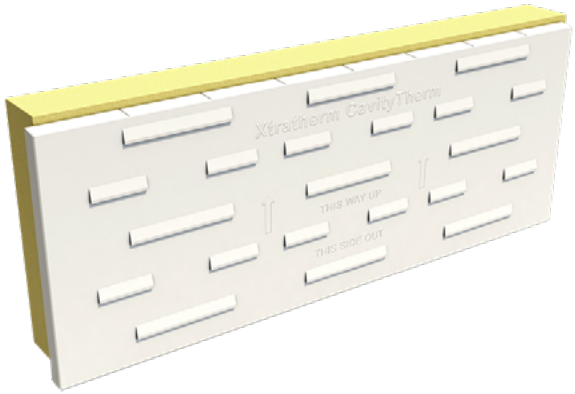
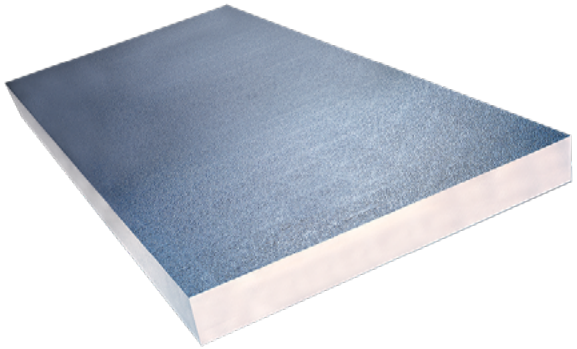
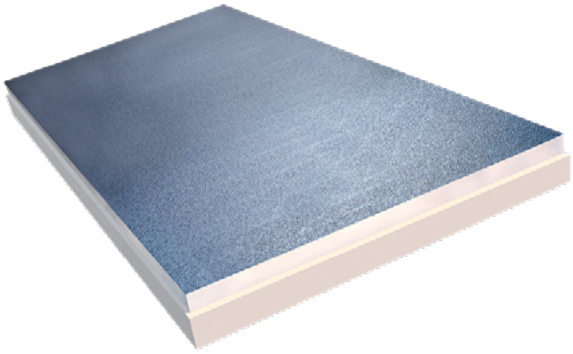
EN 15804+A2 EPD







ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2
Owner of the Declaration – Unilin Insulation Ireland Ltd

Declaration number: EPDIE-21-27
Issue date 12th April 2022 (Rev.2 - XX/XX/XXXX)
Valid to 12th April 2027

EPD Programme - EPD Ireland
Programme Operator - Irish Green Building Council
www.epdireland.org

UNILIN INSULATION

Unilin Insulation Ireland Ltd

Cavity Therm (CT/PIR)

Xtroliner (XO)

Xtrowall Plus (XO/XWP)

1. General information

PROGRAMME OPERATOR	OWNER OF DECLARATION
Irish Green Building Council 19 Mountjoy Square, Dublin D01 E8P5 info@igbc.ie	Unilin Insulation Ireland Ltd Kells Road, Navan, Co. Mearh, Ireland C15 NP79 T +353 (0) 46 906 6000; info.ui@unilin.com www.unilininsulation.ie
DECLARATION NUMBER	**PRODUCTION SITE**
EPDIE-21-27	Unilin Insulation Ireland Ltd Kells Road, Navan, Co. Meath, Ireland
ECO PLATFORM EPD	**DECLARED UNIT**
Yes	1m² 100mm CT/PIR R-value 4.5 m²K/W 1m² 100mm XO R-value 4.75 m²K/W 1m² 110mm XO/XWP R-value 5.5 m²K/W
APPLICABLE PRODUCT CATEGORY RULES	**DECLARED PRODUCT**
1. EN 15804:2012+A2:2019 2. Product Category Rules: Part A, Implementation and use of EN 15804:2012+A2:2019 and CEN TR 16970:2016 in Ireland, Version 2.0 3. 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	• CT/PIR 100mm • XO 100mm • XO/XWP 110mm
DATE OF ISSUE	**SCOPE OF EPD**
12th April 2022 Reissue: 09.01.2023 - Changes: owner name and logo from Xtratherm to Unilin Insulation Ireland Limited and products' name due to rebranding	Cradle to gate, with options including Modules C and D
DATE OF EXPIRY	**LCA CONSULTANT OR PERSON RESPONSIBLE FOR LCA**
12th April 2027	EcoReview, Kilkenny, Ireland, +353 (0)87 258 9783 www.ecoreview.ie
TYPE OF EPD: SINGLE OR MULTI PRODUCT	**LCA SOFTWARE AND DEVELOPER IF APPLICABLE**
Multi product EPD	Ecochain LCA tool version 3.5.13 (2022)
PRODUCT CLASSIFICATION OR NACE CODE	**NAME AND VERSION OF INVENTORY USED**
Thermal insulation products	Ecoinvent version 3.6
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	Chris Foster - EuGeos SRL

2. Scope and Type of EPD

Scope

This is a Cradle to Gate, with options EPD. The Modules that are declared are shown in the table below.

