ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	Stiferite
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-STF-20240206-CBA2-EN
Issue date	03/09/2024
Valid to	02/09/2029

Stiferite Isocanale AAB panel

Stiferite

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD VERIFIED

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General Information

Stiferite

Programme holder

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

Declaration number

EPD-STF-20240206-CBA2-EN

This declaration is based on the product category rules:

Insulating materials made of foam plastics, 01/08/2021
(PCR checked and approved by the SVR)

Issue date

03/09/2024

Valid to

02/09/2029

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

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

Stiferite Isocanale AAB panel

Owner of the declaration

Stiferite
Viale Navigazione Interna 54
35129 Padova
Italy

Declared product / declared unit

Stiferite Isocanale AAB expanded rigid polyurethane foam, covered on one side by 80 µm embossed aluminium facing and on the other side by 80 µm smooth aluminium facing lacquered with an antimicrobial material, and produced by Stiferite. The EPD applies to 1 m^2 of 20.0 mm thick PUR sandwich board, i.e. 0.0200 m^3, with density between foam and facing of 57.1 kg/m^3.

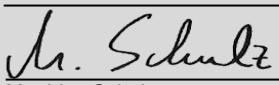
Scope:

Stiferite produces Stiferite Isocanale AAB that is a high-performance insulation board manufactured from closed cell expanded rigid polyurethane foam, covered on one side by 80 µm embossed aluminium facing and on the other side by 80 µm smooth aluminium facing lacquered with an antimicrobial material. The data have been provided by the only Stiferite factory that is located in Padova (Italy) for the year 2023 and sold worldwide.
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+A2. 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



Matthias Schulz,
(Independent verifier)

Product

Product description/Product definition

Stiferite's thermal insulation panels are mainly used in the building/construction sector and in industrial insulation.
The panels are made of thermo-setting closed cells polyurethane foam (PU) supplied with various types of flexible facers on both sides of the panel. The nature/type of facer is a function of the type of panel and its application.
Expanded rigid polyurethane foam is distinguished by its thermal insulation performance, mechanical resistance, workability, lightness, and durability.
The performance of Stiferite's panels is determined based on the European norm *EN 14308:2009+A1:2013 - Thermal insulation products for building equipment and industrial installations - Factory made rigid polyurethane foam (PUR) and polyisocyanurate foam (PIR) products - Specification*.
This EPD refers to Stiferite's Isocanale AAB panel, made of an insulation component in polyurethane foam using blowing agent Pentane-based, covered on one side by 80 µm embossed aluminium facing and on the other side by 80 µm smooth aluminium facing lacquered with an antimicrobial material. The panel is produced in standard dimensions of 1200 x 4000 mm and straight finish borders.
Upon request and for minimum quantities, the panels may be produced in various dimensions, and the borders may be rabbeted along the sides. The surface of the panel may be evened out with sandpaper in order to allow installation on uneven surfaces. Stiferite Isocanale AAB panel is produced by a certified company with systems:*ISO 9001, ISO 45001, ISO 14001* in its entire line of products.

Application

The Stiferite Isocanale AAB panel is suited for the construction of pre-insulated heating and ventilation ducts.

Technical Data

In this Life Cycle Assessment, a PU insulation board with the following properties has been regarded:

Constructional data

Name	Value	Unit
Gross density	57.1	kg/m^3
Declared Thermal conductivity λi acc. to EN 14308	0.021	W/mK
Water absorption by total immersion acc. to EN 12087	<1	Vol.-%
Water absorption by partial immersion acc. to EN 1609	< 0.1	kg/m²
Water vapour diffusion resistance factor µ acc. to EN 12086	Endless	
Euroclass reaction to fire Stiferite Duct acc. to EN 13823	B-s2,d0	

This provides a thermal resistance R = 0.91 m²k/W.

Product according to the *CPR* based on a *hEN/:14308:2009+A1:2013* For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No.305/2011 (*CPR*) applies. The product needs a Declaration of Performance taking into consideration *EN 14308:2009+A1:2013* - Thermal insulation products for building equipment and industrial installations - Factory made rigid polyurethane foam (PUR) and polyisocyanurate foam (PIR) products - Specification and the CE-marking. For the application and use the respective national provisions apply.

