

# ENVIRONMENTAL PRODUCT DECLARATION

## Melamine Faced Particleboard

In accordance with ISO 14025 and EN 15804:2012+A2:2019

Programme:	S-P Code	Publication Date
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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](http://www.environdec.com)



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ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR)

## Product Category Rules (PCR):

2019:14 Version 1.11, 2021-02-05, UN CPC code of 3143, EN 15804:2012 + A2:2019  
Sustainability of Construction Works, c-PCR-006 Wood and wood-based products for use in construction (EN 16485)

## PCR review was conducted by:

The Technical Committee of the International EPD® System. See [www.environdec.com/about-us/the-international-epd-system-about-the-system](http://www.environdec.com/about-us/the-international-epd-system-about-the-system) for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat [www.environdec.com](http://www.environdec.com).

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

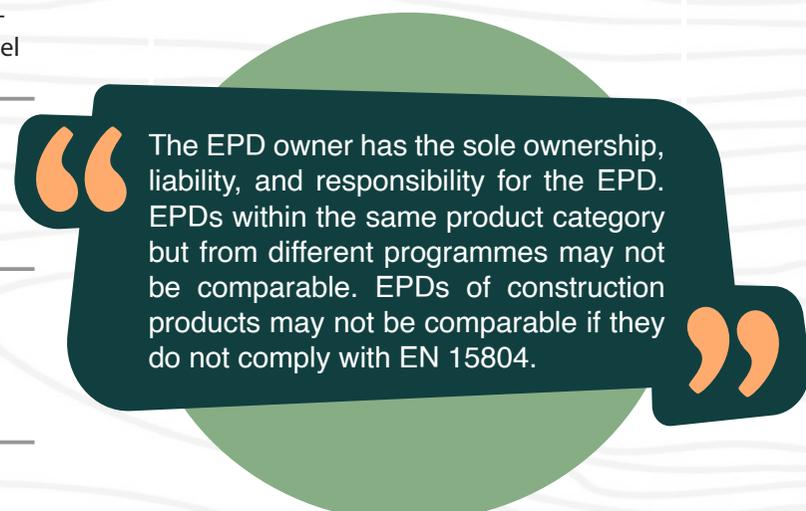
EPD process certification       EPD verification

**Third party verifier:** Prof. Vladimír Kocí

**Approved by:** The International EPD® System Technical Committee, supported by the Secretariat

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

Yes       No





# About The Company

Orma is one of the most important and reliable companies in the sector with its long years of knowledge and corporate identity. In 1970, Orma was established on a land of 50 thousand square meters, 5 km from the city center. In Şevket Demirel's words, "An industry is being established in Isparta to utilize forest products, other wood products and their wastes fully".

Following the establishment of Orma, high-quality chipboard product has continuously developed with designs and surfaces that determine the market and has become the pioneer of the sector and has reached today with its sustainable production approach. The Orma brand is commemorated with quality and success and continues its production without making concession on it.

It started its first integration with a particle board unit with a capacity of 150 m<sup>3</sup> / day, a natural veneering unit of 5000 m<sup>2</sup> / day and closed sheet units of 400 sheets/day. It has renewed itself in line with the needs of furniture sector and still continues to produce particle board and melamin faced particle board in an area of 500 thousand square meters, 70 thousand square meters of which is closed, three particleboard plants, one of which is integrated , with a total capacity of 2,220 m<sup>3</sup>/day and three impregnation lines with a total capacity of 90 million m<sup>2</sup>/year and four coating lines with a total capacity of 4.500.000 units/year.

# Product Information

Melamine faced Particleboards (MFP) are products that result from pressing the chipboard with the impregnated decorative paper under a specific temperature and pressure for a certain period of time. Melamine faced Particleboard (MFP) offers various usage possibilities for furniture, office and interior among 13 different surfaces on around 200 decors produced in different thicknesses and sizes.

Material Composition in 1 m<sup>3</sup> of ORMA Melamine Faced Particleboard:

Raw Material	Weight, %
Chipboard	90-99
Paper	1-5
Other	1-5

The type of sawdust can be varied in particleboard production, but mainly pine and its species, as well as poplar and beech wood, are used.





