Instytut Techniki Budowlanej
00-611 Warsaw, Filtrowa 1

Thermal Physics, Acoustics and Environment Department
02-656 Warsaw, Ksawerów 21

CERTIFICATE № 066/2018
of TYPE III ENVIRONMENTAL DECLARATION

Product:

Double skin steel faced sandwich panels
with polyurethane/polyisocyanurate (PUR/PIR) core
PROMISOL / ONDATHERM

Manufacturer:

ArcelorMittal Construction Polska Sp. z o.o.
Metalowców 1, 41-600 Świętochłowice

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 12" March 2018 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics
and Environment Department
Michał Piasecki, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director
for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, March 2018

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Validity date: 12.03.2023

Double skin steel faced sandwich panels with polyurethane/polyisocyanurate (PUR/PIR) core PROMISOL / ONDATHERM

ECO EPD Ref. No. 00000648

ITB is the verified member of The European Platform for EPD program operators and LCA practitioner www.eco-platform.org

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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: 2018
Declared durability: for standard product – 45 years
Product standard: PN-EN 14509:2013-12E
PCR: ITB-PCR A (PCR based on EN 15804)
Functional unit: m^2
Reasons for performing LCA: B2B
Representativeness: Polish product

MANUFACTURER AND PRODUCT INFORMATION

ArcelorMittal Construction Polska Sp. z o. o., that belongs to ArcelorMittal Group, was established at the start of 2006 in result of a merger of two companies already operating in the Polish construction market: Haironville Polska Sp. z o. o. and Prekon Sp. z o. o. At the beginning of 2009, ArcelorMittal Construction Polska Sp. z o.o. merged with the company Florprofile seated in Świętochłowice.

ArcelorMittal Construction Polska Sp. z o. o. offers a wide range of folded and corrugated steel sheets, sandwich panels with polystyrene, polyurethane and polyisocyanurate core in steel skin sheets, solid and perforated longitudinal trays. The company presently operates three production plants in: Świętochłowice, Starachowice and Rawa Mazowiecka (Fig. 1). The machine park includes modern lines which ensure proper product quality parameters.

Fig. 1. The view of ArcelorMittal Construction Sp. z o.o. plant in Rawa Mazowiecka.

The system of PROMISOL / ONDATHERM sandwich panels includes:

- PROMISOL 1003B cladding panels with visible fixing (PUR/PIR),
- PROMISOL 2003BI cladding panels with hidden fixing (PUR/PIR),
- PROMISOL 1003BC cladding panels with visible fixing (PUR/PIR) – coldroom version
- ONDATHERM 1001TS roofing panels (PUR/PIR)

Structure

All available panel types have the modular width of 1000 mm. The sandwich panels consist of two steel skin sheets and an insulating core. The core is made of PUR/ PIR type freon-free polyurethane / polyisocyanurate foam with the density of 40±3kg/m^3. The skin sheets serve the purpose of conveying normal stress whereas the core is responsible for conveying tangential stress and keeping a permanent distance between the skin sheets. This structure makes the panel light while retaining its high load capacity and stiffness, which allow increasing the span of supports (purlines, locks). See table 1 for the key range of panels. The panel skin sheets are made of S220GD, S250GD, S280GD, S320GD and S350GD steel sheets. The available skin sheet thickness varies from 0.40 mm to 0.75 mm. In case of wall panels, the standard thickness is 0.50 mm (int. and ext. skin). In case of roof panels, the standard thickness is 0.50 mm for the external skin sheet and 0.40 mm for the internal skin sheet. They are protected with a metallic layer coated with an organic layer.

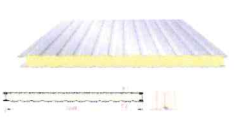
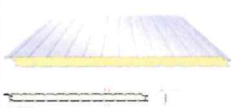
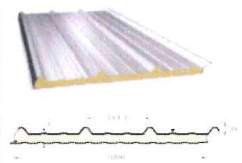
Colours

Standard colours of external skins are: RAL 9010, RAL 9002, RAL 9006, RAL 9007, RAL 7035, RAL 1015, RAL 5010, RAL 7024, RAL 3000, RAL 6011. Standard colours of internal skins are: RAL 9010, RAL 9002.

Applications

PROMISOL / ONDATHERM sandwich panels are used especially for the construction of halls, industrial plants and public facilities (shopping malls, logistic depots, sport halls etc.). Apart from being used for cladding curtain walls and roofing systems, PROMISOL / ONDATHERM panels are also used as partition walls, suspended ceilings or load-bearing walls in small refrigerated vehicles, construction site back-up facilities and outbuildings. Rich colour palette and a selection of panel profile shapes allow completing a variety of interesting facilities. PROMISOL / ONDATHERM panels can be mounted both in vertical and in horizontal position.

