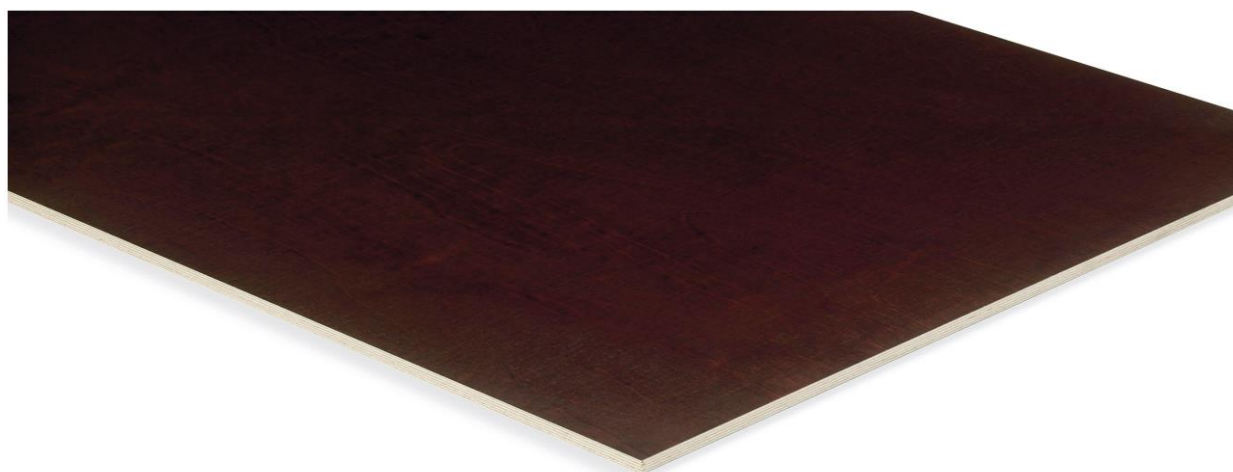




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Rakennustietosäätiö RTS
Building Information
Foundation RTS

RTS EPD,
RTS_EPD_39_19
Birch plywood
phenol coated

Scope of the declaration

This environmental product declaration covers the environmental impacts of phenol coated birch plywood. The declaration has been prepared in accordance with EN 15804:2012A1: 2013 and ISO 14025 standards and the additional requirements stated in the RTS PCR (English version, 14.6.2018). This declaration covers the life cycle stages from from cradle-to-gate with options including transportation to installation site, deconstruction, transportation, treatment and recovery of the product at its end-of-life.

RAKENNUSTIETO

14.11.2019
Building Information Foundation
RTS
Malminkatu 16 A
00100 Helsinki

<http://epd.rts.fi>

Committee secretary

RTS managing director



This verified Environmental Product Declaration was created with One Click LCA - the world leading life-cycle assessment, life-cycle costing and sustainability metrics tool designed by Bionova Ltd, Finland, www.oneclicklca.com.



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General information, declaration scope and verification (7.1)

1. Owner of the declaration, manufacturer

Koskisen Oy
Tehdastie 2, 16600 Järvelä , Finland
Riitta Ahokas
358 40 5534 410
riitta.ahokas@koskisen.com

2. Product name and number

Birch plywood, coated with phenol formaldehyde impregnated papers; KoskiForm, KoskiCrown, KoskiCarat,

3. Place of production

Järvelä mill, Finland

4. Additional information

www.koskisen.com

5. Product Category Rules and the scope of the declaration

This EPD has been prepared in accordance with EN 15804:2012A1:2013 and ISO 14025 standards together with the RTS PCR (English version, 14.6.2018). 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

Riitta Ahokas
Koskisen Oy

7. Verification

This EPD has been verified according to the requirements of ISO 14025:2010, EN 15804:2012A1:2013 and RTS PCR by a third party. The verification has been carried out by Bionova Oy, Anastasia Sipari

8. Declaration issue date and validity

14.11.2019-18.10.2024

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:

Bionova Oy/ Anastasia Sipari



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Product information

9. Product description

This EPD represents product exterior glued birch plywood coated with phenol overlays produced in Järvelä, Finland. Coated plywood is a Finnish plywood with high-quality.

