Environmental Product Declaration

EPD of multiple products, based on worst-case results in accordance with ISO 14025:2006 and EN 15804:2012+A2/AC:2021

for

HushPhone (HUS-BX-018), HushHybrid (HUS-BX-020)

from **Fabryka Mebli Biurowych Mikomax Sp. z o.o.**
ul. Dostawcza 4 | 93-231 | Łódź | Polska

Programme:	The International EPD® System, www.environdec.com
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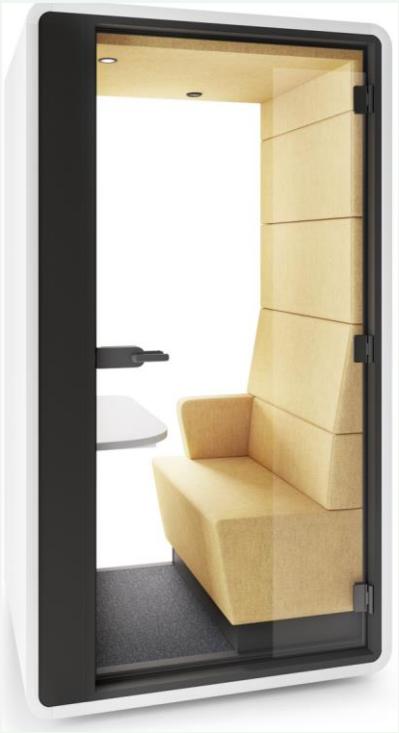
An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm; Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com
Version of standard	ISO 14025 and EN 15804:2012+ A2:2019/AC:2021

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction Products, version 1.3.3 PCR 2019:14-c-PCR-021 c-PCR-021 Furniture (c-PCR to PCR 2019:14) (Adopted from EPD Norway): NPCR 026 PCR - Part B for Furniture; version 2.0; Issue date: 29.09.2022 Valid to: 18.10.2023 (extended to 01.07.2024) EN15804 reference package based on EF 3.1 was used for the calculations PCR review was conducted by: The Technical Committee of the International EPD® System See www.environdec.com for a list of members. Chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact - Contact via info@environdec.com
Life Cycle Assessment (LCA)
LCA accountability: Bogusz Staniaszek Senior Certification Specialist Mikomax Smart Office Centrala / Headquarters t: +48 697 081 675 e: bogusz.staniaszek@mikomax.pl
Technical support **LCA Practitioner:** Carbonium Expert Team; www.carbonium.pl CRMP Wojciech Piskorski, ul. Ledóchowskich 10, 33-101 Tarnów, Poland Wojciech Piskorski; Mob: +48 601 473 692; Wojciech.piskorski@carbonium.pl Ryszard Ścigała Mob: +48 883 200 510; ryszard.scigalai@carbonium.pl
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: Joanna Zhuravlova, Bureau Veritas Polska Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier:

☐ Yes ☒ No

[Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier]

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:

FABRYKA MEBLI BIUROWYCH MIKOMAX sp. z o.o.;
ul. Dostawcza; 93-231 Łódź; Poland

Contact:

Bogusz Staniaszek
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Description of the organisation:

Mikomax is a manufacturer of highly specialised furniture in the form of acoustic booths for work and meetings and contract furniture. Mikomax has more than 30 years of experience in the production and sale of contract furniture, tailored to the diverse needs of users in the domestic and export markets. The company's flagship products are the Hush acoustic solutions, which provide independent spaces for telephone conversations, focused work and meetings.

Product-related or management system-related certifications:

The organisation has a certified environmental management system ISO 14001:2015 no., certificate 0198 104 14307 valid until 30.06.2026 and has a certified quality management system ISO 9001:20115; certificate no. 0198 104 14308 valid until 30.06.2026 issued by TUV_Rheinland

Name and location of production site(s):

Mikomax Sp. z o.o. ul. Dostawcza 4; 93-231 Łódź; PL

Product information

Product name:

HUS-BX-018; BX-020

Product description	The EPD describes the environmental impacts of one unit of HS-BX-018; BX-020 (furniture). These products are manufactured at the Mikomax site located in Łódź; PL
Identification of the product CPC Code:	UNCPC - Division 38 Furniture; other transportable goods **3812** – Other furniture, of kind used in offices
Main Product Material	Particleboard, tempered glass, aluminium, MDF, electric parts
Dangerous material	The product does not contain any substances included in the “Candidate List of Substances of Very High Concern for Authorization" compliant with /REACH/ and with EC 1272/2008
Geographical scope	A1, A2 - Poland and EU A3 – Poland Rest of modules – EU

HUS BX-018

1. Led ceiling light run by motion sensor
2. Efficient ventilation run by motion sensor
3. Power module (power + USB type A, USB type C)
4. Tempered, laminated acoustic glass door with high quality handle
5. Laminated acoustic glass rear wall
6. Ergonomic shelf/storage
7. Fold-away laptop table
8. Acoustic lined fabric panels
9. Integral carpeted floor
10. Leveling feet
11. Integrated castors

EXTERIOR

GLASS DOOR with LATCH HANDLE: acoustic, tempered and laminated safety glass 0.39 in, 5.5.2 thickness including the thickness of 0.19 in glass, 0.07 in acoustic sheet and 0.19 in glass. Clear color.

REAR SIDE GLASS PANEL: acoustic and laminated glass 0,39 in (RW= 35 dB), 5.5.2 thickness including the thickness of 0.19 in glass, 0.07 in acoustic sheet and 0.19 in glass. Placed in aluminum profiles with acoustic seal. Clear color.

