

Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Engineered Wood

Flooring



Programme

The International EPD® System,
www.environdec.com

EPD registration number

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EPD Southeast Asia,
<https://www.epd-southeastasia.com/>

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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

Regional Hub

EPD Southeast Asia



PT Kayu Lapis Indonesia

Desa Mororejo, Kaliwungu, Kendal,

Jawa Tengah 51372, Indonesia

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GENERAL INFORMATION

Programme Information

| | | |
|-----------|--|--|
| Programme | The International EPD® System EPD registered through the fully aligned regional hub: EPD Southeast Asia | |
| Address: | EPD International AB Box 210 60, SE-100 31 Stockholm, Sweden EPD Southeast Asia Kencana Tower Level M, Business Park Kebon Jeruk Jl. Raya Meruya Ilir No. 88, Jakarta Barat 11620, Indonesia | Website www.environdec.com www.epd-southeastasia.com Email info@environdec.com |

Accountabilities for PCR, LCA and independent, third-party verification

Product category rules (PCR):

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): Product Category Rules (PCR) of Construction Products (PCR 2019:14 Version 1.2.5), c-PCR-006 Wood and wood-based products for use in construction (EN 16485) and UN CPC 316

PCR review was conducted by:

The Technical Committee of the International EPD® System.

Review chair:

Hüdai Kara from Metsims Sustainability Consulting.

The review panel may be contacted via the Secretariat www.environdec.com/contact.

Life Cycle Assessment (LCA)

LCA accountability: PT Life Cycle Indonesia

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by individual verifier

Third party verifier:

Hüdai Kara, Phd, Metsims Sustainability Consulting, www.metsims.com

Approved by:

The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY INFORMATION

Owner of the EPD

PT Kayu Lapis Indonesia

Contact

marketing@pt-kli.com

Description of the organisation

Kayu Lapis Indonesia (KLI) founded in 1977 is an integrated timber company that applies the highest standards and constant innovation to surpass market requirements while maximizing yield to promote superior value for money, nature sustainability, and people empowerment.

With decades of existence in Indonesian timber industry, KLI continues to place itself at the forefront by fulfilling its threefold commitment toward nature, toward quality, and toward society.

Kayu Lapis Indonesia's product line includes various types of plywood, solid and engineered wooden flooring, solid and engineered timber moulding products including decking, door frame, finger joint laminated (FJL) wood components, glued laminated timber (GLULAM), and decorative wooden wall panel / cladding.

Product-related or management system-related certifications

- FSC COC Standard :
 - License Code : FSC-C007486
 - Certificate Code : SA-COC-013224
- SVLK :
 - Certificate No. : 0001/MHI-VLK
 - Certificate No. : 0012/MHI-VLK
- ISO 9001:2015 :
 - Certificate No. : QMS-006

Name and location of production site(s)

Desa Mororejo, Kaliwungu, Kendal,
Jawa Tengah 51372, Indonesia



PRODUCT INFORMATION

Product name

The products included in this EPD are KLI's Engineered Wood Flooring products

Product identification

UN CPC 316

Product description

Wood flooring collection from Kayu Lapis Indonesia is comprised of engineered wood construction. Both constructions are offered in a variety of wood species, grading, widths, lengths, thicknesses, and surface treatments, making it suitable for various types of residential and commercial spaces. Each floor is produced to follow the trend in the market and with surface coating protection that gives a long lasting durability.

