ENVIRONMENTAL PRODUCT DECLARATION

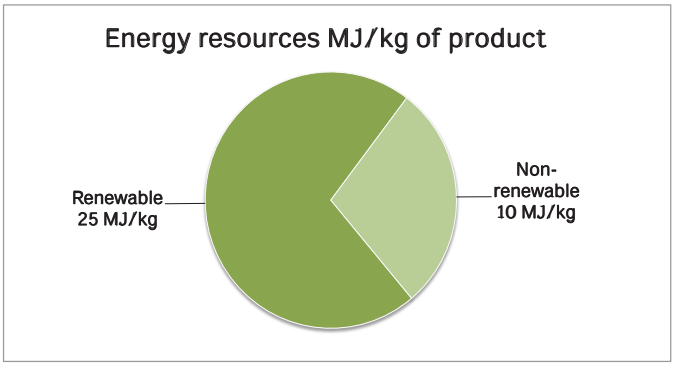
Metsä Wood Finnjoist
I-joist

The declaration has been prepared according to EN 16485 and EN 15804, which is based on the standards ISO 14040 and ISO 14044, ISO 14025 and ISO 21930. The results are based on the Life Cycle Assessment (LCA) approach taking into account raw material sourcing, raw material transportation, raw material use and production operations (cradle to gate). The downstream processes are excluded.

Summary

IMPACT	UNIT	TOTAL
Global warming potential; GWP [1] (incl. biogenic carbon)	kg CO_2 equiv./kg of product	-1.02
Global warming potential; GWP (excl. biogenic carbon)	kg CO_2 equiv./kg of product	0.40
Depletion potential of the stratospheric ozone layer; ODP	kg CFC 11 equiv./kg of product	0.105×10^{-7}
Acidification potential of soil and water sources; AP	kg SO_2 equiv./kg of product	0.003
Eutrophication potential; EP	kg Phosphate equiv./kg of product	0.0007
Formation of tropospheric ozone; POCP	kg Ethene equiv./kg of product	0.0003
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb equiv./kg of product	0.114×10^{-5}
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ, net caloric value/kg of product	8.59

[1] GWP value is negative due to biogenic carbon stored in the materials



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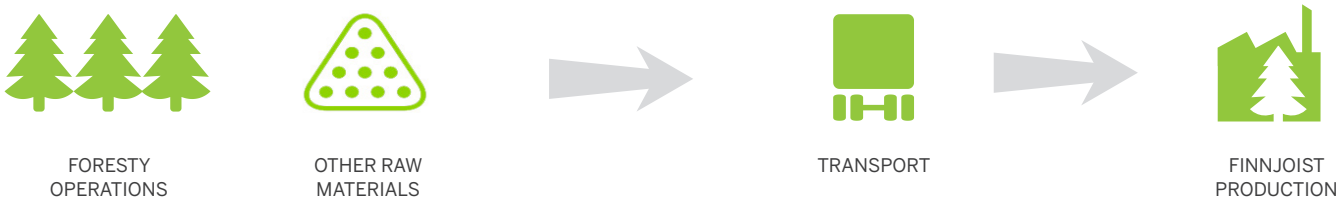
SCOPE OF THE DECLARATION

INCLUDED

Raw material supply	Transport	Manufacturing



1. PRODUCT DESCRIPTION

Metsä Wood Finnjoists (FJI) are timber-based composite joists and columns with an I-shaped cross section. Finnjoists are manufactured from high quality oriented strand board (OSB/3) web, and the flanges made from our own Kerto® laminated veneer lumber (LVL). Our engineered timber I- joists deliver strength and rigidity, virtually eradicating floor movement and its associated problems, resulting in greater floor performance.
- Instructions for use comply with Eurocode 5 requirements

