Environmental Product Declaration

According to ISO 14025 and EN15804+A2

Glulam
(Glued laminated timber)

Owner of Declaration	Heko Spanten
Publisher	Hedgehog Company B.V.
Program operator	N.a.
Calculation number	EPD-2023-4701
Issue Date	08-02-2023

Heko Spanten

General information

Company

Manufacturer	Heko Spanten B.V.
Production Location	The Netherlands
Address	Rijksweg 39, 6710 BC Ede
E-mail	info@hekospanten.nl
Website	https://www.hekospanten.nl/

EPD information

EPD for	Glulam (Glued laminated timber)
Projectnumber	EPD-2023-4701
Date of Issue	08-02-2023
Product Category Rules	EN 15804+A2/NMD Assessment Method
Declared unit	1 m

Scope of declaration

This is a cradle-to-gate EPD for softwood Glulam of Heko Spanten. The declared life cycle stages are presented in the table below. The declared life cycle stages are as shown below (X=declared, MND = not declared). The results of other LCA studies and resulting Environmental Product Declarations (EPDs) are only comparable if they have been carried out according to the same calculation rules.

Production stage			Construction stage		Use stage							End of life stage				Benefits and loads beyond the systemboundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	x	x	x	x	x	x	x	MND	MND	x	x	x	x	x
Raw material supply	Transport	Manufacturing	Transport	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction	Transport	Waste processing	Disposal	Reuse, recovery, recycling, potential

This EPD is representative for the following dimensions:

- Width: 100 mm, Height: 1300 t/m 1800 mm;
- Width: 200 mm, Height: 600 t/m 950 mm;
- Width: 300 mm, Height: 450 t/m 600 mm

Verification statement of the background LCA

CEN standard EN15804+A2 serves as core PCR. Independent verification of the background LCA report and data, according to EN ISO 14040/14044:

☐ Internal ☒ External

Third party verifier:

Pieter Stadhouders, Ecoreview NL B.V

Product description

The product of this study comprises glued laminated timber (glulam), produced from spruce with a moisture content of +- 10%. The density of the final product is approx. 470 kg/m3. An adhesive based on a melamine resin is used for the lamination process.

Declaration of material content of SVHC

No substances of very high concern of authorisation to declare.

Biogenic carbon content

The biogenic carbon content in the product is 33 kg C (120 kg CO2)*.

Calculation rules

The method used to quantify the environmental performance of the product in question is the life cycle assessment (LCA) regulated by ISO 14040 and ISO 14044. Process data over the year of 2022 is used to model the product system. Ecoinvent v3.6 and NMD v3.5 are used as background databases.

Production (A1-A3)
Glulam is produced at the production site of Heko Spanten in Ede. At the Heko site, dried spruce timber is fingerjointed and horizontally laminated. The production stage includes the following:

- The provision of resources, additives and energy;
- Transport of the above items to the production site;
- On-site production processes including energy;
- Treatment of the production waste

Construction stage (A4-A5)
Transport to the project is based on a transport distance of 150 km. Installation of the product is perfomed with a construction crane.

Deconstruction stage (C1)
Similarly to the installation, deconstruction is performed using a construction crane.

** C content is 50%. 460 kg/m3 MC 12%. 753 kg CO2 per m3.*

End-of-life stage (C2-C4)

This EPD includes the transport from the project site to the sorting, waste treatment and final disposal locations in accordance with the Assment Method. The waste treatment scenario is based on material specific waste treatment scenario's, as prescribed by the Assessment Method (Forfaitaire afval scenario's, version May 2022).

Loads and benefits outside the system boundaries (D)

The potential loads and benefits of recycling and reuse of materials are included in this EPD. Next to that, the potential benefits from incineratio nare calculated and included as well.

