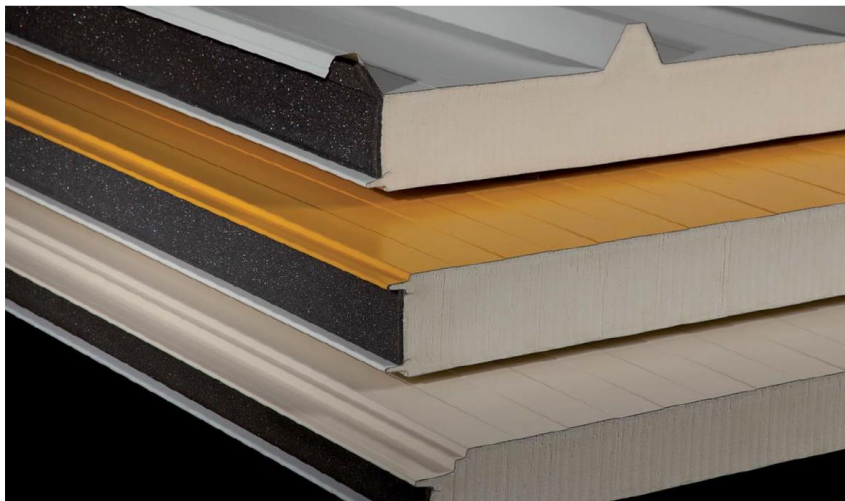


BALEXMETAL

Sandwich panels with polyurethane foam core



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EPD program operator:

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Basic information

This declaration is the type III Environmental Product Declaration (EPD) based on EN 15804 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment. Their aspects were verified by the independent body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).

Life cycle analysis (LCA): A1-A3 modules in accordance with EN 15804 (Cradle to Gate)

The year of preparing the EPD: 2020

Declared durability: Under normal conditions, BalexMetal sandwich panel with polyurethane foam core has reference service life (RSL) of 50 years

PCR: ITB PCR A (PCR based on EN 15804)

Declared unit: 1 m² of BalexMetal sandwich panel with polyurethane foam core

Reasons for performing LCA: B2B

Representativeness: Polish product

Manufacturer and Product Information

BalexMetal Sp. z o.o. is a leading producer of steel building materials in Poland. In the company's offer there are complete solutions and steel roof and facade systems for residential construction, construction for companies and agricultural construction.

The assortment is appreciated by customers in Poland, Belarus, Lithuania, Latvia, Estonia, Ukraine, the Czech Republic, Slovakia, Germany, Denmark, Sweden and Norway. Advice and sales are provided through our own network of regional branches, cooperating distributors and a team of professional advisers.

BalexMetal is a market leader in the production of sandwich panels with double-sided cladding metal with cores made of various thermal insulation materials is due to its high level of advancement technology of production lines purchased from the most renowned European companies, perfectly a qualified team of employees and special attention to quality.

BalexMetal has introduced complete curtain wall and roof covering systems to its offer. The most important elements of the described systems are wall and roof sandwich panels, consisting of two steel sheet claddings connected to the structural and insulating core. The offer of BalexMetal includes plates in steel cladding with three types of insulation core:

- sandwich panels with a mineral wool core with a fiber orientation perpendicular to the facings,
- sandwich panels with a polyurethane core marked as PUR or a polyisocyanurate core
- sandwich panels with polystyrene core (EPS) - PWS and PWD

This Environmental Product Declaration includes sandwich panels with polyurethane foam core in double-sided metal cladding suitable as external walls and wall cladding or partition walls. The product range and technical specification among this document is presented in Table 1

