Łukasiewicz
Institute of Ceramics
and Building Materials

FAKRO

ENVIRONMENTAL PRODUCT DECLARATION

no. 01-02/2026

Flashings for roof windows

FAKRO PP Sp. z o.o

Owner of the declaration: *FAKRO PP Sp. z o.o.*
Program owner: *Łukasiewicz Research Network – Institute of Ceramics and Building Materials*
Data of issue: ***17.02.2026***
Declaration valid until: ***17.02.2031***

ENVIRNOMENTAL PRODUCT DECLARATION no. 01-02/2026

1. GENERAL INFORMATION

Product of declaration	Flashing for roof windows Standard: EZV-A, EZ, ES, EH, EL, EG, EB, EU, EE, ER, ET, KD, KB, KZ, KS, KH, KL, KG, KX, KM Flashings for roof windows Thermo: EHV-AT Thermo, EH Thermo, EZ Thermo, ES Thermo, EL Thermo, EG Thermo, EB Thermo, EU Thermo, EE Thermo, ER Thermo, ET Thermo, EO Thermo KH Thermo, KZ Thermo, KM Thermo, KS Thermo, KD Thermo, KX Thermo, KL Thermo, KG Thermo, KB Thermo
Program owner:	Łukasiewicz Research Network – Institute of Ceramics and Building Materials Environmental Engineering Center in Opole. **http://www.icimb.pl/opole/**
Declaration owner:	FAKRO PP Sp. z o.o. 144a Węgierska str., 33-300 Nowy Sącz Telephone: +48 18 444-0-444 Adress: e-mail: fakro@fakro.pl **https:/www.fakro.pl/**
Declared unit:	**1 m²**
This verified Environmental Product Declaration (EPD) applies only to specific products and is valid for a period of five years from the date of publication in accordance with PN-EN ISO 15804.	
Life Cycle Analysis (LCA):	A1-A3, C1-C4 and D according to PN-EN 15804+A2 (Cradle-to-Gate with options)
Product Categorization (PCR) Rules	PN-EN 15804+A2:2020-03 Sustainability of construction works. Environmental Product Declarations. Basic principles of categorization of construction products, ICIMB-PCR A. PN-EN 17213: 2020-09 - Windows and doors - Environmental Product Declarations - Product category rules for windows and pedestrian door sets.
Representatives:	Polish product, year 2024
Declared durability:	40 years
Reasons for performing LCA:	B2B
Standard of product	none
Publication:	ICIMB, www.icimb.lukasiewicz.gov.pl/deklaracje-srodowiskowe
Declarations that are the result of different programs or are not performed in accordance with the standard may not be comparable.	

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The Łukasiewicz – Institute of Ceramics and Building Materials Environmental Engineering Center provides access to the Type III environmental declaration for flashings for roof windows to interested parties.
The declaration owner is responsible for the information and the base evidence. Łukasiewicz Research Network - Institute of Ceramics and Building Materials Center for Environmental Engineering is not responsible for the manufacturer's information and data and evidence regarding the life cycle assessment.
The Łukasiewicz Research Network – Institute of Ceramics and Building Materials is a public Reasearch Organization and a Notified Body (reg. no. 1487) to the European Commission and other Member States European Union designated for tasks concerning the assessment of the performance of construction products. The Łukasieiwcz Research Network - Institute of Ceramics and Building Materials is accredited (reg. no. AB 054) for a testing laboratory and accreditation (reg. no. AC 008) for testing and certification of building materials.

Approved: Joanna Poluszyńska, PhD Director of the Environmental Engineering Center Ewa Głodek-Bucyk, Ph.D Leader of the Process Engineering Research Group	**Review:** CEN standard PN-EN 15804+A2 serves as the main PCR document. Independent verification of declarations and data according to EN ISO 14025:2010 ☐ Internal ☒ External Katarzyna Grzesik, PhD, DSc
Authors' team:	Katarzyna Kiprian, M.Sc. Ewa Głodek-Bucyk, Ph.D. Patryk Okoń, M.Sc. Eng. Kamil Ryfiak

2. MANUFACTURER AND PRODUCT INFORMATION

FAKRO Group is an international company operating in the construction industry since 1991. The FAKRO Group, employing over 4,000 people, consists of 11 production companies and 17 distribution companies. The product range of FAKRO includes primarily:

- Wooden and aluminum clad-plastic roof windows in various designs and with different opening systems. In addition to roof windows, the product portfolio also includes flat roof windows,
- Flashings, electric control systems, loft ladders, access roof windows, light tunnels, smoke ventilation systems,
- Accessories for roof windows: venetian blinds, curtains, internal and external roller shutters, external awnings, installation accessories, films and membranes.

The company's headquarters is located in Nowy Sącz, where FAKRO has more than 230,000 m² of production, warehouse, and office space.
The environmental impact of purchased products is becoming increasingly important for both consumers and manufacturers. For this reason, the production process at FAKRO undergoes numerous assessments, confirmed by the many certificates awarded to FAKRO.

Figure 1. Production plant of Fakro PP Sp. z o.o. in Nowy Sącz.

Flashings for roof windows Standard are a key element ensuring the correct and safe installation of roof windows in the roof slope. Their main function is to effectively drain rainwater and snow away from the window and protect against wind, which guarantees the durability and tightness of the entire structure. Made of high-quality aluminum sheets, coated on both sides, they are resistant to corrosion and weather conditions. Depending on the roofing type, the lower section of the flashing can be made of rigid aluminum sheet or equipped with a flexible apron, allowing it to be adjusted to the roofing shape.

Flashings for roof windows Thermo They are equipped with additional thermal insulation material, ensuring insulation of the window frame above the level of the battens level, thus improving the thermal insulation of the window, which allows for increased energy efficiency.

Flashings FAKRO are precisely designed as system solutions that adapt to different types of roofing. Tables 1 and 2 present the possible configurations offered by FAKRO, while Table 3 presents the range of products offered by FAKRO.

