ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Romakowski GmbH & Co. KG
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-ROK-20240247-IBI1-EN
Issue date	26.09.2024
Valid to	25.09.2029

ROMA sandwich elements with a core made of mineral wool type FP, FP eco, FP+, FV, FV eco, FV+, FD and FD eco

Romakowski GmbH & Co. KG

Institut Bauen und Umwelt e.V.

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ROMA
DÄMM-SYSTEME

1. General Information

Romakowski GmbH & Co. KG

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-ROK-20240247-IBI1-EN

This declaration is based on the product category rules:

Double skin metal faced sandwich panels, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

26.09.2024

Valid to

25.09.2029

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

ROMA sandwich elements with a core made of mineral wool type FP, FP eco, FP+, FV, FV eco, FV +, FD and FD eco

Owner of the declaration

Romakowski GmbH & Co. KG
Herdweg 31
86647 Buttenwiesen
Germany

Declared product / declared unit

1 m² ROMA prefabricated double-skin steel-faced sandwich panels with an insulating core made of mineral wool.

Product-specific results for FP-panels with thicknesses of 60 mm, 80 mm, 100 mm, 120 mm, 140 mm, 150 mm, 170 mm, 200 mm and 240 mm are declared in a supplementary EPD annexe.

Scope:

This EPD is based on a declared unit of 1 m² prefabricated ROMA sandwich panels with a core made of mineral wool with a surface weight of 21.4 kg/m², manufactured by ROMA Dämmsysteme in Buttenwiesen (Germany). The weighted average is representative for all ROMA elements. Therefore, the produced quantities as well as the variance of the element's thicknesses were taken into account.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Matthias Klingler,
(Independent verifier)

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2. Product

2.1 Product description/Product definition

Prefabricated double-skin steel-faced ROMA-sandwich panels with a core made of mineral wool used for load-bearing, self-supporting and non-supporting applications in roof, wall and ceiling structures.

The profiled internal and external steel sheets are made of a core of steel, which is protected against corrosion with zinc and organic coatings. The thermal insulating core material is made of mineral wool according to *EN 13162* with sealing tapes according to *DIN 18542*. The core is linked on both sides with resistance to shear forces to the profiled steel sheets.

The elements are manufactured in a width up to 1150 mm and in thicknesses up to 240 mm. The core consists of mineral wool with type dependent densities of 120 kg/m³ (standard), 90 kg/m³ (eco) or 135 kg/m³ (+). Flat and profiled sheets of steel are used as cover layers.

The placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) is governed by *Regulation (EU) No 305/2011 (CPR)*. The product requires a declaration of performance taking into account the *EN 14509:2013, Self-supporting sandwich panels with double-sided metal facings – factory-made products - specifications*, and the CE marking. For use, the respective national regulations apply.
For use in Germany, the general building inspectorate approval of the DIBT (Deutsches Institut für Bautechnik, German technical approval body, DIBt represents the authority of the German Länder Governments for a uniform fulfilment of technical tasks in the field of public law) applies.

2.2 Application

Application as covering component in roof and wall structures mainly for static loads. Sandwich panels in wall and roof applications overtake tasks of the building physics, especially sound, heat and moisture safety. They perform simultaneously the function of air tightness of the building envelope.

2.3 Technical Data

Technical specifications are given in:

- *DIN EN 14509:2013, Self-supporting double skin metal faced insulating panels – Factory-made products - Specifications*
- *DIN EN 13162:2012+A1:2015, Thermal insulation products for buildings – Factory-made mineral wool (MW) products - Specification*
- technical approvals for sandwich panels *Z-10.49-836* and *Z-10.49-837*

Constructional data

Name	Value	Unit
Density of the insulation	90 - 120	kg/m^3
Thickness of the element referring to the overall height of the element (D) in case of flat outer layers; referring to the consistent core thickness without profile (dc) in case of heavily profiled elements	60 - 282	mm
Thickness of the outer layer	0.6	mm
Dicke of the inner layer	0.5	mm
Calculation value for thermal conductivity for thermal conductivity of the insulation	0.039 - 0.045	W/(mK)
Heat transfer coefficient of the total Element incl. heat bridges due to overlap and fixing elments acc. to EN 14509	0.758 - 0.162	W/(m^{2}K)
Airborne sound reduction Rw(C;Ctr); Verification according EN ISO 140-3 (if required)	34	dB
Sound absorption coefficient *	n.a.	%

*Not applicable for the declared product acc. to *EN 14509*.

