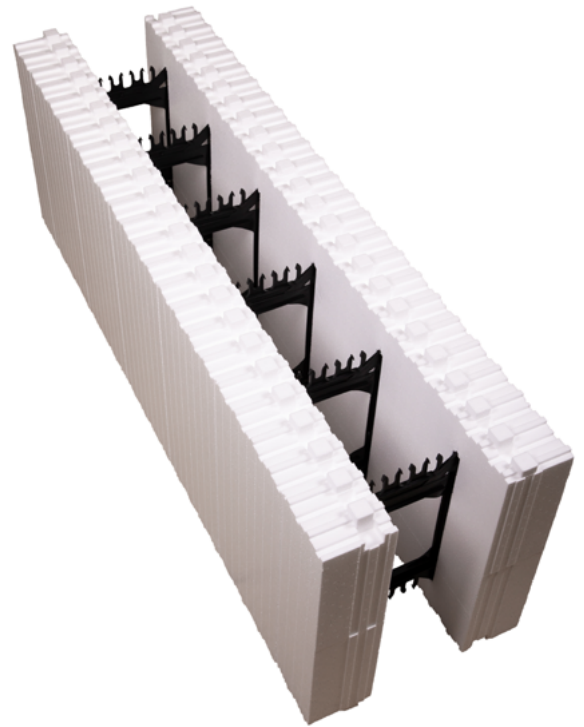


EN 15804+A2 EPD



## ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2.  
Owner of the Declaration – Amvic Ireland

Declaration number: EPDIE-23-120  
Issue date 11th October 2023  
Valid to 10th October 2028

EPD Programme - EPD Ireland  
Programme Operator - Irish Green Building Council  
[www.epdireland.org](http://www.epdireland.org)



### AMVIC EPS Insulating Concrete Formwork





300 Insulating Concrete Formwork

350 Insulating Concrete Formwork

# 1. General information

PROGRAMME OPERATOR	OWNER OF DECLARATION
Irish Green Building Council 19 Mountjoy Square, Dublin D01 E8P5 info@igbc.ie	Amvic Ireland Ltd. Unit 11, Rosemount Business Park, Ballycoolin, Dublin 11, D11 Y382, Ireland + 353 1 899 1883
DECLARATION NUMBER	PRODUCTION SITE
EPDIE-23-120	Amvic Ireland Ltd. Unit 11, Rosemount Business Park, Ballycoolin, Dublin 11, D11 Y382, Ireland + 353 1 899 1883
ECO PLATFORM EPD	DECLARED UNIT
Yes	1m <sup>2</sup> of EPS Insulating Concrete Formwork
APPLICABLE PRODUCT CATEGORY RULES	DECLARED PRODUCT
1. EN 15804:2012+A2:2019 2. EPD Ireland PCR Part A, Version 2.1, 2022	1m <sup>2</sup> 300 mm (grey) insulating concrete formwork 1m <sup>2</sup> 350 mm (white) insulating concrete formwork
DATE OF ISSUE	SCOPE OF EPD
11th October 2023	Cradle to gate with options, modules C1–C4, and module D
DATE OF EXPIRY	LCA CONSULTANT OR PERSON RESPONSIBLE FOR LCA
10th October 2028	Ecoreview, Kilkenny, Ireland. +353 (087) 258 9783 www.ecoreview.ie
TYPE OF EPD: SINGLE OR MULTI PRODUCT	LCA SOFTWARE AND DEVELOPER IF APPLICABLE
Multi product EPD	Ecochain version 3.5.80
PRODUCT CLASSIFICATION OR NACE CODE	NAME AND VERSION OF INVENTORY USED
Thermal insulation products	Ecoinvent version 3.8
COMPARABILITY	
Environmental Product Declarations from different programmes may not be directly comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See clause 5.3 of EN 15804:2012+A2:2019	
The CEN Norm /EN 15804 serves as the core PCR	
Independent verification of the declaration according to ISO 14025	

Internally  Externally

SIGNATURE OF PROGRAMME OPERATOR	SIGNATURE VERIFIER
Pat Barry - CEO - Irish Green Building Council  	Kim Allbury - Ricardo Energy & Environment  

## 2. Scope and Type of EPD

### Scope

This EPD is cradle to gate with options, modules C1–C4, and module D. The Modules that are declared are shown in the table below.

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	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
MDT	MDT	MDT	OP	OP	OP	OP	OP	OP	OP	OP	OP	MDT	MDT	MDT	MDT	MDT

X = Module declared; ND = Module not declared; MDT = Mandatory; OP = Optional.