Base materials/Ancillary materials

Core material (about 86.6 % of the weight of the declared unit):

Closed-cell Polyiso (PIR) rigid foam made from MDI (45-60 %), polyols (30-40 %), pentane (3.5-5.5 %) and additives (4-7 %).

Facing (about 13.4 % of the weight of the declared unit): consisting of aluminium (97-99 %) and lacquer (1 - 3 %).
The PU board for insulation:

- This product/article/at least one partial article contains substances listed in the candidate list (date: 27.06.2024) exceeding 0.1 percentage by mass: no
- This product/article/at least one partial article doesn't contain other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no
- Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) *Ordinance on Biocide Products No.528/2012*): no

Additional declaration according to quoted law: The product is compliant with all requirements indicated in chapter 2.4.7 Isolanti termici ed acustici' DM of the 24th November 2025 (CAM EDILIZIA):

- Any blowing agent with Ozone depletion potential >0 is not used in production
- Any substances of Very High Concern-SVHC in concentration of more than 0,1 %w are not used in production (REACH n. 1907/2006). Any specific authorizations for use are reserved provided for by the same Regulation for the substances included in Annex XIV and specifications restrictions set out in Annex XVII of the Regulation.
- Catalysts lead-based are not used in production
- Flame retardants used in production (belonging to the Organophosphorus class) are not banned by any national or European regulation
- According to the raw materials declarations of suppliers, the minimum amount of recycled raw materials based on the insulation board (PU foam and facers) weight is 3 $\%_w$ and the minimum amount of recycled raw materials based on the PU insulation foam weight is 4 $\%_w$ in compliance with REMADE in Italy type 1 certification (note: this information is not explicitly considered in the LCA and not included in the EPD tables that only refer to recycling content in the foreground system).

Reference service life

The durability of insulation panels is normally at least as long as the lifetime of the building in which it is used. The experimental data show that the reference life is greater than 50 years.

LCA: Calculation rules

Declared Unit

The declared unit is 1 m² with a thickness of 20.0 mm, e. g. 0.0200 m³.
Corresponding conversion factors are listed in the table below.

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Gross density	57.1	kg/m^3
Layer thickness	0.02	m
Initial thermal conductivity λi	0.021	W/mK
Volume	0.02	m^3
Weight of declared unit	1.14	kg/m^2
Conversion factor to 1 kg	0.875	m^2/kg

This provides a thermal resistance R = 0.91 m²K/W.

System boundary

Type of the EPD: cradle to gate - with options. This life cycle assessment for the production of the polyurethane insulation board considers the life cycle from the supply of raw materials to the manufacturer´s gate (cradle-to-gate with options). It also includes the transport to the construction site and the end-of-life stage of the used PU thermal insulation board. The life cycle is split into the following individual phases:

A1 - Raw material formulation
A2 - Raw material transport
A3 - Production of the insulation board and packaging material
A4 - Transport to the construction site
C1 - demolition and deconstruction
C2 - Transport to end of life
C3 - End-of-Life: waste management (thermal recovery)
C4 - End-of-Life: waste management (landfill)
D - Benefits and loads beyond system boundary

Geographic Representativeness

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

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. The
background database used is *GaBi 2022* database (v. 2022.1)

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on describing the biogenic Carbon Content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	0.025	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Transport to the building site (A4)

Name	Value	Unit
Truck with a capacity of 17.3 tons	250	km
Ferry with a capacity of 1200-10000 dwt payload capacity	0	km
Ship with a capacity of 27500 dwt payload capacity tons	0	km
Plane with a capacity of 22 ton	0	km

Type and amount of packaging included in module A3

Name	Value	Unit
Cardboard	0.05354	kg
EPS stock	0.00871	kg
EPS stock - glue	0.00081	kg
Paper labels	0.0022	kg
PE film	0.01590	kg
PP tape	0.00015	kg
PUR stocks	0	kg
SBR labels	0.00003	kg
TOTAL PACKAGING	0.08133	kg

End of life (C1-C4)

Name	Value	Unit
Scenario No 1: Material Incineration	100	%
Scenario No 2: Landfill	100	%

C1 – Deconstruction and demolition (0.2 MJ/kg as electrical consumption assumed)

C2 – Panel is transported from the building site to a treatment plant by truck and an average distance of 100 km is considered.

