EPD - ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

PUBLISHER	Bau EPD GmbH, A-1070 Vienna, Seidengasse 13/3, www.bau-epd.at
PROGRAMME OPERATOR	Bau EPD GmbH, A-1070 Vienna, Seidengasse 13/3, www.bau-epd.at
OWNER OF THE DECLARATION	isospan Baustoffwerk GmbH
DECLARATION NUMBER	EPD-ISOSPAN-2017-3-ECOINVENT
DECLARATION NUMBER ECOPLATFORM	ECO EPD Ref. No. 00000517
ISSUE DATE	01.05.2017
VALID TO	01.05.2022

Wood-chip concrete shuttering blocks S36.5/16.5 ISOPUR with integrated polyurethane insulation

ISOSPAN Baustoffwerk GmbH

General information

Product name ISOSPAN S 36.5/16.5 ISOPUR	**Declared product / declared unit** Wood-chip concrete shuttering blocks with integrated polyurethane insulating panel for use as outer walls. The product is manufactured from wood-chips, cement, water and a polyurethane insulation insert and is filled with concrete at the building site. The surface weight of the finished wall is 280 kg/m², the thermal conductivity 0.054 W/mK. One square metre of wall (m²) has been determined as the functional unit. **Range of validity** The life cycle inventory analysis data are representative of all of the wood-chip concrete shuttering blocks with integrated polyurethane insulation produced by ISOSPAN Baustoffwerk GmbH in 2015 at the Ramingstein production site. The owner of the declaration is liable for the underlying information and evidence; Bau EPD GmbH is not liable with respect to manufacturer information, life cycle assessment data and evidence.
Declaration number EPD-ISOSPAN-2017-3-ECOINVENT	
Declaration data ☒ Specific data ☐ Average data	
Declaration based on: PCR Prefabricated concrete products PCR code: 2.17.1 Version 16.05.2016 (PCR tested and approved by the independent expert committee = PKR-Gremium)	
Type of declaration as per OENORM EN 15804 From cradle to grave	**Database, software, version** Ecoinvent v.2.2, SimaPro 8
Author of the life cycle assessment Markus Wurm/Philipp Boogman IBO Österreichisches Institut für Bauen und Ökologie GmbH Alserbachstraße 5, 1090 Vienna Austria http://www.ibo.at	**The European standard EN 15804 serves as the core PCR.** **Independent verification of the declaration according to EN ISO 14025:2010** ☐ internally ☒ externally **Verifier 1:** DI Dr. sc ETHZ Florian Gschösser, UIBK Innsbruck **Verifier 2:** DI Hanna Schreiber, Umweltbundesamt GmbH, Vienna
Owner of the declaration ISOSPAN Baustoffwerk GmbH Madling 177 5591 Ramingstein Austria http://www.isospan.eu	**Publisher and programme operator** Bau EPD GmbH Seidengasse 13/3 1070 Vienna Austria http://www.bau-epd.at

DI (FH) DI DI Sarah Richter
Managing director Bau EPD GmbH

DI Roman Smutny
Vice chairperson of expert committee (PKR-Gremium)

DI Hanna Schreiber
Umweltbundesamt GmbH, Vienna

DI Dr. sc ETHZ Florian Gschösser
University of Innsbruck

Information:
EPDs from similar product groups from different programmes might not be comparable.

Index

1 Product / system description

1.1 General product description

The product being examined is S 36.5/16.5 ISOPUR. These are shuttering blocks made of wood-chip concrete that can be used as lost shuttering for unreinforced and reinforced in-situ concrete walls. The products are manufactured from wood-chips, cement and water and also a polyurethane insulating panel. The product falls into the product group of prefabricated concrete products.

The life cycle inventory analysis data are representative of all of the wood-chip concrete shuttering blocks with integrated polyurethane insulating panel produced by ISOSPAN Baustoffwerk GmbH in 2015 at the Ramingstein production site. The average bulk density of the wood concrete is 550 kg/m³, the thermal conductivity of the examined product is 0.054 W/mK.

1.2 Product-related standards, regulations and guidelines

The following product-related standards, regulations and guidelines were taken into consideration:

- OENORM EN 14474:2012-09-01 – Precast concrete products – Concrete with wood-chips as aggregate – Requirements and test methods
- OENORM EN 15498:2008-10-01 – Precast concrete products – Wood-chip concrete shuttering blocks – Product properties and performance OENORM EN 16757:2016-07-01 – Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements
- EC Certificate of Conformity 1159-CPD-0285/11 from 19 June 2013
- European Technical Approval from 15 May 2013 (ETA-05/0261)

According to the above ETA, conformity with the now annulled Directive 89/106/EEC was granted. According to Article 66 of the (successor) Regulation (EU) No. 305/2011, there is conformity with this Regulation.