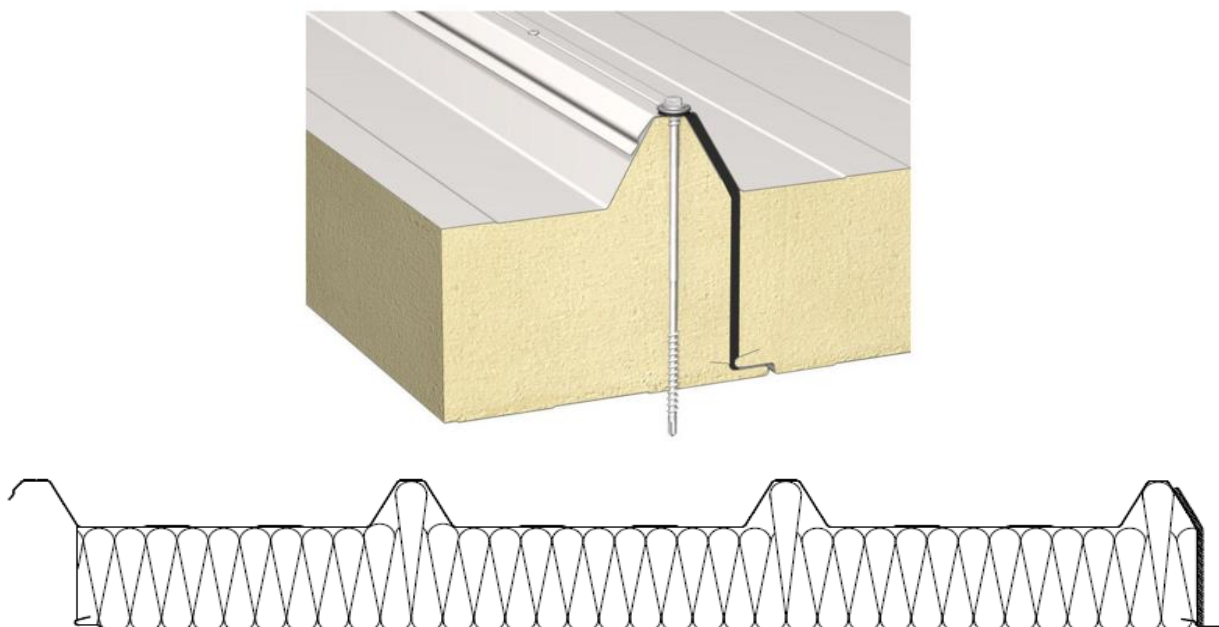


Fig. 1. Example of roof sandwich panel with polyurethane foam core

Table 1. Product range and technical specification of sandwich panels with polyurethane foam core

Trade name with unique identification code:	Thickness [mm]	Thermal insulation [kg/m ³]	Type of profile: external / internal
Wall panel PIR STANDARD (PU-PIR-W-ST)	40 - 100	40 +/- 3	Lining, Microprofiled, Flat, Clearline / Lining, Flat
Wall panel PIR PLUS (PU-PIR-W-PLUS)	60 - 120	40 +/- 3	Lining, Microprofiled, Flat, Clearline, Grooving, Softline / Lining, Flat
Cold storage panel PIR (PU-PIR-F)	120 - 200	40 +/- 3	Lining, Microprofiled, Flat, Clearline / Lining, Flat
Roofing panel PIR (PU-PIR-R)	40 - 160	40 +/- 3	Trapezoidal / Lining, Flat

Polyurethane foam core sandwich panels consist of two steel sheet claddings and a construction and insulation core. The core is made of CFC-free polyurethane foam with a density of $40 \pm 3 \text{ kg/m}^3$ (environmentally friendly), with the highest thermal insulation among other insulation materials known, is responsible for transferring shear stresses, maintaining a constant distance between the facings, and ensuring high thermal insulation.

The claddings of the panels are made of steel sheet S220GD, S250GD, S280GD with a thickness of 0.40 mm to 0.70 mm, galvanized on both sides with 275 g/m² zinc layer. The task of the cladding is to transfer normal stresses as well as to protect the object against weather conditions. Stainless steel (1.4301) is also used for the cladding. Such a structure of the board makes them very light, with high load-bearing capacity and stiffness, allowing for increasing the span of supports (purlins, transoms).

The variety of panel cladding profiles, along with their wide range of colors, allows architects and users to shape the facades of buildings in various ways, maintaining the balance between aesthetics and functionality.

