

# ENVIRONMENTAL PRODUCT DECLARATION

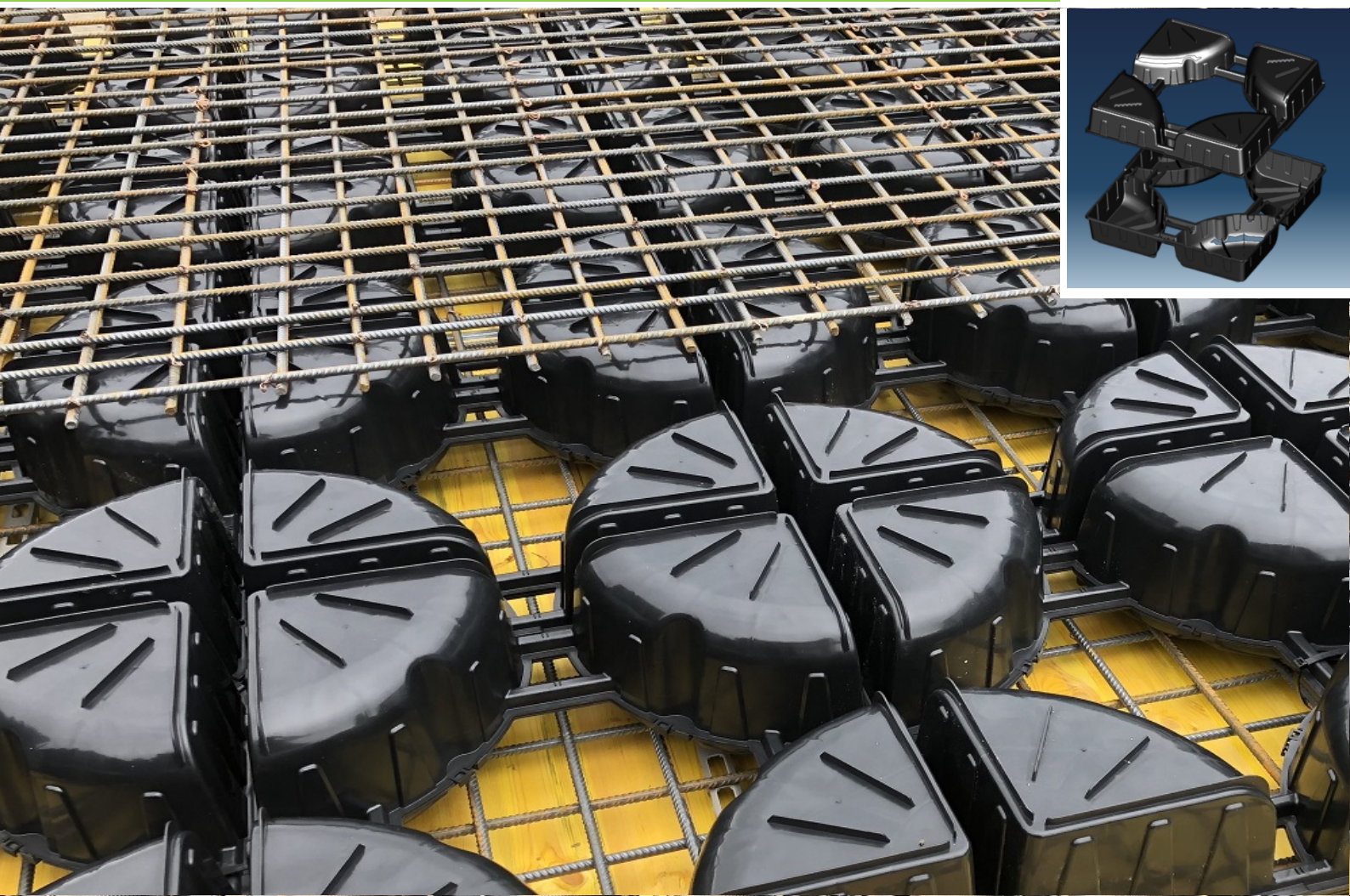
as per *ISO 14025* and *EN 15804+A1*

Owner of the Declaration	Cobix Deutschland GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-COB-20210105-IBB1-EN
Issue date	14.07.2021
Valid to	13.07.2026




