epddanmark

ECO PLATFORM EPD VERIFIED

Owner: Convert A/S
No.: MD-24165-EN
Issued: 26-02-2025
Valid to: 26-02-2030

3rd PARTY **VERIFIED**

# EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

**Owner of declaration**
Convert A/S
Håndværkervej 3-7
DK-7700 Thisted
CVR: 39159090

**Programme**
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

**Declared product(s)**
MDF Remade

Number of declared datasets/product variations: 1

**Production site**
Håndværkervej 3-7
7700 Thisted
Denmark

**Use of Guarantees of Origin**
☐ No certificates used
☒ Electricity covered by GoO
☐ Biogas covered by GoO

**Declared unit**
1 $m^3$ of product

**Year of production site data (A3)**
2022-2024

**EPD version**
Version 1.0

**Issued:** 26-02-2025
**Valid to:** 26-02-2030

**Basis of calculation**
This EPD is developed and verified in accordance with the European standard EN 15804+A2.

**Comparability**
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

**Validity**
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

**Use**
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

**EPD type**
☐Cradle-to-gate with modules C1-C4 and D
☒Cradle-to-gate with options, modules C1-C4 and D
☐Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

*David Althoff Palm, Dalemarken AB*

*Martha Katrine Sørensen*
*EPD Danmark*

| Life cycle stages and modules (MND = module not declared) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product | | | Construction process | | Use | | | | | | | End of life | | | | Beyond the system boundary |
| Raw material supply | Transport | Manufacturing | Transport | Installation process | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport | Waste processing | Disposal | Re-use, recovery and recycling potential |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | X | X | MND | MND | MND | MND | MND | MND | MND | X | X | X | X | X |

# Product information

### Product description

The main product components are shown in the table below.

| Material | Amount [kg] | Weight-% |
|---|---|---|
| MDF | 494.90 | 67.11 |
| Plastic binder fiber | 242.60 | 32.89 |
| Sum | 737.50 | 100 |

### Product packaging:

The composition of the sales- and transport packaging of the product is shown in the table below.

| Material | Amount [kg] | Weight-% |
|---|---|---|
| Flat pallet | 46.48 | 96.18 |
| Packaging film | 0.92 | 1.91 |
| Protective corners | 0.92 | 1.91 |
| Sum | 48.32 | 100 |

### Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of MDF Remade on the production site located in Thisted, Denmark. Product specific data are based on average values collected in the period August 2022 to August 2024. Background data are based on Ecoinvent 3.10 EN 15804 database and are less than 10 years old. The majority of the datasets are only a couple of years old. The market this EPD is made for is Denmark, as the tables are produced, used and undergo end of life treatment in Denmark.

### Hazardous substances

MDF Remade does not contain substances listed on the ”Candidate List of Substances of Very High Concern for authorisation” at levels above 0,1%.

(http://echa.europa.eu/candidate-list-table)

### Product(s) use

MDF Remade is a viable alternative to MDF for use in the furniture industry. It is made of recycled MDF and a plastic binder. This version is produced in its raw form, highlighting the unique history of the recycled wood and offering an authentic visual narrative. For applications requiring a liquid- and scratch-resistant finish, MDF Remade is also available with a treated surface (which is covered in a separate EPD).

Product advantages:

- First industrial initiative to use recycled MDF
- Saving MDF scrap from being incinerated
- Production process is 100% dry with no water and no formaldehyde containing glue added to the process
- Electricity used in the production is 100% renewable
- Sourcing of MDF and production are 100% local in Denmark