PRODUCT STAGE			CONSTRUCTION ON 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

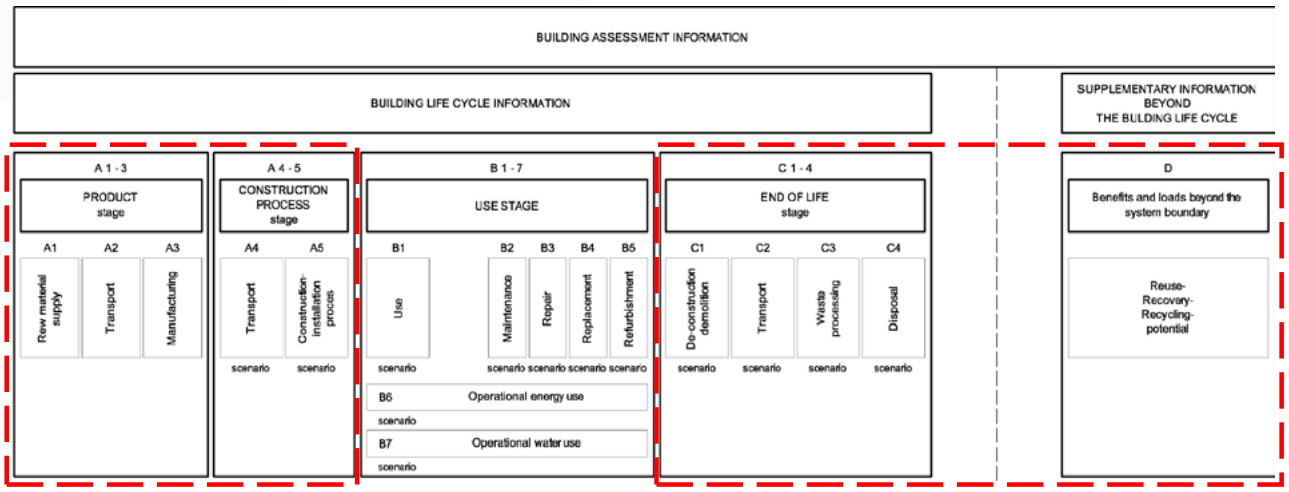
X = Module declared; ND = Module not declared; MDT = Mandatory; OP = Optional.

Declared Functional Unit

1m² 100mm CT/PIR R-value 4.5 m²K/W
1m² 100mm XO R-value 4.75 m²K/W
1m² 110mm XO/XWP R-value 5.5 m²K/W

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

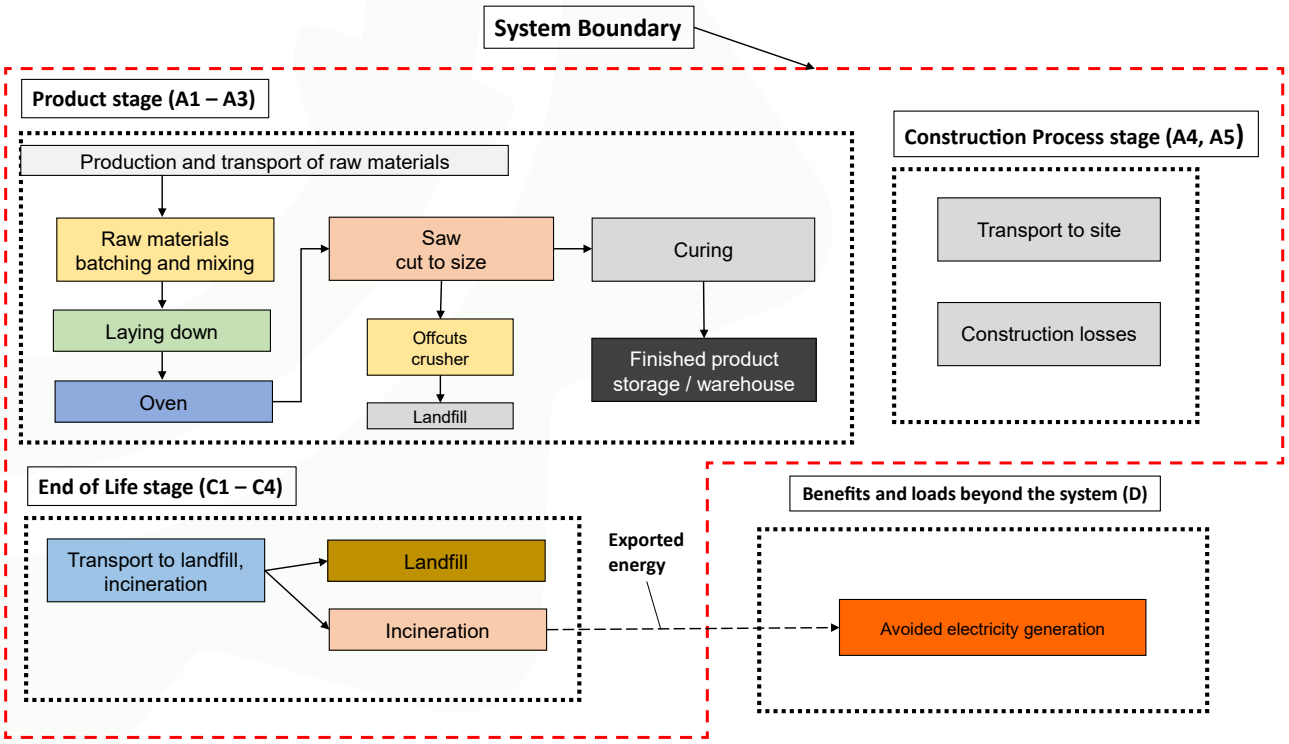
This EPD is carried out for the Unilin Insulation Ireland Ltd products: Cavity Therm, Xtroliner and Xtrowall Plus of thicknesses 100mm, 100mm and 110mm each, respectively. The bulk raw materials polyol & MDI are mixed with various catalysts and additives. The insulation products are manufactured in accordance with I.S. EN 13165:2008, Thermal insulation products for buildings, factory made rigid polyisocyanurate foam (PIR) products.

