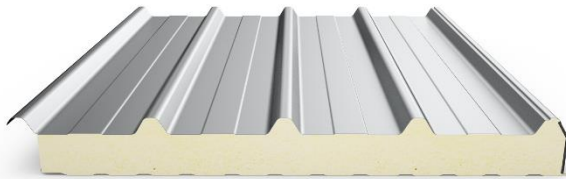




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HAIRISOL®

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



Owner of the EPD

ArcelorMittal Construcao Portugal, SA
Address: Estrada Nacional 3 Apartado 14
2071-909 Cartaxo, Portugal
Website: construction.arcelormittal.com
tel.: +351 263 400 070

EPD Program Operator

Instytut Techniki Budowlanej (ITB)
Address: Filtrowa 1,
00-611 Warsaw, Poland
Website: www.itb.pl
Contact: Justyna Tomaszewska
j.tomaszewska@itb.pl, energia@itb.pl



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

Basic information

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

Life cycle analysis (LCA): A1-A3, C3, C4 and D according to EN 15804 (Cradle-to-Gate with options)

The year of preparing the EPD: 2020

Product standard: EN 10169:2012, EN 10346:2009, EN 13165:2013, EN 14509:2009

Service Life: 50 years for standard products

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

Declared unit: 1 m² of the HAIRISOL® sandwich panel

Reasons for performing LCA: B2B

Representativeness: Portuguese products

MANUFACTURER



ArcelorMittal is a steel and mining company, present in 60 countries with an industrial footprint in 18 countries. The company supplies steel products in all major markets including automotive, construction, household appliance and packaging. ArcelorMittal Construção Portugal SA is a part of ArcelorMittal Group and is specialized in the production of corrugated steel profile sheets for roofing, ceiling, cladding, flooring and Hairisol® panels intended for roofs and walls.

Fig 1. A view of ArcelorMittal Construção Portugal SA production plant in Cartaxo (Portugal).

PRODUCT DESCRIPTION AND APPLICATION

Hairisol® sandwich panels with polyurethane / polyisocyanurate (PUR/ PIR) core provide a waterproofing and thermal performance building insulation with an easiest building solution. The support structure to which they are fix can be made of steel, concrete or wood. Characteristics of the Hairisol® sandwich panels produced by ArcelorMittal Construção Portugal SA are presented in Table 1.

Table 1. Characteristics of the Hairisol® sandwich panels produced by ArcelorMittal Construção Portugal SA.

Range Product		Hairisol® 1000C	Hairisol® 1025
Panel Thickness (mm)		30, 40, 50, 60	35, 40, 50, 60, 80
Face 1 (external)	Thickness (mm)	0.4; 0.50. 0.60. 0.63 ; 0.75	0.4; 0.50. 0.60. 0.63 ; 0.75
	Grade	S220; S280; S320; S350	S220; S280; S320; S350
	Metallic coating	Z100; Z140; Z200; Z225; Z275; ZM 60; ZM80; ZM100; ZM120	Z100; Z140; Z200; Z225; Z275; ZM 60; ZM80; ZM100; ZM120
	Organic Coating	SP 12; SP15; SP25; SP35; PVDF25; PVDF35; PVDF60; PUR45; PUR50; PUR60; PUR85; PVC(P)100; PVC(P)150; PVC(P)200	SP 12; SP15; SP25; SP35; PVDF25; PVDF35; PVDF60; PUR45; PUR50; PUR60; PUR85; PVC(P)100; PVC(P)150; PVC(P)200
Face 2 (internal)	Thickness (mm)	0.4; 0.50. 0.60. 0.63 ; 0.75	0.4; 0.50. 0.60. 0.63 ; 0.75
	Grade	S220; S280; S320; S350	S220; S280; S320; S350
	Metallic coating	Z100; Z140; Z200; Z225; Z275; ZM 60; ZM80; ZM100; ZM120	Z100; Z140; Z200; Z225; Z275; ZM 60; ZM80; ZM100; ZM120

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	Organic Coating	SP 12; SP15; SP25; SP35; PVDF25; PVDF35; PVDF60; PUR45; PUR50; PUR60; PUR85; PVC(P)100; PVC(P)150; PVC(P)200	SP 12; SP15; SP25; SP35; PVDF25; PVDF35; PVDF60; PUR45; PUR50; PUR60; PUR85; PVC(P)100; PVC(P)150; PVC(P)200
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Hairisol® sandwich panels are fastened to the steel structure by means of self drilling fasteners (screws). This technique eliminates the need to drill a through hole in the panel leading to a hole in the bearing structure. The fasteners increase the fastening reliability and reduce the 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 16mm. They are made of quenched carbon steel with an anti corrosion protective surface coating. All fasteners come with aluminium or steel washers with vulcanized EPDM rubber. In case of steel structures whose thickness exceeds 6 mm as well as wooden and concrete structures, it is possible to use other fasteners accordingly:

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

Hairisol® 1025 cladding panel with invisible fixation – is fixed at each connection point to steel structure with two fasteners through a steel profile (washer) the so-called load distributor.

