

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A2

Owner of the Declaration	Kingspan Insulation B.V.
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-KIN-20230016-CBA1-EN
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Valid to	06/02/2028

Kingspan Sauna-Satu®
Kingspan Insulation B.V.

www.ibu-epd.com | <https://epd-online.com>



General Information

<p>Kingspan Insulation B.V.</p> <hr/> <p>Programme holder IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany</p> <hr/> <p>Declaration number EPD-KIN-20230016-CBA1-EN</p> <hr/> <p>This declaration is based on the product category rules: Insulating materials made of foam plastics, 01.2019 (PCR checked and approved by the SVR)</p> <hr/> <p>Issue date 07/02/2023</p> <hr/> <p>Valid to 06/02/2028</p> <hr/> <div style="text-align: center;">  </div> <hr/> <p>Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)</p> <hr/> <div style="text-align: center;">  </div> <hr/> <p>Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)</p>	<p>Kingspan Sauna-Satu®</p> <hr/> <p>Owner of the declaration Kingspan Insulation Oy Sillanpääkatu 20 38710 Kankaanpää Finland</p> <hr/> <p>Declared product / declared unit Kingspan Sauna-Satu® 1m², 30mm thickness, R_D = 1,35 m².K/W</p> <hr/> <p>Scope: The insulation material Kingspan Sauna-Satu® is produced by Kingspan Insulation at the manufacturing facility in Kankaanpää (Finland).</p> <p>Kingspan Sauna-Satu® is an insulation board with a rigid thermoset polyisocyanurate (PIR) fibrefree insulation core, faced on both sides with a low emissivity composite foil. Kingspan Sauna-Satu® is used as thermal insulation of sauna walls and ceilings.</p> <p>The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.</p> <p>The EPD was created according to the specifications of <i>EN 15804+A2</i>. In the following, the standard will be simplified as <i>EN 15804</i>.</p> <hr/> <p>Verification</p> <table border="1"> <tr> <td colspan="2">The standard <i>EN 15804</i> serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to <i>ISO 14025:2011</i></td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/> internally</td> <td style="text-align: center;"><input checked="" type="checkbox"/> externally</td> </tr> </table> <hr/> <div style="text-align: center;">  </div> <hr/> <p>Vito D'Incognito (Independent verifier)</p>	The standard <i>EN 15804</i> serves as the core PCR		Independent verification of the declaration and data according to <i>ISO 14025:2011</i>		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
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Independent verification of the declaration and data according to <i>ISO 14025:2011</i>							
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Product

Product description/Product definition

Kingspan Sauna-Satu® is an insulation board with a rigid thermoset polyisocyanurate (PIR) fibre-free insulation core, faced on both sides with a low emissivity composite foil. The product is available in 30 mm thickness. This EPD is based on a thickness of 30 mm and R_D-value of 1,35 m².K/W.

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (*CPR*) applies. The product needs a declaration of performance taking into consideration *EN 13165* - Thermal insulation products for buildings - Factory made polyurethane foam (PU) products - Specification and the CE-marking. For the application and use the respective national provisions apply.

Application

Kingspan Sauna-Satu® is used as thermal insulation of sauna walls and ceilings.

Technical Data

Constructional data

Name	Value	Unit
Thermal conductivity according to EN 13165	0.022	W(m.K)
Reaction to fire according to EN 13165	E	
Compressive strength according to EN 13165	CS(10Y) 100	
Thickness tolerance according to EN 13165	T2	

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 13165* - Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU) products - Specification.

The declaration of performance of the product can be found at www.kingspan.com.

Base materials/Ancillary materials

The product contains approximately 0,6 kg/m² polyurethane rigid foam and 0,3 kg/m² multi-layer aluminium facings.

The main materials of the polyurethane foam are MDI (between 57-62 %), polyol (between 27-32 %) and a blowing agent (between 5-6 %). Due to the closed-cell structure (conform *EN 13165*), the blowing agent remains in the foam. Water, flame retardants and additives are added (between 4-8 %).

In the current *REACH* regulations, polyurethane foam insulation products are considered “articles” and are

exempt from the requirements of Articles 57 and 59(1) of *REACH Regulation (EC) No 1907/2006*. These products are not classified as “hazardous products” according to any current legislation, and can hence be declared as follows:

- This article contains substances listed in the *candidate list* (date: 31.08.2022) exceeding 0.1 percentage by mass: no.
- This article contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the *candidate list*, exceeding 0.1 percentage by mass: no.
- Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the *(EU) Biocidal Products Regulation No. 528/2012 (BPR)*: no.

Reference service life

The reference service life is not to be declared in this EPD as it does not cover the use stage.

LCA: Calculation rules

Declared Unit

The declared unit (1 m²) and conversion factors are listed in the table below.

