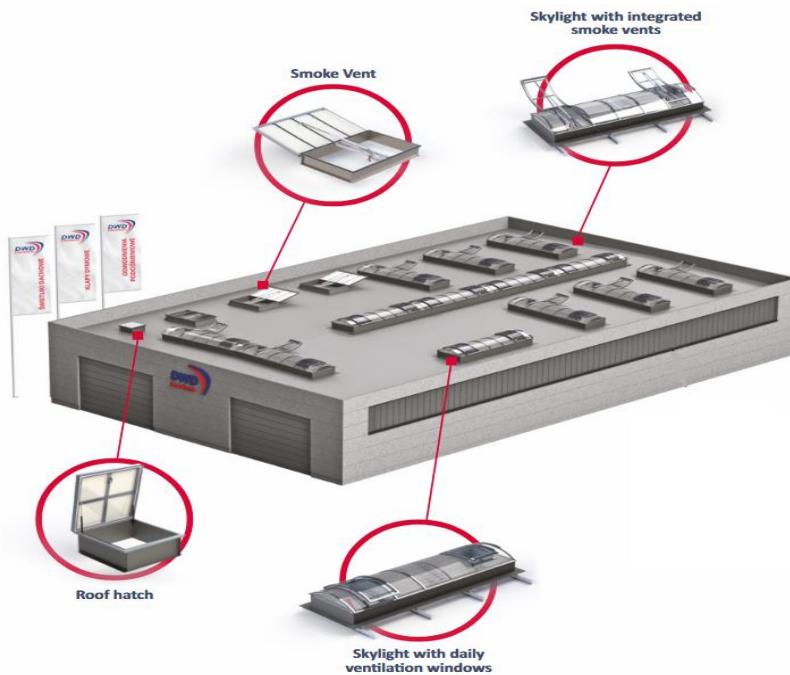




Issuance date: 26.05.2023  
Validity date: 26.05.2028

## DWD Sky Light and DWD Sky Vent products



### Owner of the EPD:

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ITB is the verified member of The European Platform for EPD program operators and LCA practitioner [www.eco-platform.org](http://www.eco-platform.org)

### Basic information

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment and their aspects verified by the independent body according to ISO 14025. Basically, comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804+A2.

**Life cycle analysis (LCA):** A1-A3, C1-C4 and D modules in accordance with EN 15804  
(Cradle-to-Gate with options)

**The year of preparing the EPD:** 2023

**Tech. assessment doc.:** EN 14963, EN 1873, EN 12101-2

**Service Life:** 30 years

**PCR:** ITB-PCR A

**Declared unit:** 1 m<sup>2</sup>

**Reasons for performing LCA:** B2B

**Representativeness:** Poland, European, 2021

### MANUFACTURER

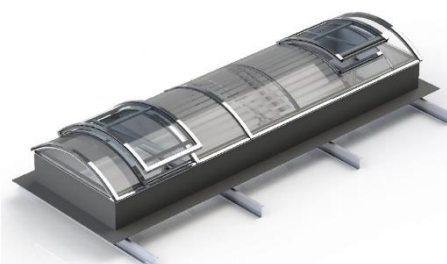
DWD BauTech Sp z o. o. was established in year 2010 as part of the DWD manufacturing group. The factory located in Ujazd (Poland) specializes in the production of lighting systems, skylights, smoke vents, roof skylights, lighting and smoke extraction systems for commercial buildings. DWD BauTech specializes in the design, production and installation of roof skylights, skylights, smoke hatches and roof hatches. They are used in halls for various purposes, sports and entertainment buildings and shopping malls. They are also perfect for facilities such as car workshops and outbuildings. The DWD



BauTech company offers a systems of modular polycarbonate panels. The modules are connected using a unique lock that guarantees tightness, which is used in wall lights, facades and roofing. The complete system consists of multi-chamber polycarbonate panels of various thicknesses and colors as well as standard aluminum profiles or with a thermal break.