# Technical Specifications

1. General Requirements:						
General requirements at dispatch						
No	Property	Test Method	Unit	Requirement		
				Thickness range (mm, nominal)		
				< 15	≥ 15 to 20	> 20
1	Tolerances on nominal dimensions Thickness Within and Between Boards	EN 14323	mm	± 0.3		± 0.5
	Length and Width -Standart dimensions -Precut sheets	EN 14323	mm	tmax – tmin ≤ 0.6		
2	Edge Straightness Tolerance	EN 14323	mm/m	-	≤ 2 (only for balanced surface)	
3	Side damage -Standart dimensions -Precut sheets	EN 14323	mm	≤ 10 ≤ 3		
4	Surface defects	EN 14323	mm <sup>2</sup> /m <sup>2</sup> mm/m <sup>2</sup>	dots on surface ≤ 2 stripes on surface ≤ 20		
5	Scratch Resistance	EN 14323	N	≥ 1.5		
6	Resistance to Staining	EN 14323	classification	≥ 3		
7	Resistance to Cracking	EN 14323	classification	≥ 3		
8	Resistance to Abrasion	EN 14323	Revolution	Pattern Class 1 < 50 Plain Class 3A ≥ 150		
9	Test Method	12460- 3	mg/m <sup>2</sup> .h	E1 ≤ 3.5		

**Note:** This document may be modified at any time by the company without any express obligation to send any updated edition to all original recipients. To verify that you have the latest edition available, you are advised to contact the relevant sales executive.



# LCA Information

<b>Declared Unit</b>	1 m <sup>3</sup> of Melamine Faced Particleboard with an average weight 622 kg/m <sup>3</sup>
<b>Time Representativeness</b>	2021
<b>Database(s) and LCA Software Used</b>	Ecoinvent 3.6, SimaPro 9.1

“ The inventory for the LCA study is based on the 2021 production figures for Melamine Faced Particleboard products by ORMA production plant in Isparta/Turkey. This EPD's system boundary is cradle to gate. The system boundary covers A1 - A3 product stages, C1 - C4 end of life and D stages. ”

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage			Benefits and Loads	
	Raw Material Supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Deconstruction. demolition	Transport	Waste Processing		Disposal
<b>Module</b>	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
<b>Modules Declared</b>	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
<b>Geography</b>	TR	TR	TR	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
<b>Specific Data Used</b>	> 90%	> 90%	> 90%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Variation - products</b>	NR					-	-	-	-	-	-	-	-	-	-	-	-
<b>Variation - Sites</b>	NR					-	-	-	-	-	-	-	-	-	-	-	-

X = Included in LCA, ND = Not Declared

# System Boundary

## A1: Raw Material Supply

Productions start from wood. ORMA supplies its raw materials from suitable forests. Raw material supply includes extraction/ preparation and pretreatment processes before production.

