

Environmental Product Declaration

Group of multiple products EPD based on average results

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021

Playground equipment – wooden with steel elements

Intersystem EU s.r.o. made by Ringpol Waldemar Kubiak



Programme

EPD Square | www.epdsquare.com

Programme operator

EPD Square, s.r.o.

EPD Registration number

SQ 00-039

Publication date

25.09.2025

Valid until

24.09.2030



General information

Product

Playground equipment - wooden with steel elements

Program operator

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Registration number

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Owner of the declaration

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Manufacturer

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Place of production

ul. Bieszczadzka 5A, 38-540 Zagórz, Poland

Product Category Rules (PCR)

EPD Square PCR v1.0, January 2024

Declared unit

1 kg

Mass per DU

1 kg

UN CPC code

031

Geographical scope

Poland, Europe

Year of study

2024

Comparability

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in the context of the building.

EPD author

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Verification type

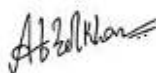
Independent verification of the declaration and data,
according to ISO14025:2006

Internal: ☐

External: ☒

Verified by

Afzal khan Peerukhan



The owner of the declaration shall be liable for the underlying information and evidence.

EPD Square shall not be liable with respect to manufacturer, life cycle assessment data and evidence.

System boundaries

This EPD covers the cradle to gate with options, modules C1-C4 and module D; i.e. A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Assembly), C1 (Demolition), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary are included.

Modules declared and geographical scope

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x
Geography	EU	EU	PI	EU	EU	-	-	-	-	-	-	-	EU	EU	EU	EU	EU

EU: Europe; PI: Poland

Modules not declared = MND

Description of organization

Ringpol has been operating in the playground and outdoor gym market since 3 February 2014, serving a wide range of customers, including local government units, private investors, as well as hotel and agritourism facility owners. For years, the company has enjoyed a reputation as a reliable and innovative manufacturer that combines high quality workmanship with modern design and an individual approach to each project. Each project begins with gathering information about the usable space available to the investor. On this basis, the company develops a technical development plan for the area and prepares a concept for the layout of recreational equipment. The design includes both the functional layout of the playground or gym and dedicated play equipment, which is designed specifically for the specific spatial and functional conditions. Ringpol implements projects from scratch – from the concept, through the selection of materials, to the final assembly of the finished equipment. A particular value of the company's activity is its ability to implement non-standard and innovative solutions, created with specific user needs and environmental conditions in mind.

As part of the design process, Ringpol uses and tests modern construction materials, such as various types of steel, aluminium, plastic and composite elements, and innovative anti-corrosion coatings. The company conducts strength and resistance tests to confirm the durability and reliability of the solutions used in conditions of intensive use and a changing climate. Thanks to its many years of experience, in-house design and technological resources, and openness to innovation, Ringpol effectively implements modern, durable and environmentally friendly solutions that meet the highest standards of safety, aesthetics and functionality. The company is consistently developing its product range and strengthening its position as a local manufacturer of innovative recreational equipment with a nationwide reach.

Product information

Product name

Playground equipment - wooden with steel elements

Product description

Playground equipment refers to all devices, structures, and elements that create a recreational space for children and young people, serving for play, physical development, integration, and outdoor activities. It is a collective product comprising various play and exercise equipment. It must meet strict safety standards (e.g., PN-EN 1176, PN-EN 1177). It is characterized by high resistance to weather conditions and intensive use.

The environmental impacts presented in this EPD are based on a reference configuration of the playground equipment. Actual products may vary according to customer requirements in terms of shape, dimensions, and number of elements. Material types and production processes remain unchanged. The average was calculated based on weight.

Product application

The playground is primarily social, educational, and recreational in nature - it is a space that supports children's development through play and physical activity. The main uses of the playground are:

- **Physical development of the child**, improvement of motor skills, balance and coordination,
 - Supporting muscle strength and endurance, developing fine and gross motor skills through climbing, swinging, and jumping.
 - Social development – building peer relationships, learning to cooperate, share and follow rules, integrating children of different ages and from different backgrounds. Emotional and mental development – reducing stress and tension
 - Building self-confidence and independence, the opportunity for creative expression through play.
- **Educational function** – learning through experience and experimentation, developing imagination through themed play (e.g., playing house, ships, vehicles), some playgrounds are equipped with sensory and educational panels.
- **Recreational function** - active outdoor recreation,
 - an alternative to spending time in front of a screen,
 - an attractive place for family gatherings and local community integration.