Full technical details on these products can be found at:
https://unilininsulation.ie/products/cavitytherm/
https://unilininsulation.ie/products/xtroliner/
https://unilininsulation.ie/products/xtroliner/xtrowall-plus-110/

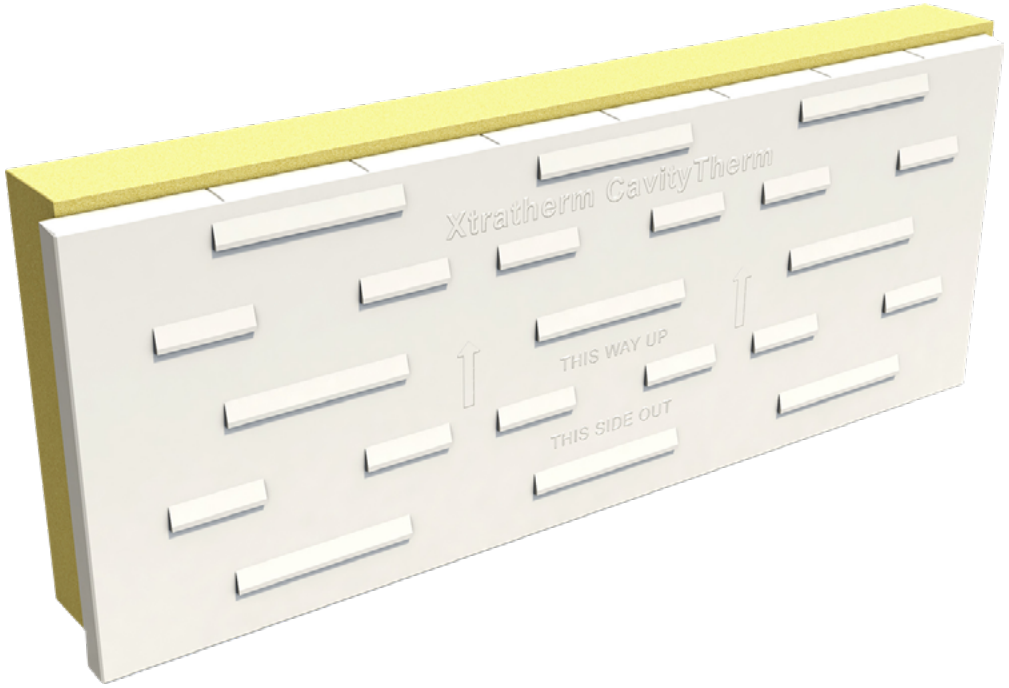
3.1 Manufacturing Process Description

The bulk raw materials polyol & MDI are mixed with various catalysts and additives before being metered onto a moving conveyor. The chemical mix then starts to rise and produce the foam. The foam continues to rise until it contacts the top layer of facer material as it enters the double-belt laminator, where it is then cured under heat to produce the rigid, thermoset foam board. The board exits the lamination oven and then reaches a cross-cut saw which cuts the board into shorter mother boards. Each mother board then enters a cooling zone before entering a multiblade cutting area which removes side trims and cuts the boards to the required length. There is a minor amount of additional cutting to produce speciality boards such as rebated edges. Finished boards are stored in the warehouse before despatch to customers. Off-cuts from the cutting and trimming are compressed on-site and sent to landfill.

The manufacturing process flowchart is shown below:



Cavity Therm (CT/PIR)
1m² 100mm
R-value 4.5 m²K/W



4.1.A. LCA results - Cavity Therm

Core Environmental impact per 1m² 100mm CT/PIR R-value 4.5 m²K/W

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_2 eq.]	1.11E+01	4.86E-01	2.79E-01	1.18E+01	3.14E-02	7.71E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.37E-02	2.65E+00	6.75E-01	-7.11E-01
GWP-fossil	[kg CO_2 eq.]	1.17E+01	4.85E-01	2.79E-01	1.24E+01	3.14E-02	8.09E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.36E-02	2.54E+00	2.81E-01	-7.03E-01
GWP-biogenic	[kg CO_2 eq.]	-7.76E-01	1.48E-04	-2.46E-04	-7.77E-01	1.69E-05	-5.05E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.50E-05	1.14E-01	3.95E-01	-7.54E-03
GWP-luluc	[kg CO_2 eq.]	1.88E-01	1.45E-04	1.85E-05	1.88E-01	1.12E-05	1.22E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.98E-05	1.99E-05	4.08E-05	-6.59E-04
ODP	[kg CFC-11 eq.]	2.81E-07	1.11E-07	1.79E-08	4.10E-07	7.13E-09	2.70E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.90E-08	1.32E-08	8.58E-09	-3.26E-08
AP	[mol H+ eq.]	2.14E-02	1.50E-03	5.64E-04	2.35E-02	9.01E-05	1.53E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.40E-04	2.15E-03	3.48E-04	-3.09E-03
EP-freshwater	[kg P eq.]	1.50E-04	7.33E-06	7.81E-07	1.58E-04	2.50E-07	1.03E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.68E-07	8.65E-07	1.23E-06	-1.84E-05
EP-marine	[kg N eq.]	7.71E-03	2.81E-04	1.13E-04	8.11E-03	1.78E-05	5.28E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.76E-05	1.19E-03	2.89E-03	-4.39E-04
EP-terrestrial	[mol N eq.]	4.36E-02	3.21E-03	1.26E-03	4.81E-02	1.99E-04	3.14E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.32E-04	1.14E-02	1.15E-03	-5.18E-03
POCP	[kg NMVOC eq.]	2.42E-02	1.19E-03	4.31E-03	2.97E-02	7.64E-05	1.93E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.04E-04	2.71E-03	1.41E-01	-1.34E-03
ADP-minerals&metals[2]	[kg Sb eq.]	2.39E-04	1.46E-06	1.40E-06	2.42E-04	8.66E-07	1.58E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.31E-06	1.17E-06	3.31E-07	-2.88E-06
ADP-fossils[2]	[MJ] ncv	2.85E+02	7.41E+00	4.36E+00	2.96E+02	4.74E-01	1.93E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.26E+00	1.32E+00	7.92E-01	-1.01E+01
WDP[2]	m^3 world eq. deprived	5.34E+00	5.66E-02	1.93E-02	5.42E+00	1.34E-03	3.52E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.58E-03	1.55E-01	2.84E-02	-7.87E-02

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&fossils = Abiotic depletion potential for non-fossil resources; ADP-fossils= Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

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

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

4.1.B. LCA results - Cavity Therm

Resource use per 1m² 100mm CT/PIR R-value 4.5 m²K/W

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	2.65E+01	7.97E-02	8.03E-01	2.74E+01	6.79E-03	1.78E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.81E-02	2.38E-02	3.23E-02	-1.77E+00
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]	2.65E+01	7.97E-02	8.03E-01	2.74E+01	6.79E-03	1.78E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.81E-02	2.38E-02	3.23E-02	-1.77E+00
PENRE	[MJ]	2.06E+02	7.87E+00	4.78E+00	2.19E+02	5.03E-01	1.97E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.34E+00	1.44E+00	8.42E-01	-1.08E+01
PENRM	[MJ]	8.39E+01	0.00E+00	0.00E+00	8.39E+01	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]	2.90E+02	7.87E+00	4.78E+00	3.03E+02	5.03E-01	1.97E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.34E+00	1.44E+00	8.42E-01	-1.08E+01
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	[m³]	2.06E+01	1.21E-03	5.72E-04	2.06E+01	5.07E-05	1.34E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.35E-04	4.73E-03	7.41E-04	-1.34E-03

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 - Cavity Therm

Output flows and waste categories per 1m² 100mm CT/PIR R-value 4.5 m²K/W

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	2.27E-04	4.72E-06	7.90E-07	2.33E-04	1.24E-06	1.52E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.31E-06	2.57E-06	1.01E-06	-2.02E-06
NHWD	[kg]	7.10E+00	3.52E-01	6.20E-04	7.45E+00	2.31E-02	4.85E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.15E-02	4.82E-02	2.44E+00	-3.93E-02
RWD	[kg]	2.61E-03	5.01E-05	2.92E-06	2.66E-03	3.23E-06	1.73E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.61E-06	2.08E-06	4.18E-06	-4.60E-05
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 - Cavity Therm

Additonal Environmental impact per 1m² 100mm CT/PIR R-value 4.5 m²K/W

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	2.78E-07	3.08E-08	1.73E-09	3.11E-07	1.99E-09	2.03E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.31E-09	6.99E-09	4.92E-09	-7.51E-09
IRP[1]	kBq U235 eq	3.48E+00	3.17E-02	1.93E-03	3.52E+00	2.07E-03	2.29E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.53E-03	1.56E-03	3.17E-03	-3.31E-02
ETP-fw[2]	CTUe	7.64E+01	5.25E+00	1.66E+00	8.33E+01	3.82E-01	5.43E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.02E+00	6.51E+00	3.70E+01	-7.49E+00
HTP-c[2]	CTUe	5.39E-08	1.54E-10	5.36E-11	5.41E-08	1.06E-11	3.52E-09	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.84E-11	2.27E-10	2.47E-11	-1.80E-10
HTP-nc[2]	CTUe	8.85E-07	5.85E-09	1.67E-09	8.92E-07	4.02E-10	5.80E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.07E-09	8.94E-09	1.39E-09	-6.54E-09
SQP[2]	dimensionless	2.10E+02	5.03E+00	3.72E-01	2.15E+02	3.32E-01	1.40E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.85E-01	2.09E-01	1.48E+00	-2.32E+00