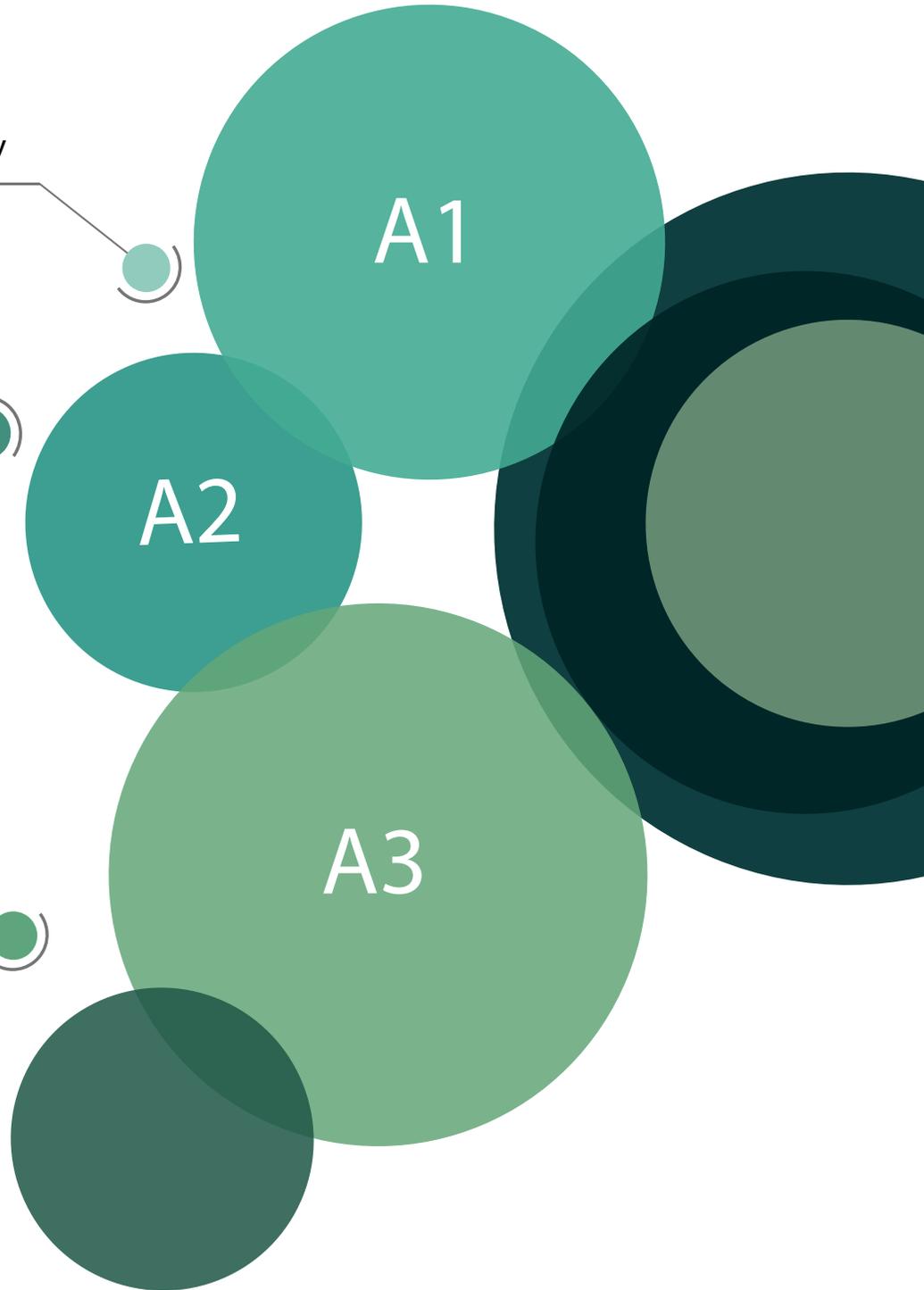
## A2: Transportation

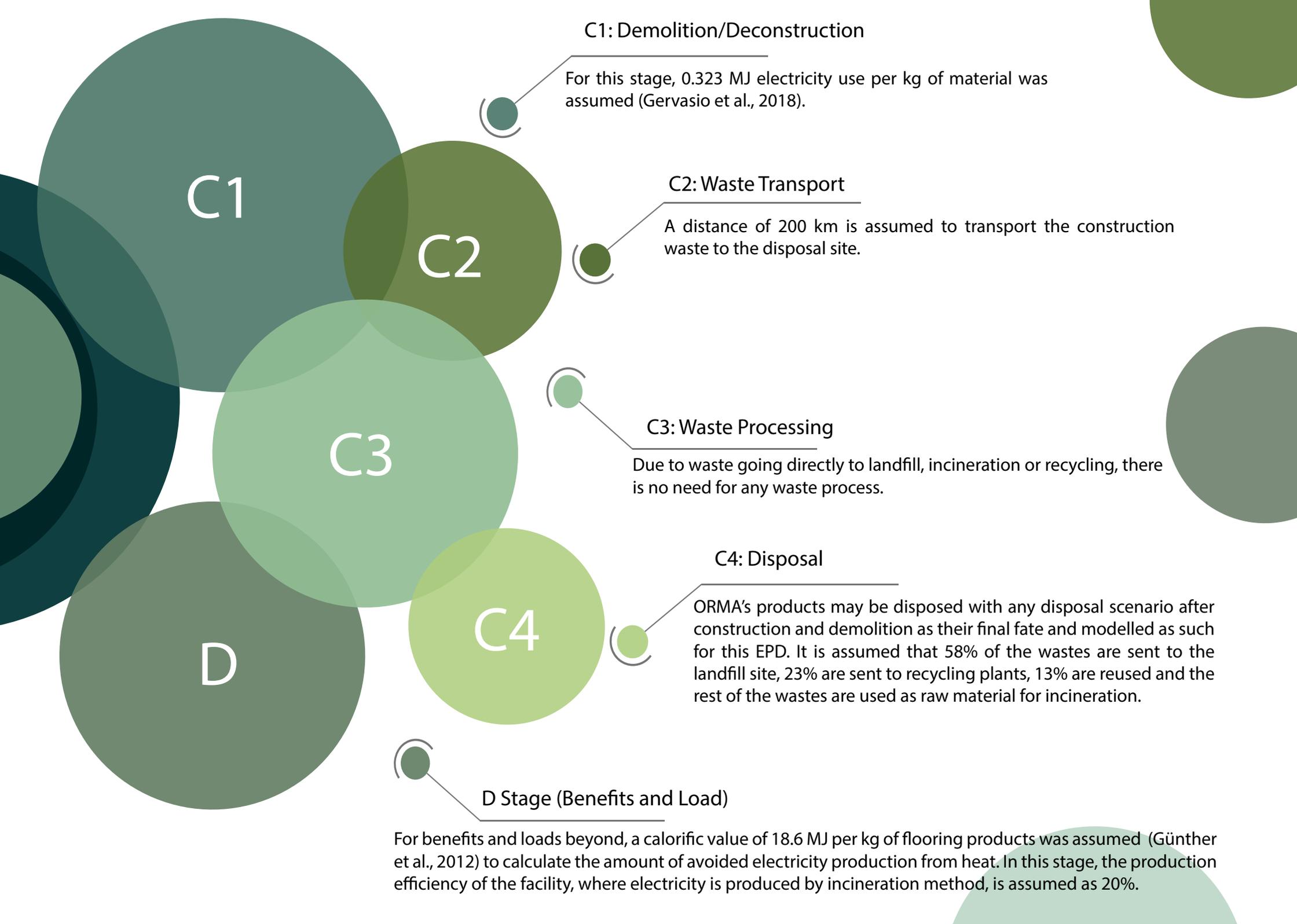
Transportation is relevant for delivering raw materials and other materials to the plant and transporting materials within the plant. Transport within the factory is included in the LCA model. Transport of raw materials to production sites is taken as the weight average values for transport from raw materials suppliers in 2021.

## A3: Manufacturing

Workflow of ORMA is as follows:

- |                              |                     |
|------------------------------|---------------------|
| 1 - Raw material preparation | 6 - Pressing        |
| 2 - Feeding                  | 7 - Trimming        |
| 3 -Bottom paper laying       | 8 - Quality control |
| 4 -Chipboard laying          | 9 - Storage         |
| 5 -Top paper laying          |                     |





### C1: Demolition/Deconstruction

For this stage, 0.323 MJ electricity use per kg of material was assumed (Gervasio et al., 2018).

### C2: Waste Transport

A distance of 200 km is assumed to transport the construction waste to the disposal site.

### C3: Waste Processing

Due to waste going directly to landfill, incineration or recycling, there is no need for any waste process.

### C4: Disposal

ORMA's products may be disposed with any disposal scenario after construction and demolition as their final fate and modelled as such for this EPD. It is assumed that 58% of the wastes are sent to the landfill site, 23% are sent to recycling plants, 13% are reused and the rest of the wastes are used as raw material for incineration.

### D Stage (Benefits and Load)

For benefits and loads beyond, a calorific value of 18.6 MJ per kg of flooring products was assumed (Günther et al., 2012) to calculate the amount of avoided electricity production from heat. In this stage, the production efficiency of the facility, where electricity is produced by incineration method, is assumed as 20%.



