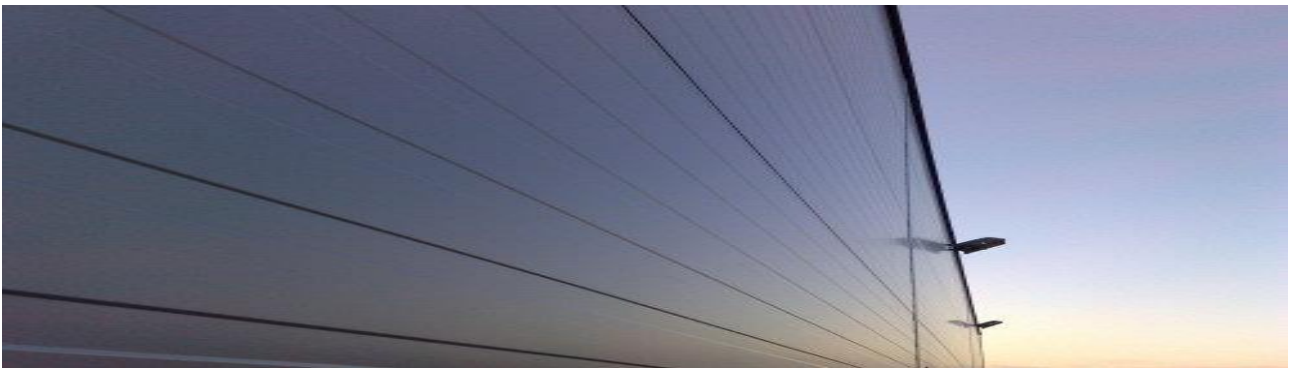




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Validity date: 29.03.2028

## Sandwich panels (PROMISOL / FRIGOTHERM / ONDATHERM) with PIR core



ITB is the verified member of The European Platform for EPD program operators and LCA practitioner [www.eco-platform.org](http://www.eco-platform.org)

### EPD Program Operator:

Building Research Institute (ITB)  
Address: Filtrowa 1  
00-611 Warsaw, Poland  
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Contact: [energia@itb.pl](mailto:energia@itb.pl)

### Owner of the EPD:

ArcelorMittal Construction Polska Sp. z o.o.  
Address: Metalowców 1  
41-600 Świętochłowice, Poland  
Website: <https://construction-polska.arcelormittal.com/pl>  
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### Basic information

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 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+A2.

**Life cycle analysis (LCA):** A1-A3, C1-C4 and D modules in accordance with EN 15804+A2 (Cradle-to-Gate with options)

**The year of preparing the EPD:** 2023

**Declared durability:** 40 – 45 years for standard products

**Product standard:** PN-EN 14509

**PCR:** ITB-PCRA

**Functional unit:** m<sup>2</sup>

**Reasons for performing LCA:** B2B

**Representativeness:** Polish, European

## 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 / FRIGOTHERM / ONDATHERM sandwich panels includes:

- PROMISOL 1003B - cladding panels with visible fix (PIR),
- PROMISOL 2003BI - cladding panels with secret fix (PIR),
- FRIGOTHERM 1003BC - cladding panels with visible fix (PIR) – coldroom version
- ONDATHERM 1001TS roofing panels (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 PIR type freon-free polyisocyanurate foam with the density of  $40 \pm 3 \text{ kg/m}^3$ . 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.

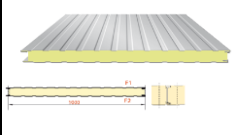
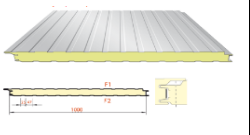

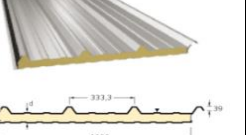
### Colours

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 / FRIGOTHERM / 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 / FRIGOTHERM / 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 / FRIGOTHERM / ONDATHERM panels can be mounted both in vertical and in horizontal position.

**Table 1. Characteristics of PROMISOL / FRIGOTHERM / ONDATHERM sandwich panels**

Range of product		PROMISOL 1003B	PROMISOL 2003BI	FRIGOTHERM 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, 140,160	
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 <sup>3</sup>	Polyisocyanurate foam PIR 40±3kg/m <sup>3</sup>	Polyisocyanurate foam PIR 40±3kg/m <sup>3</sup>	Polyisocyanurate foam PIR 40±3kg/m <sup>3</sup>	
Cross-section						

Thermal insulating core material is made of polyurethane (PIR) according to EN13165. Joint of PIR core in types 1003B, 2003BI and 1001TS is sealed with PE-foamed gasket. The products must comply with the Regulation (EU) No 305/2011 taking into account the harmonized technical specification in accordance with EN14509. Declarations of Performance and CE mark have been issued for the products.

### Fastening panels to support structures

PROMISOL / FRIGOTHERM / 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.

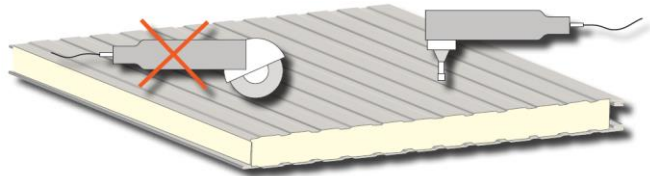


Fig. 2. Recommended cutting tools for sandwich panels

PROMISOL / FRIGOTHERM / ONDATHERM normally are fastened in the following way:

- PROMISOL 1003B cladding panel with visible fix – is fixed to the bearing structure with two fasteners along its cover width;
- PROMISOL 2003BI cladding panel with secret fix – is fixed at each connection point to the steel structure with two fasteners through a steel profile (washer) the so-called load distributor;
- FRIGOTHERM 1003BC cladding panel with visible fix – 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.

More information about sandwich panels with PIR core (PROMISOL / FRIGOTHERM / ONDATHERM) can be found on the ArcelorMittal Construction website <https://construction-polska.arcelormittal.com>

## 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 / FRIGOTHERM / 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 and processing are allocated in A1 module of EPD. Water and energy consumption, associated emissions and generated wastes are allocated to module A3. Energy supply was inventoried for whole production process. Packaging materials were taken into consideration.

### System limits

The life cycle analysis (LCA) of the declared products covers: product stage – modules A1-A3, end of life – modules C1-C4 and benefits and loads beyond the system boundary – module D (cradle-to-gate with options) in accordance with EN 15804+ A2 and ITB PCR A. Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculations. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+ A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

### Modules A1 and A2: Raw materials supply and transport

Raw materials such as steel, the chemical components as polyol, isocyanate (MDI), pentane, TCPP retardant or 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 small (<10 t) and big (>16 t) trucks are applied. Based on data provided by the manufacturer, all input of transport resources was inventoried in details.

### Module A3: Production

The production of PROMISOL / FRIGOTHERM / ONDATHERM sandwich panels with the PIR core is a continuous process performed by a fully automated line (Figure 3).

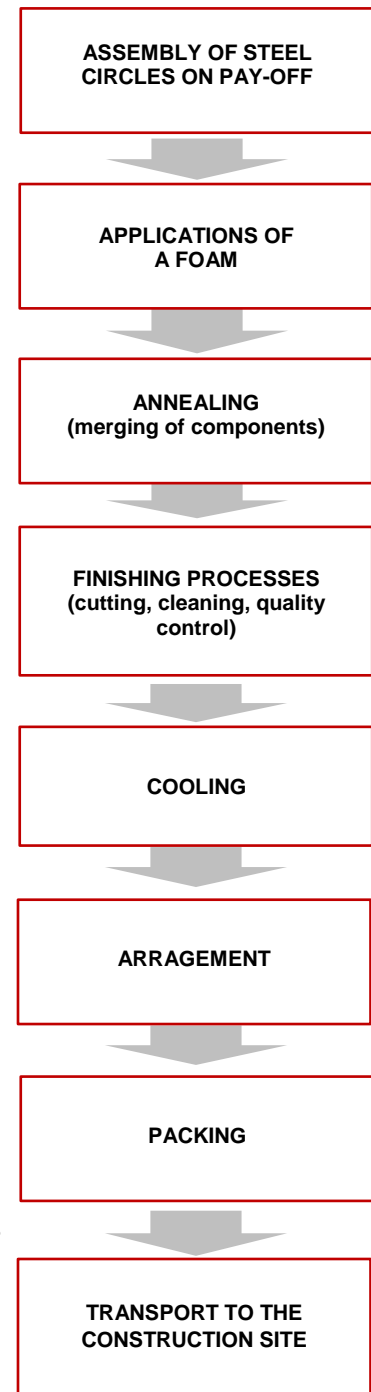


Fig. 3. A production scheme of PROMISOL / FRIGOTHERM / ONDATHERM sandwich panels in ArcelorMittal Construction Sp. z o.o. factory in Rawa Mazowiecka.

**Modules C1-C4 and D: End-of-life (EoL)**

It is assumed that at the end-of-life, 100% of sandwich panels with PIR core are demounted using electric tools (module C1) and it is transported to waste processing plant distant by 50 km, on 16-32 t lorry (Euro 5) (module C2). It is assumed that 100% of the material is recovered (Table 2). 98% of the resulting steel scrap undergo recycling after cutting and shredding while the remaining 2% is forwarded to landfill as mixed construction and demolition wastes. In turn, 95% of the PIR foam is incinerated while the 5% remaining waste materials are forwarded to landfill in the form of mixed construction and demolition wastes (modules C3 and C4). A potential credit resulting from the recycling of PIR core and steel scrap which were calculated using World Steel Association approach and are presented in module D. Utilization of packaging material which constitute less than 1 % of the total system flows was not taken into consideration.

**Table 2. End-of-life scenario for the sandwich panels with PIR core**

Component	Material recovery	Recycling	Energy recovery	Landfilling
Steel scrap	100%	98%	0%	2%
PIR foam	100%	0%	95%	5%

**Data collection period**

The data for manufacture of the declared products refer to period between 01.01.2021 – 31.12.2021 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

**Data quality**

The data selected for LCA analysis originate from ITB-LCI questionnaires completed by ArcelorMittal Construction Sp. z o.o. using the inventory data, ITB and Ecoinvent database v. 3.9. No specific data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency are judged as good.

**Assumptions and estimates**

Impacts were inventoried and calculated for sandwich panels (PROMISOL / FRIGOTHERM / ONDATHERM) with PIR core. The impacts of the representative PROMISOL / FRIGOTHERM / ONDATHERM sandwich panels in modulus C and D were aggregated using weighted average for wall and roof panels.

**Calculation rules**

LCA was performed using ITB-LCA tool developed in accordance with EN 15804 + A2.