Environmental characteristics (LCA) for BALEXMETAL sandwich panels with polyurethane foam core is presented in a few cases, depending on the thickness of polyurethane foam core (mm): 40, 80, 100, 160, 200.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on general ITB-PCR A. The production of polyurethane sandwich panels with a polyurethane core is carried out continuously on two fully automated production lines in two factories of BalexMetal Sp. z o.o. in Bolszewo and Tomaszów Mazowiecki (Poland). Allocation was done on product mass basis.

All impacts from raw materials extraction are allocated in A1 module of EPD. 100% of impacts from polyurethane foam sandwich panel production in two plants were inventoried of which 24,71% were allocated to plant in Bolszewo and 52,68% were allocated to plant in Tomaszów Mazowiecki. Municipal waste and waste water of whole factory were allocated to module A3. Electricity was inventoried for whole production process. Emissions are measured separately as well and presented in A3 module.

System limits

The life cycle analysis of the examined products covers “Product Stage”, A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB-PCR A. Details on systems limits are provided in product specific report. All materials and energy consumption inventoried in factory were included in calculation. Office impacts were also taken into consideration. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilized thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. This study also takes into account some material flows of less than 1% and energy flows with a proportion of less than 1 %. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804, machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

A1 and A2 Modules: Raw materials supply and transport

Raw materials for components of BalexMetal polyurethane foam sandwich panels production come from local suppliers and more distant locations. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include road and marine transport and Polish and European fuel averages are applied.

A3: Production

The production of polyurethane foam core sandwich panels with a polyurethane core is carried out continuously on two fully automated production lines. Pentane is used as the blowing agent, therefore, the production process is environmentally friendly, i.e. it does not deplete the ozone layer. The technological process of producing sandwich panels with a polyurethane core consists in injecting mixed components, which then form a rigid polyurethane foam, between two continuously moving steel strips (with previously profiled edges and the main contour) with the simultaneous application of a gasket and aluminium foil to the longitudinal joint of the panels. The Fig. 2 show the working process during the production of the PU-PIR-W-ST, PU-PIR -W-PLUS, PU-PIR-F, PU-PIR-R sandwich panels. Fig. 3 shows specific production of PU-R sandwich panels.

Manufacture covers all processes linked to production, which comprises various related operations besides on-site activities, including BalexMetal polyurethane foam sandwich panels components production process, packaging and internal transportation. The manufacturing process also yields data on the combustion of refinery products, such as diesel and gasoline, related to the production process. Use of electricity, fuels and auxiliary materials in the production is taken into account using national data. The environmental profile of these energy carriers is modelled by ITB for average Polish and European conditions. Packaging-related flows in the production process and all upstream packaging are included in the manufacturing module. Apart from production of packaging material, the supply and transport of packaging material are also considered in the LCA model. It is assumed

that packaging waste generated in the course of production and up-stream processes is 100% collected based on a multi-input and multi-output process specific to the elementary composition of the waste. Energy (e.g. electricity) are credited using national production averages.

