Program EPDPoland
Operator: MULTICERT Sp. z o.o.

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Product name: SMOKE FLAP SKY 1

Producer: Kingspan Light + Air Polska Sp. z o.o

Address:
ul. Franciszka Klimczaka 1
02-797 Warszawa, Poland

Issued on 23 July 2024

Valid until 22 July 2029

GENERAL INFORMATION

EPD OWNER

Manufacturer / EPD Holder	Kingspan Light + Air Polska Sp. z o.o.
Address	ul. Franciszka Klimczaka 1 02-797 Warszawa, Poland
Contact details	Marcin Pielaszek marcin.pielaszek@kingspan.com
Website	www.kingspanlightandair.pl

PRODUCT IDENTIFICATION

Product name	SMOKE FLAP SKY 1
Product number / reference	150x250
Place(s) of production	Ryczywół, Poland

EPD INFORMATION

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.

EPD Poland program operator	Multicert Sp. z o.o. Ul. Mydlarska 47, 04-690 Warszawa, Poland www.epd.org.pl, epd@epd.org.pl
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804+A2 serves as the core PCR.
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☒ External verification
EPD verifier	Izabela Sztamberek-Sochan, Ph.D.
EPD number	EPDP 02.03.2024
Registration:	EPD Polska www.epd.org.pl
Publishing date	23 July 2024
EPD valid until	22 July 2029
Reasons for performing LCA	B2B
Accountability	The EPD Holder is responsible for the information provided and evidence. Multicert Sp. z o.o. does not hold responsibility for the manufacturer information, life cycle assessment data nor supporting evidence.

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Single smoke flap SKY 1 with ventilation function opened by a pneumatic or electric actuator.

PRODUCT APPLICATION

The smoke flap SKY 1 is used for smoke extraction or daily ventilation. It also allows for daylight illumination of buildings such as warehouse and production halls, commercial, retail, and other buildings, both new and renovated.

PRODUCT STANDARDS

The product complies with PN EN 12101-2 *Smoke and heat control systems - Part 2: Natural smoke and heat exhaust ventilators.*

PHYSICAL PROPERTIES OF THE PRODUCT

Dimensions: 150 cm x 250 cm

Weight – 141,9 kg (version with two actuators: a pneumatic one used for smoke ventilation and an electric one used for regular ventilation)

Temperature resistance B 600

Snow load SL up to 700

Wind load WL 1500

Insulation coefficient U up to 1.1 W/m²K

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at www.kingspanlightandair.pl

PRODUCT RAW MATERIAL COMPOSITION

Material	Amount % (by weight)
Steel	20%
Hot-deep galvanized steel	41%
Aluminum	24%
Plastic	13%
Copper	1%
Bass	1%

SUBSTANCES, REACH - VERY HIGH CONCERN

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

PRODUCT LIFE-CYCLE

RAW MATERIALS PROCUREMENT (A1-A2)

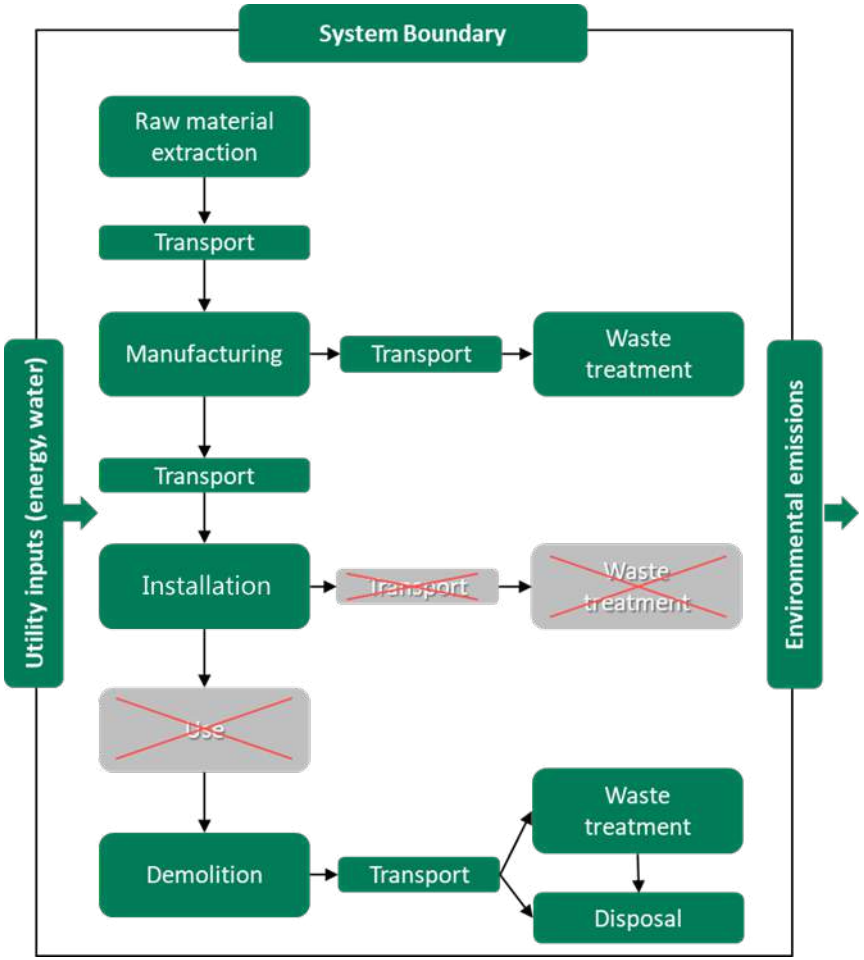
Modules A1 and A2 describe the procurement and transportation of raw materials, including aluminum profiles, polycarbonate plates, actuators, and other small components used in the production of smoke flaps. The aluminum profiles are sourced from several leading manufacturers in Poland, ensuring high-quality material for the production process. Polycarbonate plates and actuators are also critical components, acquired from reliable suppliers. Module A2 (transport) involves the transportation of these materials to the production site, utilizing truck transport and adhering to Polish and European fuel data averages. Actual data on the distances over which the goods were transported have been used to ensure accurate reporting.