Table 1. Characteristic of PROMISOL / ONDATHERM sandwich panels

Range of product			PROMISOL 1003B	PROMISOL 2003BI	PROMISOL 1003BC	ONDATHERM 1001TS
Panel thickness [mm]			40, 50, 60, 80, 100, 120	50, 60, 80, 100, 120	120, 160, 200	40, 60, 80, 100, 120, 140
Face	Face 1	Thickness [mm]	0,4; 0,5; 0,63; 0,75	0,4; 0,5; 0,63; 0,75	0,4; 0,5; 0,63; 0,75	0.4, 0.5, 0.63, 0.75
		Grade	S280GD, S320GD,S350GD	S280GD, S320GD,S350GD	S280GD,S320GD,S350GD	S280GD, S320GD,S350GD
		Metallic coating	Z100, Z187,5, Z200, Z275, AZ150, AZ185, ZM60, ZM80, ZM100, ZM120	Z100, Z187,5, Z200, Z275, AZ150, AZ185, ZM60, ZM80, ZM100, ZM120	Z100, Z187,5, Z200, Z275, AZ150, AZ185, ZM60, ZM80, ZM100, ZM120	Z187,5, Z200, Z275, AZ150, AZ185, ZM120, stainless 1.4301
		Organic coating	SP12, SP15, SP25, SP35, PVDF25, PVDF35, PVDF60, PUR45, PUR50, PUR60,PUR85, PVC(P)100, PVC(P)150, PVC(P)200, PVC(F)110, Estetic Clean 50, stainless 1.4301	SP12, SP15, SP25, SP35, PVDF25, PVDF35, PVDF60, PUR45, PUR50, PUR60, PUR85, PVC(P)100, PVC(P)150, PVC(P)200, PVC(F)110, Estetic Clean 50, stainless 1.4301	SP12, SP15, SP25, SP35, PVDF25, PVDF35, PVDF60, PUR45, PUR50, PUR60, PUR85, PVC(P)100, PVC(P)150, PVC(P)200, PVC(F)110, Estetic Clean 50, stainless 1.4301	SP12, SP15, SP25, SP35, PVDF25, PVDF35, PVDF60, PUR45, PUR50, PUR60, PUR85, PVC(P)100, PVC(P)150, PVC(P)200, PVC(F)110, Estetic Clean 50, stainless 1.4301
	Face 2	Thickness [mm]	0,4; 0,5; 0,63; 0,75	0,4; 0,5; 0,63; 0,75	0,4; 0,5; 0,63; 0,75	0.4, 0.5, 0.63, 0.75
		Grade	S250GD, S280GD, S320GD,S350GD	S250GD, S280GD, S320GD,S350GD	S250GD, S280GD, S320GD,S350GD	S250GD, S280GD, S320GD,S350GD
		Metallic coating	Z100, Z187,5, Z200, Z275, AZ150, AZ185, ZM60, ZM80,ZM100, ZM120, stainless 1.4301	Z100, Z187,5, Z200, Z275, AZ150, AZ185, ZM60, ZM80, ZM100, ZM120, stainless 1.4301	Z100, Z187,5, Z200, Z275, AZ150, AZ185, ZM60, ZM80, ZM100, ZM120, stainless 1.4301	Z100, Z187,5, Z200, Z275, AZ150, AZ185, ZM60, ZM80, ZM100, ZM120, stainless 1.4301
		Organic coating	SP12, SP15, SP25, SP35, PVDF25, PVDF35, PVDF60, PUR45, PUR55, PUR60,PUR85, PVC(P)100, PVC(P)150, PVC(P)200, PVC(F)110, Estetic Clean 50	SP12, SP15, SP25, SP35, PVDF25, PVDF35, PVDF60, PUR45, PUR55, PUR60,PUR85, PVC(P)100, PVC(P)150, PVC(P)200, PVC(F)110, Estetic Clean 50	SP12, SP15, SP25, SP35, PVDF25, PVDF35, PVDF60, PUR45, PUR55, PUR60,PUR85, PVC(P)100, PVC(P)150, PVC(P)200, PVC(F)110, Estetic Clean 50	SP12, SP25, SP35, PVDF25, PVDF35, PVDF60, PUR45, PUR55, PUR60, PVC(P)100, PVC(P)150, PVC(P)200, PVC(F)110, Estetic Clean 50
Type of insulation			Polyisocyanurate foam PIR 40±3kg/m^3	Polyisocyanurate foam PIR 40±3kg/m^3	Polyisocyanurate foam PIR 40±3kg/m^3	Polyisocyanurate foam PIR 40±3kg/m^3
Cross-section						

PROMISOL / ONDATHERM sandwich panels with polyurethane or polyisocyanurate core between steel skin sheets have the following approval documents: European Declaration of Conformity with the PN-EN 14509 – AMCPL004CPR/1/4; AMCPL005CPR/1/4; AMCPL0013CPR/1/4; No AMCPL0014CPR/2/2; No AMCPL0014CPR/3; No AMCPL0013CPR/2.