### PRODUCT DESCRIPTION

The main purpose of [Sky Light](#) product (EN 14963) is to illuminate large areas with natural light, most often used for halls of various purposes (warehouses, industrial, fair), sports and entertainment buildings, shopping malls. In buildings with a smaller cubic capacity, such as outbuildings, workshops, car washes, public utility buildings, roof skylights also properly fulfill their lighting function. The supporting structure of the roof skylights is made of system profiles made of natural aluminum with a shape that ensures drainage of water. At the customer's request, aluminum profiles can be painted in any color according to the RAL palette. Rooflights are filled with multi-chamber polycarbonate panels available in various colors and thicknesses (10 - 25 mm), with specific heat transfer coefficients (starting from 1.3 W/(m<sup>2</sup>K). In the standard offer, the supporting structure of the skylight is a base made of galvanized steel sheet with a thickness of 1.5 - 3.0 mm, which should be raised above the roof slope to a height of approx. 15 ÷ 20 cm. DWD offers light strips up to 6 m wide, the length is unlimited due to the panel construction.



The task of the [Sky Vent](#) products (EN 12101-2) is to remove smoke, heat and fire gases in the event of a fire. Sky Vent smoke vents help to protect human life and property by: removing smoke from escape routes, which will make it easier to leave the building in the event of a fire protection of structural elements and equipment, as well as minimization of damage caused by smoke and hot fire gases facilitating firefighting operations. In addition to the smoke exhaust function, during normal use, smoke vents can be used as roof skylights, ventilation hatches or roof hatches. Sky Vent products are also made of steel, aluminum and polycarbonate (with a thickness of 10 to 25mm).



Technical data of the products can be found in the manufacturer's catalog from the [website](#).

## **LIFE CYCLE ASSESSMENT (LCA) – general rules applied**

### **Unit**

The declaration refers to the functional unit of 1 m<sup>2</sup> of products: Sky Light Plus, Sky Vent, Sky Vent Plus.

*Note: The conversion to a specific Sky Light or Sky Vent product should be done by converting the impact per 1 m<sup>2</sup> by multiplying by the specific surface of the analyzed product.*

### **System boundary**

Type of the EPD is: cradle to gate - with options. The following life cycle stages were considered. Production stage including: A1 – Raw material extraction and processing, A2 – Transport to the manufacturer and A3 – Manufacturing, A4- Transport to Site, A5- Installation, End-of-life stage: C1- Deconstruction, C2 – Transport to waste processing, C3 – Waste processing, C4 – Disposal (landfill). This includes 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. EPD includes D module- declaration of all benefits and loads beyond product system. Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

### **Allocation**

The allocation rules used for this EPD are based on general ITB's document PCR A (EN 15804+A2). The total average product mass recipe per unit was used for the calculations based on input materials mass divided by the number of specific DWD products. The input substances ranges are average values and the composition of specific products complying with the EPD can deviate from these concentration levels in individual cases.

### **System limits**

99.8% materials submitted for the formulations and production data were taken into consideration. In the assessment, all available data from production have been considered, i.e. all raw materials/elements used as per formulation process, utilized thermal energy for heating, and electric power consumption. Thus, material and energy flows contributing less than 1 % of mass or energy have been considered. It can be assumed that the total sum of neglected processes does not exceed 1 % of energy use and mass per modules. Machines and facilities required during production are neglected. The production of etiquettes was not considered. Electromechanical elements such as levellers were not taken into account in the calculations.

### **Modules A1 and A2: Raw materials supply and transport**

The modules A1 and A2 represent the extraction and processing of raw materials and components and transport to the production sites (including aluminium, steel, steel elements, polycarbonate, and plastics). For A2 module (transport) European averages for fuel data are applied. All distances and types of vehicles for all input products were declared by manufacturer (LCI) and considered. Data on mode of transport and distances, as reported by suppliers were used for those materials and parts contributing more than 0.2 % of total product mass.

