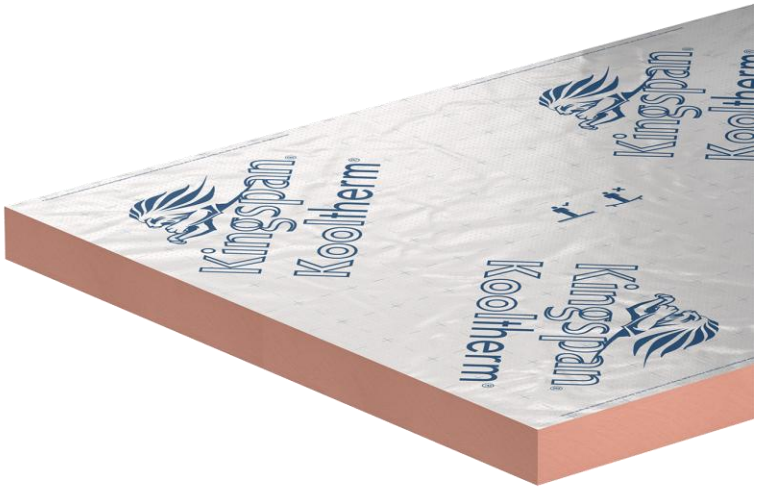
ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Kooltherm® K3 Floorboard / Kooltherm® K7 Pitched Roof Board / Kooltherm® K8 Cavity Board / Kooltherm® K12 Framing Board
Kingspan Insulation Ltd.



EPD HUB, HUB-5561
Published on 01.03.2026, last updated on 01.03.2026, valid until 01.03.2031

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.2 (24 Mar 2025) and JRC characterization factors EF 3.1.

Created with One Click LCA

GENERAL INFORMATION

MANUFACTURER

Manufacturer	Kingspan Insulation Ltd.
Address	Castleblayney, Co. Monaghan, A75 X966, Ireland
Contact details	info@kingspaninsulation.ie
Website	www.kingspan.com/ie/en/products/insulation-boards

EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR Version 1.2, 24 Mar 2025 EN 16783 Thermal insulation products
Sector	Construction product
Category of EPD	Third party verified EPD
Parent EPD number	-
Scope of the EPD	Cradle to gate with modules C1-C4, D
EPD author	Kingspan Insulation Ltd.
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☑ External verification
EPD verifier	Magaly Gonzalez Vazquez as an authorized verifier for EPD Hub

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

PRODUCT

Product name	Kooltherm® K3 Floorboard / Kooltherm® K7 Pitched Roof Board / Kooltherm® K8 Cavity Board / Kooltherm® K12 Framing Board
Additional labels	-
Product reference	-
Place(s) of raw material origin	Europe, Asia, USA
Place of production	Castleblayney, Republic of Ireland
Place(s) of Installation and use	Ireland
Period for data	Calendar year 2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	N/A

ENVIRONMENTAL DATA SUMMARY

Declared unit	1m2 at 100mm thickness (RD = 4.75m²K/W)
Declared unit mass (kg)	3.87
Mass of packaging (kg)	0.25
GWP-fossil, A1-A3 (kgCO2e)	9.65E+00
GWP-total, A1-A3 (kgCO2e)	9.65E+00
Secondary material, inputs (%)	0.69
Secondary material, outputs (%)	95.8
Total energy use, A1-A3 (kWh)	45.6
Net freshwater use, A1-A3 (m3)	0.15

PRODUCT AND MANUFACTURER

ABOUT THE MANUFACTURER

Kingspan Insulation Ltd is a market-leading manufacturer of insulation products and insulated systems for building fabric and building services applications. Kingspan Insulation Ltd products are available for both new build and refurbishment projects, in a variety of applications in both domestic and non-domestic buildings.

PRODUCT DESCRIPTION

Kooltherm® K3 Floorboard / Kooltherm® K7 Pitched Roof Board / Kooltherm® K8 Cavity Board / Kooltherm® K12 Framing Board comprises a fibre-free rigid thermoset phenolic insulation core, faced on both sides with a composite foil. It is available in various thicknesses from 25-150mm. The impact data shown in the main body of this EPD are based on a thickness of 100mm, which has a corresponding R_D of 4.75m²K/W. For impact data for different thicknesses please refer to the scaling mechanism detailed in the Supplementary Data Sheet to this EPD and/or the Results Summary given in Appendix 1 of this EPD.

Kooltherm® K3 Floorboard is designed for use in solid concrete or suspended timber floors. Kooltherm® K7 Pitched Roof Board is designed for use in pitched roofing applications. Kooltherm® K8 Cavity Board is designed for use in partial-fill cavity wall applications. Kooltherm® K12 Framing Board is designed for use in timber and steel framing systems. All products have a thermal conductivity of 0.021-0.022W/mK depending on product thickness.

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount (mass %)	Material origin
Metals	4.1	USA
Minerals	2.7	Europe
Fossil materials	90.2	Europe, USA, Asia
Bio-based materials	3.0	USA

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product (kg C)	0.091
Biogenic carbon content in packaging (kg C)	0.064

FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1m² at 100mm thickness (R_D= 4.75m²K/W)
Mass per declared unit (kg)	3.87
Reference service life (years)	60 years (as per RICS v2)

The RSL has been defined as per RICS v2. Once installed the product does not require any maintenance, repair, replacement, refurbishment or use any utilities, and once it is removed from a building it will enter its end of life stage.

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0.1% (1000ppm).

PRODUCT LIFE-CYCLE

SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Construction stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/ demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover: the raw materials used in the product; packaging and other ancillary materials; fuel use in manufacturing; and waste from manufacturing. Ancillary manufacturing materials, such as lubricants and cleaners, are excluded as they account for less than 0.1% of product mass. The study also considers material losses during manufacturing and losses during electricity transmission. Distances for raw material transportation to the manufacturing facility are based on supplier locations and known supply routes . Waste figures included within this study have been sourced from Kingspan Insulation waste partners for 2022. The transportation of the waste to the waste management facility has been assumed to be 100km. Energy sources have been profiled based on Kingspan Insulation Ltd.'s purchased energy for 2022. Where procured energy is renewable, but lacks REGOs, the model has taken the average grid mix of renewable energy from Government reports.

Kooltherm® K3 Floorboard / Kooltherm® K7 Pitched Roof Board / Kooltherm® K8 Cavity Board / Kooltherm® K12 Framing Board comprises an insulation core between two flexible facers. In order to manufacture the product, a mixture of liquid raw materials is poured onto one facer which sits on a conveyor. The liquid raw material mixture creates a foam structure, which expands to meet the top facer, which is constrained by another conveyor directly above it. As it expands, the foam autohesively adheres to the facers. Once it has reached the necessary thickness the foam is cured. The insulation boards are then cut into the required size and packaged. Packaging materials included within this study comprise wooden pallets, plastic wrapping, labels, and EPS strips.

TRANSPORT AND INSTALLATION (A4-A5)

This EPD does not cover the transport & installation phases.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. The reference service life has been defined as per RICS v2. Once installed the product does not require any maintenance, repair, replacement, refurbishment or use any utilities, and once it is removed from a building it will enter its end of life stage.