**Databases**

The data for the processes comes from Ecoinvent v. 3.9 and ITB-Database. Specific data quality analysis was a part of external audit. Polish electricity mix used (production) is 0.698 kg CO<sub>2</sub>/kWh (KOBiZE 2021). European electricity mix used is 0.430 kg CO<sub>2</sub>/kWh for the end of life (Ecoinvent v. 3.8, RER).

**LIFE CYCLE ASSESSMENT (LCA) – Results**

**Declared unit**

The declaration refers to functional unit (DU) - 1 m<sup>2</sup> of steel faced sandwich panels with polyisocyanurate (PIR) core PROMISOL / FRIGOTHERM / ONDATHERM

**Table 3. System boundaries for environmental characteristic for steel faced sandwich panels with polyisocyanurate (PIR) core PROMISOL / FRIGOTHERM / 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	MD	MD	MD	MD	MD

**Notes:** First indicator (Global Warming Potential, bolded) in each table containing environmental impacts is commonly referred to as the carbon footprint.

**Steel faced sandwich panels PROMISOL 1003B with thickness 40 mm**

Table 4. Life cycle assessment (LCA) results of steel faced sandwich panels PROMISOL 1003B with thickness 40 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>1.63E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>1.95E+01</b>	<b>1.91E-02</b>	<b>1.06E-01</b>	<b>1.22E+01</b>	<b>2.28E-03</b>	<b>-8.05E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	1.62E+01	2.01E+00	1.12E+00	1.93E+01	1.87E-02	1.06E-01	1.22E+01	2.27E-03	-9.83E+00
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	8.12E-02	7.07E-03	1.07E-02	9.89E-02	3.38E-04	3.62E-04	1.05E-03	1.19E-06	-2.52E-02
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.15E-02	8.14E-04	1.87E-04	1.25E-02	4.40E-06	4.15E-05	4.44E-05	1.37E-06	-5.17E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	6.56E-07	4.63E-07	3.51E-08	1.15E-06	3.59E-10	2.45E-08	5.00E-08	6.59E-11	-1.88E-07
Soil and water acidification potential	eq. mol H <sup>+</sup>	7.67E-02	8.13E-03	6.73E-03	9.16E-02	1.98E-04	4.30E-04	2.40E-03	1.71E-05	-3.56E-02
Eutrophication potential - freshwater	eq. kg P	7.30E-03	1.39E-04	1.07E-03	8.51E-03	3.40E-05	7.11E-06	1.92E-05	1.89E-07	-4.87E-03
Eutrophication potential - seawater	eq. kg N	2.04E-02	2.44E-03	1.04E-03	2.39E-02	2.82E-05	1.30E-04	1.10E-03	6.58E-06	-8.41E-03
Eutrophication potential - terrestrial	eq. mol N	1.55E-01	2.66E-02	9.16E-03	1.91E-01	2.42E-04	1.41E-03	1.16E-02	7.05E-05	-8.79E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	7.45E-02	8.16E-03	4.20E-03	8.68E-02	6.79E-05	4.33E-04	3.16E-03	2.45E-05	-4.28E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	8.12E-05	7.46E-06	1.20E-06	8.99E-05	2.70E-08	3.75E-07	3.59E-07	3.20E-09	-1.13E-05
Abiotic depletion potential - fossil fuels	MJ	2.58E+02	2.98E+01	1.78E+01	3.06E+02	3.06E-01	1.57E+00	3.38E+00	5.71E-02	-1.07E+02
Water deprivation potential	eq. m <sup>3</sup>	9.55E+00	1.41E-01	2.09E-01	9.90E+00	6.21E-03	7.26E-03	9.17E-02	1.77E-04	-3.30E+00



## Environmental Product Declaration Type III ITB No. 66/2023

Table 5. LCA results of steel faced sandwich panels PROMISOL 1003B with thickness 40 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 6. LCA results of steel faced sandwich panels PROMISOL 1003B with thickness 40 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.31E+01	4.40E-01	7.23E-01	1.43E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.57E+01	4.40E-01	7.23E-01	1.68E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.18E+02	2.98E+01	1.78E+01	2.66E+02	3.24E-01	1.57E+00	-1.43E+02	5.71E-02	-1.07E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	4.00E+01	0.00E+00	5.79E-01	4.05E+01	0.00E+00	0.00E+00	1.47E+02	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	2.58E+02	2.98E+01	1.84E+01	3.07E+02	3.24E-01	1.57E+00	3.61E+00	5.71E-02	-1.07E+02
Consumption of secondary materials	kg	6.14E+00	1.03E-02	2.09E-03	6.15E+00	2.47E-05	5.27E-04	2.49E-03	1.38E-05	-5.97E+00
Consumption of renewable secondary fuels	MJ	1.85E-03	1.15E-04	6.45E-06	1.97E-03	1.35E-07	5.80E-06	6.98E-06	2.95E-07	-7.14E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	2.29E-01	3.82E-03	3.18E-03	2.36E-01	9.94E-05	1.98E-04	2.06E-03	5.90E-05	-8.04E-02

## Environmental Product Declaration Type III ITB No. 66/2023

Table 7. LCA results of steel faced sandwich panels PROMISOL 1003B with thickness 40 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.44E+00	3.43E-02	1.74E-03	1.48E+00	6.32E-08	1.76E-03	9.78E-02	2.74E-05	-1.34E+00
Non-hazardous waste neutralised	kg	2.00E+01	6.10E-01	1.61E-01	2.07E+01	1.81E-03	3.13E-02	3.90E+00	8.20E-04	-1.84E+01
Radioactive waste	kg	2.80E-04	2.05E-04	8.94E-06	4.94E-04	2.63E-07	1.08E-05	2.07E-05	1.72E-07	-2.18E-04
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	3.98E-03	9.39E-05	5.55E-02	5.96E-02	1.86E-06	4.86E-06	3.67E-05	2.56E-07	-2.06E-03
Materials for energy recovery	kg	1.00E-05	7.56E-07	3.60E-02	3.60E-02	2.60E-09	3.93E-08	1.02E-07	9.20E-10	-4.62E-06
Energy exported	MJ	5.64E-01	3.36E-02	2.96E-02	6.27E-01	8.86E-04	1.74E-03	1.31E-02	5.09E-06	-1.60E-01

**Steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 50 mm**

Table 8. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 50 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	1.81E+01	2.02E+00	1.13E+00	2.12E+01	1.91E-02	1.06E-01	1.22E+01	2.28E-03	-8.05E+01
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	1.80E+01	2.01E+00	1.12E+00	2.11E+01	1.87E-02	1.06E-01	1.22E+01	2.27E-03	-9.83E+00
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	1.04E-01	7.07E-03	1.07E-02	1.22E-01	3.38E-04	3.62E-04	1.05E-03	1.19E-06	-2.52E-02
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.25E-02	8.14E-04	1.87E-04	1.35E-02	4.40E-06	4.15E-05	4.44E-05	1.37E-06	-5.17E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	7.76E-07	4.63E-07	3.51E-08	1.27E-06	3.59E-10	2.45E-08	5.00E-08	6.59E-11	-1.88E-07
Soil and water acidification potential	eq. mol H <sup>+</sup>	8.77E-02	8.13E-03	6.73E-03	1.03E-01	1.98E-04	4.30E-04	2.40E-03	1.71E-05	-3.56E-02
Eutrophication potential - freshwater	eq. kg P	7.99E-03	1.39E-04	1.07E-03	9.20E-03	3.40E-05	7.11E-06	1.92E-05	1.89E-07	-4.87E-03
Eutrophication potential - seawater	eq. kg N	2.36E-02	2.44E-03	1.04E-03	2.71E-02	2.82E-05	1.30E-04	1.10E-03	6.58E-06	-8.41E-03
Eutrophication potential - terrestrial	eq. mol N	1.74E-01	2.66E-02	9.16E-03	2.10E-01	2.42E-04	1.41E-03	1.16E-02	7.05E-05	-8.79E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	8.24E-02	8.16E-03	4.20E-03	9.48E-02	6.79E-05	4.33E-04	3.16E-03	2.45E-05	-4.28E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	9.89E-05	7.46E-06	1.20E-06	1.08E-04	2.70E-08	3.75E-07	3.59E-07	3.20E-09	-1.13E-05
Abiotic depletion potential - fossil fuels	MJ	2.97E+02	2.98E+01	1.78E+01	3.45E+02	3.06E-01	1.57E+00	3.38E+00	5.71E-02	-1.07E+02
Water deprivation potential	eq. m <sup>3</sup>	1.12E+01	1.41E-01	2.09E-01	1.15E+01	6.21E-03	7.26E-03	9.17E-02	1.77E-04	-3.30E+00

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Table 9. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 50 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 10. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 50 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.52E+01	4.40E-01	7.23E-01	1.64E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.78E+01	4.40E-01	7.23E-01	1.90E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.47E+02	2.98E+01	1.78E+01	2.95E+02	3.24E-01	1.57E+00	-1.43E+02	5.71E-02	-1.07E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	4.97E+01	0.00E+00	5.79E-01	5.03E+01	0.00E+00	0.00E+00	1.47E+02	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	2.97E+02	2.98E+01	1.84E+01	3.46E+02	3.24E-01	1.57E+00	3.61E+00	5.71E-02	-1.07E+02
Consumption of secondary materials	kg	6.26E+00	1.03E-02	2.09E-03	6.27E+00	2.47E-05	5.27E-04	2.49E-03	1.38E-05	-5.97E+00
Consumption of renewable secondary fuels	MJ	1.91E-03	1.15E-04	6.45E-06	2.03E-03	1.35E-07	5.80E-06	6.98E-06	2.95E-07	-7.14E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	2.68E-01	3.82E-03	3.18E-03	2.75E-01	9.94E-05	1.98E-04	2.06E-03	5.90E-05	-8.04E-02

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Table 11. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 50 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.49E+00	3.43E-02	1.74E-03	1.53E+00	6.32E-08	1.76E-03	9.78E-02	2.74E-05	-1.34E+00
Non-hazardous waste neutralised	kg	2.06E+01	6.10E-01	1.61E-01	2.14E+01	1.81E-03	3.13E-02	3.90E+00	8.20E-04	-1.84E+01
Radioactive waste	kg	2.98E-04	2.05E-04	8.94E-06	5.11E-04	2.63E-07	1.08E-05	2.07E-05	1.72E-07	-2.18E-04
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	4.41E-03	9.39E-05	5.55E-02	6.00E-02	1.86E-06	4.86E-06	3.67E-05	2.56E-07	-2.06E-03
Materials for energy recovery	kg	1.08E-05	7.56E-07	3.60E-02	3.60E-02	2.60E-09	3.93E-08	1.02E-07	9.20E-10	-4.62E-06
Energy exported	MJ	6.65E-01	3.36E-02	2.96E-02	7.29E-01	8.86E-04	1.74E-03	1.31E-02	5.09E-06	-1.60E-01

**Steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 60 mm**

Table 12. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 60 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>1.97E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>2.28E+01</b>	<b>1.91E-02</b>	<b>1.06E-01</b>	<b>1.22E+01</b>	<b>2.28E-03</b>	<b>-8.05E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	1.95E+01	2.01E+00	1.12E+00	2.27E+01	1.87E-02	1.06E-01	1.22E+01	2.27E-03	-9.83E+00
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	1.27E-01	7.07E-03	1.07E-02	1.44E-01	3.38E-04	3.62E-04	1.05E-03	1.19E-06	-2.52E-02
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.35E-02	8.14E-04	1.87E-04	1.45E-02	4.40E-06	4.15E-05	4.44E-05	1.37E-06	-5.17E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	8.96E-07	4.63E-07	3.51E-08	1.39E-06	3.59E-10	2.45E-08	5.00E-08	6.59E-11	-1.88E-07
Soil and water acidification potential	eq. mol H <sup>+</sup>	9.81E-02	8.13E-03	6.73E-03	1.13E-01	1.98E-04	4.30E-04	2.40E-03	1.71E-05	-3.56E-02
Eutrophication potential - freshwater	eq. kg P	8.60E-03	1.39E-04	1.07E-03	9.81E-03	3.40E-05	7.11E-06	1.92E-05	1.89E-07	-4.87E-03
Eutrophication potential - seawater	eq. kg N	2.67E-02	2.44E-03	1.04E-03	3.01E-02	2.82E-05	1.30E-04	1.10E-03	6.58E-06	-8.41E-03
Eutrophication potential - terrestrial	eq. mol N	1.91E-01	2.66E-02	9.16E-03	2.27E-01	2.42E-04	1.41E-03	1.16E-02	7.05E-05	-8.79E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	8.97E-02	8.16E-03	4.20E-03	1.02E-01	6.79E-05	4.33E-04	3.16E-03	2.45E-05	-4.28E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.17E-04	7.46E-06	1.20E-06	1.25E-04	2.70E-08	3.75E-07	3.59E-07	3.20E-09	-1.13E-05
Abiotic depletion potential - fossil fuels	MJ	3.35E+02	2.98E+01	1.78E+01	3.83E+02	3.06E-01	1.57E+00	3.38E+00	5.71E-02	-1.07E+02
Water deprivation potential	eq. m <sup>3</sup>	1.27E+01	1.41E-01	2.09E-01	1.31E+01	6.21E-03	7.26E-03	9.17E-02	1.77E-04	-3.30E+00

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Table 13. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 60 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 14. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 60 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.73E+01	4.40E-01	7.23E-01	1.84E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.98E+01	4.40E-01	7.23E-01	2.10E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.75E+02	2.98E+01	1.78E+01	3.23E+02	3.24E-01	1.57E+00	-1.43E+02	5.71E-02	-1.07E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	5.97E+01	0.00E+00	5.79E-01	6.03E+01	0.00E+00	0.00E+00	1.47E+02	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	3.35E+02	2.98E+01	1.84E+01	3.83E+02	3.24E-01	1.57E+00	3.61E+00	5.71E-02	-1.07E+02
Consumption of secondary materials	kg	6.26E+00	1.03E-02	2.09E-03	6.28E+00	2.47E-05	5.27E-04	2.49E-03	1.38E-05	-5.97E+00
Consumption of renewable secondary fuels	MJ	1.95E-03	1.15E-04	6.45E-06	2.07E-03	1.35E-07	5.80E-06	6.98E-06	2.95E-07	-7.14E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	3.06E-01	3.82E-03	3.18E-03	3.13E-01	9.94E-05	1.98E-04	2.06E-03	5.90E-05	-8.04E-02

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Table 15. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 60 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.52E+00	3.43E-02	1.74E-03	1.56E+00	6.32E-08	1.76E-03	9.78E-02	2.74E-05	-1.34E+00
Non-hazardous waste neutralised	kg	2.10E+01	6.10E-01	1.61E-01	2.18E+01	1.81E-03	3.13E-02	3.90E+00	8.20E-04	-1.84E+01
Radioactive waste	kg	3.11E-04	2.05E-04	8.94E-06	5.25E-04	2.63E-07	1.08E-05	2.07E-05	1.72E-07	-2.18E-04
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	4.80E-03	9.39E-05	5.55E-02	6.04E-02	1.86E-06	4.86E-06	3.67E-05	2.56E-07	-2.06E-03
Materials for energy recovery	kg	1.16E-05	7.56E-07	3.60E-02	3.60E-02	2.60E-09	3.93E-08	1.02E-07	9.20E-10	-4.62E-06
Energy exported	MJ	7.66E-01	3.36E-02	2.96E-02	8.29E-01	8.86E-04	1.74E-03	1.31E-02	5.09E-06	-1.60E-01



**Steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 80 mm**

Table 16. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 80 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>1.77E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>2.08E+01</b>	<b>1.91E-02</b>	<b>1.06E-01</b>	<b>1.22E+01</b>	<b>2.28E-03</b>	<b>-8.05E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	1.74E+01	2.01E+00	1.12E+00	2.05E+01	1.87E-02	1.06E-01	1.22E+01	2.27E-03	-9.83E+00
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	2.20E-01	7.07E-03	1.07E-02	2.38E-01	3.38E-04	3.62E-04	1.05E-03	1.19E-06	-2.52E-02
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.61E-02	8.14E-04	1.87E-04	1.71E-02	4.40E-06	4.15E-05	4.44E-05	1.37E-06	-5.17E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	1.01E-06	4.63E-07	3.51E-08	1.50E-06	3.59E-10	2.45E-08	5.00E-08	6.59E-11	-1.88E-07
Soil and water acidification potential	eq. mol H <sup>+</sup>	1.02E-01	8.13E-03	6.73E-03	1.17E-01	1.98E-04	4.30E-04	2.40E-03	1.71E-05	-3.56E-02
Eutrophication potential - freshwater	eq. kg P	7.44E-03	1.39E-04	1.07E-03	8.66E-03	3.40E-05	7.11E-06	1.92E-05	1.89E-07	-4.87E-03
Eutrophication potential - seawater	eq. kg N	2.84E-02	2.44E-03	1.04E-03	3.19E-02	2.82E-05	1.30E-04	1.10E-03	6.58E-06	-8.41E-03
Eutrophication potential - terrestrial	eq. mol N	1.78E-01	2.66E-02	9.16E-03	2.14E-01	2.42E-04	1.41E-03	1.16E-02	7.05E-05	-8.79E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	7.48E-02	8.16E-03	4.20E-03	8.72E-02	6.79E-05	4.33E-04	3.16E-03	2.45E-05	-4.28E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.53E-04	7.46E-06	1.20E-06	1.61E-04	2.70E-08	3.75E-07	3.59E-07	3.20E-09	-1.13E-05
Abiotic depletion potential - fossil fuels	MJ	3.69E+02	2.98E+01	1.78E+01	4.17E+02	3.06E-01	1.57E+00	3.38E+00	5.71E-02	-1.07E+02
Water deprivation potential	eq. m <sup>3</sup>	1.51E+01	1.41E-01	2.09E-01	1.55E+01	6.21E-03	7.26E-03	9.17E-02	1.77E-04	-3.30E+00

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Table 17. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 80 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 18. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 80 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.34E+01	4.40E-01	7.23E-01	2.46E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	2.60E+01	4.40E-01	7.23E-01	2.71E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.90E+02	2.98E+01	1.78E+01	3.37E+02	3.24E-01	1.57E+00	-1.43E+02	5.71E-02	-1.07E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	7.96E+01	0.00E+00	5.79E-01	8.02E+01	0.00E+00	0.00E+00	1.47E+02	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	3.70E+02	2.98E+01	1.84E+01	4.18E+02	3.24E-01	1.57E+00	3.61E+00	5.71E-02	-1.07E+02
Consumption of secondary materials	kg	1.02E+01	1.03E-02	2.09E-03	1.02E+01	2.47E-05	5.27E-04	2.49E-03	1.38E-05	-5.97E+00
Consumption of renewable secondary fuels	MJ	2.24E-03	1.15E-04	6.45E-06	2.36E-03	1.35E-07	5.80E-06	6.98E-06	2.95E-07	-7.14E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	3.81E-01	3.82E-03	3.18E-03	3.88E-01	9.94E-05	1.98E-04	2.06E-03	5.90E-05	-8.04E-02

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Table 19. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 80 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.31E+00	3.43E-02	1.74E-03	1.34E+00	6.32E-08	1.76E-03	9.78E-02	2.74E-05	-1.34E+00
Non-hazardous waste neutralised	kg	1.35E+01	6.10E-01	1.61E-01	1.43E+01	1.81E-03	3.13E-02	3.90E+00	8.20E-04	-1.84E+01
Radioactive waste	kg	4.43E-04	2.05E-04	8.94E-06	6.56E-04	2.63E-07	1.08E-05	2.07E-05	1.72E-07	-2.18E-04
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	5.66E-03	9.39E-05	5.55E-02	6.12E-02	1.86E-06	4.86E-06	3.67E-05	2.56E-07	-2.06E-03
Materials for energy recovery	kg	1.31E-05	7.56E-07	3.60E-02	3.60E-02	2.60E-09	3.93E-08	1.02E-07	9.20E-10	-4.62E-06
Energy exported	MJ	1.02E+00	3.36E-02	2.96E-02	1.08E+00	8.86E-04	1.74E-03	1.31E-02	5.09E-06	-1.60E-01

**Steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 100 mm**

Table 20. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 100 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>2.62E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>2.93E+01</b>	<b>1.91E-02</b>	<b>1.06E-01</b>	<b>1.22E+01</b>	<b>2.28E-03</b>	<b>-8.05E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	2.59E+01	2.01E+00	1.12E+00	2.91E+01	1.87E-02	1.06E-01	1.22E+01	2.27E-03	-9.83E+00
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	2.18E-01	7.07E-03	1.07E-02	2.36E-01	3.38E-04	3.62E-04	1.05E-03	1.19E-06	-2.52E-02
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.76E-02	8.14E-04	1.87E-04	1.86E-02	4.40E-06	4.15E-05	4.44E-05	1.37E-06	-5.17E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	1.37E-06	4.63E-07	3.51E-08	1.87E-06	3.59E-10	2.45E-08	5.00E-08	6.59E-11	-1.88E-07
Soil and water acidification potential	eq. mol H <sup>+</sup>	1.40E-01	8.13E-03	6.73E-03	1.55E-01	1.98E-04	4.30E-04	2.40E-03	1.71E-05	-3.56E-02
Eutrophication potential - freshwater	eq. kg P	1.11E-02	1.39E-04	1.07E-03	1.23E-02	3.40E-05	7.11E-06	1.92E-05	1.89E-07	-4.87E-03
Eutrophication potential - seawater	eq. kg N	3.89E-02	2.44E-03	1.04E-03	4.24E-02	2.82E-05	1.30E-04	1.10E-03	6.58E-06	-8.41E-03
Eutrophication potential - terrestrial	eq. mol N	2.59E-01	2.66E-02	9.16E-03	2.95E-01	2.42E-04	1.41E-03	1.16E-02	7.05E-05	-8.79E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.19E-01	8.16E-03	4.20E-03	1.31E-01	6.79E-05	4.33E-04	3.16E-03	2.45E-05	-4.28E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.88E-04	7.46E-06	1.20E-06	1.97E-04	2.70E-08	3.75E-07	3.59E-07	3.20E-09	-1.13E-05
Abiotic depletion potential - fossil fuels	MJ	4.86E+02	2.98E+01	1.78E+01	5.34E+02	3.06E-01	1.57E+00	3.38E+00	5.71E-02	-1.07E+02
Water deprivation potential	eq. m <sup>3</sup>	1.91E+01	1.41E-01	2.09E-01	1.95E+01	6.21E-03	7.26E-03	9.17E-02	1.77E-04	-3.30E+00

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Table 21. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 100 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 22. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 100 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.54E+01	4.40E-01	7.23E-01	2.66E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	2.80E+01	4.40E-01	7.23E-01	2.92E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.87E+02	2.98E+01	1.78E+01	4.34E+02	3.24E-01	1.57E+00	-1.43E+02	5.71E-02	-1.07E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	9.96E+01	0.00E+00	5.79E-01	1.00E+02	0.00E+00	0.00E+00	1.47E+02	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	4.87E+02	2.98E+01	1.84E+01	5.35E+02	3.24E-01	1.57E+00	3.61E+00	5.71E-02	-1.07E+02
Consumption of secondary materials	kg	6.29E+00	1.03E-02	2.09E-03	6.30E+00	2.47E-05	5.27E-04	2.49E-03	1.38E-05	-5.97E+00
Consumption of renewable secondary fuels	MJ	2.13E-03	1.15E-04	6.45E-06	2.25E-03	1.35E-07	5.80E-06	6.98E-06	2.95E-07	-7.14E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	4.58E-01	3.82E-03	3.18E-03	4.65E-01	9.94E-05	1.98E-04	2.06E-03	5.90E-05	-8.04E-02

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Table 23. LCA results of steel faced sandwich panels PROMISOL 1003B and PROMISOL 2003BI with thickness 100 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.63E+00	3.43E-02	1.74E-03	1.67E+00	6.32E-08	1.76E-03	9.78E-02	2.74E-05	-1.34E+00
Non-hazardous waste neutralised	kg	2.23E+01	6.10E-01	1.61E-01	2.31E+01	1.81E-03	3.13E-02	3.90E+00	8.20E-04	-1.84E+01
Radioactive waste	kg	3.67E-04	2.05E-04	8.94E-06	5.80E-04	2.63E-07	1.08E-05	2.07E-05	1.72E-07	-2.18E-04
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	6.39E-03	9.39E-05	5.55E-02	6.20E-02	1.86E-06	4.86E-06	3.67E-05	2.56E-07	-2.06E-03
Materials for energy recovery	kg	1.45E-05	7.56E-07	3.60E-02	3.60E-02	2.60E-09	3.93E-08	1.02E-07	9.20E-10	-4.62E-06
Energy exported	MJ	1.17E+00	3.36E-02	2.96E-02	1.23E+00	8.86E-04	1.74E-03	1.31E-02	5.09E-06	-1.60E-01

**Steel faced sandwich panels PROMISOL 1003B, PROMISOL 2003BI and FRIGOTHERM 1003BC  
with thickness 120 mm**

Table 24. LCA results of steel faced sandwich panels PROMISOL 1003B, PROMISOL 2003BI and FRIGOTHERM 1003BC with thickness 120 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>2.95E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>3.26E+01</b>	<b>1.91E-02</b>	<b>1.06E-01</b>	<b>1.22E+01</b>	<b>2.28E-03</b>	<b>-8.05E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	2.92E+01	2.01E+00	1.12E+00	3.23E+01	1.87E-02	1.06E-01	1.22E+01	2.27E-03	-9.83E+00
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	2.65E-01	7.07E-03	1.07E-02	2.83E-01	3.38E-04	3.62E-04	1.05E-03	1.19E-06	-2.52E-02
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.96E-02	8.14E-04	1.87E-04	2.06E-02	4.40E-06	4.15E-05	4.44E-05	1.37E-06	-5.17E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	1.62E-06	4.63E-07	3.51E-08	2.12E-06	3.59E-10	2.45E-08	5.00E-08	6.59E-11	-1.88E-07
Soil and water acidification potential	eq. mol H <sup>+</sup>	1.61E-01	8.13E-03	6.73E-03	1.76E-01	1.98E-04	4.30E-04	2.40E-03	1.71E-05	-3.56E-02
Eutrophication potential - freshwater	eq. kg P	1.23E-02	1.39E-04	1.07E-03	1.35E-02	3.40E-05	7.11E-06	1.92E-05	1.89E-07	-4.87E-03
Eutrophication potential - seawater	eq. kg N	4.52E-02	2.44E-03	1.04E-03	4.87E-02	2.82E-05	1.30E-04	1.10E-03	6.58E-06	-8.41E-03
Eutrophication potential - terrestrial	eq. mol N	2.94E-01	2.66E-02	9.16E-03	3.30E-01	2.42E-04	1.41E-03	1.16E-02	7.05E-05	-8.79E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.34E-01	8.16E-03	4.20E-03	1.46E-01	6.79E-05	4.33E-04	3.16E-03	2.45E-05	-4.28E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	2.25E-04	7.46E-06	1.20E-06	2.33E-04	2.70E-08	3.75E-07	3.59E-07	3.20E-09	-1.13E-05
Abiotic depletion potential - fossil fuels	MJ	5.64E+02	2.98E+01	1.78E+01	6.11E+02	3.06E-01	1.57E+00	3.38E+00	5.71E-02	-1.07E+02
Water deprivation potential	eq. m <sup>3</sup>	2.24E+01	1.41E-01	2.09E-01	2.27E+01	6.21E-03	7.26E-03	9.17E-02	1.77E-04	-3.30E+00

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Table 25 LCA results of steel faced sandwich panels PROMISOL 1003B, PROMISOL 2003BI and FRIGOTHERM 1003BC with thickness 120 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 26. LCA results of steel faced sandwich panels PROMISOL 1003B, PROMISOL 2003BI and FRIGOTHERM 1003BC with thickness 120 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.96E+01	4.40E-01	7.23E-01	3.08E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	3.22E+01	4.40E-01	7.23E-01	3.34E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	4.44E+02	2.98E+01	1.78E+01	4.91E+02	3.24E-01	1.57E+00	-1.43E+02	5.71E-02	-1.07E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.20E+02	0.00E+00	5.79E-01	1.21E+02	0.00E+00	0.00E+00	1.47E+02	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	5.64E+02	2.98E+01	1.84E+01	6.13E+02	3.24E-01	1.57E+00	3.61E+00	5.71E-02	-1.07E+02
Consumption of secondary materials	kg	6.26E+00	1.03E-02	2.09E-03	6.27E+00	2.47E-05	5.27E-04	2.49E-03	1.38E-05	-5.97E+00
Consumption of renewable secondary fuels	MJ	2.21E-03	1.15E-04	6.45E-06	2.34E-03	1.35E-07	5.80E-06	6.98E-06	2.95E-07	-7.14E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	5.36E-01	3.82E-03	3.18E-03	5.43E-01	9.94E-05	1.98E-04	2.06E-03	5.90E-05	-8.04E-02



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Table 27. LCA results of steel faced sandwich panels PROMISOL 1003B, PROMISOL 2003BI and FRIGOTHERM 1003BC with thickness 120 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.68E+00	3.43E-02	1.74E-03	1.72E+00	6.32E-08	1.76E-03	9.78E-02	2.74E-05	-1.34E+00
Non-hazardous waste neutralised	kg	2.29E+01	6.10E-01	1.61E-01	2.37E+01	1.81E-03	3.13E-02	3.90E+00	8.20E-04	-1.84E+01
Radioactive waste	kg	3.94E-04	2.05E-04	8.94E-06	6.07E-04	2.63E-07	1.08E-05	2.07E-05	1.72E-07	-2.18E-04
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	7.19E-03	9.39E-05	5.55E-02	6.28E-02	1.86E-06	4.86E-06	3.67E-05	2.56E-07	-2.06E-03
Materials for energy recovery	kg	1.61E-05	7.56E-07	3.60E-02	3.61E-02	2.60E-09	3.93E-08	1.02E-07	9.20E-10	-4.62E-06
Energy exported	MJ	1.38E+00	3.36E-02	2.96E-02	1.44E+00	8.86E-04	1.74E-03	1.31E-02	5.09E-06	-1.60E-01

