Statement of Verification

BREG EN EPD No.: 000322 Issue 03

This is to verify that the

Environmental Product Declaration

provided by:

Kingspan Insulation Ltd

BRE Global Verified EPD

is in accordance with the requirements of:

EN 15804:2012+A1:2013

and

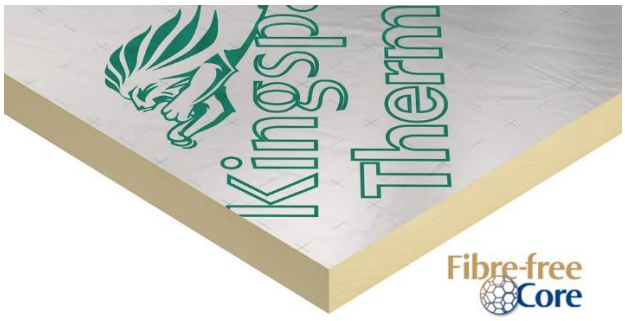
BRE Global Scheme Document SD207

This declaration is for:

Therma TP10, TF70, Therma Duct, TW50 and TW55 Insulation Boards

Company Address

Torvale Industrial Estate
Pembridge
Leominster
Herfordshire
HR6 9LA



Kingspan®

Signed for BRE Global Ltd	Laura Critien Business Group Manager	16 February 2021 Date of this Issue
05 January 2021 Date of First Issue		04 January 2026 Expiry Date

BRE Global Verified EPD

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Environmental Product Declaration

EPD Number: 000322

General Information

EPD Programme Operator	Applicable Product Category Rules
BRE Global Watford, Herts WD25 9XX United Kingdom	BRE Environmental Profiles 2013 Product Category Rules for Type III environmental product declaration of construction products to EN 15804:2012+A1:2013
Commissioner of LCA study	**LCA consultant/Tool**
Kingspan Insulation Limited Pembridge Herefordshire HR6 9LA	BRE LINA Tool v2.07
Declared/Functional Unit	**Applicability/Coverage**
1m² of insulation at a thickness that gives an R-value of 3.000m².K/W (66mm)	Product Specific.
EPD Type	**Background database**
Cradle to Gate with options	Ecoinvent 3.2

Demonstration of Verification
CEN standard EN 15804 serves as the core PCR [a]
Independent verification of the declaration and data according to EN ISO 14025:2010 ☐Internal ☒ External
(Where appropriate [b])Third party verifier: Nigel Jones

a: Product category rules
b: Optional for business-to-business communication; mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Comparability
Environmental product declarations from different programmes may not be comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See Clause 5.3 of EN 15804:2012+A1:2013 for further guidance

Information modules covered

Product			Construction		Use stage							End-of-life					Benefits and loads beyond the system boundary
					Related to the building fabric					Related to the building							
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
Raw materials supply	Transport	Manufacturing	Transport to site	Construction – Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal		Reuse, Recovery and/or Recycling potential
☑	☑	☑	☑	☑	☐	☐	☐	☐	☐	☐	☐	☐	☑	☑	☑		☐

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Kingspan Insulation Ltd Pembridge Herefordshire HR6 9LA	Kingspan Insulation Ltd Bree Industrial Estate, Castleblayney Co. Monaghan A75 X966
Kingspan Insulation, Sherburn in Elmet, Leeds, LS25 6NF	

Construction Product

Product Description

Kingspan Therma TP10, TF70, Therma Duct, TW50 and TW55 insulation boards consist of a high performance rigid thermoset fibre free PIR insulation core faced on both sides with a low emissivity foil facer. Product information is available on Kingspan.com

Technical Information

Property	Value, Unit
Thermal Conductivity - EN 13166:2012+A2:2016	0.022W/m.K
Compressive strength at 10% compression	140 kPa
Board Size at range of thicknesses	1.2 x 2.4 m