Social and urban planning application - an element of public space development, improving the quality of life of residents, supporting physical activity from an early age.

Technical specification

Compliance with PN-EN 1176 (playground equipment) and PN-EN 1177 (fall-attenuating surfaces) standards.

Product standards

PN-EN 1176, PN-EN 1177

Geographical scope

Poland, Europe

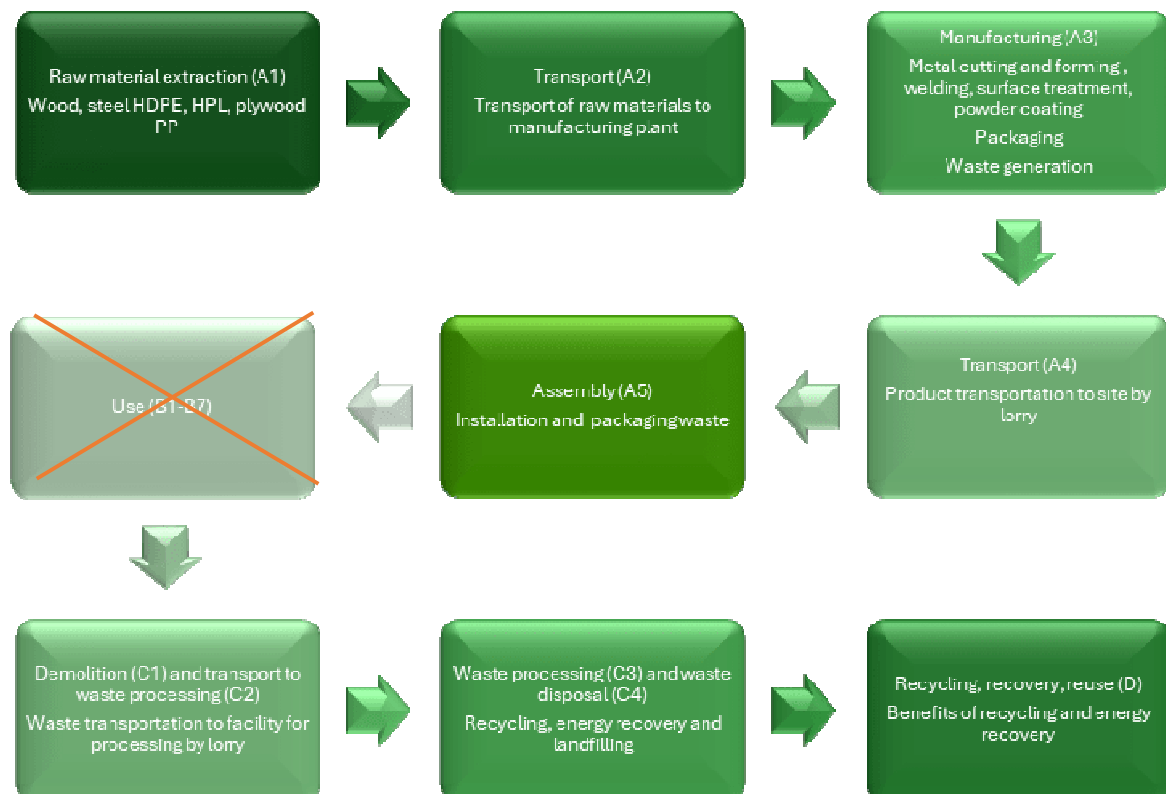
Material of product per DU 1 kg

Product components	Weight, kg	Post-consumer material, weight-%	Renewable material, weight-%	Biogenic carbon kg C
Wood	0,6780	-	97,5 %	0,339 kg C
Steel galvanized	0,0847	40 %	-	-
Stainless steel	0,0339	40 %	-	-
HDPE	0,1017	-	-	-
HPL	0,0678	-	-	-
Plywood	0,0169	-	85	0,00845 kg C
PP ropes	0,0169	-	-	-
TOTAL	1,0000	4,74 %	67,45 %;	0,347 kg C
Packaging materials	Weight, kg	Weight-% (versus the product)		Biogenic carbon kg C/kg
HDPE foil	0,0017	0,17 %		-
Non-woven geotextile	0,0017	0,17 %		-
TOTAL	0,0034	0,34 %		-

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂.

Manufacturing process

- Designing equipment and preparing documentation
- Metal cutting and forming – using lasers, presses, and bending machines.
- Welding – creating durable load-bearing structures.
- Surface treatment – sandblasting, hot-dip galvanizing, or electroplating.
- Powder coating – durable colour coating resistant to UV radiation and abrasion.
- Trial assembly – checking that the components fit and are stable.
- Quality control – safety tests and certification.