Physical properties

Joist type	Mean weight (kg/m)	Joist type	Mean weight (kg/m)
200-45	2.64	240-89	4.68
200-58	3.16	300-38	2.99
200-89	4.42	300-45	3.28
220-38	2.48	300-58	3.80
220-45	2.76	300-70	4.29
220-58	3.29	300-89	5.06
220-70	3.78	360-45	3.66
220-89	4.55	360-58	4.19
240-38	2.61	360-89	5.45
240-45	2.89	400-45	3.92
240-58	3.42	400-58	4.44
240-70	3.91	400-89	5.70

- Moisture content (delivered from the mill): 10-15%

Composition
- Kerto-S laminated veneer lumber (LVL)
- OSB/3 oriented strand board
- Structural glue Type 1 (EN 301)

Finnjoists are manufactured at the Metsä Wood factory in King's Lynn, United Kingdom.

1.1 CERTIFICATES

Metsä Wood's King's Lynn factory has the certified PEFC™ (16-37-006) Chain of Custody, the FSC® (C002779) Chain of Custody as well as certified quality (ISO 9001), environmental (ISO 14001) and OHSAS 18001 management systems in place.

Metsä Wood's King's Lynn factory fulfils the obligations of European Union Regulation No. 995/2010 (EU Timber Regulation), which prohibits the placing and trading of illegally harvested timber and timber products on the market.

Metsä Wood UK is a signatory to and supporter of the Timber Trade Federation Responsible Timber Purchasing Policy and Code of Conduct which ensures independent third party assessment of our EU Timber Regulation Due Diligence System.

As all wood raw material is covered by PEFC Chain of Custody certification, Metsä Wood knows the origin of all the wood it uses. Finnjoists are certified to the PEFC Chain of Custody standard.

Finnjoists are CE marked according to ETA-02/2006.

1.2 HANDLING AFTER USE

Finnjoists can be disposed in several ways. It should be noted that the instructions for disposal may vary by country depending on the current legislation.

Recycling or re-using Finnjoists by utilising them in other applications is always preferred; however, their structural integrity must be checked before use.

Finnjoists can be safely burnt when the combustion temperature is at least 850°C; the combustion air and gases are well mixed; the retention time of the combustion gases in the furnace is over two seconds; and the residual oxygen content of the flue gases is over 6%.

Gross heating value is 18.4 MJ/kg.

While the products can also be composted, Finnjoists need to be chipped and the long duration of the composting process has to be taken into consideration. The products can also be taken to a refuse dump, although they will degrade very slowly.

Finnjoists do not contain anything classified as hazardous waste and have the following waste codes under the consolidated European Waste Catalogue:
- 170201 Wood (Construction and Demolition Wastes)

2. SCOPE OF DECLARATION

The following processes are included in the scope of the environmental product declaration:

PROCESSES OF RAW MATERIAL AND ENERGY SUPPLY (A1):
Forestry operations; production of glues; and the generation of electricity, steam and heat from primary energy sources including extraction, refining and transport.

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EXCLUDED

ENERGY | PACKAGING | WASTE MANAGEMENT | PRODUCTION FACILITIES | DISTRIBUTION | END-USER | DISPOSAL

PROCESSES OF TRANSPORT (A2):
Supplier and internal transport.

PROCESSES OF MANUFACTURING (A3):
Production of lubricants and packaging materials. Production of Finnjoists. Transport and treatment of landfill and recycling waste. Transport of hazardous waste.

THE FOLLOWING PROCESSES HAVE BEEN EXCLUDED:
The construction and maintenance of factory buildings and related infrastructure; the treatment of hazardous waste and recycled waste; the transportation of the finished product from mill to customer; construction process stages; and the use and end-of-life stages.

3. USE OF RESOURCES

The use of resources and emissions are calculated per one kilogramme (1 kg) of product. The results are presented according to EN 15942.

