EPD®
THE INTERNATIONAL EPD® SYSTEM

ECO PLATFORM EPD VERIFIED

Environmental Product Declaration for

Invernizzi TUTTOPIOPPO

Poplar Particleboard

(thickness range 5 to 25 mm)

EPD in accordance with **ISO 14025:2006** and **EN 15804:2012+A2:2019/AC:2021**

Programme: **The International EPD® System, www.environdec.com**
Programme operator: **EPD International AB**

Registration number: **S-P-07194**

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Valid until: **2027-12-20**

INVERNIZZI
Plywood Tradition

Summary

INVERNIZZI
Plywood Tradition

General Information

Programme	THE INTERNATIONAL EPD® SYSTEM
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Product Category Rules (PCR)	CEN STANDARD EN 15804 SERVES AS THE CORE PRODUCT CATEGORY RULES (PCR) WOOD AND WOOD-BASED PRODUCTS FOR USE IN CONSTRUCTION. C-PCR-006 (TO PCR 2019:14). VERSION: 2019-12-20 PRODUCT GROUP CLASSIFICATION: UN CPC 031, 311, 312, 313, 314, 315, 316, 319
LCA developed by	VALENTINA CASTELLANI, SUSTAINABILITY CONSULTANT
Third-part verification	INDEPENDENT THIRD-PARTY VERIFICATION OF THE DECLARATION AND DATA, ACCORDING TO ISO 14025:2006, VIA: X EPD VERIFICATION BY ACCREDITED CERTIFICATION BODY THIRD-PARTY VERIFICATION: IMQ IS AN APPROVED CERTIFICATION BODY ACCOUNTABLE FOR THE THIRD-PARTY VERIFICATION THE CERTIFICATION BODY IS ACCREDITED BY: ACCREDIA - ACCREDITATION NR. 010H REV. 01
Procedure for follow-up of data during EPD validity involves third party verifier	☐ YES ☒ NO

Company Information

INVERNIZZI
Plywood Tradition

Invernizzi SpA is a leading **family-owned company** since four generations, firmly established on the domestic and the international market of wood processing and poplar plywood and poplar particleboard manufacturing.
It was first set up as a sawmill back in 1875 by Libero Invernizzi, then on January 15th 1940, Giuseppe Invernizzi founded in Gussola, Cremona, Italy, the company "Giuseppe Invernizzi e Figli" a small craftmanship dedicated to wood processing. After World War II, Giuseppe's children, Costantino and Alberto, further developed the company to include manufacturing of wooden packaging for local food products, such as cured meat, mustard ad jam. It then started producing poplar plywood in the early Fifities, becoming one of the most important players on the Italian market. Then, in 1973, in Solarolo Rainerio, Cremona, Italy, the Invernizzi family founded IPAS S.R.L., a company specialized in manufacturing poplar particleboard panels. In 1996, Giorgio Invernizzi took over the management and with a far-sighted perspective joined the two companies, establishing the headquarters in Solarolo Rainerio, thus establishing the current INVERNIZZI S.p.A.
This brave choice resulted in a stronger competitive advantage and one of the first proofs of the integral and sustainable exploitation of a precious raw material such as poplar wood.
Despite the subsequent enlargements and the latest organizational and structural changes, the company is and wants to remain a family company.
Family Invernizzi has always been the propelling heart of the company, as its members passed over from father to son the skills, the motivation and the enthusiasm. Still today, the family and the company are intertwined.
Giorgio's kids, Laura and Giuseppe, now represent the fourth generation of an industrial family proud of its history. Following their predecessors' footsteps, they join their father as company leaders, bringing their own personal touch, ideas and skills.

Reliability, flexibility and dedication are the pillars of the Invernizzi brand name, whose **mission** currently is:

- Offering an exclusive product range;
- Promoting sustainability throughout the entire supply and production chain;
- Creating added value to the customer by means of a transparent customer-oriented organization;
- Supporting continuous improvement by spreading a culture of high-quality products all over the supply and production chain;
- Increasing competitiveness and revenues in a more and more demanding market.

Nowadays, the company headquarters and facilities are located in Solarolo Rainerio (Cremona), in Northern Italy – UE, over an area of more than 246.000 square meters of which more than 39.000 are indoor with 190 employees.
INVERNIZZI SPA is a market leader in the plywood sector, well-known all-over Europe and overseas for the high quality and technical performances of its products, which can also be PEFC, CARB phase 2, E1, NAF, CE 2+ and FSC® certified.
These certifications and the best industrial practices, testified by the continuous investments in state of the art technology (new dryer to be fully operational shortly) witness the company's engagement towards the creation of a strong and efficient industrial model, which is sustainable and future-oriented.
Further to that, INVERNIZZI SPA is in a process of substantial growth and aims at getting further international acknowledgment.

Company Information

INVERNIZZI
Plywood Tradition

The company exports around 50% of its products in more than 18 countries. The main ***end markets*** *for Invernizzi products are: automotive and recreational vehicles (RV), furniture, coffins, building and construction and wood product dealers.*

One of the main reasons of the company's ***competitive advantage*** *comes from the productive complementarity between the two production lines, since the company's manufacturing facilities are divided into two different sections, one dedicated to the plywood production and the other to the chipboard.*
Both are interconnected, as the sanding and trimming residues of plywood panels produced are milled and end up into the chipboard production line, thus creating a perfect synergy between the two production lines.
This represents a virtuous example of ***production circularity*** *in the INVERNIZZI world.*

This ***"green path"*** *towards efficiency and sustainability has always been at the heart of the company's industrial philosophy.*
It all started back in 2006 when INVERNIZZI SPA was among the first companies in Italy to set up a ***cogeneration plant*** *in its premises by producing electrical energy through burning methane gas.*
This allowed the company to be self-sufficient in terms of energy.
This project, through the exploitation of a renewable energy source, represents and confirms the company's commitment for the protection of the global environment.