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 hazardous 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 neglected unit process that is more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

Allocation, estimations, and assumptions

Allocation is based on annual production rate and made with high accuracy and precision. The values for 1 kg of the products which are used within this study are calculated by considering the total product weight per annual production. In the production plant, several kinds of products are produced; since the production processes of these products are similar, the annual production percentages are taken into consideration for allocation. According to the ratio of the annual production of the declared product to the total annual production at the factory, the annual total energy consumption, packaging materials and the generated waste per the declared product are allocated. Subsequently, the produced products' output is fixed to 1 kg and the corresponding amount of product is used in the calculations.

The average EPD for this product group is calculated based on a weighted average of the environmental impacts of each product, considering production volumes to ensure representativeness.

This EPD includes certain key assumptions and estimates, such as the energy mix used in production and transportation distances which are essential for interpreting the environmental impacts.

Background data source and LCA software

This EPD has been created using One Click LCA EPD Generator. Ecoinvent v3.10.1/Ecoinvent v3.11 and One Click LCA databases were used as sources of environmental data, 2025.

LCA scenarios and additional technical information

A1 Raw material extraction

This module includes the extraction and processing of all raw materials and packaging which occur upstream to the manufacturing site. Especially raw material source for: wood, steel, HDPE, HPL, plywood and PP ropes. Recycled content accounts for 40% for both stainless and galvanized steel.

A2 Transport

The considered transportation impacts include exhaust emissions resulting from transportation of all raw materials from suppliers to production plant as well as the environmental impacts of production of the used fuel. The transportation distances and methods were provided by manufacturer. Module includes road transport (truck EURO6, 16-32 t, consumption 35 l / 100 km).

A3 Manufacturing

The environmental impacts considered for the production stage cover the manufacturing of the production materials and fuels used by machines. The environmental impacts of this stage have been calculated using the most recent data in regard to what applied in the factory. The data is from the year 2024. The study considers the losses of main raw materials occurring during the manufacturing process. A mass-based allocation is applied to split the environmental burdens of the site among the finished products. The waste materials (steel scrap) will be transferred to the incineration without energy recovery.

Manufacturing energy scenario

Electricity data source and quality	Electricity, Poland, residual mix, 2023
Electricity kg CO2e / MJ	0,93 kg CO2e / kWh
Energy data source and quality	Heat production, natural gas, at industrial furnace >100kW (Reference product: heat, district or industrial, natural gas)
Heating kg CO2e / MJ	0,0754 kg CO2e / MJ

A4 Transport

Transportation impacts occurred from final products delivery to construction site cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. The transportation distance is defined according to PCR. Average distance of transportation from production plant to building site is assumed as 381,2 km and the transportation method is assumed to be lorry with a capacity of 16-32t. Vehicle capacity utilization volume factor is assumed to be 1. Empty returns are considered. Transportation does not cause losses as the product is packaged properly.

Transportation scenario (A4)

Vehicle type used for transport	truck EURO6, 16-32t
Distance to the construction site	381,2 km
Capacity utilization factor	1

A5 Assembly

Transportation of waste packaging is accounted in A5. It is assumed that 40% of the plastic waste and non-woven geotextile is recycled, 37% is incinerated at the nearest municipal incineration plant and 23% is landfilled. Losses from packaging material during product installation represent less than 1%, therefore they are not included in the analysis.

C1 Disassembly

Impacts occurring from the demolition are negligible, and therefore they are estimated to be zero.

C2 Transport

Transportation distance to the closest disposal area is estimated as 50 km and the transportation method is assumed as lorry (Transport freight lorry >32 metric tonne) which is the most common.

C3 Waste processing

95% of stainless steel is recycled, 26% of hardwood and plywood as well as 24% of HDPE is recycled. 50% of hardwood is used for energy recovery, 49% of HDPE and 50% of plywood are incinerated. End of life of paperboard is estimated to be recycled.

C4 Disposal

It is assumed that 24% of hardwoods are taken to landfill for final disposal, 5% of the steel, 24% of plywood and 27% of HDPE are also considered for landfill.

End of Life (C1, C3, C4)

	Value	Unit
Collected separately	1	kg
Reuse	-	kg
Recycling	0,3909	kg
Incineration	0,4025	kg
Landfill	0,2000	kg

D module

Module considers the benefits of recycling and energy recovery which replace district heat and electricity.