Hairisol® 1000C roofing profile – is fixed with two connectors along its width to the steel structure together with roof saddles.

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

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on product mass basis in accordance with ITB PCR A. Production of Hairisol® sandwich panels with polyurethane / polyisocyanurate (PUR / PIR) core is a line process in the production plant of ArcelorMittal Construcão Portugal SA located in Cartaxo (Portugal). Allocation of environmental burdens was done on product mass basis. All impacts from raw materials extraction and processing are allocated in module A1 of the LCA. Impacts from the global line production of Hairisol® sandwich panels with PUR/PIR core were inventoried and were allocated to the production of the specific products as following: 70% Hairisol® 1000C and 30% Hairisol® 1025. The packaging materials are included in the system boundaries. Impacts associated with metal coatings were not taken into consideration. Module A2 includes transport of raw materials from their suppliers to ArcelorMittal Construcão Portugal SA production plant in Cartaxo (Portugal). Water and energy consumption, associated emissions and generated wastes are allocated to module A3.

System boundary

The life cycle analysis of the declared products covers “Product Stage”, A1-A3, C3, C4 and D modules (Cradle-to-Gate - with options) in accordance with EN 15804:2012+A1:2013 and ITB PCR A. The details of the system limits are provided in the background report. Energy and water consumption, emissions to air, soil and water 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 15804:2012+A1:2013, machines and facilities (capital goods) required for the production were excluded, as is transportation of employees.

A1 and A2 Modules: Raw materials supply and transport

Semi-finished steel products (coils), chemicals, polymers, plastic films, joints / seals, packaging materials, ancillary materials and propane gas come from both Portuguese and foreign suppliers. Means of transport include trucks with load: <10t, 10–16t and >16t and ships with load > 3000t. For calculation purposes Portuguese and European fuel averages were applied.

A3: Production

The production process of the Hairisol® sandwich panels with PUR / PIR core by ArcelorMittal Construcao Portugal SA is presented in Fig. 2.

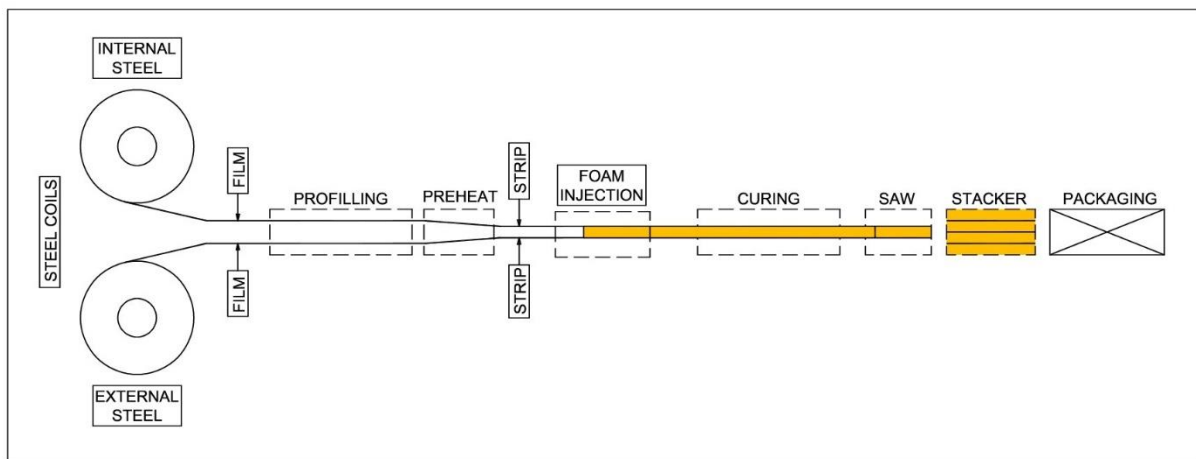


Fig. 2. A scheme of manufacturing of the Hairisol® sandwich panels with PUR / PIR core by ArcelorMittal Construcao Portugal SA.

