

## EPD (Environmental Product Declaration)<sup>1</sup>

Registrierungs-Nummer: EPD-Kiwa-EE-184414-EN

Programmhalter: Kiwa-Ecobility Experts

Gültig bis: 19-05-2030



### BISOGREEN HBL –

### Leichtbeton Planblöcke aus Naturbims mit integrierter Holzfaser-Dämmung



L x B x H in cm:  
24,7 x **36,5** x 24,9  
12 DF



L x B x H in cm:  
24,7 x **42,5** x 24,9  
14 DF

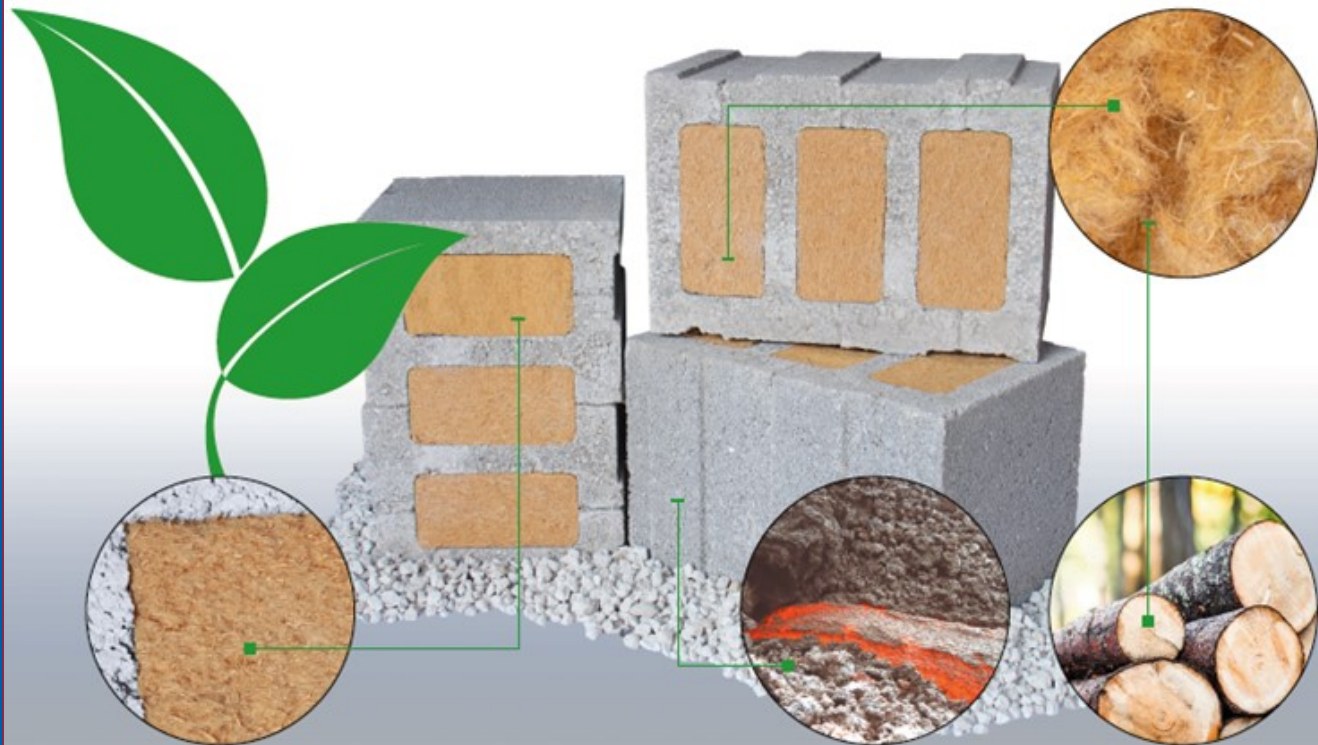
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<sup>1</sup> Dieses Deckblatt ist nicht Bestandteil der EPD und dient ausschließlich zu Informationszwecken in deutscher Sprache

