Lappset EPDs
Reading Instructions

LAPPSET®

EPD (Environmental Product Declaration)

- An EPD is a third-party verified and internationally known way to reliably report **a product's environmental impact**. An EPD is a document that describes the background information and results of a product's Life Cycle Assessment (LCA).

- Greenstep Oy has created environmental product declarations (EPDs) **for three Lappset products**. EPDs are made according to EN 15804+A2- and ISO 14025 / ISO 21930-standards.

- The scope of Lappset EPDs is cradle-to-gate, including modules C1-C4 and D. The standard to be followed requires that end-of-life (C1-C4) and out-of-bounds benefits (D) must be included because the modelled products contain biogenic carbon. Biogenic carbon in products is released at the end of their life cycle.

- The next page briefly introduces the stages of the life cycle.

Stages of the life cycle

* Included in Lappset's EPDs.

Product stage

* Preparation of raw materials (A1)
* Transportation of raw materials (A2)
* Product manufacturing (A3).

Assembly stage

Product transportation (A4)

Product installation (A5)

Use stage

Operation (B1)

Maintenance (B2)

Repair (B3)

Replacement of parts (B4)

Major repairs (B5)

Energy use (B6)

Water use (B7)

End of life

* Dismantling (C1)
* Transport of waste (C2)
* Waste treatment (C3)
* Disposal (C4)

Benefits outside the life cycle of the product (system boundaries)

* Reuse
* Recovery
* Recycling (D)

Life Cycle Assessment, LCA

LCA is an ISO-standardized, well-established analytical method that can simultaneously determine several environmental impacts that occur throughout the life cycle of a product or service.

LCA includes **inputs** (raw materials, auxiliary materials, energy and **outputs** (e.g. waste). The life cycle environmental impacts have been modelled per notified unit, which in this case has been **one complete Lappset product**.

The LCA examines not only the global warming potential (GWP), more commonly known as the carbon footprint, but also a total of 21 impact categories. The EPD contains, among other things, parameters describing the use of natural resources and parameters describing waste and output streams. The impact categories and their units are presented in Appendix 1 and in more detail **here**.

Interpretation of results

The result tables display the following information:

- Indicator e.g. GWP total
- Unit of indicator, e.g. kgCO2e
- Life cycle stage e.g. A1
- Result e.g. 293

- The environmental impacts of Lappset's products during their life cycle have been calculated per product. Thus, the figures in the result tables are e.g. 293 kgCO2e/product.

- When comparing the results with the EPDs of other products, the declared unit shall be taken into account.

Example EPD: Activity Tower

Environmental product declaration
In accordance with EN 15804+A2 &
ISO 14025 / ISO 21930

Activity Tower

- Publishing date 3.11.2023
- Last update 29.4.2024
- Valid until 3.11.2028

Activity Tower

General information

Manufacturer

Manufacturer	Lappset Group Ltd
Address	Hallitie 17, Rovaniemi
Contact details	sales@lappset.com
Website	www.lappset.com

EPD standards, scope and verification

Reference standard	EN 15804+A2:2019 and ISO 14025
Sector	Manufactured product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Susanna Kiviniemi, Greenstep Oy
EPD verification	Independent verification of this EPD and data, according to ISO 14025: External verification
EPD verifier	A.M. Kloppenburg, SHR

Scope of this EPD include manufacturing (A1-A3) + end of life (C1-C4) + module D.

More info on page 3.

This EPD is 3rd party verified which makes it more trustworthy. A verifier from a third company has examined the calculations and checked that they are done according to the requirements.

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

Product

Product name	Activity Tower
Product reference	137124M
Place of production	Tallin, Estonia and Rovaniemi, Finland
Period for data	2022

Environmental data summary

Declared unit	One product
Declared unit mass	676 kg
GWP-fossil, A1-A3 (kgCO2e)	1100
GWP-total, A1-A3 (kgCO2e) including biogenic carbon	342
Secondary material, inputs (%)	15
Secondary material, outputs (%)	86
Total energy use A1-A3 (kWh)	7630.0
Total water use A1-A3 (m3e)	134

Fossil carbon footprint from manufacturing of the product: Emissions from fossil sources only (for example petrol, diesel, coal etc.) This includes the emissions from fossil sources that are used in the manufacturing of raw materials and transportation.

Total carbon footprint from manufacturing of the product: Fossil and biogenic (burning of wood for example) emissions minus carbon absorbed in the biomass during growth (wood).