Sandwich panels have: Hygiene Certificate issued by the Medical University of Gdansk – 324/322/344/2014.

Fastening panels to support structures

PROMISOL / ONDATHERM sandwich panels are fastened to the steel structure by means of self-drilling fasteners (screws). Using this technique eliminates the need to drill a through hole in the panel and a lead hole in the bearing structure. The fasteners increase the fastening reliability and reduce number of necessary tools to a power screwdriver (before it required a driller, drills and a screwdriver). Maximum steel thickness to screw for self-tapping fasteners is 16 mm. They are made of quenched carbon steel with an anti-corrosion protective surface coating. All fasteners come with aluminum or steel washers with vulcanized EPDM rubber. In case of steel structures whose the thickness exceeds 16 mm as well as wooden and concrete structures, it is possible to use other fasteners:

• in case of steel base (thicker than 16 mm) or wooden base – it is recommended to use self-tapping fasteners with a properly shaped working thread profile;

• in case of concrete base – it is recommended to use fasteners with an anchor element or self-tapping with a properly shaped working thread profile.

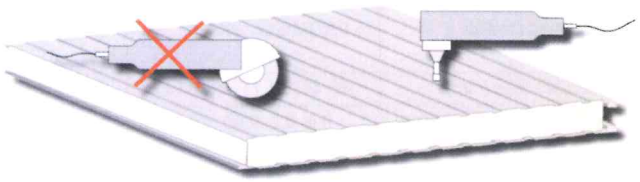


Fig. 2. Recommended cutting tools for sandwich panels

PROMISOL / ONDATHERM normally are fastened in the following way:

- PROMISOL 1003B cladding panel with visible fixing – is fixed to the bearing structure with two fasteners along its cover width;
- PROMISOL 2003BI cladding panel with invisible fixing – is fixed at each connection point to the steel structure with two fasteners through a steel profile (washer) the so-called load distributor;
- PROMISOL 1003BC cladding panel with visible fixing – is fixed to the bearing structure with two fasteners (special coldroom types) along its cover width
- ONDATHERM 1001TS roofing panel – is fixed with two connectors along its width to the steel structure together with roof saddles.

Number of fasteners depends from climatic loading (snow and wind loading conditions). Depending on the type of the material, to which are fastened sandwich panels, are applied self-tapping steel fasteners (are differentiated fasteners to cold-bended steel and hot-bended), wood or concrete.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of PROMISOL / ONDATHERM sandwich panels with the rigid foam core is a line process with steel cladding sheets and trays in one factory of ArcelorMittal Construction Sp. z o.o. in Rawa Mazowiecka. Allocation was done on product mass basis. All impacts from raw materials extraction are allocated in A1 module of EPD. 90.3% of impacts from line production were inventoried and allocated to PROMISOL / ONDATHERM sandwich panels production while the other 9.7% of impacts were attributed to the production of steel cladding sheets and trays. Municipal waste and waste water of whole factory were allocated to module A3. Energy supply was inventoried for whole production process. Emissions in ArcelorMittal Construction Sp. z o.o. are measured and were allocated to module A3.

System limits

The life cycle analysis of the declared products covers "Product Stage", A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB PCR A. The details of systems limits are provided in product technical 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, utilised thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A1, 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 such as hot rolled steel come from ArcelorMittal group steel mills (i.e Construction France in Contrisson (France), ArcelorMittal Poland in Świętochłowice), the chemical components as polyol, isocyanate (MDI), catalysts are produced in European plants of leading chemical manufacturers whereas other ancillary items come mainly from local Polish suppliers. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include trucks and Polish and European fuel averages are applied.