Cobix CLS structural formers  
**Cobix Deutschland GmbH**



[www.ibu-epd.com](http://www.ibu-epd.com) | <https://epd-online.com>



## 1. General Information

<p><b>CobiAx Deutschland GmbH</b></p> <hr/> <p><b>Programme holder</b>          IBU – Institut Bauen und Umwelt e.V.          Panoramastr. 1          10178 Berlin          Germany</p> <hr/> <p><b>Declaration number</b>          EPD-COB-20210105-IBB1-EN</p> <hr/> <p><b>This declaration is based on the product category rules:</b>          Concrete components made of in-situ or ready-mixed concrete, 07.2014          (PCR checked and approved by the SVR)</p> <hr/> <p><b>Issue date</b>          14.07.2021</p> <hr/> <p><b>Valid to</b>          13.07.2026</p> <hr/> <p>          Dipl. Ing. Hans Peters          (chairman of Institut Bauen und Umwelt e.V.)</p> <hr/> <p>          Dr. Alexander Röder          (Managing Director Institut Bauen und Umwelt e.V.)</p>	<p><b>CobiAx CLS</b></p> <hr/> <p><b>Owner of the declaration</b>          CobiAx Deutschland GmbH          Am Stadtholz 56          33609 Bielefeld,          Germany</p> <hr/> <p><b>Declared product / declared unit</b>          1m<sup>3</sup> in-situ concrete slab featuring CobiAx CLS structural formers</p> <hr/> <p><b>Scope:</b>          This document applies for in-situ concrete slabs featuring "CobiAx" structural formers. The LCA data is based on long-term project data provided by CobiAx Deutschland GmbH. The data is provided by the production site in Herford operated by the plastics manufacturer of the Heinze Group. The structural formers are manufactured at this location and loaded for transport to the installation site where they are then assembled.          The declaration applies for all CobiAx locations and sales partners supplied within a radius of 400 km of the production sites.</p> <p>The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.          The EPD was created according to the specifications of <i>EN 15804+A1</i>. In the following, the standard will be simplified as <i>EN 15804</i>.</p> <hr/> <p><b>Verification</b></p> <table border="1"> <tr> <td colspan="2">The standard <i>EN 15804</i> serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to <i>ISO 14025:2010</i></td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <hr/> <p>          Dr.-Ing. Andreas Ciroth          (Independent verifier)</p>	The standard <i>EN 15804</i> serves as the core PCR		Independent verification of the declaration and data according to <i>ISO 14025:2010</i>		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
The standard <i>EN 15804</i> serves as the core PCR							
Independent verification of the declaration and data according to <i>ISO 14025:2010</i>							
<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally						

## 2. Product

### 2.1 Product description/Product definition

The declared products comprise in-situ slabs of various component heights with structural formers made of 100% recycled plastic. CLS structural formers are marketed as half shells and are used for slab thicknesses from 20 to 80 cm.

Use of the product is subject to the respective national specifications at the place of use; in Germany, for example, the state building codes, and the technical specifications based on these guidelines.

### 2.2 Application

CobiAx installation elements are used for manufacturing reinforcing steel slabs from normal

concrete in order to deflect vertical and horizontal loads in multi-storey buildings.

The installation elements are used with the aim of reducing the dead-load of the structure as well as reducing the materials used, thereby enabling supporting structures that are more material-efficient.

### 2.3 Technical Data

As the void formers are arranged in the statically ineffective area of the slabs, the mechanical material features of CobiAx voided slabs largely correspond to the features of a solid reinforced concrete slab. Applicable design standards for reinforced concrete elements must be taken into consideration. The CobiAx Technology Manual may be used to provide the appropriate design aids. The parameters indicated in the following tables exclusively refer to solid reinforced concrete slabs.

The void formers can improve the insulating features of the slabs. Owing to the thermal bridge effect of the surrounding concrete, a "worst-case scenario" should however be assumed, and the physical characteristics of a solid reinforced concrete slab applied. The strength and building physics parameters refer to normal concrete types C20/25 to C45/55 and reinforcing steel BSt 500.

## Construction data

Name	Value	Unit
Thermal conductivity	2.3	W/(mK)
Water vapour diffusion resistance factor	80 - 130	-
Sound absorption coefficient *	irrelevant	%
Gross density	2400	kg/m <sup>3</sup>
Compressive strength	20 - 45	N/mm <sup>2</sup>
Tensile strength	500	N/mm <sup>2</sup>
Flexural strength	23 - 40	N/mm <sup>2</sup>
Modulus of elasticity	28800 - 35700	N/mm <sup>2</sup>
Equilibrium moisture content	0.13	%

\*The airborne & impact sound properties of Cobi-ax voided slabs can be classified as approximating solid slabs as defined by DIN 4109.

Product performance values in terms of its characteristics following the relevant technical determination (no CE marking).

## 2.4 Delivery status

Cobi-ax CLS structural formers are delivered on pallets as half-shells to the construction site or precast plant and assembled into installation elements on site. The loading dimensions of the pallets and other transport-relevant parameters can be found in the application data sheets.



