

Type III Environmental Declaration – Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 + A2

## Cement-bonded particleboards CETRIS®



### Company

**CIDEM Hranice, a.s. - CETRIS Division** is a producer of board material marketed under the CETRIS® cement-bonded particleboard trademark. The construction of a plant for manufacturing cement-bonded particleboard in the Czech Republic was initiated in 1987, and the plant was commissioned in 1991. In 2011, it was a full 20 years since the material was launched onto the market. During the first years of production, the range was limited to the basic CETRIS® BASIC board without a surface finish. Gradually, the product portfolio expanded, including a variety of services, such as cutting, milling, grinding, drilling, surface finish, etc. At present, we offer 17 types of cement-bonded particleboard and are continually developing new types to satisfy the needs and requirements of our customers. CIDEM Hranice, a.s. - CETRIS division is currently the largest producer of cement-bonded particleboards in Europe. The production line capacity is 55 000 m<sup>3</sup> per year.

## Product description

<b>Declared unit</b>	1 m <sup>3</sup> of Cement bonded particleboards
<b>UN CPC</b>	375 Articles of concrete, cement and plaster 3752 Boards, blocks and similar articles of vegetable fibre, straw or wood waste agglomerated with mineral binders
<b>This EPD is valid for the following products:</b>	Cement-bonded particle board CETRIS - basic Cement-bonded particle board CETRIS - custom-made Cement-bonded particle board CETRIS - painted, without other services Cement-bonded particle board CETRIS - painted, with other services

CETRIS® BASIC is cement-bonded particleboard with the smooth naturally cement-grey surface. It is produced by pressing a mixture of wood chips (63% by volume), Portland cement (25% vol.), water (10% vol), and hydration additives (2% by volume); it is available in standard thicknesses of 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, and 32 mm. Upon prior agreement, it is also possible to deliver the following thicknesses: 34, 36, 38 and 40 mm. The basic size of the board is 3 350 x 1 250 mm. We deliver the boards cut to the sizes specified by the customer, with a rounded edge or chamfered edge to 45° angle, milled starting from the 12-mm thickness with half-groove, beginning from the 16-mm thickness with tongue and groove. The boards may also be delivered with pre-drilled holes. The cement-bonded particleboard is used mainly as a structural material in cases where moisture resistance, strength, fire resistance, ecological and hygienic harmlessness are required at the same time. CETRIS® Boards do not contain either asbestos or formaldehyde; they are resistant to insects and mould exposure. They are fireproof and can provide sound insulation. The boards can be worked with conventional woodworking tools.

CETRIS® cement-bonded particleboards are non-structural elements used for internal or external applications in dry or humid conditions (thickness < 16,0 mm) and structural elements used for internal or external applications in dry or humid conditions (thickness ≥ 16,0 mm). The boards can be used in wall and floor structures, in fire-resistant applications and as façade and balcony boards.

## System boundary and production process

The system boundary is "Cradle to gate" with modules C1–C4 and module D (A1–A3 + C + D). It covers the production of raw materials, all relevant transport down to factory gate and manufacturing by CIDEM Hranice, a.s. deconstruction, transport on landfill and landfilling. The review framework comprises the following details:

- Raw materials acquisition and transport,
- Further processing of raw materials,
- Production operations,
- Energy and water consumption,
- Waste management,
- Packaging of the final product for delivery,
- Typical deconstruction using heavy equipment,
- Transport and landfilling.

<b>Reference service life:</b>	The <b>reference service life</b> is the same as the building.
<b>Time representativeness:</b>	Specific data about the manufacturer were based on the 1-year average (the reference year 2019). Time scope less than 10-years were applied for background data.

<b>Cut off rules:</b>	The cut-off criterion was chosen based on the used PCR. According to the used PCR, more than 95 % of flows were included.
<b>Database(s) and LCA software used:</b>	GaBi software, GaBi database and EcolInvent database
<b>Allocations:</b>	As a general allocation rule, allocation on 1 m <sup>3</sup> of the product was chosen. No secondary material and/or fuels used in production.
<b>Geographical scope:</b>	Europe, Global