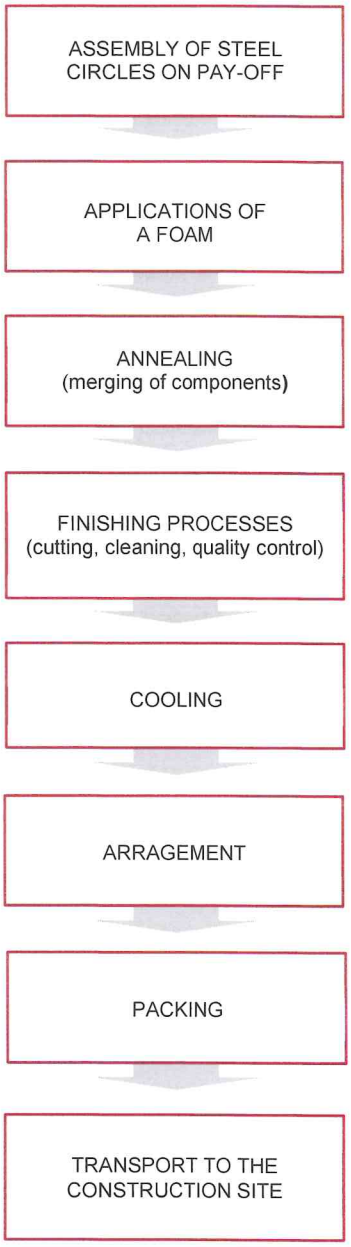


Fig. 3. A production scheme of PROMISOL / ONDATHERM sandwich panels in ArcelorMittal Construction Sp. z o.o. factory in Rawa Mazowiecka.

A3: Production

The production of PROMISOL / ONDATHERM sandwich panels with the rigid foam core is a continuous process performed by a fully automated line which was delivered by the company Hennecke (Germany), one of the leaders in this market sector. Due to the fact that pentane is used

as the foaming agent, the production of panels does not cause any harm to the natural environment, i.e. it does not contribute to any further damage of the ozone layer. The production technology used to manufacture sandwich panels with polyurethane / polyisocyanurate core consists in injecting mixed chemical components between two continuously moving steel sheets with preformed edges while simultaneously applying a soft 5 mm thick (initial thickness) polyurethane / polyisocyanurate seal and 25 µm thick PVC foil into the longitudinal contactor. During the production process the liquid components transform into panels' rigid insulating foam.

Data collection period

The data for manufacture of the declared products refer to period between 01.1.2016 – 31.12.2016 (1 year). The life cycle assessments were prepared for Poland as reference area.

Data quality

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

Assumptions and estimates

The impacts of the representative PROMISOL / ONDATHERM sandwich panels were aggregated using weighted average. Impacts were inventoried and calculated for all products of sandwich panels product group.

Calculation rules

LCA was done in accordance with ITB PCR A document.

Databases

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

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to functional unit (FU) - 1 m^2 of double skin steel faced sandwich panels with polyurethane/polyisocyanurate (PUR/PIR) core PROMISOL / ONDATHERM

Table 2. System boundaries for environmental characteristic for double skin steel faced sandwich panels with polyurethane/polyisocyanurate (PUR/PIR) core PROMISOL / ONDATHERM

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

Double skin steel faced sandwich panels PROMISOL 1003B
with thickness 40 mm (face 1: 0.5 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	2.98E+01	1.02E+00	5.12E-01	3.13E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	7.21E-03	0.00E+00	0.00E+00	7.21E-03
Acidification potential of soil and water	[kg SO_2 eq.]	7.84E+00	7.32E-03	0.00E+00	7.85E+00
Formation potential of tropospheric ozone	[kg Ethene eq.]	1.86E+00	5.33E-04	7.59E-04	1.86E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	1.28E+00	1.29E-03	0.00E+00	1.28E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.59E-03	0.00E+00	1.97E-06	6.59E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	3.75E+02	7.89E+00	1.18E+01	3.95E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	4.86E+01	5.52E-01	7.38E-01	4.99E+01
Use of renewable primary energy resources used as raw materials	[MJ]	4.74E+00	0.00E+00	0.00E+00	4.74E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	5.33E+01	5.52E-01	7.38E-01	5.46E+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]	3.99E+02	8.28E+00	1.22E+01	4.19E+02
Use of secondary material	[kg]	6.50E+00	0.00E+00	0.00E+00	6.50E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	3.37E+01	7.16E-08	3.44E-04	3.37E+01
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	5.38E-03	1.40E-04	1.07E-03	6.59E-03
Non-hazardous waste disposed	[kg]	1.31E+00	1.30E-01	2.87E-02	1.47E+00
Radioactive waste disposed	[kg]	2.11E-02	0.00E+00	0.00E+00	2.11E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.60E+00	0.00E+00	2.07E-02	1.62E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI

with thickness 50 mm (face 1: 0.5 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	3.08E+01	1.02E+00	5.12E-01	3.23E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9.05E-03	0.00E+00	0.00E+00	9.05E-03
Acidification potential of soil and water	[kg SO_2 eq.]	9.64E+00	7.32E-03	0.00E+00	9.64E+00
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.30E+00	5.33E-04	7.59E-04	2.30E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	1.59E+00	1.29E-03	0.00E+00	1.59E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.59E-03	0.00E+00	1.97E-06	6.59E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	3.99E+02	7.89E+00	1.18E+01	4.19E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	4.93E+01	5.52E-01	7.38E-01	5.06E+01
Use of renewable primary energy resources used as raw materials	[MJ]	4.96E+00	0.00E+00	0.00E+00	4.96E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	5.43E+01	5.52E-01	7.38E-01	5.56E+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]	4.26E+02	8.28E+00	1.22E+01	4.46E+02
Use of secondary material	[kg]	6.50E+00	0.00E+00	0.00E+00	6.50E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	3.94E+01	7.16E-08	3.44E-04	3.94E+01
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	5.61E-03	1.40E-04	1.07E-03	6.82E-03
Non-hazardous waste disposed	[kg]	1.34E+00	1.30E-01	2.87E-02	1.50E+00
Radioactive waste disposed	[kg]	2.12E-02	0.00E+00	0.00E+00	2.12E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.60E+00	0.00E+00	2.07E-02	1.62E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI

with thickness 60 mm (face 1: 0.5 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	3.17E+01	1.02E+00	5.12E-01	3.32E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1.09E-02	0.00E+00	0.00E+00	1.09E-02
Acidification potential of soil and water	[kg SO_2 eq.]	1.14E+01	7.32E-03	0.00E+00	1.14E+01
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.74E+00	5.33E-04	7.59E-04	2.74E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	1.91E+00	1.29E-03	0.00E+00	1.91E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.60E-03	0.00E+00	1.97E-06	6.60E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	4.23E+02	7.89E+00	1.18E+01	4.43E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	5.00E+01	5.52E-01	7.38E-01	5.13E+01
Use of renewable primary energy resources used as raw materials	[MJ]	5.19E+00	0.00E+00	0.00E+00	5.19E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	5.52E+01	5.52E-01	7.38E-01	5.65E+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]	4.53E+02	8.28E+00	1.22E+01	4.73E+02
Use of secondary material	[kg]	6.50E+00	0.00E+00	0.00E+00	6.50E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	4.52E+01	7.16E-08	3.44E-04	4.52E+01
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	5.84E-03	1.40E-04	1.07E-03	7.05E-03
Non-hazardous waste disposed	[kg]	1.38E+00	1.30E-01	2.87E-02	1.54E+00
Radioactive waste disposed	[kg]	2.13E-02	0.00E+00	0.00E+00	2.13E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.60E+00	0.00E+00	2.07E-02	1.62E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI

with thickness 80 mm (face 1: 0.5 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m^2					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	3.37E+01	1.02E+00	5.12E-01	3.52E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1.46E-02	0.00E+00	0.00E+00	1.46E-02
Acidification potential of soil and water	[kg SO_2 eq.]	1.50E+01	7.32E-03	0.00E+00	1.50E+01
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.62E+00	5.33E-04	7.59E-04	3.62E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	2.53E+00	1.29E-03	0.00E+00	2.53E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.60E-03	0.00E+00	1.97E-06	6.60E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	4.72E+02	7.89E+00	1.18E+01	4.91E+02
Environmental aspects on resource use: (FU) 1 m^2					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	5.14E+01	5.52E-01	7.38E-01	5.27E+01
Use of renewable primary energy resources used as raw materials	[MJ]	5.63E+00	0.00E+00	0.00E+00	5.63E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	5.71E+01	5.52E-01	7.38E-01	5.84E+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]	5.08E+02	8.28E+00	1.22E+01	5.28E+02
Use of secondary material	[kg]	6.50E+00	0.00E+00	0.00E+00	6.50E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	5.66E+01	7.16E-08	3.44E-04	5.66E+01
Other environmental information describing waste categories: (FU) 1 m^2					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	6.30E-03	1.40E-04	1.07E-03	7.51E-03
Non-hazardous waste disposed	[kg]	1.46E+00	1.30E-01	2.87E-02	1.62E+00
Radioactive waste disposed	[kg]	2.16E-02	0.00E+00	0.00E+00	2.16E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.60E+00	0.00E+00	2.07E-02	1.62E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI

with thickness 100 mm (face 1: 0.5 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	3.56E+01	1.02E+00	5.12E-01	3.71E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1.83E-02	0.00E+00	0.00E+00	1.83E-02
Acidification potential of soil and water	[kg SO_2 eq.]	1.86E+01	7.32E-03	0.00E+00	1.86E+01
Formation potential of tropospheric ozone	[kg Ethene eq.]	4.51E+00	5.33E-04	7.59E-04	4.51E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	3.16E+00	1.29E-03	0.00E+00	3.16E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.60E-03	0.00E+00	1.97E-06	6.60E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	5.20E+02	7.89E+00	1.18E+01	5.40E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	5.29E+01	5.52E-01	7.38E-01	5.42E+01
Use of renewable primary energy resources used as raw materials	[MJ]	6.08E+00	0.00E+00	0.00E+00	6.08E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	5.89E+01	5.52E-01	7.38E-01	6.02E+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]	5.62E+02	8.28E+00	1.22E+01	5.82E+02
Use of secondary material	[kg]	6.50E+00	0.00E+00	0.00E+00	6.50E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	6.81E+01	7.16E-08	3.44E-04	6.81E+01
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	6.76E-03	1.40E-04	1.07E-03	7.97E-03
Non-hazardous waste disposed	[kg]	1.54E+00	1.30E-01	2.87E-02	1.70E+00
Radioactive waste disposed	[kg]	2.19E-02	0.00E+00	0.00E+00	2.19E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.60E+00	0.00E+00	2.07E-02	1.62E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels PROMISOL 1003B, PROMISOL 2003BI and PROMISOL 1003BC