## 2.5 Base materials/Ancillary materials

Depending on the slab depth, a 1 m<sup>3</sup> Cobi-ax voided slab with CLS structural formers contains the following material volumes, at a 65% coverage with structural formers and a reinforcement ratio of 1.8% by volume:

Concrete 93.5% by mass

Reinforcing steel to DIN 488-1 5.8% by mass

Structural former (polypropylene) 0.7% by mass

The product / At least one partial product contains substances on the ECHA Candidate List (15.01.2018) exceeding 0.1% by mass: no.

The product / At least one partial product contains other CMR substances in category 1A or 1B which are not on the List of Candidates, exceeding 0.1% by mass in at least one partial product: No.

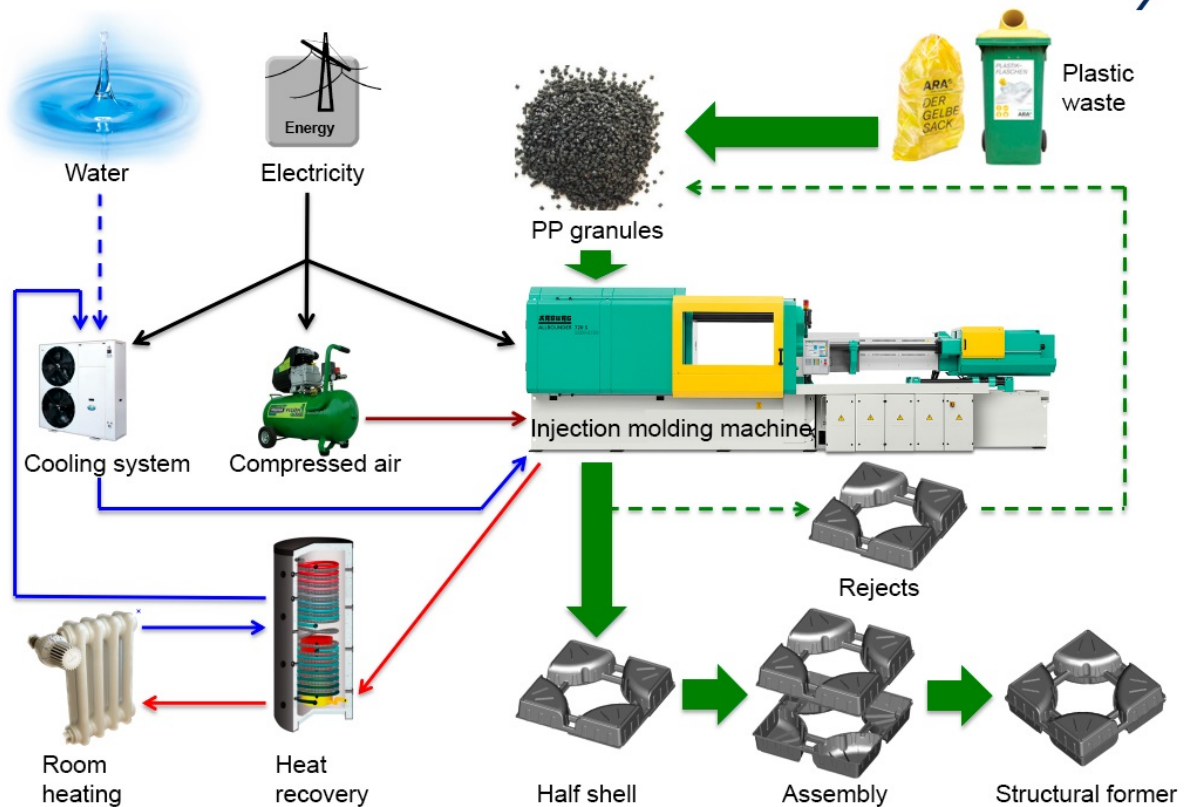
Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products (No. 528/2012): No.

## 2.6 Manufacture

The majority of Cobi-ax CLS structural formers are manufactured in an injection-molding process largely in the Herford site. Plastic recyclates in granulated form are fed to the injection molding machine as starting materials and converted into a thermoplastic material with energy supplied in the form of electricity. With the aid of compressed air, half-shell elements are formed, which can be assembled into void formers without further energy input.

The following graphic shows the schematic production flow at the Herford site.

## Material and energy cycle



### 2.7 Environment and health during manufacturing

Cobi CLS structural formers are manufactured in accordance with the national specifications governing industrial and environmental protection.