Performance values of the product according to the Declaration of Performance in relation to its essential characteristics according to *EN 14509:2013, Self-supporting sandwich panels with double-sided metal coatings – Factory-made products - Specifications.*

2.4 Delivery status

The sandwich elements are commissioned on a project-specific basis, manufactured in the ordered delivery lengths as a plate form in commission-related lengths up to 15 m, thicknesses up to 240 mm and widths up to 1.150 mm, and delivered as prefabricated construction.

2.5 Base materials/Ancillary materials

Composition of the sandwich panels:

Material	Thickness of the element		
	60 mm	100 mm	240 mm
Steel sheet	60%	48%	30%
Thermal insulation core	40%	52%	70%

Steel according to *EN 10169*:
S 280 GD to S 320 G

Metallic coating according to *EN 10346*:
Zinc Z 275, a total of 275 g/m² with a zinc content of > 99 % or equivalent corrosion protection by another zinc alloy.

Organic coating according to *EN 12944-1* (*DIN55634*):
Standard polyester coating (SP), coil coating, 25 µm on the visible side and max. 15 µm on the back or alternatively higher-quality coatings.

Thermal insulation core according to *EN 13162:*
mineral wool

This product/article/at least one partial article contains substances listed in the *candidate list* (23.01.2024) exceeding 0.1 percentage by mass: no.

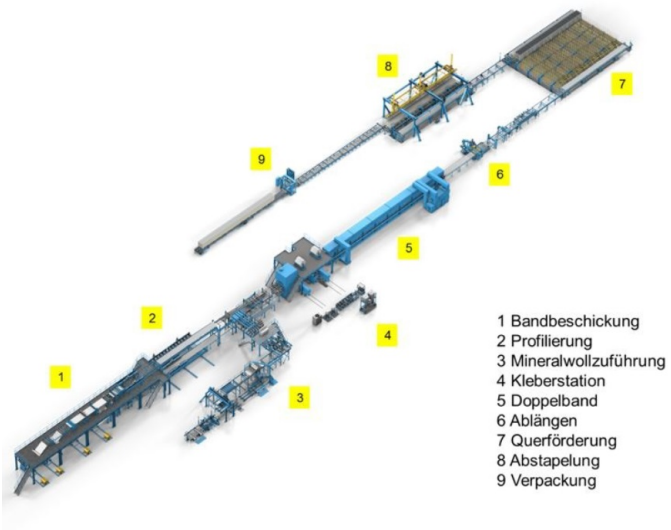
This product/article/at least one partial article contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no.

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) *Ordinance on Biocide Products* No. 528/2012): no.

2.6 Manufacture

The production of sandwich panels takes place on continuously operating production facilities. The production speed is depending on the thickness and ranges between 4 to 8 m/min.

The rollforming process of the two steel faces starts on the winches. The profile types are related to a defined number of rolls, the higher the profiles the higher the number of rolls. The profiling process runs inside out, starting in the middle.
MW sandwich panels are made by introducing prepared mineral wool bars on an adherent layer within the inlay station. The element thickness is fixed by revolving steel plate conveyors. After leaving the reaction zone, the elements are cut to the ordering length. Subsequently, the elements are stacked in an automatically stacking system into transport and assembly compatible packages. The process ends here.



2.7 Environment and health during manufacturing

No measures relating to safety, health and environment protecting during the manufacturing process extending beyond national guidelines are known.

2.8 Product processing/Installation

The sandwich panels are unloaded on the application site manually or with the aid of lifting equipment or cranes. Prior to the installation/finalisation the protective film must be removed.
The mounting of sandwich panels to the substructure must refer to the national approval *Z-14.4-407* or in accordance with European technical assessments (ETA screws manufacturer).
The required holes for mounting are either pre-drilled or the connecting elements intersect the wellbore during the setting process using drill bits.
Careful planning limits cuts and sheers on the construction site to a minimum. For technical correct construction cuts shears, electric metal shears, nibbler, special stitch, circular or chain saws or oscillating multi-cutter has to be used. The used blades must be suitable for the use, working without spark or heat. If cutting is done with an angle grinder or plasma cutters, the coil-coated surface has to be protected against injury. At risk of corrosion (e. g. outdoor areas), a post- treatment of the cut surfaces is required.
For use in an airtight and heat-insulating building envelope sealant strips according to *DIN 18542* and insulation made of polyurethane or mineral wool are in use. Manufacturers of sealing tapes and insulation provide corresponding EPDs.

