Environmental Product Declaration



EPD[®]

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

SUPERPAN A+V-V 50 - 100 mm

from

EUROFIBRE SPA - VENEZIA

Product category rules (PCR): PCR 2019:14-c-PCR-005 c-PCR-005 Thermal Insulation products (EN 16783) Geographic Scope: All performances are calculated referring to the Marcon - Venice plant. The market is intended as International.

Programme:	The International EPD® System
Programme operator:	EPD International AB
EPD registration number:	S-P01587
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Validity:	2027-08-21

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com





General Information

Information on the Programme:

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product category rules (PCR): PCR 2019:14 Construction products and construction services (v1.1 del 14/09/2020) CPC 371, c-PCR 005 Thermal insulation product (v 1.0 del 20/12/2019)

PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact

Independent third-party verification of the declaration and data, according to ISO 14025:2006: [X] EPD process certification [] EPD verification

Third party verifier: CSQA Certificazioni srl, Via San Gaetano 74, Thiene (VI) In case of accredited certification bodies: Accredited by: ACCREDIA

Procedure for follow-up of data during EPD validity involves third party verifier: [X] Yes [] No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.







Company

EPD Owner:

Eurofibre Spa – via Venier 41 – 30020 Marcon (VE) <u>Representative</u>: Giorgia De Marchi tecnico.commerciale@eurofibre.it

Name and location of plant: EUROFIBRE SPA - via Venier 41 - Marcon Venezia

Description of the organization:

Since its foundation in 1981, in the Marcon Venezia plant, Eurofibre has constantly implemented its own technology necessary to produce glass wool insulations to meet the increasingly complex and stringent needs of the building and industrial market.

Eurofibre is synonymous of innovation, production and commercial flexibility for high-tech solutions offered in multiple segments of thermal, acoustic and fire insulation market.

To date, Eurofibre has developed different types of glass wool, distinguished by traditional brands TERMOVER[®] and EUROVER[®], and from innovatives EUROVER EVO[®], EUROVER 2000[®], TERMOVER AG, TERMOVER NG and TERMOVER A⁺.

The productions are structured on a wide range of thicknesses (from 6 to 250 mm) and a variety of customized facings and packaging, according to the customers' needs.

The set of industrial activities, facilitated by the strategic geographical position, has allowed Eurofibre to develop a stable presence in the European market as well as in the national one.

The need to meet the quality standards of the different national and international markets, in addition to the need to constantly demonstrate compliance with the regulations relating to environmental and safety aspects related to industrial production, made it necessary to implement an Integrated Quality System (ISO 9001), Environment (ISO 14001) and Safety (OHSAS 18001).

Using Eurofibre's thermo-acoustic insulation solutions do not mean buying products in the catalog but designing technical solutions, taking advantage of a complete service that allows us to identify and satisfy the customers' needs, thanks to the help of a competent technical and commercial staff.

The goal of Eurofibre has always been customer satisfaction through a personalized business relationship, based on correct advice and a mutual desire for success and growth on the market.







Product informations

Product name: SUPERPAN A⁺ V-V 50 - 100 mm

Product Description: SUPERPAN A⁺ V-V

Board in Termover[®] glass wool with organic binder based on acrilic resin, double-faceing with glass tissue (V-V) and with the technical characteristics according to EN 13162, shown in the table below.

F	Parameter		Thickness	s (EN 823)
			50 mm	100 mm
Density	(EN 1602)	kg/m³	50	50
Thermal conductivity	(EN 13162)	W/(mK)	0,031	0,031
Resistance	(EN 13162)	m ² K/W	1,61	3,23

The Eurofibre's glass wool is compliant with the Note Q of (CE) Regulation n. 1272/2008 of the European Parliament and of the Council concerning the classification, labeling and packaging of substances and blends.

Geographical scope:

Italy

LCA informations

Declared unit:

1 m² of thermal insulation product with specific RD value ready for market distribution and usable according to the applications provided in Annex A of the Standard EN 16783:2017.