PRODUCT END OF LIFE (C1 & C2)

This EPD assesses three alternative end of life scenarios. In all three scenarios the packaging materials are included. For all three end of life scenarios the energy usage in C1 to remove the boards from the building is assumed minimal, likely removed by hand and has therefore been excluded from the model. End-of-life waste transport (C2) has been conservatively modelled at 100km. This distance is derived from the Qflow UK Construction Industry Waste Report 2023, which examined more than 90,000 Waste Transfer Notes

and found disposal journeys to average 9.6mi, with outliers reaching 290mi. Choosing 100km places the assumption above the mean yet comfortably within the documented range, providing a robust "mid-range worst-case" value that avoids understating potential impacts while staying faithful to the report's empirical data. https://www.qualisflow.com/uk-construction-waste-report-2023/

PRODUCT END OF LIFE (C1-C4, D)

This EPD assesses three alternative end of life scenarios. In all three scenarios the packaging materials are included, following the same routes as the product. All waste disposal routes within this EPD are relevant specifically to the UK and Irish markets.

Scenario 1: Current waste destinations

Data published in 2023 from the UK Government* shows that there is a 93% demolition waste recovery rate for construction materials. This scenario assumes that that recovered waste goes to waste to energy (WTE), the current best practice method of disposal for foam insulation waste as of 2025. The remaining 7% unrecovered material is assumed to go to landfill. Packaging materials follow this same logic, whereby 93% are sent to WTE and 7% are landfilled.

*www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste

Scenario 2: Mechanical recycling into particle board – timber displacement

The UK & EU have committed to net zero carbon economies by 2050. The assessed service life of the product is 60 years, and its real service life is likely to be longer. Consequently, it can be reasonably assumed that incineration (WTE or otherwise) without carbon capture will not be an available waste destination at the end of life of the assessed product. Similarly, because of the desire for a more resource efficient economy, it can be reasonably assumed that incineration (WTE or otherwise) with carbon capture and landfill will also not be available waste destinations at the end of life of the assessed product. It can be reasonably assumed that recycling will be the norm at the end of life of the assessed product. For this scenario it is assumed that the assessed product is fully recovered from the building upon demolition, and mechanically processed into a feedstock for the manufacture of a timber-based particle board. Packaging materials follow this same logic whereby 100% of the materials are recycled into their respective materials.

Scenario 3: Mechanical recycling into masonry product – fly ash displacement

This is identical to Scenario 2, other than that it is assumed that the assessed product is mechanically processed into a feedstock for the manufacture of a fly-ash based masonry product. Packaging materials follow this same logic whereby 100% of the materials are recycled into their respective materials.

BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

Module D of this Environmental Product Declaration (EPD) represents the potential environmental benefits and burdens that occur outside the life cycle stages (Modules A-C) of the product covered by this EPD i.e. outside of the system boundary. Module D is purely hypothetical and has no relevance to the environmental impact of the product covered by this EPD. Module D data should never be added to data for Modules A-C and used for comparison purposes. The benefits to be gained from the use of recovered energy or the use of a recyclate are taken into account in the EPD of the future products in which they are used.

As this EPD assesses three alternative end of life scenarios, there are three different scenarios for module D, for benefits and loads beyond the system boundary. In all three scenarios packaging materials are included, following the same routes as the product.

Scenario 1: Current waste destinations

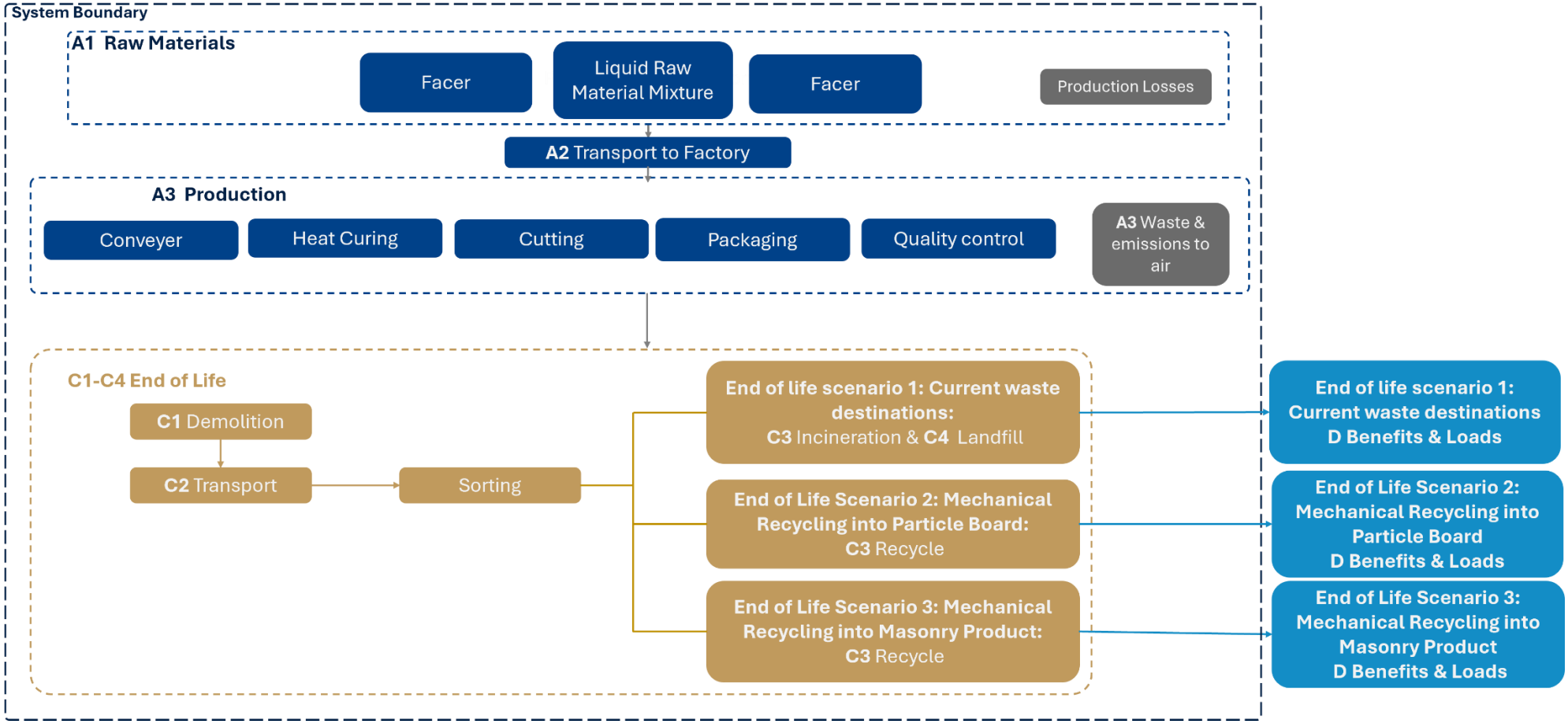
The net benefit from the incineration (waste to energy) of the product and packaging is included as electricity and heat production exported to the grid. The substitution of energy production from incineration is based on efficiency assumptions of 62% for thermal energy and 11% for electrical energy, as

reported by Eriksson O. & Finnveden G. (2017). These assumptions have been applied consistently when calculating the benefits.