With a wide range of options available, FAKRO flashings enable windows to be installed in various configurations – single, combined vertically, horizontally or in blocks – ensuring an aesthetic connection with the roof and roof window durability.

Table 1. Types of flashings for roof windows Standard.

Flashings for roof windows Standard			
First letter	Second letter	Third letter	Fourth letter
E – flashings standard for windows	S – for flat coverings	A – to change the installation angle	-F – for flat tiles
K – flashings for assemblages	Z – for profiled coverings with a height of up to 45 mm	V – standard installation depth (0 cm)	-A – aluminum apron
	H – for high-profile covers for 90 mm	J – installation depth J (-3 cm from V)	/G – for balcony windows
	L – for thin shell coverings	N – installation depth N (+3 cm from V)	/R – for shingles
	G – for thick shell coverings	W – for exit windows	
	E – for flat sheet metal joined to felt	S – for smoke exhaust dampers	
	B – for panel sheets on „click”	U – universal height	
	U – for knee aassemblages		
	R – to connect two windows on opposite sides of the ridge		
	M – for masard assemblages		
	T – for thatched roofing		
	D – vertical assemblages		
	X – for block assemblages		

Table 2. Types of flashings for roof windows Thermo

Flashings for roof windows Thermo			
First letter	Second letter	Third letter	Fourth/fifth letter
E – flashings standard for windows	S – for flat coverings	A – to change the installation angle	-T – Thermo
K –flashings for assemblages	Z – for profiled coverings with a height of up to 45 mm	V – standard installation depth (0 cm)	-AT – Thermo with aluminum apron
	H – for high-profile covers for 90 mm	J – installation depth J (-3 cm from V)	-FT – Thermo for flat tiles
	L – for thin shell coverings	N – installation depth N (+3 cm from V)	
	G – for thick shell coverings	W – for exit windows	
	E – for flat sheet metal joined to felt	S – for smoke exhaust dampers	
	B – for panel sheets on „click”	U – universal height	
	U – for knee aassemblages		
	R – to connect two windows on opposite sides of the ridge		
	M – for masard assemblages		
	T – for thatched roofing		
	O – for a terrace window		
	D – vertical assemblages		
	X – for block assemblages		

Table 3. Product groups

Product group	**Marking***
Flashings for roof windows Standard	**EZV-A,** EZ, ES, EH, EL, EG, EB, EU, EE, ER, ET, KD, KB, KZ, KS, KH, KL, KG, KX, KM
Flashings for roof windows Thermo	**EHV-AT Thermo,** EH Thermo, EZ Thermo, ES Thermo, EL Thermo, EG Thermo, EB Thermo, EU Thermo, EE Thermo, ER Thermo, ET Thermo, EO Thermo KH Thermo, KZ Thermo, KM Thermo, KS Thermo, KD Thermo, KX Thermo, KL Thermo, KG Thermo, KB Thermo

* Bold = Reference Products

Flashing for roof windows EZV-A and EHV-AT Thermo were selected as representative models.

Table 4. Material composition of flashing for roof windows EZV-A and EHV-AT Thermo

MATERIAL	EZV-A	EHV-AT Thermo
Metal	77,20%	75,23%
Aluminum Strip	9,91%	12,05%
Plastic	4,50%	6,47%
Other	8,39%	6,25%

Flashings offered by FAKRO are an integral part of roof windows, which are placed on the market in accordance with the harmonized standard EN 14351-1+A2:2016. Tests of roof windows required under CE marking are carried out together with the sealing flanges. Declarations of performance for roof windows are available on the company's website.

The production process of flashings begins in the raw material warehouse, where all the necessary materials to produce the finished product are stored.
Sheet metal rolls are taken from the warehouse, from which in further stages the flashing elements are formed – used to finish and protect the window structure. Next, part of the tapes is used to prepare the middle elements and sides of the lower flange, while the remaining ones are used to prepare the side elements of the flange and the centers and sides of the upper flange. After preparing the elements of the lower flange, they are joined, and in the next stage, aprons are installed, which complement the structure of the lower flange.
At the same time, the centers and sides of the upper flange are prepared, which are then combined into one unit. Wedges are glued to the finished set of upper flange elements that have a sealing or stabilizing function. In the meantime, the processes of preparing the side gutters and profiles covering the side of the frame are also carried out, which, after completion, are directed to the packaging nest.
At the same time, identification and operational materials are being prepared. This includes creating labels, assembly instructions, packaging, and marketing materials that will be included with the finished product.
The finished flange is carefully packaged and protected against damage in transit.
The last stage of the production process is the handover of the finished flange to the finished goods warehouse, where the product is waiting to be shipped to the customer or further distributed.
The production diagram is shown in Figure 2.