2.9 Packaging

Transport and delivery runs on packaging racks made of wood. The packages are foiled avoiding damage and dirt. The edges are protected with slides made of metal, plastic or wood.
The packages can be handled with stacker or cranes.
Packaging materials shall be collected separately for recycling.

2.10 Condition of use

The substantial composition during the use phase refers to the composition during the manufacture.

2.11 Environment and health during use

The loss of zinc refers to the local micro-climatic conditions. Categorisation follows *EN 12944-2* and depends on the surface-depending loss of mass.

Adverse effects emanating from double-skin steel-faced sandwich panels are not known.

2.12 Reference service life

Double-skin steel-faced sandwich panels with the use in lightweight metal constructions must withstand a term of protection of at least 15 years. The term of protection is the period until the first slight renewals in the surface are needed, and only if there is no need for frequent inspections and service.
The term of protection depends on the location, weather conditions and the quality of the coating.
Double-skin steel-faced sandwich panels exhibit an estimated service life of 40 – 45 years depending on the use conditions.

The information in this section does not refer to a reference service life according to *ISO 15686.*

2.13 Extraordinary effects

Fire

The ROMA quick-assembly insulating panels are hardly flammable. They are classified in class A2-s1, d0 according to *EN 13501-1*.

Fire protection

Name	Value
Building material class	A2
Smoke gas development	s1
Burning droplets	d0

Water

No risks for the environment and living organisms are known under unforeseeable water effects.

Mechanical destruction

No risks for the environment and living organisms are known under unforeseeable mechanical destruction.

2.14 Re-use phase

The steel sheets of the sandwich panels can be detached from the core and collected, reused or recycled after dismantling.
The recycling of the mineral wool core is possible. If appropriate recycling facilities do not exist, the mineral wool is landfilled.

2.15 Disposal

The disposal code for thin-walled profiled sheets made of steel, protected with zinc coatings refer to the German List of Wastes Ordinance (*AVV*) and European waste Index (*EWC*):
17 04 05 – Iron and steel
17 06 04 – Insulation material

2.16 Further information

Technical information on the products and technical rules for the design, planning and execution is available at www.roma-daemmsysteme.de

3. LCA: Calculation rules

3.1 Declared Unit

This EPD refers to a declared unit of 1 m² of double-skin steel-faced sandwich panel with a core made of mineral wool. The results represent an average surface weight of 21.4 kg/m² and a specific thickness of 119 mm.

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Grammage of the entire element	21.44	kg/m^2
Layer thickness	0.119	m

Sandwich panels produced by ROMA vary mainly in the thickness of the thermal insulation material. Therefore the referring product was calculated based on the analysis and weighting of both the produced running meter of the single types of elements and their specific thickness. The thickness of the steel sheets is constant for each product. However, the specific profile of the steel layer (e. g. grooves) may differ depending on the type of element.

Product-specific results for FP-panels with a thickness of 60 mm, 80 mm, 100 mm, 120 mm, 140 mm, 150 mm, 170 mm, 200 mm and 240 mm are declared in a supplementary EPD-annexe.

3.2 System boundary

The life cycle assessment of average sandwich panels produced by ROMA refers to a cradle-to-gate analysis with modules C1–C4 and module D (A1–A3 + C + D). The following lifecycle phases are part of the analysis:

Module A1-A3 | Production stage
The production stage includes upstream burdens of raw materials (steel sheets, thermal insulation core etc.) and the corresponding transports to the production site at Buttenwiesen. The majority of environmental impacts of the steel sheet and thermal insulation material are calculated based on primary data of the specific supplier. Natural gas and light fuel oil provide the required thermal energy. The electric energy demand is procured from the German national grid.

Module C1 | Deconstruction and demolition
It is assumed that the product is not connected with other materials and can therefore be dismantled. Associated efforts are negligible, no environmental impacts from the deconstruction of the products are declared.

Module C2 | Transport to disposal
The transport to the disposal of the material is estimated declaring a 50 km radius to the waste processing.

