B-EPD ENVIRONMENTAL PRODUCT DECLARATION

UNILIN
PIR INSULATION BOARD “UTHERM” WITH MULTILAYER FACER

1 m² of a thermal insulation board of 80 mm with an RD value of 3,60 m²K/W
or 4,00 m²K/W for the Premium insulation board

Issued 01.04.2021
Valid until 01.04.2026

Third party verified
Conform to EN 15804+A2, NBN/DTD B08-001,
NBN EN 16783 and ISO 14025

Modules declared					
A123	A4	A5	B2 B4 B6	C	D
•	•		•	•	•

[B-EPD n° 21-0009-004-00-00-EN]

UNILIN
FOR SMART LIVING

OWNER OF THIS ENVIRONMENTAL PRODUCT DECLARATION
UNILIN
EPD PROGRAM OPERATOR
Federal Public Service of Health, Food Chain Safety and Environment
www.b-epd.be

The intended use of this EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings. This EPD is only valid when registered on www.b-epd.be. The FPS Public Health cannot be held responsible for the information provided by the owner of the EPD.

PRODUCT DESCRIPTION

PRODUCT NAME

UNILIN PIR insulation board with multilayer facer with a thickness of 80 mm (± 10 mm). The insulation board has commercial names depending on the application: e.g. UTHERM WALL (or KD) in masonry cavity walls, for interior and exterior insulation of walls and in timber frame construction. UTHERM FLOOR (or FBO) is used in floors, UTHERM ROOF (or FD) on flat roofs, and UTHERM SARKING (or SD) on pitched roofs and UTHERM Premium, which is a variant of the normal foam that can be used in all above mentioned applications.

PRODUCT DESCRIPTION AND INTENDED USE

UTHERM is a factory-made rigid insulation board of polyisocyanurate (PIR) for the use as thermal insulation of buildings (for wall, floor, flat roof, pitched roofs), according to EN 13165. The rigid insulation boards are faced on both sides with a multilayer facing. The product is available in variable thicknesses from 20 mm up to 240 mm. This EPD covers the thicknesses of 80 ± 10 mm with an R-value of 3.60 m²K/W (or 4.00 m²K/W for the Premium insulation product) ± 10% and a density of 32 ± 3 kg/m³. The results presented in this EPD can be recalculated to other thicknesses and R_D values using an equation.

REFERENCE FLOW / DECLARED UNIT

This environmental product declaration (EPD) describes the environmental impact of 1 m² of a PU insulation board of 80 mm faced on both sides with a multilayer facing, to be used for thermal insulation of buildings for 60 years, produced by UNILIN. The applied declared unit is 1 m² thermal insulation board with an R_D value of 3.6 m_2K/W or 4.0 m_2K/W for the Premium insulation product. The results presented in this EPD can be recalculated to other thicknesses and R_D values using an equation.

Packaging is included.

The weight per reference flow is 2,91 kg.

INSTALLATION

Installation is included for following applications: floor insulation, cavity wall insulation and insulation for ballasted roofs.
Ancillary materials for installation are not included as these applications do not need fixation materials.
For other applications fixation materials may be necessary to install the product such as adhesives or screws.

IMAGES OF THE PRODUCT AND ITS INSTALLATION

COMPOSITION AND CONTENT

Components	Composition / content / ingredients	Quantity
Product	Multilayer facer (alu/kraft/PE/MetPET)	13 %
	PIR Core (MDI, Polyester derived polyol, others)	87 %
Packaging	LDPE packaging film	3,51E-02 kg/m^2
	PS	2,65E-03 kg/m^2

The product does not contain materials listed in the “Candidate list of Substances of Very High Concern for authorization”.

REFERENCE SERVICE LIFE

The RSL of the PIR insulation board with multilayer facer is estimated at 60 years.
In general insulation materials are not replaced during the life span of a building. In the MMG project (Servaes et al., 2013) of the Flemish Waste Agency, a building life span of 60 years has been applied. The fact that insulation materials are in general not replaced during the life span of the building is considered as the most plausible scenario and thus a life span of 60 years is assumed as reference service life.

The reference service life depends largely on the type of building and the building element in which it is applied. Reference service life of insulation materials in different applications are can be found in for example SBR (2011).
The PCR on insulation materials (EN 16783:2017) mentions that the thermal performance characteristics of thermal insulation products are usually based on a minimum of 50 years.

PU Europe tested a 28 year old and a 33 year old sample. The 28 year old sample still reached all declared performance values (PU Europe).