C3, C4 and D Modules: End-of-life scenarios

At the end of life the Hairisol® sandwich panels with PUR/PIR core are deconstructed with the use of electrical tools. It is assumed that 100% of the materials is recovered – 98% of the steel scrap undergo recycling after cutting and shredding, 95% of the PUR/PIR foam is incinerated while the remaining waste materials are forwarded to landfill in the form of mixed construction and demolition wastes. Waste processing – module C3 – includes impacts associated with collecting of the steel scrap and sorting. Environmental burdens declared in module C4 are associated with waste-specific emissions to air and groundwater via landfill gas incineration and landfill leachate. Benefits and loads beyond the system boundary resulting from the recycling of the steel scrap are included in module D. Utilization of packaging material such as plastic films and wood which constitute less than 1.0% of the total system flows was not taken into consideration.

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Table 2. End-of-life scenario for the the Hairisol® sandwich panels with PUR/PIR core.

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

Data collection period

The data for manufacture of the declared products refer to period between 01.01.2019 – 31.12.2019 (1 year). The life cycle assessments were prepared for Portugal as reference area.

Data quality

The values determined to calculate the LCA originate from verified ArcelorMittal Construc ao Portugal SA inventory data.

Calculation rules

LCA was done in accordance with ITB PCR A document.

Databases

The data for the processes come from the following databases: Ecoinvent v.3.7, specific EPDs, ITB-Data. Specific data quality analysis was a part of external ISO 14001 audit.

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 m² of Hairisol® sandwich panels with PUR / PIR core produced by ArcelorMittal Construc ao Portugal SA .

Table 3. System boundaries for the environmental characteristic of the Hairisol® sandwich panels with PUR / PIR core produced by ArcelorMittal Construc ao Portugal SA.

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

**Hairisol® 1000C roof panels
with thickness 30 mm**

Environmental impacts: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Global warming potential	kg CO ₂ eq.	2.36E+01	6.34E-01	2.24E-01	2.44E+01	1.43E-02	6.48E-01	-1.35E+01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	1.62E-06	0.00E+00	1.18E-08	1.63E-06	6.75E-15	7.30E-09	-1.58E-07
Acidification potential of soil and water	kg SO ₂ eq.	6.15E-02	4.63E-03	1.60E-03	6.77E-02	4.76E-05	3.93E-03	-2.95E-02
Formation potential of tropospheric ozone	kg Ethene eq.	1.02E-02	3.38E-04	6.97E-05	1.06E-02	0.00E+00	2.53E-04	-3.75E-03
Eutrophication potential	kg (PO ₄) ³⁻ eq.	1.66E-02	8.16E-04	3.67E-04	1.77E-02	0.00E+00	2.86E-03	-2.61E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	2.35E-04	0.00E+00	1.72E-07	2.35E-04	1.91E-11	1.47E-07	9.20E-07
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	3.00E+02	5.67E+00	2.86E+00	3.09E+02	3.22E-03	7.27E-01	-1.22E+02
Environmental aspects on resource use: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.43E+01	3.97E-01	2.15E+00	2.68E+01	0.00E+00	2.46E-02	8.19E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.85E+02	5.54E+00	3.00E+00	2.93E+02	0.00E+00	7.40E-01	-1.19E+02
Use of secondary material	kg	5.02E+00	0.00E+00	0.00E+00	5.02E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	3.87E-01	0.00E+00	3.87E-01	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	3.44E-06	0.00E+00	0.00E+00	3.44E-06	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m ³	1.60E-01	2.64E-06	5.03E-04	1.61E-01	0.00E+00	1.55E-02	-1.35E-02
Other environmental information describing waste categories: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Hazardous waste disposed	kg	1.82E-04	8.56E-06	0.00E+00	1.90E-04	0.00E+00	1.59E-06	-2.08E-05
Non-hazardous waste disposed	kg	6.39E-01	3.83E-03	1.77E-02	6.60E-01	0.00E+00	2.95E-01	-1.92E-01
Radioactive waste disposed	kg	2.00E-04	2.21E-05	0.00E+00	2.22E-04	0.00E+00	3.76E-06	2.05E-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
Materials for recycling	kg	0.00E+00	0.00E+00	3.14E-01	3.14E-01	0.00E+00	7.02E+00	0.00E+00
Materials for energy recover	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E+00	0.00E+00
Exported energy	MJ per energy carrier	INA	INA	INA	INA	INA	INA	INA