Apart from that, the company never abandoned its original raw material, which is mainly ***Italian poplar****, locally harvested, contributing to develop both its farming and industrial potential, promoting the local economy and the conservation of the local surrounding landscape.*

Moreover, INVERNIZZI SPA is constantly working to produce ***low-emitting plywood*** *panels by developing new bonding techniques, bio-based and made with natural ingredients. This represents a further step towards a responsible and sustainable production, which is closer to mankind and the environment.*

The final step in this path is represented by the installation of ***photovoltaic panels*** *on the shed of the new dryer, that came into operation in July 2022. The system contains 1090 panels which, together, will cut* CO_2 *emissions by as much as 250 kg.*

Product Description

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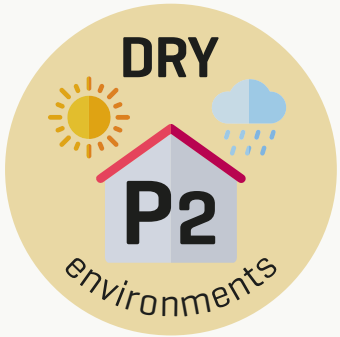
Plywood Tradition

INVERNIZZI 100% poplar particleboard "Tuttopioppo" *is a single ply board made of 100% virgin poplar chips of different sizes, which result from the poplar plywood processing. The chips are stored in silos to be dried and then mixed with urea-based resins and then pressed. The full particleboard production process is checked in all its stages, from the chips gathering up to the pressing ph ase. It is manufactured in a single chamber press in a whole board of 11,16 by 2,02 metres, that can be cut into smaller panels on request. The available thicknesses range from 6 to 60 mm.*

▪ TYPES OF BONDING

INVERNIZZI 100% poplar particleboard "Tuttopioppo" complies with the provisions of **UNI EN 312 Standard** and is classified as follows:

P2 – boards for **interior fitments** (including furniture) for **use in dry conditions**.



for **INTERIOR** use

▪ CONTENT DECLARATION

The product contains poplar wood (moisture content: 9%) and glue, in different proportions according to the panel thickness.

	5 mm (minimum)	18 mm (reference)	25 mm (maximum)
Poplar Wood	84%	85%	86%
Glue	16%	15%	14%

Packaging materials: Paper and board 77,6%, Plastic 22,3%, Metal: 0,1%.
Weight of packaging: 0,9 kg.

- The product does not contain Asbestos.
- The product does not contain hazardous substances and substances of very high concern (SVHC) included in the REACH candidate list published by the European Chemical Agency. Detection rate below 100 ppm.
- In addition, the product does not contain: Mercury, Lead, Cadmium, Halogenated Flame Retardants (HFR),Perfluoroalkyl chemicals (PFAS), textiles and plastics. Detection rate below 100 ppm.
- The maximum formaldehyde content of the panel is 2.03 mg HCHO/100g (dry).

Product Description

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Plywood Tradition

▪ CERTIFICATIONS

Particleboard panels are manufactured according to the formaldehyde emission control rules and, in this regard, they boast following internationally acknowledged certifications, such as:

Class E1 standard - *its compliance provides that formaldehyde emissions of wood-based panels must not exceed 0,124 mg/m³.*
CARB Phase 2 - *(upon request) certificate issued by the California Air Resources Board aimed at putting a stricter limit then E1 standard to formaldehyde emissions of wood panels.*

With regards to its supply and production chain, INVERNIZZI 100% poplar particleboard "Tuttopioppo" also abides by the following international standards:

FSC® - *issued by the Forest Stewardship Council, aimed at responsible and sustainable management of forest resources.*
EU 995/2010 – *EU Timber Regulation.*
PEFC - *stands for Program for the Endorsement of Forest Certification and is aimed at promoting a sustainable forest management.*
CE/CE2+ markings - *certificates for structural use with 2+ system EN 13986:04 standard, wood panels for structural use.*

Invernizzi's 100% poplar particleboard is also available in a fire retardant version, under the brand name **IGNIPAS**, *which allows CE marking under the B-s2, d0 fire reaction Euroclass according to EN 13501-1:2001.*

STANDARD/CERTIFICATION	CONFORMITY
Class E1 standard	ALL PRODUCTS
CARB Phase 2	ON DEMAND
FSC®	ON DEMAND
EU 995/2010	ALL PRODUCTS
PEFC	ON DEMAND
CE/CE2+	ALL PRODUCTS

Available thicknesses range from 6 mm to 60 mm.
The reference thickness considered for the study is 18 mm.

Product Description

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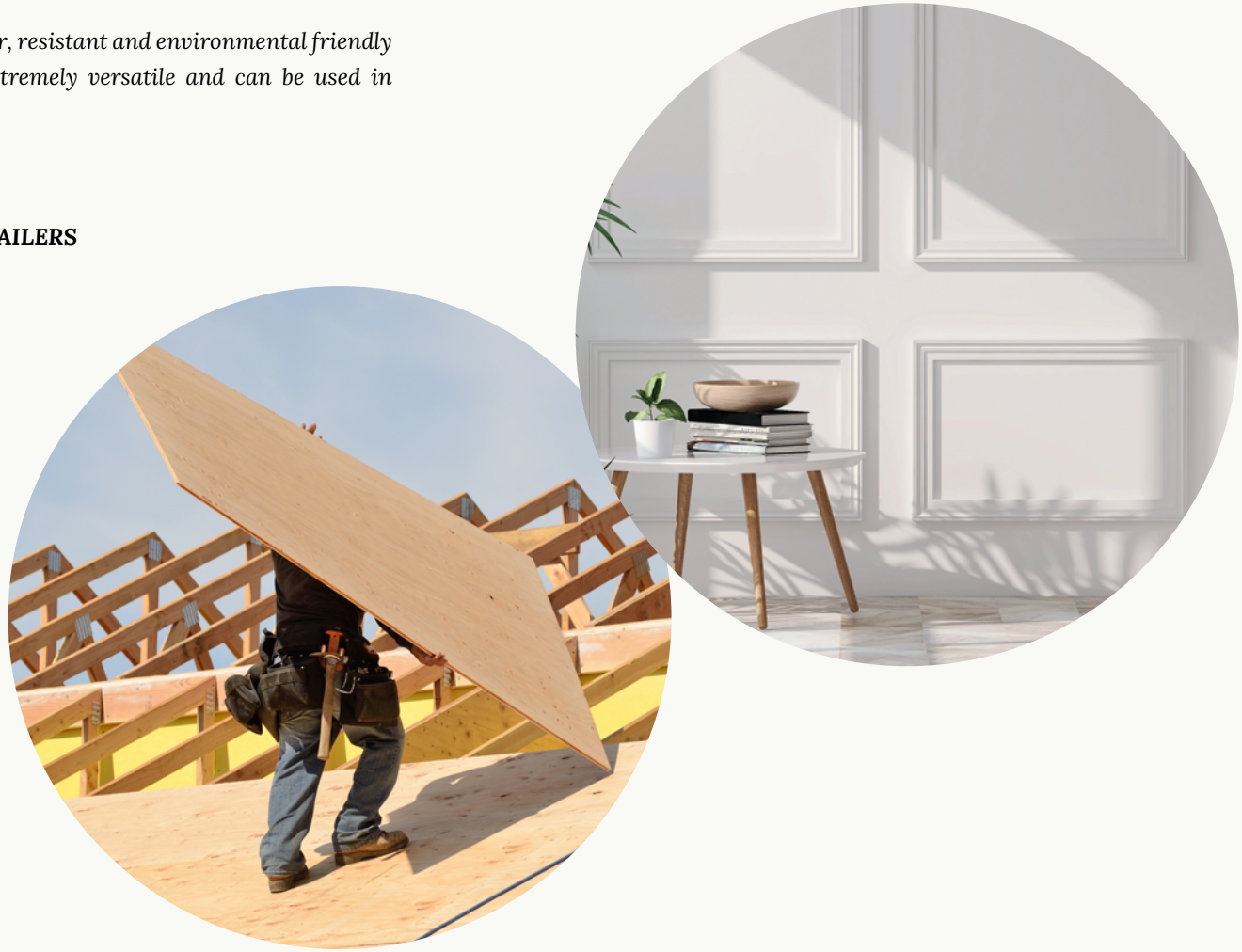
▪ APPLICATIONS