Table 1. Product Specification of Engineered Wood Flooring

| | | | | |
|--|---|---|-------------|-------------|
| Total Thickness (mm) | | 14 ± 0.2 mm | 15 ± 0.2 mm | 18 ± 0.2 mm |
| Top Layer | Thickness (mm) | 3.0 - 4.0 | | |
| | Wood Species | Kempas , Trembesi , White Oak | | |
| Middle Layer (Plywood) | Thickness (mm) | 9 - 12 | | |
| | Wood Species | Meranti (FSC certified) | | |
| Bottom Layer | Thickness (mm) | 2 - 3 | | |
| | Wood Species | Meranti (FSC certified), Sengon , Hevea | | |
| Dimensions (mm) | Width | 120 - 240 | | |
| | Length | 400 - 2400 mm ± 1.0 mm | | |
| Number of layers | 7 - 9 | | | |
| Density (kg/m ³) | 595 - 880 | | | |
| Adhesive | Phenolic / EPI that complies with CARB Phase 2 , EPA TSCA Title VI and JAS standard | | | |
| Moisture content (%) | 7 - 11 | | | |
| Coating | UV Lacquer , UV Oil , Oxidative Oil | | | |
| Sheen level | 5% , 8% , 12% , 17% , 22% , 30% or 55% sheen level ± 2% | | | |
| Permitted deviation (EN 13489): | | | | |
| Width | ± 0.2 mm | | | |
| Lipping (between panels) | ≤ 0.2 mm | | | |
| Squareness | ≤ 0.2 % over the width | | | |
| Cupping (across the panel) | ≤ 0.2 % over the width | | | |
| Spring (along the panel) | ≤ 0.1 % over the length | | | |

UN CPC code

UN CPC 316 - Builders' joinery and carpentry of wood (including cellular wood panels, assembled parquet panels, shingles and shakes)

Geographical scope:

Supplier from Taiwan, Singapore, Netherlands, Hungary, Germany, China and USA. Manufactured in Indonesia, supplied to USA, Netherlands, France, Australia, New Zealand, India, and Indonesia.

LCA INFORMATION

Functional unit / declared unit

1 m² of Engineered Wood Flooring with thickness of 14, 15 and 18 mm in packaging

Reference service life

The reference service life of the surface performance of the finish for multilayer wood flooring system is 25 years for residential and 3 years for limited light commercial installations.

Time representativeness

Specific data for the manufacturing collected from 2022-01-01 to 2022-12-31. The 10-year age requirement for generic data has been met.

Database(s) and LCA software used

Generic data for upstream and downstream processes use Ecoinvent 3.8 and USLCI database and modelled by using SimaPro Developer software version 9.4.0.2. No datasets older than 10 years were used.

Description of system boundaries

The system boundary was chosen based on the goal and scope of the study and in accordance with EN 15804:2012+A2:2019, i.e. cradle to grave and module D (A + B + C + D). The processes below are included in the product system to be studied:

1. Upstream (A1-A2)

- Production of raw materials (e.g., RST, Veneer and Plywood).
- Production of auxiliary materials (e.g., Chemicals, Diesel, etc.).
- Production of packaging (e.g., Plastic, Sticker, Strapping Band, etc.).
- Production of electricity.
- Transportation of raw/auxiliary materials from the supplier to the manufacturing plant.