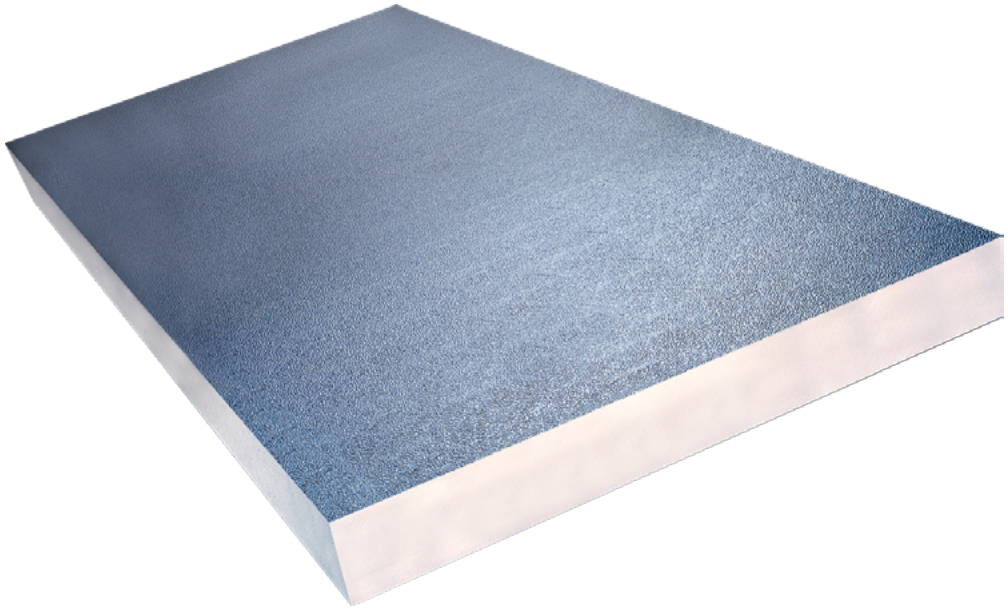
PM = Potential incidence of disease due to PM emissions, IRP = Potential Human exposure efficiency relative to U235, ETP-fw = Potential Comparative Toxic Unit for ecosystems; HTP-c:Potential Comparative Toxic Unit for humans, HTP-nc = Potential Comparative Toxic Unit for humans, SQP = Potential soil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

[1] 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.

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

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

Xtroliner (XO)
1m² 100mm
R-value 4.75 m²K/W



4.2.A. LCA results - Xtroliner (XO)

Core Environmental impact per 1m² 100mm XO R-value 4.75 m²K/W

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_2 eq.]	1.04E+01	4.87E-01	2.78E-01	1.12E+01	3.14E-02	7.28E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.37E-02	2.42E+00	2.73E-01	-7.11E-01
GWP-fossil	[kg CO_2 eq.]	1.06E+01	4.87E-01	2.78E-01	1.14E+01	3.14E-02	7.43E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.36E-02	2.42E+00	2.73E-01	-7.03E-01
GWP-biogenic	[kg CO_2 eq.]	-4.25E-01	1.48E-04	-2.47E-04	-4.25E-01	1.69E-05	-2.76E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.50E-05	2.01E-04	4.21E-04	-7.54E-03
GWP-luluc	[kg CO_2 eq.]	1.84E-01	1.46E-04	1.84E-05	1.85E-01	1.12E-05	1.20E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.98E-05	1.88E-05	4.21E-05	-6.59E-04
ODP	[kg CFC-11 eq.]	2.82E-07	1.12E-07	1.77E-08	4.12E-07	7.13E-09	2.71E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.90E-08	1.26E-08	8.42E-09	-3.26E-08
AP	[mol H+ eq.]	1.97E-02	1.51E-03	5.62E-04	2.18E-02	9.01E-05	1.42E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.40E-04	2.07E-03	3.41E-04	-3.09E-03
EP-freshwater	[kg P eq.]	1.49E-04	7.35E-06	7.79E-07	1.58E-04	2.50E-07	1.03E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.68E-07	8.15E-07	1.32E-06	-1.84E-05
EP-marine	[kg N eq.]	7.19E-03	2.82E-04	1.13E-04	7.58E-03	1.78E-05	4.94E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.76E-05	1.15E-03	2.55E-03	-4.39E-04
EP-terrestrial	[mol N eq.]	3.84E-02	3.22E-03	1.26E-03	4.29E-02	1.99E-04	2.80E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.32E-04	1.10E-02	1.14E-03	-5.18E-03
POCP	[kg NMVOC eq.]	2.10E-02	1.19E-03	4.31E-03	2.65E-02	7.64E-05	1.73E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.04E-04	2.61E-03	1.40E-01	-1.34E-03
ADP-minerals&metals[2]	[kg Sb eq.]	9.84E-04	1.46E-06	1.40E-06	9.87E-04	8.66E-07	6.42E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.31E-06	1.11E-06	3.49E-07	-2.88E-06
ADP-fossils[2]	[MJ] ncv	2.48E+02	7.44E+00	4.35E+00	2.60E+02	4.74E-01	1.69E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.26E+00	1.27E+00	8.00E-01	-1.01E+01
WDP[2]	m^3 world eq. deprived	3.92E+00	5.68E-02	1.92E-02	3.99E+00	1.34E-03	2.60E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.58E-03	1.49E-01	2.77E-02	-7.87E-02

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&fossils = Abiotic depletion potential for non-fossil resources; ADP-fossils= Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

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

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

4.2.B. LCA results - Xtroliner (XO)