Hairisol® 1000C roof panels

with thickness 40 mm

Environmental impacts: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Global warming potential	kg CO ₂ eq.	2.60E+01	6.34E-01	2.24E-01	2.69E+01	1.43E-02	8.63E-01	-1.41E+01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	2.15E-06	0.00E+00	1.18E-08	2.17E-06	4.94E-14	9.64E-09	-2.11E-07
Acidification potential of soil and water	kg SO ₂ eq.	7.25E-02	4.63E-03	1.60E-03	7.87E-02	4.86E-05	5.24E-03	-3.01E-02
Formation potential of tropospheric ozone	kg Ethene eq.	1.18E-02	3.38E-04	6.97E-05	1.22E-02	5.73E-06	3.37E-04	-3.80E-03
Eutrophication potential	kg (PO ₄) ³⁻ eq.	2.10E-02	8.16E-04	3.67E-04	2.22E-02	3.40E-06	3.81E-03	-2.68E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	3.13E-04	0.00E+00	1.72E-07	3.13E-04	6.83E-09	1.95E-07	8.31E-07
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	3.52E+02	5.67E+00	2.86E+00	3.61E+02	1.61E-01	9.62E-01	-1.32E+02
Environmental aspects on resource use: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.98E+01	3.97E-01	2.15E+00	3.24E+01	8.03E-02	3.27E-02	8.13E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.33E+02	5.54E+00	3.00E+00	3.41E+02	2.46E-01	9.78E-01	-1.30E+02
Use of secondary material	kg	5.02E+00	0.00E+00	0.00E+00	5.02E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	3.87E-01	0.00E+00	3.87E-01	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	4.59E-06	0.00E+00	0.00E+00	4.59E-06	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m ³	1.73E-01	2.64E-06	5.03E-04	1.74E-01	1.10E-04	2.06E-02	-1.94E-02
Other environmental information describing waste categories: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Hazardous waste disposed	kg	2.24E-04	8.56E-06	0.00E+00	2.32E-04	1.56E-09	2.11E-06	-2.77E-05
Non-hazardous waste disposed	kg	8.32E-01	3.83E-03	1.77E-02	8.53E-01	1.44E-01	3.45E-01	-1.95E-01
Radioactive waste disposed	kg	2.58E-04	2.21E-05	0.00E+00	2.80E-04	3.37E-05	4.96E-06	2.05E-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
Materials for recycling	kg	0.00E+00	0.00E+00	3.14E-01	3.14E-01	7.02E+00	7.02E+00	0.00E+00
Materials for energy recover	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.52E+00	0.00E+00
Exported energy	MJ per energy carrier	INA	INA	INA	INA	INA	INA	INA

Hairisol® 1000C roof panels

with thickness 50 mm

Environmental impacts: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Global warming potential	kg CO ₂ eq.	2.84E+01	6.34E-01	2.24E-01	2.93E+01	1.43E-02	1.08E+00	-1.48E+01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	2.69E-06	0.00E+00	1.18E-08	2.70E-06	4.94E-14	1.20E-08	-2.64E-07
Acidification potential of soil and water	kg SO ₂ eq.	8.35E-02	4.63E-03	1.60E-03	8.97E-02	4.86E-05	6.55E-03	-3.07E-02
Formation potential of tropospheric ozone	kg Ethene eq.	1.34E-02	3.38E-04	6.97E-05	1.38E-02	5.73E-06	4.22E-04	-3.86E-03
Eutrophication potential	kg (PO ₄) ³⁻ eq.	2.55E-02	8.16E-04	3.67E-04	2.66E-02	3.40E-06	4.76E-03	-2.76E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	3.91E-04	0.00E+00	1.72E-07	3.91E-04	6.83E-09	2.44E-07	7.42E-07
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	4.05E+02	5.67E+00	2.86E+00	4.13E+02	1.61E-01	1.20E+00	-1.42E+02
Environmental aspects on resource use: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.53E+01	3.97E-01	2.15E+00	3.79E+01	8.03E-02	4.07E-02	8.08E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.81E+02	5.54E+00	3.00E+00	3.89E+02	2.46E-01	1.22E+00	-1.41E+02
Use of secondary material	kg	5.02E+00	0.00E+00	0.00E+00	5.02E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	3.87E-01	0.00E+00	3.87E-01	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	5.74E-06	0.00E+00	0.00E+00	5.74E-06	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m ³	1.86E-01	2.64E-06	5.03E-04	1.87E-01	1.10E-04	2.58E-02	-2.52E-02
Other environmental information describing waste categories: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Hazardous waste disposed	kg	2.66E-04	8.56E-06	0.00E+00	2.74E-04	1.56E-09	2.64E-06	-3.46E-05
Non-hazardous waste disposed	kg	1.02E+00	3.83E-03	1.77E-02	1.05E+00	1.44E-01	3.95E-01	-1.97E-01
Radioactive waste disposed	kg	3.17E-04	2.21E-05	0.00E+00	3.39E-04	3.37E-05	6.16E-06	2.05E-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
Materials for recycling	kg	0.00E+00	0.00E+00	3.14E-01	3.14E-01	7.02E+00	7.02E+00	0.00E+00
Materials for energy recover	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E+00	0.00E+00
Exported energy	MJ per energy carrier	INA	INA	INA	INA	INA	INA	INA