**Module A3: Production**

The manufacturing process occurs in one factory in Ujazd in Poland. The production process is composed of: input material delivery (steel, aluminum, plastics, polycarbonate, other), cutting bending, drilling, welding, bonding, fitting accessories. The product specific manufacturing process line is presented in Figure 1. Electricity is consumed in the mixture process and gas for plant space heating purposes. The averaged product has the following averaged by weight material composition: aluminum 26.8%, polycarbonates 33.9%, steel and steel elements 31.9%, plastics and other 7.3%.

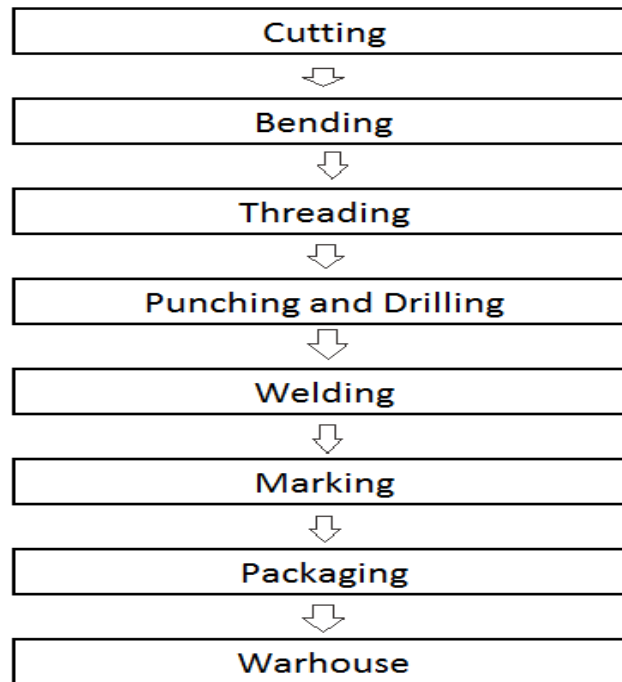


Fig. 1. A basic scheme of manufacturing process of DWD products

**Module A4, A5: transport to construction site and Installation**

Transport of the packed product from factory gate to the place of installation is considered. Delivery of the final product over a distance of 500 km by truck (Euro 5) was assumed. Installation is done with a crane and power tools, assuming only electricity consumption (declared by DWD).

**Modules C and D: End-of-life (EOL)**

The product (at the end of life in building) is to be removed from a building using electrical tools. The End of Life scenario is based on a material split and respective recycling rates (Table 2). In the applied scenario, the steel and aluminium parts (98%) are assumed mainly to be recycled, plastics polycarbonate are incinerated/recycled (80%). The energy required for treatment of recycled materials is included. In the adapted end-of-life scenario, the de-constructed products are transported to recycling plant 100 km on > 16t lorry EURO 5. Module D presents credits resulting from the recycling (packaging), energy recovered (plastic incineration) and steel/aluminium scrap use in a new metals production process. Regarding incineration, model for the waste incineration is adapted according to the material composition and heating value of the plastic material. The reuse, recovery and recycling stage is considered beyond the system boundaries (D). Net scrap is an amount of metal recycled at end-of-life minus scrap input from previous product life cycles. Each scenario assumes that rate % of the material is sent to that scenario (Table 2).

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Table 2. End-of-life scenario for the product components.

Material	Recycling %	Landfilling %	Energy recovery %
Steel (and steel elements)	98	2	0
Plastics/Polycarbonates	40	10	40
Aluminium	98	2	0
Other	80	15	5

Regarding the recycling material of metals, the metal parts in the EoL are declared as end-of-waste status. Electricity at end-of-life (module C) has been modelled. Electricity at end-of-life (module D) has been modelled using an average EU-27 electricity mix as the location where the product reaches end-of-life is unknown.