Additional environmental information

Results refer to the declared unit of 1 kg of playground equipment - wooden with steel elements. The LCIA results for products within this group show a certain range of environmental impacts, influenced by materials used and geographical location. While the average values provide a general overview, individual products may experience fluctuations in their impact profiles. This variability is inherent in the product group and should be considered when evaluating the environmental performance, as some products may have higher (+2%) or lower (-6%) impacts compared to the average.

LCA results

Core environmental impact indicators – EN 15804+A2, EF 3.1

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	6,87E-02	7,26E-02	4,40E-03	0,00E+00	1,94E-02	1,14E+00	3,08E-01	-5,34E-01
GWP-fossil	kg CO ₂ eq.	1,31E+00	7,26E-02	4,26E-03	0,00E+00	1,94E-02	1,83E-01	5,49E-03	-5,34E-01
GWP-biogenic	kg CO ₂ eq.	-1,26E+00	0,00E+00	1,41E-04	0,00E+00	-3,31E-24	9,59E-01	3,03E-01	0,00E+00
GWP-LULUC	kg CO ₂ eq.	1,46E-02	2,61E-05	1,52E-07	0,00E+00	8,60E-06	1,23E-05	1,42E-06	-7,69E-05
ODP	kg CFC11 eq.	8,27E-07	1,44E-09	2,01E-12	0,00E+00	2,86E-10	1,59E-10	5,71E-11	-7,32E-09
AP	mol H ⁺ eq.	6,43E-03	1,51E-04	1,02E-06	0,00E+00	6,56E-05	1,27E-04	1,56E-05	-2,98E-03
EP-freshwater	kg P eq.	5,48E-04	4,89E-06	3,12E-08	0,00E+00	1,50E-06	6,21E-06	1,46E-06	-2,28E-04
EP-marine	kg N eq.	1,80E-03	3,63E-05	7,09E-07	0,00E+00	2,15E-05	5,45E-05	6,83E-05	-5,23E-04
EP-terrestrial	mol N eq.	1,33E-02	3,92E-04	4,30E-06	0,00E+00	2,34E-04	5,17E-04	6,42E-05	-5,46E-03
POCP	kg NMVOC eq.	5,23E-03	2,51E-04	1,24E-06	0,00E+00	9,54E-05	1,35E-04	2,64E-05	-1,95E-03
ADP-M&M	kg Sb eq.	7,62E-06	2,42E-07	1,04E-09	0,00E+00	5,72E-08	2,31E-07	4,93E-09	-1,06E-05
ADP-fossil	MJ	2,17E+01	1,02E+00	1,72E-03	0,00E+00	2,79E-01	1,52E-01	4,90E-02	-8,61E+00
WDP	m ³	3,88E+00	5,08E-03	1,25E-04	0,00E+00	1,35E-03	1,76E-02	2,34E-04	-1,92E-01

GWP-total: Global Warming Potential; **GWP-fossil:** Global Warming Potential fossil fuels; **GWP-biogenic:** Global Warming Potential biogenic; **GWP-LULUC:** Global Warming Potential land use and land use change; **ODP:** Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential, Accumulated Exceedance; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See "additional requirements" for indicator given as PO₄ eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Additional (optional) environmental impact indicators – EN 15804+A2

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	3,60E-08	5,35E-09	1,19E-11	0,00E+00	1,81E-09	1,33E-09	3,55E-10	-3,97E-08
IRP	kBq U235 eq.	9,98E-02	1,32E-03	7,10E-06	0,00E+00	2,42E-04	1,42E-03	4,78E-05	-1,03E-01
ETP-fw	CTUe	2,14E+01	1,36E-01	1,84E-03	0,00E+00	4,07E-02	2,00E-01	3,06E-02	2,83E+00
HTP-c	CTUh	4,98E-10	1,22E-11	2,29E-13	0,00E+00	3,24E-12	2,06E-11	7,40E-13	-3,93E-10
HTP-nc	CTUh	8,42E-09	6,46E-10	8,56E-12	0,00E+00	1,79E-10	1,15E-09	7,84E-11	-9,25E-09
SQP	Dimensionless	1,62E+01	6,17E-01	2,12E-03	0,00E+00	2,45E-01	1,22E-01	1,14E-01	-9,77E+00

PM: Particulate matter emissions; IRP: Ionising radiation, human health; ETP-fw: Ecotoxicity (freshwater); ETP-c: Human toxicity, cancer effects; HTP-nc: Human toxicity, non-cancer effects; SQP: Land use related impacts / soil quality