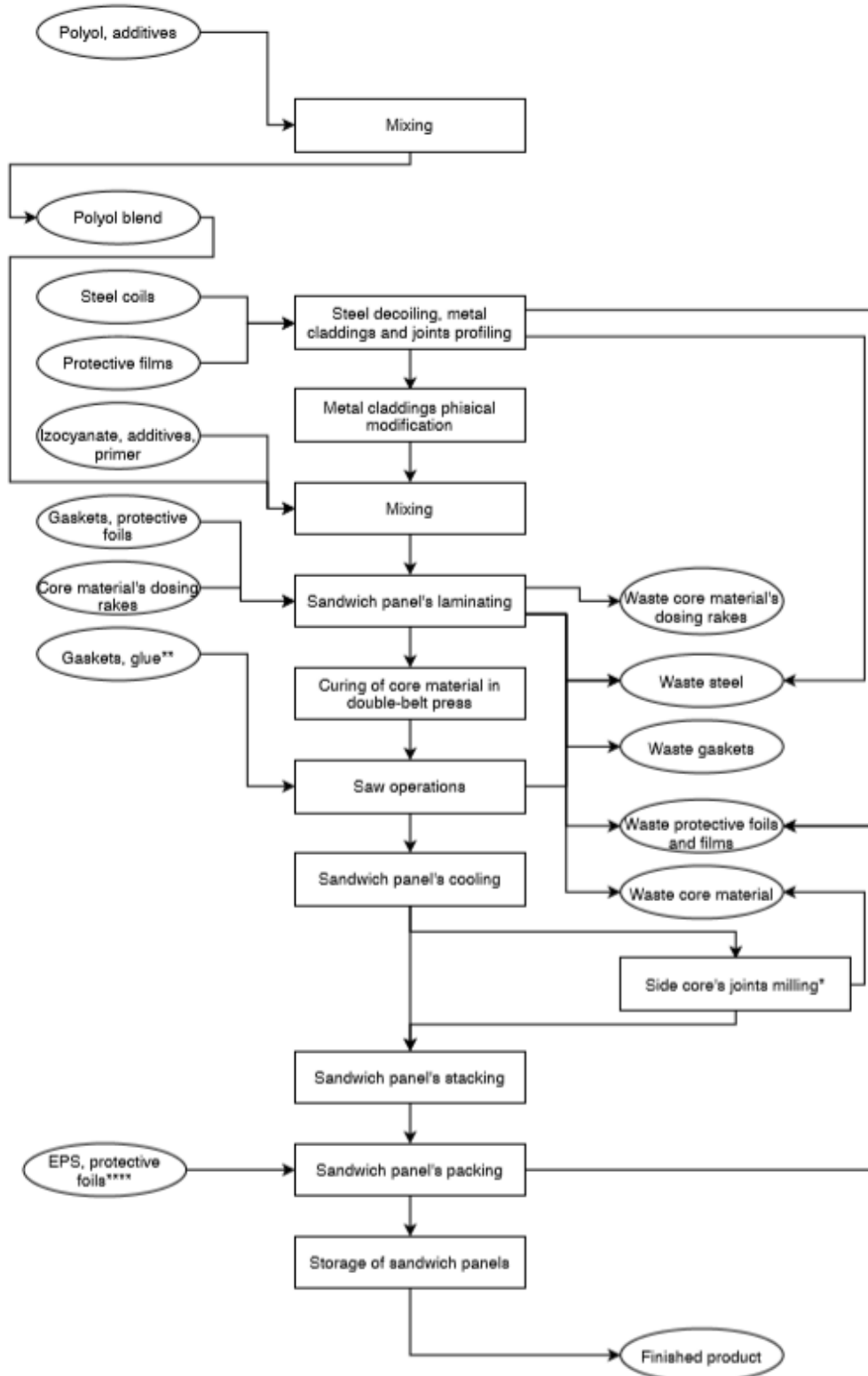


Fig. 2 Production scheme of PU-PIR-W-ST, PU-PIR -W-PLUS, PU-PIR-F sandwich panels with polyurethane foam core at plant in Bolszewo and Tomaszów Mazowiecki