1.3 Areas of application

According to the European Technical Approval, the shuttering blocks made of wood-chip concrete are suitable for constructing aboveground and underground load-bearing or non-load-bearing inner and outer walls. Use of the shuttering system as free-standing walls or noise-insulating walls is also possible.

1.4 Technical data

The following table contains structural/technical data relevant for the product ISOPUR.

Table 1: Technical data of S 36.5/16.5 ISOPUR

Description	Value	Unit
Block dimensions: Width Height Length	 0.365 0.25 1.25	 m m m
Insulation thickness	0.165	m
Thermal conductivity	0.054	W/mK
Water vapour diffusion resistance	8	-
Bulk density	550	kg/m³
Tensile strength	> 0.15	N/mm²
Dry bulk density (oven-dried)	550	kg/m³
Weighted sound reduction index Rw	55	dB

1.5 Conditions of delivery

The products are delivered without pallets, but in the dimensions of a Europool pallet. The goods are wrapped with PE film and stored in the open air until delivery.

2 Description of life cycle

2.1 Base materials (main components and auxiliary materials)

Table 2: Base materials of S 36.5/16.5 ISOPUR

Components of wood concrete:	kg/kg
Wood-chips	0,530
Cement	0,445
Water	0,025
Components of wood-chip concrete shuttering blocks:	**kg/m²**
Wood concrete	61.6
Polyurethane insulating panel	5.0

Table 3: Further components for 1 m² of wall (declared unit)

Components of wall:	kg/m²
Wood-chip concrete shuttering blocks	66.6
Reinforcing steel *	0.3
Filling concrete *	213.4

*The reinforcing steel and filling concrete are inserted in the wall on the building site and are therefore taken into consideration in construction stage A5

2.2 Production

The wood-chip concrete is produced at the plant in Ramingstein. Here wood-chips, cement and water are mixed, filled into moulding boxes and the insulating insert is added. Then the blocks harden in the air and are milled to the same height.

2.3 Packaging

The hardened blocks are packed in polyethylene film and stored in the open air. Pallets are not necessary because the first layer of blocks is turned 90 degrees and acts as a pallet.

2.4 Transport

The wood-chip concrete shuttering blocks are transported from the manufacturing plant to the customer by truck. The average transport distance is 145 km.

2.5 Processing and installation

The mantle blocks are placed next to each other and on top of each other without grout. It must be ensured that there is level ground and, if necessary, this must be created using levelling grout for the first set of blocks. Then the mantle blocks are filled with concrete and this is compacted using internal vibrators. Corresponding processing guidelines are provided by the manufacturer.

2.6 Use stage

2.6.1 Use condition

With proper planning, correct and appropriate installation and disruption-free use there is no change in the material composition over the entire service life.

2.6.2 Environment & health during use

There are no known effects on the environment and health coming from the product. The result of the measurement to determine radioactivity is clearly below the limit stipulated in OENORM S 5200.

2.6.3 Reference service life (RSL)

The service life is the period of time from the installation of the product in the building up to disposal.

Table 4: Reference service life for wood-chip concrete shuttering blocks

Description	Value	Unit
Wood-chip concrete shuttering blocks with core concrete and insulation insert	100	Years

2.7 End-of-life stage

2.7.1 Re-use and recycling

The product cannot be re-used because it cannot be dismantled in a non-destructive way. Recycling at the end of the product life cycle would be conceivable but, on account of the high expense required for separating the building component layers and subsequent processing, this is not carried out.

2.7.2 Disposal

The product can be stored in construction waste landfills after the demolition of the building.

3 Life cycle assessment

3.1 Methodological assumptions

As the basis for the calculation of the life cycle assessment the method of CML 2001 v 4.1 (“baseline”) dated from October 2012 (Institute of Environmental Sciences, Faculty of Science, University of Leiden, Netherlands) is used.

3.1.1 Type of EPD, system boundary

In this EPD all stages of the life cycle from cradle to grave are examined. Benefits and loads beyond the product system boundary are not declared.

3.1.2 Declared unit/functional unit

The declared unit is 1 m² of wall. In this report the functional unit corresponds with the declared unit.

Table 5: Declared unit

Description	Value	Measurement
Declared unit	1	m²
Surface weight for conversion into kg:		
Wood-chip concrete shuttering blocks	66.6	kg/m²
Filling concrete	213.4	kg/m²
Reinforcing steel	0.3	kg/m²
Total weight of the wall	280	kg/m²

3.1.3 Calculation of averages

At the production plant mantle blocks and absorber elements for noise-insulating walls are manufactured. The energy consumption data were averaged over the entire production range.