Resource use per 1m² 100mm XO R-value 4.75 m²K/W

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.76E+01	8.00E-02	8.03E-01	1.85E+01	6.79E-03	1.20E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.81E-02	2.26E-02	3.41E-02	-1.77E+00
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]	1.76E+01	8.00E-02	8.03E-01	1.85E+01	6.79E-03	1.20E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.81E-02	2.26E-02	3.41E-02	-1.77E+00
PENRE	[MJ]	1.71E+02	7.90E+00	4.77E+00	1.84E+02	5.03E-01	1.72E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.34E+00	1.39E+00	8.50E-01	-1.08E+01
PENRM	[MJ]	8.01E+01	0.00E+00	0.00E+00	8.01E+01	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]	2.51E+02	7.90E+00	4.77E+00	2.64E+02	5.03E-01	1.72E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.34E+00	1.39E+00	8.50E-01	-1.08E+01
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	[m³]	2.06E+01	1.22E-03	5.71E-04	2.06E+01	5.07E-05	1.34E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.35E-04	4.53E-03	7.32E-04	-1.34E-03

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 - Xtroliner (XO)

Output flows and waste categories per 1m² 100mm XO R-value 4.75 m²K/W

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	8.87E-04	4.74E-06	7.68E-07	8.92E-04	1.24E-06	5.81E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.31E-06	2.42E-06	9.95E-07	-2.02E-06
NHWD	[kg]	7.26E+00	3.53E-01	6.07E-04	7.61E+00	2.31E-02	4.96E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.15E-02	4.49E-02	2.35E+00	-3.93E-02
RWD	[kg]	2.61E-03	5.02E-05	2.84E-06	2.66E-03	3.23E-06	1.73E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.61E-06	1.98E-06	4.10E-06	-4.60E-05
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 - Xtroliner (XO)

Additonal Environmental impact per 1m² 100mm XO R-value 4.75 m²K/W

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	2.64E-07	3.10E-08	1.71E-09	2.97E-07	1.99E-09	1.94E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.31E-09	6.64E-09	4.99E-09	-7.51E-09
IRP[1]	kBq U235 eq	3.48E+00	3.18E-02	1.88E-03	3.52E+00	2.07E-03	2.29E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.53E-03	1.48E-03	3.13E-03	-3.31E-02
ETP-fw[2]	CTUe	7.53E+01	5.26E+00	1.65E+00	8.22E+01	3.82E-01	5.36E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.02E+00	6.21E+00	1.45E+02	-7.49E+00
HTP-c[2]	CTUe	5.51E-08	1.55E-10	5.35E-11	5.54E-08	1.06E-11	3.60E-09	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.84E-11	2.14E-10	2.70E-11	-1.80E-10
HTP-nc[2]	CTUe	9.08E-07	5.87E-09	1.66E-09	9.16E-07	4.02E-10	5.95E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.07E-09	8.38E-09	9.30E-10	-6.54E-09
SQP[2]	dimensionless	1.53E+02	5.05E+00	3.71E-01	1.58E+02	3.32E-01	1.03E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.85E-01	1.97E-01	1.44E+00	-2.32E+00

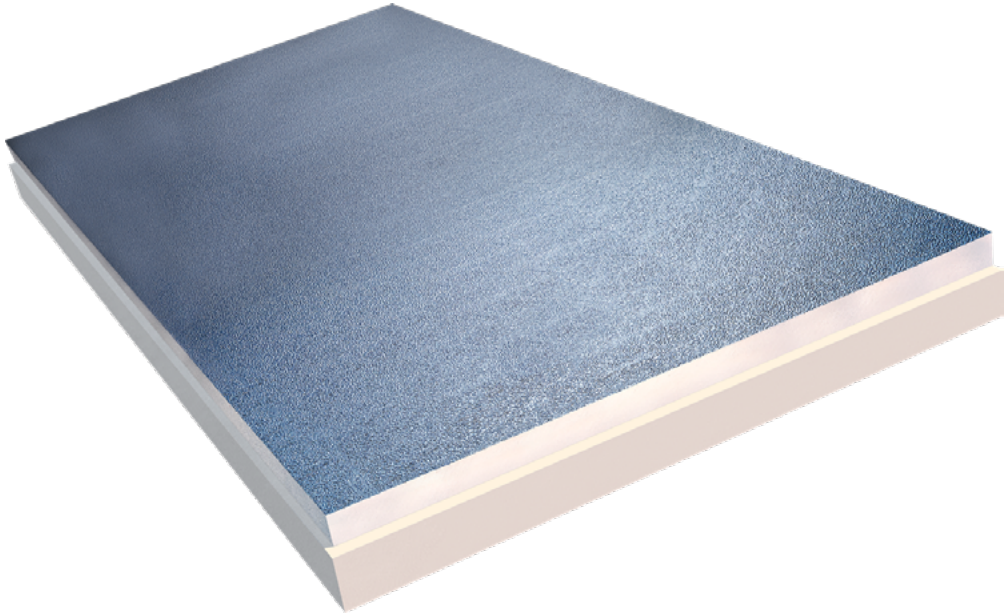
PM = Potential incidence of disease due to PM emissions, IRP = Potential Human exposure efficiency relative to U235, ETP-fw = Potential Comparative Toxic Unit for ecosystems; HTP-c:Potential Comparative Toxic Unit for humans, HTP-nc = Potential Comparative Toxic Unit for humans, SQP = Potential soil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

[1] 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.