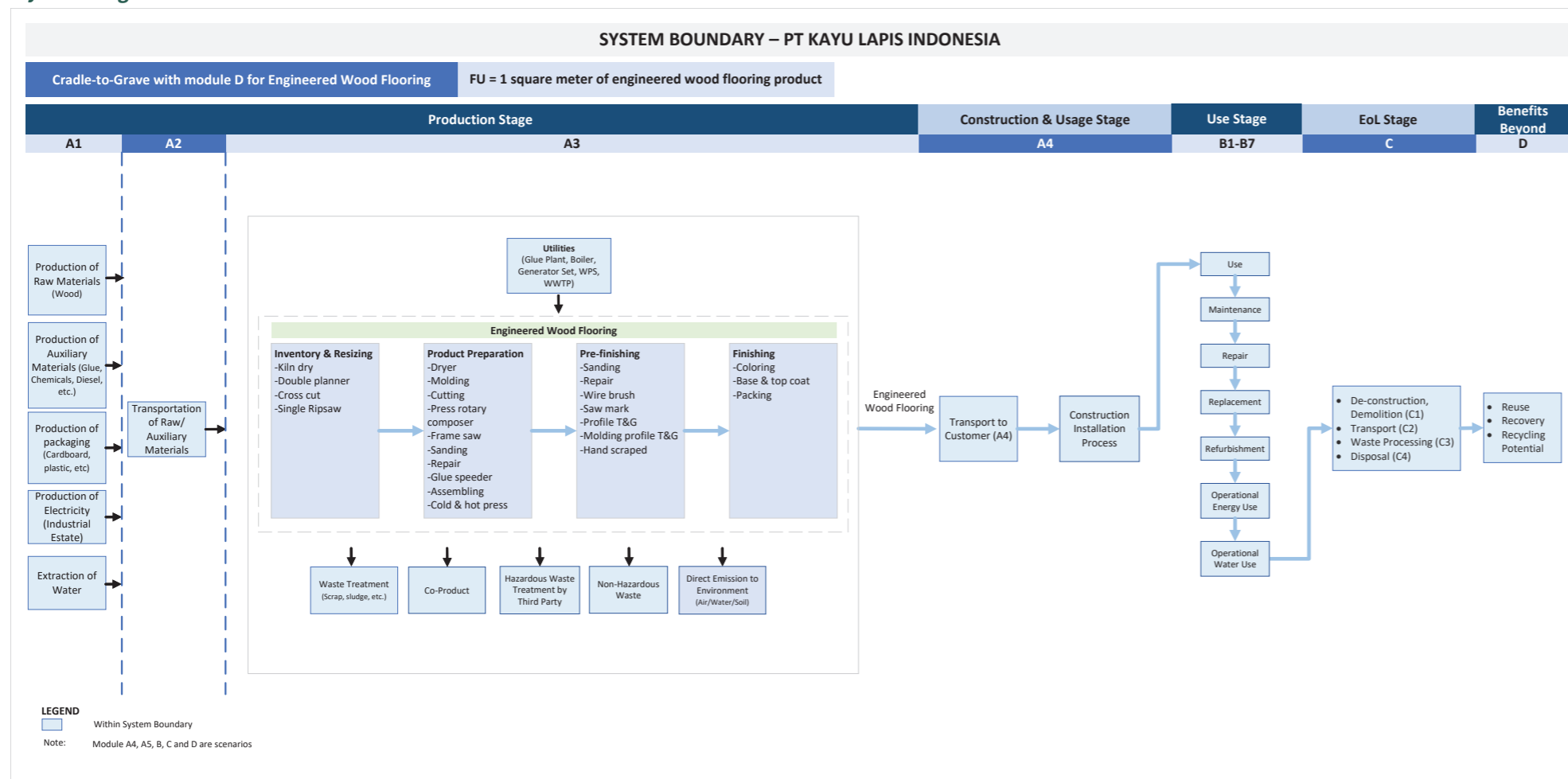
2. Core (A3)

- Raw material inventory.
- Resizing: Rough Sawn Timber (RST) is kiln dried and then resized using double planner, crosscut, and single rip saw machines to make face layers.
- Product Preparation:
 - The resized RST for face layer is framed saw and sanded.
 - The veneer is dried, guillotine-cuts, and repaired with the gum tape to make back layers.
 - Plywood was cut, sanded and spread with glue to make core layers.
 - Face layer, plywood and veneer back are stacked and assembled, cold pressed then hot pressed.
- Product Pre-finishing:
 - The assembled engineered flooring was putty repaired, sand brushed, saw marked, T&G profiled to make joints, and handscraped.
- Finishing: The profiled engineered flooring was coloured, base & top coated and packed.
- Storing and Loading.
- Waste treatment (used sandpaper, used saw blade, etc.).
- Hazardous and non-hazardous waste sold to the third party.
- Direct emission to the environment.

3. Downstream (A4, C1-C4, D)

- Transport to customer.
- Construction installation process.
- Use stage.
- Maintenance.
- Repair.
- Replacement.
- Refurbishment.
- Operational energy use.
- Operational water use.
- Deconstruction & Demolition.
- Transport to waste processing unit.
- Waste processing including waste treatment process by a registered third party for hazardous waste.
- Disposal.
- Reuse/Recovery/Recycling of the end of life of the products.