### Essential characteristics

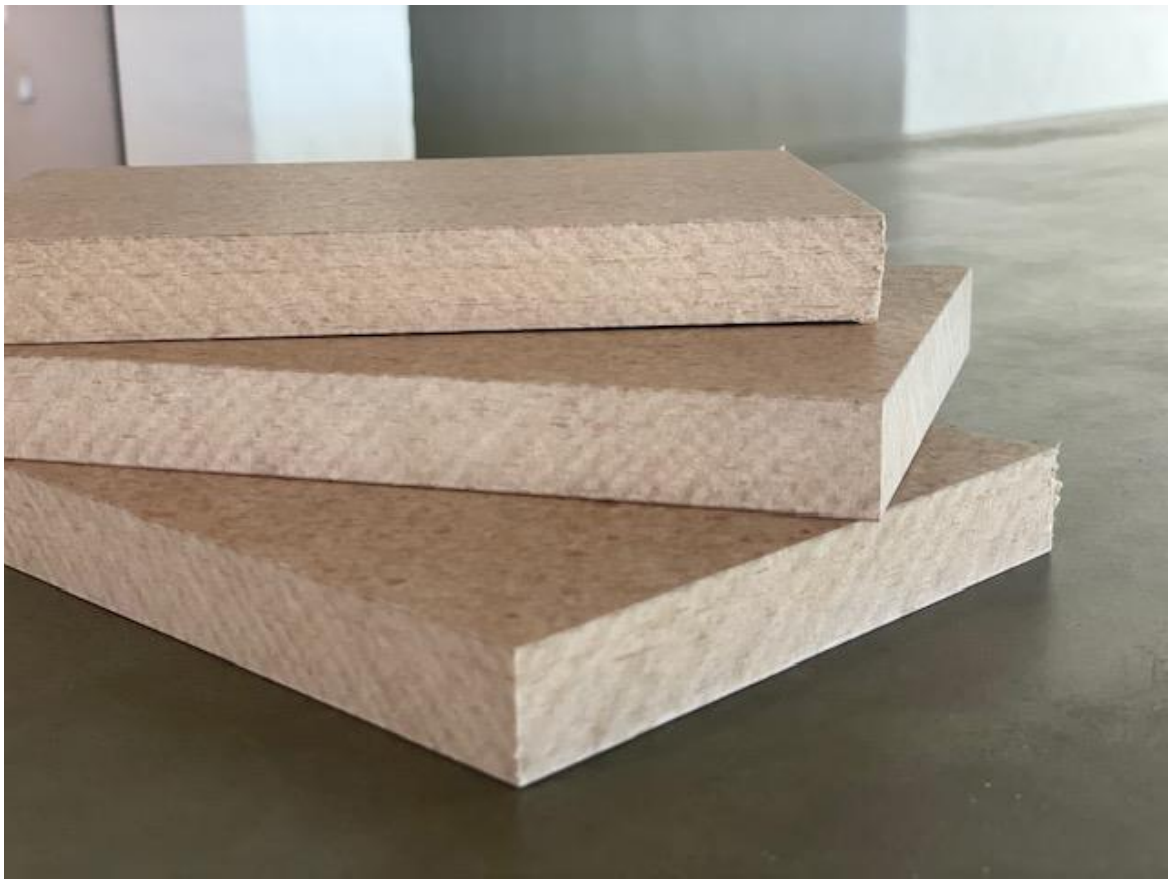
Further technical information can be obtained by contacting the manufacturer or on the manufacturer’s website:

https://convert.as

### Reference Service Life (RSL)

15 years

### Picture of product(s)



# LCA background

### Declared unit

The LCI and LCIA results in this EPD relates to 1 $m^3$ MDF Remade.

| Name | Value | Unit |
|---|---|---|
| Declared unit | 1 | $m^3$ |
| Density | 737,5 | $kg/m^3$ |
| Conversion factor to 1 kg. | 0.0014 | - |

### Declared unit

Production of 1 $m^3$ of medium density fiberboard (MDF) and plastic composite board, including the life cycle from raw materials to end-of-life treatment (excluding the use phase).

### PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804 and EN 16485:2014 – "Round and sawn timber – Environmental Product Declarations – Product category rules for wood and wood-based products for use in construction"

### Energy modelling principles

Foreground system:

The product is produced using energy covered by GOs in the production.