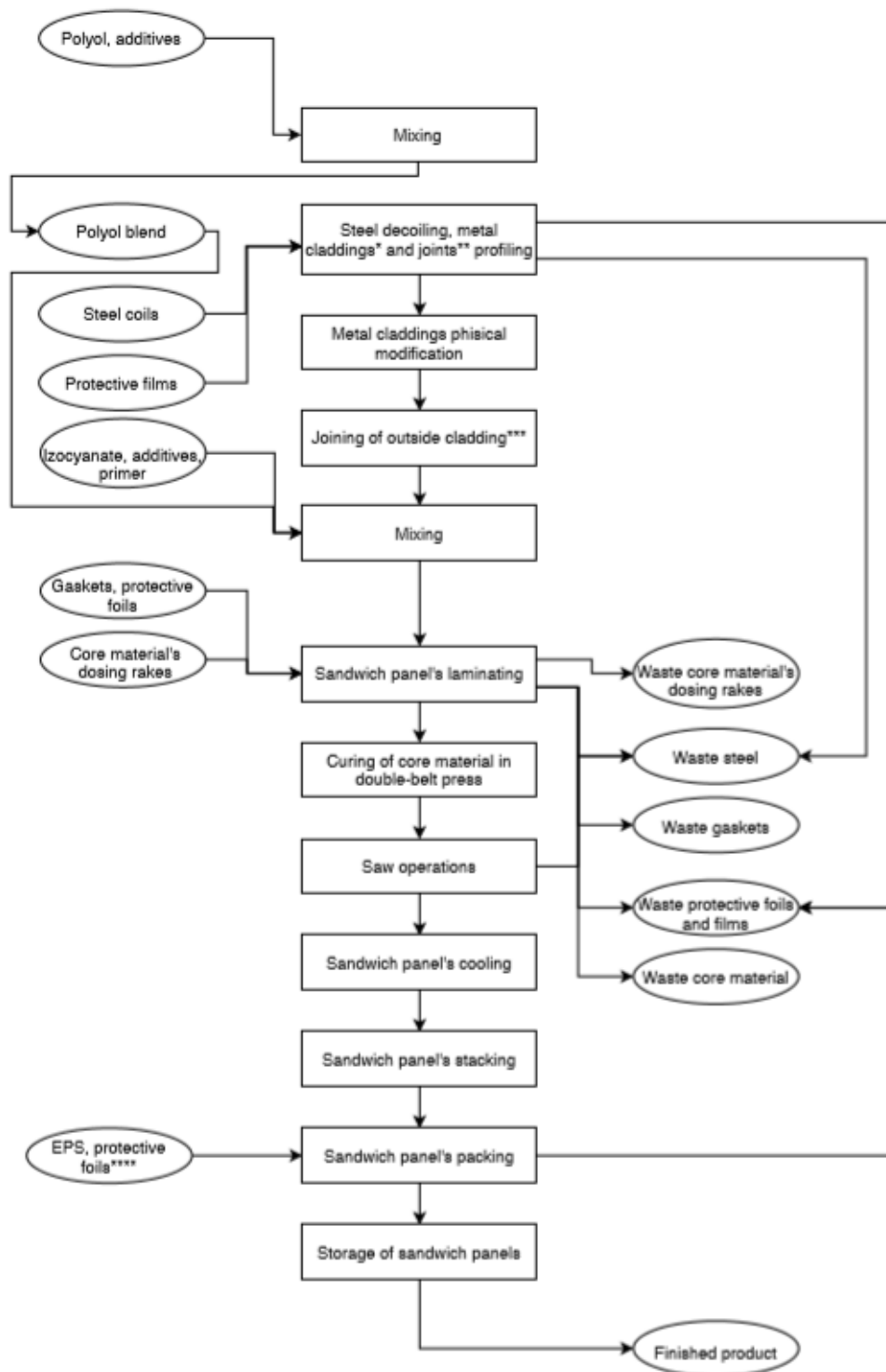


Fig. 3 Production scheme of PU-PIR-R sandwich panels with polyurethane foam core at plant in Bolszewo and Tomaszów Mazowiecki

Data collection period

The data for manufacture of the examined products refer to period between 01.01.2018-31.12.2018. The life cycle assessments were prepared for Poland as reference area.

Data quality

The values determined to calculate the LCA originate from verified BalexMetal Sp. z o.o. inventory data.

Assumptions and estimates

The impacts of the representative BalexMetal Sp. z o.o. products were aggregated using weighted average. The weighted average method was used according to the percentage of each product in sandwich panels with mineral wool core based on the relation to whole production quantity. Impacts for each product and factory were inventoried and calculated separately.

Calculation rules

LCA was done in accordance with PCR A document.