3.1.4 Estimations and assumptions

For infrastructure data such as the machinery no specific data were collected, instead data sets of ecoinvent were used. The heat value of the wood-chips to calculate the renewable energy requirement was taken from ecoinvent and amounts to 17.2 MJ/kg wood. From the European Technical Approval it can be seen that the strength class of the filling concrete must at least correspond with class C16/20. Therefore, as a conservative assumption, concrete of strength class C20/25 was used as the filling concrete.
As reinforcing steel the data set of ecoinvent with a secondary share of 37% was used.

3.1.5 Cut-off criteria

All used raw materials were considered. Auxiliary materials such as lubricating oils and cleaning agents were ignored on the basis of a sensitivity analysis of another manufacturer of wall-building materials.

In the upstream chains of the substances the general life cycle assessment rules of Bau-EPD GmbH were taken into consideration.

3.1.6 Data

The used data fulfil the following quality requirements:

- The data sets are up to date (production year 2015).
- There was compliance with the criteria of Bau EPD GmbH for data collection, generic data and cut-off of material and energy flows.
- A data validation as per EN ISO 14044:2006 was carried out.
- The used data correspond with the yearly average of the reference year.
- All essential data like energy and raw material demand, transport distances and packaging within the system boundary were provided by the manufacturer.
- The data are plausible, meaning that deviations from comparable results (other manufacturers, literature, similar products) are comprehensible.

- Data sets from ecoinvent v2.2 were used as the source of the background data.

3.1.7 Reporting period

All manufacturer-specific data concern the entire production quantity in 2015.

3.1.8 Allocation

The loads for the manufacture of the wood-chips are economically allocated by ecoinvent.

3.2 Information on the life cycle for the assessment

Table 6: Declared life cycle stages

PRODUCT STAGE			CON-STRUC-TION STAGE		USE STAGE							END-OF-LIFE STAGE				BENEFITS AND LOADS
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	Manufacture	Transport	Construction/installation	Use	Maintenance	Repair	Replacement	Conversion, renovation	Energy use for operations	Water use for operations	Demolition	Transport	Waste management	Disposal	Potential for reuse, recovery, recycling
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	MND

X = included in life cycle assessment; MND = module not declared

3.2.1 A1-A3 Product stage

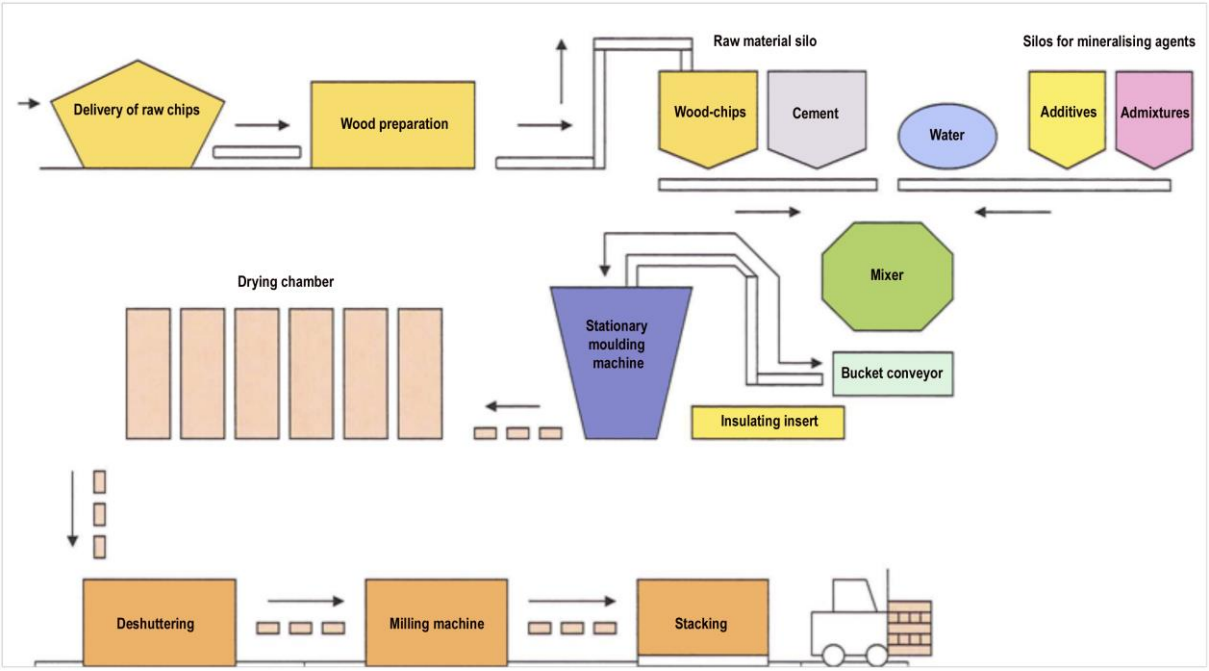
The wood-chips used are delivered by various sawmills from the region. They are cut up, blown through a tunnel into the production hall and here they are mixed with recycled grit of wood-chip concrete, cement and water. The wood-chip concrete mass thus created is finally shaped into mantle blocks in moulding boxes, compacted by shaking and stored in the drying zone for at least 24 h until hard. Subsequently the blocks are made the same height and length using a milling machine and are then filled with insulating material. The finished products are packed with plastic film in the format of a Europool pallet and are stacked in the open air at the storage location.