Easily workable, characterized by low weight and white color, resistant and environmental friendly Invernizzi 100% poplar particleboard "Tuttopioppo" is extremely versatile and can be used in several applications, such as:

- **BUILDING AND CONSTRUCTION**
- **HIGH QUALITY FURNITURE**
- **DIY AND WOOD PRODUCT WHOLESALERS AND RETAILERS**
- **EXHIBITION STANDS AND THEATRES**
- **COFFINS**



LCA Information/1

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▪ DECLARED UNIT

1m³ of poplar particleboard with thickness 18 mm.

▪ CONSIDERED PARAMETERS

Parameters considered for the study: moisture content 9%, density 495 kg/m³.

▪ STUDY DEVELOPED

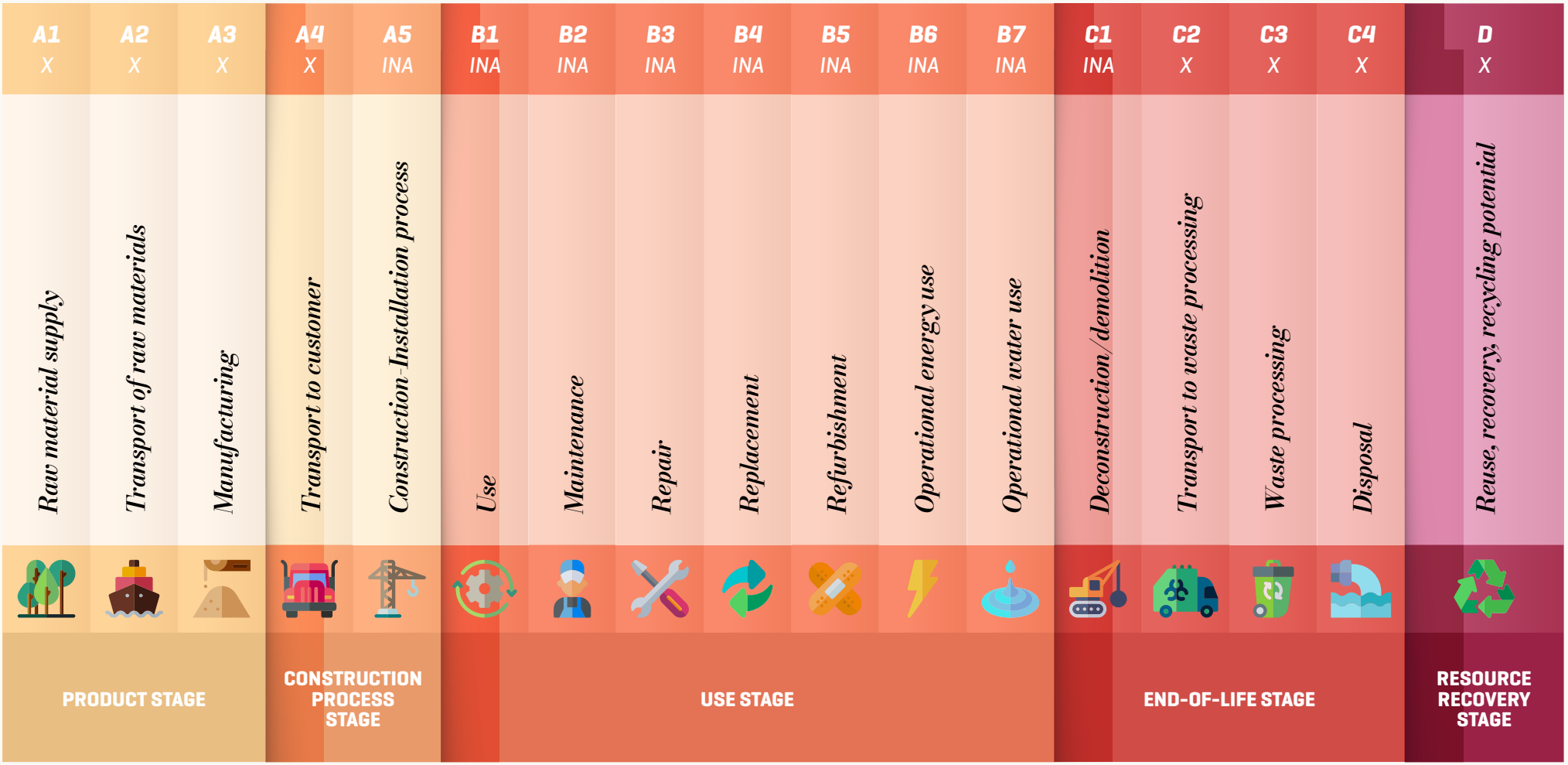
Study developed using Simapro 9.4 software and ecoinvent 3.8 library.