Module C3 | Waste treatment
The steel sheet that reaches Module D for recycling leaves the product system in C3. Environmental impacts resulting from the grinding and sorting of steel scrap are not included.

Module C4 | Disposal
Module C4 declares environmental impacts due to landfilling of mineral wool after disassembling and sorting. Furthermore, landfilling of steel recycling losses (5 %) are declared in Module C4.

Module D | Benefits and loads beyond the system boundary
Using a European average scenario, Module D sets out the substitution potential resulting from the recycling of steel.

3.3 Estimates and assumptions

All assumptions are verified through detailed documentation and correspond to the best possible representation of reality based on the available data. Regional applicability of the used background data refers to average data under European or German conditions taken from the *MLC* database.

3.4 Cut-off criteria

The LCA model covers all available input and output flows, which can be represented based on robust data and from which a significant contribution can be expected. Data gaps are filled with conservative assumptions of average data or generic data if available and are documented accordingly. Only data with a contribution of less than 1 % were cut off. Thus, no data were neglected, of which a substantial impact is to be expected. All relevant data were collected comprehensively. Cutoff material and energy flows were chosen carefully based on their expected quantitative contribution as well as potential environmental impacts. Thus, it can be assumed that the sum of all neglected input flows does not account for more than 5 % of the total material, water and energy flows. Environmental impacts of machines, plant and infrastructure were not included.

3.5 Background data

Primary and secondary background data for the evaluation of upstream environmental impacts are used in the LCA model. Product-specific environmental product declarations are available to model the upstream supply chain for the majority of the steel sheets as well as a part of the mineral wool used. Secondary data from the *MLC* 2023.2 database in the *LCA FE*-software version 10 are used.

3.6 Data quality

Data collection is based on product-specific questionnaires. It follows an iterative process of clarifying questions via email, telephone calls or in personal/web meetings. Intensive discussions between Romakowski and Daxner & Merl results in an accurate mapping of product-related material and energy flows. This leads to a high quality of foreground data collected. Data collection relies on a consistent process according to *ISO 14044*.

The technological, geographical and time-related representativeness of the database was kept in mind when selecting background data. Whenever specific data were missing, either generic datasets or representative average data were used instead. The implemented *MLC*-background datasets are not older than 10 years and are carefully chosen.

3.7 Period under review

Foreground data were collected for the 2022 production year, and the data are based on the volumes produced on an annual basis.

3.8 Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Germany

3.9 Allocation

Background data for organic coated steel were selected in conformity to *EN 15804*. Primary data are allocated using the partitioning approach developed by *worldsteel 2014* for calculating life cycle inventories of co-products in steel production, which is in line with the provisions of *EN 15804*. The so-called partitioning approach provides for the allocation of environmental impacts to the steelmaking process and the emerging byproducts based on their physical relations. Material-inherent flow properties are thus taken into account. The net flows are calculated by deducting the external steel crap used in the production of the organic coated steel sheets in A1–A3 from the overall mass of the product.

To model the upstream supply chain of the average steel sheet, worldsteel data sets were used for the allocation of co-products from steel production which are modelled with the system expansion approach. As a result, these datasets are not fully compliant with the requirements of the *EN 15804*. Due to the high representativeness of the worldsteel data, these were used for the calculation of the LCA. Scrap input is regarded as burden free.

The demand for electrical and thermal energy is specifically available for the production of PU and MW elements. The fuel requirement for the internal plant logistics was divided by the annual production quantities of PU and MW elements.
ROMA sells the steel residues from production as by-products at current scrap prices. Due to the low contribution to operating income (<0.1 %), no allocation was used to allocate the environmental impact to the main and by-products.

3.10 Comparability

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

The *MLC* 2023.2 background database in the *LCA FE*-softwareversion 10 was used to calculate the LCA.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The declared product does not contain any biogenic carbon.

Information describing the biogenic carbon content at the factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	0.72	kg C

The carbon stored in the packaging was taken into account as "CO_2-neutral". Thus the storage effect of the carbon bound in the packaging is not included in the calculation but is considered as emitted immediately.

Note: 1kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Installation into the building (A5)

The end-of-life of the product packaging is not declared in module A5.