The energy required for the production processes is covered by electricity. In winter, heating oil is additionally used to heat the production hall. Five diesel-powered forklift trucks are also used on the plant premises.

Table 7: Energy and water consumption for manufacturing per m² product

Description	Value	Measurement
Energy consumption broken down by energy carrier:		
Electricity	7.112	MJ/m²
Heating oil	2.759	MJ/m²
Diesel	1.440	MJ/m²
Propane gas	1.199	MJ/m²
Fresh water consumption from rain water	-	m³/m²
Fresh water consumption from surface water	-	m³/m²
Fresh water consumption from well water	8.64E-03	m³/m²
Fresh water consumption from public water supply	-	m³/m²

Figure 1: Diagram of the product stage (A1-A3) [ISOSPAN Baustoffwerk GmbH]



3.2.2 A4-A5 Construction stage

The products are transported to the building site by truck. The average delivery distance is 100 km within Austria and 350 km for deliveries abroad. 82% of the products are used in buildings in Austria and 18% abroad. This gives an average delivery radius of 145 km for the wood-chip concrete shuttering blocks and the reinforcing steel. The filling concrete comes from regional concrete plants via concrete-mixing trucks from an average distance of 15 km. According to OENORM EN 16757, the environmental effects of the production of filling concrete and reinforcing steel are taken into consideration in stage A5.

Table 8: Description of the scenario for "Transport to the building site (A4)" (as per Table 7 in OENORM EN 15804)

Parameters to describe the transport to the building site (A4)	Value	Measurement
Average transport distance for wood-chip concrete shuttering blocks and reinforcing steel	145	km
Transport distance for the filling concrete	15	km
Vehicle type according to Commission Directive 2007/37/EC (European Emission Standard)		-
Average fuel consumption, fuel type: ….		l/100 km
Average transport mass		t
Average capacity utilisation (including empty returns)		%
Average bulk density of transported products		t /m^3
Volume capacity utilisation factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaged products)	< 1	-

Table 9: Description of the scenario for "Installation of the product in the building (A5)" (as per Table 8 in OENORM EN 15804)

Parameters to describe the installation of the product in the building (A5)	Value	Measurement
Auxiliary materials for installation (specified by material)	-	kg/m³ t/m³ l/m³
Tools for installation (specified by type)	-	-
Other product components: Filling concrete (of strength class C20/25) Reinforcing steel (37% secondary share)	 213,4 0.3	 kg/m² kg/m²
Water consumption	-	m³/m³ l/m³
Other resource use	-	kg/m³ t/m³ l/m³
Electricity consumption	-	kWh or MJ/m³
Other energy carriers: …….	-	kWh or MJ/m³
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by material)	0.03	m²/m²
Output materials (specified by material) as a result of waste processing at the building site, e.g. of collection for recycling, for energy recovery, disposal (specified by route)	0.03 waste for recycling	m²/m²
Direct emissions to ambient air (e.g. dust, VOC), soil and water	-	kg/m³

3.2.3 B1-B7 Use stage

During the use stage of the product there are no material and energy flows relevant for the life cycle assessment.

3.2.4 C1-C4 End-of-life stage

The end-of-life stage of the wood-chip concrete shuttering blocks begins with the demolition of the building. It must be assumed that the inhomogeneous layers of the products are not separated but rather are disposed of together on construction waste landfills. A distance of 50 km was calculated as the average distance to the landfill.