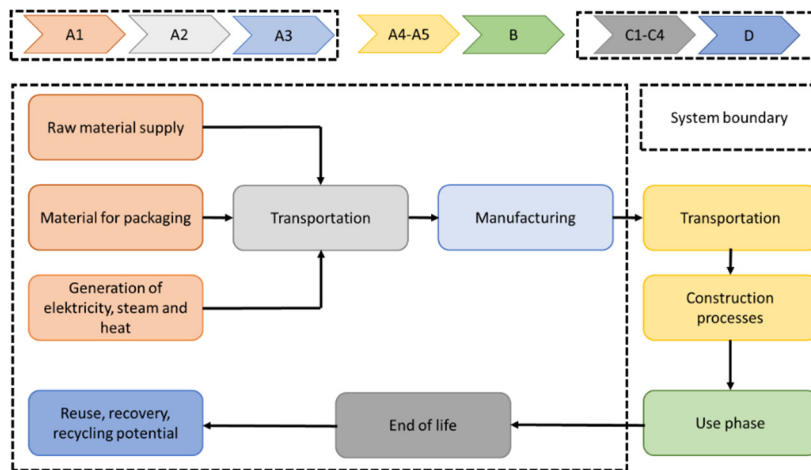


Figure 1 System Boundary of the LCA study conducted on CIDEM Hranice, a.s cement-bonded particleboard

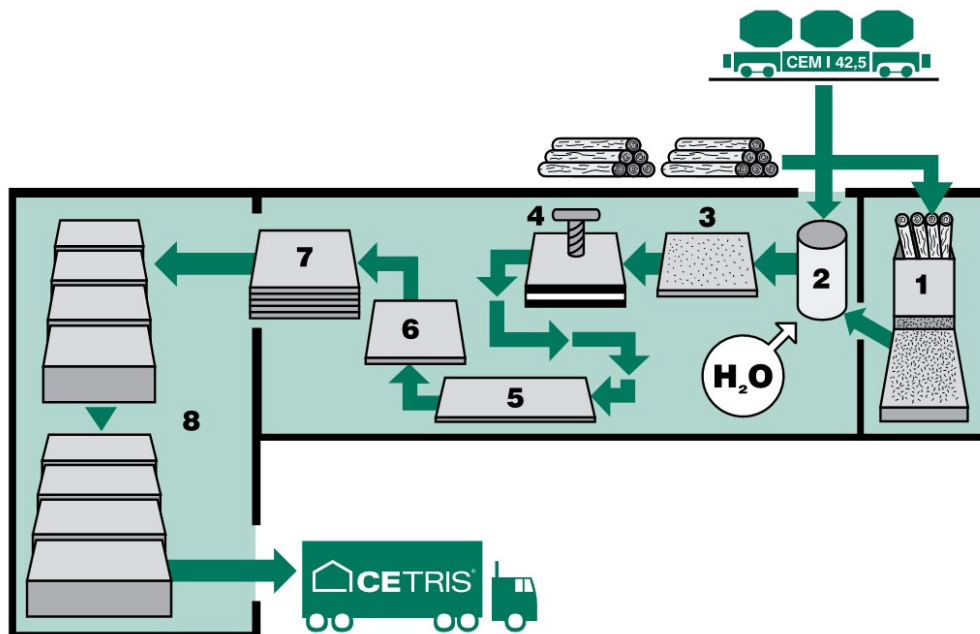


Figure 2 Production flow-chart of CIDEM Hranice, a.s cement-bonded particleboard: 1 spilling; 2 preparation of mixture; 3 layering of boards; 4 pressing; 5 drying; 6 formatting; 7 storage; 8 transport

*Table 1 Description of the system boundary (D = Declared, Included in LCA, ND = Module Not Declared)*

A1 - A3 Product stage	Raw material supply	A1	D
	Transport	A2	D
	Manufacturing	A3	D
A4 - A5 Construction process	Transport from the gate to the site	A4	ND
	Assembly	A5	ND
B1 - B7 Use stage	Use	B1	ND
	Maintenance	B2	ND
	Repair	B3	ND
	Replacement	B4	ND
	Refurbishment	B5	ND
	Operational water use	B6	ND
	Operational energy use	B7	ND
C1 - C4 End of life stage	De-construction	C1	D
	Transport	C2	D
	Waste processing	C3	D
	Disposal	C4	D
D Benefits and loads beyond the system boundaries	Reuse- Recycling - Recovery Potential	D	D

## Content declaration

The CIDEM Hranice, a.s cement-bonded particleboards consists of Portland cement and a mixture of wooden chips. All of the constituents of cement-bonded particleboard are not classified as harmful, nor are listed on the list of Substances of Very High Concern (SVHC).