with thickness 120 mm (face 1: 0.5 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	3.76E+01	1.02E+00	5.12E-01	3.91E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2.20E-02	0.00E+00	0.00E+00	2.20E-02
Acidification potential of soil and water	[kg SO_2 eq.]	2.22E+01	7.32E-03	0.00E+00	2.22E+01
Formation potential of tropospheric ozone	[kg Ethene eq.]	5.39E+00	5.33E-04	7.59E-04	5.39E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	3.78E+00	1.29E-03	0.00E+00	3.79E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.61E-03	0.00E+00	1.97E-06	6.61E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	5.68E+02	7.89E+00	1.18E+01	5.88E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	5.43E+01	5.52E-01	7.38E-01	5.56E+01
Use of renewable primary energy resources used as raw materials	[MJ]	6.52E+00	0.00E+00	0.00E+00	6.52E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	6.08E+01	5.52E-01	7.38E-01	6.21E+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]	6.17E+02	8.28E+00	1.22E+01	6.37E+02
Use of secondary material	[kg]	6.50E+00	0.00E+00	0.00E+00	6.50E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	7.95E+01	7.16E-08	3.44E-04	7.95E+01
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	7.22E-03	1.40E-04	1.07E-03	8.42E-03
Non-hazardous waste disposed	[kg]	1.62E+00	1.30E-01	2.87E-02	1.78E+00
Radioactive waste disposed	[kg]	2.21E-02	0.00E+00	0.00E+00	2.21E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.60E+00	0.00E+00	2.07E-02	1.62E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels PROMISOL 1003BC
with thickness 160 mm (face 1: 0.5 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	4.14E+01	1.02E+00	5.12E-01	4.29E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2.94E-02	0.00E+00	0.00E+00	2.94E-02
Acidification potential of soil and water	[kg SO_2 eq.]	2.94E+01	7.32E-03	0.00E+00	2.94E+01
Formation potential of tropospheric ozone	[kg Ethene eq.]	7.15E+00	5.33E-04	7.59E-04	7.15E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	5.04E+00	1.29E-03	0.00E+00	5.04E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.61E-03	0.00E+00	1.97E-06	6.61E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	6.64E+02	7.89E+00	1.18E+01	6.84E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	5.72E+01	5.52E-01	7.38E-01	5.84E+01
Use of renewable primary energy resources used as raw materials	[MJ]	7.42E+00	0.00E+00	0.00E+00	7.42E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	6.46E+01	5.52E-01	7.38E-01	6.59E+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]	7.26E+02	8.28E+00	1.22E+01	7.46E+02
Use of secondary material	[kg]	6.50E+00	0.00E+00	0.00E+00	6.50E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	1.02E+02	7.16E-08	3.44E-04	1.02E+02
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	8.13E-03	1.40E-04	1.07E-03	9.34E-03
Non-hazardous waste disposed	[kg]	1.78E+00	1.30E-01	2.87E-02	1.94E+00
Radioactive waste disposed	[kg]	2.27E-02	0.00E+00	0.00E+00	2.27E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.60E+00	0.00E+00	2.07E-02	1.62E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels PROMISOL 1003BC
with thickness 200 mm (face 1: 0.5 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m^2					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	4.46E+01	1.02E+00	5.12E-01	4.61E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	3.51E-02	0.00E+00	0.00E+00	3.51E-02
Acidification potential of soil and water	[kg SO_2 eq.]	3.49E+01	7.32E-03	0.00E+00	3.49E+01
Formation potential of tropospheric ozone	[kg Ethene eq.]	8.52E+00	5.33E-04	7.59E-04	8.52E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	6.01E+00	1.29E-03	0.00E+00	6.01E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.62E-03	0.00E+00	1.97E-06	6.62E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	7.42E+02	7.89E+00	1.18E+01	7.62E+02
Environmental aspects on resource use: (FU) 1 m^2					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	5.95E+01	5.52E-01	7.38E-01	6.08E+01
Use of renewable primary energy resources used as raw materials	[MJ]	8.11E+00	0.00E+00	0.00E+00	8.11E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	6.76E+01	5.52E-01	7.38E-01	6.89E+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]	8.14E+02	8.28E+00	1.22E+01	8.34E+02
Use of secondary material	[kg]	6.50E+00	0.00E+00	0.00E+00	6.50E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	1.20E+02	7.16E-08	3.44E-04	1.20E+02
Other environmental information describing waste categories: (FU) 1 m^2					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	8.86E-03	1.40E-04	1.07E-03	1.01E-02
Non-hazardous waste disposed	[kg]	1.91E+00	1.30E-01	2.87E-02	2.07E+00
Radioactive waste disposed	[kg]	2.31E-02	0.00E+00	0.00E+00	2.31E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.60E+00	0.00E+00	2.07E-02	1.62E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels ONDATHERM 1001TS