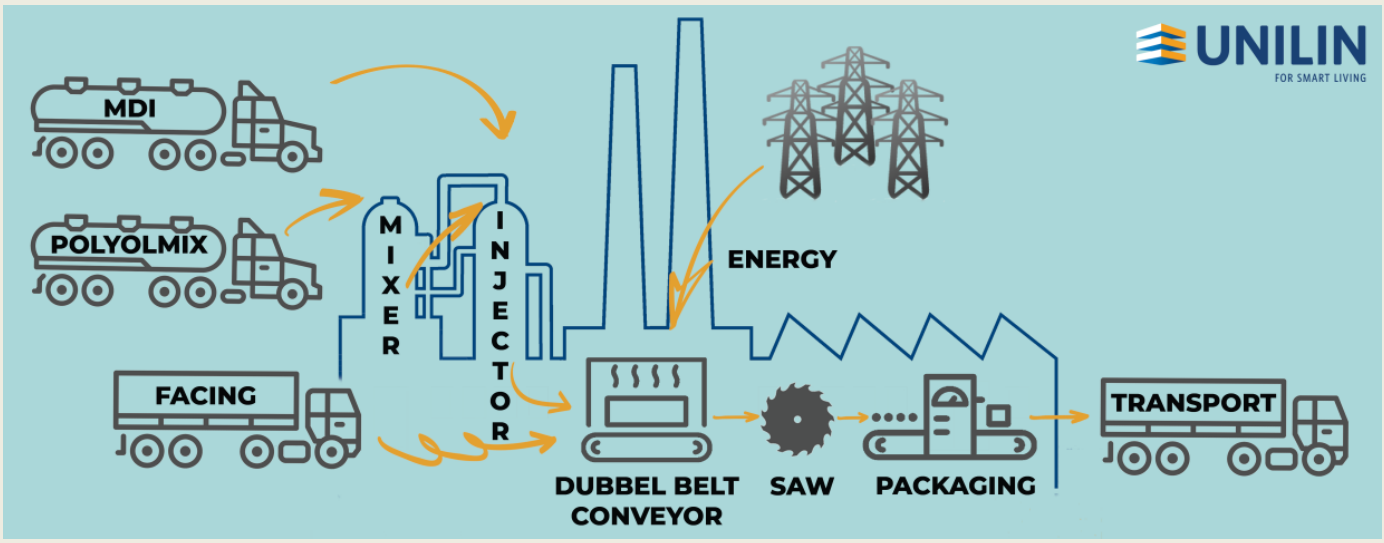
The conditions under which this RSL is valid are as following: natural aging conditions, no exposure to UV, no moisture uptake.

DESCRIPTION OF GEOGRAPHICAL REPRESENTATIVITY

The EPD is representative for the Belgian market.
The composed datasets for this project are representative and relevant for PIR insulation boards with a multilayer facer produced by UNILIN in Belgium. The data describing the direct inputs and outputs of the foreground processes are representative for the production by UNILIN in Desselgem and Feluy. Inputs and outputs from both production sites have been used, according to the share of products from the two sites sold on the Belgium market.

DESCRIPTION OF THE PRODUCTION PROCESS AND TECHNOLOGY

PIR insulation boards with multilayer facings are manufactured in a continuous process on a double belt conveyor. This manufacturing process involves the reaction mixture flowing from a mixing head to a lower facing made of flexible material where it foams up to, and adheres to a top facing applied from above within the pressure zone of the laminator. The foam boards are cut to the required sizes after passing through the double belt conveyor.



TECHNICAL DATA / PHYSICAL CHARACTERISTICS

Technical property	Standard	Value	Unit
Thickness	EN 13165:2012+A2:2016	80	mm
Density PIR core	EN 13165:2012+A2:2016	32 ± 3	kg/m³
Thermal conductivity	EN 13165:2012+A2:2016	0.022	W/mK
Thermal conductivity Premium	EN 13165:2012+A2:2016	0.020	W/mK
R_D-value	EN 13165:2012+A2:2016	3.60	m²K/W
R_D-value Premium	EN 13165:2012+A2:2016	4.00	m²K/W

LCA STUDY

DATE OF LCA STUDY
March 2021

SOFTWARE
For the calculation of the LCA results, the software program SimaPro 9.1.1.1 (PRé Consultants, 2019) has been used.

INFORMATION ON ALLOCATION
At UNILIN, different types of insulation boards are produced. Only facility level data were available for the use of electricity, natural gas, etc. The facility level data have been allocated to the analyzed product using their respective annual production volume (physical relationship). Material inputs and outputs which were not available at the product level, such as waste, were allocated similarly.

INFORMATION ON CUT OFF
The following processes are considered below cut-off: Transport to end-of-life treatment of packaging materials (A3 and A5); Electricity use during installation. Possible energy recovery from packaging materials in module D. The total of neglected input flows is less than 5% of energy usage and mass as prescribed by EN15804+A2.

INFORMATION ON EXCLUDED PROCESSES
Following processes were excluded for the inventory:

- Transport to end-of-life treatment of packaging materials (A3 and A5);
- Electricity use during installation.
- Possible energy recovery from packaging materials and facing in module D.
- Losses during transport are considered to be below cut-off because breakage during transport only rarely occurs.
- Environmental impacts caused by the personnel of the production plants are not included in the LCA, e.g. waste from the cafeteria and sanitary installations, accidental pollution caused by human mistakes, or environmental effects caused by commuter traffic. Heating or cooling of the plants in order to ensure a comfortable indoor climate for the personnel for example is also neglected.

INFORMATION ON BIOGENIC CARBON MODELLING

	Biogenic carbon content (kg C / FU)
Biogenic carbon content in product (at the gate)	/
Biogenic carbon content in accompagnying packaging (at the gate)	/

INFORMATION ON CARBON OFFSETTING
Carbon offsetting is not allowed in the EN 15804 and hence not taken into account in the calculations.

ADDITIONAL OR DEVIATING CHARACTERISATION FACTORS
The characterization factors from EC-JRC were applied conform EN15804+A2. No additional or deviating characterization factors were used.

DATA

SPECIFICITY

The data used for the LCA are specific for this product which is manufactured by a single manufacturer in two production sites (Desselgem & Feluy). The life cycle inventory is based on data from both Desselgem and Feluy. A weighted average of the input data has been made using the market shares of Desselgem and Feluy on the Belgian market. All input data are identical except for the electricity and natural gas use of the plants.

PERIOD OF DATA COLLECTION

Company specific data have been collected for the year 2018 (Desselgem) and part of 2019 (Feluy).