System diagram



More information

Relevant websites for more information regarding the process in manufacturing: <http://pt-kli.com/>

Key Assumptions and Limitations

- Production process of materials in upstream process taken from Ecoinvent database reflects average or generic production and therefore does not correspond to actual suppliers.
- Land use change emissions in module A3 were considered immaterial. The plant is in an industrial zone which was established in 1977 (more than 46 years ago).
- Energy consumption and emissions from the transportation process (suppliers to manufacturing plant or from manufacturing plant to downstream process including transport to waste processing) are modelled using data available in the Ecoinvent database by considering the type of transportation used and the transport distance.
- Emission to air is only measured on boilers and generators, where the sampling is conducted semi-annually.

Cut-off rules

In case of insufficient input data or data gaps for a unit process, the cut-off criteria shall be 1 % of renewable and non-renewable primary energy usage and 1 % of the total mass input of that unit process. The total of neglected input flows per module, e.g. per module A1-A5, B1-B7, C1-C4 and module D shall be a maximum of 5 % of energy usage and mass. In this study, all data in the product system is included. If there is missing specific data, generic data from the database or literature was used.

Data Quality

Time related coverage: specific data were collected from 2022-01-01 to 2022-12-31, and generic data are representative of the year 2022.

Geographic coverage: specific data were collected from area under study, i.e., Central Java, Indonesia. Generic data were collected from global average data.

Technological coverage: specific data were collected



from current wood making process under study. Generic data from global average with technology aspects were similar with what described in the process under study, but merits improvement as processes were not modelled with specific data.

Data quality for both specific and generic data were sufficient to conduct life cycle assessment in accordance with the defined goal and scope.

Allocation

Mass allocation was applied in accordance with EN 15804:2012+A2:2019. Allocation was applied to allocate the electricity used in the manufacturing process. For the end-of-life of waste generated in the manufacturing process, polluter pays principle are applied for each type of waste. This means that KLI will carry the full environmental impact until the end-of-waste state is reached.

In the wood product system, utilizing wood scrap for processing is considered environmentally beneficial as it can reduce the impact of virgin wood cutting and prevent the negative consequences of poorly managed wood scrap. Recycling and energy recovery scenario is made for the wood waste. To allocate the benefits and burdens of the recycling procedure, two types of recycling processes are utilized - open and closed loop recycling. Open loop recycling involves recycling materials into a new product or when material properties change, while closed loop recycling involves recycling products to produce the same type of product or when material properties remain unchanged. Open loop recycling is commonly used for wood recycling, where wood waste is formed into new raw material.

The impacts assigned to the credit or burden that comes from module D are calculated by adding impact connected to secondary wood production into particleboard (beyond system boundary) and energy recovered from wood waste, then subtracting the impacts resulting from primary wood production as wood chips and energy recovered from virgin wood. The difference between 100% primary wood processing and 100% secondary wood processing is the result of the module D.

The benefit beyond system boundary (module D) is a credit estimation resulted from the system because in real-life there is a trans-continent boundary of the market in USA and Netherlands and producers in Indonesia which do not share the recycled material market. The assessed products are exported to USA and Netherlands. Therefore, the recycling and energy recovery rate is adjusted to the rate in each country, i.e., 17.14% in USA and 39.66% in Netherlands for recycling rate. The remaining wood scrap is considered as material losses that will go to another disposal scenario to landfill.