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

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

Xtrowall Plus (XO/XWP)
1m² 110mm
R-value 5.5 m²K/W



4.3.A. LCA results - Xtrowall Plus (XO/XWP)

Core Environmental impact per 1m² 110mm XO/XWP R-value 5.5 m²K/W

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_2 eq.]	1.13E+01	5.36E-01	2.81E-01	1.21E+01	3.45E-02	7.87E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.63E-02	2.65E+00	2.99E-01	-7.66E-01
GWP-fossil	[kg CO_2 eq.]	1.15E+01	5.36E-01	2.81E-01	1.23E+01	3.45E-02	8.04E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.62E-02	2.65E+00	2.99E-01	-7.57E-01
GWP-biogenic	[kg CO_2 eq.]	-4.66E-01	1.63E-04	-2.46E-04	-4.66E-01	1.85E-05	-3.03E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.64E-05	2.21E-04	4.51E-04	-8.12E-03
GWP-luluc	[kg CO_2 eq.]	2.02E-01	1.60E-04	1.86E-05	2.02E-01	1.23E-05	1.32E-02	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.07E-05	2.07E-05	4.54E-05	-7.10E-04
ODP	[kg CFC-11 eq.]	3.02E-07	1.23E-07	1.83E-08	4.43E-07	7.85E-09	2.92E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.96E-08	1.39E-08	9.14E-09	-3.52E-08
AP	[mol H+ eq.]	2.06E-02	1.66E-03	5.68E-04	2.28E-02	9.91E-05	1.49E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.48E-04	2.28E-03	3.68E-04	-3.33E-03
EP-freshwater	[kg P eq.]	1.58E-04	8.09E-06	7.86E-07	1.67E-04	2.76E-07	1.09E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.89E-07	8.96E-07	1.42E-06	-1.98E-05
EP-marine	[kg N eq.]	7.73E-03	3.10E-04	1.14E-04	8.15E-03	1.96E-05	5.31E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	4.90E-05	1.27E-03	2.80E-03	-4.73E-04
EP-terrestrial	[mol N eq.]	4.02E-02	3.54E-03	1.27E-03	4.51E-02	2.19E-04	2.94E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.49E-04	1.21E-02	1.23E-03	-5.58E-03
POCP	[kg NMVOC eq.]	2.25E-02	1.31E-03	4.31E-03	2.81E-02	8.41E-05	1.83E-03	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.10E-04	2.87E-03	1.40E-01	-1.45E-03
ADP-minerals&metals[2]	[kg Sb eq.]	9.85E-04	1.61E-06	1.41E-06	9.88E-04	9.52E-07	6.43E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.38E-06	1.22E-06	3.76E-07	-3.10E-06
ADP-fossils[2]	[MJ] ncv	2.71E+02	8.18E+00	4.39E+00	2.84E+02	5.22E-01	1.85E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.30E+00	1.39E+00	8.66E-01	-1.09E+01
WDP[2]	m^3 world eq. deprived	4.27E+00	6.24E-02	1.93E-02	4.35E+00	1.48E-03	2.83E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.69E-03	1.64E-01	3.01E-02	-8.48E-02

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&fossils = Abiotic depletion potential for non-fossil resources; ADP-fossils= Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential, deprivation-weighted water consumption.

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

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

4.3.B. LCA results - Xtrowall Plus (XO/XWP)

Resource use per 1m² 110mm XO/XWP R-value 5.5 m²K/W

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	1.92E+01	8.80E-02	8.03E-01	2.01E+01	7.47E-03	1.30E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.87E-02	2.48E-02	3.67E-02	-1.91E+00
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]	1.92E+01	8.80E-02	8.03E-01	2.01E+01	7.47E-03	1.30E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.87E-02	2.48E-02	3.67E-02	-1.91E+00
PENRE	[MJ]	1.86E+02	8.69E+00	4.81E+00	2.00E+02	5.54E-01	1.87E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.38E+00	1.53E+00	9.21E-01	-1.16E+01
PENRM	[MJ]	8.80E+01	0.00E+00	0.00E+00	8.80E+01	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]	2.74E+02	8.69E+00	4.81E+00	2.88E+02	5.54E-01	1.87E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.38E+00	1.53E+00	9.21E-01	-1.16E+01
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	[m³]	2.27E+01	1.34E-03	5.73E-04	2.27E+01	5.58E-05	1.47E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.39E-04	4.98E-03	7.95E-04	-1.45E-03

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.

4.3.C. LCA results - Xtrowall Plus (XO/XWP)

Output flows and waste categories per 1m² 110mm XO/XWP R-value 5.5 m²K/W

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	8.88E-04	5.21E-06	8.37E-07	8.94E-04	1.37E-06	5.82E-05	ND	ND	ND	ND	ND	ND	ND	0.00E+00	3.42E-06	2.65E-06	1.08E-06	-2.17E-06
NHWD	[kg]	7.95E+00	3.88E-01	6.48E-04	8.34E+00	2.54E-02	5.43E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	6.34E-02	4.94E-02	2.56E+00	-4.23E-02
RWD	[kg]	2.86E-03	5.53E-05	3.09E-06	2.92E-03	3.55E-06	1.90E-04	ND	ND	ND	ND	ND	ND	ND	0.00E+00	8.88E-06	2.18E-06	4.45E-06	-4.96E-05
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.