Environmental Product Declaration (EPD)  
According to ISO 14025 and EN  
15804+A2:2019

# KLB Isostar and BisoGreen Hbl : Blocks with integrated insulation

Registration number:	EPD-Kiwa-EE-184414-EN
Issue date:	19-05-2025
Valid until:	19-05-2030
Declaration owner:	KLB Klimaleichtblock GmbH
Publisher:	Kiwa-Ecobilicity Experts
Programme operator:	Kiwa-Ecobilicity Experts
Status:	verified



# 1 General information

## 1.1 PRODUCT

KLB Isostar and BisoGreen Hbl : Blocks with integrated insulation

## 1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-184414-EN

## 1.3 VALIDITY

**Issue date:** 19-05-2025

**Valid until:** 19-05-2030

## 1.4 PROGRAMME OPERATOR

Kiwa-Ecobility Experts  
Wattstraße 11-13  
13355 Berlin  
DE



Raoul Mancke

*(Head of programme operations, Kiwa-Ecobility Experts)*



Dr. Ronny Stadie

*(Verification body, Kiwa-Ecobility Experts)*

## 1.5 OWNER OF THE DECLARATION

**Manufacturer:** KLB Klimaleichtblock GmbH

**Address:** Lohmannstraße 31, 56626 Andernach, Germany

**E-mail:** info@klb.de

**Website:** <https://www.klb-klimaleichtblock.de>

**Production location 1:** GEBR. ZIEGLOWSKI GMBH & CO. KG

**Address production location 1:** Waldstraße 17, 56642 Kruft, Germany

**Production location 2:** Bisotherm GmbH

**Address production location 2:** Eisenbahnstr 12, 56218, Mülheim-Kärlich, Germany

## 1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804+A2:2019 serves as the core PCR.

Internal  External



Lucas Pedro Berman, Senda

## 1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The programme operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

## 1.8 PRODUCT CATEGORY RULES

Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules (2022-02-14)

DIN EN 16757 - Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements; German version EN 16757:2022 (2023-03)

## 1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804+A2:2019. For the evaluation of the comparability, the following aspects have to be considered in

## 1 General information

particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPD program operators may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2:2019 and ISO 14025.

### 1.10 CALCULATION BASIS

**LCA method R<THINK:** Ecobility Experts | EN15804+A2

**LCA software\*:** Simapro 9.6

**Characterization method:** R<THINK characterization method (see references for more

details)

**LCA database profiles:** ecoinvent (for version see references)

**Version database:** v3.19 (20250306)

*\* Simapro is used for calculating the characterized results of the Environmental profiles within R<THINK.*

### 1.11 LCA BACKGROUND REPORT

This EPD is generated on the basis of the LCA background report 'KLB Isostar and BisoGreen Hbl : Blocks with integrated insulation' with the calculation identifier ReTHiNK-84414.

## 2 Product

### 2.1 PRODUCT DESCRIPTION

This is a specific EPD describing KLB Isostar blocks; an unreinforced component with integrated insulation; manufactured from lightweight aggregate concrete block (LAC block) in various formats and sizes.

LAC block consists of natural aggregates, water, and hydraulic binders (cement). The product described here, with gross density classes ranging from 0.40 to 0.60 g/cm<sup>3</sup> (400–600 kg/m<sup>3</sup>), represents all backfilled, lightweight plane blocks of this type manufactured at the plant.

Composition of product is available in the following table:

Material	Value	Unit
Cement	17	%
Washed pumice	75	%
Wood fiber insulation boards	4	%
Water	4	%

### 2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

Plan blocks with integrated thermal insulation are used as unproven building blocks for masonry, monolithic, load-bearing and non-load-bearing exterior walls. The standard formats for these blocks feature wall thicknesses of 36.5 cm and 42.5 cm.

### 2.3 REFERENCE SERVICE LIFE

#### RSL PRODUCT

As the entire life cycle of the product is not considered in the scope of the study, the specification of the reference service life (RSL) is voluntary. According to the information from the manufacturer, the RSL of the product is 80 years.