Secondary material inputs: Recycled content of the product, based on info from suppliers (for example Aluminum is 100 % recycled).

Secondary material outputs: Recyclability potentialof the product, based on assumptions (**see p. 5**).

Total energy and water consumption from manufacturing the product including the manufacturing the raw materials and transportation.

Goal and intended application of the study

The goal of the study was to provide information to the clients about the environmental impact of the product for the supply phase of a new playground.

Product and manufacturer

About the manufacturer

Lappset Group Ltd is one of the leading manufacturers of playground and sport equipment worldwide. We make high-quality products that are hard-wearing and long-lasting and take account of the needs of users of different ages. Our products are safe, as they are designed in accordance with European safety standards. Our range of interactive products makes us pioneer in play and sport solutions for the digital era. Our senior parks support active ageing and psychological and physical wellbeing. Our versatile range of park and street furniture provides rest and relaxation and opportunities for socialising. Our thematic activity parks, which are delivered on turnkey basis, create unforgettable experiences, and take play, sport and quality time to a completely new level. Fantasia Works produces activity parks for different kinds of indoor and outdoor spaces, based on your brand or chosen theme and customised to suit your needs. The Lappset Lifecycle service takes care of assembling, servicing and maintaining products on turnkey basis. Our Lappset Lifecycle service team also inspects and services products supplied by other manufacturers.

Product description

Multifunctional tower set suitable for kids of all different ages split on two levels. There are steps leading to a low (870 mm) platform and the adjoining slide. The higher (1 470 mm) tower can be accessed by the climbing wall with holes or the climbing frame on the side. These options provide challenges for climbers of different levels. Descent is via a slide or a firemans pole.

Beneath the tower there is a roulette wall. 1970 mm high climbing frame consists of see-through climbing wall with genuine bouldering grips, climbing frame with rungs, rings, trapeze and a horizontal climbing net. Thanks to its many options, it can accommodate several children at a time. Climbing develops childrens sense of balance and strength.

Further information can be found at www.lappset.com.

Product raw material main composition

Raw material category	Amount, mass- %	Material origin
Metals	29.2	Finland / EU / China
Minerals	0	-
Fossil materials	3.4	EU
Bio-based materials	67.2	Finland / Sweden

Material composition of the product based on the raw materials of the products

Biogenic carbon content

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	195
Biogenic carbon content in packaging, kg C	27

Biogenic carbon content = carbon content from use of wood and wood based products

Functional unit and service life

Declared unit	One product
Mass per declared unit	676 kg
Functional unit	-
Reference service life	-

Substances, reach - very high concern

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

REACH = European Union Regulation for Chemicals

Product life-cycle

System boundary

This EPD covers the life-cycle modules listed in the following table. ------► **Life Cycle Stages** in the EPD See also explanations to the A1-A3 +C1-C4 and D

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	MND		MND							x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy	Operational water use	Deconstr. / demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

Manufacturing and packaging (A1-A3)

------► **A1-A3** = included. This chapter describes the production on a general level

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occuring during the manufacturing processes as well as losses during electricity transmission.

The products are manufactured in two locations. Metal parts are manufactured in Estonia factory and the wooden parts are manufactured in Finland. The metal parts are transported to Finland where all the product parts are sent to the customer. The following items come to Lappset as readymade parts/components to the component storage: All the screws, bolts and such, plastic parts, net parts such as the ropes. Lappset has also items that are only intermediary products, such as the swing seats.

Estonia factory uses hydropower as an energy source. The painting line operates on gas as well as some forklifts. The rest of the forklifts operates on diesel. In Finland the factory uses district heating generated from wood in the vicinity of the factory. The electricity used in Rovaniemi is green electricity (Hydro 51,7 %, Bio 25,7 %, Wind 15,8 % and solar 6,8 % according to 2022 distribution).

The painting line operates on gas and there are two types if forklifts, diesel and electric. The

energy utilisation of the different operations are calculated according to the treatments made for the product parts, as the energy utilisation of the different processes is known. The raw material consumption information comes from the design of the products. The waste from the process are allocated by production volumes. The ready made product parts are packaged on wooden pallets and boxes and wrapped in plastics.

Transport and installation (A4-A5)

A4-A5 = excluded
This chapter gives reasoning to why the stage is excluded.

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The products are transported all over the world and the installation requirements vary according to the installation location. This stage was not included in the calculations.