Main Product Contents

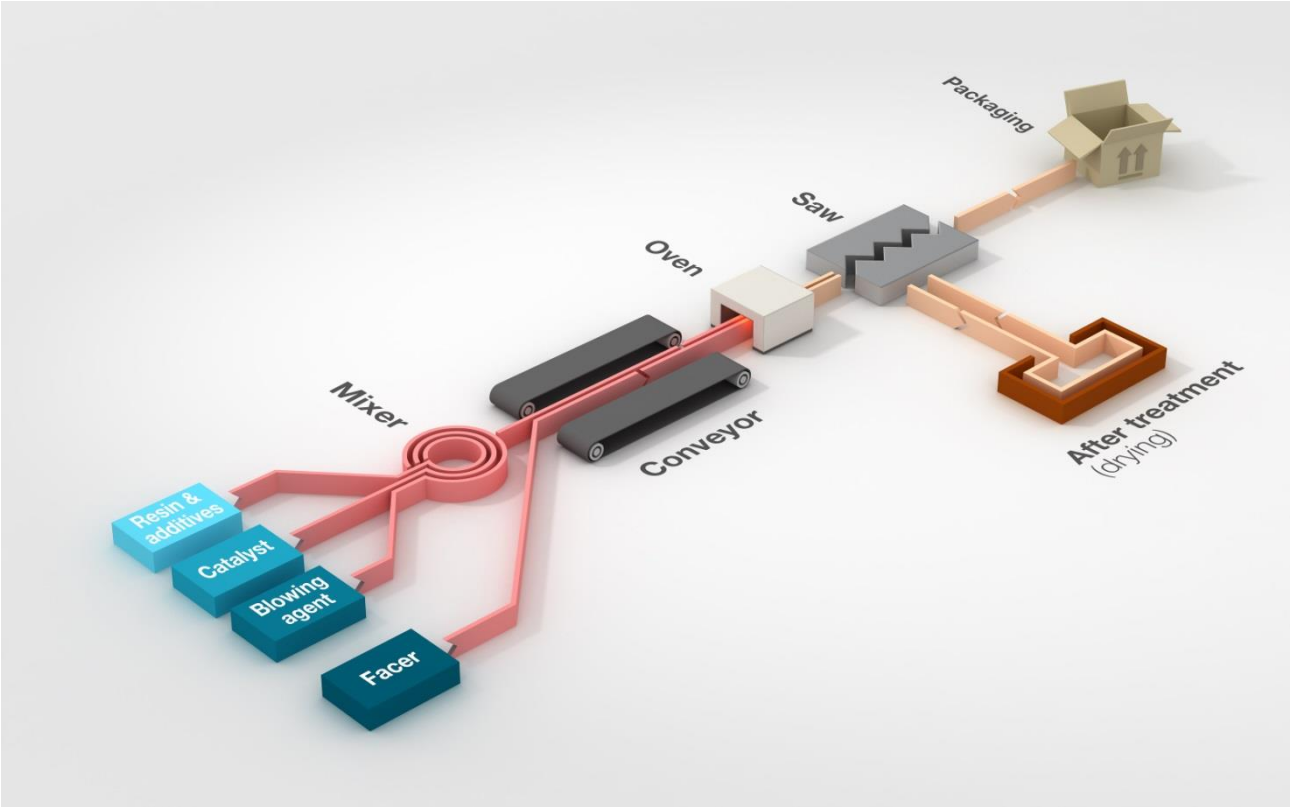
Material/Chemical Input	%
Rigid thermoset fibre free PIR insulation core	83%
Low emissivity foil facer	17%

**Average percentages applicable for 1m^2 of insulation at thickness that gives an R-value of 3.000 m^{2}K/W*

Manufacturing Process

Kingspan Therma is made through a manufacturing process in which a foam forms an insulating core between two facing elements. At the start of the process a mix of chemicals is added directly to the bottom layer of facing and then expands to meet the top layer of facing. As it dries, the foam becomes tacky and adheres itself to the facing, top and bottom. Once it has reached the necessary thickness the foam is cooked under pressure. The insulation boards are then cut into the necessary sizes, packaged and sent to the loading bay for collection.

Process flow diagram



Construction Installation

The product will be installed in a variety of building wall, floor and roof applications using standard construction techniques.

Use Information

The product will be left alone after installation, and there are no known associated environmental impacts.

End of Life

The insulation will be removed for disposal when the building reaches the end of its life.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1m^2 of insulation at a thickness that gives an R-value of 3.00m^2.K/W

System boundary

Cradle to gate with options: Modules A1-3, A4, A5, C2, C3 and C4.
The following processes are included in the A1-A3 production stage: Manufacture of preliminary products (resin, blowing agent, additives). Transportation of raw materials and preliminary products to the manufacturing site. Manufacturing process on the production site including, energy, disposal of residual materials, water consumption and VOC emissions to air.
The following process is included within the A4 construction stage: Transportation of the product to the construction site.
The following processes are included in the A5 construction stage: installation wastage rate, material wastes produced by installation.
The following processes are included in the C2, C3 and C4 End of life scenarios: Transportation of waste from the construction site to the waste processing plant, waste processing operations for recovery, waste sent to landfill.