C3/C4- Disposal scenarios used are divided into 2 sub-scenarios:
1) Incineration 100 % (C3)
2) Landfilling 100 % (C4/1)

Reuse, recovery and/or recycling potentials (D), relevant scenario information

D: Benefits and loads beyond system boundary are divided into 2 sub-scenarios:

Name	Value	Unit
Scenario No 1: Material Incineration	100	%
Scenario No 2: Landfill	100	%

LCA: Results

The tables below show the results of the LCA. Basic information on all declared modules provides chapter 4.
There are two scenarios for the end-of-life (C2, C4 and D) analyzed: Scenario 1 considers 100 % incineration, Scenario 2 considers 100 % landfill disposal.
For SM, RSF, NRSF, CRU indicators only the foreground system is considered.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE OR INDICATOR 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	MND	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m2 Isocanale AAB

Parameter	Unit	A1-A3	A4	C1	C2	C3	C3/1	C4	C4/1	D	D/1
GWP-total	kg CO_2 eq	4.67E+00	2.63E-02	2.61E-02	6.92E-03	2.2E+00	0	0	1.72E-02	-1.04E+00	0
GWP-fossil	kg CO_2 eq	4.81E+00	2.6E-02	2.61E-02	6.85E-03	2.2E+00	0	0	1.71E-02	-1.04E+00	0
GWP-biogenic	kg CO_2 eq	-1.45E-01	8.46E-05	1.54E-05	2.22E-05	1.74E-04	0	0	5.31E-05	-9.31E-04	0
GWP-luluc	kg CO_2 eq	2.15E-03	1.76E-04	1.69E-06	4.6E-05	1.15E-05	0	0	3.14E-05	-5.62E-05	0
ODP	kg CFC11 eq	8.31E-12	2.56E-15	2.58E-13	6.71E-16	2.48E-13	0	0	4.01E-14	-7.63E-12	0
AP	mol H^+ eq	1.16E-02	9.25E-05	3.83E-05	2.28E-05	1.32E-03	0	0	1.21E-04	-1.28E-03	0
EP-freshwater	kg P eq	1.24E-05	9.31E-08	1.17E-08	2.44E-08	9.06E-08	0	0	5.64E-08	-3.62E-07	0
EP-marine	kg N eq	2.48E-03	4.26E-05	1.05E-05	1.04E-05	6.37E-04	0	0	3.08E-05	-3.74E-04	0
EP-terrestrial	mol N eq	2.58E-02	4.77E-04	1.12E-04	1.17E-04	7.32E-03	0	0	3.39E-04	-4.02E-03	0
POCP	kg NMVOC eq	1.14E-02	8.32E-05	2.96E-05	2.05E-05	1.64E-03	0	0	9.37E-05	-1.06E-03	0
ADPE	kg Sb eq	1.02E-06	2.63E-09	3.1E-09	6.89E-10	6.19E-09	0	0	1.75E-09	-1.04E-07	0
ADPF	MJ	9.43E+01	3.42E-01	5.53E-01	8.97E-02	8.44E-01	0	0	2.24E-01	-2.06E+01	0
WDP	m^3 world eq deprived	8.97E-01	2.92E-04	1.95E-03	7.65E-05	2.33E-01	0	0	1.86E-03	-5.83E-02	0

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m2 Isocanale AAB

Parameter	Unit	A1-A3	A4	C1	C2	C3	C3/1	C4	C4/1	D	D/1
PERE	MJ	1.22E+01	2.37E-02	7.99E-02	6.22E-03	1.36E-01	0	0	3.35E-02	-2.38E+00	0
PERM	MJ	9.72E-01	ND	ND	ND	ND	0	0	ND	ND	0
PERT	MJ	1.31E+01	2.37E-02	7.99E-02	6.22E-03	1.36E-01	0	0	3.35E-02	-2.38E+00	0
PENRE	MJ	6.65E+01	3.43E-01	5.53E-01	9.01E-02	2.75E+01	0	0	2.69E+01	-2.06E+01	0
PENRM	MJ	2.78E+01	ND	ND	ND	-2.67E+01	0	0	-2.67E+01	ND	0
PENRT	MJ	9.43E+01	3.43E-01	5.53E-01	9.01E-02	8.44E-01	0	0	2.25E-01	-2.06E+01	0
SM	kg	2.02E-01	ND	ND	ND	ND	0	0	ND	ND	0
RSF	MJ	ND	ND	ND	ND	ND	0	0	ND	ND	0
NRSF	MJ	ND	ND	ND	ND	ND	0	0	ND	ND	0
FW	m^3	4.12E-02	2.74E-05	1.21E-04	7.18E-06	5.49E-03	0	0	5.65E-05	-3.61E-03	0

