ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A1*

Owner of the Declaration	PPA-Europe
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-PPA-20180075-CBG3-EN
Issue date	14.09.2018
Valid to	13.03.2024

Double skin steel faced sandwich panels with a core made of mineral wool

PPA-Europe

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

www.ibu-epd.com | https://epd-online.com

European Association for Panels and Profiles

General Information

PPA-Europe

Programme holder

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

Declaration number

EPD-PPA-20180075-CBG3-EN

This declaration is based on the product category rules:

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

Issue date

14.09.2018

Valid to

13.03.2024

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

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

Double skin steel faced sandwich panels with a core made of mineral wool

Owner of the declaration

PPA-Europe
Europark Fichtenhain A 13a
47807 Krefeld
Germany

Declared product / declared unit

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

Scope:

This document is an association EPD and it represents an average EPD. Its applicability is limited to continuously produced double skin steel faced sandwich panels with an insulating core made of mineral wool, which are manufactured by member companies of the European Association for Panels and Profiles.

The following eight member companies of the European Association for Panels and Profiles have provided data for the year 2016:

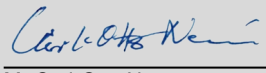
1. Hoesch Bausysteme
2. ISOCAB France
3. Isolpack
4. Italpannelli
5. Metecno Bausysteme
6. N.V. Joris Ide Belgium
7. Romakowski
8. Trimo

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

The EPD was created according to the specifications of EN 15804+A1. In the following, the standard will be simplified as *EN 15804*.

Verification

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



Mr Carl-Otto Neven,
(Independent verifier)

Product

Product description/Product definition

The EPD applies to prefabricated double skin steel faced sandwich panels with a core made of mineral wool, which are produced by member companies of PPA-Europe.

The profiled internal and external faces are made of a core of steel, which is protected against corrosion with zinc and organic coatings. The thermal insulating core material is made of mineral wool according to /EN 13162/ with sealing tapes. The core is bonded with adhesive to the steel sheets on both sides, to ensure a certain resistance to shear forces of the panel.

The LCA is based on vertical averaging of the specific producer datasets under consideration of the respective yearly production amounts. For the placing of the product on the market in the EU/EFTA (with the exception of Switzerland), /CPR/ applies. The product needs a Declaration of Performance taking into consideration /EN 14509/ and the CE-marking. The data listed in the Declaration of Performance apply.

For the application and use, the respective national provisions apply.

Application

The products are used for structural, self-supporting and non-supporting applications in roof, wall and ceiling structures.

Sandwich panels in wall and roof applications take on tasks of the building physics, especially sound, heat and moisture safety. They simultaneously perform the function of air tightness of the building envelope.

Technical Data

Technical specifications for sandwich panels with a core made of mineral wool are:

- /EN 14509/
- /EN 13162/

Constructional Data

Name	Value	Unit
Density of the insulation	115 - 120	kg/m^3
Thickness of the element When the outer layers are flat, this is the overall height of the element (D); on heavily profiled elements, this is the continuous core thickness without profile (dc)	100	mm
Calculation value for thermal conductivity of the insulation	0.044	W/(mK)
Heat transfer coefficient of the total element incl. thermal bridges due to overlapping and fixing elements	0.4467	W/(m^{2}K)
Thickness of the inner layer	0.5	mm
Weight	20.2	kg/m²
Thickness of the outer layer	0.6	mm

Base materials/Ancillary materials

Composition of the sandwich panels:

Material	Thickness of the element
	100mm
Steel sheet	42%
Thermal insulation core	56%
Adhesive	2%

Steel according to /EN 10346/:
S280 GD to S350 GD

Metallic coating according to /EN 10346/:
Zinc Z275, coating 275 g/m²
The zinc layer has a content of at least 99 weight percent zinc and typical thickness of 20 µm.

Organic coating according to /EN 10169/:
Polyester (SP), coil coating, 25 µm on the application side and max.15 µm on the backside.

Thermal insulation core according to /EN 13162/:
Mineral wool
The thermal insulating core is bonded with an organic adhesive between the steel sheets.
The panels contain sealing tapes (amount on total weight < 0.1%).
The product does not contain any SVHCs (Substances of Very High Concern) /REACH/.

