cycle Assessment - Requirements and guidelines (2006)
5. SFS-EN 15804:2012+A1:2013: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products. (2014)
6. SFS-EN 16449: Wood and wood-based products. Calculation of the biogenic carbon content of wood and conversion to carbon dioxide (2014)
7. SFS-EN 16485: Round and sawn timber. Environmental product declarations. Product category rules for wood and wood-based products for use in construction (2014)
8. LCA report: Puutuoteteollisuus – Sawn dried timber (2018)