

Statement of Verification

BREG EN EPD No.: 000201

Issue 03

This is to verify that the
Environmental Product Declaration
provided by:
Kingspan Insulation B.V.



is in accordance with the requirements of:
EN 15804:2012+A1:2013
and
BRE Global Scheme Document SD207

This declaration is for:
Kooltherm K5 External Wall Board

Company Address

Lingewei 8
4004 LL Tiel
The Netherlands



Emma Baker
Operator

17 August 2018
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Environmental Product Declaration

EPD Number: 000201

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 B.V. Lingewei 8 4004 LL Tiel The Netherlands	BRE LINA tool
Declared/Functional Unit	Applicability/Coverage
1m ² of Kooltherm K5 insulation at a thickness that gives an R-value of 3.000m ² .K/W	Product specific.
EPD Type	Background database
Cradle to Gate with options	ecoinvent
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 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> 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
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Note: Ticks indicate the Information Modules declared.

Manufacturing site(s)

Kingspan Insulation B.V.

Lingewei 8
4004 LL Tiel
The Netherlands

Construction Product:

Product Description

Kingspan **Kooltherm K5** External Wall board premium performance rigid thermoset fibre free phenolic insulation core faced on both sides with a glass tissue based facing which is autohesively bonded to the insulation core during manufacture.

Product information on www.kingspan.com

Technical Information

Property	Value, Unit
Thermal conductivity - EN 13166:2012+A2:2016	0.020 W/m.K
Other technical information see Declaration of Performance: https://www.kingspan.com/roe/el-gr/products/insulation/declaration-of-performance	

Main Product Contents

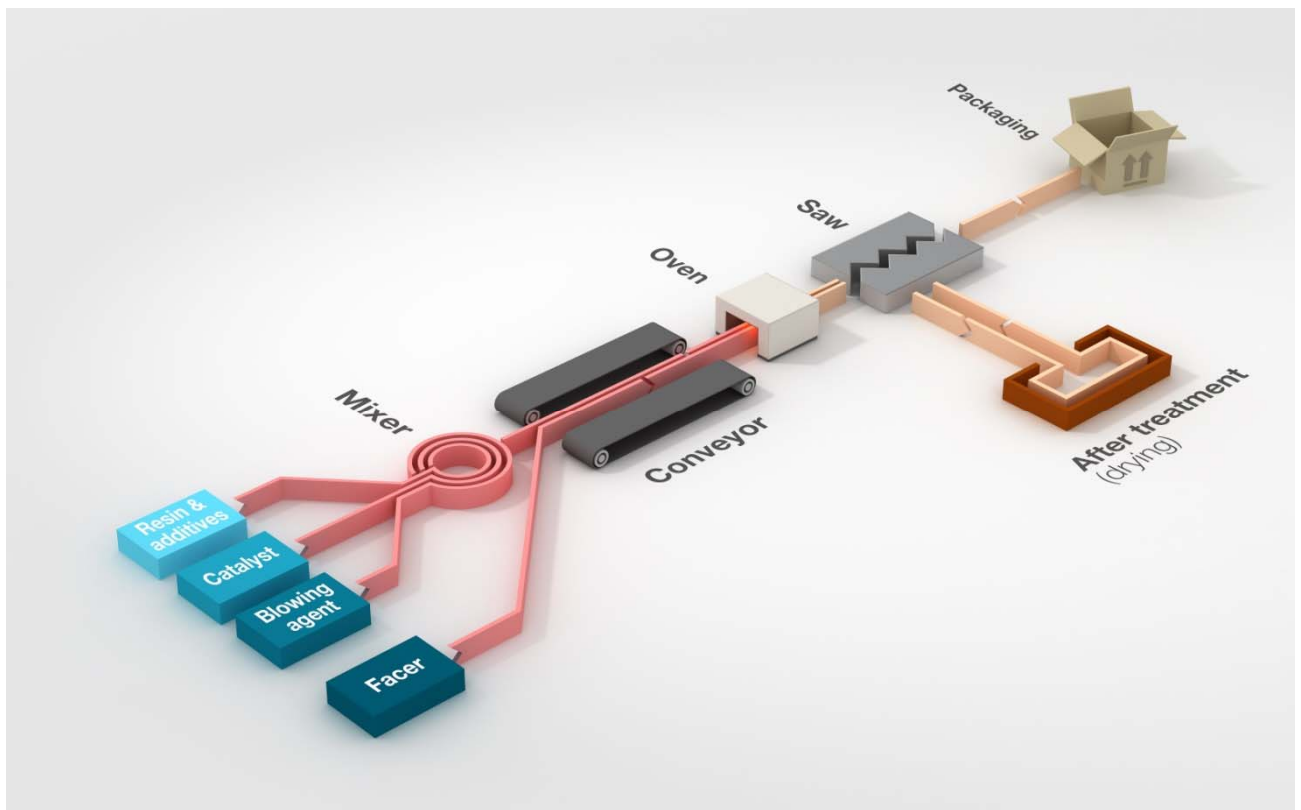
Material/Chemical Input	%
Rigid thermoset fibre free phenolic insulation core	93.3
Glass tissue based facing	6.7