Hairisol® 1000C roof panels

with thickness 60 mm

Environmental impacts: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Global warming potential	kg CO ₂ eq.	3.08E+01	6.34E-01	2.24E-01	3.17E+01	1.43E-02	1.29E+00	-1.54E+01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	3.22E-06	0.00E+00	1.18E-08	3.23E-06	4.94E-14	1.43E-08	-3.16E-07
Acidification potential of soil and water	kg SO ₂ eq.	9.45E-02	4.63E-03	1.60E-03	1.01E-01	4.86E-05	7.86E-03	-3.13E-02
Formation potential of tropospheric ozone	kg Ethene eq.	1.50E-02	3.38E-04	6.97E-05	1.54E-02	5.73E-06	5.06E-04	-3.92E-03
Eutrophication potential	kg (PO ₄) ³⁻ eq.	2.99E-02	8.16E-04	3.67E-04	3.11E-02	3.40E-06	5.71E-03	-2.83E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	4.69E-04	0.00E+00	1.72E-07	4.69E-04	6.83E-09	2.92E-07	6.53E-07
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	4.57E+02	5.67E+00	2.86E+00	4.66E+02	1.61E-01	1.43E+00	-1.52E+02
Environmental aspects on resource use: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	4.09E+01	3.97E-01	2.15E+00	4.34E+01	8.03E-02	4.87E-02	8.02E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	4.28E+02	5.54E+00	3.00E+00	4.37E+02	2.46E-01	1.46E+00	-1.52E+02
Use of secondary material	kg	5.02E+00	0.00E+00	0.00E+00	5.02E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	3.87E-01	0.00E+00	3.87E-01	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	6.89E-06	0.00E+00	0.00E+00	6.89E-06	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m ³	2.00E-01	2.64E-06	5.03E-04	2.00E-01	1.10E-04	3.10E-02	-3.11E-02
Other environmental information describing waste categories: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Hazardous waste disposed	kg	3.08E-04	8.56E-06	0.00E+00	3.16E-04	1.56E-09	3.16E-06	-4.15E-05
Non-hazardous waste disposed	kg	1.22E+00	3.83E-03	1.77E-02	1.24E+00	1.44E-01	4.44E-01	-2.00E-01
Radioactive waste disposed	kg	3.75E-04	2.21E-05	0.00E+00	3.97E-04	3.37E-05	7.36E-06	2.05E-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
Materials for recycling	kg	0.00E+00	0.00E+00	3.14E-01	3.14E-01	7.02E+00	7.02E+00	0.00E+00
Materials for energy recover	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E+00	0.00E+00
Exported energy	MJ per energy carrier	INA	INA	INA	INA	INA	INA	INA

Hairisol® 1025 wall panels

with thickness 35 mm

Environmental impacts: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Global warming potential	kg CO ₂ eq.	2.48E+01	6.34E-01	2.24E-01	2.56E+01	1.43E-02	7.55E-01	-1.38E+01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	1.89E-06	0.00E+00	1.18E-08	1.90E-06	4.94E-14	8.47E-09	-1.84E-07
Acidification potential of soil and water	kg SO ₂ eq.	6.70E-02	4.63E-03	1.60E-03	7.32E-02	4.86E-05	4.59E-03	-2.98E-02
Formation potential of tropospheric ozone	kg Ethene eq.	1.10E-02	3.38E-04	6.97E-05	1.14E-02	5.73E-06	2.95E-04	-3.77E-03
Eutrophication potential	kg (PO ₄) ³⁻ eq.	1.88E-02	8.16E-04	3.67E-04	2.00E-02	3.40E-06	3.33E-03	-2.64E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	2.74E-04	0.00E+00	1.72E-07	2.74E-04	6.83E-09	1.71E-07	8.76E-07
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	3.26E+02	5.67E+00	2.86E+00	3.35E+02	1.61E-01	8.45E-01	-1.27E+02
Environmental aspects on resource use: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.70E+01	3.97E-01	2.15E+00	2.96E+01	8.03E-02	2.86E-02	8.16E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.09E+02	5.54E+00	3.00E+00	3.17E+02	2.46E-01	8.59E-01	-1.24E+02
Use of secondary material	kg	5.02E+00	0.00E+00	0.00E+00	5.02E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	3.87E-01	0.00E+00	3.87E-01	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	4.02E-06	0.00E+00	0.00E+00	4.02E-06	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m ³	1.67E-01	2.64E-06	5.03E-04	1.67E-01	1.10E-04	1.81E-02	-1.64E-02
Other environmental information describing waste categories: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Hazardous waste disposed	kg	2.03E-04	8.56E-06	0.00E+00	2.11E-04	1.56E-09	1.85E-06	-2.42E-05
Non-hazardous waste disposed	kg	7.35E-01	3.83E-03	1.77E-02	7.57E-01	1.44E-01	3.20E-01	-1.93E-01
Radioactive waste disposed	kg	2.29E-04	2.21E-05	0.00E+00	2.51E-04	3.37E-05	4.36E-06	2.05E-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
Materials for recycling	kg	0.00E+00	0.00E+00	3.14E-01	3.14E-01	7.02E+00	7.02E+00	0.00E+00
Materials for energy recover	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E+00	0.00E+00
Exported energy	MJ per energy carrier	INA	INA	INA	INA	INA	INA	INA