# More Information

## Production Plants and Allocations

Water consumption, energy consumption and raw material transportation were weighted according to 2021 production figures.

In addition, hazardous and non-hazardous waste amounts were also allocated from the 2021 total waste generation.

## Packaging

Products by ORMA are delivered to end-users in film plastic packaging or corrugated board. The packaging of the final product is included in the LCA.

## Cut-Off Criteria

1% cut-off applied. Data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts have been included.

## Assumptions

For benefits and loads beyond, a calorific value of 18.6 MJ per kg of MDF was assumed (Günther et al., 2012) to calculate the amount of avoided natural gas used for heating. For the deconstruction stage, 0.323 MJ electricity use per kg of material was assumed (Gervasio et al., 2018).

## LCA Modelling, Calculation and Data Quality

The results of the LCA with the indicators as per EPD requirement are given in the LCA result tables. According to the PCR, all energy calculations were obtained using Cumulative Energy Demand (LHV) methodology, while freshwater use is calculated with selected inventory flows in SimaPro.

There are no co-product allocations within the LCA study underlying this EPD.

The SimaPro 9.1 LCA software and the Ecoinvent 3.6 LCA database were used to calculate the environmental impacts. The regional energy datasets were used for all energy calculations.

Raw materials, energy and water consumption, waste and material and product transport data are collected from Orma. All primary data collected from ORMA is for the period year of 2021.

## Geographical Scope

The geographical scope of this EPD is global. The assumptions of the end of life (C modules) and benefit (D module) stages can be referred to as the global.

## REACH

The product contains formaldehyde, a substance of very high concern (SVHC) and is subject to authorization under the REACH Regulation.



# LCA Results

Environmental Impacts for 1 m <sup>3</sup> of Melamine Faced Particleboard							
Impact Category	Unit	A1-A3	C1	C2	C3	C4	D
GWP - Fossil	kg CO <sub>2</sub> eq	218	41.7	11.3	0	7.53	-84.1
GWP - Biogenic	kg CO <sub>2</sub> eq	-1011	0.066	5.57E-03	0	126	-41.6
GWP - Luluc	kg CO <sub>2</sub> eq	1.11	0.073	2.83E-03	0	1.20E-03	-0.120
GWP - Total	kg CO <sub>2</sub> eq	-793	41.9	11.3	0	133	-42.5
ODP	kg CFC-11 eq	34.4E-6	1.76E-06	2.69E-06	0	1.24E-06	-8.22E-06
AP	mol H+ eq	1.54	0.221	47.5E-3	0	0.045	-0.528
EP - Freshwater*	kg P eq	0.077	0.023	886E-6	0	0.002	-0.032
EP - Freshwater	kg PO <sub>4</sub> eq	0.235	0.069	2.71E-03	0	0.005	-0.099
EP - Marine	kg N eq	0.329	0.040	14.0E-3	0	0.193	-0.100
EP - Terrestrial	mol N eq	4.50	0.439	155E-3	0	0.186	-1.39
POCP	kg NMVOC	0.986	0.105	49.3E-3	0	0.066	-0.340
ADPE	kg Sb eq	668E-6	10.6E-6	20.9E-6	0	5.53E-06	-211E-6
ADPF	MJ	3630	542	179	0	95.4	-1251
WDP	m <sup>3</sup> depriv.	226	6.89	1.32	0	2.63	-56.6
PM	disease inc.	24.7E-6	1.56E-06	1.02E-06	0	696E-9	-6.96E-06
IR	kBq U-235 eq	13.4	6.24	0.884	0	0.660	-8.25
ETP - FW	CTUe	4201	723	124	0	273	-1725
HTTP - C	CTUh	122E-9	8.70E-9	3.25E-9	0	13.9E-9	-477E-9
HTTP - NC	CTUh	3.05E-6	357E-9	154E-9	0	209E-9	-1.17E-6
SQP	Pt	58566	74.1	199	0	211	-4311
Acronyms	GWP-total: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Ecotoxicity freshwater, HTP-c: Cancer human health effects, HTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality.						
Legend	A1: Raw Material Supply, A2: Transport, A3: Manufacturing, C1: De-Construction, C2: Waste Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary.						
Disclaimer 1	This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents. occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil. from radon and from some construction materials is also not measured by this indicator.						
Disclaimer 2	The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.						
*Disclaimer 3	EP-freshwater: This indicator is calculated both in kg PO <sub>4</sub> eq and kg P eq as required in the characterization model. (EUTREND model. Struijs et al. 2009b. as implemented in ReCiPe; <a href="http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml">http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml</a> )						