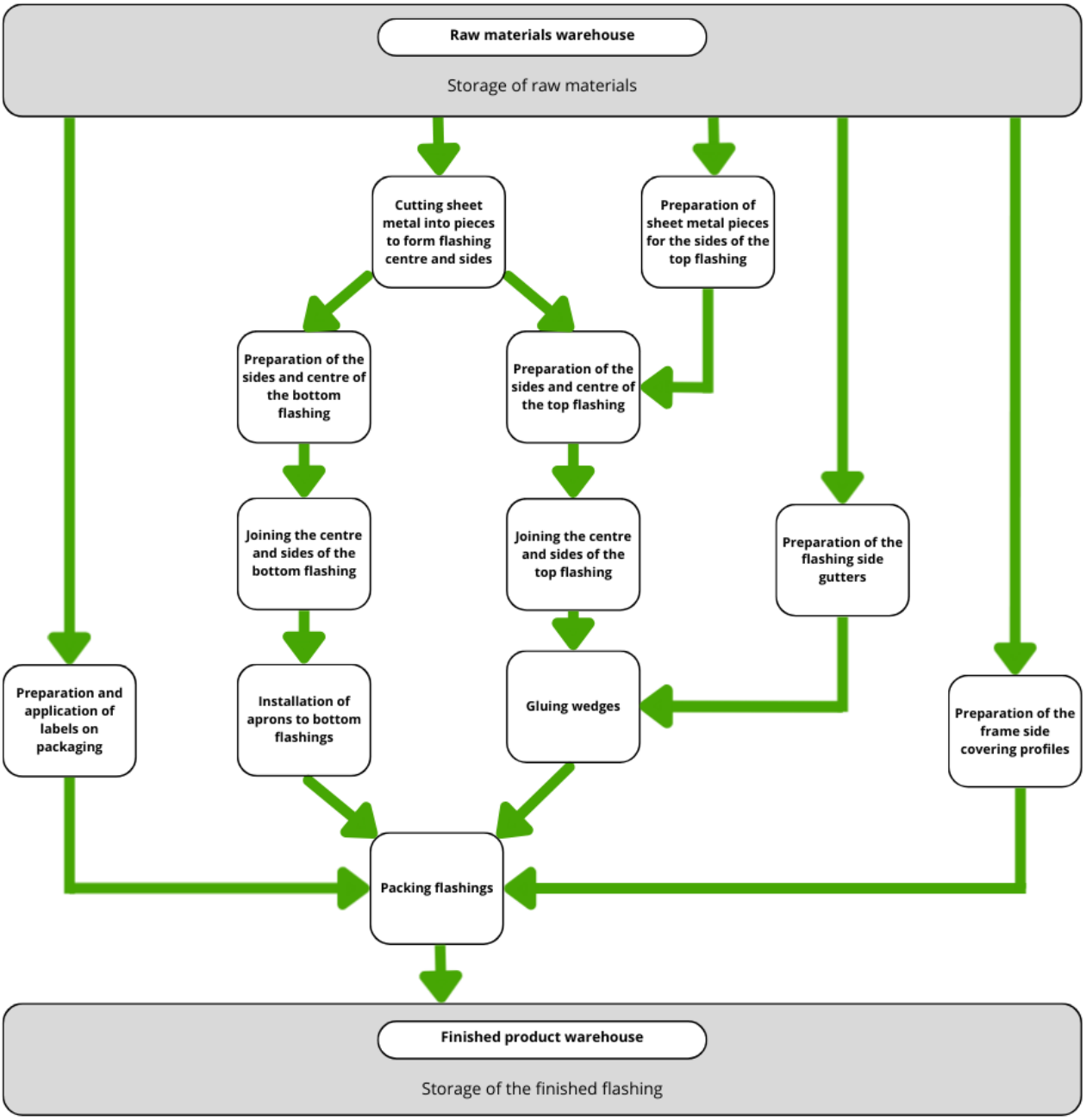


Figure 2. Production diagram of flashings for roof windows Standard manufactured by Fakro PP Sp. z o.o.

The production process of flashings Thermo is analogous to the production process of the Standard version of flashings, with the difference that it includes an additional technological step consisting in gluing the insulation layer to the flashings. The production diagram is shown in Figure 3.

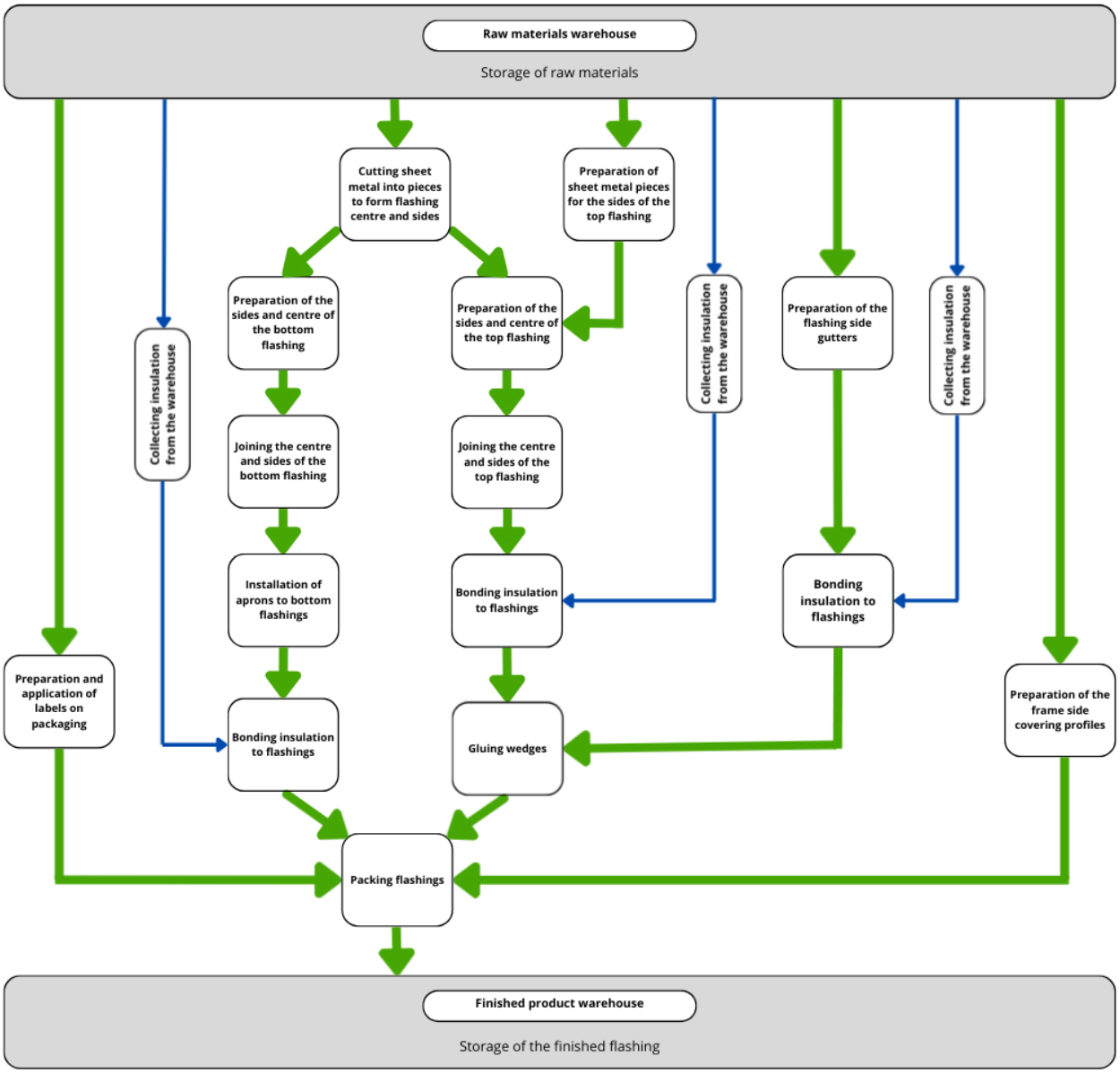


Figure 3. Production diagram of flashings for roof windows Thermo manufactured by Fakro PP Sp. z o.o.