Scenario 2: Mechanical recycling into particle board – timber displacement
The net benefit / impact of the avoided use of timber as a raw material input into a particle board product is included and packaging recycling into their respective materials.

Scenario 3: Mechanical recycling into masonry product – fly ash displacement
The net benefit / impact of the avoided use of fly ash as a raw material input into a masonry product is included and packaging recycling into their respective materials.

LIFE CYCLE PROCESS DIAGRAM



LIFE-CYCLE ASSESSMENT

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

This LCA study includes the provision of all materials, transportation, energy and emission flows, and end of life processing of the product. The use phase is not covered, assuming there are no use emissions or replacements. All industrial processes from raw material acquisition and pre-processing, production, and end-of-life management are included. For easier modelling and because of lack of accuracy in available modelling resources, some constituents under 0.1% of product mass are excluded. These include some ancillary materials which are used in manufacturing only in very small amounts and have a negligible impact on the emissions of the product.

VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR.

In this study, allocation is based on manufacturing data for the calendar year 2022 for the Castleblayney manufacturing facility. There are no co-products within the production process so no co-product allocation is required. Allocation has been done in the following ways.

Data type	Allocation
Raw materials	No allocation
Packaging material	Allocated by mass or volume
Ancillary materials	Not applicable
Manufacturing energy and waste	Allocated by volume & machine production hours (electricity)

All estimations and assumptions are given below.

- **Module A3:** Transportation of manufacturing waste to the waste processing facility has been assumed to be 100km.
- **Module C1**: Consumed energy and other sources for demolition process of the product is negligible.
- **Module C2**: End-of-life waste transport has been conservatively modelled at 100km per movement. This distance is derived from the Qflow UK Construction Industry Waste Report 2023, which examined more than 90 000 Waste Transfer Notes and found disposal journeys to average 9.6mi, with outliers reaching 290mi. Choosing 100km

places our assumption above the mean yet comfortably within the documented range, providing a robust "mid-range worst-case value that avoids understating potential impacts while staying faithful to the report's empirical data. https://www.qualisflow.com/uk-construction-waste-report-2023/

- **EOL Scenario 1 Current Waste Destinations**: 93% of the EOL product and packaging is assumed to be incinerated and the rest is landfilled.
- **EOL Scenario 2 & 3 Recycling:** 100% of the EOL product and packaging is assumed to be recycled.

AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	No averaging
Variation in GWP-fossil for A1-A3	Not applicable

This EPD is product and factory specific and does not contain average calculations. The output of this study is fixed to the mass of 1m^2 of the declared product grouping. The products covered by this EPD are grouped because they have identical compositions. The only difference between the products being their use within a building.

LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. The EPD Generator uses EcoInvent v3.10.1, Plastics Europe, Federal LCA Commons and One Click LCA databases as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.

ENVIRONMENTAL IMPACT DATA

Product stage			Construction stage		Use stage							End of life stage				Beyond the system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	x	x	x	x	x

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

							END OF LIFE SCENARIO 1: CURRENT WASTE DESTINATIONS						END OF LIFE SCENARIO 2: MECHANICAL RECYCLING INTO PARTICLE BOARD – TIMBER DISPLACEMENT						END OF LIFE SCENARIO 3: MECHANICAL RECYCLING INTO MASONARY PRODUCT – FLY ASH DISPLACEMENT				
Impact category	Unit	A1	A2	A3	A1-A3		C1	C2	C3	C4	D		C1	C2	C3	C4	D		C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	7.45E+00	3.21E-01	1.88E+00	9.65E+00		0.00E+00	4.53E-02	9.98E+00	4.88E-02	-4.11E-01		0.00E+00	4.53E-02	2.41E-01	0.00E+00	1.45E+01		0.00E+00	4.53E-02	2.41E-01	0.00E+00	2.77E+00
GWP – fossil	kg CO_2e	7.51E+00	3.21E-01	1.82E+00	9.65E+00		0.00E+00	4.53E-02	9.77E+00	3.29E-02	-4.10E-01		0.00E+00	4.53E-02	1.54E-02	0.00E+00	7.46E+00		0.00E+00	4.53E-02	1.54E-02	0.00E+00	2.56E+00
GWP – biogenic	kg CO_2e	-3.33E-01	6.30E-05	6.19E-02	-2.71E-01		0.00E+00	9.61E-06	2.10E-01	1.58E-02	-2.27E-04		0.00E+00	9.60E-06	2.25E-01	0.00E+00	7.07E+00		0.00E+00	9.60E-06	2.25E-01	0.00E+00	2.09E-01
GWP – LULUC	kg CO_2e	2.75E-01	1.49E-04	1.02E-03	2.77E-01		0.00E+00	2.03E-05	1.04E-04	1.03E-05	-2.97E-04		0.00E+00	2.03E-05	2.45E-05	0.00E+00	1.43E-02		0.00E+00	2.03E-05	2.45E-05	0.00E+00	5.45E-03
Ozone depletion pot.	kg $CFC\text{-}_{11}e$	5.55E-07	4.71E-09	8.26E-08	6.43E-07		0.00E+00	6.69E-10	8.59E-09	1.79E-10	-3.59E-09		0.00E+00	6.69E-10	1.06E-10	0.00E+00	3.81E-07		0.00E+00	6.69E-10	1.06E-10	0.00E+00	4.92E-09
Acidification potential	mol H^+e	4.28E-02	2.61E-03	4.01E-03	4.94E-02		0.00E+00	1.54E-04	8.12E-03	8.07E-05	-2.95E-03		0.00E+00	1.55E-04	6.71E-05	0.00E+00	4.08E-02		0.00E+00	1.55E-04	6.71E-05	0.00E+00	1.05E-02
EP-freshwater[2)]	kg Pe	1.30E-03	2.23E-05	1.73E-04	1.49E-03		0.00E+00	3.53E-06	4.83E-05	3.21E-06	-2.04E-04		0.00E+00	3.53E-06	5.33E-06	0.00E+00	2.34E-03		0.00E+00	3.53E-06	5.33E-06	0.00E+00	1.08E-03
EP-marine	kg Ne	8.07E-03	7.20E-04	1.01E-03	9.81E-03		0.00E+00	5.08E-05	6.29E-03	5.70E-03	-3.91E-04		0.00E+00	5.08E-05	4.04E-05	0.00E+00	8.77E-03		0.00E+00	5.08E-05	4.04E-05	0.00E+00	2.38E-03
EP-terrestrial	mol Ne	7.26E-02	7.93E-03	1.03E-02	9.09E-02		0.00E+00	5.52E-04	4.36E-02	2.79E-04	-4.06E-03		0.00E+00	5.52E-04	1.79E-04	0.00E+00	9.24E-02		0.00E+00	5.52E-04	1.79E-04	0.00E+00	2.43E-02
POCP ("smog")[3)]	kg NMVOCe	2.80E-02	2.60E-03	5.71E-02	8.77E-02		0.00E+00	2.28E-04	1.07E-02	1.36E-04	-1.28E-03		0.00E+00	2.28E-04	5.60E-05	0.00E+00	3.06E-02		0.00E+00	2.28E-04	5.60E-05	0.00E+00	7.73E-03
ADP-minerals & metals[4)]	kg Sbe	9.11E-05	7.89E-07	4.52E-06	9.64E-05		0.00E+00	1.26E-07	1.06E-06	1.98E-08	-2.39E-07		0.00E+00	1.26E-07	1.45E-07	0.00E+00	4.02E-05		0.00E+00	1.26E-07	1.45E-07	0.00E+00	2.34E-05
ADP-fossil resources	MJ	1.97E+02	4.52E+00	3.02E+01	2.32E+02		0.00E+00	6.57E-01	5.38E+00	1.69E-01	-5.06E+00		0.00E+00	6.58E-01	1.41E-01	0.00E+00	8.94E+01		0.00E+00	6.58E-01	1.41E-01	0.00E+00	2.06E+01
Water use[5)]	m^3e depr.	2.99E+00	2.08E-02	3.84E-01	3.40E+00		0.00E+00	3.25E-03	6.89E-01	2.22E-03	-6.53E-02		0.00E+00	3.25E-03	4.13E-03	0.00E+00	2.50E+00		0.00E+00	3.25E-03	4.13E-03	0.00E+00	1.51E+00