▪ REFERENCE YEAR

2021

LCA Information/2
System Boundaries

Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).



Production Process A1-A3

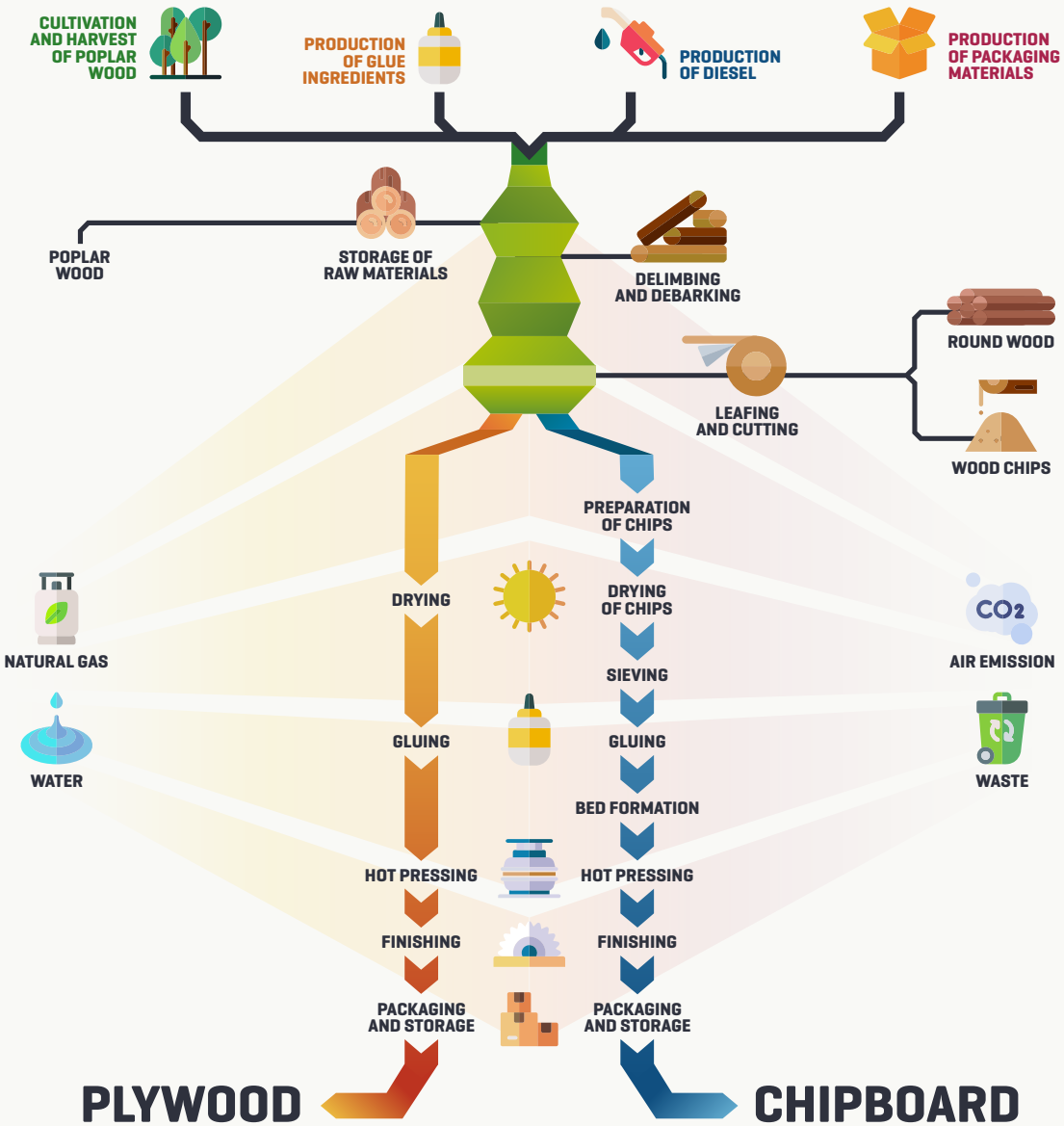
Invernizzi ***"Tuttopioppo" particleboard*** *panels are produced exclusively with residues of virgin poplar wood that is processed inside the company for plywood production, thus following a* ***circular production pattern****.*

Poplar branches, barks and cuts-off of poplar veneers are collected and transported to a grinding machine equipped with sieves to collect particles in ***different granulometry****.*

The resulting grinded particles, also called chips, are then ***dried*** *in dedicated silos. Subsequently, the chips in different sizes are collected separately and transported via conveyors to the* ***gluing basin****, where they are mixed with a* ***urea based resin****. Before getting to the press, all the chips are spreaded in a* ***forming bed****, where the outer sides are composed of smaller chips and the inner of thicker ones. The forming bed accounts for the whole length of the press, i.e. 11,16 meters, it then enters the* ***press chamber****.*

The ***high pressing temperature*** *and the applied pressure allow the forming bed to reach the desired thickness of the finished panels. The resulting full board is then* ***cut*** *directly at the press output according to the specified lenghts, which can be 4180 mm, 3720 mm and 2790 mm.*

The panels enter the finishing line to be ***squared and sanded****. The last phase of the production line is the* ***quality selection****. The panels are then* ***labelled****,* ***packed*** *and* ***stored*** *into the loading warehouse, ready to be* ***shipped*** *to their final destinations.*



Distribution Scenario A4

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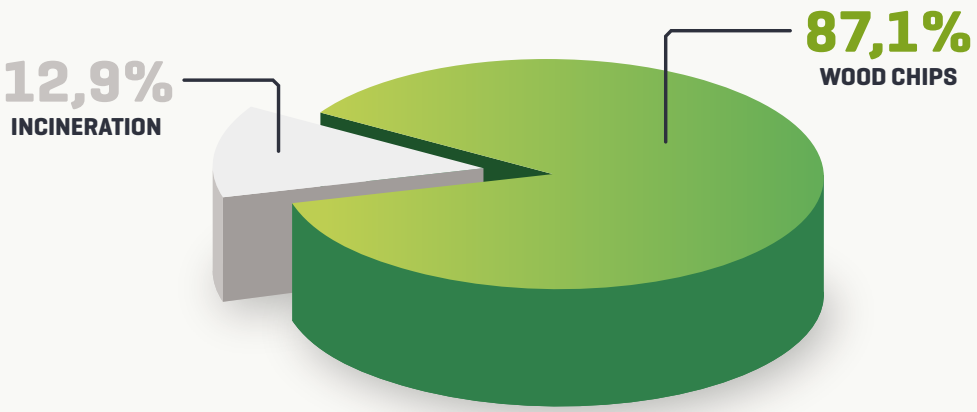
Transport distances are calculated based on company statistics on location of final clients in the reference year (2021).
Transport by road is assumed for National and Continental transportation whereas sea transport (by container ship) is assumed for intercontinental transportation.
Details on the scenarios are provided below.