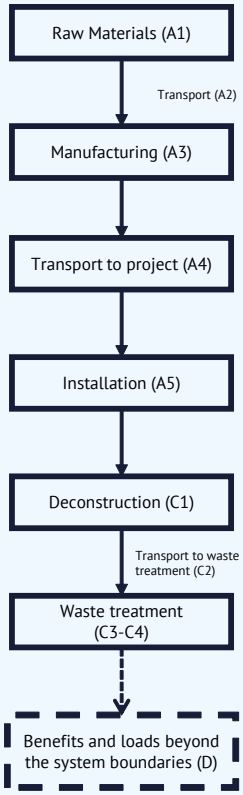

Figure 1: Flow chart of the life cycle

Environmental impact per declared unit

The LCA results are presented in accordance with the Bepalingsmethode. Set 1 is in accordance with EN15804+A1:2013, and is supplemented with the correct characterization factors as described in the PCR. Set 2, in accordance with EN15804+A2:2019, is an addition to the first set and contains additional environmental impact categories.

Set 1	A1-A3	A4	A5	B1-5	C1	C2	C3	C4	D	Total
ADPE	9,85E-04	3,79E-05	4,93E-06	0,00E+00	3,57E-06	2,34E-05	5,25E-06	4,21E-07	-1,07E-04	**1,94E-03**
ADPF	2,17E-01	1,09E-02	1,55E-02	0,00E+00	1,52E-02	6,73E-03	4,70E-03	4,54E-04	-3,35E-02	**4,54E-01**
GWP	2,83E+01	1,48E+00	2,35E+00	0,00E+00	2,31E+00	9,15E-01	4,74E+00	2,82E-01	-5,14E+00	**6,35E+01**
ODP	3,50E-06	2,63E-07	4,03E-07	0,00E+00	3,99E-07	1,62E-07	8,30E-08	9,71E-09	-1,20E-06	**7,12E-06**
POCP	2,36E-02	8,95E-04	2,37E-03	0,00E+00	2,35E-03	5,52E-04	2,42E-03	8,75E-05	-1,25E-02	**4,34E-02**
AP	1,39E-01	6,52E-03	1,75E-02	0,00E+00	1,74E-02	4,02E-03	1,51E-02	2,61E-04	-7,89E-02	**2,59E-01**
EP	2,44E-02	1,28E-03	3,97E-03	0,00E+00	3,95E-03	7,91E-04	4,36E-03	1,55E-04	-2,48E-02	**3,86E-02**

Toxicity indicators for Dutch market

HTP	1,25E+01	6,25E-01	8,68E-01	0,00E+00	8,54E-01	3,85E-01	1,73E+00	2,44E-02	-6,83E+00	**2,26E+01**
FAETP	3,50E-01	1,82E-02	1,23E-02	0,00E+00	1,19E-02	1,12E-02	2,49E-02	5,67E-04	-1,49E-01	**6,30E-01**
MAETP	1,05E+03	6,56E+01	4,27E+01	0,00E+00	4,13E+01	4,05E+01	7,50E+01	1,80E+00	-2,35E+02	**2,13E+03**
TETP	8,08E-02	2,21E-03	1,48E-03	0,00E+00	1,41E-03	1,36E-03	2,89E-03	8,12E-05	-4,41E-02	**1,27E-01**
ECI	3,51E+00	1,79E-01	3,13E-01	0,00E+00	3,09E-01	1,10E-01	5,06E-01	1,92E-02	-1,47E+00	**6,99E+00**
ADPF	4,51E+02	2,27E+01	3,22E+01	0,00E+00	3,16E+01	1,40E+01	9,78E+00	9,44E-01	-6,96E+01	**9,44E+02**

ADPE = Abiotic depletion potential for non-fossil resources [kg Sb-eq]; **ADPF** = Abiotic depletion potential for fossil resources [MJ]; **GWP** = Global warming potential [kg CO2-eq]; **ODP** = Depletion potential of the stratospheric ozone layer [kg CFC-11-eq]; **POCP** = Formation potential of tropospheric ozone photochemical oxidants [kg ethene-eq]; **AP** = Acidification potential of land and water [kg SO2-eq]; **EP** = Eutrophication potential [kg PO4 3−-eq]; **HTP** = Human toxicity potential [kg 1,4-DB-eq]; **FAETP** = Freshwater aquatic ecotoxicity potential [kg 1,4-DB-eq]; **MAETP** = Marine aquatic ecotoxicity potential [kg 1,4-DB-eq]; **TETP** = Terrestrial ecotoxicity potential [kg 1,4-DB-eq]; **ECI** = Environmental Costs Indicator [euro]; **ADPF** = Abiotic depletion potential for fossil resources [kg Sb-eq]