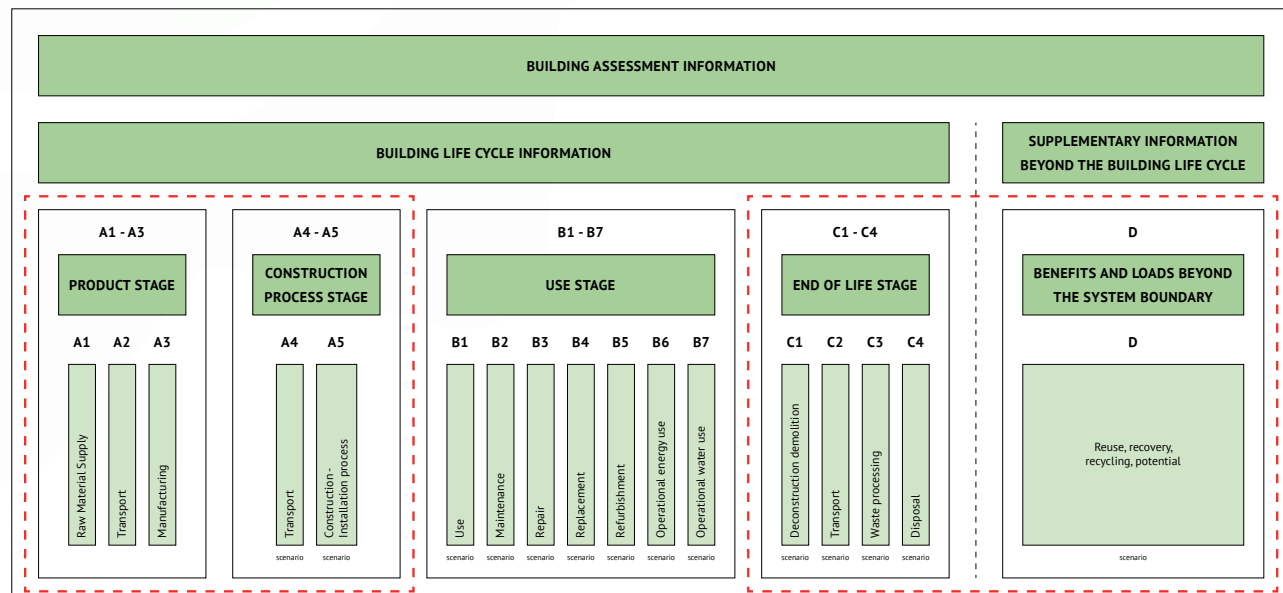
### Declared Functional Unit

1m<sup>2</sup> 300 mm (grey) insulating concrete formwork, mass 6.37 kg

1m<sup>2</sup> 350 mm (white) insulating concrete formwork, mass 7.74 kg

### System Boundaries

This LCA covers the Product (A1 - A3), Construction Process (A4 - A5), end of Life (C1 - C4), and benefits and loads beyond the system boundary (D).



### 3. Detailed product description

This EPD is for Amvic’s installed EPS insulated concrete formwork and connectors that comprise Amvic’s Insulated Concrete Formwork (ICF) system for house building. The installed system comprises two EPS panels, connected with polypropylene connectors, pre-assembled at Amvic’s production site in Ballycoolin, Dublin. There is an internal hollow core of 150mm that is filled on-site with readymixed concrete.

The Amvic ICF EPS products are used in the construction of Insulated Concrete Formwork structure.

Key technical characteristics of the insulated concrete formwork system are:

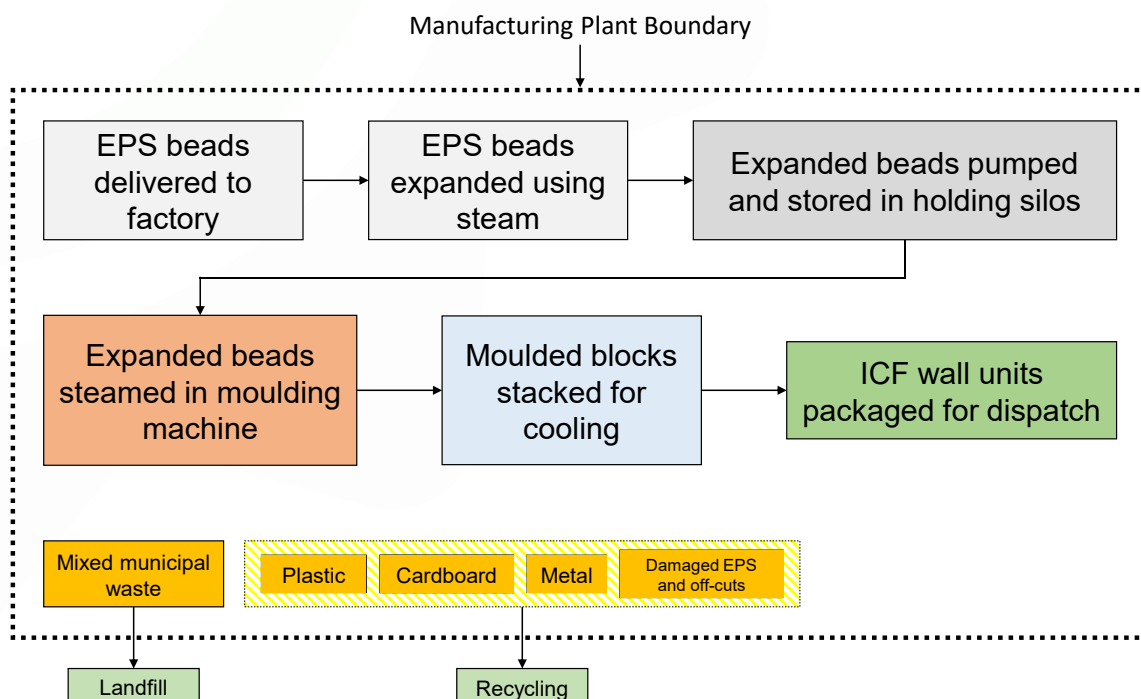
Product	Area of DU (m <sup>2</sup> )	Thickness of individual EPS panel (mm)	Thickness of cavity for concrete (mm)	Overall Thickness, 2 panels and internal core (mm)	Overall volume of EPS per DU (m <sup>3</sup> )	Density of moulded EPS (kg/m <sup>3</sup> )	Mass of EPS beads per DU (kg)	Mass of PP connectors per DU (kg)	Total mass of DU (kg)	Thermal resistance R, of system including concrete core (m <sup>2</sup> K/W)
300	1	75	150	300	0.15	24	3.6	2.77	6.37	5.06
350	1	100	150	350	0.2	24	4.8	2.94	7.74	6.2

#### 3.1 Manufacturing Process Description

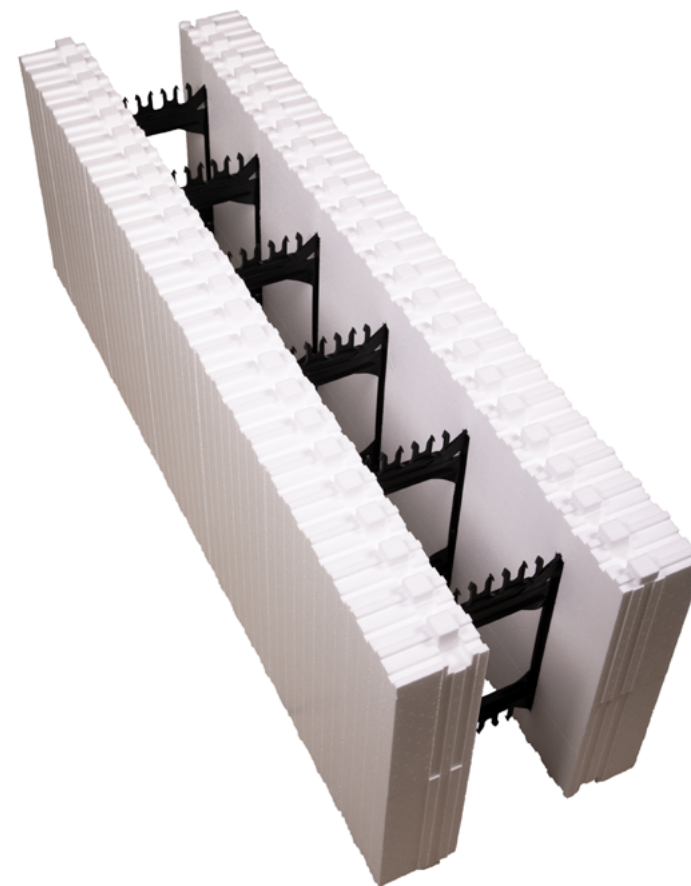
The main raw materials, EPS beads, are heated by steam and expanded. The expanded beads are then transferred to a block moulding machine, in which the pellets are steam-fused together and moulded to a fixed size block. As the pellets are placed in the moulding machine, so also are polypropylene webbing connectors, and these connectors are fixed in place in the system as the blocks are moulded. The moulded blocks, connected with the connectors are then bagged and loaded onto trailers for dispatch to customers. Off-cuts and damaged blocks are sent off-site for recycling.