MANUFACTURING AND PACKAGING (A1-A3)

At the beginning of the smoke flap production process, proper profiles are cut from raw materials. After the initial cutting, the materials are transported to the welding station, where the cut profiles undergo a welding process to create the frame and the hatch frame. Following welding, the polycarbonate plate is subjected to mechanical processing to achieve the desired shape.

Next, the welded components and shaped polycarbonate plate are moved to the assembly stations, where the smoke flap is assembled. Once the assembly is completed, the smoke flap along with the bottom profile is secured on a transport pallet and stored in the warehouse.

Diagram 1 - Life cycle stages:



TRANSPORT & INSTALLATION (A4, A5)

Ready-to-ship smoke flaps are then transported to the construction site, where the final installation takes place. This includes the completion of the smoke flap with traverses, actuators, and a steel base. The on-site assembly is performed under the supervision of a representative from Kingspan Light + Air Polska Sp. z o. o., by trained personnel.

After the completion of the on-site assembly, the fully assembled smoke flap is inspected and approved by an authorized representative of Kingspan Light + Air Polska Sp. z o. o. The production processes carried out are shown in the attached process flowchart.

Impacts occurring in stage A4 from final product's delivery to installation site cover direct exhaust emissions of fuel and in stage A5 environmental impacts of installation were allocated as per a single unit.

PRODUCT END OF LIFE (C1-C4, D)

At the end-of-life, in the demolition phase 100% of the waste is assumed to be collected as separate construction waste and used for recycling. (C1). All of end-of-life product is assumed to be sent to the closest facilities that is assumed to be 40 kms away (C2). Polycarbonate is incinerated whilst some of the waste is processed (C3). The rest of the waste is sent to landfill (C4). All of the metal waste is recycled, and a portion of the electric component is also recycled (D).

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2023 year

DECLARED AND FUNCTIONAL UNIT

Declared unit	One smoke flap SKY 1 - 150x250 cm
Mass per declared unit	141.9 kg

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	-

SYSTEM BOUNDARY

The scope of the EPD is "cradle to gate with modules C1-C4 and D". The modules A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Installation) as well as C1 (Deconstruction/ demolition), C2 (Transport at end-of-life), C3 (Waste processing), C4 (Disposal) and D (benefits and loads beyond the system boundary) are included in the study.

Product stage			Assembly 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	D	D
X	X	X	X	X	MND	MND	MNR	MNR	MNR	MND	MND	x	x	x	x	x	x	x
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the *EN 15804:2012+A2:2019*. 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 which data are available for are included in the calculation. There is no neglected unit process more than 1% of total mass and energy flows. The total neglected input and output flows do also not exceed 5% of energy usage or mass. The life cycle analysis includes all industrial processes from raw material acquisition to production, distribution, and end-of-life stages.

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.

ALLOCATION

The allocation is made in accordance with the provisions of EN 15804. Energy (electricity and heating), water, and waste production in-house are allocated equally among all products through mass allocation. The recycling process and transportation of the material are allocated to this analysis.