LCA Scenarios and Additional Technical Information

- Electricity grid in module A3 was based on Ecoinvent database for Indonesia that was modified to represent JAMALI (Java-Madura-Bali) electricity network. The composition of electricity mixed for JAMALI and the amount of electricity losses were adjusted based on Statistic from Directorate General of Electricity (2019) which is highly reliant on coal (66%), gas fired (27.5%), hydropower (4%), geothermal (2%), and diesel (<1%). The climate impact of the electricity is 1.2 kg CO2 eq./kWh.
- The 'Resource depletion - water' (RDW) indicator requires water scarcity data for the production areas, and these were modelled using the specific watershed scarcity data for Kendal, West Java, i.e., 19.2 m3/m3 for the characterisation factor.
- RST was sent to KLI in solid form from the supplier in Netherlands, Hungary, Germany and Indonesia. Therefore, the global Ecoinvent database was modified by using available Netherlands, Hungary, Germany and Indonesia Ecoinvent databases. This modification was applied as well for Veneer that was from the supplier in China, USA and Indonesia.
- Transportation using truck in Indonesia use EURO3 to represent the current condition. Meanwhile in USA and Netherlands, EURO5 is used as a standard emission.
- Transport distance was estimated by Google Maps from KLI to Indonesia's Port (33 km), and Indonesia's Port to destination port (USA = 25,133.49 km, Netherlands = 17,895.88 km).
- Transportation in US were estimated based on US statistic for average rigid truck travelled 276.68 kilometres a day (2020).
- Transportation in Netherland were estimated based on Netherland statistic for average truck travelled 53 kilometres a day (2020).
- Amount of electricity used for the demolition process is modelled using the Ecoinvent database for global data, i.e 4.26E-02 kWh/m2 wood.
- Amount of supporting material and electricity consumption for waste processing is modelled using the Ecoinvent database for global data on processing and chipping wood scrap, i.e 2.04E-06 kg lubricating oil/kg wood and 0.02 kWh/kg wood. Electricity is modelled using the Ecoinvent database for each country.
- Electricity was modelled using Ecoinvent database for Indonesia, USA and Netherlands.

- The wood recycling rate in the USA is 17.14% according to the US Environment Protection Agency (2018). Average recycling rate for wood is 39.66% in the Netherlands according to the European Union (2018).
- The wood energy recovery rate in the USA is 15.70% according to the US Environment Protection Agency (2018). Average energy recovery rate for wood is 58.10% in the Netherlands according to the European Union (2018).



Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

| | Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | Resource recovery stage |
|----------------------|---------------------|-----------|---------------|----------------------------|---------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-----------|------------------|----------|------------------------------------|
| | Raw material supply | Transport | Manufacturing | Transport | Construction installation | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |
| Module | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Modules declared | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Geography | GLO | GLO | ID | GLO | GLO | GLO | GLO | GLO | GLO | GLO | GLO | GLO | GLO | GLO | GLO | GLO | GLO |
| Specific data used | >90% | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – products | <10% | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Variation – sites | Not Relevant | | | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



CONTENT INFORMATION

| Product components | Weight, kg | Post-consumer material, weight-% | Biogenic material, weight-% and kg C/kg |
|--------------------|------------|----------------------------------|---|
| Wood | 10.10 | 0% | 100%, 1.73 kg C/kg |
| Coating | 0.16 | 0% | - |
| Glue | 0.50 | 0% | - |
| TOTAL | 10.76 | | |

| Product components | Weight, kg | Weight-% (versus the product) | Weight biogenic carbon, kg C/kg |
|--------------------|------------|-------------------------------|---------------------------------|
| Cardboard | 0.26 | 2.42% | 1.71 kg C/kg |
| Plastic | 0.03 | 0.28% | - |
| Straping | 0.01 | 0.09% | - |
| TOTAL | 0.30 | | |

| Dangerous substances from the candidate list of SVHC for Authorisation |
|--|
| No dangerous substances |