The expanded insulation is manufactured to EN 13163:2012+A1:2015, Thermal Insulation Products for Buildings - Factory Made Expanded Polystyrene (EPS) Products - Specification.

The manufacturing process is outlined below:



# Amvic 300 Insulating Concrete Formwork



## 4.1.A. LCA results - Amvic 300 Insulating Concrete Formwork

### Core Environmental impact per 1m<sup>2</sup> Amvic 300 Insulating Concrete Formwork

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	1.63E+01	4.22E-01	4.96E+00	2.16E+01	1.84E-01	8.49E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.63E-01	0.00E+00	1.86E+01	-9.05E+00
GWP-fossil	[kg CO <sub>2</sub> eq.]	1.53E+01	4.22E-01	4.95E+00	2.07E+01	1.84E-01	8.20E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.63E-01	0.00E+00	1.86E+01	-8.89E+00
GWP-biogenic	[kg CO <sub>2</sub> eq.]	9.49E-01	2.77E-04	8.61E-03	9.58E-01	1.68E-04	2.91E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.48E-04	0.00E+00	5.02E-04	-1.60E-01
GWP-luluc	[kg CO <sub>2</sub> eq.]	8.90E-03	1.84E-04	4.96E-04	9.58E-03	7.36E-05	2.60E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.51E-05	0.00E+00	6.45E-05	-8.49E-03
ODP	[kg CFC-11 eq.]	4.38E-07	8.98E-08	9.31E-07	1.46E-06	4.26E-08	3.87E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.77E-08	0.00E+00	1.54E-08	-4.77E-07
AP	[mol H+ eq.]	5.72E-02	2.61E-03	4.51E-02	1.05E-01	5.23E-04	2.74E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.62E-04	0.00E+00	2.39E-03	-2.92E-02
EP-freshwater <sup>[1]</sup>	[kg P eq.]	3.38E-04	4.09E-06	3.13E-05	3.73E-04	1.31E-06	9.78E-06	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.16E-06	0.00E+00	2.18E-06	-1.40E-04
EP-marine	[kg N eq.]	1.10E-02	5.15E-04	1.89E-02	3.04E-02	1.04E-04	8.06E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	9.19E-05	0.00E+00	1.12E-03	-4.80E-03
EP-terrestrial	[mol N eq.]	1.16E-01	5.78E-03	2.07E-01	3.29E-01	1.16E-03	8.66E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.02E-03	0.00E+00	1.21E-02	-5.51E-02
POCP	[kg NMVOC eq.]	3.83E-02	1.79E-03	1.97E-01	2.37E-01	4.45E-04	6.05E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.94E-04	0.00E+00	2.92E-03	-1.46E-02
ADP-minerals&metals <sup>[2]</sup>	[kg Sb eq.]	2.59E-05	1.27E-06	9.24E-06	3.64E-05	6.52E-07	1.05E-06	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.77E-07	0.00E+00	5.41E-07	-6.94E-05
ADP-fossils <sup>[2]</sup>	[MJ] ncv	3.83E+02	6.20E+00	6.74E+01	4.57E+02	2.79E+00	1.17E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.47E+00	0.00E+00	1.75E+00	-1.38E+02
WDP <sup>[2]</sup>	m <sup>3</sup> world eq. deprived	4.34E+00	2.58E-02	2.03E-01	4.57E+00	8.49E-03	1.21E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	7.52E-03	0.00E+00	8.83E-02	-1.13E+00

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels (GWP-fossil); 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; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossils = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

<sup>[2]</sup>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.

ND = Module not declared; INA = Indicator not assessed.

## 4.1.B. LCA results - Amvic 300 Insulating Concrete Formwork

### Resource use per 1m<sup>2</sup> Amvic 300 Insulating Concrete Formwork

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.37E+01	8.22E-02	3.52E+00	1.73E+01	3.99E-02	4.45E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.53E-02	0.00E+00	4.18E-02	-3.30E+01
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.37E+01	8.22E-02	3.52E+00	1.73E+01	3.99E-02	4.45E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.53E-02	0.00E+00	4.18E-02	-3.30E+01
PENRE	[MJ]	9.55E+01	6.59E+00	7.19E+01	1.74E+02	2.96E+00	1.20E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.62E+00	0.00E+00	1.91E+00	-1.48E+02
PENRM	[MJ]	2.93E+02	0.00E+00	0.00E+00	2.93E+02	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	3.89E+02	6.59E+00	7.19E+01	4.67E+02	2.96E+00	1.20E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.62E+00	0.00E+00	1.91E+00	-1.48E+02
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m <sup>3</sup> ]	5.03E+00	7.80E-04	7.51E-03	5.04E+00	3.16E-04	1.26E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.79E-04	0.00E+00	3.41E-03	-1.90E-02

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 = Use of net fresh water.