Set 2	A1-A3	A4	A5	B1-5	C1	C2	C3	C4	D	Total
GWP-total	-2,30E+02	1,50E+00	2,15E+00	0,00E+00	2,33E+00	9,24E-01	2,46E+02	4,13E-01	1,21E+01	**6,45E+01**
GWP-f	2,88E+01	1,50E+00	2,37E+00	0,00E+00	2,33E+00	9,23E-01	4,79E+00	5,09E-02	-5,23E+00	**6,43E+01**
GWP-b	-2,59E+02	6,91E-04	-2,22E-01	0,00E+00	6,48E-04	4,26E-04	2,42E+02	3,62E-01	1,74E+01	**0,00E+00**
GWP-luluc	1,18E-01	5,48E-04	3,06E-04	0,00E+00	1,84E-04	3,38E-04	3,50E-04	2,03E-05	-4,69E-02	**1,91E-01**
ODP	4,18E-06	3,30E-07	5,08E-07	0,00E+00	5,03E-07	2,04E-07	9,13E-08	1,21E-08	-1,25E-06	**8,76E-06**
AP	1,79E-01	8,68E-03	2,45E-02	0,00E+00	2,44E-02	5,35E-03	2,21E-02	3,44E-04	-1,21E-01	**3,21E-01**
EP-fw	1,37E-03	1,51E-05	1,00E-05	0,00E+00	8,48E-06	9,31E-06	1,79E-05	8,44E-07	-4,44E-04	**2,35E-03**
EP-m	5,15E-02	3,06E-03	1,08E-02	0,00E+00	1,08E-02	1,89E-03	1,05E-02	3,33E-04	-3,55E-02	**1,05E-01**
EP-T	5,71E-01	3,37E-02	1,18E-01	0,00E+00	1,18E-01	2,08E-02	1,16E-01	1,27E-03	-5,65E-01	**9,85E-01**
POCP	1,74E-01	9,63E-03	3,27E-02	0,00E+00	3,25E-02	5,94E-03	2,99E-02	4,52E-04	-1,04E-01	**3,55E-01**
ADP-mm	9,85E-04	3,79E-05	4,93E-06	0,00E+00	3,57E-06	2,34E-05	5,25E-06	4,21E-07	-1,07E-04	**1,94E-03**
ADP-f	4,25E+02	2,26E+01	3,26E+01	0,00E+00	3,21E+01	1,39E+01	8,81E+00	9,33E-01	-6,87E+01	**8,91E+02**
WDP	9,08E+00	8,07E-02	5,61E-02	0,00E+00	4,30E-02	4,98E-02	4,61E-01	3,98E-02	-8,96E-01	**1,80E+01**
PM	6,63E-06	1,34E-07	6,53E-07	0,00E+00	6,45E-07	8,29E-08	1,60E-07	6,45E-09	-1,91E-06	**1,30E-05**
IR	1,58E+00	9,46E-02	1,40E-01	0,00E+00	1,37E-01	5,83E-02	2,29E-02	3,66E-03	-2,89E-01	**3,34E+00**
ETP-fw	4,06E+02	2,01E+01	1,88E+01	0,00E+00	1,93E+01	1,24E+01	2,56E+01	1,13E+00	-1,09E+03	**-1,84E+02**
HTP-c	2,85E-08	6,53E-10	7,31E-10	0,00E+00	6,76E-10	4,03E-10	1,74E-08	2,58E-11	-1,39E-08	**6,29E-08**
HTP-nc	4,85E-07	2,20E-08	1,69E-08	0,00E+00	1,66E-08	1,36E-08	6,94E-08	1,00E-09	-4,78E-07	**6,31E-07**
SQP	2,38E+04	2,11E+01	3,29E+01	0,00E+00	4,37E+00	1,30E+01	2,92E+00	2,34E+00	-5,78E+03	**4,18E+04**