### 2.8 Product processing/Installation

A Cobi CLS voided slab can be designed as a "purely in-situ concrete solution" with conventional formwork or in combination with semi-precast elements (element slabs):

#### In-situ concrete solution:

The Cobi CLS structural formers are assembled directly on site from half-shells stacked on pallets. After installation of the lower reinforcement layer, the CLS installation elements are laid close together without any gaps and fixed in position. This is followed by the installation of the upper reinforcement layer and, if necessary, additional bond reinforcement. In addition to concrete displacement, the structural former also serves as a spacer for the upper reinforcement. The Cobi CLS structural formers have a uniform delivery format of 0.6 x 0.6 m. When assembling, the specified structural grid must always be observed.

The concrete must be applied and consolidated in the specified quality grade. A maximum grain size of  $d = 16$  mm must be selected. Due to the concrete displacement, an uplift force is generated during the casting process. To prevent the structural former from being uplifted, the individual installation elements must be held down by suitable measures.

This is usually ensured by casting in two working steps.

When casting the first concrete layer, make sure that the installation elements and, if necessary, the bond

reinforcement are integrated into it according to the specifications on the installation plan. After stiffening (depending on concrete composition, weather, etc.), this layer fixes the structural formers in position. The correct height of the structural formers must be checked after the first casting step. If holes are drilled from above into the finished concreted Cobi CLS voided slab, e.g., for suspending walls, they must be sealed again afterwards. This is to prevent individual void formers from filling with water.

If the areas without void formers are also enclosed in the first layer of concrete, a composite joint must be established and a bond reinforcement included if necessary.

#### Semi-precast variant:

Installation of the semi-precast panels is followed by transverse and joint reinforcement. Then the Cobi CLS structural formers are placed between the lattice girders on the semi-precast panel. This is followed by application of the upper reinforcement layer.

The concrete must be applied and consolidated in the specified quality grade. A maximum grain size of  $d = 16$  mm must be selected. Due to the concrete displacement, an uplift force is generated during the casting process. To prevent the structural former from being uplifted, the individual installation elements must be held down by suitable measures.

This is usually achieved by connecting the upper reinforcement layer to the upper belt of the lattice girder at specific points. The S-hooks required for this are not included in the scope of delivery of Cobi CLS Deutschland GmbH.

The required distances can be found in the installation plan.



## 2.9 Packaging

Cobiax CLS structural formers are delivered to the construction site or precast plant on pallets as half-shells and assembled into structural formers on site. A recyclable LLDPE film is incurred.

## 2.10 Condition of use

No particular features need to be taken into consideration during the period of use.

## 2.11 Environment and health during use

No inter-reactions by hazardous substances of health or environmental relevance can be anticipated.

## 2.12 Reference service life

The reference service life for reinforced concrete voided slabs with a concrete composition in accordance with the limit values outlined in DIN EN 206-1 is at least  $\geq 50$  years under the respective exposure class / environmental conditions.

## 2.13 Extraordinary effects

### Fire

A Cobiax voided slab made of CLS structural formers is considered like a solid reinforced concrete slab in terms of fire resistance (according to DIN-EN 13501-1).

Fire protection is regulated for the products in the respective technical approval.

### Fire resistance

Name	Value
Building material class Structural formers made of PP	B2
Burning droplets Structural formers made of PP	d2

The fire resistance class of the entire component is F30-A to F180-A.

If the concrete cover is properly executed, no toxic

gases and vapors can be generated in the event of a fire.

BBy complying with the minimum requirement for the concrete overlay, the voided slabs can therefore be considered to consist "in essential parts of non-combustible building materials".

### Water

No contents which are hazardous to water are used.

### Mechanical destruction

Contents released in the event of unforeseen mechanical destruction do not represent any environmentally-harmful risk.

## 2.14 Re-use phase

De-constructed slab systems featuring void formers are crushed and sifted conventionally. Results by Darmstadt Technical University (1999) indicated that less than 0.2 mass percentage of non-mineral residue remains in the recycling material which can be reused as an aggregate material. The void former fragments sorted during processing can be reused or recovered energetically following the appropriate treatment as recycle.

## 2.15 Disposal

After the appropriate treatment, the processed void former waste can be redirected to the material circuit as plastic recycle or recovered as energy (waste code 17 02 03 as per the European Waste Catalogue). After processing (crushing and sifting), the concrete can be reused as an aggregate material (waste code 17 01 01 as per the European Waste Catalogue).

## 2.16 Further information

Information on the recyclability of in-situ concrete slabs with plastic void formers is based on test report no. 233.1.99 conducted by Darmstadt Technical University dated 09.08.1999.

### 3. LCA: Calculation rules

#### 3.1 Declared Unit

As a declared unit, 1 m<sup>3</sup> of reinforced concrete CLS structural former slab system Cobix® is selected in accordance with the document PCR: Concrete components made of in-situ and ready-mixed concrete, as of 30.11.17.