ND = Module not declared; INA = Indicator not assessed.

## 4.1.C. LCA results - Amvic 300 Insulating Concrete Formwork

### Output flows and waste categories per 1m<sup>2</sup> Amvic 300 Insulating Concrete Formwork

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	7.85E-04	1.46E-05	1.61E-04	9.61E-04	7.28E-06	2.46E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.45E-06	0.00E+00	1.16E-05	-3.16E-05
NHWD	[kg]	1.45E+00	2.77E-01	1.34E-01	1.86E+00	1.46E-01	6.53E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.29E-01	0.00E+00	1.87E-01	-5.10E-01
RWD	[kg]	3.72E-04	4.05E-05	3.88E-04	8.01E-04	1.89E-05	2.10E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.67E-05	0.00E+00	2.92E-06	-7.60E-04
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

ND = Module not declared; INA = Indicator not assessed.



## 4.1.D. LCA results - Amvic 300 Insulating Concrete Formwork

### Additional Environmental impact per 1m<sup>2</sup> Amvic 300 Insulating Concrete Formwork

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	4.98E-07	3.05E-08	1.13E-06	1.66E-06	1.48E-08	4.31E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.31E-08	0.00E+00	1.16E-08	-8.29E-08
IRP <sup>[1]</sup>	kBq U235 eq	2.51E+00	2.59E-02	2.41E-01	2.77E+00	1.21E-02	7.00E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.07E-02	0.00E+00	2.27E-03	-5.97E-01
ETP-fw <sup>[2]</sup>	CTUe	8.53E+02	5.19E+00	4.45E+01	9.03E+02	2.19E+00	2.44E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.94E+00	0.00E+00	6.08E+01	-7.24E+01
HTP-c <sup>[2]</sup>	CTUe	6.53E-09	1.55E-10	1.61E-09	8.30E-09	7.04E-11	2.54E-10	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.23E-11	0.00E+00	1.02E-09	-2.72E-09
HTP-nc <sup>[2]</sup>	CTUe	1.21E-07	4.75E-09	3.18E-08	1.57E-07	2.21E-09	4.92E-09	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.96E-09	0.00E+00	3.87E-08	-7.78E-08
SQP <sup>[2]</sup>	dimensionless	2.68E+01	3.80E+00	8.45E+00	3.90E+01	1.94E+00	1.20E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.72E+00	0.00E+00	5.68E-01	-2.11E+01

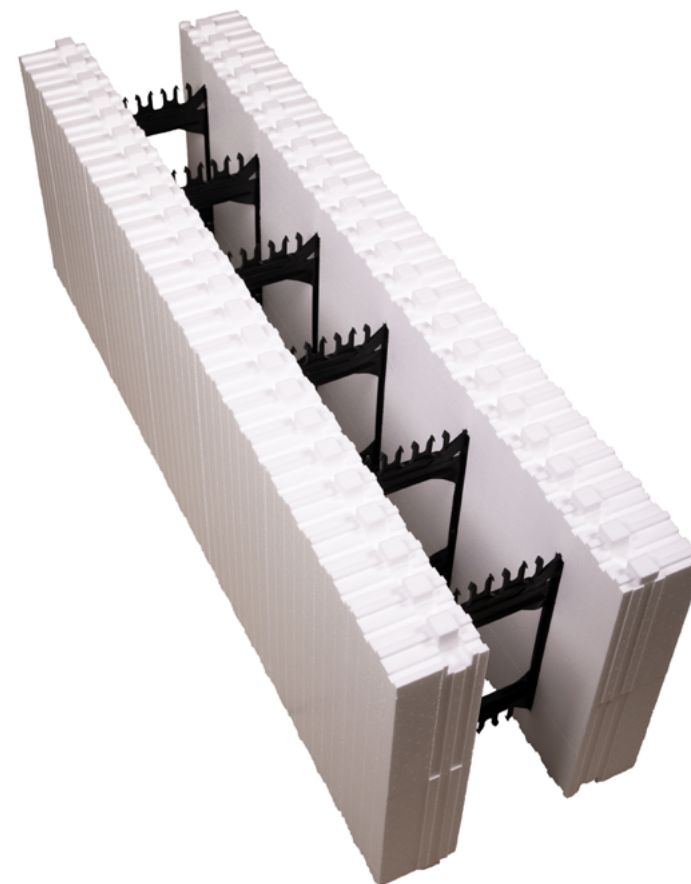
PM = Potential incidence of disease due to PM emissions, IRP = Potential Human exposure efficiency relative to U235, ETP-fw = Potential Comparative Toxic Unit for ecosystems; HTP-c: Potential Comparative Toxic Unit for humans, HTP-nc = Potential Comparative Toxic Unit for humans, SQP = Potential soil quality index.