**Steel faced sandwich panels FRIGOTHERM 1003BC with thickness 160 mm**

Table 28. LCA results of steel faced sandwich panels FRIGOTHERM 1003BC with thickness 160 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>3.61E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>3.92E+01</b>	<b>1.91E-02</b>	<b>1.06E-01</b>	<b>1.22E+01</b>	<b>2.28E-03</b>	<b>-8.05E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	3.57E+01	2.01E+00	1.12E+00	3.88E+01	1.87E-02	1.06E-01	1.22E+01	2.27E-03	-9.83E+00
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	3.59E-01	7.07E-03	1.07E-02	3.77E-01	3.38E-04	3.62E-04	1.05E-03	1.19E-06	-2.52E-02
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	2.37E-02	8.14E-04	1.87E-04	2.47E-02	4.40E-06	4.15E-05	4.44E-05	1.37E-06	-5.17E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	2.11E-06	4.63E-07	3.51E-08	2.61E-06	3.59E-10	2.45E-08	5.00E-08	6.59E-11	-1.88E-07
Soil and water acidification potential	eq. mol H <sup>+</sup>	2.05E-01	8.13E-03	6.73E-03	2.19E-01	1.98E-04	4.30E-04	2.40E-03	1.71E-05	-3.56E-02
Eutrophication potential - freshwater	eq. kg P	1.48E-02	1.39E-04	1.07E-03	1.60E-02	3.40E-05	7.11E-06	1.92E-05	1.89E-07	-4.87E-03
Eutrophication potential - seawater	eq. kg N	5.79E-02	2.44E-03	1.04E-03	6.14E-02	2.82E-05	1.30E-04	1.10E-03	6.58E-06	-8.41E-03
Eutrophication potential - terrestrial	eq. mol N	3.64E-01	2.66E-02	9.16E-03	4.00E-01	2.42E-04	1.41E-03	1.16E-02	7.05E-05	-8.79E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.64E-01	8.16E-03	4.20E-03	1.76E-01	6.79E-05	4.33E-04	3.16E-03	2.45E-05	-4.28E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	2.99E-04	7.46E-06	1.20E-06	3.07E-04	2.70E-08	3.75E-07	3.59E-07	3.20E-09	-1.13E-05
Abiotic depletion potential - fossil fuels	MJ	7.19E+02	2.98E+01	1.78E+01	7.67E+02	3.06E-01	1.57E+00	3.38E+00	5.71E-02	-1.07E+02
Water deprivation potential	eq. m <sup>3</sup>	2.89E+01	1.41E-01	2.09E-01	2.93E+01	6.21E-03	7.26E-03	9.17E-02	1.77E-04	-3.30E+00

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Table 29. LCA results of steel faced sandwich panels FRIGOTHERM 1003BC with thickness 160 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 30. LCA results of steel faced sandwich panels FRIGOTHERM 1003BC with thickness 160 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.80E+01	4.40E-01	7.23E-01	3.92E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	4.06E+01	4.40E-01	7.23E-01	4.17E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	5.58E+02	2.98E+01	1.78E+01	6.05E+02	3.24E-01	1.57E+00	-1.43E+02	5.71E-02	-1.07E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.62E+02	0.00E+00	5.79E-01	1.62E+02	0.00E+00	0.00E+00	1.47E+02	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	7.20E+02	2.98E+01	1.84E+01	7.69E+02	3.24E-01	1.57E+00	3.61E+00	5.71E-02	-1.07E+02
Consumption of secondary materials	kg	6.20E+00	1.03E-02	2.09E-03	6.22E+00	2.47E-05	5.27E-04	2.49E-03	1.38E-05	-5.97E+00
Consumption of renewable secondary fuels	MJ	2.39E-03	1.15E-04	6.45E-06	2.51E-03	1.35E-07	5.80E-06	6.98E-06	2.95E-07	-7.14E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	6.93E-01	3.82E-03	3.18E-03	7.00E-01	9.94E-05	1.98E-04	2.06E-03	5.90E-05	-8.04E-02

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Table 31. LCA results of steel faced sandwich panels FRIGOTHERM 1003BC with thickness 160 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.78E+00	3.43E-02	1.74E-03	1.82E+00	6.32E-08	1.76E-03	9.78E-02	2.74E-05	-1.34E+00
Non-hazardous waste neutralised	kg	2.41E+01	6.10E-01	1.61E-01	2.49E+01	1.81E-03	3.13E-02	3.90E+00	8.20E-04	-1.84E+01
Radioactive waste	kg	4.48E-04	2.05E-04	8.94E-06	6.62E-04	2.63E-07	1.08E-05	2.07E-05	1.72E-07	-2.18E-04
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	8.81E-03	9.39E-05	5.55E-02	6.44E-02	1.86E-06	4.86E-06	3.67E-05	2.56E-07	-2.06E-03
Materials for energy recovery	kg	1.91E-05	7.56E-07	3.60E-02	3.61E-02	2.60E-09	3.93E-08	1.02E-07	9.20E-10	-4.62E-06
Energy exported	MJ	1.79E+00	3.36E-02	2.96E-02	1.86E+00	8.86E-04	1.74E-03	1.31E-02	5.09E-06	-1.60E-01

**Steel faced sandwich panels FRIGOTHERM 1003BC with thickness 200 mm**

Table 32. LCA results of steel faced sandwich panels FRIGOTHERM 1003BC with thickness 200 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>4.26E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>4.57E+01</b>	<b>1.91E-02</b>	<b>1.06E-01</b>	<b>1.22E+01</b>	<b>2.28E-03</b>	<b>-8.05E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	4.21E+01	2.01E+00	1.12E+00	4.52E+01	1.87E-02	1.06E-01	1.22E+01	2.27E-03	-9.83E+00
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	4.50E-01	7.07E-03	1.07E-02	4.68E-01	3.38E-04	3.62E-04	1.05E-03	1.19E-06	-2.52E-02
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	2.77E-02	8.14E-04	1.87E-04	2.87E-02	4.40E-06	4.15E-05	4.44E-05	1.37E-06	-5.17E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	2.59E-06	4.63E-07	3.51E-08	3.09E-06	3.59E-10	2.45E-08	5.00E-08	6.59E-11	-1.88E-07
Soil and water acidification potential	eq. mol H <sup>+</sup>	2.47E-01	8.13E-03	6.73E-03	2.61E-01	1.98E-04	4.30E-04	2.40E-03	1.71E-05	-3.56E-02
Eutrophication potential - freshwater	eq. kg P	1.72E-02	1.39E-04	1.07E-03	1.85E-02	3.40E-05	7.11E-06	1.92E-05	1.89E-07	-4.87E-03
Eutrophication potential - seawater	eq. kg N	7.02E-02	2.44E-03	1.04E-03	7.37E-02	2.82E-05	1.30E-04	1.10E-03	6.58E-06	-8.41E-03
Eutrophication potential - terrestrial	eq. mol N	4.32E-01	2.66E-02	9.16E-03	4.68E-01	2.42E-04	1.41E-03	1.16E-02	7.05E-05	-8.79E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.93E-01	8.16E-03	4.20E-03	2.05E-01	6.79E-05	4.33E-04	3.16E-03	2.45E-05	-4.28E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	3.70E-04	7.46E-06	1.20E-06	3.79E-04	2.70E-08	3.75E-07	3.59E-07	3.20E-09	-1.13E-05
Abiotic depletion potential - fossil fuels	MJ	8.71E+02	2.98E+01	1.78E+01	9.19E+02	3.06E-01	1.57E+00	3.38E+00	5.71E-02	-1.07E+02
Water deprivation potential	eq. m <sup>3</sup>	3.53E+01	1.41E-01	2.09E-01	3.57E+01	6.21E-03	7.26E-03	9.17E-02	1.77E-04	-3.30E+00

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Table 33. LCA results of steel faced sandwich panels FRIGOTHERM 1003BC with thickness 200 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 34. LCA results of steel faced sandwich panels FRIGOTHERM 1003BC with thickness 200 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	4.62E+01	4.40E-01	7.23E-01	4.74E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	4.88E+01	4.40E-01	7.23E-01	4.99E+01	2.22E-02	2.25E-02	4.83E-02	4.79E-04	-7.27E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	6.69E+02	2.98E+01	1.78E+01	7.17E+02	3.24E-01	1.57E+00	-1.43E+02	5.71E-02	-1.07E+02
Consumption of non-renewable primary energy resources used as raw materials	MJ	2.02E+02	0.00E+00	5.79E-01	2.02E+02	0.00E+00	0.00E+00	1.47E+02	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	8.72E+02	2.98E+01	1.84E+01	9.20E+02	3.24E-01	1.57E+00	3.61E+00	5.71E-02	-1.07E+02
Consumption of secondary materials	kg	6.22E+00	1.03E-02	2.09E-03	6.24E+00	2.47E-05	5.27E-04	2.49E-03	1.38E-05	-5.97E+00
Consumption of renewable secondary fuels	MJ	2.56E-03	1.15E-04	6.45E-06	2.69E-03	1.35E-07	5.80E-06	6.98E-06	2.95E-07	-7.14E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	8.46E-01	3.82E-03	3.18E-03	8.53E-01	9.94E-05	1.98E-04	2.06E-03	5.90E-05	-8.04E-02

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Table 35. LCA results of steel faced sandwich panels FRIGOTHERM 1003BC with thickness 200 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.89E+00	3.43E-02	1.74E-03	1.93E+00	6.32E-08	1.76E-03	9.78E-02	2.74E-05	-1.34E+00
Non-hazardous waste neutralised	kg	2.55E+01	6.10E-01	1.61E-01	2.63E+01	1.81E-03	3.13E-02	3.90E+00	8.20E-04	-1.84E+01
Radioactive waste	kg	5.04E-04	2.05E-04	8.94E-06	7.17E-04	2.63E-07	1.08E-05	2.07E-05	1.72E-07	-2.18E-04
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.04E-02	9.39E-05	5.55E-02	6.60E-02	1.86E-06	4.86E-06	3.67E-05	2.56E-07	-2.06E-03
Materials for energy recovery	kg	2.21E-05	7.56E-07	3.60E-02	3.61E-02	2.60E-09	3.93E-08	1.02E-07	9.20E-10	-4.62E-06
Energy exported	MJ	2.20E+00	3.36E-02	2.96E-02	2.26E+00	8.86E-04	1.74E-03	1.31E-02	5.09E-06	-1.60E-01

**Steel faced sandwich panels ONDATHERM 1001TS with thickness 40 mm**

Table 36. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 40 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>1.66E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>1.98E+01</b>	<b>1.91E-02</b>	<b>1.02E-01</b>	<b>1.26E+01</b>	<b>2.25E-03</b>	<b>-8.26E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	1.65E+01	2.01E+00	1.12E+00	1.96E+01	1.87E-02	1.02E-01	1.24E+01	2.25E-03	-8.17E+01
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	9.24E-02	7.07E-03	1.07E-02	1.10E-01	3.38E-04	3.49E-04	9.00E-04	1.18E-06	-7.92E-01
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.17E-02	8.14E-04	1.87E-04	1.27E-02	4.40E-06	4.01E-05	2.42E-05	1.36E-06	-9.10E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	7.12E-07	4.63E-07	3.51E-08	1.21E-06	3.59E-10	2.36E-08	4.91E-09	6.50E-11	-5.37E-06
Soil and water acidification potential	eq. mol H <sup>+</sup>	8.05E-02	8.13E-03	6.73E-03	9.53E-02	1.98E-04	4.14E-04	1.39E-03	1.69E-05	-4.19E-01
Eutrophication potential - freshwater	eq. kg P	7.34E-03	1.39E-04	1.07E-03	8.56E-03	3.40E-05	6.86E-06	1.31E-05	1.87E-07	-6.63E-02
Eutrophication potential - seawater	eq. kg N	2.16E-02	2.44E-03	1.04E-03	2.51E-02	2.82E-05	1.25E-04	7.11E-04	6.49E-06	-1.07E-01
Eutrophication potential - terrestrial	eq. mol N	1.60E-01	2.66E-02	9.16E-03	1.95E-01	2.42E-04	1.36E-03	7.28E-03	6.96E-05	-7.87E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	7.60E-02	8.16E-03	4.20E-03	8.83E-02	6.79E-05	4.18E-04	1.95E-03	2.42E-05	-1.30E+00
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	9.06E-05	7.46E-06	1.20E-06	9.92E-05	2.70E-08	3.62E-07	2.59E-07	3.16E-09	-7.35E-04
Abiotic depletion potential - fossil fuels	MJ	2.73E+02	2.98E+01	1.78E+01	3.21E+02	3.06E-01	1.51E+007	5.47E-01	5.64E-02	-1.98E+03
Water deprivation potential	eq. m <sup>3</sup>	1.02E+01	1.41E-01	2.09E-01	1.06E+01	6.21E-03	.00E-03	8.73E-02	1.75E-04	-6.12E+01