One cubic meter of Cobix® slab of the thickness d = 32 cm has a mass of 2,063.1 kg. The conversion from 1 m<sup>3</sup> to 1 kg is done with the factor 4.847E-4.

No proportional functional units are declared.

#### Declared unit

Name	Value	Unit
Declared unit	1	m <sup>3</sup>
Density (average)	2063	kg/m <sup>3</sup>
Conversion factor to 1 kg (mass per declared unit)	2063	kg/m <sup>3</sup>
Occupancy rate of slabs with CLS structural formers	65	%

The conversion of the declared unit to 1 kg is made considering the actual mass of the reinforced concrete slab with CLS structural formers. Due to the concrete displacement, the mass is lower than for a conventional reinforced concrete slab with a density of 2400 kg/m<sup>3</sup>.

#### 3.2 System boundary

Type of EPD: cradle to plant gate with options

The following modules and processes were taken into consideration:

Production stage A1 to A3:

- Concrete production process including provision of raw materials and transport to the production site
- Steel production process including provision of raw materials and transport to the production site
- Production of plastic recyclate (allocated as per ISO 14040)
- German grid mix for re-granulation of plastic production waste (approx. 60% of the processes plastic) and for production of the void formers including generation and distribution
- Transporting the plastic re-granulate from the manufacturing site to the Cobix module production site

Transport to construction site A4:

- Transporting the concrete by truck to the construction site
- Transporting the reinforcing steel by truck to the construction site
- Transporting the void formers by truck to the construction site

#### 3.3 Estimates and assumptions

Cobix voided slabs comprise patented Cobix structural formers and normal concrete with concrete steel reinforcement manufactured in a conventional process. Both the in-situ concrete and reinforcements are provided by regional suppliers.

The LCA data on concrete and reinforcement manufacturing is estimated using the "1.4.01 Concrete C20/25" and "4.1.02 Reinforcement steel" data sets in the Ökobau.dat data base.

On the basis of information supplied by the manufacturer, 90 km were estimated for transporting the plastic re-granulate to the production site for manufacturing the void formers.

An average distance of 30 km for concrete and reinforcement steel and 400 km for the plastic components (CLS structural formers) were estimated for the transport processes from the plant gate to the construction site.

The LCA results published in this EPD represent a Cobix slab system with a slab thickness of 32 cm, which represents a weighted average slab thickness from the production period from 2015 to 2019. Depending on the slab thickness and the LCA indicator, a deviation of +6 % to -3 % can occur. Thereby, lower slab thicknesses tend to show higher values and higher slab thicknesses lower values. Detailed results can be obtained directly from the manufacturer Cobix.

#### 3.4 Cut-off criteria

All base materials and energy flows for manufacturing CLS structural formers as well as the transport processes from plant gate to plant gate and plant gate to construction site were taken into consideration in the Life Cycle Assessment. Owing to its insignificance, the packaging foil for transporting CLS structural formers has been ignored.

#### 3.5 Background data

The volumes on which the LCA is based represent empirical values collated by Cobix over many years. The background data used for the LCA was taken from Ökobaudat 2020-II.

#### 3.6 Data quality

The background data on the manufacturer on which the LCA is based is from 2018. The data sets from the Ökobaudat are from the following reference years:

- 1.4.01 Concrete C20/25: 2018
- 4.1.02 Reinforced steel: 2018
- 9.2.05 Power mix 2015 (D): 2018
- 9.3.01 Trucks: 2018

#### 3.7 Period under review

The LCIA data is based on many years of project and product experience on the part of Cobix Deutschland GmbH. The data originates from 2020, the year the Life Cycle Assessment was drawn up.

#### 3.8 Allocation

Allocation concerning plastic manufacturing for the CLS structural formers is depicted below. The plastic used is exclusively processed from recycled material and as a secondary material. In accordance with information provided by the manufacturer, the primary substances are substituted in full. The impact by plastic manufacturing on the environment is therefore fully allocated to the upstream production processes in accordance with EN 15804.

Furthermore, the energy required for re-granulation of plastic recyclate material is also allocated. In accordance with information provided by the manufacturer, 60 % of plastic recyclate is purchased

from the dual system or comprises re-granulated production waste. As re-granulation is necessary for manufacturing the void formers, the requisite energy volume is allocated to the Cobiax slab system boundary.

### 3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared

were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

The background database used is *Ökobaudat 2020-II* (last revised 03.04.2020). The data sets conform with the EN 15804 standard and are calculated on the basis of GaBi background data.