*Table 2 Product content declaration*

All materials/components	Substances	Volume %	CAS number	Environmental class	Health class
Mixture of wood chips	-	63	-	No	No
Portland cement	-	25	-	No	No
Water	-	10	-	No	No
Hydration additives	-	2	-	No	No

## Environmental performance

Environmental indicators shown below are calculated according to ISO 14025 and EN 15804+A2:2019. Results per declared unit – 1 m<sup>3</sup> of cement-bonded particleboard are presented.

## Use of resources

Following table represents Life Cycle Inventory Analysis indicator results.

*Table 3 Resource use. Summarization of modules A1 – A3, C1-C4 a D.*

Resource consumption	Unit	CETRIS Basic	CETRIS custom made	CETRIS painted, without other services	CETRIS painted, with additional services
Crude oil	MJ	1143	1254	1607	1718
Hard coal	MJ	914	1017	1749	1852
Lignite	MJ	1344	1503	3319	3478
Natural gas	MJ	696	770	1540	1614
Soil	Kg	138	153	149	164
Clay	Kg	91	102	95	106
Gravel	Kg	90	100	90	100
Inert rock	Kg	1676	1874	4059	4256
Limestone (calcium carbonate)	Kg	1253	1393	1323	1462
Natural Aggregate	Kg	129	143	132	146

## Potential environmental impacts

Environmental impacts per declared unit for each module are reported in the following tables.

In the tables, following abbreviations are used:

- 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 nonrenewable primary energy resources used as raw materials,
- PENRT: Total use of non-renewable primary energy.

Table 4 CETRIS boards basic: Parameters describing environmental impact

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
Climate change - total	kg CO <sub>2</sub> eq.	-1.92E+01	1.08E+01	9.92E-01	8.40E-01	1.05E+01	0.00E+00	1.89E+01	0.00E+00
Climate change - fossil	kg CO <sub>2</sub> eq.	8.01E+02	1.07E+01	-5.59E+00	8.71E-01	1.04E+01	0.00E+00	2.05E+01	0.00E+00
Climate change - biogenic	kg CO <sub>2</sub> eq.	-8.21E+02	-1.81E-02	6.59E+00	-3.83E-02	-1.76E-02	0.00E+00	-1.62E+00	0.00E+00
Climate change - land use and land use change	kg CO <sub>2</sub> eq.	3.82E-01	8.73E-02	-1.13E-02	6.77E-03	8.48E-02	0.00E+00	5.90E-02	0.00E+00
Ozone Depletion	kg CFC 11 eq.	8.31E-06	1.98E-15	8.63E-13	1.53E-16	1.92E-15	0.00E+00	7.67E-14	0.00E+00
Acidification	mol H <sup>+</sup> eq.	1.32E+00	6.27E-02	2.47E-02	4.27E-03	6.04E-02	0.00E+00	1.47E-01	0.00E+00
Eutrophication aquatic freshwater	kg P eq.	1.90E-02	3.28E-05	6.76E-05	2.55E-06	3.19E-05	0.00E+00	3.53E-05	0.00E+00
Eutrophication aquatic marine	kg N eq.	3.50E-01	3.02E-02	2.33E-02	1.98E-03	2.91E-02	0.00E+00	3.78E-02	0.00E+00
Eutrophication terrestrial	mol N eq.	3.81E+00	3.35E-01	2.51E-01	2.19E-02	3.22E-01	0.00E+00	4.16E-01	0.00E+00
Photochemical ozone formation	kg NMVOC eq.	1.31E+00	5.84E-02	6.73E-02	5.54E-03	5.63E-02	0.00E+00	1.15E-01	0.00E+00
Depletion of abiotic resources - minerals and metals	kg Sb eq.	4.42E-04	8.72E-07	-1.94E-04	6.76E-08	8.47E-07	0.00E+00	1.85E-06	0.00E+00
Depletion of abiotic resources - fossil fuels	MJ, net calorific value	4.34E+03	1.44E+02	-7.12E+01	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
Water use	m <sup>3</sup> world eq. deprived	3.68E+03	1.05E-01	1.98E+00	8.15E-03	1.02E-01	0.00E+00	2.14E+00	0.00E+00
Particulate matter emissions	Disease incidence	2.22E-05	2.30E-07	-4.29E-07	4.81E-08	2.28E-07	0.00E+00	1.82E-06	0.00E+00
Ionizing radiation, human health	kBq U235 eq.	2.72E+01	3.93E-02	-1.98E-02	3.05E-03	3.81E-02	0.00E+00	3.03E-01	0.00E+00
Ecotoxicity (freshwater)	CTUe	1.45E+04	1.08E+02	-3.35E+01	8.35E+00	1.05E+02	0.00E+00	1.53E+02	0.00E+00
Human toxicity, cancer effects	CTUh	3.90E-07	2.23E-09	-1.41E-09	1.73E-10	2.16E-09	0.00E+00	2.27E-08	0.00E+00
Human toxicity, noncancer effects	CTUh	7.59E-06	1.20E-07	1.48E-06	1.02E-08	1.17E-07	0.00E+00	2.51E-06	0.00E+00
Land use related impacts / soil quality	Pt	4.71E+04	5.05E+01	-9.91E+00	3.92E+00	4.90E+01	0.00E+00	5.85E+01	0.00E+00