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

							END OF LIFE SCENARIO 1: CURRENT WASTE DESTINATIONS						END OF LIFE SCENARIO 2: MECHANICAL RECYCLING INTO PARTICLE BOARD – TIMBER DISPLACEMENT						END OF LIFE SCENARIO 3: MECHANICAL RECYCLING INTO MASONARY PRODUCT – FLY ASH DISPLACEMENT				
Impact category	**Unit**	**A1**	**A2**	**A3**	**A1-A3**		**C1**	**C2**	**C3**	**C4**	**D**		**C1**	**C2**	**C3**	**C4**	**D**		**C1**	**C2**	**C3**	**C4**	**D**
Particulate matter	Incidence	3.74E-07	2.80E-08	3.62E-08	4.38E-07		0.00E+00	4.54E-09	2.74E-08	1.19E-09	-2.91E-08		0.00E+00	4.54E-09	1.71E-09	0.00E+00	6.51E-07		0.00E+00	4.54E-09	1.71E-09	0.00E+00	2.27E-07
Ionizing radiation[6)]	kBq U235e	3.68E-01	3.64E-03	5.24E-02	4.24E-01		0.00E+00	5.73E-04	4.87E-03	4.27E-04	-5.46E-02		0.00E+00	5.73E-04	1.78E-03	0.00E+00	3.97E-01		0.00E+00	5.73E-04	1.78E-03	0.00E+00	9.90E-02
Ecotoxicity (freshwater)	CTUe	1.71E+02	5.92E-01	6.05E+00	1.78E+02		0.00E+00	9.30E-02	2.24E+01	1.50E+01	-6.76E-01		0.00E+00	9.30E-02	1.27E-01	0.00E+00	3.67E+01		0.00E+00	9.30E-02	1.27E-01	0.00E+00	1.23E+01
Human toxicity, cancer	CTUh	8.11E-09	5.57E-11	5.52E-10	8.72E-09		0.00E+00	7.48E-12	8.17E-10	8.53E-12	-7.95E-11		0.00E+00	7.48E-12	2.41E-11	0.00E+00	1.77E-08		0.00E+00	7.48E-12	2.41E-11	0.00E+00	3.27E-09
Human tox. non-cancer	CTUh	9.16E-08	2.64E-09	1.03E-08	1.05E-07		0.00E+00	4.26E-10	2.86E-08	1.75E-09	-3.35E-09		0.00E+00	4.26E-10	3.32E-10	0.00E+00	1.64E-07		0.00E+00	4.26E-10	3.32E-10	0.00E+00	4.33E-08
SQP[7)]	-	6.46E+01	3.89E+00	2.16E+01	9.01E+01		0.00E+00	6.62E-01	7.58E-01	3.04E-01	-2.78E+00		0.00E+00	6.62E-01	2.14E-01	0.00E+00	2.48E+02		0.00E+00	6.62E-01	2.14E-01	0.00E+00	1.27E+01

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

							END OF LIFE SCENARIO 1: CURRENT WASTE DESTINATIONS					END OF LIFE SCENARIO 2: MECHANICAL RECYCLING INTO PARTICLE BOARD – TIMBER DISPLACEMENT					END OF LIFE SCENARIO 3: MECHANICAL RECYCLING INTO MASONARY PRODUCT – FLY ASH DISPLACEMENT				
Impact category	**Unit**	**A1**	**A2**	**A3**	**A1-A3**		**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**
Renew. PER as energy[8)]	MJ	1.92E+01	5.77E-02	1.78E+00	2.10E+01		0.00E+00	9.01E-03	-1.76E+00	-2.50E+00	-9.75E-01	0.00E+00	9.01E-03	-2.24E+00	0.00E+00	8.07E+01	0.00E+00	9.01E-03	-2.24E+00	0.00E+00	3.79E+00
Renew. PER as material	MJ	2.25E+00	0.00E+00	0.00E+00	2.25E+00		0.00E+00	0.00E+00	-2.09E+00	-1.57E-01	0.00E+00	0.00E+00	0.00E+00	-2.25E+00	0.00E+00	-3.84E+01	0.00E+00	0.00E+00	-2.25E+00	0.00E+00	-1.10E+00
Total use of renew. PER	MJ	2.14E+01	5.77E-02	1.78E+00	2.32E+01		0.00E+00	9.01E-03	-3.85E+00	-2.66E+00	-9.75E-01	0.00E+00	9.01E-03	-4.49E+00	0.00E+00	4.23E+01	0.00E+00	9.01E-03	-4.49E+00	0.00E+00	2.69E+00
Non-re. PER as energy	MJ	1.17E+02	4.53E+00	2.19E+01	1.43E+02		0.00E+00	6.58E-01	-1.06E+02	-8.29E+00	-5.06E+00	0.00E+00	6.58E-01	-5.49E+00	0.00E+00	8.82E+01	0.00E+00	6.58E-01	-5.49E+00	0.00E+00	1.94E+01
Non-re. PER as material	MJ	9.09E+01	0.00E+00	0.00E+00	9.09E+01		0.00E+00	0.00E+00	-8.45E+01	-6.36E+00	0.00E+00	0.00E+00	0.00E+00	-9.09E+01	0.00E+00	1.22E+00	0.00E+00	0.00E+00	-9.09E+01	0.00E+00	1.22E+00
Total use of non-re. PER	MJ	2.07E+02	4.53E+00	2.19E+01	2.34E+02		0.00E+00	6.58E-01	-1.91E+02	-1.47E+01	-5.06E+00	0.00E+00	6.58E-01	-9.64E+01	0.00E+00	8.95E+01	0.00E+00	6.58E-01	-9.64E+01	0.00E+00	2.06E+01
Secondary materials	kg	2.68E-02	1.96E-03	1.67E-02	4.55E-02		0.00E+00	2.80E-04	2.20E-03	5.72E-05	-4.92E-04	0.00E+00	2.80E-04	5.34E-04	0.00E+00	7.18E-01	0.00E+00	2.80E-04	5.34E-04	0.00E+00	5.28E-01
Renew. secondary fuels	MJ	3.00E-04	2.13E-05	7.24E-02	7.27E-02		0.00E+00	3.55E-06	7.19E-05	9.44E-07	-2.56E-06	0.00E+00	3.56E-06	5.57E-06	0.00E+00	2.75E+00	0.00E+00	3.56E-06	5.57E-06	0.00E+00	9.75E-04
Non-ren. secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m^3	1.38E-01	6.12E-04	8.80E-03	1.48E-01		0.00E+00	9.72E-05	1.37E-02	-1.86E-03	-3.61E-03	0.00E+00	9.72E-05	9.32E-05	0.00E+00	6.14E-02	0.00E+00	9.72E-05	9.32E-05	0.00E+00	2.64E-02

8) PER = Primary energy resources.