<sup>[1]</sup> This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuelcycle. 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.

<sup>[2]</sup> 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.

ND = Module not declared; INA = Indicator not assessed.

## Amvic 350 Insulating Concrete Formwork



## 4.2.A. LCA results - Amvic 350 Insulating Concrete Formwork

### Core Environmental impact per 1m<sup>2</sup> Amvic 350 Insulating Concrete Formwork

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	[kg CO <sub>2</sub> eq.]	2.11E+01	7.18E-01	5.13E+00	2.69E+01	1.91E-01	1.08E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.68E-01	0.00E+00	2.29E+01	-1.08E+01
GWP-fossil	[kg CO <sub>2</sub> eq.]	2.02E+01	7.17E-01	5.12E+00	2.60E+01	1.91E-01	1.05E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.68E-01	0.00E+00	2.29E+01	-1.06E+01
GWP-biogenic	[kg CO <sub>2</sub> eq.]	8.72E-01	4.68E-04	8.90E-03	8.81E-01	1.74E-04	2.84E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.53E-04	0.00E+00	6.23E-04	-1.90E-01
GWP-luluc	[kg CO <sub>2</sub> eq.]	1.21E-02	3.11E-04	5.13E-04	1.29E-02	7.62E-05	3.42E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.71E-05	0.00E+00	7.94E-05	-1.01E-02
ODP	[kg CFC-11 eq.]	6.36E-07	1.53E-07	9.62E-07	1.75E-06	4.42E-08	4.63E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.89E-08	0.00E+00	1.89E-08	-5.68E-07
AP	[mol H+ eq.]	7.79E-02	4.28E-03	4.66E-02	1.29E-01	5.41E-04	3.35E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.76E-04	0.00E+00	2.93E-03	-3.48E-02
EP-freshwater <sup>[1]</sup>	[kg P eq.]	3.52E-04	6.89E-06	3.23E-05	3.91E-04	1.36E-06	1.03E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.20E-06	0.00E+00	2.68E-06	-1.67E-04
EP-marine	[kg N eq.]	1.54E-02	8.45E-04	1.95E-02	3.58E-02	1.08E-04	9.44E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	9.47E-05	0.00E+00	1.38E-03	-5.71E-03
EP-terrestrial	[mol N eq.]	1.60E-01	9.47E-03	2.14E-01	3.83E-01	1.20E-03	1.01E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.06E-03	0.00E+00	1.48E-02	-6.56E-02
POCP	[kg NMVOC eq.]	5.22E-02	2.95E-03	2.46E-01	3.01E-01	4.61E-04	7.67E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.06E-04	0.00E+00	3.58E-03	-1.74E-02
ADP-minerals&metals <sup>[2]</sup>	[kg Sb eq.]	2.71E-05	2.18E-06	9.55E-06	3.88E-05	6.75E-07	1.12E-06	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.95E-07	0.00E+00	6.64E-07	-8.26E-05
ADP-fossils <sup>[2]</sup>	[MJ] ncv	4.94E+02	1.06E+01	6.96E+01	5.74E+02	2.89E+00	1.47E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.54E+00	0.00E+00	2.15E+00	-1.65E+02
WDP <sup>[2]</sup>	m <sup>3</sup> world eq. deprived	5.11E+00	4.34E-02	2.09E-01	5.37E+00	8.79E-03	1.42E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	7.74E-03	0.00E+00	1.17E-01	-1.34E+00

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels (GWP-fossil); 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; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossils = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

<sup>[2]</sup>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.

ND = Module not declared; INA = Indicator not assessed.

## 4.2.B. LCA results - Amvic 350 Insulating Concrete Formwork

### Resource use per 1m<sup>2</sup> Amvic 350 Insulating Concrete Formwork

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.41E+01	1.39E-01	3.63E+00	1.79E+01	4.13E-02	4.62E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.64E-02	0.00E+00	5.16E-02	-3.93E+01
PERM	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.41E+01	1.39E-01	3.63E+00	1.79E+01	4.13E-02	4.62E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.64E-02	0.00E+00	5.16E-02	-3.93E+01
PENRE	[MJ]	1.44E+02	1.12E+01	7.43E+01	2.30E+02	3.07E+00	1.50E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.70E+00	0.00E+00	2.34E+00	-1.77E+02
PENRM	[MJ]	3.56E+02	0.00E+00	0.00E+00	3.56E+02	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	5.00E+02	1.12E+01	7.43E+01	5.86E+02	3.07E+00	1.50E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.70E+00	0.00E+00	2.34E+00	-1.77E+02
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m <sup>3</sup> ]	6.71E+00	1.32E-03	7.76E-03	6.72E+00	3.27E-04	1.68E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.88E-04	0.00E+00	4.43E-03	-2.26E-02

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 = Use of net fresh water.