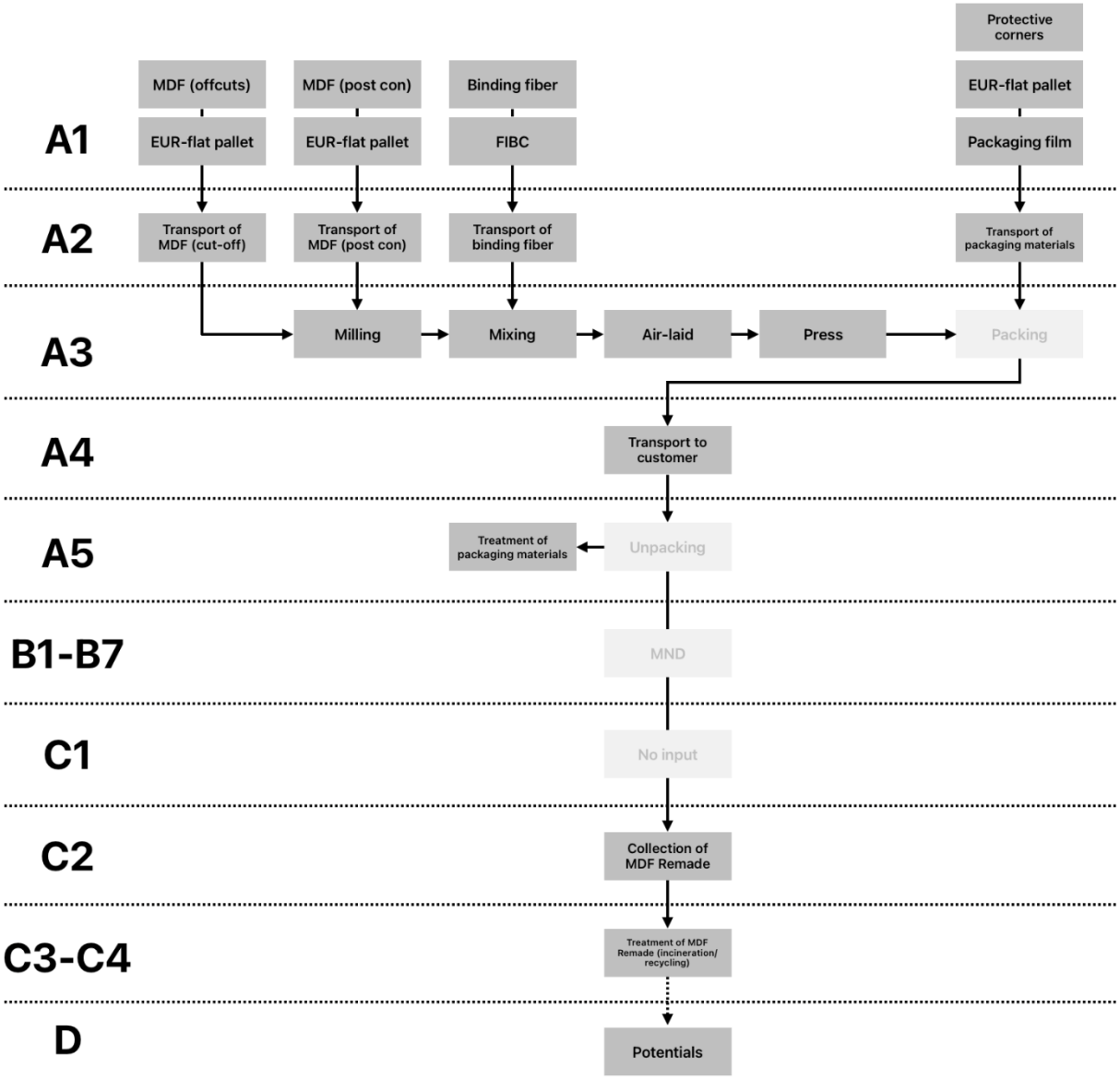
Information about the energy mix in the foreground system

| Dataset | EF | Unit |
|---|---|---|
| Renewable electricity prod. wind, DK, ref. year 2023 | 0,014 | kg $CO_2$e/kWh |
| Natural gas mix, DK, ref. year 2021 | 0,517 | kg $CO_2$e/$m^3$ |

Background system:

No energy input in upstream and downstream processes.

## Flowdiagram




## System boundary

This EPD is based on a cradle-to-grave LCA, in which 100 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

**Product stage (A1-A3) includes**:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the "end-of-waste" state.

MDF Remade is made from locally sources production offcuts from Denmark and old MDF tabletops mainly from Greater Copenhagen, Denmark, as well as second-grade binder fiber from Europe. MDF Remade is produced in four steps; milling, mixing, airlaid and pressing, and packaged in Thisted, Denmark.

**Construction process stage (A4-A5) includes:**

The construction phase includes transport from the factory gate to the customer, as well as installation. There are no inputs associated with the installation of MDF Remade, and therefore no emissions. Additionally, the waste treatment of packaging from the products is also included in this phase.

**Use stage (B1-B7) includes:**

B1 – Use

No emissions to surrounding environment occur during the products lifetime, thus impact of this module is assumed to be zero.

B2-B5 – Maintenance, repair, replacement, and refurbishment

The installed product is not intended to require repair, maintenance, replacement, or refurbishment over the lifetime of MDF Remade, thus impacts of these modules are assumed to be zero.

B6-B7 – Operational energy and water use

There is no energy or water use involved in the use of MDF Remade, thus impacts of these modules are assumed to be zero.

**End of Life (C1-C4) includes:**

C1-C4 involves the handling of the products at the end-of-life stage by the end-customer.

C1 – Disassembling

It is assumed that the end-customer disassembles the product and sorts it as residual waste or for recycling. It is assumed that there are no inputs or outputs in the disassembly process, thus impacts of this module are assumed to be zero.

C2 – Transport to end-of-life treatment

This module includes the transport of MDF Remade to the end-of-life treatment.

C3 – Waste processing

Incineration scenario: It is assumed that MDF Remade is incinerated with heat and electricity recovery.

Recycling scenario: EOW is defined as entire MDF Remade boards without any treatment processes, meaning there is no waste processing in C3. The recycling process is assumed to be the same as Convert's.

C4 – Disposal

Disposal of incineration residue is included in C3.

**Re-use, recovery and recycling potential (D) includes:**

Incineration scenario: As it is assumed that the product is incinerated the module include the benefits of the energy recovery.

Recycling scenario: As it is assumed that the product is recycled the module include the loads of recycling.