3. LCA: CALCULATION RULES

The environmental declaration is based on the data provided by the owner of the declaration, Fakro PP Sp. z o.o. for one production plant located in Nowy Sącz, Węgierska 144a str. The following product groups were analyzed:

- Flashings for roof windows Standard: EZV-A, EZ, ES, EH, EL, EG, EB, EU, EE, ER, ET, KD, KB, KZ, KS, KH, KL, KG, KX, KM.
- Flashings for roof windows Thermo: EHV-AT Thermo**,** EH Thermo, EZ Thermo, ES Thermo, EL Thermo, EG Thermo, EB Thermo, EU Thermo, EE Thermo, ER Thermo, ET Thermo, EO Thermo KH Thermo, KZ Thermo, KM Thermo, KS Thermo, KD Thermo, KX Thermo, KL Thermo, KG Thermo, KB Thermo.

Due to the design and material diversity of the products, separate LCA calculations were performed for each of the two separate groups of sealing flanges.
The division into groups was made on the basis of technological differences, materials used and performance parameters of products.
In order to ensure the representativeness of the results and to optimize the environmental modeling process, a reference model (representative product) was selected for each group, the material and technological parameters of which reflect the average characteristics of a given product group:

- EZV-A – as a representative model for flashing for roof windows Standard,
- EHV-AT Thermo – as a representative model for flashing for roof windows Thermo with increased insulation parameters.

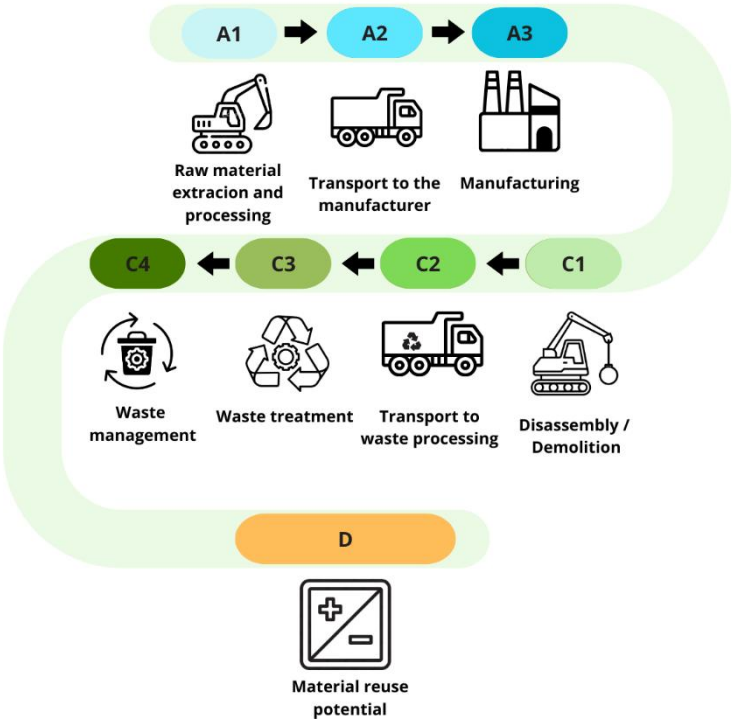
Table 5. Unit declared for the reference device

Rated product	Reference Product Surface	Declared unit	Mass per unit area
EZV-A	1,23 m x 1,48 m	1 m²	2,40 kg/m^2
EHV-AT Thermo	1,23 m x 1,48 m	1 m²	2,63 kg/m2

The validity of this Environmental Product Declaration is limited to the products listed in Table 3

System limitations

The life cycle analysis of the tested products includes modules A1-A3, C1-C4 and D (Cradle to Gate whit options) in accordance PN-EN 15804.



Data colleration period

Data on the production process were provided in 2025 for the period 01.01.2024 - 31.12.2024 (12 months) and correspond to the production technology of the time. The data were determined separately for both product groups on the basis of the share of the declared products in the total production at the plant.

Declared unit

1 m^2

Assumptions

extraction and consumption of raw materials refers to specific mass shares in the production process, per unit declared of the product.
A2 – distances from the place of obtaining raw materials to the production plant individual for each raw material, means of transport differentiated due to the method of delivery of raw materials,
A3 – CO_2, NO_x, SO_2, and particulate emissions from the production process were provided by the manufacturer.
C1 - Describes the handling flashings during dismantling/demolition. Calculations are based on the developed scenario.
C2 – Refers to the transport of waste from the construction site to the recovery or disposal facility. Calculations are based on the developed scenario.
C3 – Takes into account the environmental impact during the processing of demolition waste containing elements flashing, at the waste recovery plant. Calculations are based on the developed scenario.
C4 – Accounts for the environmental impact of landfilling and recycling flashings components. Calculations are based on the developed scenario.
D – Refers to the impact and benefits of using secondary materials.