Biogenic Carbon Content	Unit	A1-A3
Biogenic carbon content in product	kg C / m <sup>3</sup> product	275
Biogenic carbon content in packaging	kg C / m <sup>3</sup> product	21.7E-6
Note: 1 kg biogenic carbon is equivalent to 44/12 kg of CO <sub>2</sub> .		

Resource Use for 1 m <sup>3</sup> of Melamine Faced Particleboard							
Impact Category	Unit	A1-A3	C1	C2	C3	C4	D
PERE	MJ	12670	56.1	1.89	0	3.06	-803
PERM	MJ	0	0	0	0	0	0
PERT	MJ	12670	56.1	1.89	0	3.06	-803
PENRE	MJ	3632	542	3.46E-03	0	95.4	-1251
PENRM	MJ	0	0	0	0	0	0
PENRT	MJ	3632	542	3.46E-03	0	95.4	-1251
SM	kg	0.159	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m <sup>3</sup>	1.47	0.169	0.038	0	0.142	-0.339
Waste & Output Flows for 1 m <sup>3</sup> of Melamine Faced Particleboard							
Impact Category	Unit	A1-A3	C1	C2	C3	C4	D
HWD	kg	0.476	0	0	0	0	0
NHWD	kg	8.29	0	0	0	0	0
RWD	kg	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0
MER	kg	80.9	0	0	0	0	0
EE (Electrical)	MJ	0	0	0	0	693	0
EE (Thermal)	MJ	0	0	0	0	0	0

PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding 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, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water, HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy, Thermal.

Climate Impact for 1 m <sup>3</sup> of Melamine Faced Particleboard							
Indicator	Unit	A1-A3	C1	C2	C3	C4	D
GWP-CHG*	kg CO <sub>2</sub> eq	215	41.1	11.2	0	49.2	-82.7
Acronyms	GWP-GHG = Global Warming Potential total excl. Biogenic carbon following IPCC AR5 methodology						
*Disclaimer	The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013						



# References

*/GPI/ General Programme Instructions of the International EPD® System. Version 4.0*

*/ISO 9001/ Quality management systems – Requirements*

*/ISO 14001/ Environment Management System- Requirements*

*/EN 15804:2012+A2:2019/ Sustainability of construction works - Environmental Product Declarations – Core rules for the product category of construction products*

*/ISO 14020:2000/ Environmental labels and declarations – General principles*

*/ISO 14025/ ISO 14025:2006 Preview Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures*

*/ISO 14040-44/ ISO 14040:2006-10, Environmental management - Life cycle assessment -Principles and framework (ISO 14040:2006) and Requirements and guidelines (ISO 14044:2006)*

*/ISO 45001/ Occupational Health & Safety Management System Certification - Requirements*

*/ Gervasio et al., 2018 /Model for Life Cycle Assessment of buildings LCA, JRC Technical Reports, 2018.*

*/ Günther et al. ,2012 /Calorific value of selected wood species and wood products, Springer.*

*/UN CPC code of 31431/ Prepared by IVL Swedish Environmental Research Institute, Swedish Environmental Protection Agency,*

*SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB, The International EPD System, 2019:14 Version 2.0, DATE 2019-12-20*

*/Ecoinvent/ Ecoinvent Centre, [www.ecoinvent.org](http://www.ecoinvent.org)*

*/SimaPro/ SimaPro LCA Package, Pré Consultants, the Netherlands, [www.pre-sustainability.com](http://www.pre-sustainability.com)*

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