Environmental Product Declaration

In accordance with the EN 15804 +A2 and the NMD Bepalingsmethode, v2.0

Elka particle board standard, esb and esb Plus

Scope of the declaration

Type of the EPD is Cradle to grave, including modules A-D

According to the EN 15804 +A2 and the NMD Bepalingsmethode, version 2.0

The LCA was carried out by Agrodome B.V. (NL)

Based on production data provided by Elka-Holzwerke GmbH

Release date: 22 July 2026

Validity: 5 years

Functional unit: 1 m^2

Goal and target group

Goal

The declaration covers the environmental effects throughout the lifetime of the product: Elka particle board standard, esb and esb Plus.

Target audience

The EPD can be used for building or building part level assessments by designers, architects, constructors, developers etc. The EPD is made business-to-business communication and can be used for business-to-consumer communication purposes. The background EPD report is third party verified.

Product description

Elka particle boards are panel-shaped and made from wood-based materials, mainly from spruce wood. They are available with blunt edges or with tongue and groove profile. They consist mainly of small-sized wood particles such as chips and sawdust, pressed together adding duroplastic adhesives. They are not coated.

This LCA is made for general particle boards, esb Standard and esb Plus. The production process for all particle boards is similar; differences are achieved by different glue mixtures and applying different pressures with heat. The low formaldehyde content in esb Plus is achieved by different additives and stocking the panels for a longer period. This LCA is based on annual figures for wood inputs, glues, additives, and energy, averaged over the total production.

EU regulation no. /305/2011/ of the European Parliament and Council of 9th March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC applies for putting the product on the market in the EU/EFTA (with the exception of Switzerland). The required declarations of performance and CE labelling were produced in accordance with the specifications of the harmonised standard /EN 13986:2004+A1:2015/, Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking.

Function of the product

The esb board type P5 can be used for load-bearing purposes, is suitable for use in damp rooms and can be used for all common applications in the building sector. It can be used in ceiling, roof and wall construction. The particle boards can also be used in decorative interior design, exhibition stands and shop construction.

Composition of Elka particle board

Material	Share
Wood (dry matter)	82,1%
UF – MUF	10,7%
Hardener, fire retardants, other additives	1,2%
Moisture content	6,0%

Table 1: Composition Elka particle board

Technical data Elka particle board

Name	Value
Width	200 – 2100 mm
Length	200 – 5500 mm
Thickness element	12 – 50 mm
Density	600-730 kg/m^3
Tensile strength (longitudal) to /EN 310/	7 – 22 N/mm^2
Tensile strength (longitudal) to /EN 319/	0,14 – 0,75 N/mm^2
Tensile strength (longitudal) to /EN 310/	1,2 – 3,35 N/mm^2
Material humidity on delivery /EN 322/	5 – 13%
Thermal conductivity /EN13986/	0,12
Water vapour diffusion resistance level	damp 80 dry 40
Sound absorption coefficient	0,1 – 0,25%
Formaldehyde emissions in accordance with EN 717-1	Requirement fulfilled

Table 2: Technical data Elka particle board

Environment and health during use phase

Elka particle boards do not contain concentrations of substances or materials listed in the 'Candidate List of Substances of Very High Concern for authorisation'.

Biogenic carbon storage

Biogenic carbon storage during the lifetime of the product is 266,8 kg C/m^3, which is equivalent to 978,27 kg CO2-eq./m^3. [1]

Biogenic content in Elka particle board, m^2

Biogenic carbon	Share biogenic carbon per m^2
Biogenic carbon in product	3,2 kg C
Biogenic carbon in packaging	0,001 kg C

Table 3: Biogenic content in Elka particle board, m^2

Certifications

Elka particle boards are certified with the following certificates:

- PEFC certificate DIN C-PEFC-COC-00341
- Blue Angel (esb Plus P5 Spanplatte, thickness 9 – 30 mm)

[1] Dry wood content of the product is 533,64 kg/m^3, with a biogenic carbon content of 533,64 / 2 = 266,82 kg C/m^3.

Scaling

Elka particle boards can basically be produced in many dimensions. Broadly speaking, they are proportionally scalable: the product is manufactured with the same composition independently of size.

The scaling factor is

$$\frac{thickness}{reference\ thickness} \times \frac{density}{reference\ density}$$

with *reference thickness* = 12 mm and *reference density* = 650 kg/m³.