Product use and maintenance (B1-B7)

B1-B6 = excluded
This chapter gives reasoning to why the stage is excluded.

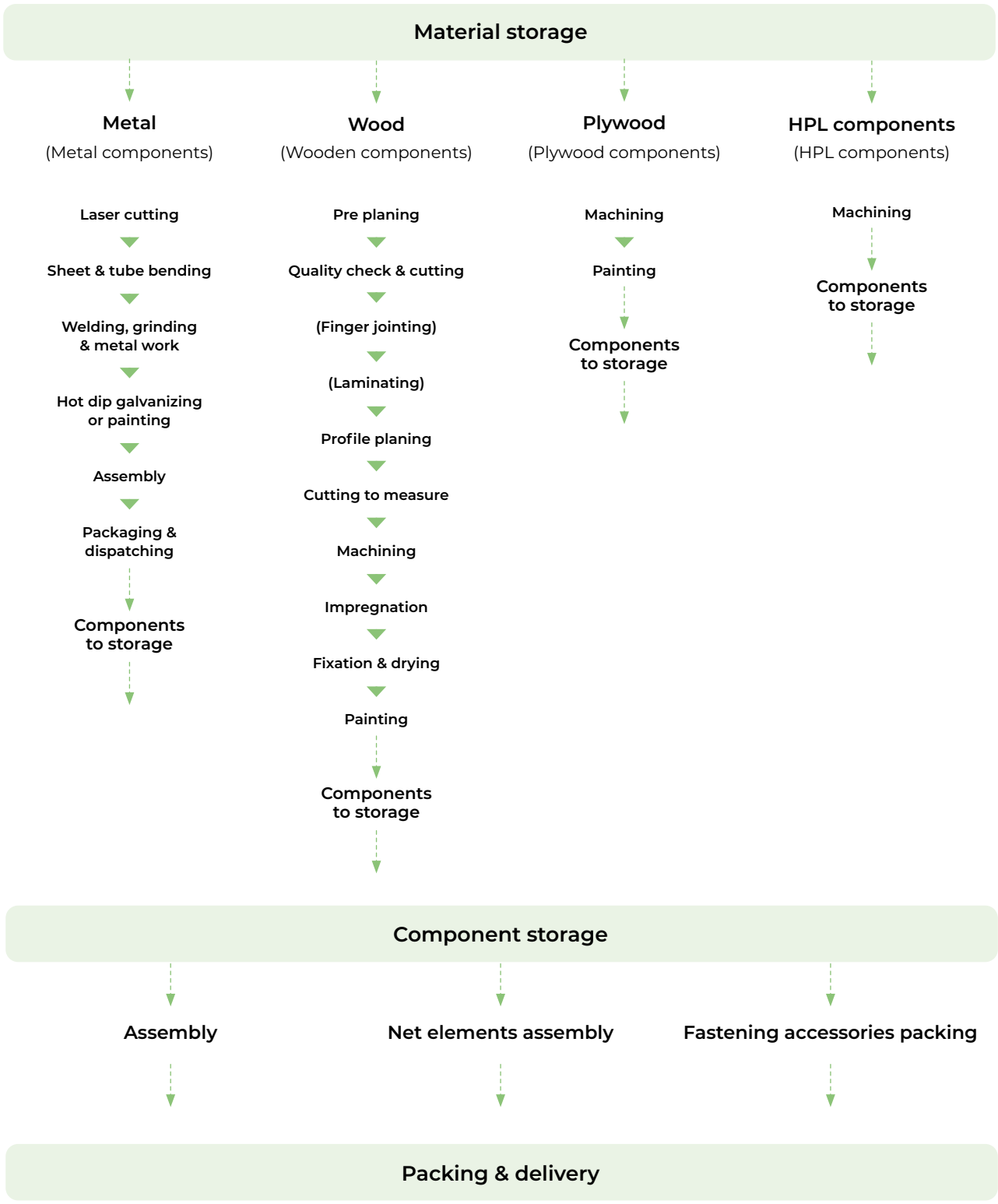
This EPD does not cover the use phase.
Air, soil, and water impacts during the use phase have not been studied.

Product end of life (C1-C4, D)

C1-C4 + D = included.
This is based on assumptions.