ND = Module not declared; INA = Indicator not assessed.

## 4.2.C. LCA results - Amvic 350 Insulating Concrete Formwork

### Output flows and waste categories per 1m<sup>2</sup> Amvic 350 Insulating Concrete Formwork

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	7.91E-04	2.50E-05	1.67E-04	9.83E-04	7.54E-06	2.52E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.64E-06	0.00E+00	1.36E-05	-3.76E-05
NHWD	[kg]	1.93E+00	4.76E-01	1.38E-01	2.55E+00	1.51E-01	8.28E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.33E-01	0.00E+00	2.30E-01	-6.08E-01
RWD	[kg]	2.52E-04	6.89E-05	4.01E-04	7.22E-04	1.95E-05	1.92E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.72E-05	0.00E+00	3.60E-06	-9.05E-04
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.

CRU, MFR, MER, EEE, EET are not calculated by the EcoChain software.

ND = Module not declared; INA = Indicator not assessed.

## 4.2.D. LCA results - Amvic 350 Insulating Concrete Formwork

### Additional Environmental impact per 1m<sup>2</sup> Amvic 350 Insulating Concrete Formwork

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	6.96E-07	5.22E-08	1.17E-06	1.92E-06	1.53E-08	4.96E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.35E-08	0.00E+00	1.43E-08	-9.87E-08
IRP <sup>[1]</sup>	kBq U235 eq	3.06E+00	4.41E-02	2.49E-01	3.35E+00	1.25E-02	8.48E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.10E-02	0.00E+00	2.80E-03	-7.11E-01
ETP-fw <sup>[2]</sup>	CTUe	1.10E+03	8.86E+00	4.60E+01	1.15E+03	2.27E+00	3.15E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.00E+00	0.00E+00	8.06E+01	-8.62E+01
HTP-c <sup>[2]</sup>	CTUe	7.51E-09	2.65E-10	1.67E-09	9.44E-09	7.29E-11	2.94E-10	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.42E-11	0.00E+00	1.29E-09	-3.24E-09
HTP-nc <sup>[2]</sup>	CTUe	1.53E-07	8.12E-09	3.29E-08	1.94E-07	2.29E-09	6.12E-09	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.02E-09	0.00E+00	4.90E-08	-9.26E-08
SQP <sup>[2]</sup>	dimensionless	2.97E+01	6.52E+00	8.74E+00	4.49E+01	2.01E+00	1.36E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.77E+00	0.00E+00	6.99E-01	-2.51E+01

PM = Potential incidence of disease due to PM emissions, IRP = Potential Human exposure efficiency relative to U235, ETP-fw = Potential Comparative Toxic Unit for ecosystems; HTP-c: Potential Comparative Toxic Unit for humans, HTP-nc = Potential Comparative Toxic Unit for humans, SQP = Potential soil quality index.

<sup>[1]</sup> This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuelcycle. 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.

<sup>[2]</sup> 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.

ND = Module not declared; INA = Indicator not assessed.

## 5. Calculation rules

The measurement of environmental impacts in this EPD uses the LCIA methodologies recommended for PEF3.0. The indicator values for EPS are from Plastics Europe Ecoprofile (GaBi); and the impact assessment results of this material were calculated using OpenLCA. As this EPD is based on Ecoinvent database, there can be a lack of consistency between GaBi and Ecoinvent indicators such as toxicities, ozone depletion and hazardous waste disposal, although there is good agreement on global warming potential.

The process descriptions and quantities in this study are reproducible in accordance to the reference standards that have been used. The references of all sources, both primary and public sources and literature, have been documented in the LCA report. The 'polluter pays' and 'modularity' principles have been followed.

In addition, to facilitate the reproducibility of this LCA, a full set of data records has been generated which can be accessed via the LCA tool. This data portfolio contains a summary of all the data used in this LCA.

### Cut-off criteria

The cut-off criteria of section 6.3.6 of EN15804 +A2 have been followed.

### Database and data collection

Ecoinvent v 3.8, Issued 2019, dataset reference year 2018; Plastics Europe Eco-Profile issued 2022, dataset reference year 2019. Production data collected for 2022.