END OF LIFE – WASTE

							END OF LIFE SCENARIO 1: CURRENT WASTE DESTINATIONS					END OF LIFE SCENARIO 2: MECHANICAL RECYCLING INTO PARTICLE BOARD – TIMBER DISPLACEMENT					END OF LIFE SCENARIO 3: MECHANICAL RECYCLING INTO MASONARY PRODUCT – FLY ASH DISPLACEMENT				
Impact category	**Unit**	**A1**	**A2**	**A3**	**A1-A3**		**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste	kg	1.00E+00	7.40E-03	4.88E-02	1.06E+00		0.00E+00	1.11E-03	1.74E-01	6.01E-04	-3.50E-02	0.00E+00	1.11E-03	1.82E-03	0.00E+00	1.04E+00	0.00E+00	1.11E-03	1.82E-03	0.00E+00	9.44E-01
Non-hazardous waste	kg	1.23E+01	1.32E-01	3.29E+00	1.57E+01		0.00E+00	2.06E-02	4.33E+00	2.56E+00	-9.97E-01	0.00E+00	2.06E-02	5.39E-02	0.00E+00	1.29E+01	0.00E+00	2.06E-02	5.39E-02	0.00E+00	8.18E+00
Radioactive waste	kg	2.42E-04	8.91E-07	1.31E-05	2.56E-04		0.00E+00	1.40E-07	1.22E-06	1.04E-07	-1.40E-05	0.00E+00	1.40E-07	4.55E-07	0.00E+00	9.76E-05	0.00E+00	1.40E-07	4.55E-07	0.00E+00	2.47E-05

END OF LIFE – OUTPUT FLOWS

							END OF LIFE SCENARIO 1: CURRENT WASTE DESTINATIONS						END OF LIFE SCENARIO 2: MECHANICAL RECYCLING INTO PARTICLE BOARD – TIMBER DISPLACEMENT						END OF LIFE SCENARIO 3: MECHANICAL RECYCLING INTO MASONARY PRODUCT – FLY ASH DISPLACEMENT				
Impact category	**Unit**	**A1**	**A2**	**A3**	**A1-A3**		**C1**	**C2**	**C3**	**C4**	**D**		**C1**	**C2**	**C3**	**C4**	**D**		**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	4.21E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	4.21E+00	0.00E+00	0.00E+00
Material for energy recovery	kg	0.00E+00	0.00E+00	4.30E-02	4.30E-02		0.00E+00	0.00E+00	3.71E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	5.45E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy– Electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	8.20E-01	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy – Heat	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	4.63E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ENVIRONMENTAL IMPACTS – EN 15804+A1, CML

							END OF LIFE SCENARIO 1: CURRENT WASTE DESTINATIONS						END OF LIFE SCENARIO 2: MECHANICAL RECYCLING INTO PARTICLE BOARD – TIMBER DISPLACEMENT						END OF LIFE SCENARIO 3: MECHANICAL RECYCLING INTO MASONARY PRODUCT – FLY ASH DISPLACEMENT				
Impact category	**Unit**	**A1**	**A2**	**A3**	**A1-A3**		**C1**	**C2**	**C3**	**C4**	**D**		**C1**	**C2**	**C3**	**C4**	**D**		**C1**	**C2**	**C3**	**C4**	**D**
Global Warming Pot.	kg CO_2e	7.57E+00	3.19E-01	1.81E+00	9.69E+00		0.00E+00	4.51E-02	9.74E+00	1.88E-01	-4.09E-01		0.00E+00	4.51E-02	1.92E-02	0.00E+00	7.64E+00		0.00E+00	4.51E-02	1.92E-02	0.00E+00	2.56E+00
Ozone depletion Pot.	kg $CFC_{11}e$	4.86E-07	3.76E-09	6.77E-08	5.58E-07		0.00E+00	5.34E-10	7.23E-09	1.44E-10	-3.06E-09		0.00E+00	5.34E-10	8.93E-11	0.00E+00	2.66E-07		0.00E+00	5.34E-10	8.93E-11	0.00E+00	5.39E-09
Acidification	kg SO_2e	3.60E-02	2.05E-03	3.23E-03	4.13E-02		0.00E+00	1.18E-04	5.60E-03	5.95E-05	-2.51E-03		0.00E+00	1.18E-04	5.31E-05	0.00E+00	3.32E-02		0.00E+00	1.18E-04	5.31E-05	0.00E+00	8.50E-03
Eutrophication	kg PO_4^3e	2.66E-02	3.17E-04	7.78E-03	3.47E-02		0.00E+00	2.87E-05	2.57E-03	4.31E-04	-2.16E-04		0.00E+00	2.88E-05	1.55E-05	0.00E+00	8.26E-02		0.00E+00	2.88E-05	1.55E-05	0.00E+00	2.65E-03
POCP ("smog")	kg C_2H_4e	3.44E-03	1.29E-04	4.28E-04	4.00E-03		0.00E+00	1.05E-05	3.44E-04	4.09E-05	-1.38E-04		0.00E+00	1.05E-05	7.29E-06	0.00E+00	2.98E-03		0.00E+00	1.05E-05	7.29E-06	0.00E+00	9.84E-04
ADP-elements	kg Sbe	8.94E-05	7.71E-07	4.27E-06	9.44E-05		0.00E+00	1.23E-07	8.39E-07	1.93E-08	-2.36E-07		0.00E+00	1.23E-07	1.44E-07	0.00E+00	3.92E-05		0.00E+00	1.23E-07	1.44E-07	0.00E+00	1.60E-05
ADP-fossil	MJ	1.96E+02	4.47E+00	2.93E+01	2.29E+02		0.00E+00	6.48E-01	5.30E+00	1.63E-01	-4.10E+00		0.00E+00	6.49E-01	1.10E-01	0.00E+00	8.31E+01		0.00E+00	6.49E-01	1.10E-01	0.00E+00	1.90E+01

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Kingspan Insulation Ltd Electricity Mix IE
Electricity (kg CO2e / kWh)	0.221
District heating data source and quality	Kingspan Insulation Ltd Heating Mix IE
District heating (kg CO2e / kWh)	0.230