The end of life is modelled to EU area. In the end of life all the wooden parts of the product can be utilized in energy production. The utilisation rate was assumed to be 100% as no organic waste can be landfilled in EU area. The metal can be recycled at the end of life. The assumptions in the calculations for recycling rates were 90% for steel and 70% for aluminium. The plastic parts are assumed to be utilised at energy production in the end of life. The EU average value 25 % for plastics landfilling was used in the calculations.

Manufacturing process



Life-cycle assessment

Cut-off criteria

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazarous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no negleted unit process more than 1 % of total mass or energy flows. The module specific total negleted input and output flows also do not exceed 5 % of energy usage or mass. The infrastructure is not included in the calculation because of the complexity of the infrastructure elements and because the long lifecycle of the infrastructure, which make the allocation factor relatively small.

In some cases, minor processes or materials may be excluded due to lack of data. In this EPD, only the infrastructure of Lappset's manufacturing site is excluded. That is very common that the infrastructure is not included in the calculations.

Allocation, estimates and assumption

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

As there is no product specific data available about the packaging material use or the manufacturing energy and waste use but only the total yearly consumption the amounts were allocated to the product based on the wood/ metal consumption per product compared to the total use per year.

Data type	Allocation
Raw materials	No allocation
Packaging materials	Allocated by mass
Manufacturing energy and waste	Cradle to gate with

Certain assumptions about glue, paint and wood preservative amounts have been made as no measured data is available on how much of these chemicals are used per item. The assumptions made are based on information from the total use per year, machine information about the amounts per m² and measurement information of test pieces of wood. As the wooden parts come in different forms and shapes the surface area per cubic meter varies also. This means that the average number gives us the best estimate of the amounts.

Assumptions were also used to calculate the amount of certain chemicals used in the products as this information was not yet available in Lappset's PDM system..

LCA software and bibliography

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent 3.8 and On Click LCA databases were used as sources of environmental data.

The tool that was used to make the calculations.

Environmental impact data

Environmental impacts by:
- Life cycle stage (A1-A3...)
- Impact category (global warming potential...) according to EN 15804+A2

Core environmental impact indicators - EN 15804+A2, PEF

			Raw materials	Transportation	Manufacturing	Sum	Not taken into consideration									Dismantling	Transportation to waste treatment facility	Treatment of the waste	Landfilling	Impacts outside system boundaries
	Impact category	**Unit**	**A1**	**A2**	**A3**	**A1- A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
1.	GWP - total1)	kg C02e	293,0	61,70	-12,40	342	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	3,97	5,68	779	0,04	-489
2.	GWP - fossil	kg C02e	876,0	61,70	160,00	1100	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	3,97	5,68	15,50	1,60	-489
3.	GWP - biogenic	kg C02e	-589,0	0,00	-173,00	-762	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	763,00	-1,56	0,00
4.	GWP - LULUC	kg C02e	5,68	0,03	0,24	5,94	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0,01	0,00	-009
	Ozone depletion pot.	kg CFC-11e	0,00	0,00	0,00	0,00	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0,00	0,00	0,00
	Acidification potential	mol H+e	10,40	0,47	1,09	12,0	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,04	0,02	0,13	0,00	-3,48
	EP -freshwater1)	kg Pe	0,04	0,00	0,01	0,05	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0,00	0,00	-0,04
	EP-marine	kg Ne	1,15	0,11	0,31	1,57	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,02	0,00	0,05	0,00	-0,48
	EP-terrestial	mol Ne	37,00	1,21	4,10	42,30	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,20	0,05	0,53	0,01	-5,38
5.	POCP("smog")3)	kg NMVOCe	3,65	0,36	1,02	5,02	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,06	0,02	0,14	0,00	-2,02
	ADP-minerals & metals4)	kg Sbe	0,00	0,00	0,00	0,01	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0,00	0,00	-0,001
	ADP-fossil recources	MJ	10500	898	2330	13700	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	53,40	88,50	128	3,32	-5790
	Water use5)	m3e depr.	354	3,91	99,60	457	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,14	0,40	32,80	0,01	-86,2

1. GWP – total = total carbon footprint of the product including fossil, biogenic, LULUC.
2. Emissions from fossil energy sources such as petrol, diesel, coal.
3. Emissions from biogenic sources such as burning off wood and the uptake of carbon into biomass for example growing of wood. The uptake is presented as a negative value.
4. Emissions from land use and land use change for example transformation of forest to fields.
5. Ozone depletion potential, Acidification potential EP (Eutrophication potential) freshwater / marine / terrestrial, POCP AKA smog ADP (abiotic depletion potential) and water use are more seldomly looked at measures and describe the overall impact to the air water bodies and soil.