Resistance: different for each thickness.

Applications: WTR WZ WI WTH WAB WH

Time representativness:

The primary data cover the period January 2020 - December 2020

Database and software:

Database Ecoinvent 3.7.1; Software SimaPro version 9.4.

UN CPC Code: 371

System boundaries and process units excluded:

The system boundaries include the mandatory A1, A2, A3, C1, C2, C3, C4 e D provided by the Standard EN 15804 (CEN, 2019), as shown in the following table according to an application *"from cradle to gate with module C1-C4 and module D".* It is emphasized that the construction, maintenance and disposal of the infrastructures, intended as building, and the occupation of industrial land were not considered, since it is considered that their contribution to the environmental impact relative to the declared unit is negligible. Consumption of oils for machine maintenance and water treatment are included. It should also be noted that the distribution, use and disposal phases of the product after use are not included in the study.







The table below shows the scenarios adopted for modelling modules C1, C2, C3, C4 and D.

MODULE	SCENARIO
[C1]	Impacts associated with demolition are assumed to be negligible.
[C2]	The end-of-life product is sent to landfill with an EWC code of Chapter 17, so the scenario is assumed to be landfill at a distance of 50 km. The means of transport is represented by the following dataset Transport, freight lorry, 16-32 EUR 4.
[C3]	The product after dismantling activities is not recovered. This module therefore only contains the benefits and impacts due to the recycling and energy recovery of product packaging materials.
[C4]	The product after demolition activities is disposed of in landfill, the dataset used is Inert waste for final disposal CH treatment of inert waste, inert waste material landfill. This choice is dictated by the fact that the waste is classified with an EWC code of Chapter 17.
[D]	This module contains the potential impacts and benefits related to the recycling of the product for the production of new glass wool in the event of optimal waste management. The calculated value is excluded from the sum of the total impacts. It is assumed that there are no material losses during collection and pre- processing of waste. The scenarios included are currently in use and are representative of one of the most likely alternatives.

The criterion chosen for the initial inclusion of input and output elements is based on the definition of a 1% cut-off level, in terms of mass, energy and environmental relevance. This means that a process has been neglected if it is responsible for less than 1% of the total mass, primary energy and impact. However, all processes for which data is available were taken into account, even if they contributed less than 1%.

The method chosen to assess the potential environmental impacts of the product subject of this study is the method provided by the standard EN 15804 (CEN, 2019)

Electricity Modelling (Module A3): Modelling of electricity consumption in Module A3 was carried out using the Italian national residual mix, using the latest available AIB report (AIB, 2020) as the data source. The breakdown of the energy sources used is shown. The emission factor obtained is 692 gC02eq/kWh.

FONTE	RESIDUAL MIX 2020
Renewables Unspecified	0,00%
[Solar]	5,02%
[Wind]	[1,75%]
Hydro&Marine	[1,72%]
Geothermal	0,00%
Biomass	[1,73%]
Nuclear	[11,42%]
Fossil Unspecified	2,11%
Lignite	0,54%
Hard Coal	[17,40%]
[Gas]	54,44%
[0il]	3,87%
TOTAL]	100,00%

Product stage		je]	Con	struction stage	Use stage							End of the stage				Benefits beyond systemboundaries		
Raw materials supply	[Transport]	Manufacturing	Transport to site	On site processes	[Use]	Manteinence	[Repair]	Replacement	Refurbishment	Operational energy use	Operational water use	DeConstruction/ Demolition	[Transport]	Waste Processing	Disposal	Reuse/Recovery/Recycling		
[A1]	[A2]	[A3]	[A4]	[A5]	[B1]	[B2]	[B3]	[B4]	[B5]	[B6]	[B7]	[C1]	[C2]	C3]	[C4]	[D]		
[X]	[X]	[X]	ND]	ND]	ND]	ND]	[ND]	[ND]	[ND]	[ND]	[ND]	[X]	[X]	[X]	[X]	[X]		

ND=Non dichiarato









Content declaration

The product does not contain substances included in the "Candidate list of substances of very high concern (SVHC) for authorization" in percentage higher than $0.1\%^{(1)}$.