Reference service life

Double skin steel faced sandwich panels used in lightweight metal constructions must withstand a term of protection of at least 15 years. The term of protection is the period until first slight renewals in the surface are required, only if there is no need of frequent inspections and service.

The term of protection depends on the location, weather conditions and the quality of the coating.

Double skin steel faced sandwich panels exhibit an estimated service life of 40 – 45 years depending on the use conditions, according to the /BBSR table/.

LCA: Calculation rules

Declared Unit

The declared unit is 1 m² of sandwich element. The averaging is done based on the production volume per company.

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Conversion factor to 1 kg	20.2	-
Grammage of the panel (total value)	20.2	kg/m^2
Layer thickness	0,1	m

Type of EPD: 2a) Declaration of a specific product as an average from several manufacturers´ plants.

System boundary

Type of the EPD: cradle to gate - with options

Production stage (modules A1-A3) includes processes that provide materials and energy input for the system, manufacturing and transport processes up to the factory gate, as well as waste processing.

For the end of life it is assumed that the steel proportion is recycled with credit for the recycling potential declared in module D and the MW proportion is landfilled without any credit.

Geographic Representativeness

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

Comparability

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

Impact Categories	Modules A1-A3		Module A4		Module C4		Module D	
	MW 50	MW 200	MW 50	MW 200	MW 50	MW 200	MW 50	MW 200
GWP	0,85	1,42	0,75	1,63	0,52	2,06	1,06	1,04
ODP	0,19	0,06	0,75	1,63	0,52	2,06	1,06	1,04
AP	0,78	1,57	0,75	1,63	0,52	2,06	1,06	1,04
EP	0,76	1,63	0,75	1,63	0,52	2,06	1,06	1,04
POCP	0,83	1,37	0,75	1,63	0,52	2,06	1,06	1,04
ADPE	1,03	1,04	0,75	1,63	0,52	2,06	1,06	1,04
ADPF	0,86	1,42	0,75	1,63	0,52	2,06	1,06	1,04

The declared results for A5 are valid for all product variations.

LCA: Scenarios and additional technical information

The following technical information is a basis for the declared modules.

Transport to the building site (A4)

Name	Value	Unit
Transport distance	100	km
Capacity utilisation (including empty runs)	85	%

Installation (A5)

The following packaging material is considered in A1-A3: Polystyrene: 0.04 kg/m² profile PE film 0.09 kg/m² profile Wooden pallets 0.3 kg/m² profile A5 covers the recycling of packaging material at the point of installation. The export of biogenic carbon dioxide from the packaging material is declared in the table of results in module A5. Recycling potential of the packaging material is neglected and not quantified in module D.

End of life (C1-C4)

Name	Value	Unit
Collected separately waste type waste type	20.2	kg
Recycling	8.1	kg
Energy recovery	-	kg
Landfilling	11.4	kg
Scrap content (not credited)	0.7	kg

Reuse, recovery or recycling potential (D)

Resulting potential benefits and loads for the metal recycling are declared in module D.

LCA: Results

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

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m² MW Sandwich panel 100 mm (20.2 kg/m²)

Parameter	Unit	A1-A3	A4	A5	C4	D
Global warming potential (GWP)	kg CO_2 eq	35.9088	0.108287661	1.26	0.183554	-13.0812
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	2.42E-07	3.63E-14	IND	1.87E-13	-5.98E-11
Acidification potential of land and water (AP)	kg SO_2 eq	1.68E-01	4.58E-04	IND	1.09E-03	-5.01E-02
Eutrophication potential (EP)	kg PO_4^3 eq	1.79E-02	1.14E-04	IND	1.48E-04	-3.93E-03
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg Ethen eq	1.54E-02	-1.68E-04	IND	8.55E-05	-7.23E-03
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	1.65E-03	8.71E-09	IND	6.58E-08	1.17E-06
Abiotic depletion potential for fossil resources (ADPF)	MJ	434.931	1.49626526	IND	2.37531	-122.896

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m² MW Sandwich panel 100 mm (20.2 kg/m²)