RESULTS OF THE ENVIRONMENTAL PERFORMANCE INDICATORS

Mandatory impact category indicators according to EN 15804:2012+A2:2019

| Results per 1 m ² of Engineered Wood Flooring | | | | | | | | | | | | | | | | |
|--|------------------------|-----------|-----------|----|----|----------|----|----|----|----|----|----------|-----------|----------|----------|----------|
| Indicator | Unit | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| GWP - fossil | kg CO ₂ eq. | 3.04E+01 | 4.85E+00 | 0 | 0 | 2.42E-01 | 0 | 0 | 0 | 0 | 0 | 2.18E-02 | 3.24E-01 | 9.98E-02 | 3.06E-01 | 1.39E+00 |
| GWP - biogenic | kg CO ₂ eq. | -4.11E+01 | 3.11E-03 | 0 | 0 | 6.24E-03 | 0 | 0 | 0 | 0 | 0 | 2.53E-04 | 2.18E-04 | 4.20E+01 | 8.44E-02 | 4.88E-03 |
| GWP - luluc | kg CO ₂ eq. | 7.14E-02 | 4.42E-05 | 0 | 0 | 2.96E-04 | 0 | 0 | 0 | 0 | 0 | 8.73E-06 | 2.42E-06 | 4.00E-05 | 1.16E-05 | 1.84E-04 |
| GWP - total | kg CO ₂ eq. | -1.05E+01 | 4.86E+00 | 0 | 0 | 2.48E-01 | 0 | 0 | 0 | 0 | 0 | 2.20E-02 | 3.24E-01 | 4.21E+01 | 3.91E-01 | 1.40E+00 |
| ODP | kg CFC 11 eq. | 2.16E-06 | 1.09E-06 | 0 | 0 | 2.40E-08 | 0 | 0 | 0 | 0 | 0 | 1.17E-09 | 7.69E-08 | 5.39E-09 | 7.32E-08 | 1.48E-07 |
| AP | mol H ⁺ eq. | 3.77E-01 | 5.73E-02 | 0 | 0 | 2.27E-03 | 0 | 0 | 0 | 0 | 0 | 6.13E-05 | 1.14E-03 | 2.81E-04 | 1.12E-03 | 1.15E-02 |
| EP - fresh water | kg P eq. | 4.03E-03 | 2.34E-06 | 0 | 0 | 1.05E-05 | 0 | 0 | 0 | 0 | 0 | 1.67E-06 | 1.48E-07 | 7.63E-06 | 3.09E-07 | 3.73E-05 |
| EP - marine | kg N eq. | 1.47E-01 | 2.64E-02 | 0 | 0 | 2.72E-04 | 0 | 0 | 0 | 0 | 0 | 8.83E-06 | 3.62E-04 | 4.05E-05 | 3.81E-04 | 2.80E-03 |
| EP - terrestrial | mol N eq. | 1.58E+00 | 2.90E-01 | 0 | 0 | 3.61E-03 | 0 | 0 | 0 | 0 | 0 | 9.99E-05 | 3.98E-03 | 4.58E-04 | 3.93E-03 | 3.26E-02 |
| POCP | kg NMVOC eq. | 3.77E-01 | 6.85E-02 | 0 | 0 | 7.28E-04 | 0 | 0 | 0 | 0 | 0 | 2.66E-05 | 9.82E-04 | 1.22E-04 | 9.89E-04 | 7.94E-03 |
| ADP - minerals & metals | kg Sb eq. | 1.53E-05 | 2.02E-07 | 0 | 0 | 7.66E-06 | 0 | 0 | 0 | 0 | 0 | 9.18E-10 | 1.48E-08 | 5.03E-09 | 4.32E-08 | 2.30E-06 |
| ADP - fossil | MJ | 3.77E+02 | 6.52E+01 | 0 | 0 | 4.49E+00 | 0 | 0 | 0 | 0 | 0 | 3.53E-01 | 4.59E+00 | 1.62E+00 | 4.42E+00 | 2.25E+01 |
| WDP | m ³ | 3.97E+00 | -1.41E-02 | 0 | 0 | 1.92E-01 | 0 | 0 | 0 | 0 | 0 | 3.58E-03 | -2.24E-04 | 1.64E-02 | 8.81E-03 | 3.91E-01 |

Acronyms

- GWP-fossil** : Global Warming Potential fossil fuels
- GWP-biogenic** : Global Warming Potential biogenic
- GWP-luluc** : Global Warming Potential land use and land use change
- ODP** : Depletion potential of the stratospheric ozone layer
- AP** : Acidification potential, Accumulated Exceedance
- EP-freshwater** : Eutrophication potential, fraction of nutrients reaching freshwater end compartment
- EP-marine** : Eutrophication potential, fraction of nutrients reaching marine end compartment
- EP-terrestrial** : Eutrophication potential, Accumulated Exceedance
- POCP** : Formation potential of tropospheric ozone
- ADP-minerals&metals** : Abiotic depletion potential for non-fossil resources
- ADP-fossil** : Abiotic depletion for fossil resources potential
- WDP** : Water (user) deprivation potential, deprivation-weighted water consumption