## 4. LCA: Scenarios and additional technical information

The following technical information forms the basis for the declared modules or can be used for developing specific scenarios within the context of a building analysis:

### Transport to construction site (A4)

Name	Value	Unit
Litres of fuel per tonne	2045	l/100km
Transport distance for concrete and reinforced steel	30	km
Transport distance CLS structural formers	400	km
Capacity utilisation (including empty runs)	85	%
Total permissible truck weight	20-26	t

### Reference service life

Name	Value	Unit
Life span (acc. to BSSR, Federal Institute for Research on Building, Urban Affairs and Spatial Development)	>50	a

## 5. LCA: Results

The results of the estimated impact are relative statements which do not make any claims regarding impact category limits, exceeding threshold values, safety levels or risks.

### DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	MND	MND	MND

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m<sup>3</sup> Cobiax structural formers CLS-P-200

Parameter	Unit	A1-A3	A4
Global warming potential	[kg CO <sub>2</sub> -Eq.]	2.74E+2	6.05E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	3.66E-12	2.78E-15
Acidification potential of land and water	[kg SO <sub>2</sub> -Eq.]	3.78E-1	1.47E-2
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3</sup> -Eq.]	6.43E-2	3.53E-3
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	2.96E-2	-4.96E-3
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	4.05E-5	5.31E-7
Abiotic depletion potential for fossil resources	[MJ]	1.71E+3	8.12E+1

### RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m<sup>3</sup> Cobiax structural formers CLS-P-200

Parameter	Unit	A1-A3	A4
Renewable primary energy as energy carrier	[MJ]	6.72E+2	1.15E+1
Renewable primary energy resources as material utilization	[MJ]	0.00E+0	0.00E+0
Total use of renewable primary energy resources	[MJ]	6.72E+2	1.15E+1
Non-renewable primary energy as energy carrier	[MJ]	1.92E+3	8.15E+1
Non-renewable primary energy as material utilization	[MJ]	0.00E+0	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	1.92E+3	8.15E+1
Use of secondary material	[kg]	IND	IND
Use of renewable secondary fuels	[MJ]	IND	IND
Use of non-renewable secondary fuels	[MJ]	IND	IND
Use of net fresh water	[m <sup>3</sup> ]	7.86E-1	4.31E-3

### RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m<sup>3</sup> Cobiax structural formers CLS-P-200

Parameter	Unit	A1-A3	A4
Hazardous waste disposed	[kg]	8.81E-6	3.03E-6
Non-hazardous waste disposed	[kg]	7.07E+1	1.46E-2
Radioactive waste disposed	[kg]	8.26E-2	1.08E-4
Components for re-use	[kg]	IND	IND
Materials for recycling	[kg]	IND	IND
Materials for energy recovery	[kg]	IND	IND
Exported electrical energy	[MJ]	IND	IND
Exported thermal energy	[MJ]	IND	IND

## 6. LCA: Interpretation

Total primary energy of 2,835 MJ is required for manufacturing and transporting 1 m<sup>3</sup> Cobiax slabs, whereby primary energy requirements are dominated by the provision of reinforcement steel accounting for 59.7 %. Concrete production accounts for 33.1 %, making it, together with steel production, the major contributor to primary energy requirements as well as to the other indicators in the Life Cycle Inventory Analysis. Energy required for re-granulation of plastic recycle and production of the void formers is very low

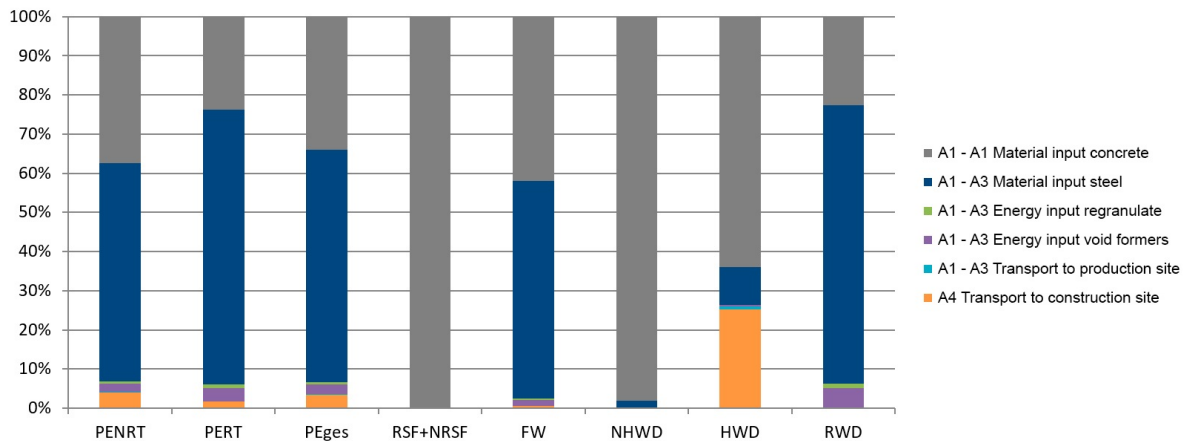
at 3.5 %. Transport to the place of installation accounts for 3.6 % of total primary energy requirements which also represents a very minor influence.