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m2 Isocanale AAB

Parameter	Unit	A1-A3	A4	C1	C2	C3	C3/1	C4	C4/1	D	D/1
HWD	kg	2.04E-08	1.82E-12	3.95E-11	4.77E-13	1.05E-10	0	0	1.17E-11	-1.95E-09	0
NHWD	kg	5.05E-01	5.6E-05	1.18E-04	1.47E-05	7.95E-02	0	0	1.14E+00	-4.58E-03	0
RWD	kg	2.13E-03	6.38E-07	9.19E-05	1.67E-07	4.72E-05	0	0	2.51E-06	-2.72E-03	0
CRU	kg	ND	ND	ND	ND	ND	0	0	ND	ND	0

MFR	kg	ND	ND	ND	ND	ND	0	0	ND	ND	0
MER	kg	ND	ND	ND	ND	ND	0	0	ND	ND	0
EEE	MJ	ND	ND	ND	ND	6.73E+00	0	0	ND	ND	0
EET	MJ	ND	ND	ND	ND	3.78E+00	0	0	ND	ND	0

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m2 Isocanale AAB

Parameter	Unit	A1-A3	A4	C1	C2	C3	C3/1	C4	C4/1	D	D/1
PM	Disease incidence	1.09E-07	5.36E-10	3.42E-10	1.31E-10	4.31E-09	0	0	1.48E-09	-1.14E-08	0
IR	kBq U235 eq	3.51E-01	9.63E-05	1.35E-02	2.52E-05	7.25E-03	0	0	2.8E-04	-3.98E-01	0
ETP-fw	CTUe	3.67E+01	2.42E-01	1.69E-01	6.36E-02	2.95E-01	0	0	4.05E+00	-5.04E+00	0
HTP-c	CTUh	2.95E-09	5E-12	3.12E-12	1.31E-12	1.8E-11	0	0	1.91E-11	-1.25E-10	0
HTP-nc	CTUh	2.16E-07	3.11E-10	1.59E-10	8.03E-11	7.73E-10	0	0	2.11E-09	-6.04E-09	0
SQP	SQP	1.23E+01	1.45E-01	5.08E-02	3.8E-02	1.56E-01	0	0	4.64E-02	-1.51E+00	0

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

This EPD was created using a software tool.

References

Standards CPR
Regulation (EU) No.305/2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC

EN 1609
EN 1609: Thermal insulating products for building applications. Determination of short term water absorption by partial immersion.

EN 13823
EN 13823:2020 Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item

EN 12086
EN 12086: 2013 Thermal insulating products for building applications. Determination of water vapour transmission properties.

EN 12087
EN 12087:2013 Thermal insulating products for building applications. Determination of long term water absorption by immersion.

EN 14308
EN 14308:2009+A1:2013 - Thermal insulation products for building equipment and industrial installations - Factory made rigid polyurethane foam (PUR) and polyisocyanurate foam (PIR) products - Specification

EN 15804
EN 15804:2012+A2:2019+AC:2021 Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

ISO 9001
ISO 9001:2015 Quality management

ISO 14001
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ISO 14025 EN ISO 14025:2011 Environmental labels and declarations — Type III environmental declarations - Principles and procedures.

ISO 45001
ISO 45001: 2018 Occupational health and safety management systems

GaBi 2022
GaBi 10 and DB 2022.1: Documentation of GaBi 10: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, Leinfelden-Echterdingen, 1992-2022 http://www.gabi-software.com

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Product Category Rules for Building-Related Products and Services. Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019; V1.2, 11/2021

IBU PCR Part B
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https://www.mase.gov.it/portale/cam-vigenti

REACH
REACH Registration, Evaluation, Authorization and Restriction of Chemical, 2007

REMADE IN ITALY
Certificate No.1245/001 for Stiferite Rev. n. 0 18 November 2021

Ordinance on Biocide Products
Regulation (eu) n. 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products Text with EEA relevance

STIFERITE LCA tool background report v 2.3 (03-06-2022)

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