Percentages applicable for 1m² of insulation at a thickness that gives an R-value of 3.000m².K/W (60 mm of Kooltherm K5)

Manufacturing Process

Kingspan Kooltherm 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 cured under pressure. It is then moved onto a secondary oven to cure and harden, becoming bright pink in colour. 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 external wall applications.

Use Information

The product will be left alone after installation, 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. The foam can be used for waste to energy. However, for this study it is assumed that the majority of the waste is sent to landfill.

Life Cycle Assessment Calculation Rules

Declared / Functional unit description

1m² of Kooltherm K5 insulation at a thickness that gives an R-value of 3.000m².K/W

System boundary

Cradle to Gate with options

Data sources, quality and allocation

This EPD covers all Kooltherm K5 phenolic insulation manufactured at one location, representing 100% of production in 2015. Information on raw materials used has been provided by sub-suppliers and additionally the Ecoinvent 3.2 database has been consulted. Information on production process is measured data by Kingspan Insulation B.V. Amounts of waste / energy consumption / water / emissions / raw materials used / packaging / transport / etc. has been allocated to the share of Kooltherm K5 on the total Kooltherm production in this factory over the year 2015.

Cut-off criteria

No inputs or outputs have been excluded. All raw materials, packaging materials, associated transport to the plant and from the plant to the building site, process energy, water use, direct production waste and installation 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 ₂ H 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	4.62	5.38E-07	2.15E-02	5.10E-03	4.34E-03	4.83E-05	1.36E+02
Construction process stage	Transport	A4	6.21E-02	1.14E-08	2.08E-04	5.48E-05	3.63E-05	1.64E-07	9.39E-01
	Construction	A5	9.41E-02	1.11E-08	4.36E-04	1.04E-04	8.80E-05	9.69E-07	2.75
Use stage	Use	B1	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Maintenance	B2	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Repair	B3	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Refurbishment	B5	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Operational energy use	B6	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Transport	C2	4.90E-02	9.16E-09	2.18E-04	5.71E-05	3.60E-05	1.24E-07	7.54E-01
	Waste processing	C3	MNR	MNR	MNR	MNR	MNR	MNR	MNR
	Disposal	C4	1.96E-02	5.15E-09	1.37E-04	4.50E-05	2.28E-05	2.78E-08	4.80E-01
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	3.70	8.47E-04	3.70	1.35E+02	0	1.35E+02
Construction process stage	Transport	A4	1.25E-02	4.64E-08	1.25E-02	9.32E-01	0	9.32E-01
	Construction	A5	7.45E-02	1.69E-05	7.45E-02	2.74	0	2.74
Use stage	Use	B1	MNR	MNR	MNR	MNR	MNR	MNR
	Maintenance	B2	MNR	MNR	MNR	MNR	MNR	MNR
	Repair	B3	MNR	MNR	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR	MNR	MNR
	Refurbishment	B5	MNR	MNR	MNR	MNR	MNR	MNR
	Operational energy use	B6	MNR	MNR	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	MNR	MNR	MNR	MNR	MNR	MNR
	Transport	C2	1.08E-02	3.63E-08	1.08E-02	7.50E-01	0	7.50E-01
	Waste processing	C3	MNR	MNR	MNR	MNR	MNR	MNR
	Disposal	C4	1.47E-02	4.01E-08	1.47E-02	4.83E-01	0	4.83E-01