LCA calculation rules

Functional unit

One square meter load bearing Elka particle board, type P5, with a lifespan of 75 years, with a thickness of 12 mm, a density of 650 kg/m³ and a weight of 7,8 kg/m².

Name	Value	Unit
Functional Unit	1,00	m²
Weight	7,8	kg/FU

CUAS (NL)

The CUAS-codes are used in the NMD to refer to the application. For Elka particle boards, the possible classifications are:

22.1 Binnenwanden; niet-constructief (interior wall; not structural)
22.2 Binnenwanden; constructie (interior wall; structural)
23.1 Vloeren; niet-constructief (floors; not structural)
23.2 Vloeren; constructief (floors; structural)
27.1 Daken; niet-constructief (roofs; not structural)
27.2 Daken; constructief (roofs; structural)

Reference Service Life

The lifespan of the product, as declared by the manufacturer, is 75 years when applied correctly. This corresponds to the lifespan of a residential building in the Netherlands. No maintenance is needed. Elka-Holzwerke does not have a take-back programme.

Comparability

A comparison or evaluation of EPD data is only possible if all datasets have been made in accordance with EN 15804 and the same product-related standard properties and modules have been taken into account.

System boundaries

The LCA study was created for 'Cradle to Grave A1-D' according to the modules below. All declared values relate to the specified functional unit. The functional unit of the European standard EN 15804 +A2 and the NMD - Bepalingsmethode 'Milieuprestatie Bouwwerken' are identical.
The environmental performance of building materials is categorized in four modules corresponding to

different lifecycle phases in the building material; Modules A (production of materials and construction), B (use phase), C (end-of-life phase of the building) and D (loads and benefits outside the system boundary); see Figure 1.

Product stage			Construction installation stage		Use stage							End of life stage					Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction installation stage	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal		Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☐	☐	☒	☒	☒	☒		☒

Figure 1: Calculated modules Elka particle board

For this LCA study, all modules A1-3, A4, A5, B, C and D have been examined, except B6 and B7.

Allocations

There are no allocations of co-products from the production of Elka particle boards.

Assumptions, omissions and deviations

Maintenance

Based on the information from the manufacturer, it is assumed that no structural maintenance is needed, provided that the panel is installed correctly.

Production process and Flowchart

The flowchart below shows the production process of Elka particle board including the inputs and outputs. This flowchart lists the entire production process starting with the delivery of the materials.

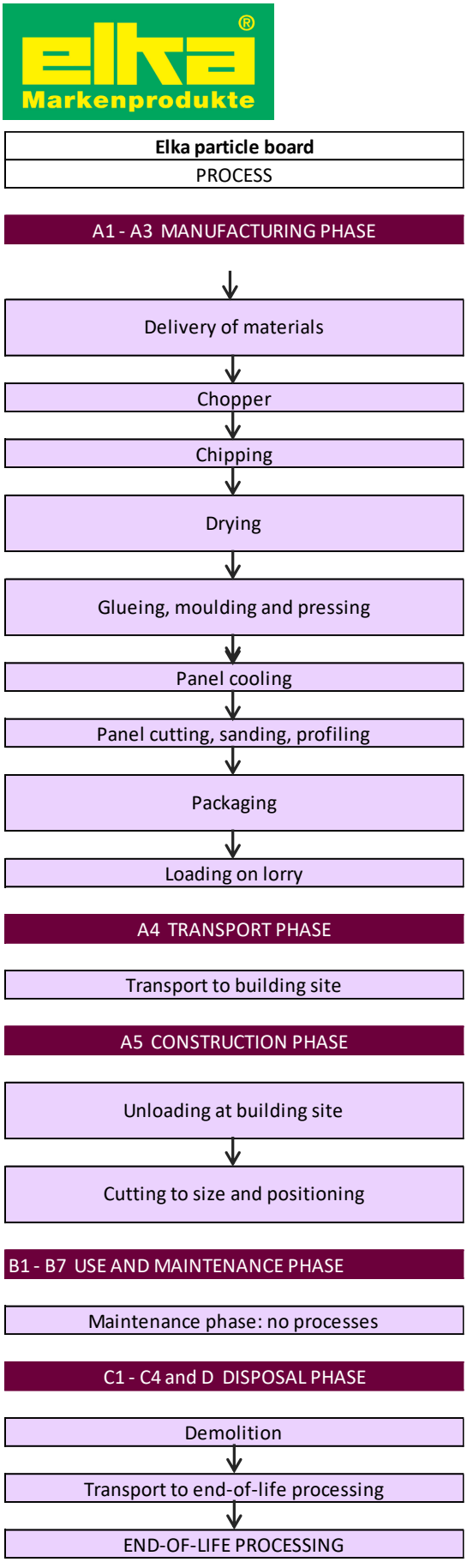

Figure 1: Flowchart Elka particle boards

Production phase (A1-3)