# LCA results

| ENVIRONMENTAL IMPACTS PER 1 M3 MDF REMADE | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1** | **A2** | **A3** | **A4** | **A5** | **C1** | **C2 (I)** | **C2 (R)** | **C3 (I)** | **C3 (R)** | **C4** | **D (I)** | **D (R)** |
| GWP-total | [kg $CO_2$ eq.] | -5.27E+02 | 4.50E+01 | 2.01E+02 | 3.45E+01 | 7.32E+01 | 0.00E+00 | 3.17E+00 | 3.24E+01 | 1.62E+03 | 7.26E+02 | 0.00E+00 | -8.85E+01 | 4.44E+02 |
| GWP-fossil | [kg $CO_2$ eq.] | 3.86E+02 | 4.49E+01 | 8.25E+01 | 3.45E+01 | 3.61E+00 | 0.00E+00 | 3.17E+00 | 3.24E+01 | 8.97E+02 | 0.00E+00 | 0.00E+00 | -8.50E+01 | 4.06E+00 |
| GWP-biogenic | [kg $CO_2$ eq.] | -9.13E+02 | 2.40E-02 | 1.18E+02 | 1.85E-02 | 6.97E+01 | 0.00E+00 | 1.70E-03 | 1.73E-02 | 7.26E+02 | 7.26E+02 | 0.00E+00 | -3.31E+00 | 4.40E+02 |
| GWP-luluc | [kg $CO_2$ eq.] | 3.00E-01 | 1.59E-02 | 2.29E-02 | 1.22E-02 | 1.92E-04 | 0.00E+00 | 1.12E-03 | 1.15E-02 | 5.04E-03 | 0.00E+00 | 0.00E+00 | -2.32E-01 | -7.18E-02 |
| ODP | [kg CFC 11 eq.] | 1.70E-05 | 9.36E-07 | 1.63E-05 | 7.19E-07 | 8.91E-09 | 0.00E+00 | 6.61E-08 | 6.75E-07 | 3.28E-07 | 0.00E+00 | 0.00E+00 | -1.17E-05 | -6.30E-07 |
| AP | [mol $H^+$ eq.] | 1.23E+00 | 1.06E-01 | 1.80E-01 | 8.15E-02 | 8.12E-03 | 0.00E+00 | 7.49E-03 | 7.65E-02 | 3.07E-01 | 0.00E+00 | 0.00E+00 | -3.66E-01 | 4.12E-02 |
| EP-freshwater | [kg P eq.] | 7.58E-02 | 3.16E-03 | 8.29E-03 | 2.43E-03 | 3.21E-04 | 0.00E+00 | 2.23E-04 | 2.28E-03 | 4.70E-03 | 0.00E+00 | 0.00E+00 | -4.01E-02 | 4.45E-03 |
| EP-marine | [kg N eq.] | 2.56E-01 | 2.78E-02 | 5.99E-02 | 2.14E-02 | 4.29E-03 | 0.00E+00 | 1.97E-03 | 2.01E-02 | 1.95E-01 | 0.00E+00 | 0.00E+00 | -7.52E-02 | 3.39E-03 |
| EP-terrestrial | [mol N eq.] | 2.67E+00 | 3.01E-01 | 5.56E-01 | 2.31E-01 | 4.12E-02 | 0.00E+00 | 2.13E-02 | 2.17E-01 | 1.61E+00 | 0.00E+00 | 0.00E+00 | -8.67E-01 | 6.33E-02 |
| POCP | [kg NMVOC eq.] | 2.15E+00 | 1.84E-01 | 3.62E-01 | 1.42E-01 | 1.04E-02 | 0.00E+00 | 1.30E-02 | 1.33E-01 | 3.97E-01 | 0.00E+00 | 0.00E+00 | -3.55E-01 | -3.49E-02 |
| ADPm[1] | [kg Sb eq.] | 3.37E-03 | 1.29E-04 | 4.27E-04 | 9.88E-05 | 1.66E-06 | 0.00E+00 | 9.08E-06 | 9.27E-05 | 5.18E-05 | 0.00E+00 | 0.00E+00 | -1.68E-03 | 3.46E-04 |
| ADPf[1] | [MJ] | 1.19E+04 | 6.74E+02 | 4.04E+03 | 5.18E+02 | 6.90E+00 | 0.00E+00 | 4.76E+01 | 4.86E+02 | 2.26E+02 | 0.00E+00 | 0.00E+00 | -3.39E+03 | -9.68E+01 |
| WDP[1] | [$m^3$ world eq. deprived] | 1.06E+02 | 3.39E+00 | 1.49E+01 | 2.60E+00 | 1.65E+00 | 0.00E+00 | 2.39E-01 | 2.44E+00 | 4.34E+01 | 0.00E+00 | 0.00E+00 | -9.82E+01 | 1.79E+01 |
| Caption | GWP-total = Globale Warming Potential - total; 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water depletion potential | | | | | | | | | | | | | |
| | The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112. | | | | | | | | | | | | | |
| Disclaimer | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. | | | | | | | | | | | | | |