Name	Value	Unit
Packaging (wood)	1.6	kg
Packaging (PE)	0.15	kg
Packaging (polystyrene)	0.05	kg
Packaging (cardboard)	0	kg

End of life (C1–C4)

The end-of-life scenario used in this LCA study is based on the following assumptions:

Name	Value	Unit
Collected separately waste type (steel)	9.7	kg
Recycling (95 %)	9.3	kg
Landfilling (5 % steel loss)	0.5	kg
Landfilling (mineral wool)	11,7	kg

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

Name	Value	Unit
Netflow steel scrap	8.5	kg

This scenario includes a steel recycling rate of 95 %. Since scrap is purchased in the upstream supply chain for the production of the purchased steel sheets, this is offset against the steel scrap for recycling ("net flow").

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5. LCA: Results

The following table contains the LCA results for a declared unit of 1 m² of double-skin steel-faced sandwich panels with a core made of mineral wool with an average surface density of 21.4 kg.

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

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m² sandwich panels (21.4 kg/m²)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	4.31E+01	0	1.35E-02	0	1.96E-01	-1.46E+01
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	4.3E+01	0	1.34E-02	0	1.96E-01	-1.47E+01
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	8.65E-02	0	3.03E-05	0	0	8.68E-02
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	1.71E-02	0	3.64E-05	0	5.69E-04	-1.96E-03
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	1.75E-09	0	1.77E-13	0	4.84E-13	1.98E-11
Acidification potential of land and water (AP)	mol H^+ eq	1.68E-01	0	5.99E-05	0	1.32E-03	-3.6E-02
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	4.9E-05	0	4.97E-08	0	3.74E-07	-3.43E-06
Eutrophication potential aquatic marine (EP-marine)	kg N eq	2.8E-02	0	2.48E-05	0	3.4E-04	-5.79E-03
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	4.88E-01	0	2.7E-04	0	3.74E-03	-5.19E-02
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	9.28E-02	0	6.96E-05	0	1.03E-03	-2.35E-02
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	5.25E-04	0	1.73E-09	0	8.74E-09	-8.34E-05
Abiotic depletion potential for fossil resources (ADPF)	MJ	4.94E+02	0	2.53E-01	0	2.68E+00	-1.46E+02
Water use (WDP)	m^3 world eq deprived	2.63E+00	0	2.18E-03	0	1.9E-02	-9.94E-01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² sandwich panels (21.4 kg/m²)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	4.08E+01	0	1.24E-01	0	4.12E-01	5.78E+00
Renewable primary energy resources as material utilization (PERM)	MJ	2.88E+01	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	6.97E+01	0	1.24E-01	0	4.12E-01	5.78E+00
Non renewable primary energy as energy carrier (PENRE)	MJ	4.78E+02	0	2.54E-01	0	2.68E+00	-1.47E+02
Non renewable primary energy as material utilization (PENRM)	MJ	1.72E+01	0	0	0	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	4.95E+02	0	2.54E-01	0	2.68E+00	-1.47E+02
Use of secondary material (SM)	kg	1.4E+00	0	0	0	0	8.48E+00
Use of renewable secondary fuels (RSF)	MJ	0	0	0	0	0	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	0
Use of net fresh water (FW)	m^3	9.88E-02	0	1.01E-04	0	5.95E-04	-1.49E+00

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² sandwich panels (21.4 kg/m²)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	1.92E-06	0	-1.56E-11	0	7.91E-11	-1.1E-06
Non hazardous waste disposed (NHWD)	kg	5.27E+00	0	1.56E-04	0	1.22E+01	1.77E+00
Radioactive waste disposed (RWD)	kg	8.6E-03	0	3.21E-05	0	3.06E-05	1.6E-05
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	9.26E+00	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	0	0	0	0	0	0
Exported thermal energy (EET)	MJ	0	0	0	0	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m² sandwich panels (21.4 kg/m²)