Use of Natural Resources

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	3,16E+00	1,79E-02	1,11E-04	0,00E+00	3,85E-03	-6,96E+00	-2,78E+00	-1,47E+00
RPEM	MJ	9,09E+00	0,00E+00	-4,32E-04	0,00E+00	0,00E+00	-6,91E+00	-2,18E+00	0,00E+00
TPE	MJ	1,22E+01	1,79E-02	-3,21E-04	0,00E+00	3,85E-03	-1,39E+01	-4,96E+00	-1,47E+00
NRPE	MJ	1,79E+01	1,02E+00	-1,36E-01	0,00E+00	2,79E-01	-3,07E+00	-1,13E+00	-8,62E+00
NRPM	MJ	5,67E+00	0,00E+00	-1,53E-01	0,00E+00	0,00E+00	-4,18E+00	-1,34E+00	0,00E+00
TRPE	MJ	2,36E+01	1,02E+00	-2,89E-01	0,00E+00	2,79E-01	-7,25E+00	-2,47E+00	-8,62E+00
SM	kg	8,86E-02	4,74E-04	5,39E-06	0,00E+00	1,21E-04	3,14E-04	1,76E-05	1,23E-01
RSF	MJ	1,36E-01	6,00E-06	4,34E-08	0,00E+00	1,54E-06	3,20E-06	3,32E-07	-1,09E-04
NRSF	MJ	7,67E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m ³	1,47E-02	1,39E-04	-1,63E-06	0,00E+00	3,99E-05	1,58E-04	-7,17E-04	-6,16E-03

RPEE: Renewable primary energy resources used as energy carrier; RPEM: Renewable primary energy resources used as raw materials; TPE: Total use of renewable primary energy resources; NRPE: Non-renewable primary energy resources used as energy carrier; NRPM: Non-renewable primary energy resources used as materials; TRPE: Total use of non-renewable primary energy resources; SM: Use of secondary materials; RSF: Use of renewable secondary fuels; NRSF: Use of non-renewable secondary fuels; W: Use of net fresh water

End of life – Waste

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HW	KG	1,89E-01	1,48E-03	4,73E-05	0,00E+00	4,74E-04	4,37E-03	8,49E-05	-3,74E-01
NHW	KG	4,73E+00	3,13E-02	5,67E-03	0,00E+00	8,84E-03	4,42E-01	9,64E-01	-1,56E+00
RW	KG	5,48E-03	3,27E-07	1,81E-09	0,00E+00	5,92E-08	3,64E-07	1,17E-08	-2,64E-05

HW: Hazardous waste disposed; NHW: Non-hazardous waste disposed; RW: Radioactive waste disposed

End of life – Output flows

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
CR	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
MR	kg	0,00E+00	0,00E+00	1,36E-03	0,00E+00	0,00E+00	3,91E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,86E-02	0,00E+00	0,00E+00	0,87E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	0,12E-01	0,00E+00	0,00E+00	1,19E+00	0,00E+00	0,00E+00

CR: Components for reuse; MR: Materials for recycling; MER: Materials for energy recovery; EEE: Exported electric energy; ETE: Exported thermal energy

Information describing biogenic carbon content at factory gate

Biogenic carbon content	Value	Unit
Biogenic carbon content in product	0,347	kg C
Biogenic carbon content in the accompanying packaging	-	kg C

Specific data (GWP-GHG) and data variation for A1-A3

Specific data and data variation	Value-%
Specific data	52,05%
Variation - product	-6%; +2%
Variation - site	-

Hazardous substances

- ☒ The product does not contain any REACH SVHC substances in amounts greater than 0,1 %.

Contact information

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Bibliography

ISO 14020:2000

Environmental labels and declarations – General principles

ISO 14025:2010

Environmental labels and declarations - Type III environmental declarations - Principles and procedures

ISO 14040:2006

Environmental management – Life cycle assessment – Principles and frameworks

ISO 14044:2006

Environmental management - Life cycle assessment - Requirements and guidelines

EN 15804:2012+A2:2019

Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products

EPD Square PCR v.1.0, 2024

EPD Square, General Programme Instructions v.1, 2024

Ecoinvent database v3.10.1/Ecoinvent v3.11 (2025) and One Click LCA database

Annex

Environmental impacts – GWP-GHG

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - GHG	kg CO ₂ e	1,33E+00	7,26E-02	4,26E-03	0,00E+00	1,94E-02	1,83E-01	5,49E-03	-5,34E-01

GWP- GHG: Global Warming Potential, greenhouse gases