with thickness 40 mm (face 1: 0.4 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	2.76E+01	1.02E+00	5.12E-01	2.91E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	7.22E-03	0.00E+00	0.00E+00	7.22E-03
Acidification potential of soil and water	[kg SO_2 eq.]	7.84E+00	7.32E-03	0.00E+00	7.85E+00
Formation potential of tropospheric ozone	[kg Ethene eq.]	1.86E+00	5.33E-04	7.59E-04	1.87E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	1.28E+00	1.29E-03	0.00E+00	1.28E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.36E-03	0.00E+00	1.97E-06	6.36E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	3.48E+02	7.89E+00	1.18E+01	3.67E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	4.41E+01	5.52E-01	7.38E-01	4.54E+01
Use of renewable primary energy resources used as raw materials	[MJ]	4.74E+00	0.00E+00	0.00E+00	4.74E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	4.89E+01	5.52E-01	7.38E-01	5.02E+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]	3.71E+02	8.28E+00	1.22E+01	3.91E+02
Use of secondary material	[kg]	5.86E+00	0.00E+00	0.00E+00	5.86E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	3.27E+01	7.16E-08	3.44E-04	3.27E+01
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	5.08E-03	1.40E-04	1.07E-03	6.29E-03
Non-hazardous waste disposed	[kg]	1.19E+00	1.30E-01	2.87E-02	1.35E+00
Radioactive waste disposed	[kg]	1.90E-02	0.00E+00	0.00E+00	1.90E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.44E+00	0.00E+00	2.07E-02	1.46E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels ONDATHERM 1001TS

with thickness 60 mm (face 1: 0.4 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	2.96E+01	1.02E+00	5.12E-01	3.11E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1.09E-02	0.00E+00	0.00E+00	1.09E-02
Acidification potential of soil and water	[kg SO_2 eq.]	1.14E+01	7.32E-03	0.00E+00	1.14E+01
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.75E+00	5.33E-04	7.59E-04	2.75E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	1.91E+00	1.29E-03	0.00E+00	1.91E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.36E-03	0.00E+00	1.97E-06	6.36E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	3.96E+02	7.89E+00	1.18E+01	4.16E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	4.56E+01	5.52E-01	7.38E-01	4.69E+01
Use of renewable primary energy resources used as raw materials	[MJ]	5.19E+00	0.00E+00	0.00E+00	5.19E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	5.07E+01	5.52E-01	7.38E-01	5.20E+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]	4.26E+02	8.28E+00	1.22E+01	4.46E+02
Use of secondary material	[kg]	5.86E+00	0.00E+00	0.00E+00	5.86E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	4.41E+01	7.16E-08	3.44E-04	4.41E+01
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	5.54E-03	1.40E-04	1.07E-03	6.75E-03
Non-hazardous waste disposed	[kg]	1.27E+00	1.30E-01	2.87E-02	1.43E+00
Radioactive waste disposed	[kg]	1.93E-02	0.00E+00	0.00E+00	1.93E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.44E+00	0.00E+00	2.07E-02	1.46E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels ONDATHERM 1001TS
with thickness 80 mm (face 1: 0.4 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	3.15E+01	1.02E+00	5.12E-01	3.30E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1.46E-02	0.00E+00	0.00E+00	1.46E-02
Acidification potential of soil and water	[kg SO_2 eq.]	1.50E+01	7.32E-03	0.00E+00	1.50E+01
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.63E+00	5.33E-04	7.59E-04	3.63E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	2.53E+00	1.29E-03	0.00E+00	2.54E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.37E-03	0.00E+00	1.97E-06	6.37E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	4.44E+02	7.89E+00	1.18E+01	4.64E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	4.70E+01	5.52E-01	7.38E-01	4.83E+01
Use of renewable primary energy resources used as raw materials	[MJ]	5.64E+00	0.00E+00	0.00E+00	5.64E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	5.14E+01	5.52E-01	7.38E-01	5.27E+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]	4.80E+02	8.28E+00	1.22E+01	5.00E+02
Use of secondary material	[kg]	5.86E+00	0.00E+00	0.00E+00	5.86E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	5.56E+01	7.16E-08	3.44E-04	5.56E+01
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	6.00E-03	1.40E-04	1.07E-03	7.21E-03
Non-hazardous waste disposed	[kg]	1.35E+00	1.30E-01	2.87E-02	1.51E+00
Radioactive waste disposed	[kg]	1.95E-02	0.00E+00	0.00E+00	1.95E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.44E+00	0.00E+00	2.07E-02	1.46E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels ONDATHERM 1001TS
with thickness 100 mm (face 1: 0.4 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	3.35E+01	1.02E+00	5.12E-01	3.50E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1.83E-02	0.00E+00	0.00E+00	1.83E-02
Acidification potential of soil and water	[kg SO_2 eq.]	1.86E+01	7.32E-03	0.00E+00	1.86E+01
Formation potential of tropospheric ozone	[kg Ethene eq.]	4.51E+00	5.33E-04	7.59E-04	4.51E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	3.16E+00	1.29E-03	0.00E+00	3.16E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.37E-03	0.00E+00	1.97E-06	6.37E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	4.92E+02	7.89E+00	1.18E+01	5.12E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	4.84E+01	5.52E-01	7.38E-01	4.97E+01
Use of renewable primary energy resources used as raw materials	[MJ]	6.08E+00	0.00E+00	0.00E+00	6.08E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	5.45E+01	5.52E-01	7.38E-01	5.58E+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]	5.35E+02	8.28E+00	1.22E+01	5.55E+02
Use of secondary material	[kg]	5.86E+00	0.00E+00	0.00E+00	5.86E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	6.70E+01	7.16E-08	3.44E-04	6.70E+01
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	6.46E-03	1.40E-04	1.07E-03	7.67E-03
Non-hazardous waste disposed	[kg]	1.43E+00	1.30E-01	2.87E-02	1.59E+00
Radioactive waste disposed	[kg]	1.98E-02	0.00E+00	0.00E+00	1.98E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.44E+00	0.00E+00	2.07E-02	1.46E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Double skin steel faced sandwich panels ONDATHERM 1001TS
with thickness 120 mm (face 1: 0.4 mm, face 2: 0.5 mm)