### **Data collection period**

The data for manufacture of the declared products refer to period between 01.01.2021 – 31.12.2021 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

### **Data quality**

The data selected for LCA originate from ITB-LCI questionnaires (1 manufacturing plants) completed by producer and verified via data audit. No data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency is judged as good. The background data for the processes come from the following resources database Ecoinvent v.3.9 (energy carriers, polycarbonate, plastics, steels, waste treatment, incineration, and packaging) and specific EPDs (aluminium). The background data for energy is national based on KOBiZE/GUS reports (Polish electricity mix and combustion factors for fuels). Specific (LCI) data quality analysis was a part of the input data verification. Where no background data was available, data gaps were complemented by literature research.

### **Assumptions and estimates**

The impacts of the representative gates products were aggregated using mass averaged approach per unit.

### **Calculation rules**

LCA was performed using ITB-LCA tool developed in accordance with EN15804+A2. Emission of greenhouse gases was calculated using the IPCC 2013 GWP method with a 100-year horizon. Emission of acidifying substances, Emission of substances to water contributing to oxygen depletion, Emission of gases that contribute to the creation of ground-level ozone, Abiotic depletion, and ozone depletion emissions where all calculated with the CML-IA baseline method

### **Additional information**

Polish electricity mix used (production) is 0.698 kg CO<sub>2</sub>/kWh (KOBiZE 2021). European electricity mix used is 0.430kg CO<sub>2</sub>/kWh for the end of life (Ecoinvent v3.9, RER).

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As a general rule, no particular environmental or health protection measures other than those specified by law are necessary. There is no harmful emissive potential. No damage to health or impairment is expected under normal use corresponding to the intended use of the product. The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available. Repairs or replacement are not usually necessary. No cleaning efforts need to be taken into consideration.

### LIFE CYCLE ASSESSMENT (LCA) – Results

#### Declared unit

The declaration refers to declared unit (DU) – 1 m<sup>2</sup>. The following life cycle modules (Table 3) were included in the analysis. The following tables 4-7 present the environmental impacts of the life cycle of covered DWD products

Table 3. System boundaries for the environmental characteristic included in LCA

Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction 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
MD	MD	MD	MD	MD	MND	MND	MND	MND	MND	MD	MND	MD	MD	MD	MD	MD

*Note: ITB is a public Research Organization and Notified Body (EC Reg. no 1488) to the European Commission and to other Member States of the European Union designated for the tasks concerning the assessment of building products' performance. ITB acts as the independent, third-party verification organization (17065/17025 certified).*

*ITB is the recognized and registered member of The European Platform for EPD program operators and LCA practitioner. The ITB-EPD program meets the requirements of the third-party verification, EPD declarations are verified by external LCA experts associated in the EPD program in compliance with ISO 14025.*