PARAMETER	TRUCK	SHIP
Vehicle type	TRUCK > 32t	CONTAINER SHIP
Fuel type	DIESEL	HEAVY FUEL OIL
Fuel consumption (Kg/tkm)	0,0196	0,0025
Gross vehicle weight (t)	29,96	n.a.
Average load factor (t/vehicle)	15,96	50 000
Bulk density of goods (kg/m^3)	425	425
Utilisatio ratio	< 1	< 1
Ecoinvent dataset	Transport, freight, lorry >32 metric ton, EURO5 {RER}| transport, freight, lorry >32 metric ton, EURO5 | Cut-off	Transport, freight, sea, container ship {GLO}| transport, freight, sea, container ship | Cut-off, U

End of Life C2-C4 *and Recovery* D

The End of life scenario includes the following assumptions:

- *87,1% of plywood is recycled into wood chips (source: ISPRA, 2022. Report on waste from economic activities);*
- *The remaining fraction (12,9%) is incinerated with energy recover (efficiency higher than 60%). The recovered energy is 33% electricity and 66% heat. The avoided products are electricity from the national grid and heat produced by a plant fuelled by natural gas (source: ISPRA, 2022. Report on waste from economic activities);*
- *Waste are transported for 100 km from the installation site to the waste processing facility.*



Cut-Off and Allocation

▪ CUT-OFF

All input and output flows contributing to more than 1% by mass and 5% by energy to the system are included.

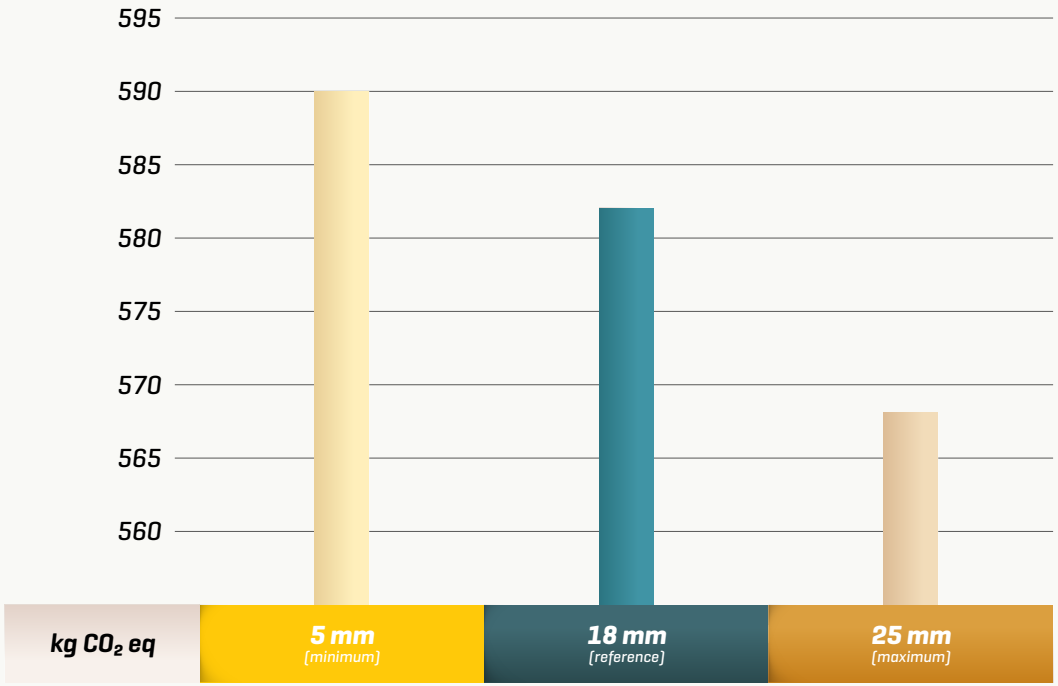
▪ ALLOCATION

As the difference in economic value of co-product is high (>25%), economic allocation is applied in the study.