PROFILES: for glass and door frame in cosmos grey color.

DOOR HANDLE AND HINGES: anodized aluminum or aluminum painted in cosmos grey color.

CASE: 3-layer honeycomb board with a thickness of 1.49 in. Both sides covered with melamine and finished with ABS edging.

Integrated castors with levelling feet.

2.50 in hole with grommet for sprinkler installation.

INTERIOR

Side FOLD-AWAY LAPTOP TABLE (with leather handle).
Dimension: 18.42 x 12.79 in. Opened from the side wall. Made of natural veneer, melamine or non-finger laminate. Maksimum load – **3 kg** (6.61 lbs).

Ergonomic MDF tapered **REAR SHELF** 32.28 x 8.42 x 9.85 in.
Maximum load on the upper shelf – **10 kg** / 22 lbs.
Maximum load on the lower shelf – **5 kg** / 11 lbs.

STOOL (optional): Base made of steel, powder in cosmos grey color. Column adjustment range: 9.8 in. Min. height 24.8 in. Max. height 34.6 in. Footrest integrated with the column. Seat frame made of LDF. Upholstered with the use of 17.70 in foam layer. Maximum load 100 kg (264.55 lbs).

INTERIOR PANELS: high-density LDF (HDF) 0.12 in thickness, covered with non-flammable polyurethane foam. Upholstered.

FLAME RETARDANT FOAM: complies with BS 5852: Part 2: 1982, Ignition source 5 (Crib 5).

UPHOLSTERY Wool:

weight: 325 g/m², **composition:** 70%WO, 20%PL, 5%PA, 5%AF, **flammability:** cigarette and match (BS-EN 1021-1, 2) (BS 5852-0, 1), CAL 117 (class 1), ASTM 84 (class 1), **light fastness:** 5 (EN ISO 105BO2), **fastness to rubbing:** wet: 4/5; dry: 4/5 (ISO 105-X12),**abrasion resistance:** 100.000 martindale cycles (EN ISO 12947-2).

INTEGRAL CARPETED FLOOR.

CARPET: complies with ASTM D2859 – 16 (2021), standard test method for ignitability characteristics of finished textile floor covering materials. Adapted to commercial intensive use (hotel room, hotel suite, boutique, shop, restaurant, conference room, high traffic office, reception, stairs). Graphite color.

Figure 1. HUS-BX-018

HUS BX-020

1. LED ceiling light run by motion sensor
2. Efficient ventilation run by motion sensor
3. Tempered, laminated acoustic glass door with high quality handle and hinges
4. Laminated acoustic glass rear panel
5. Power module
6. Control panel
7. Tabletop
8. Acoustic lined fabric panels
9. Upholstered soft seating
10. Integral carpeted floor
11. Leveling feet
12. Integrated castors

EXTERIOR

GLASS DOOR with LATCH HANDLE: acoustic, tempered and laminated safety glass 0.39 in, 5.5.2 thickness including the thickness of 0.19 in glass, 0.07 in acoustic sheet and 0.19 in glass. Clear color.

REAR SIDE GLASS PANEL: acoustic and laminated glass 0,39 in (RW= 35 dB), 5.5.2 thickness including the thickness of 0.19 in glass, 0.07 in acoustic sheet and 0.19 in glass. Placed in aluminum profiles with acoustic seal. Clear color.

PROFILES: for glass and door frame in cosmos grey color.

DOOR HANDLE AND HINGES: anodized aluminum or aluminum painted in cosmos grey color.

CASE: 3-layer honeycomb board with a thickness of 1.49 in. Both sides covered with melamine and finished with ABS edging.

Integrated castors with levelling feet.

2.50 in hole with grommet for sprinkler installation.

INTERIOR

TABLETOP: (W/D) 39.37 x 15.78 in. Worktop made of 3-layer melamine chipboard, 0.98 in thickness. Finish in non-finger laminate optional. Maximum load – **15 kg** (33 lbs).

Integrated comfortable **BENCH**. Maximum load of the one-person bench – **150 kg** (331 lbs).

INTERIOR PANELS: high-density LDF (HDF) 0.12 in thickness, covered with non-flammable polyurethane foam. Upholstered.

FLAME RETARDANT FOAM: complies with BS 5852: Part 2: 1982, Ignition source 5 (Crib 5).

UPHOLSTERY Wool:

weight: 325 g/m^2, **composition:** 70%WO, 20%PL, 5%PA, 5%AF, **flammability:** cigarette and match (BS-EN 1021-1, 2) (BS 5852-0, 1), CAL 117 (class 1), ASTM 84 (class 1), **light fastness:** 5 (EN ISO 105BO2), **fastness to rubbing:** wet: 4/5; dry: 4/5 (ISO 105-X12),**abrasion resistance:** 100.000 martindale cycles (EN ISO 12947-2).

INTEGRAL CARPETED FLOOR.

CARPET: complies with ASTM D2859 – 16 (2021), standard test method for ignitability characteristics of finished textile floor covering materials. Adapted to commercial intensive use (hotel room, hotel suite, boutique, shop, restaurant, conference room, high traffic office, reception, stairs). Graphite color.