Hairisol® 1025 wall panels

with thickness 40 mm

Environmental impacts: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Global warming potential	kg CO ₂ eq.	2.60E+01	6.34E-01	2.24E-01	2.69E+01	1.43E-02	8.63E-01	-1.41E+01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	2.15E-06	0.00E+00	1.18E-08	2.17E-06	4.94E-14	9.64E-09	-2.11E-07
Acidification potential of soil and water	kg SO ₂ eq.	7.25E-02	4.63E-03	1.60E-03	7.87E-02	4.86E-05	5.24E-03	-3.01E-02
Formation potential of tropospheric ozone	kg Ethene eq.	1.18E-02	3.38E-04	6.97E-05	1.22E-02	5.73E-06	3.37E-04	-3.80E-03
Eutrophication potential	kg (PO ₄) ³⁻ eq.	2.10E-02	8.16E-04	3.67E-04	2.22E-02	3.40E-06	3.81E-03	-2.68E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	3.13E-04	0.00E+00	1.72E-07	3.13E-04	6.83E-09	1.95E-07	8.31E-07
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	3.52E+02	5.67E+00	2.86E+00	3.61E+02	1.61E-01	9.62E-01	-1.32E+02
Environmental aspects on resource use: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	2.98E+01	3.97E-01	2.15E+00	3.24E+01	8.03E-02	3.27E-02	8.13E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.33E+02	5.54E+00	3.00E+00	3.41E+02	2.46E-01	9.78E-01	-1.30E+02
Use of secondary material	kg	5.02E+00	0.00E+00	0.00E+00	5.02E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	3.87E-01	0.00E+00	3.87E-01	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	4.59E-06	0.00E+00	0.00E+00	4.59E-06	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m ³	1.73E-01	2.64E-06	5.03E-04	1.74E-01	1.10E-04	2.06E-02	-1.94E-02
Other environmental information describing waste categories: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Hazardous waste disposed	kg	2.24E-04	8.56E-06	0.00E+00	2.32E-04	1.56E-09	2.11E-06	-2.77E-05
Non-hazardous waste disposed	kg	8.32E-01	3.83E-03	1.77E-02	8.53E-01	1.44E-01	3.45E-01	-1.95E-01
Radioactive waste disposed	kg	2.58E-04	2.21E-05	0.00E+00	2.80E-04	3.37E-05	4.96E-06	2.05E-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
Materials for recycling	kg	0.00E+00	0.00E+00	3.14E-01	3.14E-01	7.02E+00	7.02E+00	0.00E+00
Materials for energy recover	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.52E+00	0.00E+00
Exported energy	MJ per energy carrier	INA	INA	INA	INA	INA	INA	INA