#### USED RSL (YR) IN THIS LCA CALCULATION:

80

### 2.4 TECHNICAL DATA

Technical data of the product is available in the following table:

Technical Property	Values/Classes
Strength Classes (MPa)	2, 4
Bulk Density Classes (g/cm <sup>3</sup> )	0.40, 0.45, 0.50, 0.55, 0.60
Thermal Conductivity (W/mK)	0.08, 0.09, 0.10, 0.11
Fire Protection	F30
Sound Insulation Dimension (db)	≥45
General Building Authority Approval	Z-17.23-1287, Z-17.23-1288

### 2.5 SUBSTANCES OF VERY HIGH CONCERN

No substance present in the product with a contribution of more than 0.1 % of the total weight is present on the "List of Potentially Hazardous Substances" (SVHC) that are candidates for authorisation under REACH legislation.

### 2.6 DESCRIPTION PRODUCTION PROCESS

The manufacturing operations are carried out across two production locations, each contributing equally to production (50%). These locations include:

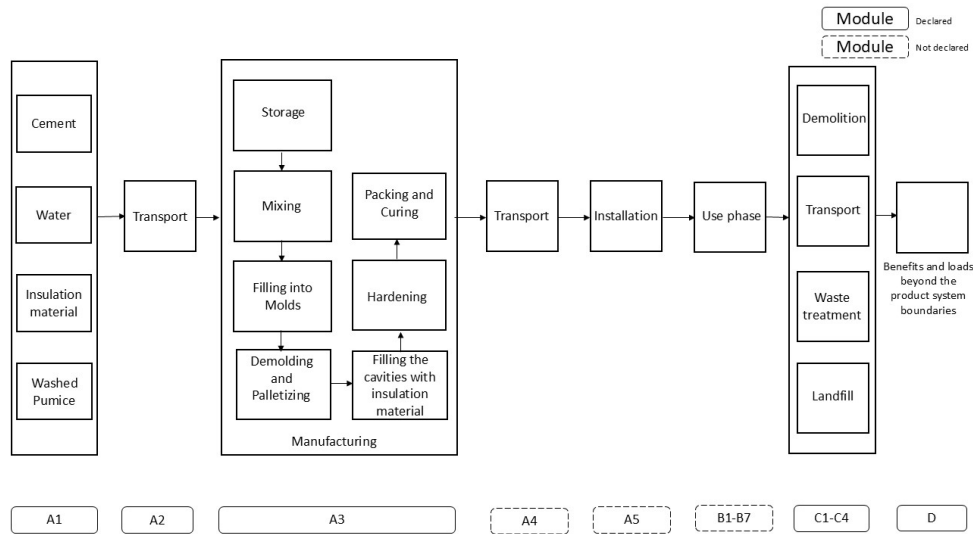
1. **GEBR. ZIEGLOWSKI GMBH & CO. KG**, located at Waldstraße 17, 56642 Kruft, Germany.
2. **Bisotherm GmbH**, located at Eisenbahnstr. 12, 56218, Mülheim-Kärlich, Germany.

Below is a summary of the manufacturing process:

- Cement is added to natural lightweight aggregates (pumice).
- Aggregates are stored in silos or in the open air, depending on type.
- Binder and additives are stored in silos
- Aggregates are dosed and premixed dry with binder.
- The mixture is combined with water to form lightweight concrete.
- Recycled water from the factory's water treatment plant is used.
- Lightweight concrete mass is filled into steel block molds.
- Cores for slots or chambers are given to molds as needed.
- Blocks are compacted and released using load and vibration.
- Demolded bricks are loaded onto pallets.
- Bricks are transported to dry high-bay warehouse for hardening (24-36 hours).
- Filling the cavities with thermal insulation material;
- Bricks are packed for commissioning after reaching sufficient strength.
- Fully cured in weatherproof packaging for at least 28 days.