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Table 4. Life cycle assessment (LCA) results for DWD Sky Light and Sky Vent products – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO <sub>2</sub>	4.84E+01	1.82E+00	4.07E+00	5.43E+01	1.12E+00	1.65E+00	1.40E+00	2.96E-01	3.48E+00	2.34E-02	-5.56E+00
Greenhouse potential - fossil	eq. kg CO <sub>2</sub>	4.80E+01	2.18E+00	4.00E+00	5.41E+01	1.11E+00	1.63E+00	1.37E+00	2.95E-01	3.48E+00	2.31E-02	-5.50E+00
Greenhouse potential - biogenic	eq. kg CO <sub>2</sub>	2.54E-01	8.52E-03	1.02E-01	3.65E-01	3.81E-03	4.00E-02	4.00E-02	1.01E-03	0.00E+00	2.33E-04	-2.06E-02
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	2.13E-01	9.86E-04	1.36E-03	2.16E-01	4.37E-04	4.80E-04	4.80E-04	1.16E-04	0.00E+00	2.34E-05	-5.24E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	3.92E-06	4.97E-07	3.75E-07	4.79E-06	2.58E-07	2.80E-08	2.80E-08	6.82E-08	0.00E+00	7.03E-09	-4.85E-07
Soil and water acidification potential	eq. mol H+	3.02E-01	8.75E-03	4.06E-02	3.52E-01	4.52E-03	2.08E-02	1.52E-02	1.20E-03	7.51E-02	1.95E-04	-4.34E-02
Eutrophication potential - freshwater	eq. kg P	2.05E-02	1.66E-04	1.29E-02	3.36E-02	7.49E-05	2.60E-03	2.60E-03	1.98E-05	0.00E+00	6.71E-06	-2.29E-03
Eutrophication potential - seawater	eq. kg N	4.55E-02	2.58E-03	5.78E-03	5.38E-02	1.36E-03	5.11E-03	2.20E-03	3.61E-04	3.94E-02	6.73E-05	-4.70E-03
Eutrophication potential - terrestrial	eq. mol N	4.56E-01	2.14E-02	4.85E-02	5.25E-01	1.49E-02	5.05E-02	1.86E-02	3.94E-03	4.32E-01	7.32E-04	-4.78E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	2.11E-01	8.65E-03	5.92E-02	2.79E-01	4.56E-03	1.31E-02	5.20E-03	1.21E-03	1.07E-01	2.12E-04	-1.87E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	4.15E-04	9.49E-06	8.73E-05	5.12E-04	3.95E-06	6.68E-06	6.68E-06	1.05E-06	0.00E+00	7.83E-08	-4.70E-05
Abiotic depletion potential - fossil fuels	MJ	8.94E+02	3.22E+01	7.75E+01	1.00E+03	1.65E+01	2.32E+01	2.32E+01	4.38E+00	0.00E+00	5.34E-01	-7.86E+01
Water deprivation potential	eq. m <sup>3</sup>	3.55E+01	1.64E-01	1.27E+00	3.70E+01	7.64E-02	4.83E-01	4.80E-01	2.02E-02	3.93E-02	3.10E-03	-3.99E+00

Table 5. Life cycle assessment (LCA) results for DWD sky light and sky vent products – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1-A5	C1-C4	D
Particulate matter	disease incidence	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTU <sub>e</sub>	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTU <sub>h</sub>	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTU <sub>h</sub>	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA

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Table 6. Life cycle assessment (LCA) results for DWD Sky Light and Sky Vent products – the resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Consumption of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Total consumption of renewable primary energy resources	MJ	8.77E+01	5.29E-01	4.28E+00	9.26E+01	2.37E-01	1.72E+00	1.72E+00	6.28E-02	0.00E+00	9.38E-03	-1.56E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Consumption of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Total consumption of non-renewable primary energy resources	MJ	8.94E+02	3.22E+01	7.99E+01	1.01E+03	1.65E+01	2.33E+01	2.33E+01	4.38E+00	0.00E+00	5.77E-01	-8.06E+01
Consumption of secondary materials	kg	1.46E+00	1.26E-02	8.28E-03	1.48E+00	5.54E-03	2.12E-03	2.12E-03	1.47E-03	0.00E+00	0.00E+00	-1.50E-01
Consumption of renew. secondary fuels	MJ	9.92E-03	1.43E-04	3.05E-05	1.01E-02	6.11E-05	1.18E-05	1.18E-05	1.62E-05	0.00E+00	0.00E+00	-3.20E-04
Consumption of non-renewable secondary fuels	MJ	2.53E-02	0.00E+00	4.25E-02	6.78E-02	0.00E+00	1.88E-02	1.88E-02	0.00E+00	0.00E+00	0.00E+00	-3.74E-03
Net consumption of freshwater	m <sup>3</sup>	7.92E-01	4.42E-03	1.54E-01	9.50E-01	2.08E-03	6.30E-03	6.30E-03	5.51E-04	0.00E+00	8.33E-05	-9.38E-02