Material preparation

For particle board production, wood chips from the in-house sawmill, manufactured chips from offcuts of the sawmill, or purchased chips from other companies are used. Sawdust from the company's own sawmill and other companies is also used. These two components are pushed into the chip depth bunkers in the required/changing ratio. The chips and sawdust pass through a sieve, with the sawdust being sifted out and fed into a bunker (sawdust for top layers). Chips are introduced into the intermediate bunker of the ring chipper by means of a conveyor system. The chips then pass through the ring chippers, where they are chipped according to their required size. Post-consumer wood is shredded and exclusively used for thermal purposes, providing a significant portion of the company's energy needs.

Drying and sieving of the chips

The chip mixture (top layer/middle layer) is dried using two dryers. The achieved production process moisture content is u = 1,5 to 2%. Both drying systems are equipped with cyclones and scrubbers to meet the required emission values. The chips coming from the main dryer are processed through sieves, separating the material into five fractions: coarse material, coarse and fine middle layers, top layer, and combustion dust. Chips that are too coarse undergo re-chipping. The dust is used to heat the main dryer. The middle and top layer chips are conveyed to separate bunkers and made available for production.

Pressing of the boards

Each type of board has a specific pressing programme in which plate-specific parameters for production are set. These parameters of plate properties are clearly defined and ensure a consistently high quality of the products. The chipped and glued chips are fed into the press. Depending on the customer order, the glue recipe is adjusted. For this study, the average recipe is used.

The production of a 3-layer particleboard requires a combination of spreading processes. Spreading is done using three spreading machines, one for the lower top layer, one for the middle layer, and one for the upper top layer. The esb board, on the other hand, is a 1-layer particleboard. The feeding of the spreading units is done through a dosing bunker with a bottom conveyor belt and discharge rollers. The pressing of the board is done in two stages: pre-pressing and hot-pressing. The first stage consists of a continuously operating cold double-belt press, which aims to pre-compact the loose chip cake as much as possible; the hot press finally compacts the chip cake. The boards are pressed in a single-stage press and then dried on a star turner.

Finalisation

The particleboards coming from the climate control are fed to the sanding line using a forklift. Each particleboard is sanded. Depending on the order, the boards are equipped with a tongue and groove or fed to another cutting saw. After the production is completed, the boards are ready for loading.

Construction process phase (A4-5)

Transport to the building site (A4)

The finished product is transported from the production site in Germany to the Netherlands. To the transport movement from Germany to the Netherlands, no empty return applies. The default values from

the determination method version 2.0 are used for the transport to the building site, in this case Morbach to Utrecht.

Processing and construction on the construction site (A5)

At the construction site the particle board is fitted; for this only hand tools are used. During construction, 5% loss of material occurs. The additional production for this construction loss is included in Module A5.

Elka particle boards can be sawn, machined, planed, sanded and bored with normal machines. Recommendations for processing are available in the corresponding data sheets. Professional installation in accordance with constructional requirements must be ensured. When selecting additional products, it must be ensured that they do not have a negative effect on the environmental compatibility properties of the specified building products. Normal protective measures (dust mask, gloves, protective clothing, dust extraction) must be complied with when processing the products.

The wood fibre cut-offs and packaging materials (pallets, cardboard, PET and PE) are disposed of together with other building materials. In line with the NMD Bepalingsmethode (determination method), the following waste scenarios and processes were taken into account for the calculations:

- particle board: 5% landfill, 95% incineration
- pallets: 5% landfill, 80% incineration, 15% recycling
- cardboard: 15% landfill, 85% incineration
- PET band: 10% landfill, 85% incineration, 5% recycling
- PE foil: 10% landfill, 85% incineration, 5% recycling

Use phase (B1-7)

Elka particle board has a lifespan of 75 years when correctly applied in a building. During this period, no additional maintenance is needed.