## 2 Product

· Delivered to construction site



### 3 Calculation rules

#### 3.1 DECLARED UNIT

##### 1 m<sup>3</sup> KLB Isostar: Blocks with integrated insulation

In Life Cycle Assessment (LCA) calculations, 1 m<sup>3</sup> KLB Isostar: Blocks with integrated insulation was defined as the declared unit.

Reference unit: cubic meter (m<sup>3</sup>)

#### 3.2 CONVERSION FACTORS

Description	Value	Unit
Reference unit	1	m <sup>3</sup>
Weight per reference unit	542.200	kg
Conversion factor to 1 kg	0.001844	m <sup>3</sup>

#### 3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This is a Cradle to gate with modules C1-C4 and module D EPD. The life cycle stages included are as shown below:

(X = module included, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN 15804 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

#### 3.4 REPRESENTATIVENESS

This EPD is representative for KLB Isostar and BisoGreen Hbl : Blocks with integrated insulation, a product of KLB Klimaleichtblock GmbH. The results of this EPD are representative for European Union.

#### 3.5 CUT-OFF CRITERIA

##### Product stage (A1-A3)

All input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output flows (e.g. production waste) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

## 3 Calculation rules

### End of life stage (C1-C4)

All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

### Benefits and loads beyond the system boundary (Module D)

All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

### Excluded Elements from LCA Calculation:

- The manufacture of equipment used in production, buildings or any other capital goods;
- The transport of personnel to the plant;
- The transportation of personnel within the plant;
- Research and development activities;
- Long-term emissions.

## 3.6 ALLOCATION

Allocations were avoided as far as possible. No by-products or co-products are produced during the manufacture of the analysed product. The energy requirements of production were allocated to the individual products on the basis of energy consumption measurements. Specific information on the allocations within the background data can be found in the documentation of the Ecoinvent datasets.

## 3.7 DATA COLLECTION & REFERENCE PERIOD

All primary data were collected by KLB Klimaleichtblock GmbH for the period January–December 2023.

## 3.8 ESTIMATES AND ASSUMPTIONS

- A payload factor of 50 percent was used for all truck transports, which in fact corresponds to a full delivery and empty return trip. A data set for a non-specific truck was used.
- The demolition process for end-of-life products is assumed to be based on data from the National Milieudatabase (NMD) in the Netherlands. According to the NMD, a hydraulic excavator is capable of breaking 9.8 tons of concrete per hour and moving 8.3 tons of concrete per hour.
- The waste scenario for this LCA was determined based on NMD ID 9, which relates to concrete (i.a. elements, brickwork, reinforced concrete). According to this standard, the waste treatment process comprises 99% recycling and 1 % landfill.

## 3.9 DATA QUALITY

All primary data were collected by KLB Klimaleichtblock GmbH for the reference year of 2023.

For the data, which the manufacturer does not influence, generic data was used. Secondary data were sourced from the regularly updated Ecoinvent database (version 3.6), aligning with EN 15804 standards to ensure background data not exceeding 10 years.

ReTHiNK EPD web application was used to model the life cycle for the production and disposal of the declared product systems. To ensure that the results are comparable, consistent background data from the international database Ecoinvent was used in the LCA (e.g., data records on energy, transport, auxiliary materials, and supplies). Almost all consistent data sets contained in the Ecoinvent database are documented and can be viewed online.

The scenarios included are currently in use and are representative for one of the most likely scenario alternatives.

According to the criteria of the "UN Environmental Global Guidance on LCA database development" mentioned in EN 15804+A2, the data quality for all three representativeness categories (geographical, technical and time) can be described as good.

## 3.10 POWER MIX

The electricity profile was modeled using the market-based method, aligned with the geographical reference area of Germany. It comprises 49.1% residual mix and 50.9% renewable energy, with the renewable portion consisting of 71% hydropower, 21% solar PV, and 8% onshore wind, based on supplier-specific data.