INFORMATION ON DATA COLLECTION

Company specific data for the product stage have been collected by UNILIN and were provided to VITO.

DATABASE USED FOR BACKGROUND DATA

The LCI sources used in this study are the Ecoinvent v3.6 database (Wernet et al., 2016) and Industry data 2.0 (Pré consultants, 2019)

ENERGY MIX

The Belgian electricity mix (consumption mix + import) has been used to model electricity use, the used record is the Ecoinvent record 'Electricity, low voltage {BE}| market for | Cut-off, U' (Wernet et al., 2016).
For the gas use, the Belgian natural gas mix (consumption mix + import) was used, the record is de Ecoinvent record 'Heat, district or industrial, natural gas [BE]| heat production, natural gas, at industrial furnace low-NOx >100kW | Cut-off, U' (Werner et al., 2016).

PRODUCTION SITES

UNILIN, division insulation Desselgem (Desselgem, Belgium)
UNILIN, division insulation Feluy (Seneffe, Belgium)

SYSTEM BOUNDARIES

Product stage			Construction installation stage		Use stage							End of life stage					Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction installation stage	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
☒	☒	☒	☒	☒	**MND**	☒	**MND**	☒	**MND**	☒	**MND**	☒	☒	☒	☒		☒

X = included in the EPD
MND = module not declared

POTENTIAL ENVIRONMENTAL IMPACTS PER REFERENCE FLOW

The LCA results are provided for an insulation panel with a thickness of 80 mm. The LCA results are declared separately for the PIR core and multilayer facer. LCA results PIR insulation plates with another thickness can be calculated using the below equation:

*LCA results PIR multilayer insulation with new thickness = (LCA result PIR core 80 mm * new thickness (mm) / 80 mm) + LCA result facer*

The equation can be applied to products with a thickness between 20 mm and 240 mm. The density of the products and the composition of the PIR core remains the same.

POTENTIAL ENVIRONMENTAL IMPACTS PER REFERENCE FLOW

Environmental profile of the PIR core of a thermal insulation board per declared unit

	Production			Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling	Total excl module D
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal		
GWP total (kg CO2 equiv/FU)	6,86E+00	2,19E-01	7,04E-01	3,97E-02	7,34E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	5,36E-02	0,00E+00	5,96E+00	-1,66E+00	1,46E+01
GWP fossil (kg CO2 equiv/FU)	6,83E+00	2,19E-01	7,08E-01	3,97E-02	7,33E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	5,36E-02	0,00E+00	5,96E+00	-1,65E+00	1,45E+01
GWP biogenic (kg CO2 equiv/FU)	3,13E-02	1,25E-04	-4,75E-03	2,23E-05	1,36E-03	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	2,86E-05	0,00E+00	4,58E-04	-8,73E-03	2,85E-02
GWP luluc (kg CO2 equiv/FU)	1,10E-04	8,99E-05	4,38E-04	8,84E-06	4,04E-05	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,87E-05	0,00E+00	1,38E-04	-1,32E-03	8,43E-04
ODP (kg CFC 11 equiv/FU)	7,00E-08	4,84E-08	4,22E-08	5,67E-09	1,24E-08	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,22E-08	0,00E+00	6,76E-08	-2,95E-07	2,59E-07
AP (mol H^+ equiv/FU)	1,67E-02	1,65E-03	1,51E-03	1,37E-04	1,29E-03	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	2,19E-04	0,00E+00	5,51E-03	-2,18E-03	2,70E-02
EP - freshwater (kg P equiv/FU)	3,78E-05	1,81E-06	8,45E-06	2,21E-07	2,71E-06	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	4,21E-07	0,00E+00	5,31E-06	-1,48E-05	5,67E-05
EP - marine (kg N equiv/FU)	3,97E-03	4,49E-04	3,94E-04	4,75E-05	3,99E-04	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	6,49E-05	0,00E+00	3,00E-03	-5,52E-04	8,32E-03
EP - terrestrial (mol N equiv/FU)	4,28E-02	4,98E-03	4,89E-03	5,24E-04	4,15E-03	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	7,18E-04	0,00E+00	2,83E-02	-6,39E-03	8,64E-02

 *POCP (kg Ethene equiv/FU)*	1,46E-02	1,41E-03	1,25E-02	1,57E-04	1,78E-03	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	2,20E-04	0,00E+00	6,56E-03	-1,91E-03	3,73E-02
 *ADP Elements (kg Sb equiv/FU)*	9,48E-07	3,91E-07	1,18E-06	4,60E-08	1,55E-07	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,04E-07	0,00E+00	4,10E-07	-2,17E-07	3,23E-06
 *ADP fossil fuels (MJ/FU)*	1,76E+02	3,23E+00	9,00E+00	3,82E-01	9,64E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	8,08E-01	0,00E+00	2,86E+00	-3,85E+01	2,02E+02
 *WDP (m^3 water eq deprived /FU)*	1,93E+00	9,07E-03	1,42E-01	1,38E-03	1,07E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	2,25E-03	0,00E+00	6,73E-02	-1,98E-01	2,25E+00

Environmental profile of the facing of a thermal insulation board per declared unit