No emissions occur in the use phase.

End-of-life phase (C1-4)

Disassembly and demolition (C1)

Disassembly and demolition takes place manually, there is no industrial process.

Transport (C2)

Transport phase assumptions: the default value according to the Bepalingsmethode 2.0 is used. This is 50 km to recycling or reuse, 100 km to landfill and 150 km to incineration. Selection of the means of transport according to the Bepalingsmethode version 2.0.

Waste treatment (C3-C4)

For waste processing, the distribution below and the scenarios chosen have been taken into account:

- particle board: 95% incineration and 5% landfill

Benefits and burdens outside the system boundary (D)

The benefits and burdens outside the system boundary relate to combustion in which energy use is avoided. Recycling and reuse are also part of the benefits and burdens outside the system boundary. The efficiency of heat and electricity recovery from waste material is 31% for heat and 18% for electricity, according to the fixed values in the NMD Bepalingsmethode.

Results EN 15804 Set +A2, per m² Elka particle board

Core Environmental Indicators per FU (m²) EN 15804 +A2, Elka particle board

Potential Environmental Impacts	Production			Construction process stage		Use stage					End-of-life stage				D Reuse, recovery, recycling
	A1 Raw material A2 Transport A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
CC total (kg CO2 eq)	-9,89E+00	4,69E-01	1,02E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,74E-01	1,01E+01	1,77E+00	-3,77E-01
CC fossil (kg CO2 eq)	1,85E+00	4,69E-01	9,81E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,73E-01	7,11E-02	5,02E-03	-3,73E-01
CC biogenic (kg CO2 eq) [2]	-1,17E+01	0,00E+00	3,71E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,98E+00	1,76E+00	0,00E+00
CC luluc (kg CO2 eq)	4,74E-03	2,29E-04	2,39E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,18E-04	2,43E-05	3,52E-06	-4,12E-03
ODP (kg CFC 11 eq)	2,85E-08	1,03E-08	1,66E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,08E-09	3,62E-09	1,08E-10	-6,13E-08
AP (mol H+ eq)	7,91E-03	2,19E-03	5,13E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,30E-04	2,29E-03	3,33E-05	-1,42E-02
EP – freshwater (kg P eq)	7,88E-05	3,85E-06	4,02E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,72E-06	1,39E-06	8,27E-08	-6,87E-05
EP – marine (kg N eq)	2,70E-03	8,62E-04	1,91E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,15E-04	1,08E-03	2,33E-05	-4,13E-03
EP – terrestrial (mol N eq)	2,92E-02	9,30E-03	2,09E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,36E-03	1,24E-02	1,32E-04	-6,90E-02
POCP (kg NMVOC eq)	9,51E-03	3,25E-03	6,43E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,15E-03	3,27E-03	5,36E-05	-1,20E-02
ADP Elements (kg Sb eq)	9,44E-06	1,46E-06	4,82E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,43E-07	1,76E-07	9,71E-09	-1,01E-06
ADP fossil fuels (MJ)	3,84E+01	6,76E+00	1,96E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,48E+00	7,03E-01	1,00E-01	-4,45E+00
WDP (m³ water eq deprived)	4,83E-01	3,32E-02	2,55E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,52E-02	2,21E-02	4,33E-03	-4,87E-02

CC total = Climate Change total; CC fossil = Climate Change fossil; CC biogenic= Climate Change biogenic; CC-luluc = Climate Change land use and land use change; ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels; WDP = water use (Water (user) deprivation potential, deprivation-weighted water consumption)

Table 4: Core Environmental Indicators per FU (m²) EN 15804 +A2, Elka particle board

[2] Calculated according to the NMD Stappenplan biogene koolstof, December 2024

Additional Environmental Indicators per FU (m^2) EN 15804 +A2, Elka particle board