Figure 2. HUS- BX-020

Parameter	Basic characteristic of product	
	HUS-BX-018	**HUS-BX-020**
Dimensioning & weight		
W/D/H exterior, [cm]	105x90x224	124x90x224
W/D/H interior, [cm]	82x83x203	81x100x203
Weight[1], [kg]	337,9	361,9
Weight with crate, [kg]	427,7	444,9
Construction - Exterior		
Glass door	accoustic, temperad and laminated safety glass 0,39 in; glass 0,19 in; accoustic sheet 0,07 in, 0,19 glass	
Rear side glass panel	accoustic, temperad and laminated safety glass 0,39 in; glass 0,19 in; accoustic sheet 0,07 in, 0,19 glass, placed in aluminium profiles	
Case	3 layer honeycomb board, thickness of 1,49 in; both sides covered with melamine and finished with ABS edging	
Construction - Interior		
Interior panels	high-density LDF (HDF) 0,12 thickness, covered with non-flamable polyurethane foam, uphostered	
Upholstery wool	325 g/m3; composition 70%WO; 20%PL; 5%PA; 5%AF	
Elektrification	LED ceiling light; UL standard (power, RJ45, USB type A 2,4A; USB type C 5A)	
Lighting	LED 2,5W	LED 6,4W +2x2,4W
Maximum power consumption, W	7	27,5
Ventilation	2 fans	2 fans
Speech level reduction D sa; dB	24,7	25,6

[1] The weights quoted are the declared weights and are stated in the commercial documentation. Actual weights may vary by a few percent due to natural variations in moisture content and tolerances in the materials used.

LCA information

Functional unit / declared unit:

Declared unit: one unit (piece) of product

Reference service life:

The manufacturer's documentation does not specify an RSL, but an ESL of 10 years has been assumed in accordance with manufacturer data

Time representativeness:

1 January to 31 December 2022

Database(s) and LCA software used:

LCA software	SimaPro 9.6.0.1 (2024)
LCA database	Ecoinvent v.3.10 (2024)
LCIA methodology	The methodology is based on standard EN15804 + A2:2019/AC:2021 (adapted for SimaPro substances). The EN 15804 standard covers Environmental Product Declarations (EPDs) of Construction Products. The 2019 EN 15804+ A2:2019/AC:2021 revision of this standard has aligned their methodology with the Environmental Footprint method

Description of system boundaries:

System boundaries	**Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and additional modules)**

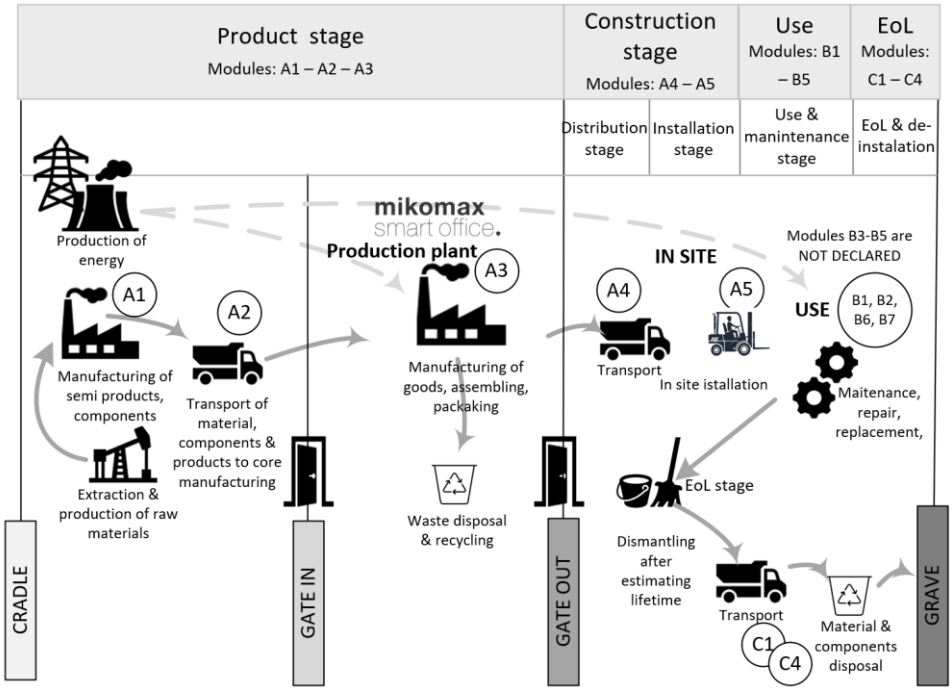
Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

Table 1 Modules analysed in the LCA

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	X	X	ND	ND	ND	X	X	X	X	X	X	X
Geography	EU	PL	PL	EU	EU	EU	EU	-	-	-	EU	EU	EU	EU	EU	EU	EU
Specific data used	90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	±10%					-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	0%					-	-	-	-	-	-	-	-	-	-	-	-

X - included; ND -not declared

System diagram:



LCA information:

Table 2 LCA basic information

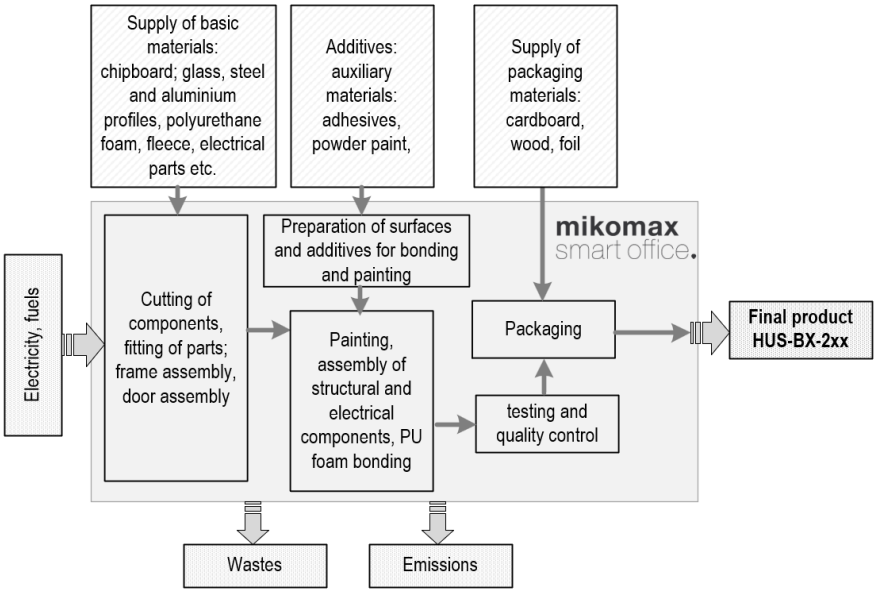
Name of the basic LCA report	**LCA Report LCA report for HUS-BX-2xx furniture products manufactured by Mikomax, Łódź, PL**
Intended application	The main objective of the report is to understand the potential environmental impact of the Mikomax products produced, and to prepare an information base for the preparation of the EPD
Reasons for carrying out the study	The report was created due to the growing demand from interested party, including customers, to know the indicators characterizing the products manufactured by Mikomax, in the form of EPD declarations. The report was compiled following enquiries from customers, recipients of the products, regarding the environmental footprint of the - product.
Intended audience	This report is a document containing the results of the quantification of the environmental footprint of the products, which has been developed for the first time for the products presented above. The report is internal in nature and is not intended for external publication or broad sharing with third parties.
Comparative assertions	LCA report is not intended to be used in comparative assertions intended to be disclosed to the public
Scope of presentation of the report and results:	The results of the calculations are intended for the development of EPDs and business to business (B2B) communication. The organization intends to publish the EPD under the International EPD System The report, due to its content on production indicators characterizing the technologies used, can be considered by its Organization as protected information, not subject to disclosure to third parties.
Product description	The LCA Report describes the environmental impacts of 1 piece of hush furniture products, as applied. These products are manufactured at the Mikomax site located in Łódź differentiated by their construction and purpose. The products of the analysed HUS BX-2xx series are free-standing, closed furniture constructions for placing in office spaces, non-permanently connected to the ground, they improve working and living comfort mainly by the possibility to isolate from other employees, to obtain a private space, as well as reducing the noise level.
Product name:	HUS-BX-018; BX-020
Main Product Material	Chipboard, particleboard, glass, steel, aluminium, electric parts
Dangerous material	The product does not contain any substances included in the “Candidate List of Substances of Very High Concern for Authorization" compliant with /REACH/ and with EC 1272/2008
Version of PCR	EN 15804+A2 is the framework reference for PCRs. PCR 2019:14 Construction products (EN 15804+A2) (1.3.3) - this document serves as Product Category Rules (PCR) for Construction products. It aims to be the main way to develop and register EPDs in the International EPD System, compliant with the European standard EN 15804:2012+A2:2019/AC:2021 (Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products). PCR 2019:14-c-PCR-021 c-PCR-021 Furniture (c-PCR to PCR 2019:14) (Adopted from EPD Norway): NPCR 026 PCR - Part B for Furniture; version 2.0; Issue date: 29.09.2022 Valid to: 18.10.2023 (extended to 01.07.2024)
Declared unit	Declared unit (UD): 1 unit (piece) of furniture model Hush BX-018; BX-020
Time boundaries	1 January to 31 December 2022
System boundaries	Cradle to gate with options, modules C1–C4, module D and with optional modules (A1–A3 + C + D and additional modules)
Reporting frequency	The organisation anticipates periodically updating the calculations if there are changes in technology, changes in the structure and volume of electricity supply and significant changes in suppliers.
Allocation	The allocation criteria are based on the mass flow of products and co-products – i.e. mass allocation between the different product ranges produced at Mikomax. Where raw materials

	and energy usage cannot be directly attributed to individual products the total quantity used in the factory was divided by the total mass of products produced to achieve materials and energy per kilogram of product.
Cut-off	In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than 5% of the mass and energy used, as well as emissions to the environment, per module. Process, material
	Module A1: Additives used in the manufacture, whose mass fraction is negligible and whose composition is unknown or not present in the databases
	Module A3: Waste handling of cardboard & plastic is included in the calculations. The rest of the waste, representing less than 1% by weight, was excluded on a cut-off basis; The cut-off also included auxiliares such as materials used during the maintenance - welding gases, electrodes, lubricants, etc.
	The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared to the system's lifetime level. Flows related to human activities such as employee transport are also excluded.
Assumption	The assumptions are described in the following section on individual modules

Basic information and assumption on the system under study in relation to the individual modules is presented in the table:

Table 3 Description of the LCA modules in relation to the Mikomax product system

Module	Description & assumption
A1	The calculations used a model for individual raw materials and components used as built parts. The Ecoinvent database and SimaPro software were used. In the case of composite materials, the calculation separates the material into the basic raw materials according to the percentage of the individual components. Some materials have been modelled on the basis of published EPD declarations. When modelling raw materials, the most chemically similar substances or mixtures of substances were adopted when exact scenarios were not present in the generic databases. In some cases, specific substance models were created on the basis of published and verified EPDs using accurate values for environmental indicators. For some materials, cut-off criteria were applied according to PCR-accepted rules. The total mass of materials for which modelling was not applied was negligibly small and the relative proportion did not exceed 0.03%
A2	The calculations used a model of transport from sources to manufacturing plant of materials based on actual logistic data from Mikomax IT system. 2. The transport process models were based on a methodology developed by Pre and implemented in SimaPro software. This approach allowed the values of the Capacity utilisation parameter adopted in SimaPro to be taken into account.
A3	The calculations used actual data on consumption of electricity, fuels, water, and also took into account emissions to the environment, and handling of production waste; For production waste, a waste scenario specific to the Polish market was applied, taking into account the current data contained in the Ecoinvent database, including the shares of recycling or incineration. Raw materials for packaging are included in Module A3. The flowchart of the manufacturing process is presented below:

Module	Description & assumption
	
	The energy source behind electricity used in the manufacturing process in A3 and its climate impact as kg CO2 eq./kWh (using the GWP-GHG indicator): Electricity, low voltage {PL}| electricity, low voltage, residual mix | Cut-off, S; The climate impact as kg CO2 eq./kWh (using the GWP-GHG indicator) is 1.09 kgCO2e/kWh
A4	Transport work was assessed on the basis of transport distances and modes of transport (road/deepsea) using primary data taken from an ERP information system. The transport process models were based on a methodology developed by Pre and implemented in SimaPro software. This approach allowed the values of the Capacity utilisation parameter adopted in SimaPro to be taken into account.
A5	Assembly - as the products analysed do not require the use of specialised equipment, additional materials and the labour input for assembly is negligible. The module takes only into account the handling of waste from product packaging specific to the markets to which the products are supplied. Mass of packaging waste equals the amount of input packaging materials.
B1	There are no environmental loads during the use of the product other than energy consumption, as demonstrated in module B6
B2	In accordance with section 6.3.8.4 of the c-PCR, it was assumed that the analysed products would require maintenance during the ESL period. An ESL period of 10 years was assumed. Based on expert judgement, it was assumed that the furniture would be vacuumed once a week for 10 minutes using a 750W vacuum cleaner.
B3-B5	Not declared
B6	The power consumption of the equipment (fans) and lighting with which the products are equipped was taken into account, the maximum power of the installed equipment was assumed in the calculations and, based on expert judgement, the equipment was assumed to operate for 50% of the working day, on working days for the US market for which the products are intended. The products were assumed to have an ESL of 10 years -- which is in accordance with c-PCR guidance section 6.3.3.
C1	The deconstruction and/or dismantling process of the product range is assumed to be deconstructed as part of the entire building. These processes mainly use energy for mechanical operations. The small amount of energy is considered 0.0437 MJ/kg - according to the literature[2] (analogous in the EPD published in EPD International)
C2	According to NPCR 009 Part B for Technical – Chemical products for the building and construction industry (Section 6.3.8): for transport of waste to a waste handling facility, a standard transport distance of 50 km was be

[2] EPD S-P-10804 Wberfloor screeds type Multiple Products (worst case), published 13.10.2023; valid 12.10.2028

Module	Description & assumption
	assumed. The assumption of drawing data from another PCR was made because of the analogous procedures for demolishing structural elements of buildings and transporting waste from such demolition.
C3	No waste processing for reuse, recovery and recycling was assumed, hence no environmental loads are attributed to this stage
C4	Mass of waste, dismantled - products equals the amount of input materials. At the end of the application period, a waste scenario was assumed according to the Ecoinvent database specific to the country of use of the products and disposal of the materials making up the product - here the EU market - Municipal solid waste (waste scenario) {EU27}| Treatment of waste. Under this scenario, it is envisaged that part of the materials are recycled (coreboard, paper, steel, aluminium, part of plastics including PE, PP, PET and their mixtures). The degree of recycling depends on the type of material. For some of the materials, incineration is envisaged as described in the models Municipal solid waste (waste scenario)| Treatment of municipal solid waste, incineration. The proportion of incinerated materials was assumed according to data specific to the country of disposal (here the EU market). According to the Waste scenario for materials and their residues after taking into account % recycling and % incineration, it has been assumed that the residue will be landfilled - Treatment of municipal solid waste, landfill
D	Module D includes benefits from all net flows in the end-of-life stage that leave the product boundary system after having passed the end-of-waste stage. Module D includes the potential benefits associated with the earlier life cycle modules. Among other things, the so-called avoided products related to recovered materials from packaged materials and from materials contained in products after dismantling according to a scenario specific to the end-use market (here the EU market - Municipal solid waste (waste scenario) {EU} Treatment of waste (module C4) are included, as well as possible energy recovery in the form of heat and electricity according to the characteristics of waste materials presented in the Ecoinvent database - for example, for paper: dataset represents the activity of waste disposal of waste packaging paper in a municipal solid waste incinerator (MSWI) // Recommended use of this dataset: For packaging paper, which goes to disposal as part of communal waste mixture. Larger amounts of separated packaging paper will likely not be disposed in incinerators or landfills, but rather go to recycling. // // Waste composition (wet, in ppm): upper heating value 16.77 MJ/kg; lower heating value 14.12 MJ/kg; Share of carbon in waste that is biogenic 100%. // Share of metals in waste not oxidized. Net energy production: 1.74MJ/kg electric energy and 3.49MJ/kg thermal energy. Benefits from packaging incineration (electricity and thermal energy) are declared within module D.
A-D Energy Indicators	Calculations were carried out according to the guidelines in Annex 3 of the current PCR. Option B of Annex B was chosen for the calculations. The energy used as raw materials is limited to the inherent energy of the product and the packaging. All other input of primary energy resources are considered as energy used as energy carrier. The energy used as raw material shall be declared as an input to the module where it enters the product system (in module A1) and as an output from the product system if it exits the product system as useful energy (from modules A5 or C4). Energy content that is wasted (e.g. in landfill or in incineration), remains as part of the indicator for energy used for raw materials. In the energy calculation, the proportion of materials recycled and incinerated in waste incineration plants was taken into account using data characterising the different types of materials, including data such as: Net Calorific Value, net energy production (electricity and thermal energy). For the raw materials defined in Module A, result data obtained from the SimaPro software and associated databases were used.