ESTIMATES AND ASSUMPTIONS

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. All estimations and assumptions are given below:

- Module (A1-A3): 100% Mass Balance is considered, and no additional waste is generated, only a small portion for weight loss is considered for the production of the unit as per the raw materials added.
- Module (A5): Resources such as energy (electricity, heating and diesel) and water were taken into account for a certain amount of the product. However, the quantities were then allocated as per the Functional Unit and integrated into the LCA model.
- Module (C1): For deconstruction and demolition, resource use is assumed to be similar to that of the installation process, except for iron screws.
- Module (C2): Transportation is assumed to cover a distance of 40 km from the site to the waste processing location
- For the end-of-life scenario (C3, C4 and D):

  1) Metal parts are 100% recycled

  2) Actuators are processed through 50% dismantling and component separation, with 10% of the total waste being recycled metal parts.

  3) Polycarbonate components are incinerated,

  4) The remaining materials are sent to landfill.

- Disposal (C4): The dataset used for modelling the landfill of smoke flap represents the environmental profile of inert waste in a typical European municipal waste landfill. Inert disposal of smoke flap in landfill has also been included based on the method outlined in the BRE environmental profiles methodology document.

Data Quality

For foreground data, the LCA study relies on high-quality primary data gathered by Kingspan Light + Air Polska Sp. z o.o. including detailed EPD information obtained from providers of the actuators. All relevant background data sets have been sourced from the OpenLCA software's database: ecoinvent 3.9.1, which includes consistent and well-documented data sets accessible in the ecoinvent online database or through the ecoinvent database documentation.

Geographic Representativeness

The specified land or region where the product system is manufactured, utilized, or managed at the end of its lifespan is Poland, Europe.

ENVIRONMENTAL IMPACT DATA

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

Impact category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Acidification	mol H+e	3.04E+00	1.16E-01	9.10E-02	MND	5.40E-02	1.00E-02	3.00E-03	2.00E-03	-2.45E+00
Climate change – total	kg CO2e	5.12E+02	3.23E+00	3.56E+01	MND	9.92E+00	3.27E+00	9.40E-02	2.25E+00	-3.73E+02
Climate change – fossil	kg CO2e	-1.52E+00	-3.20E+01	-5.80E-02	MND	-3.00E-03	-3.00E-03	0.00E+00	2.00E-03	1.72E+00
Climate change – biogenic	kg CO2e	5.13E+02	3.52E+01	3.57E+01	MND	9.92E+00	3.27E+00	9.40E-02	2.25E+00	-3.74E+02
Climate change – LULUC	kg CO2e	1.17E+00	6.10E-02	1.10E-02	MND	1.00E-03	1.00E-03	0.00E+00	0.00E+00	-1.08E+00
Abiotic depletion of fossil resources	MJ	5.84E+03	1.48E+02	4.83E+02	MND	1.30E+02	4.53E+01	1.41E+00	4.50E+00	-3.55E+03
Eutrophication, aquatic freshwater	kg PO4e	1.70E-01	3.00E-03	4.00E-03	MND	0.00E+00	0.00E+00	0.00E+00	1.00E-03	-1.29E-01
Eutrophication, aquatic marine	kg Ne	5.24E-01	1.13E-01	5.10E-02	MND	2.50E-02	3.00E-03	1.00E-03	8.90E-02	-3.91E-01
Eutrophication, terrestrial	mol Ne	5.48E+00	5.46E-01	5.44E-01	MND	2.76E-01	3.30E-02	1.50E-02	8.00E-03	-4.12E+00
Abiotic depletion, minerals & metals	kg Sbe	2.00E-03	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-03
Ozone depletion	kg CFC11e	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Photochemical ozone formation	kg NMVOCe	1.98E+00	1.78E-01	1.98E-01	MND	8.80E-02	1.40E-02	4.00E-03	3.00E-03	-1.35E+00
Water use	m3e depr.	1.43E+02	4.07E+00	2.86E+00	MND	2.65E-01	2.33E-01	1.87E-01	-3.00E-03	-9.86E+01

MND abbreviation stands for Module Not Declared

EN 15804+A2 disclaimer for Abiotic depletion and Water use indicators and all 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 experienced with the indicator.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Eco-toxicity (freshwater)	CTUe	4.20E+03	1.76E+02	2.81E+02	MND	6.09E+01	2.29E+01	4.80E-02	2.19E+01	-7.10E+02
Human toxicity, cancer effects	CTUh	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Human toxicity, non-cancer effects	CTUh	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ionizing radiation, human health	kBq U235e	8.77E+00	5.00E-02	3.10E-01	MND	8.00E-03	2.20E-02	-7.00E-03	-3.00E-03	-3.59E+00
Particulate matter	Incidence	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