Potential Environmental Impacts	A1 t/m A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
PM (disease incidence)	1,35E-07	4,60E-08	7,71E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,71E-08	1,86E-08	7,06E-10	-1,97E-07
IRHH (kg U235 eq)	3,94E-02	3,50E-03	2,02E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,68E-04	8,10E-04	5,48E-05	-9,46E-03
ETF (CTUe)	8,05E+00	3,33E+00	6,23E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,83E+00	3,96E+00	6,29E-02	-4,74E+00
HTCE (CTUh)	1,66E-08	2,52E-10	2,15E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,18E-11	2,64E-08	2,74E-12	-1,35E-09
HTnCE (CTUh)	2,94E-08	5,25E-09	1,70E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,99E-09	4,40E-09	8,02E-11	-4,00E-08
Land Use (Pt)	1,41E+02	5,08E+00	7,06E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,96E+00	2,19E-01	2,26E-01	-2,96E+02
PERE (MJ, net calorific value)	-6,80E+01	1,07E-01	-3,40E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,51E-02	3,40E-02	1,84E-03	-7,04E+01
PERM (MJ, net calorific value)	1,13E+02	0,00E+00	5,64E+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
PERT (MJ, net calorific value)	4,48E+01	1,07E-01	2,24E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,51E-02	3,40E-02	1,84E-03	-7,04E+01
PENRE (MJ, net calorific value)	3,84E+01	6,76E+00	1,96E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,49E+00	7,03E-01	1,00E-01	-4,45E+00
PENRM (MJ, net calorific value)	1,94E-02	0,00E+00	9,71E-04	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
PENRT (MJ, net calorific value)	3,84E+01	6,76E+00	1,96E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,49E+00	7,03E-01	1,00E-01	-4,45E+00
SM (kg)	1,19E-04	0,00E+00	5,93E-06	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, net calorific value)	2,41E-24	0,00E+00	1,21E-25	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, net calorific value)	2,84E-23	0,00E+00	1,42E-24	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 water eq)	1,74E-02	1,11E-03	1,06E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,39E-04	3,63E-03	1,06E-04	-2,02E-03

PM = Particulate Matter; IRHH = Ionizing Radiation – human health effects; ETF = Ecotoxicity – freshwater; HTCE = Human Toxicity – cancer effects; HTnCE = Human Toxicity – non cancer effects; 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

Table 5: Additional Environmental Indicators per FU (m^2) EN 15804 +A2, Elka particle board

Environmental information describing output flows and waste categories per FU (m^2) EN 15804 +A2, Elka particle board

Potential Environmental Impacts	Production		Construction process stage		Use stage					End-of-life stage				D Reuse, recovery, recycling
	A1 Raw material A2 Transport A3 manufacturing		A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Hazardous waste disposed (kg/FU)	5,64E-05		4,26E-05	3,17E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,58E-05	6,26E-06	4,96E-07	-2,43E-05
Non-hazardous waste disposed (kg)	2,39E-01		4,28E-01	3,50E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,64E-01	6,53E-02	3,91E-01	-1,72E-01
Radioactive waste disposed (kg)	7,59E-05		2,27E-06	3,83E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,68E-07	5,19E-07	3,35E-08	-6,86E-06
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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling (kg)	0,00E+00		0,00E+00	3,55E-04	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
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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy Heat (MJ)	6,15E-01		0,00E+00	8,42E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,67E+01	0,00E+00	0,00E+00
Exported energy Energy (MJ)	1,06E+00		0,00E+00	1,45E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,88E+01	0,00E+00	0,00E+00

Table 6: Environmental information describing output flows and waste categories per FU (m^2) EN 15804 +A2, Elka particle board