Potential environmental impact – additional environmental information according to EN 15804:2012+A2:2019

| Results per 1 m ² of Engineered Wood Flooring | | | | | | | | | | | | | | | | |
|--|-------------------|----------|----------|----|----|----------|----|----|----|----|----|----------|----------|----------|----------|-----------|
| Indicator | Unit | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| PM | Disease incidence | 1.06E-05 | 5.51E-08 | 0 | 0 | 1.95E-08 | 0 | 0 | 0 | 0 | 0 | 2.57E-10 | 2.11E-08 | 1.19E-09 | 2.08E-08 | 1.32E-07 |
| IRP | kBq U235 eq. | 5.22E-01 | 2.82E-01 | 0 | 0 | 6.74E-03 | 0 | 0 | 0 | 0 | 0 | 2.75E-03 | 1.99E-02 | 1.26E-02 | 1.90E-02 | 5.49E-02 |
| ETP- fw | CTUe | 3.91E+02 | 2.22E+01 | 0 | 0 | 1.05E+01 | 0 | 0 | 0 | 0 | 0 | 2.08E-01 | 1.88E+00 | 9.57E-01 | 1.93E+00 | 3.42E+01 |
| HTP- c | CTUh | 4.31E-08 | 1.22E-10 | 0 | 0 | 4.44E-10 | 0 | 0 | 0 | 0 | 0 | 3.55E-12 | 2.61E-11 | 1.69E-11 | 3.06E-11 | 1.55E-08 |
| HTP- nc | CTUh | 2.38E-06 | 1.04E-08 | 0 | 0 | 9.70E-09 | 0 | 0 | 0 | 0 | 0 | 1.09E-10 | 3.03E-09 | 5.04E-10 | 2.99E-09 | 2.33E-08 |
| SQP | dimensionless | 1.22E+04 | 1.75E-01 | 0 | 0 | 2.73E+00 | 0 | 0 | 0 | 0 | 0 | 4.34E-02 | 1.20E-02 | 1.99E-01 | 5.07E-01 | -1.14E+02 |

Acronyms

- PM:** Particulate Matter emissions
- IRP:** Ionizing radiation - human health
- ETP-fw:** Eco-toxicity – freshwater
- HTP-c:** Human toxicity - cancer effects
- HTP-nc:** Human toxicity - non-cancer effects
- SQP:** Land use related impacts / soil quality

Additional mandatory and voluntary impact category indicators according to IPCC 2013 GWP 100a (Incl CO2 Uptake)

| Results per 1 m ² of Engineered Wood Flooring | | | | | | | | | | | | | | | | |
|--|------------------------|-----------|----------|----|----|----------|----|----|----|----|----|----------|----------|----------|----------|----------|
| Indicator | Unit | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| GWP - GHG | kg CO ₂ eq. | -5.19E+00 | 4.82E+00 | 0 | 0 | 2.39E-01 | 0 | 0 | 0 | 0 | 0 | 2.17E-02 | 3.22E-01 | 3.62E+01 | 3.76E-01 | 1.37E+00 |