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Table 37. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 40 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 38. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 40 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.38E+01	4.40E-01	7.23E-01	1.50E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	3.11E+01
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.11E+02
Total consumption of renewable primary energy resources	MJ	1.64E+01	4.40E-01	7.23E-01	1.75E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	-7.97E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.27E+02	2.98E+01	1.78E+01	2.75E+02	3.24E-01	1.51E+00	-1.52E+02	5.64E-02	-1.49E+03
Consumption of non-renewable primary energy resources used as raw materials	MJ	4.56E+01	0.00E+00	5.79E-01	4.61E+01	0.00E+00	0.00E+00	1.52E+02	0.00E+00	-4.86E+02
Total consumption of non-renewable primary energy resources	MJ	2.73E+02	2.98E+01	1.84E+01	3.21E+02	3.24E-01	1.51E+00	5.48E-01	5.64E-02	-1.98E+03
Consumption of secondary materials	kg	5.78E+00	1.03E-02	2.09E-03	5.79E+00	2.47E-05	5.08E-04	1.42E-03	1.36E-05	-5.72E+00
Consumption of renewable secondary fuels	MJ	1.83E-03	1.15E-04	6.45E-06	1.95E-03	1.35E-07	5.60E-06	3.46E-06	2.91E-07	-2.32E-03
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	2.46E-01	3.82E-03	3.18E-03	2.53E-01	9.94E-05	1.91E-04	2.09E-03	5.82E-05	-1.46E+00

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Table 39. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 40 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.38E+00	3.43E-02	1.74E-03	1.41E+00	6.32E-08	1.70E-03	1.02E-01	2.71E-05	-5.22E+00
Non-hazardous waste neutralised	kg	1.90E+01	6.10E-01	1.61E-01	1.98E+01	1.81E-03	3.02E-02	4.05E+00	8.09E-04	-6.79E+01
Radioactive waste	kg	2.75E-04	2.05E-04	8.94E-06	4.88E-04	2.63E-07	1.04E-05	5.52E-07	1.60E-07	-1.25E-03
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	4.08E-03	9.39E-05	5.55E-02	5.97E-02	1.86E-06	4.69E-06	3.42E-05	2.52E-07	-1.23E-02
Materials for energy recovery	kg	1.01E-05	7.56E-07	3.60E-02	3.60E-02	2.60E-09	3.79E-08	4.24E-08	9.09E-10	-3.85E-05
Energy exported	MJ	6.11E-01	3.36E-02	2.96E-02	6.74E-01	8.86E-04	1.68E-03	6.39E-04	5.02E-06	-3.74E+00

**Steel faced sandwich panels ONDATHERM 1001TS with thickness 60 mm**

Table 40. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 60 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>1.99E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>2.30E+01</b>	<b>1.91E-02</b>	<b>1.02E-01</b>	<b>1.26E+01</b>	<b>2.25E-03</b>	<b>-8.26E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	1.97E+01	2.01E+00	1.12E+00	2.28E+01	1.87E-02	1.02E-01	1.24E+01	2.25E-03	-8.17E+01
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	1.38E-01	7.07E-03	1.07E-02	1.56E-01	3.38E-04	3.49E-04	9.00E-04	1.18E-06	-7.92E-01
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.37E-02	8.14E-04	1.87E-04	1.47E-02	4.40E-06	4.01E-05	2.42E-05	1.36E-06	-9.10E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	9.50E-07	4.63E-07	3.51E-08	1.45E-06	3.59E-10	2.36E-08	4.91E-09	6.50E-11	-5.37E-06
Soil and water acidification potential	eq. mol H <sup>+</sup>	1.01E-01	8.13E-03	6.73E-03	1.16E-01	1.98E-04	4.14E-04	1.39E-03	1.69E-05	-4.19E-01
Eutrophication potential - freshwater	eq. kg P	8.57E-03	1.39E-04	1.07E-03	9.78E-03	3.40E-05	6.86E-06	1.31E-05	1.87E-07	-6.63E-02
Eutrophication potential - seawater	eq. kg N	2.78E-02	2.44E-03	1.04E-03	3.13E-02	2.82E-05	1.25E-04	7.11E-04	6.49E-06	-1.07E-01
Eutrophication potential - terrestrial	eq. mol N	1.94E-01	2.66E-02	9.16E-03	2.30E-01	2.42E-04	1.36E-03	7.28E-03	6.96E-05	-7.87E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	9.06E-02	8.16E-03	4.20E-03	1.03E-01	6.79E-05	4.18E-04	1.95E-03	2.42E-05	-1.30E+00
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.26E-04	7.46E-06	1.20E-06	1.35E-04	2.70E-08	3.62E-07	2.59E-07	3.16E-09	-7.35E-04
Abiotic depletion potential - fossil fuels	MJ	3.48E+02	2.98E+01	1.78E+01	3.96E+02	3.06E-01	1.51E+007	5.47E-01	5.64E-02	-1.98E+03
Water deprivation potential	eq. m <sup>3</sup>	1.34E+01	1.41E-01	2.09E-01	1.38E+01	6.21E-03	.00E-03	8.73E-02	1.75E-04	-6.12E+01

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Table 41. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 60 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 42. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 60 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.79E+01	4.40E-01	7.23E-01	1.91E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	3.11E+01
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.11E+02
Total consumption of renewable primary energy resources	MJ	2.05E+01	4.40E-01	7.23E-01	2.16E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	-7.97E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.83E+02	2.98E+01	1.78E+01	3.31E+02	3.24E-01	1.51E+00	-1.52E+02	5.64E-02	-1.49E+03
Consumption of non-renewable primary energy resources used as raw materials	MJ	6.55E+01	0.00E+00	5.79E-01	6.61E+01	0.00E+00	0.00E+00	1.52E+02	0.00E+00	-4.86E+02
Total consumption of non-renewable primary energy resources	MJ	3.49E+02	2.98E+01	1.84E+01	3.97E+02	3.24E-01	1.51E+00	5.48E-01	5.64E-02	-1.98E+03
Consumption of secondary materials	kg	5.79E+00	1.03E-02	2.09E-03	5.80E+00	2.47E-05	5.08E-04	1.42E-03	1.36E-05	-5.72E+00
Consumption of renewable secondary fuels	MJ	1.92E-03	1.15E-04	6.45E-06	2.04E-03	1.35E-07	5.60E-06	3.46E-06	2.91E-07	-2.32E-03
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	3.22E-01	3.82E-03	3.18E-03	3.29E-01	9.94E-05	1.91E-04	2.09E-03	5.82E-05	-1.46E+00

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Table 43. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 60 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.43E+00	3.43E-02	1.74E-03	1.47E+00	6.32E-08	1.70E-03	1.02E-01	2.71E-05	-5.22E+00
Non-hazardous waste neutralised	kg	1.97E+01	6.10E-01	1.61E-01	2.05E+01	1.81E-03	3.02E-02	4.05E+00	8.09E-04	-6.79E+01
Radioactive waste	kg	3.02E-04	2.05E-04	8.94E-06	5.16E-04	2.63E-07	1.04E-05	5.52E-07	1.60E-07	-1.25E-03
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	4.87E-03	9.39E-05	5.55E-02	6.04E-02	1.86E-06	4.69E-06	3.42E-05	2.52E-07	-1.23E-02
Materials for energy recovery	kg	1.16E-05	7.56E-07	3.60E-02	3.60E-02	2.60E-09	3.79E-08	4.24E-08	9.09E-10	-3.85E-05
Energy exported	MJ	8.12E-01	3.36E-02	2.96E-02	8.75E-01	8.86E-04	1.68E-03	6.39E-04	5.02E-06	-3.74E+00

**Steel faced sandwich panels ONDATHERM 1001TS with thickness 80 mm**

Table 44. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 80 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	2.31E+01	2.02E+00	1.13E+00	2.62E+01	1.91E-02	1.02E-01	1.26E+01	2.25E-03	-8.26E+01
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	2.29E+01	2.01E+00	1.12E+00	2.60E+01	1.87E-02	1.02E-01	1.24E+01	2.25E-03	-8.17E+01
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	1.84E-01	7.07E-03	1.07E-02	2.01E-01	3.38E-04	3.49E-04	9.00E-04	1.18E-06	-7.92E-01
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.57E-02	8.14E-04	1.87E-04	1.67E-02	4.40E-06	4.01E-05	2.42E-05	1.36E-06	-9.10E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	1.19E-06	4.63E-07	3.51E-08	1.69E-06	3.59E-10	2.36E-08	4.91E-09	6.50E-11	-5.37E-06
Soil and water acidification potential	eq. mol H <sup>+</sup>	1.22E-01	8.13E-03	6.73E-03	1.37E-01	1.98E-04	4.14E-04	1.39E-03	1.69E-05	-4.19E-01
Eutrophication potential - freshwater	eq. kg P	9.80E-03	1.39E-04	1.07E-03	1.10E-02	3.40E-05	6.86E-06	1.31E-05	1.87E-07	-6.63E-02
Eutrophication potential - seawater	eq. kg N	3.39E-02	2.44E-03	1.04E-03	3.74E-02	2.82E-05	1.25E-04	7.11E-04	6.49E-06	-1.07E-01
Eutrophication potential - terrestrial	eq. mol N	2.28E-01	2.66E-02	9.16E-03	2.64E-01	2.42E-04	1.36E-03	7.28E-03	6.96E-05	-7.87E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.05E-01	8.16E-03	4.20E-03	1.18E-01	6.79E-05	4.18E-04	1.95E-03	2.42E-05	-1.30E+00
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.62E-04	7.46E-06	1.20E-06	1.70E-04	2.70E-08	3.62E-07	2.59E-07	3.16E-09	-7.35E-04
Abiotic depletion potential - fossil fuels	MJ	4.24E+02	2.98E+01	1.78E+01	4.72E+02	3.06E-01	1.51E+007	5.47E-01	5.64E-02	-1.98E+03
Water deprivation potential	eq. m <sup>3</sup>	1.66E+01	1.41E-01	2.09E-01	1.69E+01	6.21E-03	.00E-03	8.73E-02	1.75E-04	-6.12E+01