Parameter	Unit	A1-A3	A4	A5	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	42.98065374	0.075418222	IND	0.286763	7.42567
Renewable primary energy resources as material utilization (PERM)	MJ	3.53794626	0	IND	0	0
Total use of renewable primary energy resources (PERT)	MJ	46.5186	0.075418222	IND	0.286763	7.42567
Non renewable primary energy as energy carrier (PENRE)	MJ	432.16948793486	1.50231485	IND	2.4601	-117.75
Non renewable primary energy as material utilization (PENRM)	MJ	30.26851206514	0	IND	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	462.438	1.50231485	IND	2.4601	-117.75
Use of secondary material (SM)	kg	7.4E-01	0	4.3E-01	0	7.32E+00
Use of renewable secondary fuels (RSF)	MJ	0	0	IND	0	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	IND	0	0
Use of net fresh water (FW)	m^3	1.44E-01	1.4E-04	IND	4.68E-04	-7.53E-03

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m² MW Sandwich panel 100 mm (20.2 kg/m²)

Parameter	Unit	A1-A3	A4	A5	C4	D
Hazardous waste disposed (HWD)	kg	1.32E-06	7.88E-08	IND	3.89E-08	-8.72E-08
Non hazardous waste disposed (NHWD)	kg	5.44E+00	1.15E-04	IND	1.14E+01	2.22E-01
Radioactive waste disposed (RWD)	kg	1.1E-02	2.06E-06	IND	3.36E-05	2.03E-03
Components for re-use (CRU)	kg	0	0	IND	0	0
Materials for recycling (MFR)	kg	0	0	IND	8.06	0
Materials for energy recovery (MER)	kg	0	0	IND	0	0
Exported electrical energy (EEE)	MJ	0	0	IND	0	0
Exported thermal energy (EET)	MJ	0	0	IND	0	0

The CO_2 incorporation by using natural packaging materials (wooden pallets, paper) represent 3.5% of the GWP A1-A3.

References

/ISO 14044/
DIN EN/ ISO 14044/ Environmental management - Life cycle assessment - Requirements and guidelines

PCR - Part A
Calculation rules for the Life Cycle Assessment and Requirements on the Background Report, version 1.6, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, April 2017

PCR - Part B
Double skin metal faced sandwich panels, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, July 2014

/CPR/
REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

/EN 13162/
Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification

/EN 14509/
Self-supporting double skin metal faced insulating panels - Factory made products - Specifications

/EN 10346/
Continuously hot-dip coated steel flat products for cold forming - Technical delivery conditions

/EN 10169/
Continuously organic coated (coil coated) steel flat products - Technical delivery conditions

/Steel Recycling/
Steel Recycling Institute: Steel recycling rates, 2011

/Lebenszyklusanalyse 2009/Holger König, Niklaus Kohler, Johannes Kreißig, Thomas Lützkendorf: Lebenszyklusanalyse in der Gebäudeplanung Grundlagen Berechnungen Planungswerkzeuge, Institut für internationale Architektur-Dokumentation GmbH&Co. KG, München, 2009

/GaBi ts/
GaBi 8 dataset documentation for the software-system and databases, LBP, University of Stuttgart and thinkstep, Leinfelden-Echterdingen, 2017 (http://documentation.gabi-software.com/)

/BBSR table/
BBSR table (german): 'Nutzungsdauern von Bauteilen zur Lebenszyklusanalyse nach BNB', Federal Institute for Research on Building, Urban Affairs and Spatial Development, Referat II Nachhaltiges Bauen; online available under http://www.nachhaltigesbauen.de/baustoff-und-gebaeudedaten/nutzungsdauern-von-bauteilen.html

TRI
MO

Publisher

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Programme holder

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

+49 (0)30 3087748- 0
info@ibu-epd.com
www.ibu-epd.com

Author of the Life Cycle Assessment

thinkstep AG
Hauptstrasse 111- 113
70771 Leinfelden-Echterdingen
Germany

+49 711 341817-0
info@thinkstep.com
www.thinkstep.com

Owner of the Declaration

PPA-Europe
Europark Fichtenhain A 13a
47807 Krefeld
Germany

+49 2151 93630-0
info@ppa-europe.eu
www.ppa-europe.eu