	Production			Construction process stage		Use stage							End-of-life stage				D Reuse, recovery, recycling	Total excl module D
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal		
GWP total (kg CO2 equiv/FU)	5,61E-01	3,92E-02	4,99E-02	6,00E-03	7,11E-02	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	8,10E-03	0,00E+00	5,92E-01	0,00E+00	1,33E+00
GWP fossil (kg CO2 equiv/FU)	9,69E-01	3,92E-02	4,44E-02	6,00E-03	7,29E-02	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	8,10E-03	0,00E+00	2,25E-01	0,00E+00	1,36E+00
GWP biogenic (kg CO2 equiv/FU)	-4,11E-01	2,55E-05	5,44E-03	3,37E-06	-2,03E-03	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	4,32E-06	0,00E+00	3,66E-01	0,00E+00	-4,15E-02
GWP luluc (kg CO2 equiv/FU)	4,21E-03	1,26E-05	6,41E-05	1,34E-06	2,17E-04	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	2,83E-06	0,00E+00	3,61E-06	0,00E+00	4,52E-03
ODP (kg CFC 11 equiv/FU)	6,06E-08	9,11E-09	5,71E-09	8,58E-10	4,03E-09	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,84E-09	0,00E+00	2,63E-09	0,00E+00	8,47E-08
AP (mol H^+ eq/FU)	5,68E-03	2,46E-04	1,75E-04	2,07E-05	3,29E-04	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	3,31E-05	0,00E+00	2,12E-04	0,00E+00	6,69E-03
EP - freshwater (kg P eq /FU)	6,13E-05	2,89E-07	1,20E-06	3,33E-08	3,13E-06	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	6,36E-08	0,00E+00	1,62E-07	0,00E+00	6,62E-05
EP - marine (kg N – eq /FU)	1,02E-03	6,88E-05	3,16E-05	7,18E-06	6,58E-05	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	9,82E-06	0,00E+00	1,15E-04	0,00E+00	1,32E-03

EP - terrestrial (mol N eq /FU)	1,14E-02	7,63E-04	4,67E-04	7,93E-05	7,23E-04	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,09E-04	0,00E+00	1,06E-03	0,00E+00	1,46E-02
POCP (kg Ethene equiv/FU)	3,56E-03	2,29E-04	1,27E-04	2,38E-05	2,22E-04	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	3,32E-05	0,00E+00	2,85E-04	0,00E+00	4,48E-03
ADP Elements (kg Sb equiv/FU)	6,03E-06	4,66E-08	1,72E-07	6,96E-09	3,15E-07	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,58E-08	0,00E+00	1,21E-08	0,00E+00	6,60E-06
ADP fossil fuels (MJ/FU)	1,63E+01	6,02E-01	1,32E+00	5,78E-02	9,36E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,22E-01	0,00E+00	1,74E-01	0,00E+00	1,95E+01
WDP (m^3 water eq deprived /FU)	7,93E-01	1,89E-03	2,13E-02	2,08E-04	4,11E-02	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	3,40E-04	0,00E+00	2,37E-03	0,00E+00	8,60E-01

GWP total = total Global Warming Potential (Climate Change); GWP-luluc = Global Warming Potential (Climate Change) land use and land use change; ODP = Ozone Depletion Potential; AP = Acidification Potential for Soil and Water; EP = Eutrophication Potential; POCP = Photochemical Ozone Creation; ADPE = Abiotic Depletion Potential – Elements; ADPF = Abiotic Depletion Potential – Fossil Fuels; WDP = water use (Water (user) deprivation potential, deprivation-weighted water consumption)

RESOURCE USE

Parameters describing resource use for the core of a thermal insulation board per declared unit

	Production			Construction process		Use stage							End-of-life stage					
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling	Total excl module D
PERE (MJ/FU, net calorific value)	3,88E+00	4,82E-02	8,05E-01	5,91E-03	2,45E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,12E-02	0,00E+00	1,43E-01	-1,86E+00	5,14E+00
PERM (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT (MJ/FU, net calorific value)	3,88E+00	4,82E-02	8,05E-01	5,91E-03	2,45E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,12E-02	0,00E+00	1,43E-01	-1,86E+00	5,14E+00
PENRE (MJ/FU, net calorific value)	9,17E+01	3,26E+00	9,66E+00	3,87E-01	9,33E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	8,20E-01	0,00E+00	3,48E+00	-4,09E+01	1,19E+02
PENRM (MJ/FU, net calorific value)	7,73E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,73E+01
PENRT (MJ/FU, net calorific value)	1,69E+02	3,26E+00	9,66E+00	3,87E-01	9,33E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	8,13E-01	0,00E+00	3,27E+00	-4,16E+01	1,96E+02

SM (kg/FU)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW (m^3 water eq/FU)	3,24E+00	3,31E-04	3,97E-03	5,01E-05	1,63E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	8,00E-05	0,00E+00	3,73E-03	-6,45E-03	3,41E+00

Parameters describing resource use for the facing of a thermal insulation board per declared unit

	Production			Construction process		Use stage							End-of-life stage					
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling	Total excl module D
PERE (MJ/FU, net calorific value)	1,13E+01	7,22E-03	1,19E-01	8,94E-04	5,67E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,69E-03	0,00E+00	5,96E-03	0,00E+00	1,20E+01
PERM (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT (MJ/FU, net calorific value)	1,13E+01	7,22E-03	1,19E-01	8,94E-04	5,67E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,69E-03	0,00E+00	5,96E-03	0,00E+00	1,20E+01
PENRE (MJ/FU, net calorific value)	1,91E+01	6,05E-01	1,42E+00	5,85E-02	1,09E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,23E-01	0,00E+00	1,83E-01	0,00E+00	2,26E+01
PENRM (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