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The result of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

Parameters explained in appendix 1 and: **Environmental impact EN 15804 +A2 - LCA.no**

Use of natural resources

Impact category	Unit	A1	A2	A3	A1- A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy[8])	MJ	7620	11	5010	12600	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,31	0,99	12,4	0,03	-263
Renew. PER as material	MJ	5100	0	1430	6530	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	-6520	-4,5	0
Total use of renew. PER	MJ	12700	11	6430	19200	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,31	0,99	-6510	-4,5	-263
Non.re- PER as energy	MJ	11700	895	2080	14600	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	53,4	88	128	3,3	-5400
Non.re- PER as material	MJ	1570	0	515	2090	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	-1850	-237,0	0
Total use of non-re. PER	MJ	13200	895	2600	16700	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	53,40	88	-1720	-233,0	-5400
Secondary materials	MJ	74,8	0,3	17,5	93	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,02	0,02	0,29	0,00	-81
Renew. secondary fuels	MJ	0,16	0,00	150	150	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0,00	0,00	-0,2
Non.ren. secondary fuels	MJ	0,00	0,00	0,00	0,00	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0,00	0,00	0,00
Use of net fresh water	MJ	26	0,11	107	133	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,01	-0,05	0,00	-3,8

8) PER = Primary energy resources.

1. Resource use parameters:
These parameters tell how much resources have been used to produce the product. For example, how much renewable energy was used and how much non-renewable energy was used in the production.

2. e.g., Secondary materials = recycled content at each stage

End of life - Waste

Impact category	Unit	A1	A2	A3	A1- A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	133	1,13	17,90	152	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,07	0,12	0,62	0,00	-11,4
Non hazardous waste	kg	876,0	17,60	207	1420	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,50	1,91	481	27,8	-568
Radioactive waste	kg	0,08	0,01	0,01	0,10	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0,00	0,00	-0,005

3. End-of-life output parameters:
For example if nuclear energy was used in the production of some raw materials then that amount of radioactive waste which is generated from the nuclear power is presented here in the A1 stage as radioactive waste.

End of life - output flows

Impact category	Unit	A1	A2	A3	A1- A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0,00	0,00	0,00	0,00	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0,0	0,00	0
Materials for recycling	kg	2,60	0,00	3,70	6,30	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	180	0,0	0
Materials for energy rec	kg	0,15	0,00	0,00	0,15	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0	0,0	0
Exported energy	MJ	0,00	0,00	0,00	0,00	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,0	0,0	0	0,0	2660

End of life - E.g., recyclability potential based on the European average of how much of the raw materials are recycled.

Environmental impacts - EN 158004+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1- A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global warming Pot.	kg CO_2e	709,0	61,0	157,0	927,0	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	3,93	5,61	15,0	1,27	-47
Ozone depletion Pot.	kg $CO_{11}e$	0,00	0,00	0,00	0,00	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0	0,00	0
Acidification	kg SO_2e	6,34	0,38	0,79	7,50	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,03	0,02	0	0,00	-2,96
Eutrophication	kg PO_4^3e	1,81	0,06	0,35	2,22	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,0	0	0	0,1	-0,93
POCP (“smog”)	kg C_2H_4e	0,29	0,01	0,07	0,37	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0,0	0,00	-0,2
ADP-elements	kg Sbe	0,98	0,00	0,00	0,98	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	0,00	0,00	0	0,0	-0,001
ADP-fossil	MJ	9150	895	2600	12600	0,00	0,00	MND	MND	MND	MND	MND	MND	MND	53,40	88,2	128	3,3	-5630

Environmental impacts again, but according to an older standard.

Verification statement

This statement is a guarantee that the calculations are done according to the standards and are made correctly.

Verification process for this epd

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPS

Why does verification transparency matter? Read more online.

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

Third party verification statement

I hereby confirm thet, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the daclaration owner is responible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

23-10-2023
A.M. Kloppenburg MSc

INDEPENDENT RESEARCH
SHR

Appendix 1 - Impact categories

Core environmental impact indicators

Global warming potential – fossil fuels (GWP-Fossil)

Unit: Carbon dioxide equivalent, kg CO2 eq.