| ADDITIONAL ENVIRONMENTAL IMPACTS PER 1 M3 MDF REMADE | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1** | **A2** | **A3** | **A4** | **A5** | **C1** | **C2 (I)** | **C2 (R)** | **C3 (I)** | **C3 (R)** | **C4** | **D (I)** | **D (R)** |
| PM | [Disease incidence] | 1.09E-05 | 4.38E-06 | 2.05E-06 | 3.36E-06 | 8.77E-08 | 0.00E+00 | 3.09E-07 | 3.16E-06 | 1.69E-06 | 0.00E+00 | 0.00E+00 | -2.55E-06 | 1.43E-07 |
| IRP[2] | [kBq U235 eq.] | 3.04E+01 | 8.19E-01 | 1.03E+00 | 6.29E-01 | 8.13E-03 | 0.00E+00 | 5.78E-02 | 5.91E-01 | 2.35E-01 | 0.00E+00 | 0.00E+00 | -1.91E+01 | 2.43E+00 |
| ETP-fw[1] | [CTUe] | 1.50E+03 | 1.60E+02 | 4.54E+02 | 1.23E+02 | 1.07E+01 | 0.00E+00 | 1.13E+01 | 1.15E+02 | 6.55E+02 | 0.00E+00 | 0.00E+00 | -4.54E+02 | 3.75E+01 |
| HTP-c[1] | [CTUh] | 1.86E-06 | 2.87E-07 | 1.01E-06 | 2.21E-07 | 1.38E-08 | 0.00E+00 | 2.03E-08 | 2.07E-07 | 2.76E-07 | 0.00E+00 | 0.00E+00 | -4.64E-07 | 5.26E-10 |
| HTP-nc[1] | [CTUh] | 3.40E-06 | 4.45E-07 | 8.50E-07 | 3.42E-07 | 9.81E-08 | 0.00E+00 | 3.14E-08 | 3.21E-07 | 2.37E-06 | 0.00E+00 | 0.00E+00 | -1.89E-06 | 3.31E-07 |
| SQP[1] | - | 1.16E+04 | 6.78E+02 | 4.65E+02 | 5.21E+02 | 1.94E+00 | 0.00E+00 | 4.79E+01 | 4.89E+02 | 4.84E+01 | 0.00E+00 | 0.00E+00 | -1.50E+03 | -2.10E+03 |
| Caption | 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 = Soil Quality (dimensionless) | | | | | | | | | | | | | |
| | The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112. | | | | | | | | | | | | | |
| Disclaimers | [1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. | | | | | | | | | | | | | |
| | [2] 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 | | | | | | | | | | | | | |

| RESOURCE USE PER 1 M3 MDF REMADE | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1** | **A2** | **A3** | **A4** | **A5** | **C1** | **C2 (I)** | **C2 (R)** | **C3 (I)** | **C3 (R)** | **C4** | **D (I)** | **D (R)** |
| PERE | [MJ] | 2.25E+03 | 1.07E+01 | 5.25E+03 | 8.22E+00 | 7.32E+02 | 0.00E+00 | 7.56E-01 | 7.72E+00 | 7.67E+03 | 7.67E+03 | 0.00E+00 | -1.31E+03 | -8.58E+02 |
| PERM | [MJ] | 9.65E+03 | 0.00E+00 | -1.25E+03 | 0.00E+00 | -7.32E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -7.67E+03 | -7.67E+03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | [MJ] | 1.19E+04 | 1.07E+01 | 4.00E+03 | 8.22E+00 | 0.00E+00 | 0.00E+00 | 7.56E-01 | 7.72E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.31E+03 | -8.58E+02 |
| PENRE | [MJ] | 1.05E+03 | 6.12E+02 | 3.80E+03 | 4.70E+02 | 3.95E+01 | 0.00E+00 | 4.32E+01 | 4.41E+02 | 1.07E+04 | 1.07E+04 | 0.00E+00 | -3.20E+03 | -8.34E+01 |
| PENRM | [MJ] | 1.08E+04 | 6.28E+01 | 2.25E+02 | 4.82E+01 | -3.95E+01 | 0.00E+00 | 4.43E+00 | 4.53E+01 | -1.07E+04 | -1.07E+04 | 0.00E+00 | -1.87E+02 | -1.35E+01 |
| PENRT | [MJ] | 1.19E+04 | 6.74E+02 | 4.02E+03 | 5.18E+02 | 0.00E+00 | 0.00E+00 | 4.76E+01 | 4.86E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -3.39E+03 | -9.69E+01 |
| SM | [kg] | 5.41E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| RSF | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| NRSF | [MJ] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| FW | [$m^3$] | 2.73E+00 | 9.80E-02 | 3.11E-01 | 7.53E-02 | 1.09E-02 | 0.00E+00 | 6.92E-03 | 7.07E-02 | 4.62E-01 | 0.00E+00 | 0.00E+00 | -3.18E+00 | 5.98E-01 |
| Caption | 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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water | | | | | | | | | | | | | |
| | The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112. | | | | | | | | | | | | | |