GWP-total = Climate change [kg CO2 eq]; **GWP-f** = Climate change - Fossil [kg CO2 eq]; **GWP-b** = Climate change - Biogenic [kg CO2 eq]; **GWP-luluc** = Climate change - Land use and LU change [kg CO2 eq]; **ODP** = Ozone depletion [kg CFC11 eq]; **AP** = Acidification [mol H+ eq]; **EP-fw** = Eutrophication, freshwater [kg P eq]; **EP-m** = Eutrophication, marine [kg N eq]; **EP-T** = Eutrophication, terrestrial [mol N eq]; **POCP** = Photochemical ozone formation [kg NMVOC eq]; **ADP-mm** = Resource use, minerals and metals [kg Sb eq]; **ADP-f** = Resource use, fossils [MJ]; **WDP** = Water use [m3 depriv.]; **PM** = Particulate matter [disease inc.]; **IR** = Ionising radiation [kBq U-235 eq]; **ETP-fw** = Ecotoxicity, freshwater [CTUe]; **HTP-c** = Human toxicity, cancer [CTUh]; **HTP-nc** = Human toxicity, non-cancer [CTUh]; **SQP** = Land use [Pt]

Resource use										
Parameter	**A1-A3**	**A4**	**A5**	**B1-5**	**C1**	**C2**	**C3**	**C4**	**D**	**Total**
PERE	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**
PERM	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	3,21E+03	2,83E-01	3,67E+00	0,00E+00	1,73E-01	1,74E-01	4,41E-01	1,71E-02	-1,09E+03	**5,33E+03**
PENRE	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**
PENRM	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	4,53E+02	2,40E+01	3,47E+01	0,00E+00	3,41E+01	1,48E+01	9,51E+00	9,92E-01	-7,31E+01	**9,51E+02**
PET	3,66E+03	2,42E+01	3,83E+01	0,00E+00	3,42E+01	1,50E+01	9,95E+00	1,01E+00	-1,17E+03	**6,28E+03**
SM	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	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	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	2,78E-01	2,75E-03	2,09E-03	0,00E+00	1,65E-03	1,70E-03	3,67E-02	9,72E-04	-2,86E-02	**5,73E-01**
Waste categories										
Parameter	**A1-A3**	**A4**	**A5**	**B1-5**	**C1**	**C2**	**C3**	**C4**	**D**	**Total**
HWD	1,17E-02	5,72E-05	1,04E-04	0,00E+00	8,74E-05	3,53E-05	1,95E-05	1,43E-06	-7,47E-04	**2,29E-02**
NHWD	1,01E+01	1,43E+00	5,71E-02	0,00E+00	3,80E-02	8,83E-01	4,64E-01	3,71E+00	-2,19E+00	**2,46E+01**
RWD	1,91E-03	1,48E-04	2,25E-04	0,00E+00	2,23E-04	9,14E-05	2,46E-05	5,53E-06	-3,97E-04	**4,14E-03**
Output flows										
Parameter	**A1-A3**	**A4**	**A5**	**B1-5**	**C1**	**C2**	**C3**	**C4**	**D**	**Total**
CRU	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	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**
MER	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**
EE	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**

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials [MJ]; **PERM** = Use of renewable primary energy resources used as raw materials [MJ]; **PERT** = Total use of renewable primary energy resources [MJ]; **PENRE** = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials [MJ]; **PENRM** = Use of non-renewable primary energy resources used as raw materials [MJ]; **PENRT** = Total use of non-renewable primary energy resources [MJ]; **PET** = Total Energy [MJ]; **SM** = Use of secondary material [kg]; **RSF** = Use of renewable secondary fuels [MJ]; **NRSF** = Use of non-renewable secondary fuels [MJ]; **FW** = Use of net fresh water [m3]; **HWD** = Hazardous waste disposed [kg]; **NHWD** = Non-hazardous waste disposed [kg]; **RWD** = Radioactive waste disposed [kg]; **CRU** = Components for re-use [kg]; **MFR** = Materials for recycling [kg]; **MER** = Materials for energy recovery [kg]; **EE** = Exported energy [MJ]