Table 5 CETRIS boards basic: Parameters describing resource use, waste and outputs flows

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	1.03E+04	8.32E+00	-1.48E+01	6.45E-01	8.08E+00	0.00E+00	3.53E+01	0.00E+00
PERM	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
PERT	MJ	1.03E+04	8.32E+00	-1.48E+01	6.45E-01	8.08E+00	0.00E+00	3.53E+01	0.00E+00
PENRE	MJ	4.34E+03	1.44E+02	-7.13E+01	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
PENRM	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
PENRT	MJ	4.34E+03	1.44E+02	-7.13E+01	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
Use of secondary material	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
Use of renewable secondary fuels	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
Use of non-renewable secondary fuels	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
Water	m <sup>3</sup>	8.65E+01	9.69E-03	6.28E-03	7.52E-04	9.41E-03	0.00E+00	6.76E-02	0.00E+00
Hazardous waste disposed	kg	9.49E-06	6.68E-06	-1.96E-07	5.18E-07	6.49E-06	0.00E+00	4.10E-06	0.00E+00
Non hazardous waste disposed	kg	5.50E+00	2.29E-02	7.47E+00	1.78E-03	2.22E-02	0.00E+00	1.35E+03	0.00E+00
Radioactive waste disposed	kg	2.52E-01	2.66E-04	-2.47E-04	2.06E-05	2.59E-04	0.00E+00	3.01E-03	0.00E+00
Components for reuse	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
Material for recycling	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
Material for energy recovery	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
Exported energy electrical	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
Exported energy thermal	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

Table 6 CETRIS boards custom made: Parameters describing environmental impact

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
Climate change - total	kg CO <sub>2</sub> eq.	-1.75E+01	1.20E+01	3.67E+00	8.40E-01	1.05E+01	0.00E+00	1.89E+01	0.00E+00
Climate change - fossil	kg CO <sub>2</sub> eq.	8.91E+02	1.19E+01	-3.47E+00	8.71E-01	1.04E+01	0.00E+00	2.05E+01	0.00E+00
Climate change - biogenic	kg CO <sub>2</sub> eq.	-9.09E+02	-2.01E-02	7.14E+00	-3.83E-02	-1.76E-02	0.00E+00	-1.62E+00	0.00E+00
Climate change - land use and land use change	kg CO <sub>2</sub> eq.	4.27E-01	9.70E-02	-2.21E-03	6.77E-03	8.48E-02	0.00E+00	5.90E-02	0.00E+00
Ozone Depletion	kg CFC 11 eq.	9.20E-06	2.20E-15	9.67E-13	1.53E-16	1.92E-15	0.00E+00	7.67E-14	0.00E+00
Acidification	mol H <sup>+</sup> eq.	1.47E+00	6.96E-02	4.65E-02	4.27E-03	6.04E-02	0.00E+00	1.47E-01	0.00E+00
Eutrophication aquatic freshwater	kg P eq.	2.09E-02	3.65E-05	8.04E-05	2.55E-06	3.19E-05	0.00E+00	3.53E-05	0.00E+00
Eutrophication aquatic marine	kg N eq.	3.89E-01	3.36E-02	3.14E-02	1.98E-03	2.91E-02	0.00E+00	3.78E-02	0.00E+00
Eutrophication terrestrial	mol N eq.	4.23E+00	3.72E-01	3.40E-01	2.19E-02	3.22E-01	0.00E+00	4.16E-01	0.00E+00
Photochemical ozone formation	kg NMVOC eq.	1.45E+00	6.49E-02	9.00E-02	5.54E-03	5.63E-02	0.00E+00	1.15E-01	0.00E+00
Depletion of abiotic resources - minerals and metals	kg Sb eq.	4.90E-04	9.69E-07	-2.15E-04	6.76E-08	8.47E-07	0.00E+00	1.85E-06	0.00E+00
Depletion of abiotic resources - fossil fuels	MJ, net calorific value	4.83E+03	1.60E+02	-4.30E+01	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
Water use	m <sup>3</sup> world eq. deprived	4.03E+03	1.17E-01	2.44E+00	8.15E-03	1.02E-01	0.00E+00	2.14E+00	0.00E+00
Particulate matter emissions	Disease incidence	2.46E-05	2.55E-07	-2.65E-07	4.81E-08	2.28E-07	0.00E+00	1.82E-06	0.00E+00
Ionizing radiation, human health	kBq U235 eq.	3.02E+01	4.36E-02	1.34E-02	3.05E-03	3.81E-02	0.00E+00	3.03E-01	0.00E+00
Ecotoxicity (freshwater)	CTUe	1.60E+04	1.20E+02	-1.55E+01	8.35E+00	1.05E+02	0.00E+00	1.53E+02	0.00E+00
Human toxicity, cancer effects	CTUh	4.32E-07	2.47E-09	1.06E-09	1.73E-10	2.16E-09	0.00E+00	2.27E-08	0.00E+00
Human toxicity, noncancer effects	CTUh	8.42E-06	1.33E-07	1.93E-06	1.02E-08	1.17E-07	0.00E+00	2.51E-06	0.00E+00
Land use related impacts / soil quality	Pt	5.22E+04	5.61E+01	-2.33E+00	3.92E+00	4.90E+01	0.00E+00	5.85E+01	0.00E+00