	Calculations are based on the developed scenario.
Cut-off criteria	99% of all bulk streams involved in the production process were taken into account. All the energy used in the process was taken into account in the environmental declaration.
General data	The data for the calculations come from Ecoinvent v. 3.10 and have been supplemented with KOBiZE CO2, SO2, NOx, CO and total particulate matter emission factors for electricity, December 2024. Emission factors for electricity were determined using the actual KOBiZE data. The Polish electricity emission factor used (Ecoinvent supplemented with current national data from KOBiZE) is 0.597 kg CO2/kWh. A detailed analysis of data quality was part of an external audit. Life Cycle Analysis (LCA) was performed using the ICIMB-PCR tool developed in accordance with EN 15804+A2 using the EF 3.1 method.
Allocation	All data on components manufactured at the plant were provided by the owner of the declaration, Fakro PP Sp. z o.o i and were referred to the declared unit of the product – 1 m^2. The allocation rules used in this EPD are based on the general ICIMB-PCR A principles.

4. LCA: SCENARIOS AND ADDITTIONAL TECHNICAL INFORMATION

The life cycle assessment was developed in accordance with the requirements of the standards PN-EN ISO 15804+A2:2020, PN-EN ISO 14025, and PN-EN ISO 14040. The product category rules were adopted in accordance with the PN-EN 15804 standard.

For the purpose of the life cycle analysis of the products covered by the environmental declaration within the scope of "cradle to gate with options," scenarios were developed for modules C1–C4 and D:

Module C1 - Demolition/Demolition – Manual deconstruction was assumed. The consumption of energy and other raw materials in this module has been omitted due to negligible values. The module is zero.

Module C2 – Transport - Waste is transported to a processing facility, where recyclable fractions, fractions intended for incineration, and fractions destined for landfil, are separated and directed to appropriate further processes.

- 100% of the waste generated at the end of the life of the flashings are transported to the waste treatment plant.
- Transport is carried out using trucks with a load capacity of 16–32 tons, compliant with EURO 6 emission standards.
- Transport distance is 100 km from the demolition site. The truck is fully loaded in both directions.

Module C3 - **Waste treatment** – For the flashings, a scenario has been adopted in accordance with the practice of the construction industry and national waste management rules.
The processing process includes the following unit operations:

- mechanical unloading with the use of a loader,
- mechanical crushing to reduce waste dimensions,
- magnetic separation of metal fractions,
- cleaning and screening to remove contaminants and prepare homogeneous material streams.

Energy and fuel consumption in the processing process was assumed at the level of:

- electricity: 0.03 kWh/kg,
- fuel: 0.315 MJ/kg.

The separated metal fractions are sent entirely for material recycling, while the remaining plastics are recycled or recovered in accordance with environmental requirements. EN 15804+A2. The adopted shares of recycling, landfilling and incineration reflect current market practices.

It is assumed that the recycling % of landfill and recovery is as shown in the table below:

	Aluminum, Steel	PUR – Polyurethane, PE – Polyethylene, TPE – thermoplastic elastomers, POM – polyacetal, Polyolefin (glue)	Butyl
recycling	90	50	0
landfill	10	5	0
incineration	0	45	100

The environmental benefits of the use of secondary raw materials are covered in module D.

Module C4 – Waste management - It is assumed that waste that can no longer be used in any other way ends up in a landfill. These are wastes separated in the treatment process (module C3). Module C4 for flashings refers to waste storage and pre-treatment processes that have an impact on environmental loads. This module analyses the final stages of the management of waste generated as a result of the exploitation of the product. A post-use waste final management scenario was adopted, including both physical pre-treatment and management of the waste disposal site.
It is assumed that:

- Aluminum and steel are directed for recycling. In addition, some plastics are recycled in accordance with national recycling rates (PUR – 50%, PE – 50%, TPE – 50%, POM – 50%, Polyolefins – 50%) – recycling,
- Unsegregated residues go to a landfill (Aluminum 10%, Steel 10%, PUR 5%, PE 5%, TPE 5%, POM 5%, Polyolefins 5%) – landfilling,
- Synthetic plastics and elastomers are subject to combustion with energy recovery, including both heat and electricity - combustion (energy recovery).

Module D - **Material reuse potential** - The scenario includes the potential benefits of:

- material recycling of metals and plastics,
- energy recovery from waste incineration.

The obtained heat and electricity energy was included as an environmental loan in the LCA analysis. Calorific values and recovery efficiency are adopted in accordance with industry literature

5. LCA: RESULTS

The table below shows the LCA modules taken into account in the calculation of the environmental impact categories for the products covered by the declaration.

SYSTEM BOUNDARIES (X –MODULE INCLUDED IN LCA, MND – MODULE NOT DECLARED)															
Products stage			**Construction process stage**		**Use stage**							**End-of-life stage**				**Benefits and loads beyond the system boundary**
Raw material supply	Transport	Production	Transport	Construction process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction	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**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**X**	**X**	**X**	**X**	**X**
EU	**EU**	**PL**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**		**EU**	**EU**	**EU**	**EU**	**EU**

The following tables present the results of the LCA analysis to flashing for roof windows Standard - EZV-A and flashing for roof windows Thermo - EHV-AT Thermo. The abbreviations used to describe the impact categories are explained below:

GWP-total	Global warming potential
GWP-fossil	Global warming potential fossil fuel
GWP-biogenic	Global warming potential biogenic
GWP-luluc	Global warming potential land use and land change
ODP	Depletion potential of the stratospheric ozone layer
AP	Acidification potential of land and water
EP-freshwater	Eutrophication potential, fraction of nutrients reaching freshwater end compartment
EP-marine	Eutrophication potential, fraction of nutrients reaching marine end compartment
EP-terrestial	Eutrophication potential, Accumulated Exceedance
POCP	Formation potential of tropospheric ozone photochemical oxidants
ADP-minerals&metals	Abiotic depletion potential for nonfossil resources
ADP-fossil	Abiotic depletion potential for fossil resources
WDP	Water (user) deprivation potential
PM	Potential incidence of disease due to PM emissions
IRP	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 (non-cancerogenic)
SQP	Potential soil quality index
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
PEN-RE	Use of non-renewable primary energy resources excluding non-renewable primary energy resources used as raw materials

RE	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 fuels
NRSF	Use of non-renewable secondary fuels
FW	Use of net fresh water