End of life scenario documentation

Scenario parameter	End of life Scenario 1: Current Waste Destinations	End of life Scenario 2 & 3: Mechanical recycling
Insulation collected separately (kg)	0.00	3.87
Packaging collected separately (kg)	0.00	0.25
Insulation collected with mixed waste (kg)	3.87	0.00
Packaging collected with mixed waste (kg)	0.25	0.00
Insulation recovered for re-use (kg)	0.00	0.00
Packaging recovered for re-use (kg)	0.00	0.00
Insulation recovered for recycling (kg)	0.00	3.87
Packaging recovered for recycling (kg)	0.00	0.25
Insulation recovered for energy recovery (kg)	3.60	0.00
Packaging recovered for energy recovery (kg)	0.23	0.00
Insulation for landfilling (kg)	0.27	0.00
Packaging for landfilling (kg)	0.02	0.00
Insulation total disposal (kg)	3.87	3.87
Packaging total disposal (kg)	0.25	0.25
Scenario assumptions e.g. transportation distance to waste management facility (km)	100	100

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD, and its associated Supplementary Data Sheet and Background Report have been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- this Environmental Product Declaration;
- the Life-Cycle Assessment used in this EPD; and
- the digital background data for this EPD.

Why does verification transparency matter? Read more online at https://oneclicklca.com/en/resources/articles/why-epd-verification-transparency-matters/.

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

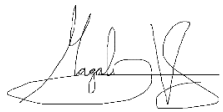
THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.
I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited
01.03.2026



VERIFIED ISO 14025

APPENDIX 1 – RESULTS SUMMARY

The tables on the following pages give summary impact data for cradle-to-gate (A1-A3) and cradle-to-grave (A-C), for core indicators. Marketing law dictates that EPD data should be published for the whole life-cycle (A-C), unless it can be shown that the provision of data for fewer life cycle stages (e.g. A1-A3 only) would not be misleading, because it does not omit life cycle stages that account for significant impacts. To evaluate whether A1-A3 data would give a misleading picture, one requires A-C data, so, for simplicity, this EPD Results Summary provides both.

This study is based on a single thickness (100mm) of the product, but it is available in a number of thicknesses.

In order to calculate the impact data for other thicknesses of the product, a scaling methodology is provided within the Supplementary Data Sheet to this EPD. Please contact Kingspan Insulation Ltd to request a copy

The data shown in the tables on the following pages, for all thicknesses other than 100mm, have been calculated according to the scaling methodology outlined within the Supplementary Data Sheet to this EPD. The data for the 100mm product have been calculated using the data in the impact data table on page 10 of this EPD.

The products covered by this EPD may not be available in all of the thicknesses shown in the tables on the following pages. Please check the relevant price list for the availability of different thicknesses for each product.

In addition to data for thicknesses of the product that are actually manufactured, the tables on the following pages also give data for the exact thicknesses that would be required to meet R-values of $3m^2K/W$ (63mm) & $5m^2K/W$ (105mm), even though these thicknesses are not manufactured.

Detailed results for the 100mm product are given in pages 10-13 of this EPD. If results at the same level of detail are required for thicknesses other than 100mm (e.g. for building LCA purposes), please refer to the scaling methodology outlined within the Supplementary Data Sheet to this EPD. Please contact Kingspan Insulation Ltd to request a copy.

Table 1: A1-A3 Core Indicators (EN 15804+A2)

This table provides the **cradle-to-gate (A1-A3)** impacts for Kooltherm® K3 Floorboard / Kooltherm® K7 Pitched Roof Board / Kooltherm® K8 Cavity Board / Kooltherm® K12 Framing Board.

Life cycle stages		A1-A3																	
Product Thickness	**mm**	**25**	**30**	**40**	**50**	**60**	**63***	**70**	**75**	**80**	**90**	**100**	**105 ***	**115**	**120**	**125**	**130**	**135**	**140**	**150**
GWP – total	kg CO2e	3.30E+00	3.78E+00	4.45E+00	5.35E+00	6.15E+00	6.41E+00	7.03E+00	7.47E+00	7.91E+00	8.80E+00	9.65E+00	1.01E+01	1.06E+01	1.17E+01	1.21E+01	1.26E+01	1.30E+01	1.35E+01	1.44E+01
GWP – fossil	kg CO2e	3.45E+00	3.93E+00	4.58E+00	5.46E+00	6.23E+00	6.49E+00	7.09E+00	7.52E+00	7.95E+00	8.81E+00	9.65E+00	1.01E+01	1.05E+01	1.16E+01	1.20E+01	1.25E+01	1.29E+01	1.34E+01	1.42E+01
GWP – biogenic	kg CO2e	-2.37E-01	-2.39E-01	-2.43E-01	-2.48E-01	-2.52E-01	-2.53E-01	-2.56E-01	-2.59E-01	-2.61E-01	-2.66E-01	-2.71E-01	-2.72E-01	-2.75E-01	-2.81E-01	-2.83E-01	-2.85E-01	-2.88E-01	-2.90E-01	-2.95E-01
GWP – LULUC	kg CO2e	8.27E-02	9.76E-02	1.18E-01	1.45E-01	1.69E-01	1.77E-01	1.96E-01	2.10E-01	2.23E-01	2.50E-01	2.77E-01	2.90E-01	3.03E-01	3.37E-01	3.50E-01	3.64E-01	3.78E-01	3.91E-01	4.19E-01
Ozone depletion pot.	kg CFC-11e	1.85E-07	2.20E-07	2.68E-07	3.32E-07	3.89E-07	4.08E-07	4.53E-07	4.84E-07	5.16E-07	5.79E-07	6.43E-07	6.74E-07	7.06E-07	7.85E-07	8.17E-07	8.49E-07	8.82E-07	9.14E-07	9.78E-07
Acidification pot.	mol H+eq	2.03E-02	2.26E-02	2.57E-02	2.99E-02	3.35E-02	3.48E-02	3.76E-02	3.97E-02	4.17E-02	4.58E-02	4.94E-02	5.20E-02	5.40E-02	5.91E-02	6.12E-02	6.33E-02	6.54E-02	6.75E-02	7.17E-02
EP-freshwater	kg Peq	8.22E-04	8.74E-04	9.46E-04	1.04E-03	1.13E-03	1.15E-03	1.22E-03	1.27E-03	1.31E-03	1.41E-03	1.49E-03	1.55E-03	1.60E-03	1.71E-03	1.76E-03	1.81E-03	1.86E-03	1.91E-03	2.00E-03
EP-marine	kg Neq	3.73E-03	4.20E-03	4.84E-03	5.69E-03	6.45E-03	6.70E-03	7.29E-03	7.71E-03	8.13E-03	8.98E-03	9.81E-03	1.02E-02	1.07E-02	1.17E-02	1.21E-02	1.26E-02	1.30E-02	1.34E-02	1.43E-02
EP-terrestrial	mol Neq	3.51E-02	3.94E-02	4.53E-02	5.31E-02	6.01E-02	6.24E-02	6.78E-02	7.16E-02	7.55E-02	8.32E-02	9.09E-02	9.48E-02	9.86E-02	1.08E-01	1.12E-01	1.16E-01	1.20E-01	1.24E-01	1.32E-01
POCP ("smog")	kg NMVOCeq	2.77E-02	3.23E-02	3.86E-02	4.71E-02	5.46E-02	5.70E-02	6.29E-02	6.70E-02	7.12E-02	7.95E-02	8.77E-02	9.19E-02	9.61E-02	1.06E-01	1.11E-01	1.15E-01	1.19E-01	1.23E-01	1.32E-01
ADP-min. & metals	kg Sbeq	2.88E-05	3.41E-05	4.14E-05	5.12E-05	5.98E-05	6.27E-05	6.94E-05	7.42E-05	7.91E-05	8.87E-05	9.64E-05	1.03E-04	1.08E-04	1.20E-04	1.25E-04	1.30E-04	1.35E-04	1.39E-04	1.49E-04
ADP-fossil resources	MJ	7.25E+01	8.47E+01	1.01E+02	1.24E+02	1.44E+02	1.50E+02	1.66E+02	1.77E+02	1.88E+02	2.10E+02	2.32E+02	2.43E+02	2.54E+02	2.82E+02	2.93E+02	3.04E+02	3.16E+02	3.27E+02	3.49E+02
Water use	m3 depr.	1.56E+00	1.70E+00	1.89E+00	2.15E+00	2.38E+00	2.46E+00	2.64E+00	2.77E+00	2.90E+00	3.15E+00	3.40E+00	3.54E+00	3.66E+00	3.98E+00	4.11E+00	4.24E+00	4.37E+00	4.50E+00	4.76E+00