Wood species used are certified according to PEFC and FSC Chain Custody and certified ISO 9001 and environmental ISO 14001 Management system.

10. Technical specifications

KoskiCrown, KoskiCarat, KoskiRuby, KoskiDeck and KoskiForm are phenol overlaid plywood which are made of Finnish birch and phenol formaldehyde resin. The plywood is produced in various thicknesses ranging from 4 mm up to 50 mm in several dimensions.

The coated plywood can be used in various end uses like Vehicles, heavy trailers and light delivery vans as well as construction. The nominal density of the product is as average 680 kg/m³. More information on web-page www.koskisen.com

11. Product standards

EN 636-3 Plywood specifications; Part 3: Requirements for plywood for use in exterior conditions

12. Physical properties

The dimensions of the panels are available up to 1880x4000 mm in various qualities. For more details see product leaflets in Koskisen web-pages www.koskisen.com. Also some technical details are shown in Handbook of Finnish plywood

In order to adapt results of EPD to plywood of different size the conversion factors presented below can be applied

| Panel thickness mm | kg/m ² | m ² /m ³ |
|-----------------------|-------------------|--------------------------------|
| 4 | 2,7 | 250,00 |
| 6,5 | 4,4 | 153,85 |
| 9 | 6,1 | 111,11 |
| 12 | 8,2 | 83,33 |
| 12,2 | 10,2 | 81,97 |
| 18 | 12,2 | 55,56 |
| 21 | 14,3 | 47,62 |
| 24 | 16,3 | 41,67 |
| 27 | 18,4 | 37,04 |
| 30 | 20,4 | 33,33 |
| 35 | 23,8 | 28,57 |
| 40 | 27,2 | 25,00 |
| 45 | 30,6 | 22,22 |
| 50 | 34 | 20,00 |



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13. Raw-materials of the product

| Product structure / composition / raw-material | Amount % |
|--|----------|
| Wood | 89,3 % |
| Phenolic resin | 5,3 % |
| Paper (lamination) | 1,6 % |
| Phenolic resin (lamination) | 2,9 % |
| Limestone aggregate | 0,5 % |
| Hardeners | 0,3 % |
| Polypropylene | 0,0 % |
| Total | 100,0 % |