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	0	0	9.50E-02
Construction process stage	Transport	A4	0	0	0	2.03E-04
	Construction	A5	0	0	0	1.92E-03
Use stage	Use	B1	MNR	MNR	MNR	MNR
	Maintenance	B2	MNR	MNR	MNR	MNR
	Repair	B3	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR
	Refurbishment	B5	MNR	MNR	MNR	MNR
	Operational energy use	B6	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	MNR	MNR	MNR	MNR
	Transport	C2	0	0	0	1.71E-04
	Waste processing	C3	MNR	MNR	MNR	MNR
	Disposal	C4	0	0	0	5.40E-04
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	1.02E-01	2.20E-01	2.43E-04
Construction process stage	Transport	A4	3.93E-04	4.38E-02	6.47E-06
	Construction	A5	2.06E-03	4.74E-02	5.06E-06
Use stage	Use	B1	MNR	MNR	MNR
	Maintenance	B2	MNR	MNR	MNR
	Repair	B3	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR
	Refurbishment	B5	MNR	MNR	MNR
	Operational energy use	B6	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	MNR	MNR	MNR
	Transport	C2	3.19E-04	4.57E-02	5.19E-06
	Waste processing	C3	MNR	MNR	MNR
	Disposal	C4	3.61E-04	1.89E+00	2.97E-06
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	2.33E-02	8.19E-03	9.88E-02	0
Construction process stage	Transport	A4	0	0	0	0
	Construction	A5	4.66E-04	1.64E-04	1.98E-03	0
Use stage	Use	B1	MNR	MNR	MNR	MNR
	Maintenance	B2	MNR	MNR	MNR	MNR
	Repair	B3	MNR	MNR	MNR	MNR
	Replacement	B4	MNR	MNR	MNR	MNR
	Refurbishment	B5	MNR	MNR	MNR	MNR
	Operational energy use	B6	MNR	MNR	MNR	MNR
	Operational water use	B7	MNR	MNR	MNR	MNR
End of life	Deconstruction, demolition	C1	MNR	MNR	MNR	MNR
	Transport	C2	0	0	0	0
	Waste processing	C3	MNR	MNR	MNR	MNR
	Disposal	C4	0	2.00E-02	1.90E-01	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	Transport with Kingspan 24T trucks and external transporters		
	Fuel type / Vehicle type	Litre of fuel type per distance or vehicle type	Truck 24T
	Distance:	km	177
	Capacity utilisation (incl. empty returns)	%	90
	Bulk density of transported products	kg/m ³	35
A5 – Installation in the building	Installation done by contractors, assumption of 2% installation losses		
B2 – Maintenance	The insulation does not require maintenance once installed		
B3 – Repair	The insulation does not require repair		
B4 – Replacement	The insulation does not require replacement		
B5 – Refurbishment	The insulation does not require refurbishment		
Reference service life	60 year		
B6 – Use of energy; B7 – Use of water	The insulation lasts the life span of the building - no operational energy- or water use applicable		
C1 to C4 End of life,	Disposal – waste routes (in kg of the declared functional unit)		
	Recycled / reused	kg	0.02
	Incinerated	kg	0.19
	Landfill	kg	1.89
	Distance to waste processing site	km	177

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.

BSI. Environmental labels and declarations – Type III Environmental declarations – Principles and procedures. BS EN ISO 14025:2010 (exactly identical to ISO 14025:2006). London, BSI, 2010.

BSI. Environmental management – Life cycle assessment – Principles and framework. BS EN ISO 14040:2006. London, BSI, 2006.

BSI. Environmental management – Life cycle assessment – requirements and guidelines. BS EN ISO 14044:2006. London, BSI, 2006.

CEN. Thermal insulation products for buildings - Factory made phenolic foam (PF) products – Specification. EN 13166:2012+A2:2016. Brussels, CEN, 2016.

www.kingspan.com