| WASTE CATEGORIES AND OUTPUT FLOWS PER 1 M3 MDF REMADE | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Unit** | **A1** | **A2** | **A3** | **A4** | **A5** | **C1** | **C2 (I)** | **C2 (R)** | **C3 (I)** | **C3 (R)** | **C4** | **D (I)** | **D (R)** |
| HWD | [kg] | 1.06E+01 | 6.69E-01 | 5.57E+00 | 5.14E-01 | 2.94E-01 | 0.00E+00 | 4.72E-02 | 4.82E-01 | 1.02E+01 | 0.00E+00 | 0.00E+00 | -2.25E+00 | 1.54E-01 |
| NHWD | [kg] | 2.90E+03 | 6.49E+00 | 1.07E+02 | 4.99E+00 | 4.92E+01 | 0.00E+00 | 4.58E-01 | 4.68E+00 | 7.61E+02 | 0.00E+00 | 0.00E+00 | -2.14E+01 | -5.18E-02 |
| RWD | [kg] | 7.76E-03 | 2.03E-04 | 2.37E-04 | 1.56E-04 | 2.03E-06 | 0.00E+00 | 1.43E-05 | 1.46E-04 | 5.88E-05 | 0.00E+00 | 0.00E+00 | -4.35E-03 | 5.16E-04 |
| CRU | [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MFR | [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.38E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| MER | [kg] | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EEE | [MJ] | 0.00E+00 | 0.00E+00 | 1.58E+02 | 0.00E+00 | 8.73E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.14E+03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EET | [MJ] | 0.00E+00 | 0.00E+00 | 3.15E+02 | 0.00E+00 | 1.75E+02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.21E+03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Caption | HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy | | | | | | | | | | | | | |
| | The numbers are declared in scientific notation, fx 1,95E+02. This number can also be written as: $1,95*10^2$ or 195, while 1,12E-11 is the same as $1,12*10^{-11}$ or 0,0000000000112. | | | | | | | | | | | | | |

| BIOGENIC CARBON CONTENT PER 1 M3 MDF REMADE | | |
|---|---|---|
| **Parameter** | **Unit** | **At the factory gate** |
| Biogenic carbon content in product | [kg C] | 197.53 |
| Biogenic carbon content in accompanying packaging | [kg C] | 19.02 |
| Note | 1 kg biogenic carbon is equivalent to 44/12 kg of $CO_2$ | |

# Additional information

## LCA interpretation

The results indicate that the most significant contributors are the incineration of polyethylene waste, followed by the production of binding fiber. Other notable impacts come from the incineration of polypropylene and MDF-binder components. The airlaid process also contributes moderately. Transport processes, while individually lower in impact, collectively contribute to the overall emissions. These findings highlight that addressing waste management and reducing emissions from binding fiber production are critical for minimizing environmental impacts.

## Technical information on scenarios

**Transport to the building site (A4)**

| Scenario information | Value | Unit |
|---|---|---|
| Fuel type | Diesel | - |
| Vehicle type | transport, freight, lorry 16-32 metric ton, EURO6 | - |
| Transport distance | 424 | km |
| Capacity utilisation (including empty runs) | 24,67 | % |
| Gross density of products transported | 737,50 | kg/m$^3$ |
| Capacity utilisation volume factor | - | - |

**Installation of the product in the building (A5)**

| Scenario information | Value | Unit |
|---|---|---|
| Ancillary materials | 0 | kg |
| Water use | 0 | m$^3$ |
| Other resource use | 0 | kg |
| Energy type and consumption | 0 | kWh |
| Waste materials | 48,32 | kg |
| Output materials | 0 | kg |
| Direct emissions to air, soil or water | 0 | kg |

**Reference service life**

| RSL information | | Unit |
|---|---|---|
| Reference service Life | 15 | Years |
| Declared product properties | MDF Remade consists of MDF offcuts from manufacturing and post-consumer waste MDF from offices and binder fiber | As appropriate |
| Design application parameters | MDF Remade can be used for the same purposes as standard MDF | As appropriate |
| Assumed quality of work | - | As appropriate |
| Outdoor environment | No | As appropriate |
| Indoor environment | Yes | As appropriate |
| Usage conditions | Surface properties; not resistant to liquids | As appropriate |
| Maintenance | Does not require maintenance | As appropriate |

**End of life (C1-C4) (incineration)**

| Scenario information | Value | Unit |
|---|---|---|
| Collected separately | 0 | kg |

| | | |
|---|---|---|
| Collected with mixed waste | 737.50 | kg |
| For reuse | 0 | kg |
| For recycling | 0 | kg |
| For energy recovery | 737.50 | kg |
| For final disposal | 0 | kg |
| Assumptions for scenario development | 100% incineration | As appropriate |