Packaging:

Distribution:

The product is packed in a polyethylene bag, multi-pack polyethylene, adhesive labels, stretch film, polyethylene cap and loaded onto the pallet to be sent to customers. The polyethylene bag consists of 50 per cent recycled material and the multi-pack polyethylene of 60 per cent recycled material.

<u>Recycled material:</u>

<u>Origin of the recycled material (pre-consumer or postconsumer) in the product:</u>

The batch materials, the binders and the oils used do not contain recycled material.

¹http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp







Environmental performances Potential environmental impact

SUPERPAN A+ V-V 50 mm

× 10 ×	INDICATOR	UNIT	A1	A2	A3	CI	C2	C3	C4	D	TOTAL
	Global Warming Potential total	kg CO2 eq	3,66E+0	[1,04E-1]	8,49E-1	0,00E+0	2,26E-2	2,51E-2	[1,66E-2]	[-1,21E+0]	(4,68E+0
	Global Warming Potential fossil fuels	kg CO2 eq	3,55E+0	[1,04E-1]	8,97E-1	0,00E+0	2,26E-2	8,31E-3	[1,40E-2]	[-1,17E+0]	4,60E+0
	Global Warming Potential biogenic	kg CO2 eq	[1,11E-1]	2,24E-4	-4,86E-2	0,00E+0	5,41E-5	[1,68E-2]	2,62E-3	-3,16E-2	8,26E-2
	Global Warming Potential land use and land use change	kg CO2 eq	[7,97E-4]	[3,13E-5]	[3,45E-4]	0,00E+0	[7,67E-6]	[-7,54E-6]	2,45E-6]	[-2,91E-3]	[1,18E-3]
	Depletion potential of the stratospheric ozone layer	kg CFCn eq 🛛	5,84E-7	2,42E-8	[5,96E-8]	0,00E+0	[5,17E-9]	[-1,99E-9]	5,47E-9	[-2,45E-7]	6,77E-7
	Acidification potential, Accumulated Exceedence	mol H⁺ eq	1,70E-2	4,61E-4	7,10E-3	0,00E+0	[1,13E-4	-1,00E-4	[1,11E-4	-1,58E-2	2,47E-2
	Eutrophication potential, fraction of nutrients reaching freshwater end compartment	kg P eq	6,55E-4	6,77E-6	6,87E-4	0,00E+0	[1,53E-6	-6,25E-6	7,61E-7	-4,60E-4	1,34E-3
	Eutrophication potential, fraction of nutrients reaching marine end compartment	kg N eq 🛛] 1,92E-3]	[1,44E-4]	[1,17E-3]	[0,00E+0]	[3,95E-5]	[-1,27E-5]	5,74E-5	[-1,63E-3]	[3,32E-3]
	Eutrophication potential, Accumulated Exceedence	mol N eq 🛛	[1,96E-2]	[1,58E-3]	2,58E-2]	0,00E+0	4,31E-4	[-1,51E-4]	4,59E-4	[-6,62E-2]	[4,77E-2]
	Formation potential of tropospheric ozone	kg NMVOC eq	[6,87E-3]	[4,85E-4]	3,43E-3]	0,00E+0	1,23E-4	[-6,42E-5]	[1,32E-4]	[-5,95E-3]	[1,10E-2]
	Abiotic depletion potential for non fossil resources*	kg Sb eq 🛛	[1,45E-5]	[2,94E-7]	[5,38E-6]	0,00E+0	[8,20E-8]	[-5,79E-8]	2,20E-8	-4,33E-5	[2,02E-5]
	Abiotic depletion for fossil sources potential*	[MJ]	5,79E+1	[1,61E+0]	[1,11E+1]	0,00E+0	[3,44E-1]	[-5,72E-1]	[3,65E-1]	[-2,66E+1]	[7,08E+1]
	Water (user) deprivation potential, deprivation-weighted water	m ³ world eq. depriv.	[1,02E+0]	[4,66E-3]	9,89E+0	0,00E+0	9,42E-4	[-1,18E-2]	[1,49E-3]	-8,97E-1]	[1,09E+1]