Table 7 CETRIS boards custom made: Parameters describing resource use, waste and outputs flows

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	1.15E+04	9.24E+00	1.21E+01	6.50E-01	8.08E+00	0.00E+00	3.53E+01	0.00E+00
PERM	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
PERT	MJ	1.15E+04	9.24E+00	1.21E+01	6.50E-01	8.08E+00	0.00E+00	3.53E+01	0.00E+00
PENRE	MJ	4.83E+03	1.60E+02	4.31E+01	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
PENRM	MJ	3.66E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	4.83E+03	1.60E+02	4.31E+01	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
Use of secondary material	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
Use of renewable secondary fuels	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
Use of non-renewable secondary fuels	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
Water	m <sup>3</sup>	9.47E+01	1.08E-02	1.49E-02	8.00E-04	9.40E-03	0.00E+00	6.76E-02	0.00E+00
Hazardous waste disposed	kg	1.05E-05	7.42E-06	5.26E-07	5.18E-07	6.49E-06	0.00E+00	4.10E-06	0.00E+00
Non hazardous waste disposed	kg	6.12E+00	2.54E-02	1.59E+02	1.78E-03	2.22E-02	0.00E+00	1.35E+03	0.00E+00
Radioactive waste disposed	kg	2.82E-01	3.00E-04	7.25E-05	2.06E-05	2.60E-04	0.00E+00	3.00E-03	0.00E+00
Components for reuse	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
Material for recycling	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
Materials for energy recovery	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
Exported energy electrical	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
Exported energy thermal	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

Table 8 CETRIS boards painted (without services): Parameters describing environmental impact