Results EN 15804 Set +A2, per m³ Elka particle board

Core Environmental Indicators per m³ EN 15804 +A2, Elka particle board

Potential Environmental Impacts	Production		Construction process stage	Use stage					End-of-life stage				
	A1 Raw material A2 Transport A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
CC total (kg CO2 eq)	-8,24E+02	3,91E+01	8,51E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,45E+01	8,38E+02	1,47E+02	-3,14E+01
CC fossil (kg CO2 eq)	1,54E+02	3,90E+01	8,18E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,44E+01	5,93E+00	4,18E-01	-3,10E+01
CC biogenic (kg CO2 eq) [3]	-9,79E+02	0,00E+00	3,09E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,32E+02	1,47E+02	0,00E+00
CC luluc (kg CO2 eq)	3,95E-01	1,91E-02	1,99E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,15E-02	2,03E-03	2,93E-04	-3,43E-01
ODP (kg CFC 11 eq)	2,38E-06	8,57E-07	1,38E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,57E-07	3,02E-07	9,00E-09	-5,11E-06
AP (mol H+ eq)	6,59E-01	1,82E-01	4,28E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,91E-02	1,91E-01	2,77E-03	-1,18E+00
EP – freshwater (kg P eq)	6,57E-03	3,21E-04	3,35E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,44E-04	1,16E-04	6,89E-06	-5,73E-03
EP – marine (kg N eq)	2,25E-01	7,18E-02	1,59E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,63E-02	8,98E-02	1,94E-03	-3,44E-01
EP – terrestrial (mol N eq)	2,43E+00	7,75E-01	1,74E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,80E-01	1,03E+00	1,10E-02	-5,75E+00
POCP (kg NMVOC eq)	7,92E-01	2,71E-01	5,36E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,57E-02	2,73E-01	4,47E-03	-1,00E+00
ADP Elements (kg Sb eq)	7,87E-04	1,22E-04	4,02E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,52E-05	1,47E-05	8,10E-07	-8,40E-05
ADP fossil fuels (MJ)	3,20E+03	5,64E+02	1,64E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,07E+02	5,86E+01	8,34E+00	-3,71E+02
WDP (m³ water eq deprived)	4,02E+01	2,77E+00	2,13E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,27E+00	1,84E+00	3,61E-01	-4,06E+00

CC total = Climate Change total; CC fossil = Climate Change fossil; CC biogenic= Climate Change biogenic; CC-luluc = Climate Change land use and land use change; ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels; WDP = water use (Water (user) deprivation potential, deprivation-weighted water consumption)

Table 7: Core Environmental Indicators per m³ EN 15804 +A2, Elka particle board

[3] Calculated according to the NMD Stappenplan biogene koolstof, December 2024

Additional Environmental Indicators per m³ EN 15804 +A2, Elka particle board

Potential Environmental Impacts	A1 t/m A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
PM (disease incidence)	1,12E-05	3,83E-06	6,42E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,43E-06	1,55E-06	5,88E-08	-1,64E-05
IRHH (kg U235 eq)	3,28E+00	2,92E-01	1,68E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,07E-02	6,75E-02	4,57E-03	-7,88E-01
ETF (CTUe)	6,71E+02	2,78E+02	5,19E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,53E+02	3,30E+02	5,25E+00	-3,95E+02
HTCE (CTUh)	1,39E-06	2,10E-08	1,79E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,65E-09	2,20E-06	2,28E-10	-1,12E-07
HTnCE (CTUh)	2,45E-06	4,37E-07	1,41E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,66E-07	3,66E-07	6,68E-09	-3,33E-06
Land Use (Pt)	1,17E+04	4,24E+02	5,89E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,63E+02	1,82E+01	1,89E+01	-2,47E+04
PERE (MJ, net calorific value)	-5,66E+03	8,92E+00	-2,83E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,92E+00	2,83E+00	1,53E-01	-5,86E+03
PERM (MJ, net calorific value)	9,40E+03	0,00E+00	4,70E+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
PERT (MJ, net calorific value)	3,73E+03	8,92E+00	1,87E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,92E+00	2,83E+00	1,53E-01	-5,86E+03
PENRE (MJ, net calorific value)	3,20E+03	5,64E+02	1,64E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,07E+02	5,86E+01	8,34E+00	-3,71E+02
PENRM (MJ, net calorific value)	1,62E+00	0,00E+00	8,09E-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
PENRT (MJ, net calorific value)	3,20E+03	5,64E+02	1,64E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,07E+02	5,86E+01	8,34E+00	-3,71E+02
SM (kg)	9,88E-03	0,00E+00	4,94E-04	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, net calorific value)	2,01E-22	0,00E+00	1,01E-23	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, net calorific value)	2,36E-21	0,00E+00	1,18E-22	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 (m³ water eq)	1,45E+00	9,22E-02	8,82E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,33E-02	3,03E-01	8,80E-03	-1,68E-01

PM = Particulate Matter; IRHH = Ionizing Radiation – human health effects; ETF = Ecotoxicity – freshwater; HTCE = Human Toxicity – cancer effects; HTnCE = Human Toxicity – non cancer effects; 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

Table 8: Additional Environmental Indicators per m³ EN 15804 +A2, Elka particle board

Environmental information describing output flows and waste categories per m³ EN 15804 +A2, Elka particle board