3.1 USE OF PRIMARY ENERGY AND FRESH WATER

	PRODUCT STAGE			
USE OF PRIMARY ENERGY (MJ, NET CALORIFIC VALUE / kg OF PRODUCT)	**RAW MATERIAL AND ENERGY SUPPLY (A1)**	**TRANSPORT (A2)**	**MANU-FACTURING** (PACKAGING, WASTE HANDLING) **(A3)**	**TOTAL**
Use of renewable primary energy excl. raw materials	8.52	0.14	0.001	8.66
Use of renewable primary energy resources used as raw materials	16.6 [1]	0	0	16.6
Total use of renewable primary energy resources	25.2	0.14	0.001	25.3
Use of non-renewable primary energy excl. non-renewable primary energy resources used as raw materials	4.86	2.45	0.11	7.42
Use of non-renewable primary energy resources used as raw materials	2.13	0	0	2.13
Total use of non-renewable primary energy resources	6.98	2.45	0.11	9.54
USE OF FRESH WATER (kg OF PRODUCT)				
Water consumption	3.05	0.24	0.015	3.30

[1] Mainly solar energy that is bound in wood during its growth

4. PRODUCT'S POTENTIAL ENVIRONMENTAL IMPACTS

Potential environmental impacts were estimated using CML2001-Apr. 2013 factors.

		PRODUCT STAGE			
IMPACT	**UNIT/kg OF PRODUCT**	**RAW MATERIAL AND ENERGY SUPPLY (A1)**	**TRANSPORT (A2)**	**MANU-FACTURING** (PACKAGING, WASTE HANDLING) **(A3)**	**TOTAL**
Global warming potential; GWP[1] (incl. biogenic carbon)	kg CO_2 equiv.	-1.20	0.18	0.007	-1.02
Global warming potential; GWP (excl. biogenic carbon)	kg CO_2 equiv.	0.22	0.18	0.007	0.40
Depletion potential of the stratospheric ozone layer; ODP	kg CFC 11 equiv.	0.105×10^{-7}	0.729×10^{-12}	0.257×10^{-13}	0.105×10^{-7}
Acidification potential of soil and water sources; AP	kg SO_2 equiv.	0.002	0.001	0.00001	0.003
Eutrophication potential; EP	kg Phosphate equiv.	0.0004	0.0003	0	0.0007
Formation of tropospheric ozone; POCP	kg Ethene equiv.	0.0002	0.0001	0	0.0003
Abiotic depletion potential (ADP-elements) for non fossil resources	kg Sb equiv.	0.113×10^{-5}	0.696×10^{-8}	0.291×10^{-9}	0.114×10^{-5}
Abiotic depletion potential (ADP-fossil fuels) for fossil elements	MJ, net caloric value	6.04	2.44	0.11	8.59

[1] GWP value is negative due to biogenic carbon stored in the materials

4.1 CARBON FOOTPRINT

Carbon footprint is a life cycle assessment (LCA) with climate change as the single impact category. To quantify the climate change impact of the product, global warming potential (GWP) has been used.

Finnjoist's GWP -1.02 kg CO_2 equiv./kg is presented in the table above. It covers a partial LCA from cradle to gate. At the mill gate, the GWP is negative due to the carbon stored in the product.

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5. OTHER ENVIRONMENTAL INFORMATION

5.1 EMISSIONS TO INDOOR AIR

Determined according to EN 717-1, the formaldehyde emitted by Finnjoists falls far below the Class E1 requirement of ≤ 0.100 ppm. The formaldehyde emission of Finnjoists is approximately 0.059 ppm.

5.2 WASTES BY CATEGORY

	DISPOSED WASTE, kg (WET WEIGHT)/kg OF PRODUCT			
WASTE CATEGORY	RAW MATERIAL AND ENERGY SUPPLY (A1)	TRANSPORT (A2)	MANUFACTURING (PACKAGING, WASTE HANDLING) (A3)	TOTAL
Hazardous	0.111×10^{-2}	0.116×10^{-5}	0.636×10^{-8}	0.112×10^{-2}
Non-hazardous	0.411×10^{-2}	0.821×10^{-3}	0.988×10^{-4}	0.503×10^{-2}
Radioactive [1]	0.230×10^{-3}	0.335×10^{-5}	0.157×10^{-6}	0.233×10^{-3}