*The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

For the impact category **Climate change - total**, a value of $4.68E+00 \text{ kg } \text{CO}_2$ eq. was obtained. Module A1 encloses the main sources of impact (78.25%), in particular: electricity (16.66%), methane and diesel (41.26%), fuels and oils (19.21%) and vitrifiable materials (1.09%). Module A2 has a more limited contribution of 2.23%, while module A3 overall contributes 18.14%. In particular, line processing accounts for 16.76%, packaging for 0.58%, while waste management and other plant consumption contribute a total of 0.77%. Overall, modules C1-C4 contribute 1.37%.]

For the impact category **Climate change - fossil**, a value of $4.60E+00 \text{ kg } CO_2 \text{ eq.}$ was obtained. Module A1 encompasses the main sources of impact (77.24%), namely: electricity (15.16%), methane and diesel (42.00%), fuels and oils (18.99%) and vitrifiable materials (1.09%). Module A2 has a more limited contribution of 2.27%, while module A3 overall contributes 19.52%. In particular, line processing accounts for 16.50%, packaging for 2.17%, while waste management and other plant consumption contribute a total of 0.86%. Overall, modules C1-C4 contribute 0.98%.





For the impact category **Climate change - biogenic**, a value of 8.26E-02 kg CO_2 eq. was obtained. Module A1 encompasses the main sources of impact, namely: electricity, vitrifiable materials, fuels and oils, methane and diesel. Module A2 has a more limited contribution. The main sources of impact in module A3 are: line processing, packaging, waste management and other plant consumption.

For the impact category **Climate change - land use and land use change** a value of 1.18E-03 kg CO₂ eq. was obtained. Module A1 encompasses the main sources of impact (67.78%), in particular: electricity (5.40%), methane and diesel (5.12%), fuels and oils (52.14%) and vitrifiable materials (5.13%). Module A2 has a more limited contribution of 2.66%, while module A3 overall contributes 29.34%. In particular, line processing accounts for 14.74%, packaging for 10.79%, while waste management and other plant consumption contribute a total of 3.81%. Overall, modules C1-C4 contribute 0.22%.

For the impact category **Ozone Depletion**, a value of 6.77E-07 kg CFC_{II} eq. was obtained. Module A1 encompasses the main sources of impact (86.33%), namely: electricity (12.34%), methane and diesel fuel (61.45%), fuels and oils (11.76%) and vitrifiable materials (0.78%). Module A2 has a more limited contribution of 3.58%, while module A3 contributes a total of 8.81%. In particular, line processing accounts for 7.50%, packaging for 0.46%, while waste management and other plant consumption contribute a total of 0.85%. Overall, modules C1-C4 contribute 1.28%. For the impact category **Acidification**, a value of 2.47E-02 mol H⁺ eq. was obtained. Module A1 encompasses the main sources of impact (68.91%), in particular: electricity (14.72%), methane and diesel (6.92%), fuels and oils (45.57%) and vitrifiable materials (1.70%). Module A2 has a more limited contribution of 1.87%, while module A3 contributes a total of 28.72%. In particular, line processing accounts for 26.06%, packaging for 1.78%, while waste management and other plant consumption contribute a total of 0.88%. Overall, modules C1-C4 contribute 0.50%.

For the impact category **Eutrophication aquatic freshwater**, a value of 1.34E-03 kg P eq (equivalent to 4.12E-03kg P043- eq) was obtained. Module A1 encompasses the main sources of impact (48.73%), in particular: electricity (15.95%), methane and diesel (1.09%), fuels and oils (30.12%) and vitrifiable materials (1.58%). Module A2 has a more limited contribution of 0.50%, while module A3 contributes a total of 51.06%. In particular, line processing accounts for 49.61%, packaging for 1.41%, while waste management and other plant consumption contribute a total of 0.04%. Overall, modules C1-C4 contribute -0.29%.