**Non-manufactured thickness. Exact thicknesses that would be required to meet R-values of 3m²K/W (63mm) & 5m²K/W (105mm).*

Table 2: A-C Core Indicators (EN 15804+A2) for End of Life Scenario 1: Current Waste Destinations

This table provides the **cradle-to-grave (A-C)** impacts for Kooltherm® K3 Floorboard / Kooltherm® K7 Pitched Roof Board / Kooltherm® K8 Cavity Board / Kooltherm® K12 Framing Board for **end of life scenario 1**.

End of life scenario 1 represents **current waste destinations**. Data published in 2023 from the UK Government* shows that there is a 93% demolition waste recovery rate for construction materials. This scenario assumes that that recovered waste goes to waste to energy (WTE), the current best practice method of disposal for foam insulation waste as of 2025. The remaining 7% unrecovered material is assumed to go to landfill.

* www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste

Life cycle stages		A-C																	
Product Thickness	**mm**	**25**	**30**	**40**	**50**	**60**	**63***	**70**	**75**	**80**	**90**	**100**	**105 ***	**115**	**120**	**125**	**130**	**135**	**140**	**150**
GWP – total	kg CO2e	6.25E+00	7.29E+00	8.70E+00	1.06E+01	1.23E+01	1.28E+01	1.41E+01	1.51E+01	1.60E+01	1.79E+01	1.97E+01	2.07E+01	2.16E+01	2.39E+01	2.49E+01	2.58E+01	2.68E+01	2.77E+01	2.96E+01
GWP – fossil	kg CO2e	6.18E+00	7.20E+00	8.60E+00	1.05E+01	1.21E+01	1.27E+01	1.40E+01	1.49E+01	1.58E+01	1.77E+01	1.95E+01	2.04E+01	2.14E+01	2.36E+01	2.46E+01	2.55E+01	2.65E+01	2.74E+01	2.93E+01
GWP – biogenic	kg CO2e	-1.01E-02	-1.27E-02	-1.62E-02	-2.10E-02	-2.52E-02	-2.66E-02	-2.99E-02	-3.23E-02	-3.46E-02	-3.93E-02	-4.52E-02	-4.63E-02	-4.87E-02	-5.45E-02	-5.69E-02	-5.93E-02	-6.17E-02	-6.41E-02	-6.89E-02
GWP – LULUC	kg CO2e	8.27E-02	9.76E-02	1.18E-01	1.45E-01	1.69E-01	1.78E-01	1.96E-01	2.10E-01	2.23E-01	2.50E-01	2.77E-01	2.90E-01	3.04E-01	3.37E-01	3.51E-01	3.64E-01	3.78E-01	3.92E-01	4.19E-01
Ozone depletion pot.	kg CFC-11e	1.87E-07	2.23E-07	2.72E-07	3.37E-07	3.95E-07	4.14E-07	4.59E-07	4.91E-07	5.24E-07	5.88E-07	6.52E-07	6.84E-07	7.16E-07	7.96E-07	8.29E-07	8.62E-07	8.94E-07	9.27E-07	9.93E-07
Acidification pot.	mol H+eq	2.27E-02	2.54E-02	2.91E-02	3.41E-02	3.86E-02	4.01E-02	4.35E-02	4.60E-02	4.84E-02	5.34E-02	5.78E-02	6.07E-02	6.32E-02	6.93E-02	7.18E-02	7.44E-02	7.69E-02	7.94E-02	8.44E-02
EP-freshwater	kg Peq	8.39E-04	8.94E-04	9.70E-04	1.07E-03	1.16E-03	1.19E-03	1.26E-03	1.31E-03	1.36E-03	1.46E-03	1.55E-03	1.61E-03	1.66E-03	1.78E-03	1.83E-03	1.88E-03	1.93E-03	1.98E-03	2.09E-03
EP-marine	kg Neq	7.30E-03	8.42E-03	9.95E-03	1.20E-02	1.38E-02	1.44E-02	1.58E-02	1.68E-02	1.78E-02	1.99E-02	2.19E-02	2.29E-02	2.39E-02	2.64E-02	2.74E-02	2.85E-02	2.95E-02	3.05E-02	3.26E-02
EP-terrestrial	mol Neq	4.76E-02	5.43E-02	6.35E-02	7.59E-02	8.68E-02	9.04E-02	9.89E-02	1.05E-01	1.11E-01	1.23E-01	1.35E-01	1.41E-01	1.47E-01	1.63E-01	1.69E-01	1.75E-01	1.81E-01	1.87E-01	2.00E-01
POCP ("smog")	kg NMVOCeq	3.08E-02	3.60E-02	4.32E-02	5.27E-02	6.12E-02	6.40E-02	7.06E-02	7.53E-02	8.00E-02	8.94E-02	9.88E-02	1.03E-01	1.08E-01	1.20E-01	1.25E-01	1.29E-01	1.34E-01	1.39E-01	1.49E-01
ADP-min. & metals	kg Sbeq	2.91E-05	3.45E-05	4.19E-05	5.18E-05	6.06E-05	6.35E-05	7.03E-05	7.52E-05	8.00E-05	8.98E-05	9.76E-05	1.04E-04	1.09E-04	1.21E-04	1.26E-04	1.31E-04	1.36E-04	1.41E-04	1.51E-04
ADP-fossil resources	MJ	7.43E+01	8.68E+01	1.04E+02	1.27E+02	1.48E+02	1.54E+02	1.70E+02	1.82E+02	1.93E+02	2.16E+02	2.38E+02	2.50E+02	2.61E+02	2.89E+02	3.01E+02	3.12E+02	3.24E+02	3.36E+02	3.59E+02
Water use	m3 depr.	1.75E+00	1.93E+00	2.18E+00	2.51E+00	2.80E+00	2.90E+00	3.13E+00	3.29E+00	3.45E+00	3.78E+00	4.09E+00	4.27E+00	4.43E+00	4.83E+00	5.00E+00	5.16E+00	5.33E+00	5.50E+00	5.83E+00

**Non-manufactured thickness. Exact thicknesses that would be required to meet R-values of 3m²K/W (63mm) & 5m²K/W (105mm).*

Table 3: A-C Core Indicators (EN 15804+A2) for End of Life Scenario 2 & 3: Mechanical Recycling

This table provides the **cradle-to-grave (A-C)** impacts for Kooltherm® K3 Floorboard / Kooltherm® K7 Pitched Roof Board / Kooltherm® K8 Cavity Board / Kooltherm® K12 Framing Board for **end of life scenarios 2 & 3**.