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
Climate change - total	kg CO <sub>2</sub> eq.	3.03E+02	1.12E+01	6.39E+01	8.40E-01	1.05E+01	0.00E+00	1.89E+01	0.00E+00
Climate change - fossil	kg CO <sub>2</sub> eq.	1.12E+03	1.11E+01	5.71E+01	8.71E-01	1.04E+01	0.00E+00	2.05E+01	0.00E+00
Climate change - biogenic	kg CO <sub>2</sub> eq.	-8.20E+02	-2.28E-02	6.70E+00	-3.83E-02	-1.76E-02	0.00E+00	-1.62E+00	0.00E+00
Climate change - land use and land use change	kg CO <sub>2</sub> eq.	7.27E-01	9.11E-02	1.85E-02	6.77E-03	8.48E-02	0.00E+00	5.90E-02	0.00E+00
Ozone Depletion	kg CFC 11 eq.	8.34E-06	2.07E-15	2.29E-10	1.53E-16	1.92E-15	0.00E+00	7.67E-14	0.00E+00
Acidification	mol H <sup>+</sup> eq.	2.15E+00	6.49E-02	2.21E-01	4.27E-03	6.04E-02	0.00E+00	1.47E-01	0.00E+00
Eutrophication aquatic freshwater	kg P eq.	1.98E-02	3.43E-05	1.37E-04	2.55E-06	3.19E-05	0.00E+00	3.53E-05	0.00E+00
Eutrophication aquatic marine	kg N eq.	5.09E-01	3.13E-02	9.13E-02	1.98E-03	2.91E-02	0.00E+00	3.78E-02	0.00E+00
Eutrophication terrestrial	mol N eq.	5.50E+00	3.46E-01	9.88E-01	2.19E-02	3.22E-01	0.00E+00	4.16E-01	0.00E+00
Photochemical ozone formation	kg NMVOC eq.	1.77E+00	6.05E-02	2.62E-01	5.54E-03	5.63E-02	0.00E+00	1.15E-01	0.00E+00
Depletion of abiotic resources - minerals and metals	kg Sb eq.	4.84E-04	9.10E-07	-1.89E-04	6.76E-08	8.47E-07	0.00E+00	1.85E-06	0.00E+00
Depletion of abiotic resources - fossil fuels	MJ, net calorific value	9.01E+03	1.50E+02	5.78E+02	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
Water use	m <sup>3</sup> world eq. deprived	3.69E+03	1.10E-01	3.67E+00	8.15E-03	1.02E-01	0.00E+00	2.14E+00	0.00E+00
Particulate matter emissions	Disease incidence	3.57E-05	2.39E-07	1.56E-06	4.81E-08	2.28E-07	0.00E+00	1.82E-06	0.00E+00
Ionizing radiation, human health	kBq U235 eq.	5.81E+01	4.10E-02	1.12E+00	3.05E-03	3.81E-02	0.00E+00	3.03E-01	0.00E+00
Ecotoxicity (freshwater)	CTUe	1.65E+04	1.12E+02	2.38E+02	8.35E+00	1.05E+02	0.00E+00	1.53E+02	0.00E+00
Human toxicity, cancer effects	CTUh	5.09E-07	2.32E-09	2.34E-06	1.73E-10	2.16E-09	0.00E+00	2.27E-08	0.00E+00
Human toxicity, noncancer effects	CTUh	1.97E-05	1.25E-07	2.76E-04	1.02E-08	1.17E-07	0.00E+00	2.51E-06	0.00E+00
Land use related impacts / soil quality	Pt	4.84E+04	5.27E+01	4.80E+01	3.92E+00	4.90E+01	0.00E+00	5.85E+01	0.00E+00

Table 9 CETRIS boards painted (without services): Parameters describing resource use, waste and outputs flows

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	1.12E+04	8.68E+00	5.49E+01	6.45E-01	8.08E+00	0.00E+00	3.53E+01	0.00E+00
PERM	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
PERT	MJ	1.12E+04	8.68E+00	5.49E+01	6.45E-01	8.08E+00	0.00E+00	3.53E+01	0.00E+00
PENRE	MJ	9.01E+03	1.51E+02	5.79E+02	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
PENRM	MJ	3.30E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	9.01E+03	1.51E+02	5.79E+02	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
Use of secondary material	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
Use of renewable secondary fuels	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
Use of non-renewable secondary fuels	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
Water	m <sup>3</sup>	8.79E+01	1.01E-02	1.19E-01	7.52E-04	9.41E-03	0.00E+00	6.76E-02	0.00E+00
Hazardous waste disposed	kg	1.70E-01	6.97E-06	6.14E-05	5.18E-07	6.49E-06	0.00E+00	4.10E-06	0.00E+00
Non hazardous waste disposed	kg	1.34E+01	2.39E-02	8.34E+01	1.78E-03	2.22E-02	0.00E+00	1.35E+03	0.00E+00
Radioactive waste disposed	kg	7.13E-01	2.78E-04	1.31E-02	2.06E-05	2.59E-04	0.00E+00	3.01E-03	0.00E+00
Components for reuse	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
Material for recycling	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
Material for energy recovery	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
Exported energy electrical	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
Exported energy thermal	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

Table 10 CETRIS boards painted, with other services: Parameters describing environmental impact