### 3 Calculation rules

The electricity used has a Global Warming Potential (GWP-total) of 0.39 kg CO<sub>2</sub>-eq per kilowatt-hour (kWh).

## 4 Scenarios and additional technical information

### 4.1 DE-CONSTRUCTION, DEMOLITION (C1)

The following information describes the scenario for demolition at end of life.

Description	Amount	Unit
(ei3.6) Hydraulic excavator (average) [NMD generic]	0.050	hr
(ei3.6) Hydraulic excavator (average) [NMD generic]	0.060	hr

### 4.2 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.6) concrete (i.a. elements, brickwork, reinforced concrete) (NMD ID 9)	(ei3.6) Lorry (Truck), unspecified (default)   market group for (GLO)	0	100	150	50	0

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

	Value and unit
Vehicle type used for transport	(ei3.6) Lorry (Truck), unspecified (default)   market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

### 4.3 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables. First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

Waste Scenario	Region	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.6) concrete (i.a. elements, brickwork, reinforced concrete) (NMD ID 9)	NL	0	1	0	99	0

## 4 Scenarios and additional technical information

Waste Scenario	Not removed (stays in work) [kg]	Landfill [kg]	Incineration [kg]	Recycling [kg]	Re-use [kg]
(ei3.6) concrete (i.a. elements, brickwork, reinforced concrete) (NMD ID 9)	0.000	5.422	0.000	536.778	0.000
<b>Total</b>	<b>0.000</b>	<b>5.422</b>	<b>0.000</b>	<b>536.778</b>	<b>0.000</b>

### 4.4 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.6) concrete (i.a. elements, brickwork, reinforced concrete) (NMD ID 9)	535.155	0.000
<b>Total</b>	<b>535.155</b>	<b>0.000</b>

## 5 Results

For the impact assessment long-term emissions (>100 years) are not considered. The results of the impact assessment are only relative statements that do not make any statements about end-points of the impact categories, exceedance of threshold values, safety margins or risks. The following tables show the results of the indicators of the impact assessment, of the use of resources as well as of waste and other output flows.

### 5.1 ENVIRONMENTAL IMPACT INDICATORS PER CUBIC METER

#### CORE ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	2.37E+1	1.84E+0	3.25E+0	2.88E+1	5.76E+0	3.70E+0	8.75E-1	2.86E-2	-2.26E+0
GWP-f	kg CO <sub>2</sub> eq.	5.68E+1	1.84E+0	3.40E+0	6.20E+1	5.76E+0	3.70E+0	8.73E-1	2.85E-2	-2.25E+0
GWP-b	kg CO <sub>2</sub> eq.	-3.28E+1	7.35E-4	-1.56E-1	-3.29E+1	1.04E-3	1.49E-3	3.30E+1	1.80E-5	-5.76E-3
GWP-luluc	kg CO <sub>2</sub> eq.	4.26E-2	6.55E-4	8.64E-4	4.41E-2	4.54E-4	1.36E-3	1.66E-4	7.96E-6	-2.42E-3
ODP	kg CFC 11 eq.	1.62E-7	4.19E-7	5.27E-8	6.34E-7	1.24E-6	8.16E-7	1.13E-7	1.18E-8	-2.25E-7
AP	mol H <sup>+</sup> eq.	9.36E-2	5.29E-3	9.63E-3	1.09E-1	6.03E-2	2.14E-2	5.48E-3	2.71E-4	-1.63E-2
EP-fw	kg P eq.	1.49E-2	1.47E-5	2.40E-4	1.51E-2	2.10E-5	3.72E-5	2.72E-5	3.20E-7	-8.32E-5
EP-m	kg N eq.	3.25E-2	1.05E-3	1.88E-3	3.54E-2	2.66E-2	7.56E-3	2.18E-3	9.32E-5	-4.66E-3
EP-T	mol N eq.	3.49E-1	1.17E-2	2.18E-2	3.82E-1	2.92E-1	8.33E-2	2.42E-2	1.03E-3	-5.41E-2
POCP	kg NMVOC eq.	8.95E-2	4.49E-3	6.49E-3	1.00E-1	8.03E-2	2.38E-2	6.58E-3	2.99E-4	-1.49E-2
ADP-mm	kg Sb-eq.	4.64E-6	5.08E-5	3.67E-5	9.22E-5	8.83E-6	9.36E-5	2.46E-6	2.61E-7	-1.12E-4
ADP-f	MJ	5.54E+0	2.78E+1	4.68E+1	8.02E+1	7.93E+1	5.57E+1	1.17E+1	7.98E-1	-2.81E+1
WDP	m <sup>3</sup> world eq.	4.77E+0	7.88E-2	4.10E-2	4.89E+0	1.06E-1	1.99E-1	5.32E-2	3.58E-2	-3.23E+1