Table 10: Description of the scenario for "Disposal of the product (C1 to C4)" (as per Table 12 in OENORM EN 15804)

Parameters for end-of-life stage (C1-C4)	Value	Measurement per m²
Collection process specified by type	- 0.280	t collected separately t collected with mixed construction waste
Recovery system specified by type	- - -	t for re-use t for recycling t for energy recovery
Disposal specified by type	Entire wall 0.280	t product or material for final deposition

3.2.5 D Potential for reuse, recovery and recycling

The products cannot be dismantled non-destructively. Separation of the individual fractions is unlikely. Therefore no scenario regarding reuse, recovery and recycling has been calculated.

3.3 Declaration of environmental indicators

The impact assessment parameters listed in OENORM EN 15804:2014 are calculated. It should be noted that the impact assessment results are only relative statements that do not include any statements about "end-points" of the impact categories, exceeding of thresholds, safety margins or risks.

For the global warming potential (GWP) the results are indicated with a division into "GWP process", "GWP C content" and "GWP total". GWP process contains all CO_2-equivalent emissions arising in the considered life cycle stages of the product. The "GWP C content" describes the share of carbon (biogenic CO_2) stored in renewable products. The corresponding values for specific materials are taken from "ecoinvent" and are displayed as negative numbers. The "GWP total" results from the sum of "GWP process" and "GWP C content".

Table 11: Parameters to describe the impact assessment of the product S 36.5/16.5 ISOPUR per m² (ecoinvent 2.2)

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4
GWP process	kg CO_2 equiv	4.42E+01	1.60E+00	2.26E+01	0.00E+00	1.12E+00	2.31E+00	0.00E+00	1.99E+00
GWP C content	kg CO_2 equiv	-5.89E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.06E+01
GWP total	kg CO_2 equiv	-1.47E+01	1.60E+00	2.26E+01	0.00E+00	1.12E+00	2.31E+00	0.00E+00	4.26E+01
ODP	kg CFC-11 equiv	8.87E-07	2.53E-07	6.28E-07	0.00E+00	1.40E-07	3.66E-07	0.00E+00	5.96E-07
AP	kg SO_2 equiv	1.24E-01	6.12E-03	4.34E-02	0.00E+00	8.61E-03	8.87E-03	0.00E+00	1.18E-02
EP	kg PO_4^{3-} equiv	4.32E-02	1.63E-03	2.75E-02	0.00E+00	2.01E-03	2.36E-03	0.00E+00	2.89E-03
POCP	kg C_2H_4 equiv	2.48E-02	8.41E-04	6.91E-03	0.00E+00	1.02E-03	1.22E-03	0.00E+00	2.13E-03
ADPE	kg Sb equiv	3.11E-05	4.40E-06	1.23E-05	0.00E+00	1.77E-07	6.38E-06	0.00E+00	2.14E-06
ADPF	MJ H_u	5.63E+02	2.34E+01	1.33E+02	0.00E+00	1.54E+01	3.39E+01	0.00E+00	4.94E+01
Legend		GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources							

Table 12: Parameters to describe the resource use of the product S 36.5/16.5 ISOPUR per m² (ecoinvent 2.2)

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4
PERE	MJ H_u	2.94E+01	3.33E-01	9.01E+00	0.00E+00	6.22E-02	4.83E-01	0.00E+00	3.99E-01
PERM	MJ H_u	5.62E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ H_u	5.91E+02	3.33E-01	9.01E+00	0.00E+00	6.22E-02	4.83E-01	0.00E+00	3.99E-01
PENRE	MJ H_u	4.93E+02	2.48E+01	1.83E+02	0.00E+00	1.59E+01	3.59E+01	0.00E+00	5.20E+01
PENRM	MJ H_u	1.54E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ H_u	6.47E+02	2.48E+01	1.83E+02	0.00E+00	1.59E+01	3.59E+01	0.00E+00	5.20E+01
SM	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
RSF	MJ H_u	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ H_u	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m^3	1.99E-01	9.07E-04	4.18E-02	0.00E+00	3.16E-04	1.31E-03	0.00E+00	5.28E-03
Legend		PERE = Renewable primary energy as energy carrier; PERM = Renewable primary energy resources as material utilisation; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy as energy carrier; PENRM = Non-renewable primary energy as material utilisation; 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 = Use of fresh water							

Table 13: Parameters to describe the waste categories of the product S 36.5/16.5 ISOPUR per m² (ecoinvent 2.2)

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4
HWD	kg	2.25E-04	2.48E-05	1.98E-04	0.00E+00	8.14E-06	3.60E-05	0.00E+00	2.04E-05
NHWD	kg	1.28E+00	1.56E-01	2.44E+00	0.00E+00	1.04E-02	2.26E-01	0.00E+00	2.80E+02
RWD	kg	5.56E-04	3.68E-05	5.47E-04	0.00E+00	8.15E-06	5.33E-05	0.00E+00	4.42E-05
Legend		HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed							