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease	ND	ND	ND	ND	ND	ND

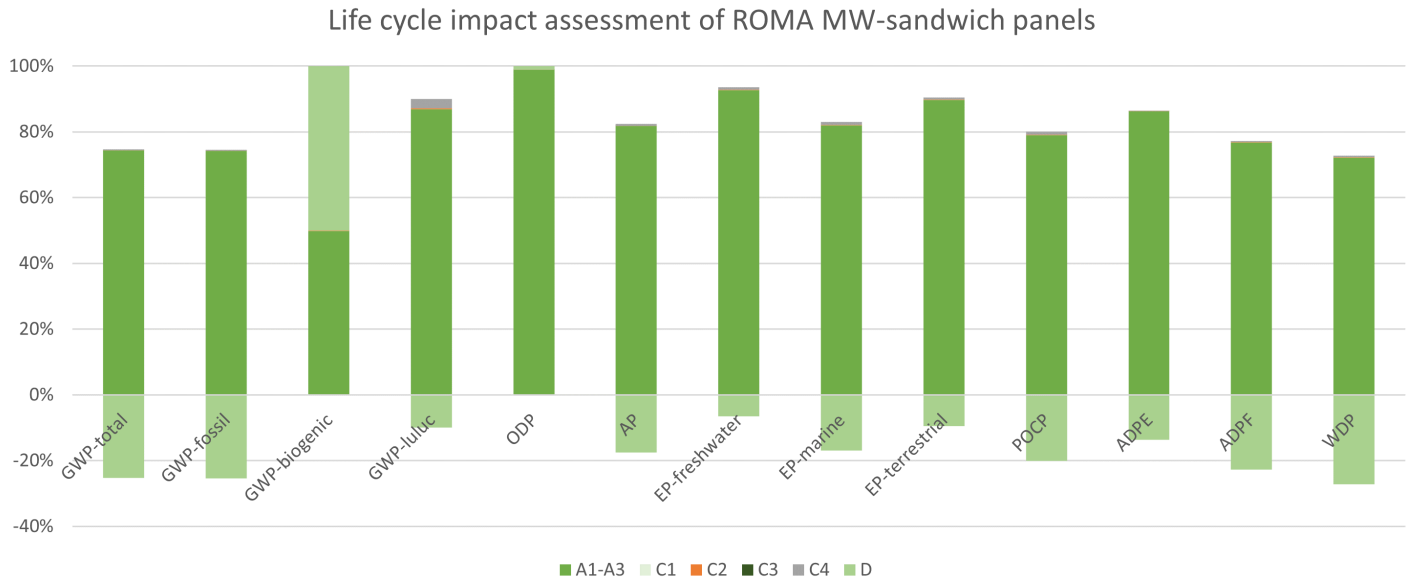
	incidence						
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	ND	ND	ND	ND	ND	ND
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	ND	ND	ND	ND	ND	ND
Soil quality index (SQP)	SQP	ND	ND	ND	ND	ND	ND

The additional and optional impact categories according to *EN 15804*+A2 are not declared, as the uncertainty of these indicators is to be classified as high.

Disclaimer – for the indicators 'abiotic depletion potential for non-fossil resources', 'abiotic depletion potential for fossil resources', 'water (user) deprivation potential, deprivation-weighted water consumption'.
The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

6. LCA: Interpretation

The following interpretation contains a summary of the LCA results referenced to a declared unit of 1 m² of average mineral wool sandwich panel produced by ROMA.



A comparison of the individual lifecycle phases results in a clear dominance of the production phase (**Modules A1–A3**). The environmental effects in the production phase are mainly dominated by the upstream products' environmental effects in the value chain.
Environmental effects of landfilling of mineral wool and steel losses (**Module C4**) make up a minor fraction of the total environmental impact of the product.

As a result of product recyclability, the material removed at the end of life can substitute primary steel. **Module D** shows the recycling potential of steel at the end of its product life. With the exception of biogenic global warming potential (**GWP-biogenic**) this results in benefits from the substitution of primary steel.

Environmental impacts in the production phase can mainly be attributed to producing both organic-coated steel sheets and mineral wool.

Potential acidification (**AP**) and potential eutrophication terrestrial (**EP-terrestrial**) in the production phase (**Modules A1–A3**) of sandwich panels mainly result from environmental burdens in the production of mineral wool. All other indicators are mainly influenced by the supply chain of steel sheets.

The utilisation of non-renewable primary energy (**PENRT**) is also attributable to the upstream chain of steel sheets and mineral wool. The use of renewable primary energy (**PERT**) is characterised by the packaging components.

All panels produced were included in the average analysis of this EPD in the form of an annual average. The specific results of the different thicknesses of the FP-panels can be found in the supplementary EPD appendix. The thickness of the facing of the different panel types is constant, the geometry of the facing can vary between the different types. The thickness of the insulation layer increases with the thickness of the element types. The thickness of the insulation layer is therefore the decisive factor for scaling the results shown.