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
Climate change - total	kg CO <sub>2</sub> eq.	3.05E+02	1.23E+01	6.65E+01	8.40E-01	1.05E+01	0.00E+00	1.89E+01	0.00E+00
Climate change - fossil	kg CO <sub>2</sub> eq.	1.21E+03	1.23E+01	5.93E+01	8.71E-01	1.04E+01	0.00E+00	2.05E+01	0.00E+00
Climate change - biogenic	kg CO <sub>2</sub> eq.	-9.09E+02	-2.07E-02	7.25E+00	-3.83E-02	-1.76E-02	0.00E+00	-1.62E+00	0.00E+00
Climate change - land use and land use change	kg CO <sub>2</sub> eq.	7.71E-01	1.00E-01	2.83E-02	6.77E-03	8.48E-02	0.00E+00	5.90E-02	0.00E+00
Ozone Depletion	kg CFC 11 eq.	9.23E-06	2.27E-15	2.29E-10	1.53E-16	1.92E-15	0.00E+00	7.67E-14	0.00E+00
Acidification	mol H <sup>+</sup> eq.	2.29E+00	7.18E-02	2.43E-01	4.27E-03	6.04E-02	0.00E+00	1.47E-01	0.00E+00
Eutrophication aquatic freshwater	kg P eq.	2.17E-02	3.76E-05	1.50E-04	2.55E-06	3.19E-05	0.00E+00	3.53E-05	0.00E+00
Eutrophication aquatic marine	kg N eq.	5.48E-01	3.46E-02	9.94E-02	1.98E-03	2.91E-02	0.00E+00	3.78E-02	0.00E+00
Eutrophication terrestrial	mol N eq.	5.92E+00	3.83E-01	1.08E+00	2.19E-02	3.22E-01	0.00E+00	4.16E-01	0.00E+00
Photochemical ozone formation	kg NMVOC eq.	1.91E+00	6.70E-02	2.85E-01	5.54E-03	5.63E-02	0.00E+00	1.15E-01	0.00E+00
Depletion of abiotic resources - minerals and metals	kg Sb eq.	5.33E-04	9.99E-07	-2.10E-04	6.76E-08	8.47E-07	0.00E+00	1.85E-06	0.00E+00
Depletion of abiotic resources - fossil fuels	MJ, net calorific value	9.50E+03	1.65E+02	6.07E+02	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
Water use	m <sup>3</sup> world eq. deprived	4.04E+03	1.21E-01	4.13E+00	8.15E-03	1.02E-01	0.00E+00	2.14E+00	0.00E+00
Particulate matter emissions	Disease incidence	3.82E-05	2.64E-07	1.72E-06	4.81E-08	2.28E-07	0.00E+00	1.82E-06	0.00E+00
Ionizing radiation, human health	kBq U235 eq.	6.11E+01	4.50E-02	1.15E+00	3.05E-03	3.81E-02	0.00E+00	3.03E-01	0.00E+00
Ecotoxicity (freshwater)	CTUe	1.80E+04	1.23E+02	2.57E+02	8.35E+00	1.05E+02	0.00E+00	1.53E+02	0.00E+00
Human toxicity, cancer effects	CTUh	5.51E-07	2.55E-09	2.34E-06	1.73E-10	2.16E-09	0.00E+00	2.27E-08	0.00E+00
Human toxicity, noncancer effects	CTUh	2.06E-05	1.38E-07	2.76E-04	1.02E-08	1.17E-07	0.00E+00	2.51E-06	0.00E+00
Land use related impacts / soil quality	Pt	5.34E+04	5.79E+01	5.60E+01	3.92E+00	4.90E+01	0.00E+00	5.85E+01	0.00E+00

Table 11 CETRIS boards painted with other services: Parameters describing resource use, waste and outputs flows

Parameter	Unit	A1	A2	A3	C1	C2	C3	C4	D
PERE	MJ	1.23E+04	9.54E+00	5.76E+01	6.45E-01	8.08E+00	0.00E+00	3.53E+01	0.00E+00
PERM	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
PERT	MJ	1.23E+04	9.54E+00	5.76E+01	6.45E-01	8.08E+00	0.00E+00	3.53E+01	0.00E+00
PENRE	MJ	9.50E+03	1.66E+02	6.08E+02	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
PENRM	MJ	3.66E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	9.50E+03	1.66E+02	6.08E+02	1.12E+01	1.40E+02	0.00E+00	2.69E+02	0.00E+00
Use of secondary material	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
Use of renewable secondary fuels	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
Use of non-renewable secondary fuels	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
Water	m <sup>3</sup>	9.61E+01	1.11E-02	1.28E-01	7.52E-04	9.41E-03	0.00E+00	6.76E-02	0.00E+00
Hazardous waste disposed	kg	1.70E-01	7.66E-06	6.22E-05	5.18E-07	6.49E-06	0.00E+00	4.10E-06	0.00E+00
Non hazardous waste disposed	kg	1.40E+01	2.62E-02	2.34E+02	1.78E-03	2.22E-02	0.00E+00	1.35E+03	0.00E+00
Radioactive waste disposed	kg	7.44E-01	3.05E-04	1.34E-02	2.06E-05	2.59E-04	0.00E+00	3.01E-03	0.00E+00
Components for reuse	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
Material for recycling	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
Materials for energy recovery	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
Exported energy electrical	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
Exported energy thermal	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