PENRT (MJ/FU, net calorific value)	1,91E+01	6,05E-01	1,42E+00	5,85E-02	1,09E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,23E-01	0,00E+00	1,83E-01	0,00E+00	2,26E+01
SM (kg/FU)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF (MJ/FU, net calorific value)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW (m^3 water eq/FU)	2,15E-02	6,21E-05	5,74E-04	7,58E-06	1,11E-03	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,21E-05	0,00E+00	2,40E-04	0,00E+00	2,35E-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 = Net use of fresh water

WASTE CATEGORIES & OUTPUT FLOWS

Parameters describing different waste categories and output flows for the core of a thermal insulation board per declared unit

	Production			Construction process stage		Use stage							End-of-life stage					
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling	Total excl module D
Hazardous waste disposed (kg/FU)	2,48E-06	7,86E-06	1,01E-05	9,27E-07	1,59E-06	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	2,12E-06	0,00E+00	7,32E-06	-3,13E-05	3,24E-05
Non-hazardous waste disposed (kg/FU)	1,70E-02	1,37E-01	7,62E-02	3,73E-02	3,04E-02	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	3,86E-02	0,00E+00	2,22E-01	-4,13E-02	5,59E-01
Radioactive waste disposed (kg/FU)	5,91E-06	2,20E-05	5,59E-05	2,57E-06	5,20E-06	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	5,51E-06	0,00E+00	1,09E-05	-2,17E-04	1,08E-04
Components for re-use (kg/FU)	0,00E+00	0,00E+00	2,26E-03	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,26E-03
Materials for recycling (kg/FU)	0,00E+00	0,00E+00	3,96E-04	0,00E+00	1,93E-02	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,97E-02
Materials for energy recovery (kg/FU)	0,00E+00	0,00E+00	1,67E-01	0,00E+00	3,12E-02	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	2,52E+00	0,00E+00	2,72E+00
Exported energy (MJ/FU)	0,00E+00	0,00E+00	5,13E+00	0,00E+00	1,32E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	7,73E+01	0,00E+00	8,37E+01

Parameters describing different waste categories and output flows for the facing of a thermal insulation board per declared unit

	Production			Construction process stage		Use stage							End-of-life stage					
	A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling	Total excl module D
Hazardous waste disposed (kg/FU)	5,16E-04	1,40E-06	1,46E-06	1,40E-07	1,59E-06	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	3,20E-07	0,00E+00	4,47E-07	0,00E+00	5,21E-04
Non-hazardous waste disposed (kg/FU)	1,48E-01	4,93E-02	9,15E-03	5,64E-03	3,04E-02	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	5,84E-03	0,00E+00	1,43E-01	0,00E+00	3,91E-01
Radioactive waste disposed (kg/FU)	4,39E-05	4,11E-06	8,30E-06	3,89E-07	5,20E-06	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	8,33E-07	0,00E+00	1,04E-06	0,00E+00	6,38E-05
Components for re-use (kg/FU)	0,00E+00	0,00E+00	2,11E-03	0,00E+00	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,11E-03
Materials for recycling (kg/FU)	0,00E+00	0,00E+00	4,78E-03	0,00E+00	2,88E-03	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,67E-03
Materials for energy recovery (kg/FU)	0,00E+00	0,00E+00	4,21E-03	0,00E+00	4,66E-03	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	3,62E-01	0,00E+00	3,71E-01
Exported energy (MJ/FU)	0,00E+00	0,00E+00	5,89E-02	0,00E+00	1,98E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	2,81E-01	0,00E+00	5,37E-01

IMPACT CATEGORIES ADDITIONAL TO EN 15804

Additional indicators for the core of a thermal insulation board per declared unit

		Production			Construction process		Use stage							End-of-life stage					
		A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling	Total excl module D
	PM (disease incidence)	1,37E-07	1,42E-08	1,09E-08	2,90E-09	1,01E-08	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	3,73E-09	0,00E+00	3,14E-08	-7,80E-09	2,11E-07
	IRHH (kg U235 eq/FU)	2,90E+00	1,42E-02	6,49E-02	1,67E-03	1,50E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	3,53E-03	0,00E+00	9,65E-03	-2,49E-01	3,14E+00
	ETF (CTUe/FU)	1,15E+02	2,56E+00	5,89E+00	3,32E-01	7,33E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	6,47E-01	0,00E+00	2,12E+01	-7,58E+00	1,53E+02
	HTCE (CTUh/FU)	1,29E-09	8,35E-11	2,34E-10	1,01E-11	1,43E-10	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,82E-11	0,00E+00	1,18E-09	-1,91E-10	2,96E-09
	HTnCE (CTUh/FU)	5,10E-08	2,73E-09	4,08E-09	4,70E-10	3,68E-09	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	7,05E-10	0,00E+00	1,28E-08	-3,75E-09	7,55E-08
	Land Use Related impacts (dimension less)	6,97E+00	2,05E+00	4,74E+00	4,85E-01	7,80E-01	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	5,57E-01	0,00E+00	6,63E-01	-5,40E+00	1,62E+01

Additional indicators for the facing of a thermal insulation board per declared unit