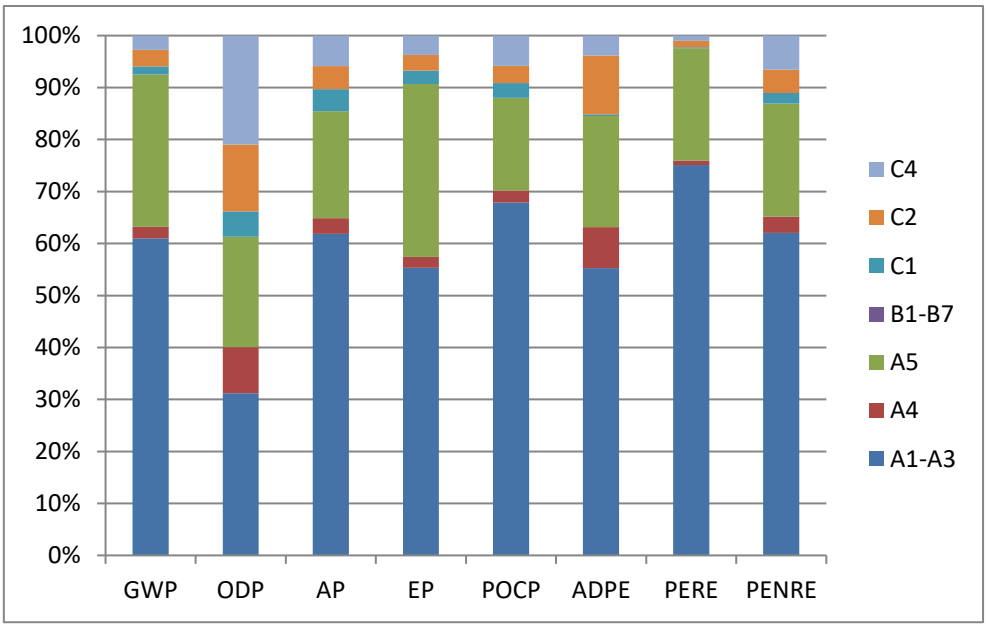
Table 14: Parameters to describe the potential of waste treatment and recovery in the end-of-life stage of the product
S 36.5/16.5 ISOPUR per m² (ecoinvent 2.2)

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4
CRU	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
MFR	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
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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Legend		CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electric energy; EET = Exported thermal energy							

3.4 Interpretation of the LCA results

3.4.1 Life cycle assessment results broken down by all relevant life cycle stages

Figure 2: Shares of the individual life cycle stages in the total life cycle assessment in selected impact indicators



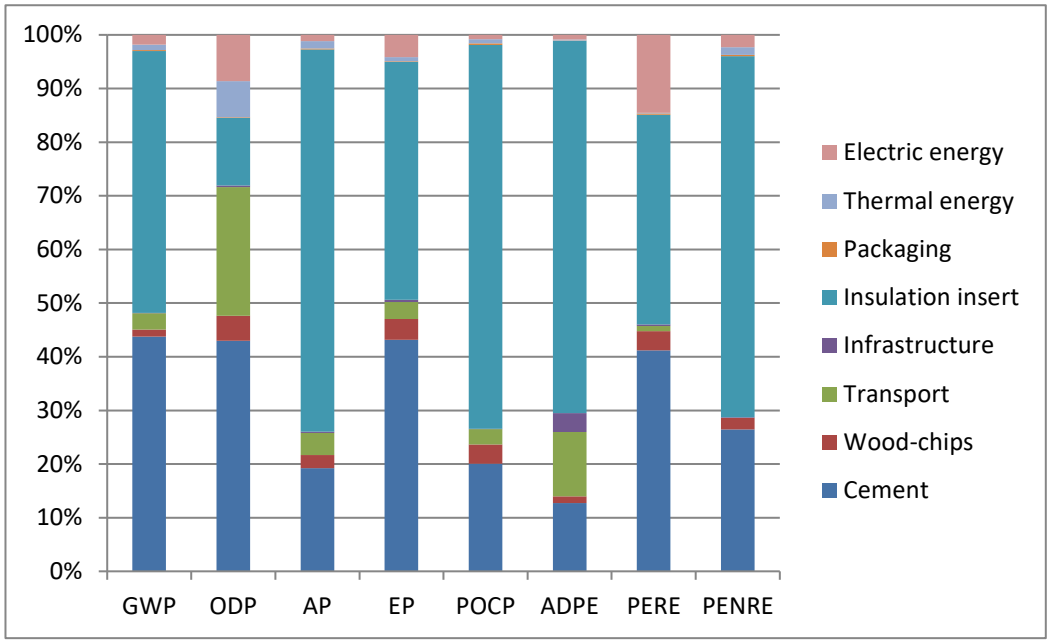
Legend

GWP = Global warming potential (without consideration of the CO_2 storage of wood and the carbonation of the concrete at the landfill); ODP = Depletion potential of the stratospheric ozone layer;
AP = Acidification potential of land and water; EP = Eutrophication potential;
POCP = Formation potential of tropospheric ozone; ADPE = Abiotic depletion potential for non-fossil resources; PERE = Renewable primary energy as energy carrier; PENRE = Non-renewable primary energy as energy carrier