The following graphic shows life cycle stage results for the indicators in the Life Cycle Inventory Analysis. Primary energy requirements (PERT, PENRT, PE total) and use of fresh water (FW) are taken into consideration as well as the fractions Non Hazardous Waste Disposition (NHWD), Hazardous Waste



Disposition (HWD), Radioactive Waste Disposition (RWD).

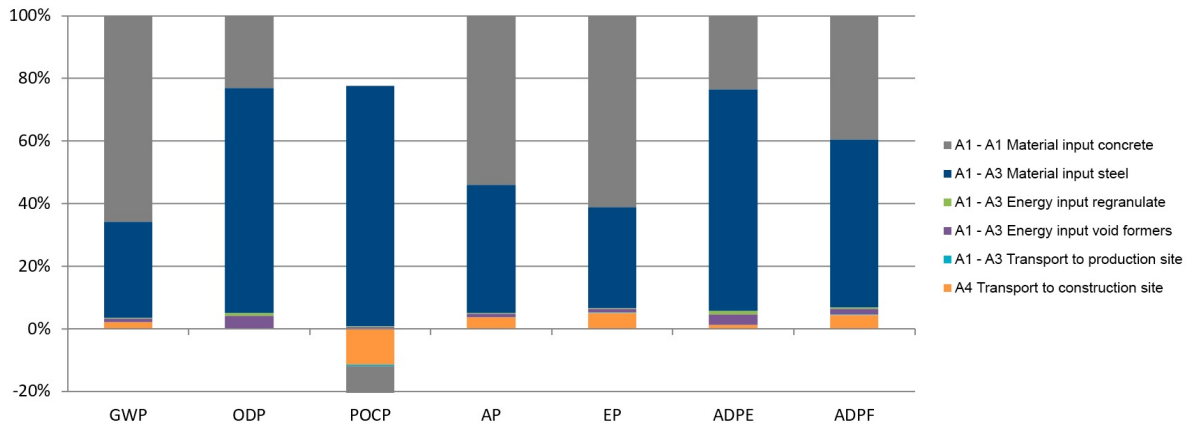
For each stage and indicator, the most contributing processes are listed.



The impact indicators are also significantly influenced by the production process associated with the base materials concrete and steel (92 - 95 %). In the case of ODP (Ozone Depletion Potential), POCP (Photochemical Ozone Creation Potential) and ADPF (Abiotic Depletion Potential of Fossil fuels) in particular, the steel component is dominant for flexural and supplementary reinforcement. At 0.1 - 5.2 %, transport of the base materials to the installation site has only a minimum influence on the impact indicators.

The electricity input for the conversion of the plastic regranulates and the production of void formers also has only a very small influence on the impact potentials with a share of less than 1.5 % (deviations: 5 % for ODP and 4.2 % for ADPE - potential for abiotic degradation of non-fossil resources).

The following graphic life cycle stages and the dominating processes based on their shares in the impact analysis indicators.



## 7. Requisite evidence

Cobias advises planners and building contractors of reinforced voided slabs, and supplies construction sites with CLS structural formers. The company does not however manufacture the flexural reinforcement layers or concrete supplied as in-situ concrete by local suppliers. The respective concrete suppliers are responsible for this evidence.

### 7.1 Radioactivity

Cobias voided slabs largely comprise concrete and steel (99.5% of mass) and recycled plastic. Concrete displays a low level of natural radioactivity. Structural steel can have a slightly increased level since 1940. It can be assumed, therefore, that Cobias voided slabs are comparable with standard reinforced concrete slabs.

### 7.2 Leaching

Cobias void formers are integrated in concrete and are not directly weathered. Leaching performance is not, therefore, of relevance.

### 7.3 VOC emissions

No VOC emissions can be anticipated by the primary components (concrete and steel) of voided slabs. The void formers are made from hard recycled plastic and are interlocked. The plastic elements are also integrated in the reinforced concrete and do not come into contact with ambient air with the result that VOC emissions can be regarded as irrelevant.