		Production			Construction process		Use stage							End-of-life stage					
		A1 Raw material	A2 Transport	A3 manufacturing	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling	Total excl module D
	PM (disease incidence)	1,14E-07	3,37E-09	1,43E-09	4,39E-10	6,28E-09	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	5,63E-10	0,00E+00	2,89E-09	0,00E+00	1,29E-07
	IRHH (kg U235 eq/FU)	4,72E-02	2,63E-03	9,64E-03	2,52E-04	2,84E-03	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	5,34E-04	0,00E+00	7,86E-04	0,00E+00	6,39E-02
	ETF (CTUe/FU)	4,36E+01	4,73E-01	6,63E-01	5,02E-02	2,50E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	9,78E-02	0,00E+00	3,68E+00	0,00E+00	5,11E+01
	HTCE (CTUh/FU)	1,25E-09	1,27E-11	2,40E-11	1,52E-12	7,18E-11	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	2,75E-12	0,00E+00	1,32E-10	0,00E+00	1,49E-09
	HTnCE (CTUh/FU)	2,10E-08	5,31E-10	4,82E-10	7,11E-11	1,19E-09	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	1,07E-10	0,00E+00	1,04E-09	0,00E+00	2,44E-08
	Land Use Related impacts (dimension less)	6,49E+01	6,52E-01	7,03E-01	7,34E-02	3,33E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	MND	0,00E+00	8,42E-02	0,00E+00	9,09E-02	0,00E+00	6,99E+01

HTCE = Human Toxicity – cancer effects; HTnCE = Human Toxicity – non cancer effects; ETF = Ecotoxicity – freshwater; (potential comparative toxic unit)
PM = Particulate Matter (Potential incidence of disease due to PM emissions);
IRHH = Ionizing Radiation – human health effects (Potential Human exposure efficiency relative to U235);

	*Global Warming Potential*	*The global warming potential of a gas refers to the total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1.* *It is split up in 4:* - *Global Warming Potential total (GWP-total) which is the sum of GWP-fossil, GWP-biogenic and GWP-luluc* - *Global Warming Potential fossil fuels (GWP-fossil) : The global warming potential related to greenhouse gas (GHG) emissions to any media originating from the oxidation and/or reduction of fossil fuels by means of their transformation or degradation (e.g. combustion, digestion, landfilling, etc).* - *Global Warming Potential biogenic (GWP-biogenic) : The global warming potential related to carbon emissions to air (CO2, CO and CH4) originating from the oxidation and/or reduction of aboveground biomass by means of its transformation or degradation (e.g. combustion, digestion, composting, landfilling) and CO2 uptake from the atmosphere through photosynthesis during biomass growth – i.e. corresponding to the carbon content of products, biofuels or above ground plant residues such as litter and dead wood.[1]* - *Global Warming Potential land use and land use change (GWP-luluc): The global warming potential related to carbon uptakes and emissions (CO2, CO and CH4) originating from carbon stock changes caused by land use change and land use. This sub-category includes biogenic carbon exchanges from deforestation, road construction or other soil activities (including soil carbon emissions).*
	*Ozone Depletion*	*Destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbonsor halons), Which break down when they reach the stratosphere and then catalytically destroy ozone molecules.*
	*Acidification potential*	*Acid depositions have negative impacts on natural ecosystems and the man-made environment incl. buildings. The main sources for emissions of acidifying substances are agriculture and fossil fuel combustion used for electricity production, heating and transport.*
	*Eutrophication potential*	*The potential to cause over-fertilization of water and soil, which can result in increased growth of biomass and following adverse effects.* *It is split up in 3:* - *Eutrophication potential – freshwater: The potential to cause over-fertilization of freshwater, which can result in increased growth of biomass and following adverse effects.* - *Eutrophication potential – marine: The potential to cause over-fertilization of marine water, which can result in increased growth of biomass and following adverse effects.* - *Eutrophication potential – terrestrial: The potential to cause over-fertilization of soil, which can result in increased growth of biomass and following adverse effects.*
	*Photochemical ozone creation*	*Chemical reactions brought about by the light energy of the sun creating photochemical smog. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.*
	*Abiotic depletion potential for non-fossil ressources*	*Consumption of non-renewable resources, thereby lowering their availability for future generations. Expressed in comparison to Antimonium (Sb).* *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.*
	*Abiotic depletion potential for fossil ressources*	*Measure for the depletion of fossil fuels such as oil, natural gas, and coal. The stock of the fossil fuels is formed by the total amount of fossil fuels, expressed in Megajoules (MJ).* *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.*
	*Ecotoxicity for aquatic fresh water*	*The impacts of chemical substances on ecosystems (freshwater).* *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.*
	*Human toxicity (carcinogenic effects)*	*The impacts of chemical substances on human health via three parts of the environment: air, soil and water.*

[1] Carbon exchanges from native forests shall be modelled under GWP - luluc (including connected soil emissions, derived products or residues), while their CO2 uptake is excluded.

		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.
	*Human toxicity (non-carcinogenic effects)*	*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.*
	*Particulate matter*	*Accounts for the adverse health effects on human health caused by emissions of Particulate Matter (PM) and its precursors (NOx, SOx, NH3)*
	*Resource depletion (water)*	*Accounts for water use related to local scarcity of water as freshwater is a scarce resource in some regions, while in others it is not.* *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.*
	*Ionizing radiation - human health effects*	*This impact category deals mainly with the eventual impact on human health of low dose ionizing radiation of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.*
	*Land use related impacts*	*The indicator is the "soil quality index" which is the result of an aggregation of following four aspects:* - *Biotic production* - *Erosion resistance* - *Mechanical filtration* - *Groundwater* *The aggregation is done based on a JRC model. The four aspects are quantified through the LANCA model for land use.* *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.*

DETAILS OF THE UNDERLYING SCENARIOS USED TO CALCULATE THE IMPACTS

A1 – RAW MATERIAL SUPPLY

This module takes into account the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process.