Examining the ecological indicators over the entire life cycle illustrates that around half of the loads in the different impact categories come from the product stage. The effects of the installation stage (A5) are, depending on the category, roughly 20-30%. The demolition of the building and the disposal of the declared product play a lesser role. The negative global warming potential from A1-A3 comes from the quantity of CO_2 absorbed during the growth of the wood. In stage C4 this quantity is emitted again entirely. Overall around a quarter of the CO_2 equivalents emitted in stages A1-C2 are reabsorbed during disposal on account of the carbonation of the concrete.

3.4.2 Life cycle assessment results of the product stage (A1-A3)

Figure 3: Shares of loads during the product stage (A1-A3)



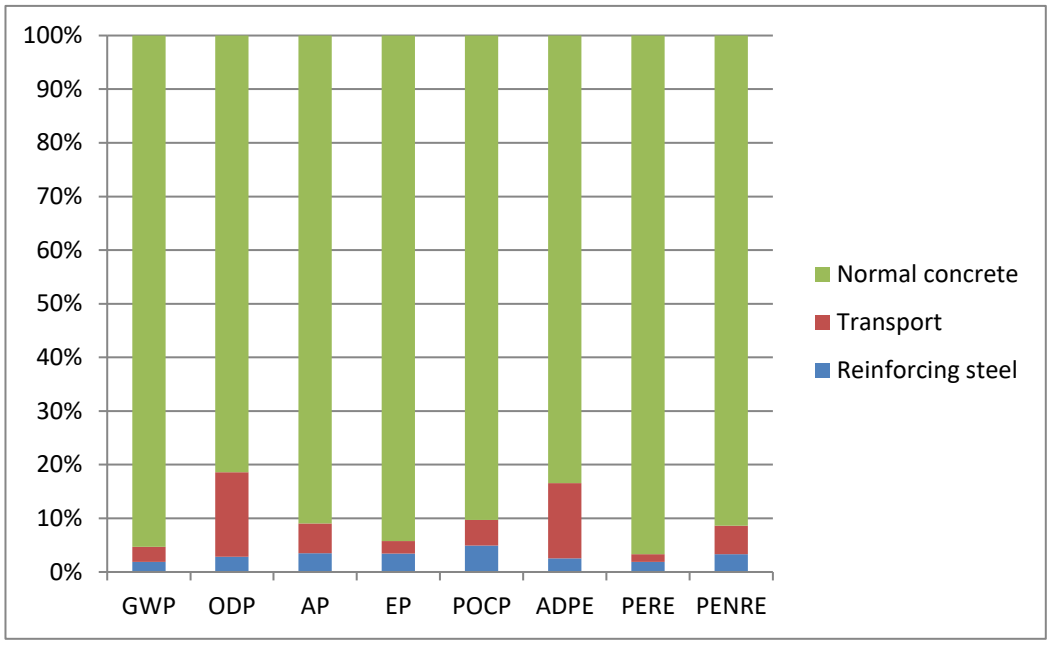
Legend

GWP = Global warming potential (without consideration of the CO_2 storage of wood); ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone; ADPE = Abiotic depletion potential for non-fossil resources; PERE = Renewable primary energy as energy carrier; PENRE = Non-renewable primary energy as energy carrier

In the product stage the ecological effects are mainly caused by the production of the preliminary products. The biggest share is contributed by the polyurethane insulation insert, followed by the used cement with around 20-40% in the examined categories. The energy input required to manufacture the declared product and the packaging hardly have any effect on the life cycle assessment.

3.4.3 Life cycle assessment results of the installation stage (A5)

Figure 4: Shares of loads during the installation stage (A5)



Legend

GWP = Global warming potential (with consideration of the CO_2 storage); ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone; ADPE = Abiotic depletion potential for non-fossil resources; PERE = Renewable primary energy as energy carrier; PENRE = Non-renewable primary energy as energy carrier

The loads in the installation stage are nearly entirely caused by the production of the filling concrete. A small part comes from the transport of the blocks from the manufacturer to the building site and from the transport of the filling concrete from the concrete plant to the building site.