Content information

The declaration include the lowest amounts of recycled and biogenic content of the included products and their packaging, respectively, and the information on environmental and hazardous properties of substances contained in the products. For other parts of the content declaration, the average content is declared. For all options, the range of the content of the included products should be included in the content declaration, in addition to the

average/representative/worst-case content as specified above.

For a summary of the components, see table

Table 4 Bill od material

Product components; kg/UD	Average weight, kg	Minimum weight, kg	Maximum weight, kg	Postconsumer material (lowest values), %	Biogenic material [%]		Biogenic material kg C/kg
Chipboard EPD	53,088	28,405	77,771	30%	85%	resp	0,341
Glass	103,841	102,472	105,209	0	0		
Steel	48,800	33,268	64,332	18%	0		
Composite board with honeycomb core	84,019	77,204	90,833	[*1]	82%	resp	0,329
Aluminium	17,970	16,794	19,145	70%	0		
MDF	23,877	17,614	30,140	[*1]	82%		7,063
PU	5,005	3,907	6,102	0	0		
ZnAl	5,980	5,240	6,720	[*1]	0		
PA	0,056	0,045	0,066	[*1]	0		
PET 30%	2,426	1,648	3,205	[*1]	0		
Textile	1,947	1,770	2,124	[*1]	0		
Electronic	1,690	1,160	2,220	[*1]	0		
Rubber	0,560	0,560	0,560	0	0		
Adhesive	0,900	0,800	1,000	[*1]	0		
PE	0,789	0,598	0,980	[*1]	0		
ABS	0,366	0,026	0,705	[*1]	0		
Silikon	1,890	0,000	3,780	0	0		
Cable	0,472	0,217	0,727	[*1]	0		
Fan	0,040	0,040	0,040	[*1]	0		
PET	0,880	0,000	1,760	0	0		
Powder coat.	0,215	0,105	0,326	0	0		
Plywood	0,000	0,000	0,000	[*1]	82%	resp	0,329
Power supply	0,255	0,230	0,280	[*1]	0		
Paper+melamine	0,455	0,180	0,730	[*1]	0		
Paper	0,119	0,106	0,132	[*1]	100%	resp	0,401
LED	0,183	0,100	0,265	0	0		
Switch	0,090	0,000	0,180	[*1]	0		
Connector	0,029	0,017	0,040	[*1]	0		
Magnet	0,030	0,000	0,060	0	0		
HDF	0,039	0,000	0,078	[*1]	0		
PVC	0,000	0,000	0,000	[*1]	0		

PP	0,010	0,000	0,020	[*1]	0		
Wood	0,001	0,000	0,002	0	100%	resp	0,401
Others (Cut-off)	0,127	0,103	0,151	[*1]	0		
Total	356,147	341,946	370,347	Lowest value of biogenic carbon:	0,256		0,103

[*1] - Provenience of recycled materials (pre-consumer or post-consumer) in the product: Some of the components include recycled materials, but there is no exact data on their total shares.

BOM of packaging, kg/UD	Average weight, kg	Minimum weight, kg	Maximum weight, kg	Weight, % vs product	weight biogenic kg_C/UD
Cardboard	76,146	76,146	76,146	21,4%	0,089
Wood	38,000	38,000	38,000	10,7%	0,041
Plastic	0,042	0,042	0,042	0,0%	0,000
PE Packaging film	0,010	0,010	0,010	0,0%	0,000
Total	114,198	114,198	114,198	30,8%	0,130

The assessment of carbon content was based on the types of materials used for product & packaging.

The product does not contain any substances included in the “Candidate List of Substances of Very High Concern for Authorization" compliant with /REACH/ and with EC 1272/2008

The packaging does not contain any substances included in the “Candidate List of Substances of Very High Concern for Authorization" compliant with /REACH/ and with EC 1272/2008

Results of the environmental performance indicators

Results per declared unit

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Don’t use the results of modules A1-A3 (A1-A5 for services) without considering the results of module C.