A value of 3.32E-03 kg N eq. was obtained for the impact category **Eutrophication aquatic marine**. Module A1 encompasses the main sources of impact (57.81%), in particular: electricity (16.98%), methane and diesel (9.71%), fuels and oils (27.69%) and vitrifiable materials (4.36%). Module A2 has a more limited contribution of 3.88%, while module A3 contributes a total of 35.29%. In particular, line processing accounts for 31.53%, packaging for 2.56%, while waste management and other plant consumption contribute a total of 1.20%. Overall, modules C1-C4 contribute 2.54%.





A value of 4.77E-02 mol N eq. was obtained for the impact category **Eutrophication terrestrial**. Module A1 encompasses the main sources of impact (41.01%), namely: electricity (13.00%), methane and diesel (7.31%), fuels and oils (18.04%) and vitrifiable materials (2.67%). Module A2 has a more limited contribution of 3.31%, while module A3 contributes a total of 54.13%. In particular, line processing accounts for 51.37%, packaging for 1.83%, while waste management and other plant consumption contribute a total of 0.93%. Overall, modules C1-C4 contribute 1.55%.

For the impact category **Photochemical ozone formation**, a value of 1.10E-02 kg NMV0C eq. was obtained. Module A1 encompasses the main sources of impact (62.57%), in particular: electricity (15.45%), methane and diesel (14.07%), fuels and oils (29.96%) and vitrifiable materials (3.10%). Module A2 has a more limited contribution of 4.42%, while module A3 contributes a total of 31.27%. In particular, line processing accounts for 25.06%, packaging for 3.67%, while waste management and other plant consumption contribute a total of 2.54%. Overall, modules C1-C4 contribute 1.74%.

For the impact category **Depletion of abiotic resources** - **mineral and metals** a value of 2.02E-05 kg Sb eq. was obtained. Module A1 encompasses the main sources of impact (71.71%), namely: electricity (5.03%), methane and diesel (1.11%), oils and oils (64.53%) and vitrifiable materials (1.03%). Module A2 has a more limited contribution of 1.45%, while module A3 overall contributes 26.61%. In particular, line processing accounts for 16.11%, packaging for 0.94%, while waste management and other plant consumption contribute a total of 9.55%. Overall, modules C1-C4 contribute 0.23%.

For the impact category **Depletion of abiotic resources** - **fossil fuels**, a value of 7.08E+01 MJ was obtained. Module A1 encompasses the main sources of impact (81.82%), namely: electricity (17.74%), methane and diesel (42.63%), fuels and oils (20.48%) and vitrifiable materials (0.97%). Module A2 has a more limited contribution of 2.27%, while module A3 overall contributes 15.71%. In particular, line processing accounts for 9.20%, packaging for 3.77%, while waste management and other plant consumption contribute a total of 2.74%. Overall, modules C1-C4 reduce the impact by 0.19%.

For the impact category **Water use**, a value of $1.09E+01 \text{ m}^3$ depriv. was obtained. Module A1 encompasses the main sources of impact (9.33%), in particular: electricity (1.05%), methane and diesel (0.08%), fuels and oils (7.73%) and vitrifiable materials (0.47%). Module A2 has a more limited contribution of 0.04%, while module A3 overall contributes 90.71%. In particular, line processing accounts for 89.82%, packaging for 0.58%, while waste management and other plant consumption contribute a total of 0.32%. Overall, modules C1-C4 reduce the impact by -0.09%.

The indicators Potential incidence of disease due to PM emissions (PM), Potential human exposure efficiency related to U235 (IRP), Potential comparative toxicity unit for ecosystems (ETP-fw), Potential comparative toxicity unit for humans (HTP-c), Potential comparative toxicity unit for humans (HTP-nc) and Potential soil quality index (SQP) are not stated (ND) in this document.