Declared unit

Name	Value	Unit
Declared unit	1	m ²
Gross density	30	kg/m ³
Grammage	0.9	kg/m ²
Layer thickness	0.03	m

The scope of this EPD is the thermal insulation product Kingspan Sauna-Satu® as produced by Kingspan Insulation at the manufacturing facility in Kankaanpää (Finland). The environmental impacts have been calculated over the calendar year 2021.

The EPD is studied for a product thickness of 30 mm.

System boundary

The type of EPD according to *EN 15804* is: cradle to gate with options, modules C1–C4, and module D (A1–A3, C, D and additional modules: A4, A5).

The product stage is a mandatory information module and it covers:

- A1, raw material extraction and processing, processing of secondary material input (e.g. recycling processes),
- A2, transport to the manufacturer,
- A3, manufacturing, including provision of all materials, products and energy, packaging processing and its transport, as well as waste processing up to the end-of-waste state or disposal of final residues during the product stage.

The construction process stage includes:

- A4 transport to the building site;
- A5 installation in the building including provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the construction process stage.

The end-of-life stage is a mandatory information module and it covers:

- C1 de-construction, demolition;
- C2 transport to waste processing;
- C3 waste processing for reuse, recovery and/or recycling;
- C4 disposal (not applicable for this EPD) including provision and all transport, provision of all materials, products and related energy and water use.

Environmental burden of the incineration (R1 > 60 %) of the product at the end-of-life stage are assigned to the product system (C3); resulting potential credits for thermal and electrical energy from energy substitution are declared in module D.

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

Background database

Background data from GaBi ts Version 10 is used with GaBi data sets CUP2022.1.

LCA: Scenarios and additional technical information

Characteristic product properties

Information on biogenic carbon

The total mass of biogenic carbon containing materials is less than 5 % of the total mass of the product and accompanying packaging.

Technical information

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment.

Manufacturing (A3)

A polyethylene packaging foil is used. The products are transported either on wooden pallets. Within Module A3 the following packaging of the final product is included:

- Polyethylene cover and wrap: 0,009 kg/m²
- Expanded Polystyrene skid: 0,000 kg/m²
- Wooden pallet: 0,017 kg/m²

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel	0.0103	l/100km
Transport distance	100	km
Gross density of products transported	30	kg/m ³

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site	0.027	kg

The recycling of the packaging is considered in A5.

End of life (C1-C4)

The assumptions for C1 are: diesel driven excavator (100 kW; 0.2 litre fuel per ton excavated material). The assumptions for C2 are: Truck Euro 6, diesel driven, 26-28 t gross weight, assumed distance 50 km

Name	Value	Unit
Collected as mixed construction waste	0.9	kg
Energy recovery	0.875	kg
Recycling (aluminium content of the multi-layer aluminium facings)	0.025	kg

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Waste incineration with energy recuperation is assumed as end-of-life scenario

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1m2 30mm Kingspan Sauna-Satu®

Core Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ -Eq.]	2.45E+0	7.58E-3	5.34E-2	5.77E-4	3.79E-3	1.84E+0	0.00E+0	-8.47E-1
GWP-fossil	[kg CO ₂ -Eq.]	2.67E+0	7.54E-3	2.29E-2	5.77E-4	3.77E-3	1.67E+0	0.00E+0	-8.43E-1
GWP-biogenic	[kg CO ₂ -Eq.]	-2.19E-1	-1.04E-5	3.05E-2	7.72E-7	-5.21E-6	1.66E-1	0.00E+0	-3.83E-3
GWP-luluc	[kg CO ₂ -Eq.]	1.68E-3	4.21E-5	3.25E-7	7.12E-9	2.10E-5	3.71E-6	0.00E+0	-1.06E-4
ODP	[kg CFC11-Eq.]	5.71E-12	4.52E-16	6.31E-15	3.54E-17	2.26E-16	1.41E-13	0.00E+0	-4.58E-12
AP	[mol H ⁺ -Eq.]	6.04E-3	7.78E-6	7.15E-6	2.68E-6	3.89E-6	1.03E-3	0.00E+0	-1.81E-3
EP-freshwater	[kg P-Eq.]	1.20E-5	2.25E-8	1.56E-9	1.16E-10	1.13E-8	3.87E-8	0.00E+0	-9.76E-7
EP-marine	[kg N-Eq.]	1.50E-3	2.54E-6	2.18E-6	1.28E-6	1.27E-6	4.93E-4	0.00E+0	-3.45E-4
EP-terrestrial	[mol N-Eq.]	1.57E-2	3.03E-5	3.35E-5	1.40E-5	1.51E-5	5.69E-3	0.00E+0	-3.71E-3
POCP	[kg NMVOC-Eq.]	6.67E-3	6.85E-6	6.03E-6	3.62E-6	3.43E-6	1.27E-3	0.00E+0	-1.00E-3
ADPE	[kg Sb-Eq.]	1.90E-6	6.31E-10	1.54E-10	2.36E-11	3.15E-10	3.82E-9	0.00E+0	-1.12E-7
ADPF	[MJ]	6.52E+1	1.01E-1	1.47E-2	7.80E-3	5.04E-2	4.81E-1	0.00E+0	-1.35E+1
WDP	[m ³ world-Eq deprived]	3.57E-1	6.77E-5	5.32E-3	1.07E-6	3.39E-5	1.85E-1	0.00E+0	-9.99E-2