1/ This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of nuclear fuel cycle accidents, occupational exposure nor due to radioactive disposal in underground facilities. Potential ionizing radiation from soil, from radon and from some construction materials is also not measured by this indicator

2/ The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Table 5. Results of calculation – worst case

Impact category	Unit	A1-A3	A4	A5	B1	B2	B3-B5	B6	B7	C1	C2	C3	C4	D
Climate change	kg CO2 eq	7,56E+02	1,81E+02	1,88E+02	0,00E+00	1,48E+01	0,00E+00	9,09E+01	0,00E+00	5,33E+00	2,84E+00	0,00E+00	2,36E+02	-4,35E+02
Climate change - Fossil	kg CO2 eq	1,09E+03	1,81E+02	8,00E-01	0,00E+00	1,47E+01	0,00E+00	9,04E+01	0,00E+00	5,30E+00	2,83E+00	0,00E+00	1,99E+01	-4,25E+02
Climate change - Biogenic	kg CO2 eq	-2,88E+02	3,30E-02	1,87E+02	0,00E+00	3,59E-02	0,00E+00	2,21E-01	0,00E+00	1,30E-02	5,24E-04	0,00E+00	2,16E+02	-8,98E+00
Climate change - Land use and LU change	kg CO2 eq	2,10E+00	6,22E-02	1,29E-04	0,00E+00	4,47E-02	0,00E+00	2,75E-01	0,00E+00	1,61E-02	9,61E-04	0,00E+00	9,65E-04	-8,44E-01
Ozone depletion	kg CFC11 eq	7,41E-05	3,65E-06	1,48E-08	0,00E+00	2,70E-07	0,00E+00	1,67E-06	0,00E+00	9,76E-08	5,69E-08	0,00E+00	8,25E-08	-5,34E-06
Acidification	mol H+ eq	7,31E+00	7,21E-01	7,31E-03	0,00E+00	8,63E-02	0,00E+00	5,31E-01	0,00E+00	3,12E-02	1,27E-02	0,00E+00	4,14E-02	-2,88E+00
Eutrophication, freshwater	kg P eq	4,86E-01	1,24E-02	2,70E-04	0,00E+00	1,37E-02	0,00E+00	8,42E-02	0,00E+00	4,93E-03	1,95E-04	0,00E+00	1,68E-03	-1,33E-01
Eutrophication, marine	kg N eq	1,40E+00	2,70E-01	1,71E-02	0,00E+00	1,35E-02	0,00E+00	8,34E-02	0,00E+00	4,89E-03	5,00E-03	0,00E+00	1,17E-01	-5,58E-01
Eutrophication, terrestrial	mol N eq	1,45E+01	2,94E+00	3,28E-02	0,00E+00	1,21E-01	0,00E+00	7,48E-01	0,00E+00	4,38E-02	5,45E-02	0,00E+00	2,07E-01	-5,71E+00
Photochemical ozone formation	kg NMVOC e	4,65E+00	1,14E+00	1,26E-02	0,00E+00	4,00E-02	0,00E+00	2,46E-01	0,00E+00	1,44E-02	1,96E-02	0,00E+00	5,99E-02	-1,80E+00
Resource use, minerals and metals /2	kg Sb eq	4,06E-02	4,91E-04	1,40E-06	0,00E+00	1,97E-04	0,00E+00	1,21E-03	0,00E+00	7,12E-05	8,80E-06	0,00E+00	7,30E-06	-2,97E-03
Resource use, fossils /2	MJ, net calorific value	7,60E+03	2,17E+02	1,31E+00	0,00E+00	2,45E+02	0,00E+00	1,51E+03	0,00E+00	8,85E+01	3,37E+00	0,00E+00	6,32E+00	-2,42E+03
Water use /2	m 3 world eq. deprived	2,77E+02	1,25E+01	-4,34E-02	0,00E+00	4,23E+00	0,00E+00	2,61E+01	0,00E+00	1,53E+00	1,77E-01	0,00E+00	-2,00E+00	-8,75E+01
Climate change GHG_GWP	kg CO2 eq	1,03E+03	1,81E+02	1,10E+01	0,00E+00	1,41E+01	0,00E+00	8,68E+01	0,00E+00	5,09E+00	2,83E+00	0,00E+00	2,96E+01	-4,06E+02
Particulate matter	disease inc.	7,73E-05	1,84E-05	8,91E-08	0,00E+00	3,08E-07	0,00E+00	1,90E-06	0,00E+00	1,11E-07	2,75E-07	0,00E+00	4,79E-07	-4,54E-05
Ionising radiation /1	kBq U235 eq	7,13E+01	3,20E+00	2,83E-02	0,00E+00	9,43E+00	0,00E+00	5,81E+01	0,00E+00	3,41E+00	5,36E-02	0,00E+00	8,86E-02	-2,78E+01
Ecotoxicity, freshwater /2	CTUe	1,24E+04	6,24E+02	3,85E+01	0,00E+00	6,10E+01	0,00E+00	3,76E+02	0,00E+00	2,20E+01	1,05E+01	0,00E+00	2,65E+02	-4,02E+03
Human toxicity, cancer /2	CTUh	2,05E-05	1,12E-06	8,79E-09	0,00E+00	3,44E-08	0,00E+00	2,12E-07	0,00E+00	1,24E-08	1,91E-08	0,00E+00	4,37E-08	-6,60E-06
Human toxicity, non-cancer /2	CTUh	1,92E-05	1,70E-06	7,28E-08	0,00E+00	2,39E-07	0,00E+00	1,47E-06	0,00E+00	8,62E-08	2,82E-08	0,00E+00	2,32E-07	-5,98E-06
Land use	dimensionless	1,85E+04	2,65E+03	1,48E+01	0,00E+00	7,60E+01	0,00E+00	4,68E+02	0,00E+00	2,74E+01	3,03E+01	0,00E+00	7,75E+01	-1,49E+04