## Release of dangerous substances during the use stage

No health and environmental impacts during use is observed.

### **Additional information**

In CIDEM Hranice, a.s. - CETRIS division continuous attention is paid to the quality of our products. Already back in 1996 we obtained the EU ISO 9002 quality certificate awarded by the international accredited certification body, Lloyd's Register Quality Assurance. After a new standard was published, this system was recertified in 2003 according to the new ISO 9001 standard. The production of CETRIS® cement-bonded particleboard is further supervised by authorized and notified entities. The company exports the products to all of Europe. The cement-bonded particleboard is certified according to European harmonized standards.

Company has established and applied a combined management system for development, production, sales and services of its products.

Obtained certificates EN ISO 9001, and the commitment of the whole company's staff to quality give the customers a guarantee of a standard quality of products.

Positive attitude to the environment of CIDEM Hranice, a.s. is also declared by the certificate of PEFC obtained according to TD CFCS 2002:2013, ensuring that all wood matter used in CIDEM Hranice originated from verified resources.

For recommended use of cement-bonded particleboards follow <http://www.cidem.cz>. After the end of life, it is possible to deposit particle boards as common non-hazardous waste.

## Verification related information

See PCR for detailed requirements.

Published:	1.10.2020
Valid until:	31.09.2025
Product Category Rules:	EN 15804+ A2:2019 Sustainability of Construction Works: Environmental Product Declarations core rules for the product category of construction products
Product group classification:	375 Articles of concrete, cement and plaster 3752 Boards, blocks and similar articles of vegetable fibre, straw or wood waste agglomerated with mineral binders
Reference year for data:	2019
Geographical scope:	Europe, Global

Independent verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD Process Certification (internal) <input checked="" type="checkbox"/> EPD Verification (external)
Third-party verifier: Hüdai Kara, Metsims Sustainability Consulting, United Kingdom, <a href="http://www.metsims.com">www.metsims.com</a>

## Mandatory statements

The LCA for this EPD is conducted according to the guidelines of ISO 14040 and ISO 14044, the requirements given in the EN 15804+ A2:2019 Sustainability of Construction Works: Environmental Product Declarations core rules for the product category of construction products.

The inventory for the LCA study is based on the 2019 production. The production plant is located in Hranice, Czech Republic. For the development of this declaration, GaBi software with the latest version characterization factors (August 2020) and the Ecoinvent database was used.

EPD of construction products may not be comparable if they do not comply with EN 15804.

This EPD covers the Cradle to Gate stage and modules C1-C4 and D.

The EPD certificate, its background data and the results will be used for business-to-business communications and are expected to be a reliable document for green building designers, architectures, manufacturers of construction products and the other stakeholders in the construction sector to understand the potential environmental impacts caused by in CIDEM Holding.

"EPDs within the same product category but from different programmes may not be comparable."

## Contact information:

EPD owner:	CIDEM Hranice, a.s. Skalní 1088, Hranice I – Město, 753 01 Hranice, Czech Republic, <a href="http://www.cidem.cz">www.cidem.cz</a> Contact person: Ing. Marie Libosvárová	
LCA author:	 Vladimír Kočí, PhD, Šárecká 5, 16000 Prague 6, Czech Republic <a href="http://www.lcastudio.cz">www.lcastudio.cz</a>	



## References

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

ISO 14025: DIN EN ISO 14025:2006-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

ISO 14040: EN ISO 14040:2006-10 Environmental management — Life cycle assessment — Principles and framework

ISO 14044: 2006 Environmental management — Life cycle assessment — Requirements and guidelines

Ecoinvent: Ecoinvent Centre, [www.Eco-invent.org](http://www.Eco-invent.org)

Thinkstep: GaBi software version 9.5, 2020, Sphera solutions.