Databases

The data for the processes come from the following databases: Ecoinvent, ITB-Data. Specific data quality analysis was a part of external ISO 14001 audit. Characterization factors are CML ver. 4.2 based on EN 15804:2012+A1:2013 version. (PN-EN 15804+A1:2014-04)



LIFE CYCLE ASSESSMENT (LCA) - Results

Declared unit

The declaration refers to 1 m² of complete BALEXMETAL sandwich panel with polyurethane foam core.

Table 2. System boundaries for environmental characteristic for BALEXMETAL sandwich panel with polyurethane foam core

Environmental assessment information (MNA – Module not assessed, MD – Module Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life			Benefits and loads beyond the system boundary	
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

BALEXMETAL sandwich panel with 40mm polyurethane foam core

Environmental impacts: (1 m ² , PU 40 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	3,48E+01	5,85E-01	1,37E-01	3,55E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8,68E-06	0,00E+00	2,42E-05	3,28E-05
Acidification potential of soil and water	[kg SO ₂ eq.]	1,36E-01	4,56E-03	9,58E-05	1,41E-01
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1,78E-02	7,94E-04	4,69E-06	1,86E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	2,18E-02	2,88E-04	6,59E-05	2,22E-02
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1,59E-02	0,00E+00	5,06E-07	1,59E-02
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	5,08E+02	2,12E+00	2,51E+00	5,12E+02
Environmental aspects on resource use: (1 m ² , PU 40 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	3,59E+01	1,99E-02	1,21E-01	3,60E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	5,37E+02	2,33E-01	2,76E+00	5,40E+02
Use of secondary material	[kg]	1,31E+00	0,00E+00	0,00E+00	1,31E+00
Use of renewable secondary fuels	[MJ]	1,77E+01	1,17E-02	0,00E+00	1,77E+01
Use of non-renewable secondary fuels	[MJ]	1,82E-02	0,00E+00	0,00E+00	1,82E-02
Net use of fresh water	[dm ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (1 m ² , PU 40 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	4,29E-02	2,05E-04	0,00E+00	4,31E-02
Non-hazardous waste disposed	[kg]	7,86E-01	2,24E-02	2,43E-02	8,33E-01
Radioactive waste disposed	[kg]	8,30E-03	0,00E+00	0,00E+00	8,30E-03
Components for re-use	[kg]	0,00E+00	0,00E+00	7,68E-02	7,68E-02
Materials for recycling	[kg]	2,52E-01	0,00E+00	2,36E-02	2,76E-01
Materials for energy recover	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	[MJ per energy carrier]	0,00E+00	0,00E+00	0,00E+00	0,00E+00

BALEXMETAL sandwich panel with 80mm polyurethane foam core

Environmental impacts: (1 m ² , PU 80 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	4,05E+01	5,85E-01	1,37E-01	4,12E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,48E-05	0,00E+00	2,42E-05	3,90E-05
Acidification potential of soil and water	[kg SO ₂ eq.]	1,53E-01	4,56E-03	9,58E-05	1,58E-01
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1,94E-02	7,94E-04	4,69E-06	2,02E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	2,59E-02	2,88E-04	6,59E-05	2,62E-02
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1,57E-02	0,00E+00	5,06E-07	1,57E-02
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	5,84E+02	2,12E+00	2,51E+00	5,88E+02
Environmental aspects on resource use: (1 m ² , PU 80 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	3,89E+01	1,99E-02	1,21E-01	3,91E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	6,21E+02	2,33E-01	2,76E+00	6,24E+02
Use of secondary material	[kg]	1,95E+00	0,00E+00	0,00E+00	1,95E+00
Use of renewable secondary fuels	[MJ]	1,77E+01	1,17E-02	0,00E+00	1,77E+01
Use of non-renewable secondary fuels	[MJ]	4,57E-02	0,00E+00	0,00E+00	4,57E-02
Net use of fresh water	[dm ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (1 m ² , PU 80 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	5,58E-02	2,05E-04	0,00E+00	5,60E-02
Non-hazardous waste disposed	[kg]	8,94E-01	2,24E-02	2,43E-02	9,41E-01
Radioactive waste disposed	[kg]	8,61E-03	0,00E+00	0,00E+00	8,61E-03
Components for re-use	[kg]	0,00E+00	0,00E+00	7,68E-02	7,68E-02
Materials for recycling	[kg]	2,61E-01	0,00E+00	2,36E-02	2,85E-01
Materials for energy recover	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	[MJ per energy carrier]	0,00E+00	0,00E+00	0,00E+00	0,00E+00