**End of life (C1-C4) (recycling)**

| Scenario information | Value | Unit |
|---|---|---|
| Collected separately | 737.50 | kg |
| Collected with mixed waste | 0 | kg |
| For reuse | 0 | kg |
| For recycling | 737.50 | kg |
| For energy recovery | 0 | kg |
| For final disposal | 0 | kg |
| Assumptions for scenario development | 100% recycling | As appropriate |

**Re-use, recovery and recycling potential (D) (incineration)**

| Scenario information/Material | Value | Unit |
|---|---|---|
| Displaced electricity, modelled as DK market mix | 1224.11 | MJ |
| Displaced thermal energy, modelled as natural gas | 2373.16 | MJ |

**Re-use, recovery and recycling potential (D) (recycling)**

| Scenario information/Material | Value | Unit |
|---|---|---|
| Wood chips production, softwood, at sawmill - Europe without Switzerland | 242.60 | kg |
| Displaced electricity, modelled as DK market mix | 87.30 | MJ |
| Displaced thermal energy, modelled as natural gas | 175.22 | MJ |

## Indoor air

The products have been tested in accordance with EN 16516:2017+A1:2020, *Construction Products — Assessment of Release of Dangerous Substances — Determination of Emissions into Indoor Air*. The testing was conducted by the Danish Technological Institute in December 2024, Report Number 273903-1-VOC-AgBB. Below are the results of the tests performed.

**ISO 16000-6 - Volatile organic compounds (VOC), Emissions of VOC according to EN 16516**

| CAS-no. | Compound | Conc. 3d [µg/m³] | Conc. 28d [µg/m³] | SER 3d [µg/(m²h)] | SER 28d [µg/(m²h)] | AgBB-LCI | Info |
|---|---|---|---|---|---|---|---|
| 000067-64-1 | Acetone | 67 | 33 | 67 | 33 | 120000 | VVOC |
| 000067-63-0 | 2-Propanol | 10 | 6 | 10 | 6 | NA | VVOC |
| 000079-20-9 | Methyl acetate | < 5 | < 5 | < 5 | < 5 | NA | VVOC |
| 000078-84-2 | Isobutyraldehyde | < 5 | < 5 | < 5 | < 5 | NA | VVOC |
| 000078-94-4 | 3-Butene-2-one | < 5 | < 5 | < 5 | < 5 | NA | VVOC |
| 000123-72-8 | Butanal | < 5 | < 5 | < 5 | < 5 | 650 | VVOC |
| 000064-19-7 | Acetic acid | 11 | 9 | 11 | 9 | 1200 | VOC |
| 000071-36-3 | n-Butanol | < 5 | < 5 | < 5 | < 5 | 3000 | VOC |
| 000107-98-2 | 1-Methoxy-2-propanol | < 5 | < 5 | < 5 | < 5 | 7900 | VOC |
| 000110-62-3 | Pentanal | 20 | 17 | 20 | 17 | 800 | VOC |
| 000142-82-5 | C7 (Heptane) | < 5 | < 5 | < 5 | < 5 | 15000 | VOC |
| 000079-31-2 | Isobutyric acid | < 5 | < 5 | < 5 | < 5 | 1800 | VOC |
| 000071-41-0 | n-Pentanol | 7 | 8 | 7 | 8 | 730 | VOC |
| 000066-25-1 | n-Hexanal | 48 | 34 | 48 | 34 | 900 | VOC |
| 000109-52-4 | Pentanoic acid | < 5 | < 5 | < 5 | < 5 | 2100 | VOC |
| 000110-43-0 | 2-Heptanone | < 5 | < 5 | < 5 | < 5 | NA | VOC |
| | Nitrogenous substance (Toluene) | < 5 | < 5 | < 5 | < 5 | NA | VOC |
| 000111-71-7 | n-Heptanal | < 5 | < 5 | < 5 | < 5 | 900 | VOC |
| 000100-52-7 | Benzaldehyde | < 5 | < 5 | < 5 | < 5 | 90 | VOC |
| 000142-62-1 | Hexanoic acid | 8 | 5 | 8 | 5 | 2100 | VOC |
| 003777-69-3 | 2-n-Pentylfurane | < 5 | < 5 | < 5 | < 5 | NA | VOC |
| 034590-94-8 | DPGMME (mixture of isomers) | < 5 | < 5 | < 5 | < 5 | 3100 | VOC |
| 000124-13-0 | Octanal | < 5 | < 5 | < 5 | < 5 | 900 | VOC |
| 000124-19-6 | n-Nonanal | < 5 | < 5 | < 5 | < 5 | 900 | VOC |
| 000122-99-6 | 2-Phenoxyethanol | < 5 | < 5 | < 5 | < 5 | 60 | VOC |
| (013475-82-6) | Sum other iso/cyclo-alkanes: | < 5 | < 5 | < 5 | < 5 | NA | VOC |
| (000108-88-3) | Sum other iso-alcohols: | < 5 | < 5 | < 5 | < 5 | NA | VOC |
| | Sum VVOC (< C6) | 77 | 39 | 77 | 39 | | |
| | Sum VOC (C6-C16) | 93 | 72 | 93 | 72 | | |
| | Sum SVOC (C16-C22) | < 5 | < 5 | < 5 | < 5 | | |
| | Sum of identified target VVOC | 77 | 39 | 77 | 39 | | |
| | Sum of non-target and unidentified VVOC | < 5 | < 5 | < 5 | < 5 | | |
| | Sum of identified target VOC | 93 | 72 | 93 | 72 | | |
| | Sum of non-target and unidentified VOC | < 5 | < 5 | < 5 | < 5 | | |
| | Sum of identified target SVOC | < 5 | < 5 | < 5 | < 5 | | |
| | Sum of non-target SVOC | < 5 | < 5 | < 5 | < 5 | | |
| | Sum of VOC (C6-C16,non-LCI) | < 5 | < 5 | < 5 | < 5 | | |
| | Carcinogens (Cat 1A,1B) | < 1 | < 1 | < 1 | < 1 | | |
| | TVOC (C6-C16) | 30 | 24 | 30 | 24 | | |
| | TSVOC (C16-C22) | < 5 | < 5 | < 5 | < 5 | | |
| | TSVOC (EN 16516) with LCI | < 5 | < 5 | < 5 | < 5 | | |
| | Sum TVOC + TSVOC (LCI) | 30 | 24 | 30 | 24 | | |