Environmental Performance
Climate Change

INVERNIZZI
Plywood Tradition

· CLIMATE CHANGE - TOTAL



Environmental Performance
Resurce Comsumption

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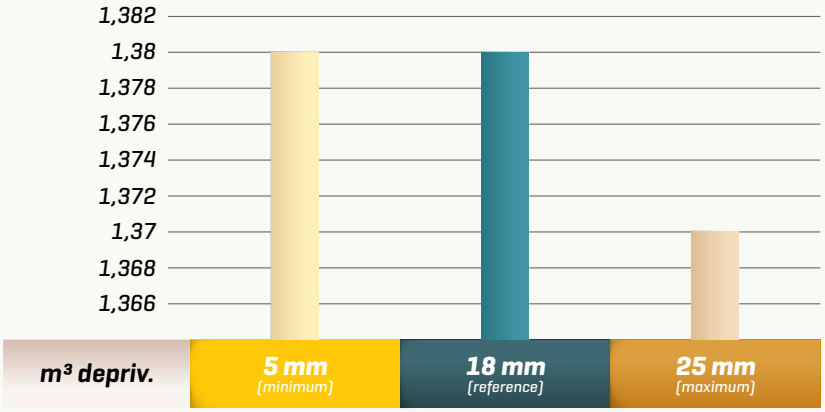
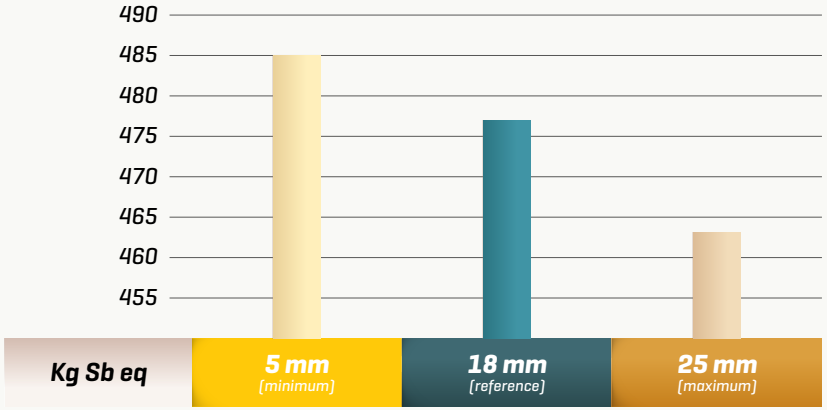
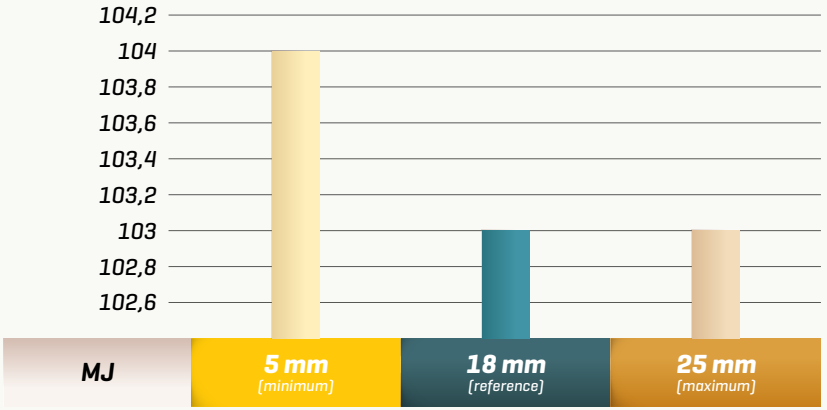
· WATER USE



· DEPLETION OF ABIOTIC RESOURCES minerals and metals



· DEPLETION OF ABIOTIC RESOURCES fossils



Environmental Performance
Air Quality

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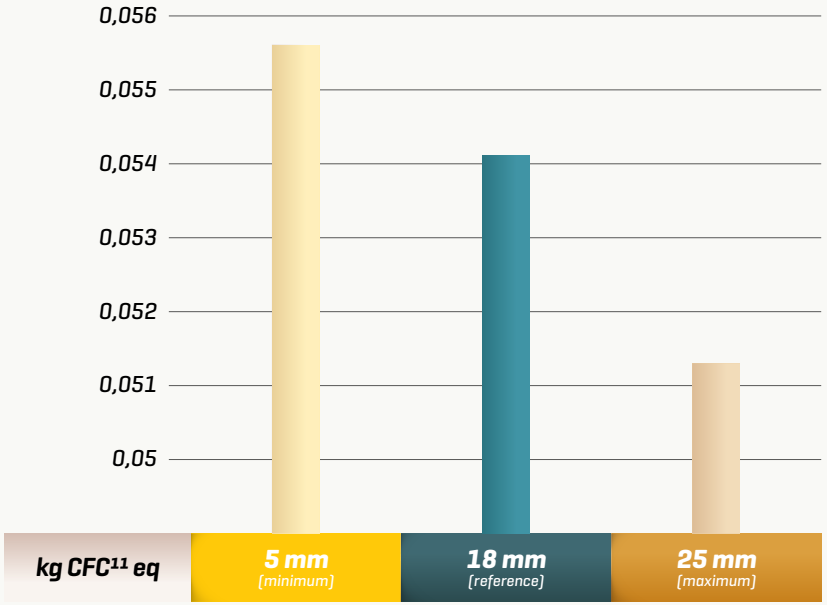
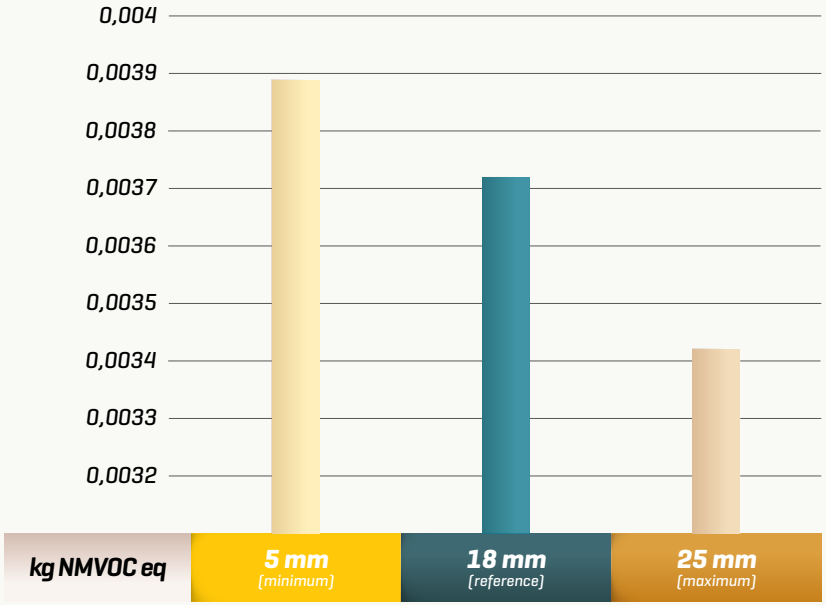
· OZONE DEPLETION