MAIN IMPACT INDICATORS: 1 m² flashing for roof windows Standard - EZV-A

		Life Cycle Stage							
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	4,82E+00	6,90E-01	6,22E+00	0,00E+00	4,58E-02	1,28E-01	6,21E-03	-1,03E+00
GWP-fossil	kg CO_2 eq.	5,07E+00	6,90E-01	6,19E+00	0,00E+00	4,58E-02	1,28E-01	6,19E-03	-1,02E+00
GWP-biogenic	kg CO_2 eq.	-2,68E-01	4,78E-04	1,83E-02	0,00E+00	3,17E-05	1,88E-04	1,64E-05	-1,12E-02
GWP-luluc	kg CO_2 eq.	1,20E-02	2,29E-04	8,18E-03	0,00E+00	1,52E-05	8,04E-05	6,45E-07	-7,30E-04
ODP	kg CFC11 eq.	1,08E-07	1,37E-08	2,02E-08	0,00E+00	9,10E-10	1,25E-09	9,55E-11	-6,14E-09
AP	mol H+ eq.	3,45E-02	1,44E-03	3,23E-02	0,00E+00	9,53E-05	9,07E-04	5,48E-05	-5,39E-03
EP-freshwater	kg PO_4 eq.	3,00E-03	4,68E-05	6,47E-03	0,00E+00	3,10E-06	6,23E-05	1,83E-07	-4,81E-04
EP-marine	kg N eq.	5,70E-03	3,45E-04	6,30E-03	0,00E+00	2,29E-05	3,59E-04	2,53E-05	-8,49E-04
EP-terrestrial	mol N eq.	5,64E-02	3,72E-03	5,42E-02	0,00E+00	2,47E-04	3,81E-03	2,78E-04	-8,68E-03
POCP	kg NMVOC eq.	2,13E-02	2,39E-03	1,56E-02	0,00E+00	1,58E-04	1,13E-03	8,31E-05	-2,67E-03
ADP-minerals & metals	kg Sb eq.	2,05E-04	2,26E-06	1,10E-05	0,00E+00	1,49E-07	9,87E-08	2,54E-09	-1,15E-05
ADP-fossil	MJ	8,18E+01	9,70E+00	6,54E+01	0,00E+00	6,44E-01	1,55E+00	8,10E-02	-8,70E+00
WDP	WDP (m^3) world eq.	2,89E+00	4,03E-02	-3,92E-01	0,00E+00	2,67E-03	4,80E-03	1,75E-04	-6,13E-02

ADDITIONAL IMPACT INDICATORS: 1 m² flashing for roof windows Standard - EZV-A

		Life Cycle Stage							
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidency	4,29E-04	8,50E-05	2,97E-04	0,00E+00	5,66E-06	3,35E-05	2,66E-06	-1,12E-04
IRP	kBq U235 eq.	5,93E-01	1,27E-02	6,11E-02	0,00E+00	8,35E-04	9,33E-04	4,47E-05	-3,58E-02
ETP-fw	CTUe	1,87E-03	2,92E-05	4,03E-03	0,00E+00	1,93E-06	3,88E-05	1,14E-07	-2,99E-04
HTP-c	CTUh	1,88E-07	4,90E-09	7,58E-08	0,00E+00	3,25E-10	3,50E-10	2,39E-11	-3,31E-09
HTP-nc	CTUh	1,96E-07	6,09E-09	7,68E-08	0,00E+00	4,04E-10	7,67E-10	1,09E-11	-1,50E-08
SQP	-	6,48E+01	5,84E+00	4,40E+01	0,00E+00	3,89E-01	2,14E-01	9,97E-02	-4,49E+00

ENVIRNOMENTAL PRODUCT DECLARATION no. 01-02/2026

Łukasiewicz Institute of Ceramics and Building Materials

INDICATORS DESCRIBTIONS RESOURCE CONSUMPTION: 1 m² flashing for roof windows Standard - EZV-A

	Life Cycle Stage								
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	1,59E+01	1,67E-01	1,68E+01	0,00E+00	1,11E-02	8,23E-02	2,41E-03	-7,84E-01
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,59E+01	1,67E-01	1,68E+01	0,00E+00	1,11E-02	8,23E-02	2,41E-03	-7,84E-01
PEN-RE	MJ	8,77E+01	1,03E+01	6,94E+01	0,00E+00	6,85E-01	1,65E+00	8,61E-02	-9,27E+00
RE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	8,77E+01	1,03E+01	6,94E+01	0,00E+00	6,85E-01	1,65E+00	8,61E-02	-9,27E+00
SM	kg	0,00E+00	0,00E+00	1,97E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	1,36E-01	1,78E-03	9,64E-02	0,00E+00	1,17E-04	9,50E-04	3,28E-06	-8,83E-03

INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 m² flashing for roof windows Standard - EZV-A

	Life Cycle Stage								
Indicator	**Unit (expressed per DU)**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste	kg	WN	WN	6,20E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for re-use	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	WN	WN	1,97E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	WN	WN	2,52E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ/energy carrier	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,52E+00

CARBON BIOGENIC	
Contents organic carbon in product (kg C_{org})	**0,00E+00**
Contents organic carbon in packaging (kg C_{org})	**3,96E-01**