**ISO 16000-3 - VVOC aldehydes, Emissions of formaldehyde and carbonyls**

| CAS-no. | Compound | Conc. 3d [µg/m3] | Conc. 28d [µg/m3] | SER 3d [µg /(m2h)] | SER 28d [µg /(m2h)] | AgBB-LCI |
|---|---|---|---|---|---|---|
| 000050-00-0 | Formaldehyde | 8 | 10 | 8 | 10 | 100 |
| 000075-07-0 | Acetaldehyde | 25 | 19 | 25 | 19 | 300 |
| 000123-38-6 | Propanal | 7 | < 5 | 7 | < 5 | 750 |
| 000123-72-8 | Butanal | < 5 | < 5 | < 5 | < 5 | 650 |
| 000107-02-8 | Acrolein | < 5 | < 5 | < 5 | < 5 | 14 |

**Calculation of risk index (R), Evaluation of emissions of volatile compounds**

| **Parameter** | **Result** | **AgBB criteria** |
|---|---|---|
| $TVOC_{spez3}$[2][mg/m³] | 0.093 | ≤ 10 |
| $TVOC_{spez28}$[2] [mg/m³] | 0.072 | ≤ 1.0 |
| $Carcinogens_3$[3] [mg/m³] | < 0.001 | ≤ 0.01 |
| $Carcinogens_{28}$[3] [mg/m³] | < 0.001 | ≤ 0.001 |
| $TSVOC_{28}$ [mg/m³] | < 0.005 | ≤ 0.1 |
| $\sum VOC_{28}$ (Non-LCI) [mg/m³] | < 0.001 | ≤ 0.1 |
| $R\text{-value}_{28}$ | 0.24 | ≤1 |

*Further information on how the tests are conducted, as well as more details about the results, can be provided by Convert A/S upon request.*

**Soil and water**

*The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.*

# References

| | |
|---|---|
| **Publisher** | epddanmark<br>www.epddanmark.dk<br>Template version 2024.1 |
| **Programme operator** | Danish Technological Institute<br>Gregersensvej<br>DK-2630 Taastrup<br>www.teknologisk.dk |
| **LCA-practitioner** | *Jonas Bak Christensen & Simon Mayall*<br>*Quantified Impacts ApS*<br>*Gammel Køge Landevej 55*<br>*DK-2500 Valby*<br>*www.quantifiedimpacts.com* |
| **LCA software /background data** | *openLCA 2.0.4*<br>*Ecoinvent v3.10 EN 15804*<br><br>*EN 15804 reference package 3.1* |
| **3rd party verifier** | *David Althoff Palm*<br>*Dalemarken AB*<br>*david@dalemarken.dk*<br>*www.dalemarken.dk* |

**General programme instructions**
General Programme Instructions, version 2.0, spring 2020
www.epddanmark.dk

**EN 15804**
DS/EN 15804 + A2:2019 - ”Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products”

**EN 16485**
DS/EN 16485:2014 – “Round and sawn timber – Environmental Product Declarations – Product category rules for wood and wood-based products for use in construction”