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Table 45. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 80 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 46. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 80 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.20E+01	4.40E-01	7.23E-01	2.31E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	3.11E+01
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.11E+02
Total consumption of renewable primary energy resources	MJ	2.45E+01	4.40E-01	7.23E-01	2.57E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	-7.97E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.39E+02	2.98E+01	1.78E+01	3.86E+02	3.24E-01	1.51E+00	-1.52E+02	5.64E-02	-1.49E+03
Consumption of non-renewable primary energy resources used as raw materials	MJ	8.54E+01	0.00E+00	5.79E-01	8.60E+01	0.00E+00	0.00E+00	1.52E+02	0.00E+00	-4.86E+02
Total consumption of non-renewable primary energy resources	MJ	4.25E+02	2.98E+01	1.84E+01	4.73E+02	3.24E-01	1.51E+00	5.48E-01	5.64E-02	-1.98E+03
Consumption of secondary materials	kg	5.80E+00	1.03E-02	2.09E-03	5.81E+00	2.47E-05	5.08E-04	1.42E-03	1.36E-05	-5.72E+00
Consumption of renewable secondary fuels	MJ	2.01E-03	1.15E-04	6.45E-06	2.13E-03	1.35E-07	5.60E-06	3.46E-06	2.91E-07	-2.32E-03
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	3.98E-01	3.82E-03	3.18E-03	4.05E-01	9.94E-05	1.91E-04	2.09E-03	5.82E-05	-1.46E+00

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Table 47. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 80 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.49E+00	3.43E-02	1.74E-03	1.52E+00	6.32E-08	1.70E-03	1.02E-01	2.71E-05	-5.22E+00
Non-hazardous waste neutralised	kg	2.04E+01	6.10E-01	1.61E-01	2.12E+01	1.81E-03	3.02E-02	4.05E+00	8.09E-04	-6.79E+01
Radioactive waste	kg	3.30E-04	2.05E-04	8.94E-06	5.43E-04	2.63E-07	1.04E-05	5.52E-07	1.60E-07	-1.25E-03
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	5.66E-03	9.39E-05	5.55E-02	6.12E-02	1.86E-06	4.69E-06	3.42E-05	2.52E-07	-1.23E-02
Materials for energy recovery	kg	1.31E-05	7.56E-07	3.60E-02	3.60E-02	2.60E-09	3.79E-08	4.24E-08	9.09E-10	-3.85E-05
Energy exported	MJ	1.01E+00	3.36E-02	2.96E-02	1.08E+00	8.86E-04	1.68E-03	6.39E-04	5.02E-06	-3.74E+00



**Steel faced sandwich panels ONDATHERM 1001TS with thickness 100 mm**

Table 48. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 100 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>2.63E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>2.95E+01</b>	<b>1.91E-02</b>	<b>1.02E-01</b>	<b>1.26E+01</b>	<b>2.25E-03</b>	<b>-8.26E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	2.61E+01	2.01E+00	1.12E+00	2.92E+01	1.87E-02	1.02E-01	1.24E+01	2.25E-03	-8.17E+01
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	2.29E-01	7.07E-03	1.07E-02	2.47E-01	3.38E-04	3.49E-04	9.00E-04	1.18E-06	-7.92E-01
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.77E-02	8.14E-04	1.87E-04	1.87E-02	4.40E-06	4.01E-05	2.42E-05	1.36E-06	-9.10E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	1.43E-06	4.63E-07	3.51E-08	1.93E-06	3.59E-10	2.36E-08	4.91E-09	6.50E-11	-5.37E-06
Soil and water acidification potential	eq. mol H <sup>+</sup>	1.43E-01	8.13E-03	6.73E-03	1.58E-01	1.98E-04	4.14E-04	1.39E-03	1.69E-05	-4.19E-01
Eutrophication potential - freshwater	eq. kg P	1.10E-02	1.39E-04	1.07E-03	1.22E-02	3.40E-05	6.86E-06	1.31E-05	1.87E-07	-6.63E-02
Eutrophication potential - seawater	eq. kg N	4.01E-02	2.44E-03	1.04E-03	4.35E-02	2.82E-05	1.25E-04	7.11E-04	6.49E-06	-1.07E-01
Eutrophication potential - terrestrial	eq. mol N	2.62E-01	2.66E-02	9.16E-03	2.98E-01	2.42E-04	1.36E-03	7.28E-03	6.96E-05	-7.87E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.20E-01	8.16E-03	4.20E-03	1.32E-01	6.79E-05	4.18E-04	1.95E-03	2.42E-05	-1.30E+00
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.97E-04	7.46E-06	1.20E-06	2.06E-04	2.70E-08	3.62E-07	2.59E-07	3.16E-09	-7.35E-04
Abiotic depletion potential - fossil fuels	MJ	5.00E+02	2.98E+01	1.78E+01	5.47E+02	3.06E-01	1.51E+007	5.47E-01	5.64E-02	-1.98E+03
Water deprivation potential	eq. m <sup>3</sup>	1.98E+01	1.41E-01	2.09E-01	2.01E+01	6.21E-03	.00E-03	8.73E-02	1.75E-04	-6.12E+01

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Table 49. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 100 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 50. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 100 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.61E+01	4.40E-01	7.23E-01	2.72E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	3.11E+01
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.11E+02
Total consumption of renewable primary energy resources	MJ	2.86E+01	4.40E-01	7.23E-01	2.98E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	-7.97E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.94E+02	2.98E+01	1.78E+01	4.42E+02	3.24E-01	1.51E+00	-1.52E+02	5.64E-02	-1.49E+03
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.05E+02	0.00E+00	5.79E-01	1.06E+02	0.00E+00	0.00E+00	1.52E+02	0.00E+00	-4.86E+02
Total consumption of non-renewable primary energy resources	MJ	5.00E+02	2.98E+01	1.84E+01	5.48E+02	3.24E-01	1.51E+00	5.48E-01	5.64E-02	-1.98E+03
Consumption of secondary materials	kg	5.81E+00	1.03E-02	2.09E-03	5.82E+00	2.47E-05	5.08E-04	1.42E-03	1.36E-05	-5.72E+00
Consumption of renewable secondary fuels	MJ	2.10E-03	1.15E-04	6.45E-06	2.22E-03	1.35E-07	5.60E-06	3.46E-06	2.91E-07	-2.32E-03
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	4.74E-01	3.82E-03	3.18E-03	4.81E-01	9.94E-05	1.91E-04	2.09E-03	5.82E-05	-1.46E+00

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Table 51. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 100 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.54E+00	3.43E-02	1.74E-03	1.58E+00	6.32E-08	1.70E-03	1.02E-01	2.71E-05	-5.22E+00
Non-hazardous waste neutralised	kg	2.11E+01	6.10E-01	1.61E-01	2.18E+01	1.81E-03	3.02E-02	4.05E+00	8.09E-04	-6.79E+01
Radioactive waste	kg	3.57E-04	2.05E-04	8.94E-06	5.71E-04	2.63E-07	1.04E-05	5.52E-07	1.60E-07	-1.25E-03
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	6.45E-03	9.39E-05	5.55E-02	6.20E-02	1.86E-06	4.69E-06	3.42E-05	2.52E-07	-1.23E-02
Materials for energy recovery	kg	1.46E-05	7.56E-07	3.60E-02	3.60E-02	2.60E-09	3.79E-08	4.24E-08	9.09E-10	-3.85E-05
Energy exported	MJ	1.21E+00	3.36E-02	2.96E-02	1.28E+00	8.86E-04	1.68E-03	6.39E-04	5.02E-06	-3.74E+00

**Steel faced sandwich panels ONDATHERM 1001TS with thickness 120 mm**

Table 52. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 120 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>2.96E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>3.27E+01</b>	<b>1.91E-02</b>	<b>1.02E-01</b>	<b>1.26E+01</b>	<b>2.25E-03</b>	<b>-8.26E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	2.93E+01	2.01E+00	1.12E+00	3.24E+01	1.87E-02	1.02E-01	1.24E+01	2.25E-03	-8.17E+01
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	2.75E-01	7.07E-03	1.07E-02	2.92E-01	3.38E-04	3.49E-04	9.00E-04	1.18E-06	-7.92E-01
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	1.97E-02	8.14E-04	1.87E-04	2.07E-02	4.40E-06	4.01E-05	2.42E-05	1.36E-06	-9.10E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	1.67E-06	4.63E-07	3.51E-08	2.16E-06	3.59E-10	2.36E-08	4.91E-09	6.50E-11	-5.37E-06
Soil and water acidification potential	eq. mol H <sup>+</sup>	1.64E-01	8.13E-03	6.73E-03	1.79E-01	1.98E-04	4.14E-04	1.39E-03	1.69E-05	-4.19E-01
Eutrophication potential - freshwater	eq. kg P	1.23E-02	1.39E-04	1.07E-03	1.35E-02	3.40E-05	6.86E-06	1.31E-05	1.87E-07	-6.63E-02
Eutrophication potential - seawater	eq. kg N	4.62E-02	2.44E-03	1.04E-03	4.97E-02	2.82E-05	1.25E-04	7.11E-04	6.49E-06	-1.07E-01
Eutrophication potential - terrestrial	eq. mol N	2.96E-01	2.66E-02	9.16E-03	3.32E-01	2.42E-04	1.36E-03	7.28E-03	6.96E-05	-7.87E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.34E-01	8.16E-03	4.20E-03	1.47E-01	6.79E-05	4.18E-04	1.95E-03	2.42E-05	-1.30E+00
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	2.33E-04	7.46E-06	1.20E-06	2.42E-04	2.70E-08	3.62E-07	2.59E-07	3.16E-09	-7.35E-04
Abiotic depletion potential - fossil fuels	MJ	5.75E+02	2.98E+01	1.78E+01	6.23E+02	3.06E-01	1.51E+007	5.47E-01	5.64E-02	-1.98E+03
Water deprivation potential	eq. m <sup>3</sup>	2.29E+01	1.41E-01	2.09E-01	2.33E+01	6.21E-03	.00E-03	8.73E-02	1.75E-04	-6.12E+01