Table 7. Life cycle assessment (LCA) results for DWD Sky Light and Sky Vent products – waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	6.54E-03	4.05E-02	2.17E-02	6.88E-02	1.85E-02	2.40E-04	2.40E-04	4.91E-03	0.00E+00	8.41E-07	8.72E-01
Non-hazardous waste	kg	5.35E-02	7.28E-01	1.39E+00	2.18E+00	3.29E-01	1.25E-02	1.25E-02	8.72E-02	0.00E+00	2.20E+00	3.12E-01
Radioactive waste	kg	3.37E-06	2.73E-06	1.54E-04	1.60E-04	1.23E-06	1.74E-05	1.74E-05	3.27E-07	0.00E+00	3.25E-06	6.87E-04
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
Materials for recycling	kg	8.68E-03	1.08E-04	1.19E+00	1.19E+00	5.12E-05	2.40E-05	2.40E-05	1.36E-05	0.00E+00	0.00E+00	3.30E-04
Materials for energy recovery	kg	5.84E-05	8.63E-07	1.20E-03	1.26E-03	4.14E-07	2.10E-07	2.10E-07	1.10E-07	0.00E+00	0.00E+00	1.37E-06
Exported Energy	MJ	9.67E-01	0.00E+00	1.69E-01	1.14E+00	0.00E+00	6.92E-02	6.92E-02	0.00E+00	0.00E+00	0.00E+00	4.64E-02



## Type III Environmental Product Declaration No. 456/2023

### Verification

The process of verification of this EPD is in accordance with ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 (sub clause 8.1.3.) <input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification: Halina Prejzner, PhD. Eng. LCA, LCI audit and input data verification: Michał Piasecki, PhD., D.Sc., eng.

*Note 1: The declaration owner has the sole ownership, liability, and responsibility for the for the information provided and contained I EPD. Declarations of construction products may not be comparable if they do not comply with EN 15804+A2. For further information about comparability, see EN 15804+A2 and ISO 14025.*

*Note 2: Note: ITB is a public Research Organization and Notified Body (EC Reg. no 1488) to the European Commission and to other Member States of the European Union designated for the tasks concerning the assessment of building products' performance. ITB acts as the independent, third-party verification organization (17065/17025 certified). ITB-EPD program is recognized and registered member of The European Platform – Association of EPD program operators and ITB-EPD declarations are registered and stored in the international [ECO-PORTAL](#).*

### Normative references

- ITB PCR A, V1.6 General Product Category Rules for Construction Products (2023)
- eN 17213:2020 Windows and doors. Environmental Product Declarations. Product category rules for windows and pedestrian doorsets
- EN 14963:2006 Roof coverings - Continuous rooflights of plastics with or without upstands - Classification, requirements and test methods
- EN 13241-1:2003+A1:2011 Industrial, commercial and garage doors and gates - Product standard Part 1: Products without fire resistance or smoke control characteristics/
- EN 1873+A1 Prefabricated accessories for roofing - Individual rooflights of plastics - Product specification and test methods
- EN 12101-2:2003. Smoke and heat control systems – Part 2: Specification for natural smoke and heat exhaust ventilators
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 14067:2018 Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- <https://ecoinvent.org/>



**Instytut Techniki Budowlanej**

00-611 Warsaw, Filtrów 1

**Thermal Physics, Acoustics and Environment Department**

02-656 Warsaw, Kasawerów 21

**CERTIFICATE № 456/2023**  
**of TYPE III ENVIRONMENTAL DECLARATION**

Products:

**Sky Light Plus – skylights, Smoke Vent- smoke vents,  
Smoke Vent Plus – smoke vents built into skylights**

Manufacturer:

**DWD BauTech Sp. z o.o.**

ul. J.H. Dąbrowskiego 77a, 60-529 Poznań, Poland

confirms the correctness of the data included in the development of  
Type III Environmental Declaration and accordance with the requirements of the standard

**EN 15804+A2**

**Sustainability of construction works.**

**Environmental product declarations.**

**Core rules for the product category of construction products.**

This certificate, issued on 26<sup>th</sup> May 2023 is valid for 5 years  
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics  
and Environment Department

*Agnieszka Winkler-Skalna*  
Agnieszka Winkler-Skalna, PhD



Deputy Director  
for Research and Innovation

*Krzysztof Kulczyński*  
Krzysztof Kulczyński, PhD

Warsaw, May 2023