Resource use indicators

| Results per 1 m ² of Engineered Wood Flooring | | | | | | | | | | | | | | | | |
|--|----------------|----------|----------|----|----|----------|----|----|----|----|----|----------|----------|----------|----------|-----------|
| Indicator | Unit | A1 -A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| PERE | MJ | 6.37E+02 | 8.31E-02 | 0 | 0 | 1.90E-01 | 0 | 0 | 0 | 0 | 0 | 3.47E-02 | 5.35E-03 | 1.59E-01 | 8.77E-03 | -2.91E+01 |
| PERM | MJ | 3.06E+02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PERT | MJ | 9.43E+02 | 8.31E-02 | 0 | 0 | 1.90E-01 | 0 | 0 | 0 | 0 | 0 | 3.47E-02 | 5.35E-03 | 1.59E-01 | 8.77E-03 | -2.91E+01 |
| PENRE | MJ | 4.14E+02 | 6.92E+01 | 0 | 0 | 4.78E+00 | 0 | 0 | 0 | 0 | 0 | 2.97E-01 | 4.87E+00 | 1.36E+00 | 4.69E+00 | 2.43E+01 |
| PENRM | MJ | 2.41E-01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PENRT | MJ | 4.14E+02 | 6.92E+01 | 0 | 0 | 4.78E+00 | 0 | 0 | 0 | 0 | 0 | 2.97E-01 | 4.87E+00 | 1.36E+00 | 4.69E+00 | 2.43E+01 |
| SM | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RSF | MJ | 2.25E+02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NRSF | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FW | m ³ | 1.58E+00 | 1.51E-02 | 0 | 0 | 1.82E-02 | 0 | 0 | 0 | 0 | 0 | 1.86E-03 | 1.24E-03 | 8.51E-03 | 1.51E-03 | 1.03E-01 |

Acronyms

- 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 re-sources
- SM:** Use of secondary material
- RSF:** Use of renewable secondary fuels
- NRSF:** Use of non-renewable secondary fuels
- FW:** Use of net fresh water

Waste indicators

| Results per 1 m ² of Engineered Wood Flooring | | | | | | | | | | | | | | | | |
|--|------|-----------|----------|----|----|----|----|----|----|----|----|----|----|----|----------|----------|
| Indicator | Unit | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Hazardous waste disposed | kg | 4.16E-03 | 6.56E-03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.86E-04 |
| Non-hazardous waste disposed | kg | -4.46E-02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8.37E-01 | 1.91E-02 |
| Radioactive waste disposed | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Output flow indicators

| Results per 1 m ² of Engineered Wood Flooring | | | | | | | | | | | | | | | | |
|--|------|----------|----|----|----|----|----|----|----|----|----|----|----|----------|----|---|
| Parameter | Unit | A1-A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Components for re-use | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Material for recycling | kg | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.09E-01 | 0 | 0 |
| Materials for energy recovery | kg | 4.09E+00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.27E-01 | 0 | 0 |
| Exported energy, electricity | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Exported energy, thermal | MJ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

INTERPRETATION OF RESULTS

- Module A1-A3 contributes significantly to the impact generated by the whole life cycle.
- The plywood production process is the largest contributor to majority of the potential impacts followed by electricity production.
- Sensitivity analysis was conducted for the thickness range of 14, 15 and 18 mm. The results show insignificant changes with average overall variation is no more than 20%. Therefore, the results are representative.



ADDITIONAL ENVIRONMENTAL INFORMATION

PT Kayu Lapis Indonesia cares for the environment and plays a role in spatial planning, the proportion of green open spaces according to UU no. 26/2007, the company participates in watershed restoration programs, planting mangroves and providing plant seeds for the surrounding community.

- Planting of mangroves and vertiver around the company area has been running as many as 9856 and 525 trees
- Participation in the River Basin Recovery Program in the CDK IV Region:
 - 10,000 falcata tree seeds, for a group of farmers in District of Blado Batang
 - 10,000 falcata tree seeds, for a group of farmers in Village of Kaliputih Singorojo
- Plant Seed Assistance
 - Mangrove 300, Trembesi 50, Ketapang 100, Palembang Putri 50 for Environmental Association, Kendal
 - Mangrove 300, Trembesi 50, Ketapang 100, Palembang Putri 50 for Departemen of Transportation, Kendal



ADDITIONAL SOCIAL AND ECONOMIC INFORMATION

For socio-economic activities, PT Kayu Lapis Indonesia provide social assistance on a routine or incidental basis, including the following :

- Ambulance services to take patients to hospitals
- Participation in building a prayer room, Korowelang Kulon village, Cepiring District
- Routine social assistance for the provision of electricity for village mosques
- Routine social assistance for the provision of clean water for villages
- Routine Social Fund assistance for Mororejo Village Development

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Environmental Product Declaration



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