## 8. References

### General programme instructions

For generating EPDs at Institut Bauen und Umwelt e.V. (IBU), 10/2015, [www.ibu-epd.com](http://www.ibu-epd.com)

### ISO 14025

DIN EN ISO 14025:2011-10, Environmental designations and declarations – Type III Environmental Declarations – Basic principles and processes

### EN 15804

EN 15804:2012-04+A1 2013, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

### ISO 14040

DIN EN ISO 14040:2006, Environmental Management – Life Cycle Assessment – Principles and framework

### ISO 14056

DIN EN ISO 14056:2010, Building materials and products – Hygrothermal properties – Tabulated design values

### EN 1992-1-1

DIN EN 1992-1-1:2011-01, Eurocode 2: Design of concrete structures

### DIN 4108-4

DIN 4108-4:2020-11, Thermal protection and saving energy in buildings – Part 4: Hygrothermal design values

### DIN 488-1

DIN 488-1:2009-08, Reinforcing steels – Part 1: Grades, properties, marking

### DIN 4109-1

DIN 4109-1:2018-01, Sound insulation in buildings – Part 1: Minimum requirements

### EN 206

**DIN EN 206:2021-06**, Concrete – Specification, performance, production and conformity

### ISO 9001

DIN EN ISO 9001:2015-11, Quality management systems – Requirements

### EN 13501-1

DIN EN 13501-1:2019-05, Fire classification of construction products and building elements

**DIBt-Z-15.1-282**, General type approval for "COBIAX" void flat plate slabs, Deutsches Institut für Bautechnik, 2015

**DIBt-Z-15.1-307**, General type approval for "COBIAX SLIM-LINE" void flat plate slabs, Deutsches Institut für Bautechnik, 2018

**DIBt-Z-15.1-352**, General type approval for "COBIAX CLS" void flat plate slabs, Deutsches Institut für Bautechnik, 2021

### Test Report No. 233.1.99

Recyclability of concrete slabs with hollow plastic spheres, Darmstadt Technical University, 1999

### COBIAX Technology Manual

Cobiax Deutschland GmbH (pub.): Technology Manual; DE version, September 2017

### Product Category Rules for Construction Products, Part A:

Institut Bauen und Umwelt e.V., Berlin (pub.): Product category rules (PCR) for building-related products and services, Part A: Calculation rules for the Life Cycle Assessment and requirements on the Project Report, 04-2017, [www.bau-umwelt.de](http://www.bau-umwelt.de)

### PCR: Concrete components made of in-situ and ready-mixed concrete

Product category rules for building-related products and services, Part B: Requirements on the EPD for concrete components made of in-situ or ready-mixed concrete, Berlin: Institut Bauen und Umwelt e.V. (pub.), 11-2017

### European Waste Catalogue

Administrative regulation 2000/532/EC: Commission decision dated 3 May 2000 substituting decision 94/3/EC on a waste index as per Article 1a) of Council Guideline 75/442/EEC on waste and Council decision 94/904/EC on an index of hazardous waste according to Article 1, paragraph 4 of Guideline 91/689/EEC on hazardous waste.

### AgBB

German-Committee for health-related evaluation of building products

### Ökobaudat

German database for building materials (<http://www.nachhaltigesbauen.de/oekobaudat/>): Federal Ministry of the Interior, for Construction and Home Affairs  
Press, Online Communications, Public Relations  
Department  
Alt-Moabit 140  
D-10557 Berlin

**Publisher**

Institut Bauen und Umwelt e.V.  
Panoramastr. 1  
10178 Berlin  
Germany

Tel +49 (0)30 3087748- 0  
Fax +49 (0)30 3087748- 29  
Mail [info@ibu-epd.com](mailto:info@ibu-epd.com)  
Web [www.ibu-epd.com](http://www.ibu-epd.com)

**Programme holder**

Institut Bauen und Umwelt e.V.  
Panoramastr. 1  
10178 Berlin  
Germany

Tel +49 (0)30 - 3087748- 0  
Fax +49 (0)30 - 3087748 - 29  
Mail [info@ibu-epd.com](mailto:info@ibu-epd.com)  
Web [www.ibu-epd.com](http://www.ibu-epd.com)

**CSDINGENIEURE+**

**Author of the Life Cycle  
Assessment**

CSD Ingenieure GmbH  
Köpenicker Straße 154a  
10997 Berlin  
Germany

Tel +49 30 69 81 42 78  
Fax +49 30 65 81 42 77  
Mail [berlin@csgivingeure.de](mailto:berlin@csgivingeure.de)  
Web [www.csgivingeure.de](http://www.csgivingeure.de)

**cobiax**

**Owner of the Declaration**

Cobiax Deutschland GmbH  
Am Stadtholz 56  
33609 Bielefeld  
Germany

Tel +49 521 9344 7681  
Fax +49 521 9344 7681  
Mail [info@cobiax.com](mailto:info@cobiax.com)  
Web [www.cobiax.com](http://www.cobiax.com)