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

m³ of plywood

16. System boundary

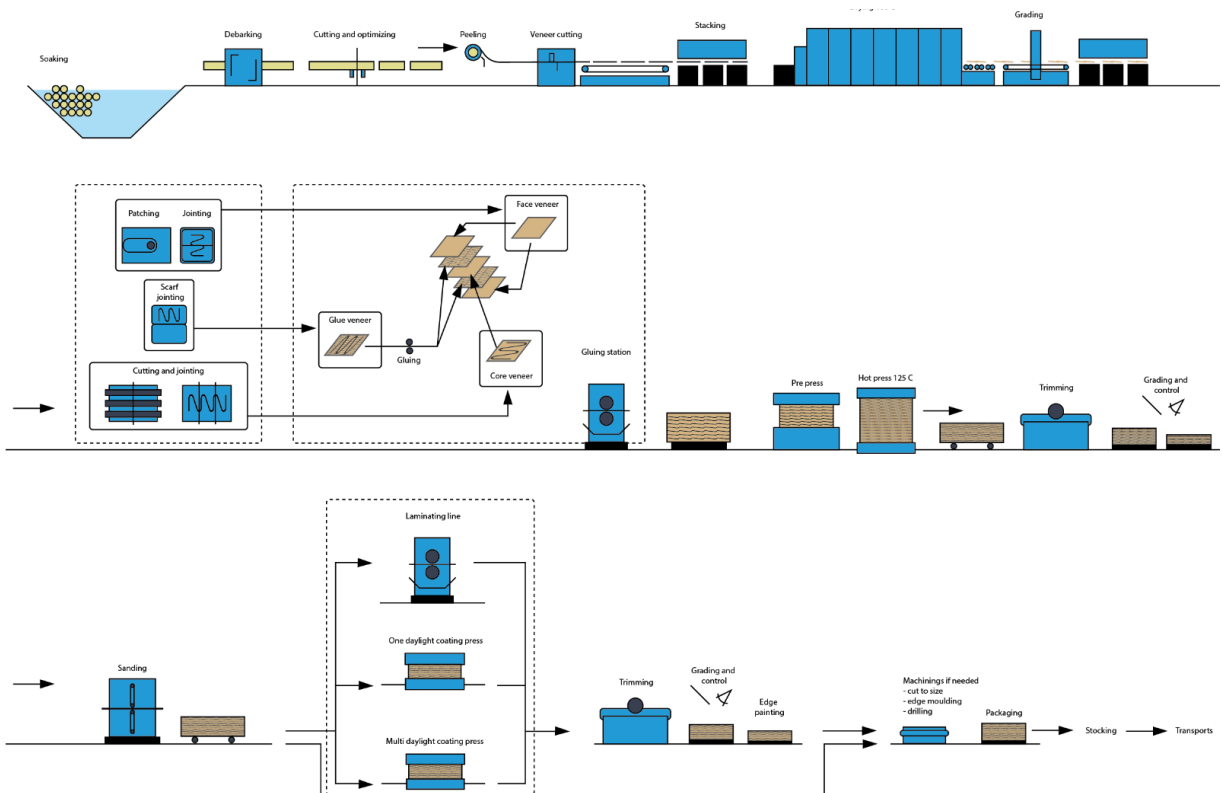
This EPD covers the following modules; A1 (Raw material supply), A2 (Transport), A3 (Manufacturing) and A4 (Transportation of the product to the building site) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and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

17. Cut-off criteria

All used materials, energy, packaging, transportation fuel and waste treatment until the end-of-waste state have been included in the product stage (A1-A3). Results for the product stage have been provided as an aggregate. A4 transportation has been estimated to be 100 km, the return trip has not been considered. Module B information has not been presented or included in the LCA calculation. Energy consumption of demolition (C1) is assumed to be negligible. Transportation distance to treatment facility is assumed to be 100 km. Collected chipboard is shredded and incinerated for energy production purposes (C3), generated ash is landfilled (C4). Module D considers the benefits of energy recovery which replaces district heat

18. Production process

The product is manufactured from birch logs certified according to PEFC/FSC and phenol formaldehyde resin for exterior applications and with urea formaldehyde for interior applications. The logs are peeled into veneers and then various thicknesses are laid up from the veneers in various construction.





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 | | |
|---------------|-----------|---------------|----------------|----------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|------------------------------|----------|-----------|
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D | D | D |
| x | x | x | x | MND | MND | MND | MND | MND | MND | MND | MND | x | x | x | x | x | x | x |
| 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 |
| | Mandatory as per the RTS PCR section 6.2.1 rules and terms |
| | Optional modules based on scenarios |

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

19. Environmental impacts

The results of a life cycle assessment are relative. They do not predict impact on category endpoints, exceeding of limit values, safety margins or risks. The impacts are presented per declared unit, 1 m3 of product. The impacts are mainly caused by the manufacturing process(A3).

| Environmental impact | | | | | | | | |
|---|---------------|---------|---------|-----|---------|---------|---------|----------|
| Parameter | Unit | A1-A3 | A4 | C1 | C2 | C3 | C4 | D |
| Global warming potential | kg CO2 -eqv | 4,38E2 | 3,47E0 | 0E0 | 2,6E0 | 6,15E0 | 3,68E-2 | -6,55E2 |
| Depletion of stratospheric ozone layer | kg CFC11-eqv | 4,12E-4 | 7,84E-7 | 0E0 | 5,14E-7 | 7,14E-7 | 9,43E-9 | -3,34E-5 |
| Formation of photochemical ozone | kg C2H4 -eqv | 9,2E-1 | 5,66E-4 | 0E0 | 1,47E-4 | 1,99E-3 | 1,18E-5 | -1,94E-1 |
| Acidification | kg SO2 -eqv | 4,15E0 | 1,78E-2 | 0E0 | 1,2E-2 | 1,5E-1 | 2,53E-4 | -3,63E0 |
| Eutrophication | kg PO4 3--eqv | 1,05E0 | 4,15E-3 | 0E0 | 2,61E-3 | 1,97E-1 | 7,63E-5 | -4,94E-1 |
| Abiotic depletion of non fossil resources | kg Sb-eqv | 3,77E0 | 1,10E-5 | 0E0 | 1,89E-2 | 1,6E-5 | 4,86E-8 | -7,75E-5 |
| Abiotic depletion of fossil resources | MJ | 8,97E3 | 9,36E1 | 0E0 | 7,43E1 | 6,05E1 | 8,67E-1 | -6,49E3 |