Hairisol® 1025 wall panels
with thickness 50 mm

Environmental impacts: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Global warming potential	kg CO ₂ eq.	2.84E+01	6.34E-01	2.24E-01	2.93E+01	1.43E-02	1.08E+00	-1.48E+01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	2.69E-06	0.00E+00	1.18E-08	2.70E-06	4.94E-14	1.20E-08	-2.64E-07
Acidification potential of soil and water	kg SO ₂ eq.	8.35E-02	4.63E-03	1.60E-03	8.97E-02	4.86E-05	6.55E-03	-3.07E-02
Formation potential of tropospheric ozone	kg Ethene eq.	1.34E-02	3.38E-04	6.97E-05	1.38E-02	5.73E-06	4.22E-04	-3.86E-03
Eutrophication potential	kg (PO ₄) ³⁻ eq.	2.55E-02	8.16E-04	3.67E-04	2.66E-02	3.40E-06	4.76E-03	-2.76E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	3.91E-04	0.00E+00	1.72E-07	3.91E-04	6.83E-09	2.44E-07	7.42E-07
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	4.05E+02	5.67E+00	2.86E+00	4.13E+02	1.61E-01	1.20E+00	-1.42E+02
Environmental aspects on resource use: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.53E+01	3.97E-01	2.15E+00	3.79E+01	8.03E-02	4.07E-02	8.08E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.81E+02	5.54E+00	3.00E+00	3.89E+02	2.46E-01	1.22E+00	-1.41E+02
Use of secondary material	kg	5.02E+00	0.00E+00	0.00E+00	5.02E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	3.87E-01	0.00E+00	3.87E-01	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	5.74E-06	0.00E+00	0.00E+00	5.74E-06	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m ³	1.86E-01	2.64E-06	5.03E-04	1.87E-01	1.10E-04	2.58E-02	-2.52E-02
Other environmental information describing waste categories: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Hazardous waste disposed	kg	2.66E-04	8.56E-06	0.00E+00	2.74E-04	1.56E-09	2.64E-06	-3.46E-05
Non-hazardous waste disposed	kg	1.02E+00	3.83E-03	1.77E-02	1.05E+00	1.44E-01	3.95E-01	-1.97E-01
Radioactive waste disposed	kg	3.17E-04	2.21E-05	0.00E+00	3.39E-04	3.37E-05	6.16E-06	2.05E-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
Materials for recycling	kg	0.00E+00	0.00E+00	3.14E-01	3.14E-01	7.02E+00	7.02E+00	0.00E+00
Materials for energy recover	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.90E+00	0.00E+00
Exported energy	MJ per energy carrier	INA	INA	INA	INA	INA	INA	INA

Hairisol® 1025 wall panels

with thickness 60 mm

Environmental impacts: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Global warming potential	kg CO ₂ eq.	3.08E+01	6.34E-01	2.24E-01	3.17E+01	1.43E-02	1.29E+00	-1.54E+01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	3.22E-06	0.00E+00	1.18E-08	3.23E-06	4.94E-14	1.43E-08	-3.16E-07
Acidification potential of soil and water	kg SO ₂ eq.	9.45E-02	4.63E-03	1.60E-03	1.01E-01	4.86E-05	7.86E-03	-3.13E-02
Formation potential of tropospheric ozone	kg Ethene eq.	1.50E-02	3.38E-04	6.97E-05	1.54E-02	5.73E-06	5.06E-04	-3.92E-03
Eutrophication potential	kg (PO ₄) ³⁻ eq.	2.99E-02	8.16E-04	3.67E-04	3.11E-02	3.40E-06	5.71E-03	-2.83E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	4.69E-04	0.00E+00	1.72E-07	4.69E-04	6.83E-09	2.92E-07	6.53E-07
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	4.57E+02	5.67E+00	2.86E+00	4.66E+02	1.61E-01	1.43E+00	-1.52E+02
Environmental aspects on resource use: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	4.09E+01	3.97E-01	2.15E+00	4.34E+01	8.03E-02	4.87E-02	8.02E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	4.28E+02	5.54E+00	3.00E+00	4.37E+02	2.46E-01	1.46E+00	-1.52E+02
Use of secondary material	kg	5.02E+00	0.00E+00	0.00E+00	5.02E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	3.87E-01	0.00E+00	3.87E-01	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	6.89E-06	0.00E+00	0.00E+00	6.89E-06	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m ³	2.00E-01	2.64E-06	5.03E-04	2.00E-01	1.10E-04	3.10E-02	-3.11E-02
Other environmental information describing waste categories: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Hazardous waste disposed	kg	3.08E-04	8.56E-06	0.00E+00	3.16E-04	1.56E-09	3.16E-06	-4.15E-05
Non-hazardous waste disposed	kg	1.22E+00	3.83E-03	1.77E-02	1.24E+00	1.44E-01	4.44E-01	-2.00E-01
Radioactive waste disposed	kg	3.75E-04	2.21E-05	0.00E+00	3.97E-04	3.37E-05	7.36E-06	2.05E-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
Materials for recycling	kg	0.00E+00	0.00E+00	3.14E-01	3.14E-01	7.02E+00	7.02E+00	0.00E+00
Materials for energy recover	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E+00	0.00E+00
Exported energy	MJ per energy carrier	INA	INA	INA	INA	INA	INA	INA