· PHOTOCHEMICAL OZONE FORMATION



Environmental Performance
Water Quality

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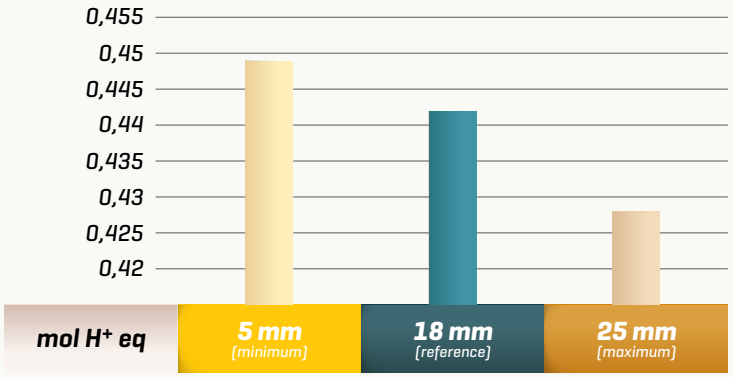
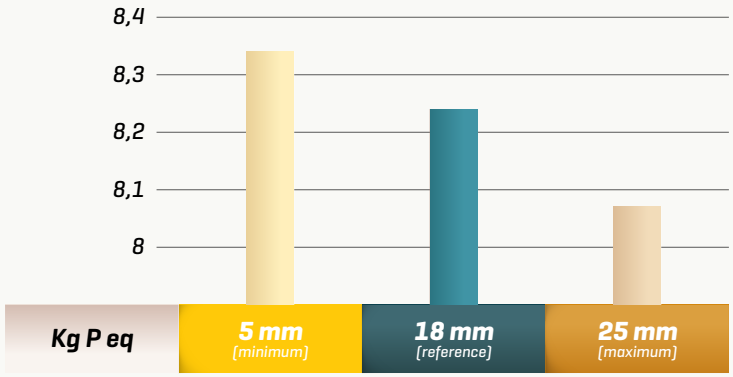
Plywood Tradition

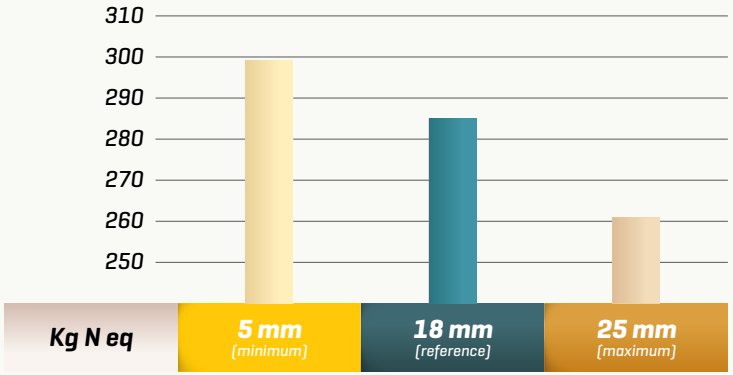
· ACIDIFICATION



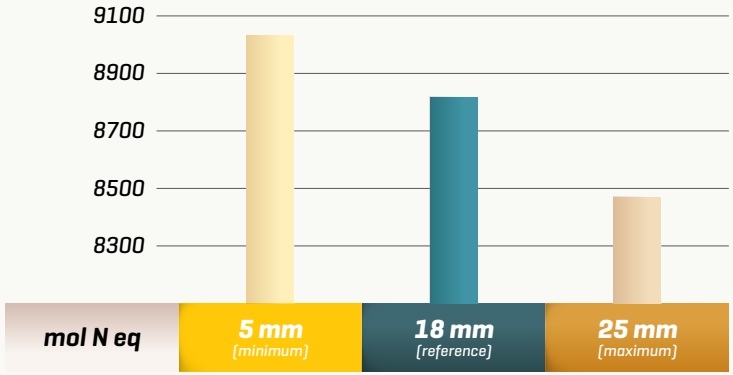
· EUTROPHICATION AQUATIC freshwater



· EUTROPHICATION AQUATIC marine



· EUTROPHICATION TERRESTRIAL



Environmental Performance
Table 1

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Plywood Tradition

▪ POTENTIAL ENVIRONMENTAL IMPACT

INDICATOR	UNIT	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total Life Cycle	D
Climate change - Total	kg CO_2 eq	-9,80E+02	4,32E+01	INA	INA	INA	4,50E+00	2,11E+03	0,00E+00	**5,82E+02**	-3,07E+01
Climate change - Fossil	kg CO_2 eq	4,25E+02	4,31E+01	INA	INA	INA	4,49E+00	4,48E+00	0,00E+00	**4,77E+02**	-2,92E+01
Climate change - Biogenic	kg CO_2 eq	-1,41E+03	4,09E-02	INA	INA	INA	4,57E-03	2,10E+03	0,00E+00	**1,03E+02**	-1,35E+00
Climate change - Land use and LU change	kg CO_2 eq	1,35E+00	1,79E-02	INA	INA	INA	1,61E-03	8,35E-03	0,00E+00	**1,38E+00**	-1,34E-01
Ozone depletion	kg CFC_{11} eq	7,24E-05	1,01E-05	INA	INA	INA	1,07E-06	2,44E-07	0,00E+00	**8,38E-05**	-4,06E-06
Acidification	mol H^+ eq	1,31E+00	2,75E-01	INA	INA	INA	1,88E-02	2,91E-02	0,00E+00	**1,64E+00**	-1,01E-01
Eutrophication aquatic freshwater	kg P eq	4,71E-02	2,87E-03	INA	INA	INA	2,80E-04	3,82E-03	0,00E+00	**5,41E-02**	-7,67E-03
Eutrophication aquatic marine	kg N eq	3,32E-01	9,51E-02	INA	INA	INA	5,72E-03	8,78E-03	0,00E+00	**4,42E-01**	-2,03E-02
Eutrophication terrestrial	mol N eq	7,06E+00	1,04E+00	INA	INA	INA	6,25E-02	8,16E-02	0,00E+00	**8,24E+00**	-2,11E-01
Photochemical ozone formation	kg NMVOC eq	1,25E+00	2,95E-01	INA	INA	INA	2,01E-02	2,11E-02	0,00E+00	**1,59E+00**	-9,31E-02
*Depletion of abiotic resources, minerals and metals**	kg Sb eq	3,55E-03	1,42E-04	INA	INA	INA	1,03E-05	1,21E-05	0,00E+00	**3,72E-03**	-1,39E-04
*Depletion of abiotic resources, fossils**	MJ	8,01E+03	6,61E+02	INA	INA	INA	7,00E+01	8,14E+01	0,00E+00	**8,82E+03**	-4,86E+02
*Water use**	m^3 depriv.	2,82E+02	2,15E+00	INA	INA	INA	2,41E-01	1,41E-01	0,00E+00	**2,85E+02**	-9,71E+00