A2 – TRANSPORT TO THE MANUFACTURER

The raw materials are transported to the manufacturing site.

A3 – MANUFACTURING

This module takes into account the production process.

A4 – TRANSPORT TO THE BUILDING SITE

Fuel type and consumption of vehicle or vehicle type used for transport	Truck >32 ton 0,208 l diesel / km	Truck 16-32 ton 0,256 l diesel / km	Truck 7,5-16 ton 0,185 diesel / km
Distance	100 km	35 km	35 km
Capacity utilisation (including empty returns)	4%	25%	25%
Bulk density of transported products	31,5 kg/m^3	Adapted Ecoinvent scenario	Adapted Ecoinvent scenario
Volume capacity utilisation factor	100%	Adapted Ecoinvent scenario	Adapted Ecoinvent scenario

The B-PCR provides default transport scenarios for the transport to the building site for cases where specific data on transport are missing. The B-PCR provides scenario's for this life cycle stage. PIR insulation boards with multilayer facer are categorized as 'Insulation' in table 5 of the B-PCR. The following transport steps apply:

- 40% directly to the construction site over 100 km with a >32 ton lorry (Ecoinvent record: 'Transport, freight, lorry > 32 metric ton, EURO5 {RER}| transport, freight, lorry >32 metric ton, EURO5 | Cut-off, U')
- 60% to a supplier over 100 km with a > 32 ton lorry (Ecoinvent record: 'Transport, freight, lorry 16-32 metric ton, EURO5 {RER}| transport, freight, lorry 16-32 metric ton, EURO5 | Cut-off, U')
- 85% of these 60% is transported over 35 km from supplier to construction site with a 16-32 ton lorry (Ecoinvent record: 'Transport, freight, lorry 16-32 metric ton, EURO5 {RER}| transport, freight, lorry 16-32 metric ton, EURO5 | Cut-off, U')
- 15% of these 60% is transported over 35 km from supplier to construction site with a 7.5-16 ton lorry (Ecoinvent record: 'Transport, freight, lorry 7.5-16 metric ton, EURO5 {RER}| transport, freight, lorry 7.5-16 metric ton, EURO5 | Cut-off, U')

A5 – INSTALLATION IN THE BUILDING

At the construction site, packaging materials are released. Also 5% material losses have been taken into account. This scenario is relevant for installation where no fixing or jointing is necessary (e.g. floor, cavity wall, ballasted roof). For some applications fixating products such as adhesives or screws are necessary. In that case the module A5 declared here needs to be complemented with the impacts of the fixating products when assessing the building.

Parts of the installation	quantity	Description
Material losses	*5%*	*5% material losses*
Packaging	0,146 kg	PIR board
	0,01062 kg	PE foil
	0,02977 kg	EPS skids

Ancillary materials for installation (specified by material);	No ancillary materials considered	/	/
Water use	/	/	/
Other resource use	/	/	/
Quantitative description of energy type (regional mix) and consumption during the installation process	/	/	/
Waste materials on the building site before waste processing, generated by the product's installation (specified by type)	5% material losses 0,146 kg PIR board	PE foil 0,01062 kg	EPS skids 0,02977 kg
Output materials (specified by type) as result of waste processing at the building site e.g. of collection for recycling, for energy recovery, disposal (specified by route)	/	/	/
Direct emissions to ambient air, soil and water	/	/	/
Distance	/	/	/

B – USE STAGE (EXCLUDING POTENTIAL SAVINGS)

The PIR insulation boards with multilayer facer are to be used for thermal insulation of residential and commercial buildings The average life span of buildings is generally longer than 60 years, but it is assumed that after 60 years the building will most likely be renovated so thoroughly that, apart from the structure, relatively few of the original materials will be present. The insulation boards don't need any maintenance or don't consume any energy or water during its use.

B1: Module not declared
B2: PIR insulation board doesn't need any specific maintenance or cleaning
B3: Module not declared
B4: No replacement is needed
B5: Module not declared
B6: No operational energy use needed

C: END OF LIFE

C1: The demolition of 2,91 kg insulation board
C2-C4: The default scenario for synthetic isolation materials in the NBN/DTD B08-001 states 5% of the waste treatment consists of landfilling and the other 95% consists of incineration and/or energetic valorisation. This default scenario was selected for this EPD.

Module C2 – Transport to waste processing					
Type of vehicle (truck/boat/etc.)	Fuel consumption (litres/km)	Distance (km)	Capacity utilisation (%)	Density of products (kg/m^3)	Assumptions
Truck 16-32 ton	0,256 l diesel/km	30	50%	Ecoinvent scenario	Ecoinvent scenario
Truck 16-32 ton	0,256 l diesel/km	50	50%	Ecoinvent scenario	Ecoinvent scenario
Truck 16-32 ton	0,256 l diesel/km	100	50%	Ecoinvent scenario	Ecoinvent scenario

End-of-life modules – C3 and C4		
Parameter	Unit	Value
Wastes collected separately	kg	0
Wastes collected as mixed construction waste	kg	2.91
Waste for re-use	kg	0
Waste for recycling	kg	0
Waste for energy recovery	kg	2.76
Waste for final disposal	kg	0.1455

D – BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES

The benefits beyond the system boundaries include the heat and electricity production originating from the 95% incineration of the insulation board (=2,52 kg).