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20. Use of natural resources

| Resource use | | | | | | | | |
|--|------|---------|---------|-----|---------|---------|---------|---------|
| Parameter | Unit | A1-A3 | A4 | C1 | C2 | C3 | C4 | D |
| Renewable primary energy resources used as energy carrier | MJ | 1,7E4 | 1,31E0 | 0E0 | 1,22E-1 | 2,41E0 | 2,73E-2 | -1,77E2 |
| Renewable primary energy resources used as raw materials | MJ | 8,52E3 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Total use of renewable primary energy resources | MJ | 2,55E4 | 1,31E0 | 0E0 | 1,22E-1 | 2,41E0 | 2,73E-2 | -1,77E2 |
| Nonrenewable primary energy resources used as energy carrier | MJ | 1,08E4 | 1,00E2 | 0E0 | 7,4E1 | 6,87E1 | 9,43E-1 | -7,06E3 |
| Nonrenewable primary energy resources used as materials | MJ | 3,29E1 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Total use of non-renewable primary energy resources | MJ | 1,08E4 | 1,00E2 | 0E0 | 7,4E1 | 6,87E1 | 9,43E-1 | -7,06E3 |
| Use of secondary materials | kg | 4,96E-1 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Use of renewable secondary fuels | MJ | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Use of non-renewable secondary fuels | MJ | 3,38E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Use of net fresh water | m3 | 5,29E0 | 3,18E-3 | 0E0 | 0E0 | 7,07E-1 | 9,33E-5 | -4,1E-1 |

21. End of life - Waste

| Waste | | | | | | | | |
|---------------------|------|---------|---------|-----|---------|---------|---------|----------|
| Parameter | Unit | A1-A3 | A4 | C1 | C2 | C3 | C4 | D |
| Hazardous waste | kg | 7,89E-1 | 3,50E-5 | 0E0 | 1,02E-5 | 1,75E-4 | 6,97E-7 | -2,23E-3 |
| Non-hazardous waste | kg | 6,68E1 | 8,24E0 | 0E0 | 7,93E-3 | 6,68E0 | 3,47E0 | -1,62E1 |
| Radioactive waste | kg | 4,15E-2 | 4,66E-4 | 0E0 | 2,91E-4 | 2,12E-4 | 5,38E-6 | -1,35E-2 |

22. End of life - Output flow

| Output flow | | | | | | | | |
|-------------------------------|------|-----------|-----|-----|-----|-------|-----|---------|
| Parameter | Unit | A1-A3 | A4 | C1 | C2 | C3 | C4 | D |
| Components for reuse | kg | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Materials for recycling | kg | 1,61E-3 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 |
| Materials for energy recovery | kg | 3,33E-3E0 | 0E0 | 0E0 | 0E0 | 6,8E2 | 0E0 | 0E0 |
| Exported energy | MJ | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | 0E0 | -2,44E0 |



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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 | FI 0,23 | Based on country specific fuel mixes for the production year 2016 from IEA . Imported electricity has been considered. The environmental impacts of the fuels are based on ecoinvent 3,4 database. The impacts include all upstream processes as well as transmission losses. |
|--|----------------|---|