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Results per declared unit (1m^3 of particleboard 18 mm)

Environmental Performance
Table 2

INVERNIZZI
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▪ USE OF RESURCES

INDICATOR	UNIT	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total Life Cycle	D
PERE	MJ	7,75E+03	9,38E+00	INA	INA	INA	8,91E-01	1,30E+01	0,00E+00	7,77E+03	-2,39E+03
PERM	MJ	1,61E+04	0,00E+00	INA	INA	INA	0,00E+00	0,00E+00	0,00E+00	1,61E+04	0,00E+00
PERT	MJ	2,38E+04	9,38E+00	INA	INA	INA	8,91E-01	1,30E+01	0,00E+00	2,39E+04	-2,39E+03
PENRE	MJ	8,00E+03	6,61E+02	INA	INA	INA	7,00E+01	8,14E+01	0,00E+00	8,82E+03	-4,87E+02
PENRM	MJ	8,60E+00	0,00E+00	INA	INA	INA	0,00E+00	0,00E+00	0,00E+00	8,60E+00	0,00E+00
PENRT	MJ	8,01E+03	6,61E+02	INA	INA	INA	7,00E+01	8,14E+01	0,00E+00	8,82E+03	-4,87E+02
SM	kg	0,00E+00	0,00E+00	INA	INA	INA	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	INA	INA	INA	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	INA	INA	INA	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	7,77E+00	8,74E-02	INA	INA	INA	9,32E-03	4,93E-02	0,00E+00	7,91E+00	-3,28E-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*

Results per declared unit (1m³ of particleboard 18 mm)

Environmental Performance
Table 3

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▪ VARIABILITY OF RESULTS DEPENDING ON PARTICLEBOARD THICKNESS

INDICATOR	UNIT	5 mm (minimum)	Variation	18 mm (reference)	25 mm (maximum)	Variation
Climate change - Total	kg CO_2 eq	5,90E+02	1%	**5,82E+02**	5,68E+02	-2%
Climate change - Fossil	kg CO_2 eq	8,54E-05	2%	**8,38E-05**	8,10E-05	-3%
Climate change - Biogenic	kg CO_2 eq	1,61E+00	1%	**1,59E+00**	1,55E+00	-3%
Climate change - Land use and LU change	kg CO_2 eq	1,68E+00	3%	**1,64E+00**	1,56E+00	-5%
Ozone depletion	kg CFC_{11} eq	5,56E-02	3%	**5,41E-02**	5,13E-02	-5%
Acidification	mol H^+ eq	4,49E-01	2%	**4,42E-01**	4,28E-01	-3%
Eutrophication aquatic freshwater	kg P eq	8,34E+00	1%	**8,24E+00**	8,07E+00	-2%
Eutrophication aquatic marine	kg N eq	2,99E+02	5%	**2,85E+02**	2,61E+02	-9%
Eutrophication terrestrial	mol N eq	9,03E+03	2%	**8,82E+03**	8,47E+03	-4%
Photochemical ozone formation	kg NMVOC eq	3,89E-03	5%	**3,72E-03**	3,42E-03	-8%
*Depletion of abiotic resources, minerals and metals**	kg Sb eq	4,85E+02	2%	**4,77E+02**	4,63E+02	-3%
*Depletion of abiotic resources, fossils**	MJ	1,04E+02	0%	**1,03E+02**	1,03E+02	0%
*Water use**	m^3 depriv.	1,38E+00	0%	**1,38E+00**	1,37E+00	0%

Results per 1m³ of particleboard

Waste Production and Output Flows

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▪ WASTE PRODUCTION

INDICATOR	UNIT	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total Life Cycle	D
Hazardous waste disposed	kg	1,29E-02	1,66E-03	INA	INA	INA	1,69E-04	5,32E-05	0,00E+00	**1,48E-02**	-8,74E-04
Non-hazardous waste disposed	kg	4,37E+01	4,32E+01	INA	INA	INA	6,55E+00	1,59E+00	0,00E+00	**9,50E+01**	-1,52E+00
Radioactive waste disposed	kg	1,14E-02	4,46E-03	INA	INA	INA	4,74E-04	5,46E-04	0,00E+00	**1,69E-02**	-1,47E-03

▪ OUTPUT FLOWS

INDICATOR	UNIT	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total Life Cycle	D
Components for re-use	kg	0,00E+00	0,00E+00	INA	INA	INA	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**	0,00E+00
Material for recycling	kg	2,63E+01	0,00E+00	INA	INA	INA	3,70E+02	0,00E+00	4,07E+02	**0,00E+00**	3,70E+02
Materials for energy recovery	kg	0,00E+00	0,00E+00	INA	INA	INA	5,47E+01	0,00E+00	5,59E+01	**0,00E+00**	5,47E+01
Exported energy, electricity	MJ	0,00E+00	0,00E+00	INA	INA	INA	0,00E+00	0,00E+00	0,00E+00	**2,86E+02**	0,00E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	INA	INA	INA	0,00E+00	0,00E+00	0,00E+00	**0,00E+00**	0,00E+00

Results per declared unit (1m³ of particleboard 18 mm)

Carbon Sequestration

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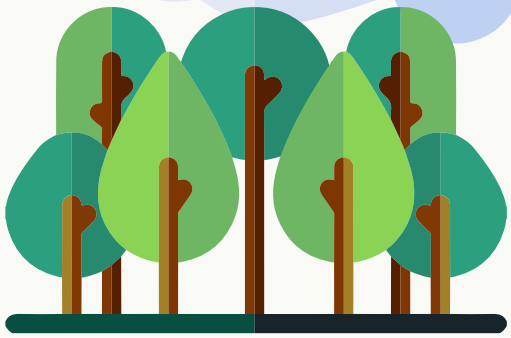
The CO_2 sequestered during tree growth and stored until the end-of-life has been calculated according to the formula:

Mass of CO_2 sequestered per m^3 of particleboard = mass of dry timber x 0,5 x 44/12

The average density of Invernizzi poplar plywood is **495 kg/m³**, *with a content of* **419 kg** *of poplar wood.*

The CO_2 sequestered by 1m^3 of Invernizzi poplar particleboard is:

768,17
kgCO_2eq



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