End of life scenarios 2 and 3 represent **mechanical recycling**. The UK & EU have committed to net zero carbon economies by 2050. The assessed service life of the product is 60 years, and its real service life is likely to be longer. Consequently, it can be reasonably assumed that incineration (WTE or otherwise) without carbon capture will not be an available waste destination at the end of life of the assessed product. Similarly, because of the desire for a more resource efficient economy, it can be reasonably assumed that incineration (WTE or otherwise) with carbon capture and landfill will also not be available waste destinations at the end of life of the assessed product. It can be reasonably assumed that recycling will be the norm at the end of life of the assessed product.

End of life scenario 2 represents mechanical recycling into **particle board** and **end of life scenario 3** represents mechanical recycling into a **masonry product**. The module C impacts for scenarios 2 & 3 are the same and so the scenarios are grouped together. They are separate scenarios only because their module D benefits & loads differ.

Life cycle stages		A-C																	
Product Thickness	**mm**	**25**	**30**	**40**	**50**	**60**	**63***	**70**	**75**	**80**	**90**	**100**	**105 ***	**115**	**120**	**125**	**130**	**135**	**140**	**150**
GWP – total	kg CO2e	3.54E+00	4.04E+00	4.71E+00	5.62E+00	6.41E+00	6.68E+00	7.30E+00	7.75E+00	8.19E+00	9.08E+00	9.94E+00	1.04E+01	1.09E+01	1.20E+01	1.24E+01	1.29E+01	1.33E+01	1.38E+01	1.47E+01
GWP – fossil	kg CO2e	3.47E+00	3.95E+00	4.61E+00	5.49E+00	6.27E+00	6.53E+00	7.14E+00	7.57E+00	8.00E+00	8.87E+00	9.71E+00	1.02E+01	1.06E+01	1.17E+01	1.21E+01	1.26E+01	1.30E+01	1.34E+01	1.43E+01
GWP – biogenic	kg CO2e	-1.03E-02	-1.30E-02	-1.67E-02	-2.16E-02	-2.59E-02	-2.73E-02	-3.07E-02	-3.31E-02	-3.55E-02	-4.04E-02	-4.60E-02	-4.76E-02	-5.00E-02	-5.60E-02	-5.84E-02	-6.09E-02	-6.33E-02	-6.58E-02	-7.07E-02
GWP – LULUC	kg CO2e	8.27E-02	9.76E-02	1.18E-01	1.45E-01	1.69E-01	1.77E-01	1.96E-01	2.10E-01	2.23E-01	2.50E-01	2.77E-01	2.90E-01	3.04E-01	3.37E-01	3.51E-01	3.64E-01	3.78E-01	3.92E-01	4.19E-01
Ozone depletion pot.	kg CFC-11e	1.85E-07	2.20E-07	2.68E-07	3.33E-07	3.90E-07	4.09E-07	4.53E-07	4.85E-07	5.17E-07	5.80E-07	6.44E-07	6.75E-07	7.07E-07	7.86E-07	8.18E-07	8.50E-07	8.83E-07	9.15E-07	9.80E-07
Acidification pot.	mol H+eq	2.04E-02	2.27E-02	2.58E-02	3.00E-02	3.37E-02	3.49E-02	3.78E-02	3.99E-02	4.19E-02	4.60E-02	4.96E-02	5.22E-02	5.43E-02	5.94E-02	6.15E-02	6.36E-02	6.57E-02	6.78E-02	7.20E-02
EP-freshwater	kg Peq	8.26E-04	8.78E-04	9.50E-04	1.05E-03	1.13E-03	1.16E-03	1.23E-03	1.27E-03	1.32E-03	1.42E-03	1.50E-03	1.56E-03	1.61E-03	1.73E-03	1.77E-03	1.82E-03	1.87E-03	1.92E-03	2.02E-03
EP-marine	kg Neq	3.76E-03	4.23E-03	4.88E-03	5.75E-03	6.51E-03	6.77E-03	7.36E-03	7.79E-03	8.21E-03	9.06E-03	9.90E-03	1.03E-02	1.08E-02	1.18E-02	1.22E-02	1.27E-02	1.31E-02	1.36E-02	1.44E-02
EP-terrestrial	mol Neq	3.54E-02	3.97E-02	4.56E-02	5.35E-02	6.05E-02	6.29E-02	6.83E-02	7.22E-02	7.61E-02	8.39E-02	9.16E-02	9.55E-02	9.94E-02	1.09E-01	1.13E-01	1.17E-01	1.21E-01	1.25E-01	1.33E-01
POCP ("smog")	kg NMVOCeq	2.78E-02	3.24E-02	3.87E-02	4.72E-02	5.47E-02	5.72E-02	6.31E-02	6.72E-02	7.14E-02	7.97E-02	8.80E-02	9.22E-02	9.64E-02	1.07E-01	1.11E-01	1.15E-01	1.19E-01	1.24E-01	1.32E-01
ADP-min. & metals	kg Sbeq	2.89E-05	3.42E-05	4.15E-05	5.14E-05	6.00E-05	6.29E-05	6.97E-05	7.45E-05	7.93E-05	8.89E-05	9.67E-05	1.03E-04	1.08E-04	1.20E-04	1.25E-04	1.30E-04	1.35E-04	1.40E-04	1.50E-04
ADP-fossil resources	MJ	7.27E+01	8.50E+01	1.02E+02	1.24E+02	1.44E+02	1.51E+02	1.67E+02	1.78E+02	1.89E+02	2.11E+02	2.33E+02	2.44E+02	2.55E+02	2.83E+02	2.94E+02	3.05E+02	3.17E+02	3.28E+02	3.50E+02
Water use	m3 depr.	1.56E+00	1.70E+00	1.90E+00	2.16E+00	2.39E+00	2.47E+00	2.65E+00	2.77E+00	2.90E+00	3.16E+00	3.41E+00	3.54E+00	3.67E+00	3.99E+00	4.12E+00	4.25E+00	4.38E+00	4.51E+00	4.78E+00

**Non-manufactured thickness. Exact thicknesses that would be required to meet R-values of $3m^2K/W$ (63mm) & $5m^2K/W$ (105mm).*