Environmental impacts: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.] (100 years)	3.54E+01	1.02E+00	5.12E-01	3.69E+01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2.20E-02	0.00E+00	0.00E+00	2.20E-02
Acidification potential of soil and water	[kg SO_2 eq.]	2.22E+01	7.32E-03	0.00E+00	2.22E+01
Formation potential of tropospheric ozone	[kg Ethene eq.]	5.39E+00	5.33E-04	7.59E-04	5.39E+00
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	3.79E+00	1.29E-03	0.00E+00	3.79E+00
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	6.37E-03	0.00E+00	1.97E-06	6.37E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	5.41E+02	7.89E+00	1.18E+01	5.60E+02
Environmental aspects on resource use: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	4.98E+01	5.52E-01	7.38E-01	5.11E+01
Use of renewable primary energy resources used as raw materials	[MJ]	6.53E+00	0.00E+00	0.00E+00	6.53E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	5.64E+01	5.52E-01	7.38E-01	5.77E+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]	5.89E+02	8.28E+00	1.22E+01	6.12E+02
Use of secondary material	[kg]	5.86E+00	0.00E+00	0.00E+00	5.86E+00
Use of renewable secondary fuels	[MJ]	6.04E-01	0.00E+00	0.00E+00	6.04E-01
Use of non-renewable secondary fuels	[MJ]	2.87E-04	0.00E+00	0.00E+00	2.87E-04
Net use of fresh water	[dm^3]	7.85E+01	7.16E-08	3.44E-04	7.85E+01
Other environmental information describing waste categories: (FU) 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	6.92E-03	1.40E-04	1.07E-03	8.13E-03
Non-hazardous waste disposed	[kg]	1.51E+00	1.30E-01	2.87E-02	1.67E+00
Radioactive waste disposed	[kg]	2.01E-02	0.00E+00	0.00E+00	2.01E-02
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.44E+00	0.00E+00	2.07E-02	1.46E+00
Materials for energy recover	[kg]	1.39E-05	0.00E+00	7.40E-02	7.40E-02
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 ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 (subclause 8.1.3.) [x] external [ ] internal
External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCI audit and input data verification: Justyna Tomaszewska, PhD. Eng., j.tomaszewska@itb.pl Verification of LCA: Michał Piasecki, PhD. Eng., m.piasecki@itb.pl

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- PN-EN 14509:2013-12E Self-supporting double skin metal faced insulating panels -- Factory made products -- Specifications
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedure
- 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 in construction works – Environmental product declarations – Core rules for the product category of construction products
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business

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