Resource use	Unit	A1-A3	A4	A5	B1	B2	B3-B5	B6	B7	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ, net calorific value	8,32E+02	4,18E+01	1,36E+03	0,00E+00	9,36E+01	0,00E+00	5,77E+02	0,00E+00	3,38E+01	7,00E-01	0,00E+00	1,03E+03	-1,25E+03
Use of renewable primary energy resources used as raw materials (PERM)	MJ, net calorific value	3,65E+03	0,00E+00	-1,36E+03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-7,51E+02	-1,52E+03
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PERT)	MJ, net calorific value	0,00E+00	4,18E+01	5,13E-01	0,00E+00	9,36E+01	0,00E+00	5,77E+02	0,00E+00	3,38E+01	7,00E-01	0,00E+00	1,60E+00	-2,90E+03
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ, net calorific value	7,24E+03	2,17E+02	2,38E+00	0,00E+00	2,45E+02	0,00E+00	1,51E+03	0,00E+00	8,85E+01	3,37E+00	0,00E+00	2,27E+02	-2,25E+03
Use of non-renewable primary energy resources used as raw material (PENRM)	MJ, net calorific value	3,58E+02	0,00E+00	-1,08E+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	-1,69E+02	-1,24E+02
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) (PENRT)	MJ, net calorific value	0,00E+00	2,17E+02	1,31E+00	0,00E+00	2,45E+02	0,00E+00	1,51E+03	0,00E+00	8,85E+01	3,37E+00	0,00E+00	6,32E+00	-2,42E+03
Use of secondary raw materials (MS)	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	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	MJ, net calorific value	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	0,00E+00	0,00E+00
Use of non-renewable secondary fuels (NRSF)	MJ, net calorific value	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	0,00E+00	0,00E+00
Net use of fresh water (FW)	m3	2,83E+01	6,32E-01	-9,31E-02	0,00E+00	9,94E-01	0,00E+00	6,13E+00	0,00E+00	3,59E-01	1,04E-02	0,00E+00	-3,00E-01	-4,57E+00
OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES	Unit	A1-A3	A4	A5	B1	B2	B3-B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	3,05E+00	7,38E-02	3,09E-01	0,00E+00	1,93E-02	0,00E+00	1,19E-01	0,00E+00	6,95E-03	1,06E-03	0,00E+00	2,37E+01	-1,18E+00
Non-hazardous waste disposed (NHWD)	kg	1,14E+02	2,25E+02	2,45E+01	0,00E+00	1,10E+00	0,00E+00	6,77E+00	0,00E+00	3,97E-01	2,50E+00	0,00E+00	1,13E+02	-3,06E+01
Radioactive waste disposed (RWD)	kg	1,88E-02	7,92E-04	6,72E-06	0,00E+00	2,42E-03	0,00E+00	1,49E-02	0,00E+00	8,75E-04	1,33E-05	0,00E+00	2,15E-05	-6,83E-03
ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS	Unit	A1-A3	A4	A5	B1	B2	B3-B5	B6	B7	C1	C2	C3	C4	D
Components for re-use (CRU)	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	0,00E+00	0,00E+00
Material for recycling (MFR)	kg	0,00E+00	0,00E+00	1,14E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,48E+02	2,62E+02
Materials for energy recovery (MER)	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	0,00E+00	0,00E+00
Exported thermal energy (ETE)	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported electricity energy (EEE)	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Assessment of data uncertainty - Data Quality Rating

The LCA analysis used data that ensures authoritativeness and eliminates bias and uncertainty as much as possible. The best quality data available was used. Data quality was characterized by both quantitative and qualitative aspects.

The characterization of data quality addressed the following issues:

(a) temporal scope: the age of the data and the minimum period over which the data should be collected;

(b) geographic coverage: the geographic area from which unit process data should be collected to meet the purpose of the LCA study;

(c) technology coverage: a specific technology or combination of technologies;

(d) precision: a measure of the variability of each expressed data value (e.g., variance);

To assess the quality of the data, the DQR index was used, understood as an evaluation of the quality criteria of the dataset on the basis of technological, geographic, time-related representativeness and precision. The DQR index was estimated in accordance with the European Commission Recommendation EU 2021/2279 according to the formula.

$$\mathbf{DQR} = \frac{\mathbf{TeR+GeR+TiR+P}}{\mathbf{4}}$$

Where the respective symbols stand for:

TeR - Technological Representativeness
GeR - Geographical Representativeness
TiR - Time-related Representativeness
P – Precision

The table summarizes the indicators and values used to assess data quality

Table 6 Data quality criteria and indicators

DQR Data quality level	DQL Data quality level	Overall DQR	Overall data quality level
1	Excellent	DQR ≤ 1,5	Excellent quality
2	Very Good	1,5 < DQR ≤ 2,0	Very Good quality
3	Good	2,0 <DQR ≤ 3,0	Good quality
4	Fair	3 < DQR ≤ 4,0	Fair quality
5	Poor	DQR > 4	Poor quality

In order to determine the values of the indicators characterising the quality of the data, the descriptive parameter matrix used in SimPro software was used. This matrix coincides with the table presented in Annex E of the ISO 15804+A2:2019/AC:2021 standard, with the exception that it still contains an additional criterion related to the Precision parameter.

The analysis presented in the LCA leads to the conclusion that the various criteria for assessing data quality take on the following values.

Process contribution	A1 Raw material		TeR Time related coverage	GeR Geografical coverage	TiR Technology coverage	P Precision
Weighted average value			1,250	1,833	2,750	2,250
DQR	2,02					

Since 2 < DQR ≤ 3.0, it can be assumed that the data used allows for calculations of good quality.

Additional environmental information

Additional environmental information, product data sheets, performance descriptions and approvals can be found at https://mikomaxsmartoffice.com/pl/

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