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

| Variable | Amount | Data quality |
|---|--------|---|
| Fuel type and consumption in liters / 100 km | 38 | Source: Driver |
| Transportation distance km | 100 | Transportation report |
| Transport capacity utilization % | 100 | Full load transport to production area. |
| Bulk density of transported products kg/m³ | 680 | Producer data |
| Volume capacity utilisation factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaged products) | 1 | Assumption |

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

| Process | Unit(expressed per functional unit or per declared unit of components products or materials and by type of material) | Amount kg/m3 Data quality |
|---|--|--|
| Collection process specified by type | kg collected separately | 680 |
| | kg collected with mixed construction waste | 0 |
| Recovery system specified by type | kg for re-use | 0 |
| | kg for recycling | 0 |
| | kg for energy recovery | 680 |
| Disposal specified by type | kg product or material for final deposition | 4 |
| Assumptions for scenario development, e.g. transportation | units as appropriate | Transportation distance estimation based on average recycling facility locations; 100 km |

26. Additional technical information

Biogenic carbon of studied product is calculated in accordance to NS-EN 16449:2014 Dry wood content of plywood is 607 kg per m³ that is equal to biogenic carbon content 1113 kg CO₂ per m³ of the plywood.

27. Product data sheet

Technical specifications – KoskiForm

| | |
|----------------------|--|
| Base plywood | Koskisen Finnish birch plywood |
| Bonding | Phenolic resin according to EN 314-2/ class 3 exterior conditions Formaldehyde emission levels of panels fulfil requirements of Class E1 (EN13986), CARB Phase II, ULEF (Ultra Low Emitting Formaldehyde) |
| Coating | Brown phenolic film from 120 g/m ² to 440g/m ² . |
| Standard thicknesses | 6.5, 9, 12, 15, 18, 21, 24, 27 and 30 mm. Other thicknesses on request. |
| Standard sizes | 1200/1220/1250 x 2400/2440/2500 mm 1500/1525 x 3000/3050 mm Other sizes on request up to 2900 x 13000 mm |
| Density | Approx 700 kg/m ³ |
| Edge treatment | Brown acrylic paint against moisture pick up |
| Wear resistance | Taber value from 800 R to 1500 R (EN 438-2) |
| Fire classification | E17 118R11 Type Approved FMVSS 302 Approval 95/28/EC Approval for vehicle floors |
| Machining | Drilling of holes edge machining like T&G, chamfer and rebate on request. |
| Other data | Detailed technical values can be found in Koskisen's Declaration of Performance (DoP). Please visit koskisen.com/download . |

Additional information

Environment

Our raw material, wood is an ecological and renewable material and it stores carbon during its whole life cycle. Koskisen plywood products are manufactured in Finland according to the strictest sustainability principles. Koskisen is a pioneer in the Finnish forest industry in paying attention to the environment and the wood's supply chain is always known in detail. Finnish forests are primarily privately owned and the owners are guided by a strong commitment to long-term forestry and forest cultivation. Yearly, Finnish forests grow more than they are harvested. This guarantees a sustainable and environmentally sound raw material.

Additional information

Wood is a living material and every panel is unique. Therefore a photograph or a sample piece cannot represent a full sized panel as regards colours, shades, figure, knots etc. Please note that a slight colour variation is accepted between panels.

The information, although based on extensive testing, is intended as a guideline only and comes without warranty. We reserve the right to amend specifications without notice. Any defects other than those caused by clearly verified production or service faults by the supplier are the responsibility of the user. Any claim for compensation is limited to the value of the defective panels. The Seller makes no guarantee that the goods are fit for a particular purpose, unless it provides a written declaration of their suitability.

Koskisen Panel Industry

Tehdastie 2, 16600 Järvelä, FINLAND
tel. +358 20 553 41
fax +358 20 553 4207

www.koskisen.com
committedto**wood.koskisen.com**





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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 15804:2012A1 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products. RTS PCR 14.6.2018 RTS PCR protocol: EPDs published by the Building Information Foundation RTS sr. PT 18 RT EPD Committee. (English version)
NS-EN 16449:2014 Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide
NS-EN 16485:2014 Round and sawn timber - Environmental Product Declaration - Product category rules for wood and wood-based products for use in construction