[1] Mainly originates from datasets used for electricity supply

5.3 OUTPUT FLOWS

OUTPUT FLOW	UNIT/kg OF PRODUCT	FINNJOIST PRODUCTION
Components for re-use	kg (wet weight)	0
Materials for recycling	kg (wet weight)	0.08
Materials for energy recovery [1]	kg (wet weight)	0
Exported energy [2]	MJ	0.01

[1] By-products, as wood chips and bark, used for energy recovery in the own manufacturing process
[2] The heat or electricity generated in incineration of wastes and landfilling process that are not used in own manufacturing processes

5.4 CO_2 STORED IN THE PRODUCT

Finnjoist (1 kg) contains the stored carbon equivalent to 1.6 kg CO_2 stored in wood. Metsä Wood's certification systems guarantee the sustainability and traceability of wood raw materials (see 1.1).

6. DEFINITIONS

Acidification: Occurs when the capacity of soil or water bodies to resist or neutralise acidifying atmospheric deposition begins to decline. It is caused by combustion gases, such as nitrogen and sulphur oxides (SO_x) that react in the atmosphere to produce acids.

CML2001-Apr.2013: An impact assessment method developed at the University of Leiden, Centre of Environmental Studies (CML).

Depletion of abiotic resources: Consumption of non-renewable resources, such as zinc ore and crude oil, thereby lowering their availability for future generations.

Eutrophication: Eutrophication is caused by an addition of excess nitrogen and phosphorus nutrients to an eco-system, e.g. through waste waters. This boosts the growth of planktonic algae leading to reduced water clarity, oxygen depletion or changes in fish stocks.

Global warming potential (GWP): Global warming is caused by the increase of greenhouse gases in the atmosphere, such as carbon dioxide (CO_2) that absorbs heat. GWP is calculated over a specific time period of 100 years (GWP100).

Ozone depletion: Ozone is an essential substance in the upper atmosphere (the stratosphere) where it screens out more than 99% of the dangerous ultraviolet radiation from the sun. Stratospheric ozone depletion refers to the thinning of the stratospheric ozone layer as a result of anthropogenic emissions of halons used as refrigerants in fire extinguishers and other applications.

Photochemical ozone creation: Ozone in the lowest layer of the atmosphere is harmful for living organisms. It is formed when traffic emissions such as nitrogen oxides (NO_x) and volatile organic hydrocarbons (VOCs), for example, react in the sunlight.

7. VERIFICATIONS

Date of publication: June 2015
Validity: until January 2020
Data reference year: 2013

European standard EN 15804 serves as the core PCR.
Independent verification of the declaration, according to ISO 14025:2010

☐ internal ☑ external

Third party verifier:
Inspecta Sertifiointi Oy
(accredited environmental verifier)

VERIFIED BY Inspecta

Note: EPD of construction products may not be comparable if they do not comply with the European standard EN 15804.

8. REFERENCES

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

EN 15942:2011. Sustainability of construction works. Environmental product declarations. Communication format business-to-business.

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

Origin of generic data: GaBi 6 Professional database and LIPASTO.
– A calculation system for traffic exhaust emissions and energy consumption in Finland (http://lipasto.vtt.fi/).

LEGAL NOTICE

MetsäWood

Metsä Group is a responsible forest industry group whose products' main raw material is renewable and sustainably grown northern wood. Metsä Group focuses on tissue and cooking papers, fresh forest fibre paperboards, pulp, wood products, and wood supply and forest services. Its high-quality products combine renewable raw materials, customer-orientation, sustainable development and innovation. Metsä Group's sales totalled EUR 5 billion in 2014, and it employs approximately 10,500 people. The Group operates in some 30 countries. Metsäliitto Cooperative is the parent company of Metsä Group and is owned by approximately 122,000 Finnish forest owners.

Metsä Wood provides competitive and environmentally friendly wood products for construction, industrial customers and distributor partners. We manufacture products from northern wood, a sustainable raw material of premium quality. Our sales in 2014 were EUR 0.9 billion, and we employ about 2,300 people. Metsä Wood is part of Metsä Group.

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PEFC/16-37-006