Hairisol® 1025 wall panels
with thickness 80 mm

Environmental impacts: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Global warming potential	kg CO ₂ eq.	3.57E+01	6.34E-01	2.24E-01	3.66E+01	1.43E-02	1.73E+00	-1.68E+01
Depletion potential of the stratospheric ozone layer	kg CFC 11 eq.	4.28E-06	0.00E+00	1.18E-08	4.29E-06	4.94E-14	1.90E-08	-4.22E-07
Acidification potential of soil and water	kg SO ₂ eq.	1.17E-01	4.63E-03	1.60E-03	1.23E-01	4.86E-05	1.05E-02	-3.24E-02
Formation potential of tropospheric ozone	kg Ethene eq.	1.83E-02	3.38E-04	6.97E-05	1.87E-02	5.73E-06	6.74E-04	-4.03E-03
Eutrophication potential	kg (PO ₄) ³⁻ eq.	3.88E-02	8.16E-04	3.67E-04	4.00E-02	3.40E-06	7.62E-03	-2.98E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.	6.25E-04	0.00E+00	1.72E-07	6.25E-04	6.83E-09	3.90E-07	4.75E-07
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ	5.62E+02	5.67E+00	2.86E+00	5.70E+02	1.61E-01	1.90E+00	-1.72E+02
Environmental aspects on resource use: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	5.19E+01	3.97E-01	2.15E+00	5.45E+01	8.03E-02	6.48E-02	7.91E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	MJ	INA	INA	INA	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	5.24E+02	5.54E+00	3.00E+00	5.33E+02	2.46E-01	1.93E+00	-1.73E+02
Use of secondary material	kg	5.02E+00	0.00E+00	0.00E+00	5.02E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	3.87E-01	0.00E+00	3.87E-01	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	9.18E-06	0.00E+00	0.00E+00	9.18E-06	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m ³	2.26E-01	2.64E-06	5.03E-04	2.26E-01	1.10E-04	4.13E-02	-4.28E-02
Other environmental information describing waste categories: (DU) 1 m ²								
Indicator	Unit	A1	A2	A3	A1-A3	C3	C4	D
Hazardous waste disposed	kg	3.91E-04	8.56E-06	0.00E+00	4.00E-04	1.56E-09	4.21E-06	-5.53E-05
Non-hazardous waste disposed	kg	1.60E+00	3.83E-03	1.77E-02	1.63E+00	1.44E-01	5.44E-01	-2.06E-01
Radioactive waste disposed	kg	4.92E-04	2.21E-05	0.00E+00	5.14E-04	3.37E-05	9.77E-06	2.05E-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
Materials for recycling	kg	0.00E+00	0.00E+00	3.14E-01	3.14E-01	7.02E+00	7.02E+00	0.00E+00
Materials for energy recover	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.04E+00	0.00E+00
Exported energy	MJ per energy carrier	INA	INA	INA	INA	INA	INA	INA

Environmental Product Declaration Type III ITB No. 142/2020

Verification

The process of this EPD verification 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 this validity period, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 (subclause 8.1.3.) <input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification of EPD: Ph.D. Halina Prejzner Input data verification, LCI audit, LCA: Ph.D. Eng. Justyna Tomaszewska, j.tomaszewska@itb.pl Verification of LCA: Ph.D. Eng. Michał Piasecki, m.piasecki@itb.pl

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- ISO 14025:2006 Environmental labels and declarations – Type III Environmental Declarations – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15804:2012+A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
- EN 15804:2012+A2:2019 Sustainability of 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
- KOBiZE Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej, grudzień 2019
- EN 10169:2012, Continuously organic coated (coil coated) steel flat products – technical delivery conditions
- EN 10346:2009 Continuously hot-dip coated steel flat products – technical delivery conditions
- EN 13165:2013 Thermal insulation products for buildings, Factory made rigid polyurethane foam (PU) products, specification
- EN 13501-1:2010 Fire classification of construction products and building elements – Part1: Classification using data from reaction to fire tests
- EN 14509:2009, Self-supporting double skin metal faced insulating panels - Factory made products - Specifications

p.o. KIEROWNIKA
Zakładu Fizyki Ciepłej, Wentylacji i Środowiska
dr inż. Agnieszka Winkler-Skalna



Instytut Techniki Budowlanej

00-611 Warsaw, Filtrowa 1

Thermal Physics, Acoustics and Environment Department

02-656 Warsaw, Ksawerów 21

**CERTIFICATE No 142/2020
of TYPE III ENVIRONMENTAL DECLARATION**

Product:

**HAIRISOL® Double skin steel faced sandwich panels
with polyurethane / polyisocyanurate (PUR/ PIR) core**

Manufacturer:

ArcelorMittal Construcáo Portugal, SA

Estrada Nacional 3 Apartado 14, 2071-909 Cartaxo, Portugal

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

PN-EN 15804+A1

Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

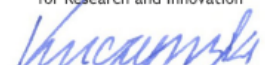
This certificate, issued for the first time on 28th December 2020 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Deputy Head of the Thermal Physic, Acoustics
and Environment Department


Agnieszka Winkler-Skalna, PhD



Deputy Director
for Research and Innovation


Krzysztof Kuczyński, PhD

Warsaw, December 2020