Quantitative description of the loads beyond the system boundaries	/
Quantitative description of the benefits beyond the system boundaries	5,83 MJ * 2,52 = produced heat
	2,91 MJ * 2,52 = produced electricity

ADDITIONAL INFORMATION ON RELEASE OF DANGEROUS SUBSTANCES TO INDOOR AIR, SOIL AND WATER DURING THE USE STAGE

INDOOR AIR

No emissions to indoor air are expected.

SOIL AND WATER

The horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonized test methods are not yet available, therefore the EPD can lack this information (CEN TC 351).

DEMONSTRATION OF VERIFICATION

EN 15804+A2 serves as the core PCR
Independent verification of the environmental declaration and data according to standard EN ISO 14025:2010 Internal ☐ External ☒
Third party verifier: Evert Vermaut (Vincotte) Jan Olieslagerslaan 35 1800 Vilvoorde, Belgium evermaut@vincotte.be

APPLICATION UNIT

This paragraph gives information on the PIR insulation board and how the reference flow and table with impacts relate to their use in different applications. The table below gives an overview of the the ratio to the declared unit of 1 m^2 for different applications.

Core ("UTHERM" PIR insulation board with MULTILAYER facer // part 01 of 02 :: core)	**Facer** ("UTHERM" PIR insulation board with multilayer facer // part 02 of 02 :: facer)	**Application**	**Ratio to the declared unit of 1 m^2 (based on standard thickness)**
UTHERM FLOOR K - PIR - 1200 x 1000 mm -- λ 0,022 W/m.K	UTHERM FLOOR K - PIR - 1200 x 1000 mm -- λ 0,022 W/m.K	soil, foundations	1
UTHERM Premium WALL LE - PIR - 600 x 1200 mm - λ 0,020 W/m.K	UTHERM Premium WALL LE - PIR - 600 x 1200 mm - λ 0,020 W/m.K	Interior walls and outer walls	1
UTHERM WALLL , LE - PIR - 600 x 1200 mm - λ 0,022 W/m.K	UTHERM WALLL , LE - PIR - 600 x 1200 mm - λ 0,022 W/m.K	Interior walls and outer walls	1
UTHERM FLOOR K -- PIR - 1200 x 1000 mm - λ 0,022 W/m.K	UTHERM FLOOR K -- PIR - 1200 x 1000 mm - λ 0,022 W/m.K	Floors, galleries, balconies, walkways	1
UTHERM Sarking K/ ROOF L, L FM and LE LS - PIR - 2400 x 1200 mm/ 1200 x 600 , 2400 x 1200 mm - λ 0,022 W/m.K	UTHERM Sarking K/ ROOF L, L FM and LE LS - PIR - 2400 x 1200 mm/ 1200 x 600 , 2400 x 1200 mm - λ 0,022 W/m.K	Roofs	1

ADDITIONAL INFORMATION ON REVERSIBILITY

For the application unit a qualitative assessment of the reversibility can be given (based on BAMB – buildings as material banks). This is shown in the table below.

Table 1: Reversibility of the PIR insulation board

Application	Reversibility	Simplicity of dissasembly	Speed of dissasembly	Ease of handling (size and weight)	Robustness of material (material resistance to disassembly)
Ballasted floor insulation Utherm Floor (or FBO) / Utherm Premium Floor (or FBO)	*reversible fixing*	*simple - no specific dismantling tools required*	*very speedy disassembly*	*easy to handle manually, one worker is usually sufficient*	*disassembly is possible but should be done carefully in order not to generate any damage*
Ballasted flat roof insulation Utherm Roof (or FD) / Utherm Premium Roof (or FD)	*reversible fixing*	*simple - no specific dismantling tools required*	*very speedy disassembly*	*easy to handle manually, one worker is usually sufficient*	*disassembly is possible but should be done carefully in order not to generate any damage*
Mechanically fixed pitched roof insulation Utherm Sarking (or SD) / Utherm Premium Sarking (or SD)	*Reversible with light repairable damage*	*simple – use of dismantling tools required*	*speedy disassembly*	*easy to handle manually, one worker is usually sufficient*	*disassembly is possible but should be done carefully in order not to generate any damage*
Mechanically fixed wall insulation Utherm Wall (or KD) / Utherm Premium Wall (or KD)	*Reversible with light repairable damage*	*simple – use of dismantling tools required*	*speedy disassembly*	*easy to handle manually, one worker is usually sufficient*	*disassembly is possible but should be done carefully in order not to generate any damage*
Mechanically fixed flat roof insulation Utherm Roof (or FD) / Utherm Premium Roof (or FD)	*Reversible with light repairable damage*	*simple – use of dismantling tools required*	*speedy disassembly*	*easy to handle manually, one worker is usually sufficient*	*disassembly is possible but should be done carefully in order not to generate any damage*
Glued flat roof insulation Utherm Roof (or FD) / Utherm Premium Roof (or FD)	*non reversible fixing*	*simple – use of dismantling tools required*	*rather slow disassembly*	*easy to handle manually, one worker is usually sufficient*	*n/a, the element is not reversible*

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General information

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Based on following PCR documents	EN 15804+A2:2019 NBN/DTD B 08-001 and its complement NBN EN:16783:2017
PCR review conducted by	Federal Public Service of Health and Environment & PCR Review committee
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Name of the third party verifier Date of verification	Evert Vermaut (Vincotte) 12.03.2021
www.b-epd.be	**www.environmentalproductdeclarations.eu**

Comparing EPDs is not possible unless they are conform to the same PCR and taking into account the building context.
The program operator cannot be held responsible for the information supplied by the owner of the EPD nor LCA practitioner.

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