BALEXMETAL sandwich panel with 100mm polyurethane foam core

Environmental impacts: (1 m ² , PU 100 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	4,23E+01	5,85E-01	1,37E-01	4,30E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,79E-05	0,00E+00	2,42E-05	4,20E-05
Acidification potential of soil and water	[kg SO ₂ eq.]	1,57E-01	4,56E-03	9,58E-05	1,62E-01
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	2,00E-02	7,94E-04	4,69E-06	2,08E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	2,71E-02	2,88E-04	6,59E-05	2,75E-02
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1,57E-02	0,00E+00	5,06E-07	1,57E-02
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	6,24E+02	2,12E+00	2,51E+00	6,28E+02
Environmental aspects on resource use: (1 m ² , PU 100 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	4,03E+01	1,99E-02	1,21E-01	4,04E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	6,64E+02	2,33E-01	2,76E+00	6,67E+02
Use of secondary material	[kg]	2,01E+00	0,00E+00	0,00E+00	2,01E+00
Use of renewable secondary fuels	[MJ]	1,77E+01	1,17E-02	0,00E+00	1,77E+01
Use of non-renewable secondary fuels	[MJ]	5,06E-02	0,00E+00	0,00E+00	5,06E-02
Net use of fresh water	[dm ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (1 m ² , PU 100 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	5,85E-02	2,05E-04	0,00E+00	5,87E-02
Non-hazardous waste disposed	[kg]	9,17E-01	2,24E-02	2,43E-02	9,63E-01
Radioactive waste disposed	[kg]	8,70E-03	0,00E+00	0,00E+00	8,70E-03
Components for re-use	[kg]	0,00E+00	0,00E+00	7,68E-02	7,68E-02
Materials for recycling	[kg]	2,63E-01	0,00E+00	2,36E-02	2,86E-01
Materials for energy recover	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	[MJ per energy carrier]	0,00E+00	0,00E+00	0,00E+00	0,00E+00

BALEXMETAL sandwich panel with 160mm polyurethane foam core

Environmental impacts: (1 m ² , PU 160 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	4,77E+01	5,85E-01	1,37E-01	4,84E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,70E-05	0,00E+00	2,42E-05	5,12E-05
Acidification potential of soil and water	[kg SO ₂ eq.]	1,70E-01	4,56E-03	9,58E-05	1,74E-01
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	2,19E-02	7,94E-04	4,69E-06	2,27E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	3,09E-02	2,88E-04	6,59E-05	3,12E-02
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1,57E-02	0,00E+00	5,06E-07	1,57E-02
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	7,43E+02	2,12E+00	2,51E+00	7,48E+02
Environmental aspects on resource use: (1 m ² , PU 160 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	4,44E+01	1,99E-02	1,21E-01	4,46E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	7,95E+02	2,33E-01	2,76E+00	7,98E+02
Use of secondary material	[kg]	2,19E+00	0,00E+00	0,00E+00	2,19E+00
Use of renewable secondary fuels	[MJ]	1,78E+01	1,17E-02	0,00E+00	1,78E+01
Use of non-renewable secondary fuels	[MJ]	6,52E-02	0,00E+00	0,00E+00	6,52E-02
Net use of fresh water	[dm ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (1 m ² , PU 160 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	6,68E-02	2,05E-04	0,00E+00	6,70E-02
Non-hazardous waste disposed	[kg]	9,85E-01	2,24E-02	2,43E-02	1,03E+00
Radioactive waste disposed	[kg]	8,98E-03	0,00E+00	0,00E+00	8,98E-03
Components for re-use	[kg]	0,00E+00	0,00E+00	7,68E-02	7,68E-02
Materials for recycling	[kg]	2,67E-01	0,00E+00	2,36E-02	2,91E-01
Materials for energy recover	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	[MJ per energy carrier]	0,00E+00	0,00E+00	0,00E+00	0,00E+00