**GWP-total**=Global Warming Potential total (GWP-total) | **GWP-f**=Global Warming Potential fossil fuels (GWP-fossil) | **GWP-b**=Global Warming Potential biogenic (GWP-biogenic) | **GWP-luluc**=Global Warming Potential land use and land use change (GWP-luluc) | **ODP**=Depletion potential of the stratospheric ozone layer (ODP) | **AP**=Acidification potential, Accumulated Exceedance (AP) | **EP-fw**=Eutrophication potential, fraction of nutrients reaching freshwater end compartment (EP-freshwater) | **EP-m**=Eutrophication potential, fraction of nutrients reaching marine end compartment (EP-marine) | **EP-T**=Eutrophication potential, Accumulated Exceedance (EP-terrestrial) | **POCP**=Formation potential of tropospheric ozone (POCP) | **ADP-mm**=Abiotic depletion potential for non fossil resources (ADP mm) | **ADP-f**=Abiotic depletion for fossil resources potential (ADP fossil) | **WDP**=Water (user) deprivation potential, deprivation-weighted water consumption (WDP)

## 5 Results

### ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN 15804+A2

Abbr.	Unit	A1	A2	A3	A1- A3	C1	C2	C3	C4	D
PM	disease incidence	7.70E-7	1.17E-7	4.21E-8	9.30E-7	1.59E-6	3.31E-7	1.21E-7	5.27E-9	-2.80E-7
IR	kBq U235 eq.	1.83E+0	1.22E-1	1.45E-1	2.10E+0	3.40E-1	2.34E-1	3.72E-2	3.27E-3	-1.13E-1
ETP-fw	CTUe	1.36E+2	2.24E+1	1.69E+1	1.75E+2	4.78E+1	4.97E+1	9.51E+0	5.18E-1	-4.53E+1
HTP-c	CTUh	3.18E-8	6.24E-10	1.25E-9	3.37E-8	1.67E-9	1.61E-9	2.25E-10	1.20E-11	-1.68E-9
HTP-nc	CTUh	4.62E-7	2.37E-8	4.86E-8	5.34E-7	4.10E-8	5.45E-8	6.37E-9	3.68E-10	-4.73E-8
SQP	Pt	1.67E+3	1.95E+1	2.57E+1	1.72E+3	1.01E+1	4.83E+1	1.96E+0	1.67E+0	-3.63E+1

**PM**=Potential incidence of disease due to PM emissions (PM) | **IR**=Potential Human exposure efficiency relative to U235 (IRP) | **ETP-fw**=Potential Comparative Toxic Unit for ecosystems (ETP-fw) | **HTP-c**=Potential Comparative Toxic Unit for humans (HTP-c) | **HTP-nc**=Potential Comparative Toxic Unit for humans (HTP-nc) | **SQP**=Potential soil quality index (SQP)

### CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2
	Potential Comparative Toxic Unit for humans (HTP-nc)	2

## 5 Results

ILCD classification	Indicator	Disclaimer
	Potential Soil quality index (SQP)	2

**Disclaimer 1** – This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

**Disclaimer 2** – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

### 5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI)

#### PARAMETERS DESCRIBING RESOURCE USE

Abbr.	Unit	A1	A2	A3	A1- A3	C1	C2	C3	C4	D
PERE	MJ	2.24E+2	3.99E-1	1.76E+1	2.42E+2	4.29E-1	6.98E-1	6.67E-1	6.45E-3	-1.95E+0
PERM	MJ	3.50E+2	0.00E+0	1.75E+0	3.52E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	5.73E+2	3.99E-1	1.93E+1	5.92E+2	4.29E-1	6.98E-1	6.67E-1	6.45E-3	-1.95E+0
PENRE	MJ	5.36E+2	2.96E+1	4.97E+1	6.15E+2	8.42E+1	5.92E+1	1.25E+1	8.48E-1	-2.98E+1
PENRM	MJ	3.60E+1	0.00E+0	1.80E-1	3.62E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ	5.73E+2	2.96E+1	4.99E+1	6.52E+2	8.42E+1	5.92E+1	1.25E+1	8.48E-1	-2.98E+1
SM	Kg	1.62E+0	0.00E+0	8.12E-3	1.63E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ	3.68E+1	0.00E+0	1.84E-1	3.69E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	1.07E+2	0.00E+0	5.34E-1	1.07E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m <sup>3</sup>	4.49E-1	2.98E-3	2.89E-2	4.80E-1	4.08E-3	6.79E-3	3.92E-3	8.53E-4	-7.57E-1

**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

## 5 Results

### OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
HWD	Kg	2.56E-1	7.29E-5	1.40E-3	2.58E-1	2.16E-4	1.41E-4	2.04E-5	1.19E-6	-5.68E-5
NHWD	Kg	7.21E+1	1.35E+0	5.99E-1	7.41E+1	9.39E-2	3.54E+0	1.63E+0	5.42E+0	-3.05E-1
RWD	Kg	6.43E-3	1.89E-4	2.12E-4	6.83E-3	5.51E-4	3.67E-4	5.27E-5	5.24E-6	-1.23E-4

HWD=Hazardous waste disposed | NHWD=Non-hazardous waste disposed | RWD=Radioactive waste disposed

### ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbr.	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
CRU	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	Kg	0.00E+0	0.00E+0	2.56E+0	2.56E+0	0.00E+0	0.00E+0	5.37E+2	0.00E+0	0.00E+0
MER	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

CRU=Components for re-use | MFR=Materials for recycling | MER=Materials for energy recovery | EET=Exported Energy, Thermic | EEE=Exported Energy, Electric

## 5 Results

### 5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER CUBIC METER

#### BIOGENIC CARBON CONTENT

The following Information describes the biogenic carbon content in (the main parts of) the product at the factory gate per cubic meter:

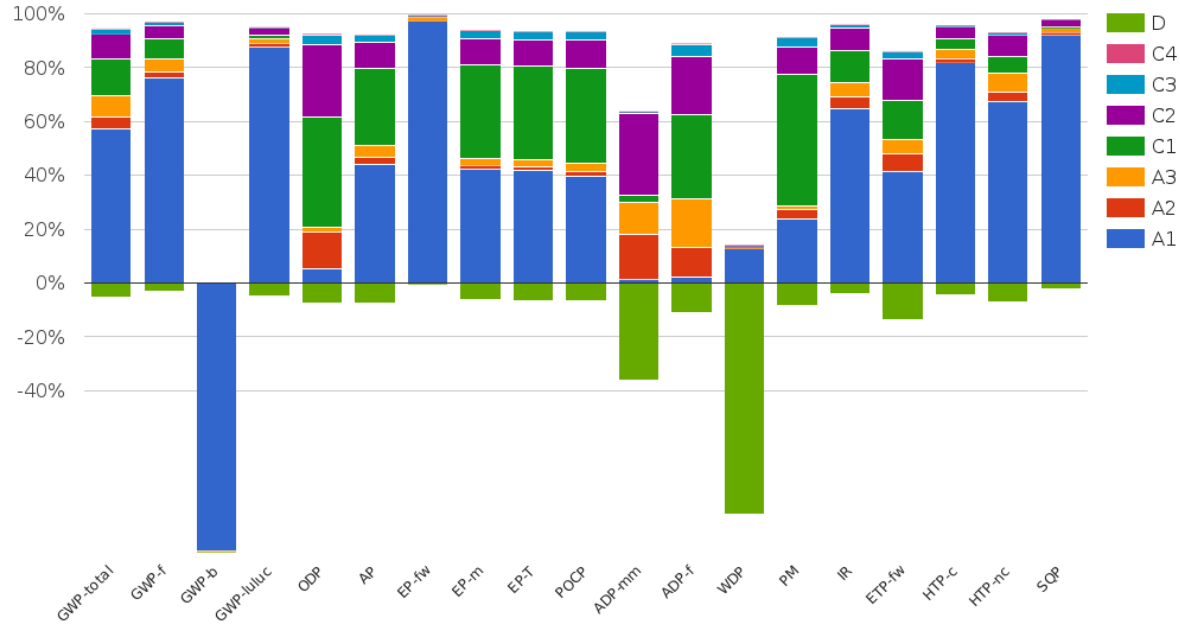
Biogenic carbon content	Amount	Unit
Biogenic carbon content in the product	9.159	kg C
Biogenic carbon content in accompanying packaging	0	kg C

#### UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount of carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic Carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

Uptake Biogenic Carbon dioxide	Amount	Unit
product	33.44	kg CO2 (biogenic)

## 6 Interpretation of results



The figure illustrates the impact categories for 1 m<sup>3</sup> of KLB - Isostar: Blocks with integrated insulation.

As depicted, the contribution of raw materials (A1) is notably higher, whereas transportation (A2) exhibits a comparatively minor impact.

The negative GWP-b value indicates that the wood used in the insulation acts as a carbon sink, sequestering more CO<sub>2</sub> from the atmosphere than is emitted, thus contributing to a reduction in the product's overall global warming potential.

For all indicators, Module D indicates environmental benefits or credits beyond the system boundaries.

## 7 References

### ISO 14040

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

### ISO 14044

ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006

### 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

### General PCR Ecobility Experts

Kiwa-Ecobility Experts (Kiwa-EE) – General Product Category Rules (2022-02-14)

### DIN EN 16757

Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements; German version EN 16757:2022 (2023-03)

### Dutch Nationale Milieu Database (NMD), 2022.

Forfaitaire waarden voor verwerking-scenario's einde leven behorende bij: Bepalingsmethode Milieuprestatie Bouwwerken [Default values for end-of-life processing scenarios related to: Method for Environmental Performance of Buildings], NMD 9.

### NMD 2021

LCA Rapportage categorie 3 data. National Milieudatabase. Hoofdstuk 42 Betonconstructies. [https://milieudatabase.nl/media/filer\\_public/03/92/0392a33f-249a-4e5cbeea-0f19c6d5d4f8/h42\\_betonconstructies\\_-\\_v11.pdf](https://milieudatabase.nl/media/filer_public/03/92/0392a33f-249a-4e5cbeea-0f19c6d5d4f8/h42_betonconstructies_-_v11.pdf)

### RSL References

[https://www.dgfm.de/fileadmin/01-DGFM/downloads/studien-mauerwerksbau/2022/IBP-TUM-Studie-Teil-1-Potentiale-Mauerwerksbau-Literaturstudie\\_Sep2021\\_signiert.pdf](https://www.dgfm.de/fileadmin/01-DGFM/downloads/studien-mauerwerksbau/2022/IBP-TUM-Studie-Teil-1-Potentiale-Mauerwerksbau-Literaturstudie_Sep2021_signiert.pdf)

<https://www.bmwsb.bund.de/SharedDocs/faqs/Webs/BMWSB/DE/bauen/novellierung-wertermittlungsrecht/10.html>

### Ecoinvent

Ecoinvent Database, Version 3.6 (2019)

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