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1m2 30mm Kingspan Sauna-Satu®

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	1.03E+1	5.73E-3	2.59E-1	2.95E-5	2.87E-3	8.65E-2	0.00E+0	-4.21E+0
PERM	[MJ]	2.55E-1	0.00E+0	-2.55E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	1.06E+1	5.73E-3	3.61E-3	2.95E-5	2.87E-3	8.65E-2	0.00E+0	-4.21E+0
PENRE	[MJ]	3.72E+1	1.01E-1	4.02E-1	7.82E-3	5.05E-2	2.81E+1	0.00E+0	-1.35E+1
PENRM	[MJ]	2.80E+1	0.00E+0	-3.87E-1	0.00E+0	0.00E+0	-2.77E+1	0.00E+0	0.00E+0
PENRT	[MJ]	6.53E+1	1.01E-1	1.47E-2	7.82E-3	5.05E-2	4.81E-1	0.00E+0	-1.35E+1
SM	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m ³]	1.95E-2	6.48E-6	1.26E-4	4.44E-8	3.24E-6	4.35E-3	0.00E+0	-5.85E-3

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA - WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1m2 30mm Kingspan Sauna-Satu®

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	4.39E-8	4.84E-13	1.31E-12	2.58E-14	2.42E-13	6.44E-11	0.00E+0	-1.21E-9
NHWD	[kg]	1.17E-1	1.45E-5	2.24E-3	7.32E-7	7.24E-6	1.37E-2	0.00E+0	-6.02E-2
RWD	[kg]	1.45E-3	1.25E-7	7.22E-7	8.57E-9	6.23E-8	2.05E-5	0.00E+0	-1.03E-3
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.54E-2	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	2.60E-2	0.00E+0	0.00E+0	7.55E-1	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	8.53E-2	0.00E+0	0.00E+0	2.88E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	1.53E-1	0.00E+0	0.00E+0	5.15E+0	0.00E+0	0.00E+0

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

**RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional:
1m2 30mm Kingspan Sauna-Satu®**

Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease Incidence]	5.62E-8	4.49E-11	5.56E-11	3.03E-11	2.25E-11	2.98E-9	0.00E+0	-1.71E-8
IRP	[kBq U235-Eq.]	1.85E-1	1.83E-5	1.09E-4	1.25E-6	9.12E-6	3.29E-3	0.00E+0	-1.80E-1
ETP-fw	[CTUe]	2.73E+1	7.00E-2	8.75E-3	5.43E-3	3.50E-2	1.71E-1	0.00E+0	-3.31E+0
HTP-c	[CTUh]	1.82E-9	1.41E-12	5.24E-13	1.01E-13	7.06E-13	1.24E-11	0.00E+0	-2.26E-10
HTP-nc	[CTUh]	1.51E-7	7.32E-11	4.04E-11	5.08E-12	3.66E-11	4.60E-10	0.00E+0	-6.65E-9
SQP	[-]	3.78E+1	3.47E-2	4.01E-3	2.15E-5	1.74E-2	1.04E-1	0.00E+0	-2.07E+0
Caption	PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index								

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. 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 or to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

References

Biocidal Products Regulation No. 528/2012 (BPR)

Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products

CPR

Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised condition for the marketing of construction products and repealing Council Directive 89/106/EC

ISO 14025

EN ISO 14025:2011, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

EN 13165

EN 13165:2012+A2:2016: Thermal insulation products for buildings. Factory made polyurethane foam (PU) products. Specification

EN 15804

EN 15804:2012+A2:2019+AC:2021, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

GaBi ts

thinkstep AG: Leinfelden-Echterdingen GaBi Software-System and Database for Life Cycle Engineering 1992-2019

IBU 2021

Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021.

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LCA-tool

Kingspan LCA tool, version 1.1. IBU-KSI-202001-LT1-EN.

Developed by Sphera Solutions GmbH (formely Thinkstep GmbH)

PCR Version 1.7, Part A

Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Building-Related Products and services, Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019 November 2021

PCR 2017, Part B

Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part B: Requirements on the EPD for insulating materials made of foam plastics. January 2019

REACH

Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

<https://echa.europa.eu/candidate-list-table>;

Candidate list

<https://echa.europa.eu/candidate-list-table>; accessed 31.08.2022, 233 substances listed.

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