Data sources, quality and allocation

This EPD covers all Kingspan Therma Kingspan Therma TP10, TF70, Therma Duct, TW50 and TW55 insulation boards are manufactured at the Pembridge, Castleblayney and Selby sites, representing 100% of production of these products in 2018 included in this EPD, and 28.5% of the total site output at the Pembridge site (6857.57 tonnes), 32.8% at the Castleblayney site (4418.67 tonnes), and 41.1% at the Selby site (5299.44 tonnes).

A profile for the PIR foam was created separately as this covered a range of PIR products. The profile included all the impacts from the manufacture of the product, including all the data for the following sections: ‘ancillary materials’, ‘packaging’, ‘fuel/energy’, ‘water’, ‘emissions to air, water and soil’, ‘production waste, ‘other waste’ and ‘water discharged’. Allocation of these factors to the products was achieved by using a proportion of the total PIR foam output. The foam profile was then used as an input for this (and other) end product profiles.

Secondary data has been drawn from the BRE LINA database v2.0.62 and the background LCI datasets are based on Ecoinvent v3.2.

Cut-off criteria

No inputs or outputs have been excluded. All raw materials, packaging materials, associated transport to the manufacturing site, and from the manufacturing site to the building site, process energy, water use, direct production waste, installations waste and emissions are included.

LCA Results

(MND = module not declared; MNR = module not relevant; INA = indicator not assessed; AGG = aggregated)

Parameters describing environmental impacts									
			GWP	ODP	AP	EP	POCP	ADPE	ADPF
			kg CO_2 equiv.	kg CFC 11 equiv.	kg SO_2 equiv.	kg $(PO_4)^{3-}$ equiv.	kg C_2H_4 equiv.	kg Sb equiv.	MJ, net calorific value.
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	9.43e+0	3.10e-7	5.23e-2	1.04e-2	1.15e-2	3.89e-5	2.02e+2
Construction process stage	Transport	A4	9.81e-2	1.87e-8	3.37e-4	8.87e-5	6.96e-5	1.65e-7	1.53e+0
	Construction	A5	1.91e-1	6.58e-9	1.05e-3	2.10e-4	2.31e-4	7.80e-7	4.06e+0
Use stage	Use	B1	MND	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	MND	MND	MND	MND	MND	MND	MND
	Transport	C2	9.81e-2	1.87e-8	3.37e-4	8.87e-5	6.96e-5	1.65e-7	1.53e+0
	Waste processing	C3	1.58e-8	1.03e-15	8.59e-11	1.97e-11	4.89e-12	1.91e-14	2.44e-7
	Disposal	C4	1.97e-3	5.18e-10	1.38e-5	4.52e-6	2.29e-6	2.79e-9	4.83e-2
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND	MND	MND	MND

GWP = Global Warming Potential;
ODP = Ozone Depletion Potential;
AP = Acidification Potential for Soil and Water;
EP = Eutrophication Potential;
POCP = Formation potential of tropospheric Ozone;
ADPE = Abiotic Depletion Potential – Elements;
ADPF = Abiotic Depletion Potential – Fossil Fuels;

LCA Results (continued)

Parameters describing resource use, primary energy								
			PERE	PERM	PERT	PENRE	PENRM	PENRT
			MJ	MJ	MJ	MJ	MJ	MJ
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	2.45e+1	1.93e-2	2.45e+1	1.37e+2	7.62e+1	2.13e+2
Construction process stage	Transport	A4	2.32e-2	5.78e-8	2.32e-2	1.52e+0	0.00e+0	1.52e+0
	Construction	A5	4.91e-1	3.87e-4	4.91e-1	4.29e+0	0.00e+0	4.29e+0
Use stage	Use	B1	MND	MND	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	MND	MND	MND	MND	MND	MND
	Transport	C2	2.32e-2	5.78e-8	2.32e-2	1.52e+0	0.00e+0	1.52e+0
	Waste processing	C3	2.11e-8	3.81e-14	2.11e-8	3.25e-7	0.00e+0	3.25e-7
	Disposal	C4	1.47e-3	4.03e-9	1.47e-3	4.86e-2	0.00e+0	4.86e-2
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND	MND	MND

PERE = Use of renewable primary energy excluding renewable primary energy 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 resource

LCA Results (continued)

Parameters describing resource use, secondary materials and fuels, use of water						
			SM	RSF	NRSF	FW
			kg	MJ net calorific value	MJ net calorific value	m^3
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00e+0	0.00e+0	0.00e+0	2.43e-1
Construction process stage	Transport	A4	0.00e+0	0.00e+0	0.00e+0	3.56e-4
	Construction	A5	0.00e+0	0.00e+0	0.00e+0	4.86e-3
Use stage	Use	B1	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	MND	MND	MND	MND
	Transport	C2	0.00e+0	0.00e+0	0.00e+0	3.56e-4
	Waste processing	C3	0.00e+0	0.00e+0	0.00e+0	6.50e-11
	Disposal	C4	0.00e+0	0.00e+0	0.00e+0	5.43e-5
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND

SM = Use of secondary material;
RSF = Use of renewable secondary fuels;
NRSF = Use of non-renewable secondary fuels;
FW = Net use of fresh water

LCA Results (continued)

Other environmental information describing waste categories					
			HWD	NHWD	RWD
			kg	kg	kg
Product stage	Raw material supply	A1	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG
	Total (of product stage)	A1-3	4.02e-1	3.02e-1	1.46e-4
Construction process stage	Transport	A4	5.75e-4	1.31e-1	1.06e-5
	Construction	A5	8.06e-3	8.65e-3	3.13e-6
Use stage	Use	B1	MND	MND	MND
	Maintenance	B2	MND	MND	MND
	Repair	B3	MND	MND	MND
	Replacement	B4	MND	MND	MND
	Refurbishment	B5	MND	MND	MND
	Operational energy use	B6	MND	MND	MND
	Operational water use	B7	MND	MND	MND
End of life	Deconstruction, demolition	C1	MND	MND	MND
	Transport	C2	5.75e-4	1.31e-1	1.06e-5
	Waste processing	C3	3.71e-11	3.95e-10	1.79e-12
	Disposal	C4	3.63e-5	1.90e-1	2.99e-7
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND

HWD = Hazardous waste disposed;
NHWD = Non-hazardous waste disposed;
RWD = Radioactive waste disposed

LCA Results (continued)

Other environmental information describing output flows – at end of life						
			CRU	MFR	MER	EE
			kg	kg	kg	MJ per energy carrier
Product stage	Raw material supply	A1	AGG	AGG	AGG	AGG
	Transport	A2	AGG	AGG	AGG	AGG
	Manufacturing	A3	AGG	AGG	AGG	AGG
	Total (of product stage)	A1-3	0.00e+0	6.44e-2	0.00e+0	0.00e+0
Construction process stage	Transport	A4	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Construction	A5	0.00e+0	1.29e-3	4.19e-2	0.00e+0
Use stage	Use	B1	MND	MND	MND	MND
	Maintenance	B2	MND	MND	MND	MND
	Repair	B3	MND	MND	MND	MND
	Replacement	B4	MND	MND	MND	MND
	Refurbishment	B5	MND	MND	MND	MND
	Operational energy use	B6	MND	MND	MND	MND
	Operational water use	B7	MND	MND	MND	MND
End of life	Deconstruction, demolition	C1	MND	MND	MND	MND
	Transport	C2	0.00e+0	0.00e+0	0.00e+0	0.00e+0
	Waste processing	C3	0.00e+0	0.00e+0	1.87e+0	0.00e+0
	Disposal	C4	0.00e+0	0.00e+0	0.00e+0	0.00e+0
Potential benefits and loads beyond the system boundaries	Reuse, recovery, recycling potential	D	MND	MND	MND	MND

CRU = Components for reuse;
MFR = Materials for recycling

MER = Materials for energy recovery;
EE = Exported Energy

Scenarios and additional technical information

Scenarios and additional technical information			
Scenario	Parameter	Units	Results
A4 – Transport to the building site	Description of scenario		
	Fuel type / Vehicle type	Litre of fuel type per distance or vehicle type	Lorry >32 metric tons
	Distance:	km	523
	Capacity utilisation (incl. empty returns)	%	86
	Bulk density of transported products	kg/m^3	31
A5 – Installation in the building	Description of scenario		
	Installation wastage rate	% of product	2
	Installation waste sent to landfill	kg	0.041
C2, C3, C4 – End of life	Description of scenario		
	Transport type	Vehicle type	Lorry >32 metric tons
	Distance	km	523
	Crushing and compacting of waste into briquettes	MJ	9.49E-08
	Waste for energy recovery	Kg	1.87
	Waste to landfill	kg	0.19

References

BSI. Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products. BS EN 15804:2012+A1:2013. London, BSI, 2013.

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BS EN ISO 14040:2006. London, BSI, 2006.

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BS EN ISO 14044:2006. London, BSI, 2006.

Kingspan insulation technical information: www.kingspaninsulation.co.uk/dop

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CEN. Thermal insulation products for building equipment and industrial installations - Factory made rigid polyurethane foam (PUR) and polyisocyanurate foam (PIR) products – Specification - EN 14308/PRA1. Brussels, CEN, 2018