Potential Environmental Impacts	Production	Construction process stage		Use stage					End-of-life stage				D Reuse, recovery, recycling
	A1 Raw material A2 Transport A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Hazardous waste disposed (kg/FU)	4,70E-03	3,55E-03	2,64E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,32E-03	5,21E-04	4,14E-05	-2,02E-03
Non-hazardous waste disposed (kg)	1,99E+01	3,56E+01	2,92E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,37E+01	5,44E+00	3,26E+01	-1,43E+01
Radioactive waste disposed (kg)	6,32E-03	1,90E-04	3,19E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,73E-05	4,32E-05	2,79E-06	-5,71E-04
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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling (kg)	0,00E+00	0,00E+00	2,96E-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
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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy Heat (MJ)	5,13E+01	0,00E+00	7,02E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,39E+03	0,00E+00	0,00E+00
Exported energy Energy (MJ)	8,83E+01	0,00E+00	1,21E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,40E+03	0,00E+00	0,00E+00

Table 9: Environmental information describing output flows and waste categories per m³ EN 15804 +A2, Elka particle board

Representativeness of the production process

Geographic representativeness

The main raw materials have a fixed production location, and are therefore linked to a specific geographical location.

Data quality

For the collection of the process and product data, information is used provided by the manufacturer, Elka-Holzwerke GmbH. These data were discussed and checked with Elka in 2026 and are completely up-to-date. In April 2024 an additional company visit was made to Germany.

Energy consumption of equipment and equipment required to manufacture the product under investigation are based on consumption figures for 2022.

For the materials a choice was made from the available data in the Ecoinvent database, version 3.9.1, and the NMD database version 3.12, based on the main ingredients.

Standard values have been used where appropriate in accordance with Ecoinvent 3.9.1 or NMD. This applies in particular to transport distances, processing in the waste phase and the choice of means of transport. Return transports loaded/unloaded are as per the manufacturer's instructions. In the final processing phase, the transports were calculated according to the Bepalingsmethode version 2.0.

Production processes can change over time. The information used in this LCA of the production process of the product is based on measurements and observations from 2022 (energy, waste percentages, quantities net, production volume).

Accountability

The LCA study was conducted by Agrodome B.V. in 2023 - 2026.

The data provided by Elka-Holzwerke have been extensively discussed with Agrodome B.V.

A factory visit took place in April 2024 at the saw mill of Elka-Holzwerke in Morbach, Germany.

The final version of the LCA study has been submitted to SHR for external peer review.

The LCA is carried out according to EN 15804 +A2 in compliance with the standards from the ISO 14000 series: 14025, 14040 and 14044. The LCA report has been tested against the Bepalingsmethode 'Milieuprestatie Bouwwerken', version 2.0 , including amendment 6 of July 2025.

When calculating the environmental impact categories, SimaPro, version 10.1.0.4 and environmental data from the NMD-basic processes database, version 3.12 March 2026 and in some cases, namely where no NMD-data were available, the Ecoinvent database, version 3.9.1.

When making calculations in SimaPro, the long-term effects (emissions that can occur after 100 years) are not taken into account, in accordance with the Bepalingsmethode version 2.0. The effects of capital goods and infrastructural processes are included, as far as present in the Ecoinvent processes.

Referenties

ISO 14040
ISO 14040:2006/Amd 1:2020, Environmental management - Life cycle assessment - Principles and framework

ISO 14044
ISO 14044:2006/Amd 2:2020, Environmental management - Life cycle assessment - Requirements and guidelines

ISO 14025
ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

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

EN 16449
EN 16449: 'Wood and wood based products - Calculation of sequestration of atmospheric carbon dioxide'

Nationale Milieudatabase
Bepalingsmethode Milieuprestatie Bouwwerken, version 2.0 of July 2026.

Nationale Milieudatabase
Stappenplan biogeen koolstof, december 2024.

SBR
SBR-publication Levensduur van bouwproducten, 2011.

Caroline van der Laan, Fred van der Burgh and Sissy Verspeek, 2026
Background report EPD Elka particle board standard, esb and esb Plus.
Agrodome B.V., Wageningen, the Netherlands

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Declaration Agrodome B.V.

SHR has reviewed the LCA background report "Elka particle board standard, esb and esb Plus", 2026, according to the Bepalingsmethode 'Milieuprestatie Bouwwerken' versie 2.0 as an external reviewer. This EPD is the summary of that LCA background report, to be used for external communication.

The LCA background report is approved by Alexander Kloppenburg, SHR, 22 July 2026.