The maximum deviation from the declared average of the different thicknesses in relation to the global warming potential, is for the MW elements between -16 % and +47 %.

The results of the previous EPD (EPD-ROK-20180145-IBC1-DE) are not directly comparable with the present updated version due to the update of the underlying methodology according to *EN 15804*+A2.

ROMA
DÄMM-SYSTEME

7. Requisite evidence

Double-skin steel-faced sandwich panels in wall and roof application encloses the rooms. The internal skin is in direct contact with the interior. The measurement of VOC emissions is not postulated by laws. Nevertheless, a study on behalf of IFBS shows that thin-walled profiled sheets with zinc and organic coating accomplish *AgBB* scheme. VOC emissions are not relevant for the external skin.

8. References

Standards

DIN 18542
DIN 18542:2009-07, Sealing of outside wall joints with impregnated sealing tapes made of cellular plastics - Impregnated sealing tapes - Requirements and testing.

EN 10169
DIN EN 10169:2012-06, Continuously organic coated (coil coated) steel flat products - Technical delivery conditions.

EN 10346
DIN EN 10346:2015, Continuously hot-dip coated steel flat products for cold forming - Technical delivery conditions.

EN 13162
DIN EN 13162:2012+A1:2015, Thermal insulation products for buildings – Factory-made mineral wool (MW) products - Specification.

EN 13501
DIN EN 13501:2018, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

EN 14509
DIN EN 14509:2013, Self-supporting double skin metal faced insulating panels – Factory-made products - Specifications.

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

ISO 12944
DIN EN ISO 12944:1998-07, Paints and varnishes - Corrosion protection of steel structures by protective paint systems.

ISO 14001
EN ISO 14001:2015, Environmental management systems - Requirements with guidance for use.

ISO 14025
DIN EN ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

ISO 14044
DIN EN ISO 14044:2006-10. Environmental management - Life cycle assessment - Requirements and guidelines.

ISO 15686
ISO 15686:2011-05, Buildings and constructed assets - Service life planning.

Z-10.49-836
Sandwich panels type "FD-", "FP-" and "FV eco" according to DIN EN 14509 with a mineral wool core layer between two steel facings; for wall and roof constructions.

Z-10.49-837
Sandwich panels type "FD-", "FP-" and "FV eco" according to DIN EN 14509 with a mineral wool core layer between two steel facings; for wall and roof constructions.

Z-14.4-407
Z-14.4-407, Thread-forming screws for fastening of sandwich panels to steel or timber supporting structures.

Further references

AgBB
Committee for Health-related Evaluation of Building Products (Ausschuss zur gesundheitlichen Bewertung von Bauprodukten).

AVV
Waste Catalogue Ordinance (German designation: Abfallverzeichnisverordnung – AVV) of 10 December 2001 (Federal Law Gazette I p. 3379), last amended by Article 1 of the Ordinance of 30 June 2020 (Federal Law Gazette I p. 3005).

Candidate list
List of substances of very high concern (SVHC) for authorisation (ECHA Candidate List), 23.01.2024, published under Article 59(10) of REACH. Helsinki: European Chemicals Agency.

EWC
European waste catalogue, by Commission decision 2000/532/EC2, 2004.

IBU 2021
General instructions for the EPD program of Institut Bauen und Umwelt e.V. (IBU). Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021. www.ibuepd.com

LCA FE
LCA FE 10, LCA for Experts Software System and Database for Life Cycle Engineering. Version 10.7. Sphera, 1992-2023.

MLC
MLC 2023.2, Database for Life Cycle Engineering implemented in LCA for Experts software system. DB v10.7 2023.2. Sphera, 1992-2023. Verfügbar unter: https://sphera.com/product sustainabilitygabidatasearch/.

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

PCR Part A
Product category rules for building-related products and services. Part A: Calculation rules for the life cycle assessment and requirements for the project report in accordance with EN 15804+A2:2019. Version 1.3. Berlin: Institut Bauen und Umwelt e.V. (eds.), 2022.

PCR Double skin metal faced sandwich panels
Product category rules for building-related products and services. Part B: EPD requirements for double skin metal faced sandwich panels. Version 5, Berlin: Institut Bauen und Umwelt e.V., 11 July 2023.

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

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