FAKRO

ENVIRNOMENTAL PRODUCT DECLARATION no. 01-02/2026

Łukasiewicz Institute of Ceramics and Building Materials

MAIN IMPACT INDICATORS: 1 m² flashing for roof windows Thermo - EHV-AT Thermo

		Life Cycle Stage							
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	5,33E+00	7,65E-01	6,82E+00	0,00E+00	4,99E-02	1,40E-01	6,76E-03	-1,11E+00
GWP-fossil	kg CO_2 eq.	5,75E+00	7,64E-01	6,79E+00	0,00E+00	4,99E-02	1,39E-01	6,74E-03	-1,10E+00
GWP-biogenic	kg CO_2 eq.	-4,39E-01	5,29E-04	1,98E-02	0,00E+00	3,46E-05	2,05E-04	1,79E-05	-1,13E-02
GWP-luluc	kg CO_2 eq.	1,74E-02	2,55E-04	8,91E-03	0,00E+00	1,66E-05	8,76E-05	7,02E-07	-8,06E-04
ODP	kg CFC11 eq.	1,31E-07	1,52E-08	2,21E-08	0,00E+00	9,92E-10	1,36E-09	1,04E-10	-7,00E-09
AP	mol H+ eq.	3,89E-02	1,59E-03	3,55E-02	0,00E+00	1,04E-04	9,88E-04	5,97E-05	-5,70E-03
EP-freshwater	kg PO_4 eq.	3,48E-03	5,20E-05	7,06E-03	0,00E+00	3,38E-06	6,79E-05	1,99E-07	-5,08E-04
EP-marine	kg N eq.	7,01E-03	3,81E-04	6,90E-03	0,00E+00	2,50E-05	3,91E-04	2,76E-05	-9,11E-04
EP-terrestrial	mol N eq.	6,71E-02	4,11E-03	5,94E-02	0,00E+00	2,69E-04	4,15E-03	3,02E-04	-9,33E-03
POCP	kg NMVOC eq.	2,45E-02	2,64E-03	1,71E-02	0,00E+00	1,73E-04	1,23E-03	9,04E-05	-2,89E-03
ADP-minerals & metals	kg Sb eq.	2,28E-04	2,51E-06	1,20E-05	0,00E+00	1,62E-07	1,08E-07	2,76E-09	-1,29E-05
ADP-fossil	MJ	9,34E+01	1,07E+01	7,16E+01	0,00E+00	7,02E-01	1,69E+00	8,81E-02	-9,42E+00
WDP	WDP (m^3) world eq.	3,21E+00	4,47E-02	-3,58E-01	0,00E+00	2,91E-03	5,23E-03	1,91E-04	-7,01E-02

ADDITIONAL IMPACT INDICATORS: 1 m² flashing for roof windows Thermo - EHV-AT Thermo

		Life Cycle Stage							
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidency	4,78E-04	9,37E-05	3,32E-04	0,00E+00	6,17E-06	3,65E-05	2,90E-06	-1,19E-04
IRP	kBq U235 eq.	7,08E-01	1,41E-02	6,67E-02	0,00E+00	9,10E-04	1,02E-03	4,86E-05	-3,96E-02
ETP-fw	CTUe	2,16E-03	3,24E-05	4,39E-03	0,00E+00	2,10E-06	4,23E-05	1,24E-07	-3,16E-04
HTP-c	CTUh	1,87E-07	5,44E-09	8,72E-08	0,00E+00	3,54E-10	3,82E-10	2,60E-11	-3,71E-09
HTP-nc	CTUh	2,21E-07	6,74E-09	8,39E-08	0,00E+00	4,41E-10	8,36E-10	1,19E-11	-1,66E-08
SQP	-	9,27E+01	6,43E+00	4,80E+01	0,00E+00	4,24E-01	2,34E-01	1,09E-01	-4,92E+00

INDICATORS DESCRIBTIONS RESOURCE CONSUMPTION: 1 m² flashing for roof windows Thermo - EHV-AT Thermo

		Life Cycle Stage							
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2,18E+01	1,87E-01	1,83E+01	0,00E+00	1,20E-02	8,97E-02	2,63E-03	-8,50E-01
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,18E+01	1,87E-01	1,83E+01	0,00E+00	1,20E-02	8,97E-02	2,63E-03	-8,50E-01
PEN-RE	MJ	1,00E+02	1,14E+01	7,60E+01	0,00E+00	7,46E-01	1,80E+00	9,37E-02	-1,00E+01
RE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	1,00E+02	1,14E+01	7,60E+01	0,00E+00	7,46E-01	1,80E+00	9,37E-02	-1,00E+01
SM	kg	0,00E+00	0,00E+00	2,19E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	6,91E-01	4,84E-04	1,00E-01	0,00E+00	1,28E-04	1,04E-03	3,57E-06	-9,44E-03

INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 m² flashing for roof windows Thermo - EHV-AT Thermo									
	Life Cycle Stage								
Indicator	**Unit (expressed per DU)**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste	kg	WN	WN	6,76E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for re-use	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	WN	WN	2,19E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	WN	WN	2,36E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ/energy carrier	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,50E+00

BIOGENIC CARBON	
Contents organic carbon in product (kg C_{org})	**0,00E+00**
Contents organic carbon in packaging (kg C_{org})	**6,47E-01**

6. INTERPRETATION OF LCA

Figures 4 and 5 present diagrams of the shares of individual life cycle modules on the basic impact categories for flashing for roof windows Standard - EZV-A and flashing for roof windows Thermo - EHV-AT Thermo:

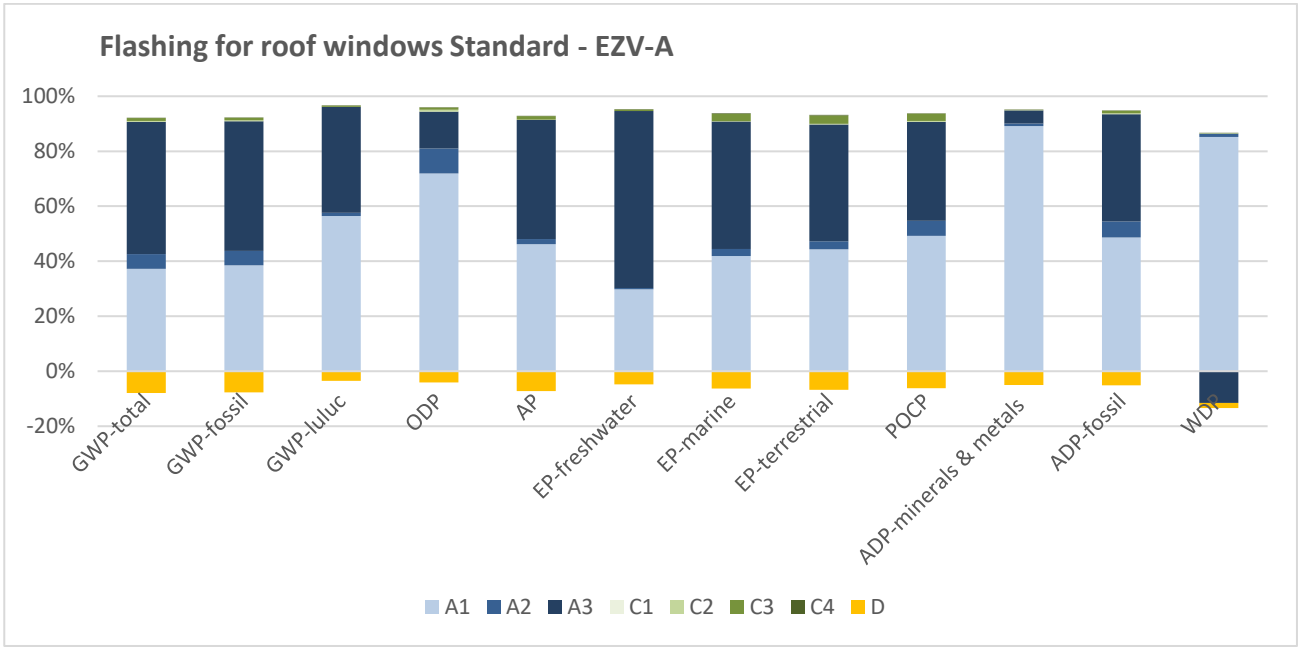


Figure 4 Shares of life cycle modules in the main categories of impacts – flashing for roof windows Standard - EZV-A

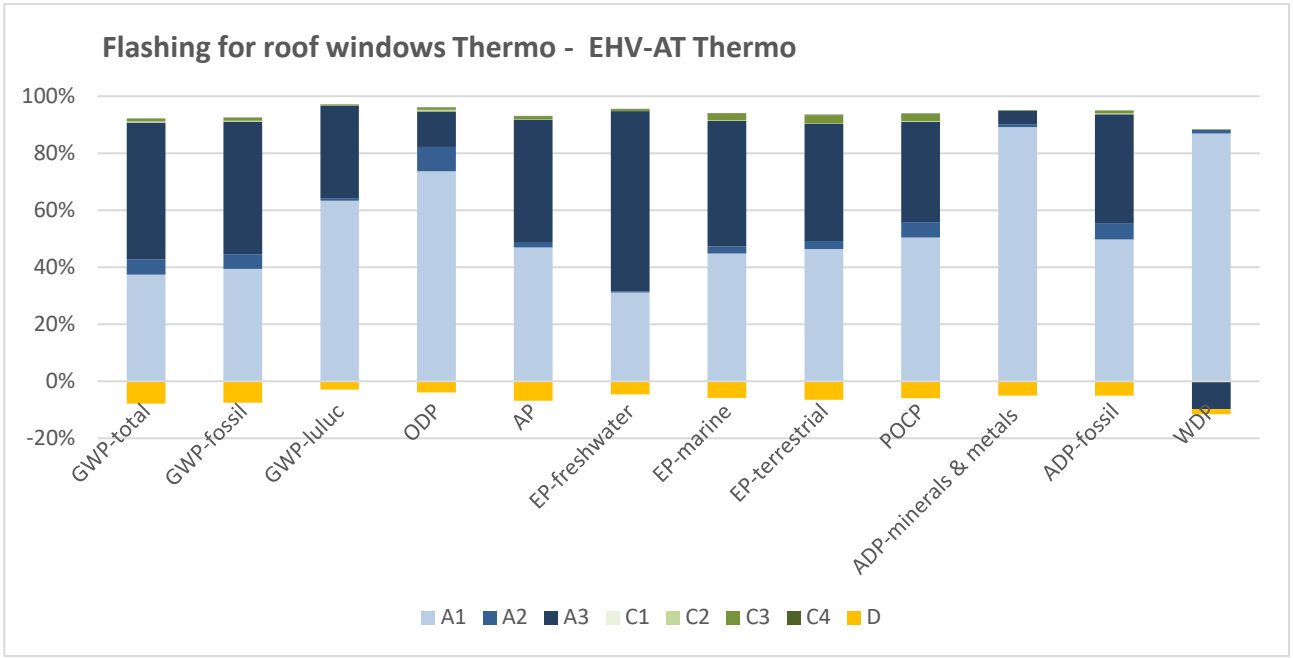


Figure 5 Shares of life cycle modules in the main categories of impacts – flashing for roof windows Thermo - EHV-AT Thermo.

LITERATURE

- ✓ PN-EN 15804+A2:2020, Sustainability of building structures -- Environmental product declarations -Basic principles of categorization of construction products.
- ✓ PN-EN ISO 14025:2014-04, Environmental labels and declarations -- Type III environmental declarations -- Rules and procedures.
- ✓ PN-EN ISO 14040:2009 Environmental management. Life Cycle Assessment. Principles and structure.
- ✓ PN-EN ISO 14044:2009, Environmental management. Life Cycle Assessment. Requirements and guidelines.
- ✓ PN-EN 17213: 2020-09 - Windows and doors - Environmental Product Declaration - Principles of product categorization for windows and doors
- ✓ ISO 21930:2017 – Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products.
- ✓ PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business.
- ✓ KOBiZE CO_2, SO_2, NO_x, CO and total particulate matter emission factors for electricity, December 2023.
- ✓ SK CERTYFICATE of constancy of performance of essential characteristics of product SK01-ZSV-0387,
- ✓ Act of 14 December 2012 on Waste, Journal of Laws 2013, item 21.
- ✓ Act of 27 April 2001 – Environmental Protection Law, Journal of Laws 2024, item 54.
- ✓ Data from the company website: **https://www.fakro.pl/**.
- ✓ Explanatory materials can be obtained by contacting a representative of FAKRO PP Sp. z o.o. directly.