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.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Total use of non-renewable PER	MJ	5.84E+03	1.48E+02	4.83E+02	MND	1.30E+02	4.53E+01	1.41E+00	4.50E+00	-3.55E+03
Total use of renewable PER	MJ	4.27E+02	3.77E+02	5.73E+00	MND	3.04E-02	1.12E+00	-7.44E-01	-2.30E-01	-3.15E+02
Use of net fresh water	m_3	3.10E+00	7.58E-02	3.63E-02	MND	7.06E-03	9.36E-03	4.15E-03	3.87E-03	-1.93E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

PER abbreviation stands for primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Hazardous waste	kg	7.41E-05	2.40E-05	1.29E-05	MND	-2.00E-07	7.18E-08	6.04E-09	-2.70E-08	8.79E-06
High Level Radioactive waste	kg	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Intermediate and Low-Level Radioactive waste	kg	0.00E+00	0.00E+00	0.00E+00	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-hazardous waste	kg	1.51E-01	1.39E-01	2.94E-02	MND	-8.00E-04	-4.50E-04	-7.20E-06	-1.50E-04	2.41E-02

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	MND	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	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	MND	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	MND	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity, medium voltage, production mix (Reference product: electricity, medium voltage), Poland
Electricity CO2e / kWh	0,314 kg CO_2e / kWh
District heating data source and quality	Heat and power co-generation, natural gas, conventional power plant, 100mw electrical (Reference product: heat, district or industrial, natural gas), Poland, Ecoinvent 3,9.1, year: 2023
District heating CO2e / kWh	0.011 kg CO_2e / kWh

Transport scenario documentation

Scenario parameter	Value
A4 specific transport CO2e emissions, kg CO2e / tkm	0,132
A4 average transport distance, km	10
Transport capacity utilization, %	100%
Bulk density of transported products, kg/unit	140.7
Volume capacity utilisation factor for nested packaged products	1

End of life scenario documentation

Scenario parameter	Value
Collection process – kg collected separately	140.7
Collection process – kg collected with mixed waste	-
Recovery process – kg for re-use	-
Recovery process – kg for recycling	102.3
Recovery process – kg for energy recovery	-
Disposal (total) – kg for final deposition	38.405
Scenario assumptions for transportation	End-of-life product is transported 40 km with an average truck.

BIBLIOGRAPHY

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ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

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EPD (M-EPD-AZR-GB-107) Building Systems for Smoke & Heat Control Systems, Electrical Drives and Pneumatic Cylinders for SHEV & Ventilation Systems (2023

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General Instructions for the EPD programme of Institut Bauen und Umwelt e.V. (General Instructions for the IBU EPD programme)

The Circular Economy for Plastics A European Analysis. (2024).

Program EPDPoland
Operator: MULTICERT Sp. z o.o.

Reg. no. EPDP 02.03.2024

CERTIFICATE

ENVIRONMENTAL PRODUCT DECLARATION TYPE III

This document confirms that developed by the company
Kingspan Light + Air Polska Sp. z o.o.
Environmental Product Declaration for
SMOKE FLAP SKY 1 - 150x250 cm
meets the requirements of the standard
PN-EN 15804+A2:2020-03
and that the data contained therein have been prepared correctly.

Verification was carried out by:
Izabela Sztamberek Sochan, Ph.D.

EPD Environmental Product Declaration
EPD VERIFIED
EPD POLAND

This document is valid until 22 July 2029, or until the EPD is deregistered and its publication on the website www.epd.org.pl is discontinued.

EPD Poland Registration Office, Multicert Sp. z o.o.
Mydlarska 47,04-690 Warsaw, Poland.
Warsaw, July 23, 2024

www.epd.org.pl

EPD VERIFICATION:

The verification procedure for this Environmental Product Declaration (EPD) has been carried out in accordance with the requirements of ISO 14025 standards. Once the verification process is complete, the EPD remains valid for a period of 5 years. There is no need to recalculate the parameters contained in the EPD after this period, provided that the data underlying the declaration have not changed substantially.

EPD CONTRIBUTORS

Manufacturer representative	Marcin Pielaszek
EPD verifier	Izabela Sztamberek-Sochan, Ph.D.

Note: The sole ownership, liability, and liability of this declaration are with the EPD Owner. Construction product declarations may not be comparable if they do not comply with EN 15804. For detailed information on comparability, please refer to EN 15804 and ISO 14025.

Approved by: Grzegorz Suwara
Managing director of EPD POLSKA