4 Dangerous substances and emissions into indoor air and environment

4.1 Declaration of substances of very high concern

Table 15: Declaration of substances of very high concern

Properties of hazardous materials as per EC Regulation 1272/2008 (CLP Regulation)	**Chemical term (CAS Number)**
Carcinogenic Cat. 1A or 1B (H350, H350i):	No such substances contained in the product
Mutagenic Cat. 1A or 1B (H340):	No such substances contained in the product
Toxic for reproduction Cat. 1A or 1B (H360F, H360D, H360FD, H360Fd, H360Df):	No such substances contained in the product
PBT (persistent, bioaccumulative and toxic) (REACH, Annex XIII):	No such substances contained in the product
vPvB (very persistent and very bioaccumulative) (REACH, Annex XIII):	No such substances contained in the product
Substances of very high concern (SVHC):	No such substances contained in the product

4.2 Formaldehyde emissions

There are no requirements regarding formaldehyde emissions for launching the product on the market.

4.3 Radioactivity

A sample of the wood-chip concrete shuttering block was examined for radioactivity by TÜV SÜD Industrie Service GmbH (Test report no. G 7110 001 for gamma-spectrometric measurements, from 25.04.2016).

Table 16: Result of the radioactivity measurement

Description	**Value**	**Limit**
Gamma-spectrometric measurement and evaluation of the chemical formula as per OENORM S 5200	0.055	1

4.4 Leaching

No measurements for leaching are required for launching the product on the market.

5 References

ISO 14025
OENORM EN ISO 14025 Environmental labels and declarations – Type III environmental declarations – Principles and procedures

ISO 14040
OENORM EN ISO 14040 Environmental management – Life cycle assessment – Principles and framework

ISO 14044
OENORM EN ISO 14044 Environmental management – Life cycle assessment – Requirements and guidelines

EN 15804
OENORM EN 15804 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. Version: 2014-04-15

EN 16757
OENORM EN 16757:2016-07-01 – Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements

General life cycle assessment rules
General Rules for LCA assessment and requirements on the project report. Bau-EPD GmbH. (Version 2.1, 11.04.2016)

Nutzungsdauerkatalog der Bau-EPD GmbH für die Erstellung von EPDs. Bau-EPD GmbH. (Version 0.02, 15.08.2016)

CML 2001
CML is a LCA methodology developed by the Center of Environmental Science (CML) of Leiden University in the Netherlands. More information on: http://cml.leiden.edu/software/data-cmlia.html

ecoinvent 2010
Database ecoinvent data v2.2. The Life Cycle Inventory. Published by Swiss Centre for Life Cycle Inventories, St. Gallen, 2010.

IBO 2010
Richtwerte für Baumaterialien – Wesentliche methodische Annahmen. Boogman Philipp, Mötzl Hildegund. Version 2.2, as of July 2007, with editorial revisions on 9.10.2009 and 24.02.2010, URL: http://www.ibo.at/documents/LCA_Methode_Referenzdaten_kurz.pdf.

ISOSPAN Baustoffwerk GmbH
Company ISOSPAN Baustoffwerk GmbH, Madling 177, 5591-Ramingstein, Austria

Dobbernack 1995
Dobbernack R. Auswertungen zur spezifischen Abbrandrate der vorliegenden m-Faktor-Versuche. IBMB TU Braunschweig, 1995

Di Nenno 2002
Di Nenno, P.J., et al.: SFPE Handbook of Fire Protection Engineering, 3rd edition, Boston, 2002

Publisher

Bau EPD GmbH
Seidengasse 13/3
1070 Vienna
Austria

Tel +43 (1)997 41 11
Mail office@bau-epd.at
Web www.bau-epd.at

Programme operator

Bau EPD GmbH
Seidengasse 13/3
1070 Vienna
Austria

Tel +43 (1)997 41 11
Mail office@bau-epd.at
Web www.bau-epd.at

Author of the life cycle assessment

IBO Österreichisches Institut
für Bauen und Ökologie GmbH
Alserbachstraße 5/8
1090 Vienna
Austria

Markus Wurm/Philipp Boogman
Tel +43 (1) 319 20 05-14
Fax +43 (1) 319 20 05-50
Mail markus.wurm@ibo.at
Web www.ibo.at

Owner of the declaration

ISOSPAN Baustoffwerk GmbH
Madling 177
5591 Ramingstein
Austria

Tel +43 (0) 6475 251-0
Fax +43 (0) 6475 251-19
Mail info@isospan.at
Web http://www.isospan.eu