Explanation: Global warming potential from fossil fuel use

Global warming potential – biogenic carbon (GWP-Biogenic)

Unit: Carbon dioxide equivalent, kg CO2 eq.

Explanation: Global warming potential due to the release of biogenic carbon. The carbon bound in the product is reported as a negative number.

Global warming potential – land use and land change (GWP-LULUC)

Unit: Carbon dioxide equivalent, kg CO2 eq.

Explanation: Global warming potential due to land use and / or change.

Global warming potential (GWP-total)

Unit: Carbon dioxide equivalent, kg CO2 eq.

Explanation: Describes the total amount of greenhouse gases formed during the life cycle. Acting on the layers of air closest to the Earth while in the atmosphere.

Ozone depletion potential (ODP)

Unit: Trichlorofluoromethane equivalent, kg CFC-11 eq.

Explanation: Describes life-cycle impacts that release gases that damage the stratospheric ozone layer. Ozone protects against UV-A and UV-B radiation.

Acidification potential (AP)

Unit: Sulphur dioxide equivalent, mol H+ eq.

Explanation: Describes the potential in which acidifying substances formed during the life cycle, when reacting with water, potentially cause acidic rainfall, which in turn acidifies the soil.

Eutrophication potential of freshwater (EP-freshwater)

Unit: Phosphate equivalent, kg PO4 eq.

Explanation: Excessive levels of nutrients in aquatic ecosystems lead to overgrowth of plants that disrupt the ecosystem, called eutrophication. It has adverse effects on the ecosystem.

Eutrophication potential of seawater (EP-marine)

Unit: Nitrogen equivalent, kg N eq.

Explanation: Excessive amounts of nutrients, especially in aquatic ecosystems, lead to overgrowth of plants that disrupt the eco-system, called eutrophication. It has adverse effects on the ecosystem.

Eutrophication potential of soil, cumulative overshoot

Unit: Nitrogen equivalent, mol N eq.

Explanation: Describes the increase in nutrient-rich (soil) habitats at the expense of nutrient-poor (soil) habitats.

Appendix 1 - Impact categories - Core environmental impact indicators

Photochemical ozone formation capacity (POCP, "smog")

Unit: kg NMVOC eq.

Explanation: Describes the formation of ozone in the tropospheric atmosphere caused by ultraviolet radiation.

Abiotic depletion of fossil resources (ADP- minerals & metals)

Unit: kg Sbe

Explanation: Describes the use of minerals and metals during their life cycle in such a way that their reserves are depleted.

Abiotic depletion of non-fossil fossil resources (ADP- fossil resources)

Unit: MJ

Explanation: In this context, abiotic resources refer to fossil energy sources and their depletion during the life cycle of a construction product.

Water use (WDP)

Unit: m3 eq. depr.

Explanation: Characterizes the possibility of water (user) deficiency with a weighted average.

Use of natural resources

Use of renewable primary energy, excluding renewable primary energy sources used as feedstock

Acronym: Renew. PER as energy

Unit: MJ

Use of renewable primary energy sources as raw material

Acronym: Renew. PER as material

Unit: MJ

Total use of renewable primary energy sources (energy and raw material)

Acronym: Total use of rener PER.

Unit: MJ

Use of non-renewable primary energy, excluding renewable primary energy sources used as feedstock

Acronym: Non-re. PER as energy

Unit: MJ

Use of non-renewable primary energy sources as raw material

Acronym: Non-re. PER as material

Unit: MJ

Total use of non-renewable primary energy sources (as energy and raw material)

Acronym: Total use of non-re. PER.

Unit: MJ

Recycled materials used

Acronym: Secondary materials

Unit: kg

Spent renewable recycled fuels

Acronym: Renew. Secondary fuels

Unit: MJ

Spent non-renewable recycled fuels

Acronym: Non-ren. Secondary fuels

Unit: MJ

End of life-output flows

Amount of hazardous waste disposed of

Acronym: Hazardous Waste

Unit: kg

Disposal of non-hazardous waste

Acronym: Non-hazardous waste

Unit: kg

Disposal of radioactive waste

Acronym: Radioactive waste

Unit: kg

Components for reuse

Acronym: Components for re-use

Unit: kg

Waste for material recycling

Acronym: Materials for recycling

Unit: kg

Waste for energy content recovery

Acronym: Exported energy

Unit: MJ

Exported energy

Acronym: Exported energy

Unit: MJ

Net freshwater use

Acronym: Use of net fresh water

Unit: m3