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Table 53. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 120 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 54. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 120 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.01E+01	4.40E-01	7.23E-01	3.13E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	3.11E+01
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.11E+02
Total consumption of renewable primary energy resources	MJ	3.27E+01	4.40E-01	7.23E-01	3.39E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	-7.97E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	4.50E+02	2.98E+01	1.78E+01	4.97E+02	3.24E-01	1.51E+00	-1.52E+02	5.64E-02	-1.49E+03
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.25E+02	0.00E+00	5.79E-01	1.26E+02	0.00E+00	0.00E+00	1.52E+02	0.00E+00	-4.86E+02
Total consumption of non-renewable primary energy resources	MJ	5.76E+02	2.98E+01	1.84E+01	6.24E+02	3.24E-01	1.51E+00	5.48E-01	5.64E-02	-1.98E+03
Consumption of secondary materials	kg	5.82E+00	1.03E-02	2.09E-03	5.83E+00	2.47E-05	5.08E-04	1.42E-03	1.36E-05	-5.72E+00
Consumption of renewable secondary fuels	MJ	2.19E-03	1.15E-04	6.45E-06	2.31E-03	1.35E-07	5.60E-06	3.46E-06	2.91E-07	-2.32E-03
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	5.50E-01	3.82E-03	3.18E-03	5.57E-01	9.94E-05	1.91E-04	2.09E-03	5.82E-05	-1.46E+00

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Table 55. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 120 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.60E+00	3.43E-02	1.74E-03	1.63E+00	6.32E-08	1.70E-03	1.02E-01	2.71E-05	-5.22E+00
Non-hazardous waste neutralised	kg	2.18E+01	6.10E-01	1.61E-01	2.25E+01	1.81E-03	3.02E-02	4.05E+00	8.09E-04	-6.79E+01
Radioactive waste	kg	3.85E-04	2.05E-04	8.94E-06	5.99E-04	2.63E-07	1.04E-05	5.52E-07	1.60E-07	-1.25E-03
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	7.24E-03	9.39E-05	5.55E-02	6.28E-02	1.86E-06	4.69E-06	3.42E-05	2.52E-07	-1.23E-02
Materials for energy recovery	kg	1.61E-05	7.56E-07	3.60E-02	3.61E-02	2.60E-09	3.79E-08	4.24E-08	9.09E-10	-3.85E-05
Energy exported	MJ	1.42E+00	3.36E-02	2.96E-02	1.48E+00	8.86E-04	1.68E-03	6.39E-04	5.02E-06	-3.74E+00

**Steel faced sandwich panels ONDATHERM 1001TS with thickness 160 mm**

Table 56. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 160 mm – environmental impacts (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
<b>Global Warming Potential</b>	eq. kg CO <sub>2</sub>	<b>3.61E+01</b>	<b>2.02E+00</b>	<b>1.13E+00</b>	<b>3.92E+01</b>	<b>1.91E-02</b>	<b>1.02E-01</b>	<b>1.26E+01</b>	<b>2.25E-03</b>	<b>-8.26E+01</b>
Greenhouse gas potential - fossil	eq. kg CO <sub>2</sub>	3.56E+01	2.01E+00	1.12E+00	3.88E+01	1.87E-02	1.02E-01	1.24E+01	2.25E-03	-8.17E+01
Greenhouse gas potential - biogenic	eq. kg CO <sub>2</sub>	3.66E-01	7.07E-03	1.07E-02	3.83E-01	3.38E-04	3.49E-04	9.00E-04	1.18E-06	-7.92E-01
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	2.38E-02	8.14E-04	1.87E-04	2.48E-02	4.40E-06	4.01E-05	2.42E-05	1.36E-06	-9.10E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	2.14E-06	4.63E-07	3.51E-08	2.64E-06	3.59E-10	2.36E-08	4.91E-09	6.50E-11	-5.37E-06
Soil and water acidification potential	eq. mol H <sup>+</sup>	2.06E-01	8.13E-03	6.73E-03	2.21E-01	1.98E-04	4.14E-04	1.39E-03	1.69E-05	-4.19E-01
Eutrophication potential - freshwater	eq. kg P	1.47E-02	1.39E-04	1.07E-03	1.59E-02	3.40E-05	6.86E-06	1.31E-05	1.87E-07	-6.63E-02
Eutrophication potential - seawater	eq. kg N	5.85E-02	2.44E-03	1.04E-03	6.20E-02	2.82E-05	1.25E-04	7.11E-04	6.49E-06	-1.07E-01
Eutrophication potential - terrestrial	eq. mol N	3.65E-01	2.66E-02	9.16E-03	4.00E-01	2.42E-04	1.36E-03	7.28E-03	6.96E-05	-7.87E-01
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.64E-01	8.16E-03	4.20E-03	1.76E-01	6.79E-05	4.18E-04	1.95E-03	2.42E-05	-1.30E+00
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	3.04E-04	7.46E-06	1.20E-06	3.13E-04	2.70E-08	3.62E-07	2.59E-07	3.16E-09	-7.35E-04
Abiotic depletion potential - fossil fuels	MJ	7.26E+02	2.98E+01	1.78E+01	7.74E+02	3.06E-01	1.51E+007	5.47E-01	5.64E-02	-1.98E+03
Water deprivation potential	eq. m <sup>3</sup>	2.93E+01	1.41E-01	2.09E-01	2.96E+01	6.21E-03	.00E-03	8.73E-02	1.75E-04	-6.12E+01

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Table 57. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 160 mm – additional impacts indicators (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA	INA	INA

Table 58. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 160 mm – environmental aspects related to resource use (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.83E+01	4.40E-01	7.23E-01	3.95E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	3.11E+01
Consumption of renewable primary energy resources used as raw materials	MJ	2.57E+00	0.00E+00	0.00E+00	2.57E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.11E+02
Total consumption of renewable primary energy resources	MJ	4.09E+01	4.40E-01	7.23E-01	4.20E+01	2.22E-02	2.17E-02	3.31E-02	4.73E-04	-7.97E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	5.61E+02	2.98E+01	1.78E+01	6.09E+02	3.24E-01	1.51E+00	-1.52E+02	5.64E-02	-1.49E+03
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.65E+02	0.00E+00	5.79E-01	1.66E+02	0.00E+00	0.00E+00	1.52E+02	0.00E+00	-4.86E+02
Total consumption of non-renewable primary energy resources	MJ	7.27E+02	2.98E+01	1.84E+01	7.75E+02	3.24E-01	1.51E+00	5.48E-01	5.64E-02	-1.98E+03
Consumption of secondary materials	kg	5.84E+00	1.03E-02	2.09E-03	5.86E+00	2.47E-05	5.08E-04	1.42E-03	1.36E-05	-5.72E+00
Consumption of renewable secondary fuels	MJ	2.36E-03	1.15E-04	6.45E-06	2.48E-03	1.35E-07	5.60E-06	3.46E-06	2.91E-07	-2.32E-03
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater resources	m <sup>3</sup>	7.02E-01	3.82E-03	3.18E-03	7.09E-01	9.94E-05	1.91E-04	2.09E-03	5.82E-05	-1.46E+00



## Environmental Product Declaration Type III ITB No. 66/2023

Table 59. LCA results of steel faced sandwich panels ONDATHERM 1001TS with thickness 160 mm – environmental information describing waste categories (DU: 1 m<sup>2</sup>)

Indicator	Unit	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
Hazardous waste neutralized	kg	1.71E+00	3.43E-02	1.74E-03	1.75E+00	6.32E-08	1.70E-03	1.02E-01	2.71E-05	-5.22E+00
Non-hazardous waste neutralised	kg	2.31E+01	6.10E-01	1.61E-01	2.39E+01	1.81E-03	3.02E-02	4.05E+00	8.09E-04	-6.79E+01
Radioactive waste	kg	4.40E-04	2.05E-04	8.94E-06	6.54E-04	2.63E-07	1.04E-05	5.52E-07	1.60E-07	-1.25E-03
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	8.82E-03	9.39E-05	5.55E-02	6.44E-02	1.86E-06	4.69E-06	3.42E-05	2.52E-07	-1.23E-02
Materials for energy recovery	kg	1.91E-05	7.56E-07	3.60E-02	3.61E-02	2.60E-09	3.79E-08	4.24E-08	9.09E-10	-3.85E-05
Energy exported	MJ	1.82E+00	3.36E-02	2.96E-02	1.88E+00	8.86E-04	1.68E-03	6.39E-04	5.02E-06	-3.74E+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 + A2 and ITB PCR A	
Independent verification corresponding to ISO 14025 (subclause 8.1.3.)	
<input checked="" type="checkbox"/> external	<input type="checkbox"/> internal
External verification of EPD: Halina Prejzner, PhD. Eng	
LCA, LCI audit and input data verification: Mateusz Kozicki, PhD	
Verification of LCA: Michał Piasecki, PhD. Eng	

Note: The declaration owner has the sole ownership, liability and responsibility for the declaration. Declarations within the same product category but from different programmes may not be comparable. Declarations of construction products may not be comparable if they do not comply with EN 15804 + A2. For further information about comparability, see EN 15804 + A2 and ISO 14025. Depending on the application, a corresponding conversion factor such as the specific weight per surface area must be taken into consideration.

**Normative references**

- ITB PCR A General Product Category Rules for Construction Products
- EN 14509:2013-12E Self-supporting double skin metal faced insulating panels - Factory made products - Specifications
- EN 13165:2013+A2:2017 Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU) products – Specification
- EN 10169:2022 - Continuously organic coated (coil coated) steel flat products - Technical delivery conditions
- EN 10143:2006 Continuously hot-dip coated steel sheet and strip — Tolerances on dimensions and shape
- 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
- EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business



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# **CERTIFICATE № 066/2023 of TYPE III ENVIRONMENTAL DECLARATION**

Products:

**Sandwich panels (PROMISOL, FRIGOTHERM, ONDATHERM)  
with PIR core**

Manufacturer:

**ArcelorMittal Construction Polska Sp. z o.o.**

ul. Metalowców 1, 41-600 Świętochłowice, Poland

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

**EN 15804+A2**

**Sustainability of construction works.**

**Environmental product declarations.**

**Core rules for the product category of construction products.**

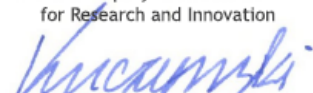
This certificate, issued on 29<sup>th</sup> March 2023 is valid for 5 years  
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics  
and Environment Department

  
Agnieszka Winkler-Skalna, PhD



Deputy Director  
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Krzysztof Kuczyński, PhD

Warsaw, March 2023