BALEXMETAL sandwich panel with 200mm polyurethane foam core

Environmental impacts: (1 m ² , PU 200 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	5,13E+01	5,85E-01	1,37E-01	5,21E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	3,32E-05	0,00E+00	2,42E-05	5,73E-05
Acidification potential of soil and water	[kg SO ₂ eq.]	1,78E-01	4,56E-03	9,58E-05	1,82E-01
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	2,31E-02	7,94E-04	4,69E-06	2,39E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	3,34E-02	2,88E-04	6,59E-05	3,37E-02
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1,57E-02	0,00E+00	5,06E-07	1,57E-02
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	8,23E+02	2,12E+00	2,51E+00	8,27E+02
Environmental aspects on resource use: (1 m ² , PU 200 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	4,72E+01	1,99E-02	1,21E-01	4,73E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	8,83E+02	2,33E-01	2,76E+00	8,86E+02
Use of secondary material	[kg]	2,32E+00	0,00E+00	0,00E+00	2,32E+00
Use of renewable secondary fuels	[MJ]	1,78E+01	1,17E-02	0,00E+00	1,78E+01
Use of non-renewable secondary fuels	[MJ]	7,50E-02	0,00E+00	0,00E+00	7,50E-02
Net use of fresh water	[dm ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (1 m ² , PU 200 mm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	7,23E-02	2,05E-04	0,00E+00	7,25E-02
Non-hazardous waste disposed	[kg]	1,03E+00	2,24E-02	2,43E-02	1,08E+00
Radioactive waste disposed	[kg]	9,17E-03	0,00E+00	0,00E+00	9,17E-03
Components for re-use	[kg]	0,00E+00	0,00E+00	7,68E-02	7,68E-02
Materials for recycling	[kg]	2,70E-01	0,00E+00	2,36E-02	2,94E-01
Materials for energy recover	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	[MJ per energy carrier]	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Verification

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

The basis for LCA analysis was EN 15804
Independent verification corresponding to ISO 14025 & 8.3.1. <input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCI audit and input data verification: M.Sc. Eng. Dominik Bekierski, d.bekierski@itb.pl Verification of LCA: PhD Eng. Michał Piasecki, m.piasecki@itb.pl

References

- ITB PCR A- General Product Category Rules for Construction Products
- ISO 14025:2006 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services
- ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets -- Service life planning -- Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets -- Service-life planning -- Part 8: Reference service life and service-life estimation
- EN 15804:2012+A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN 15942:2011 Sustainability of construction works - Environmental product declarations - Communication format business-to-business



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Thermal Physics, Acoustics and Environment Department

02-656 Warsaw, Ksawerów 21

CERTIFICATE No 109/2020 of TYPE III ENVIRONMENTAL DECLARATION

Product:

sandwich panels with a polyurethane foam core

PU-PIR-W-ST

PU-PIR-W-PLUS

PU-PIR-F

PU-PIR-R

Manufacturer:

Balex Metal Sp. z o.o.

Wejherowska 12C, 84-239 Bolszewo, Poland

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

PN-EN 15804+A1:2014-04

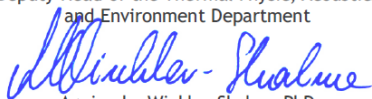
Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued for the first time on 30th September 2020 is valid for 5 years
or until amendment of mentioned Environmental Declaration

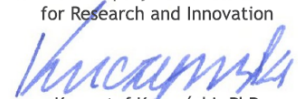
Deputy Head of the Thermal Physic, Acoustics
and Environment Department



Agnieszka Winkler-Skalna, PhD



Deputy Director
for Research and Innovation



Krzysztof Kuczyński, PhD

Warsaw, September 2020