### Data Quality

The dataset is representative for the production processes used in 2022. The data Quality Levels, according to Table E.1 of EN 15804 +A2, Annex E, for the various criteria are as follows:

- Geographical representativeness: Very Good.
- Time representativeness: Good.
- Technical representativeness: Good.

### Allocations

Allocation of electricity types and amounts to the various manufacturing processes has been provided by Amvic, along with production waste and direct emissions; allocation of impacts to the products is based on the product composition mass.

### Electricity modelling

The electricity supplied is generated by a mixture of renewable energy (wind), natural gas, coal and oil. The emission factor of this mix is 0.492 kg CO<sub>2</sub> (GWpt) per kWh. The Single Electricity Market Operator for Ireland and N.Ireland has confirmed that the fuel mix disclosure breakdown provided by the electricity supplier suffices as proof of usage of green energy by Amvic, and that the the electricity supplier has cancelled a sufficient number of guarantees of origin in the fuel mix disclosure to classify the declared renewables portion of the electricity used by Amvic as renewable.

## 6. Scenarios and additional technical information

The product and data used in this EPD are based on the being manufactured in the Republic of Ireland, and transported a mean distance of 170 km from the production site in Dublin, to customers within the island of Ireland.

### A4. Transport to customer

Distance to the customer is 60 km.

Parameter	Value / Description
Vehicle type	Freight lorry 16-32 metric ton, EURO6
Distance	170 km
Capacity Utilisation	64%
Bulk density of transported goods	24 kg/m <sup>3</sup>

### A5. Installation on site

Parameter	Value / Description
On-site losses due to damage, off-cuts, etc.	2.5% by mass
Incineration of installation losses 300 EPS	0.09 kg
Recycling of installation losses 300 PP	0.069 kg
Incineration of installation losses 350 EPS	0.12 kg
Recycling of installation losses 350 PP	0.074 kg

## C. End of Life Scenarios, Module

N/A.

### C1. De-construction demolition

In the deconstruction/demolition phase C1 it is assumed that the ICF EPS system is removed manually from the building, thus no energy or materials are required for module C1, and the impacts are assumed to be zero in C1.

In the end-of-life, it is assumed that 100% of ICF system is incinerated.

### C2. Transport

In the transport phase C2, it is assumed that the removed materials travel 250km to incineration. Transport vehicle type: Freight lorry 16-32 metric ton, EURO6.

### C3. Waste processing

The incineration process is considered a disposal process.

### C4. Disposal

100% of the ICF system at end-of-life is incinerated.



### D. Reuse – Recovery – Recycling potential

It is assumed that the efficiency of conversion of fuel energy to electricity is 25% [\[11\]](#).

### Declaration of biogenic carbon content at the production gate

Biogenic carbon (kg per declared unit)	300	350	Unit
Biogenic carbon content in product	0	0	kg C
Biogenic carbon content in packaging	0	0	kg C

### Additional Technical Information

N/A.

### 7. Mandatory additional information on release of dangerous substances to indoor air, soil and water

None of the substances contained in the product are listed in the “Candidate List of Substances of Very High Concern for authorisation”, or they do not exceed the threshold with the European Chemicals Agency.

### 8. Other optional additional environmental information

N/A.

## 9. References

- [1] ISO 14040 Environmental management - Life cycle assessment – Principles and Framework', International Organization for Standardization, ISO14040:2006.
- [2] ISO 14044 Environmental management - Life cycle assessment - Requirements and guidelines', International Organization for Standardization, ISO14044:2006
- [3] ISO 14025 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures', International Organization for Standardization, ISO14025:2006.
- [4] I.S. EN 15804:2012+A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products', EN 15804:2012+A1:2013.
- [5] Product Category Rules: Implementation and use of I.S. EN 15804:2012 and CEN TR 16970:2016 in Ireland. Product Category Rules: Part A, version 2.1 (5/03/2022).
- [6] I.S. EN 16783:2017 Thermal insulation products – Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations.
- [7] Ecochain Helix, V 3.5.80 (2023), web: <http://app.ecochain.com>.
- [8] I.S. EN 13165:2008, Thermal insulation products for buildings. Factory made rigid polyurethane foam (PUR) products. Specification.
- [9] CML - Department of Industrial Ecology, CML-IA Characterisation Factors, August 2016, Leiden University, Leiden, Netherlands.
- [10] Ministerie van Verkeer en Waterstaat, 8 maart 2004, Toxiciteit heeft z'n prijs, Schaduwpreizen voor ecotoxiciteit en uitputting van abiotische grondstoffen binnen DuboCalc.
- [11] <https://zerowasteurope.eu/wp-content/uploads/2023/01/Debunking-Efficient-Recovery-Full-Report-EN.docx.pdf>

## 10. Annex

N/A.