4.3.D. LCA results - Xtrowall Plus (XO/XWP)

Additonal Environmental impact per 1m² 110mm XO/XWP R-value 5.5 m²K/W

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	2.78E-07	3.40E-08	1.76E-09	3.14E-07	2.19E-09	2.05E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.48E-09	7.30E-09	5.40E-09	-8.09E-09
IRP[1]	kBq U235 eq	3.83E+00	3.50E-02	2.03E-03	3.87E+00	2.28E-03	2.51E-01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	5.70E-03	1.63E-03	3.40E-03	-3.56E-02
ETP-fw[2]	CTUe	7.60E+01	5.79E+00	1.68E+00	8.35E+01	4.20E-01	5.45E+00	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.05E+00	6.83E+00	1.46E+02	-8.07E+00
HTP-c[2]	CTUe	6.04E-08	1.70E-10	5.38E-11	6.06E-08	1.17E-11	3.94E-09	ND	ND	ND	ND	ND	ND	ND	0.00E+00	2.92E-11	2.35E-10	2.88E-11	-1.94E-10
HTP-nc[2]	CTUe	9.92E-07	6.46E-09	1.67E-09	1.00E-06	4.43E-10	6.51E-08	ND	ND	ND	ND	ND	ND	ND	0.00E+00	1.11E-09	9.21E-09	9.95E-10	-7.04E-09
SQP[2]	dimensionless	1.67E+02	5.55E+00	3.75E-01	1.73E+02	3.65E-01	1.13E+01	ND	ND	ND	ND	ND	ND	ND	0.00E+00	9.12E-01	2.17E-01	1.56E+00	-2.50E+00

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.

[1] 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.

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

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 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.

Note that in modelling the foils that form the exterior faces of the insulation boards, in the case of multi-component foils, no single dataset was available for these products. Thus in these cases this LCA subdivided these foils into their constituent materials and datasets fro these individual constituent materials were used. The bonding/adhesive materials and bonding process for combining these materials were not included in the calculations, however this is deemed to be not significant as the amount of adhesive and energies required are minor in relation to the impacts of the main materials in these products.

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 EN15804:2012+A2:2019 have been followed, where 99% of the total energy and materials are included, and the total neglected input flows for the modules reported on in the LCA are less than 5% of the energy usage and mass.

Data Quality

The dataset is representative for the production processes used in 2019. The data Quality Level, according to Table E.1 of EN 15804 +A2, Annex E, is 'very good'.

Allocations

Allocation of energy and electricity types and amounts to the various manufacturing processes has been provided by Unilin Insulation Ireland Ltd along with production waste. Allocation of impacts to the products is based on the product composition mass.

Flows related to human activities such as employee transport are excluded. The construction of capital assets such as buildings, manufacture of machines and transportation systems are also excluded since the related flows are assumed to be negligible compared to the manufacture of the building material when compared to these systems over a full lifetime of operation.

6. Scenarios and additional technical information

C1. De-construction demolition

In the deconstruction/demolition phase C1 it is assumed that the insulation panels are 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.

C2. Transport

In the transport phase C2, it is assumed that the removed materials travel 50km to landfill and 250km to incineration, as applicable.

C3. Waste processing

It is assumed that 30% of the recovered insulation panels are sent for incineration, where the incineration generates electricty only. No heat is assumed to be generated in the incineration.

C4. Disposal

It is assumed that 70% of the recovered insulation panels are sent to landfill disposal.

D. Reuse – Recovery – Recycling potential

It is assumed that of the mass of PIR incinerated, that 40% of this mass is converted to energy. It is also assumed that in calculating this energy amount, that the efficiency of the incineration in converting NCV to energy is 70%. Of this energy, 48% becomes electricity, according to conversion factor supplied by Sustainable Energy Authority of Ireland [11].

Declaration of biogenic carbon content at the production gate

The biogenic caerbon (C) for product raw materials (A1) is given in the table below:

BIOGENIC CARBON PER DELCARED UNIT	Cavity Therm (CT/PIR)	Xtrowall Plus (XO/XWP)	Xtroliner (XO)
Biogenic carbon content in product (kg C per m^2)	0.21	0.11	0.13
Biogenic carbon content in packaging (kg C per m^2)	ND	ND	ND

The weight of packaging is << than 5% of the mas of the products, and is not declared.

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 limit for registration 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, ISO 14040:2006.

[2] ISO 14044 Environmental management - Life cycle assessment - Requirements and guidelines', International Organization for Standardization, ISO 14044:2006.

[3] ISO 14025 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures', International Organization for Standardization, ISO 14025:2006.

[4] I.S. EN 15804:2012+A2:2019 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products', 15804:2012+A2:2019.

[5] Product Category Rules : Part A Version 2 Implementation and use of I.S. EN 15804:2012 and CEN TR 16970:2016 in Ireland. Product Category Rules: Part A, version 2.

[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 V 3.5.13 (2022), 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: https://www.universiteitleiden.nl/en/research/research-output/science/cml-ia-characterisation-factors.

[10] Ministerie van Verkeer en Waterstaat, 8 maart 2004, Toxiciteit heeft z'n prijs, Schaduwprijzen voor (eco-) toxiciteit en uitputting van abiotische grondstoffen binnen DuboCalc.

[11] https://www.seai.ie/publications/DEAP-Elec-Factors-2017.pdf