Use of resources

INDICATOR	UNIT	A1	A2	A3	C1	C2	C3	C4	D	TOTAL
Use of renewable primary energy excluding resources used as raw materials	[MJ]	9,17E-1]	[1,48E-2]	8,92E-1]	0,00E+0	3,38E-3	[-5,45E-3]	3,90E-3	-6,39E-1]	[1,83E+0]
Use of renewable primary energy resources used as raw materials	[MJ]	8,19E-1	5,12E-3	[1,20E+0]	0,00E+0	1,26E-3	[-1,10E-1]	3,27E-3	[-9,11E-1]	[1,91E+0]
Total use of renewable primary energy	[MJ]	[1,74E+0]	2,00E-2	2,09E+0	0,00E+0	4,64E-3	[-1,16E-1]	7,17E-3	-1,55E+0	3,74E+0
Use of non-renewable primary energy excluding resources used as raw materials	[MJ]	[5,79E+1]	[1,61E+0]	9,13E+0	0,00E+0	3,44E-1]	[-5,72E-1]	3,65E-1]	[-2,66E+1]	6,88E+1]
Use of non-renewable primary energy resources used as raw materials	[MJ]	0,00E+0]	[0,00E+0]	[1,99E+0]	0,00E+0	[0,00E+0]	[0,00E+0]	[0,00E+0]	0,00E+0]	[1,99E+0]
$[\mbox{Total}\ \mbox{use}\ \mbox{of}\ \mbox{non-renewable}\ \mbox{primary}\ \mbox{energy}\]$	[MJ]	5,79E+1	[1,61E+0]	[1,11E+1]	0,00E+0	3,44E-1	-5,72E-1	3,65E-1	-2,66E+1]	[7,08E+1]
Secondary material	[kg]	0,00E+0	0,00E+0	[1,71E-2]	0,00E+0]	0,00E+0	0,00E+0	0,00E+0	0,00E+0]	[1,71E-2]
Renewable secondary fuels	[MJ]	0,00E+0	0,00E+0	0,00E+0	0,00E+0	0,00E+0	0,00E+0	0,00E+0	0,00E+0]	0,00E+0
Non-renewable secondary fuels	[MJ]	0,00E+0	0,00E+0	0,00E+0	0,00E+0]	0,00E+0	0,00E+0	0,00E+0	0,00E+0]	0,00E+0
Net use of fresh water	[m ³]	2,76E-2	1,63E-4	[2,33E-1]	[0,00E+0]	[3,46E-5]	[-2,05E-4]	(4,35E-4	-2,07E-2	2,61E-1

Waste produced and outflows Waste produced

INDICATOR	UNIT	A1	A2	A3	CI	C2	C3	C4	D	TOTAL
Hazardous waste disposed	kg]	6,85E-5	[4,02E-6]	4,38E-3	0,00E+0	8,97E-7	[-2,29E-7]	4,04E-7	[-3,01E-5]	(4,46E-3
Non-hazardous waste disposed	kg]	4,63E-1	1,03E-1	9,55E-1	0,00E+0	1,65E-2	[1,59E-3]	2,62E+0	2,16E+0	[4,16E+0]
Radioactive waste disposed	kg	9,08E-5	[1,10E-5]	2,72E-5	0,00E+0	2,36E-6	-9,45E-7	2,48E-6	[-3,66E-5]	[1,33E-4]

Outflows

INDICATOR	UNIT	A1 /	A2	A3	C1	C2	C3	C4	D	TOTAL
Components for reuse	[kg]	0,00E+0	0,00E+0	[0,00E+0]	0,00E+0	0,00E+0	0,00E+0]	0,00E+0	0,00E+0	0,00E+0
Material for recycling	[kg]	0,00E+0	0,00E+0	5,64E-2	0,00E+0	0,00E+0	2,36E-2	0,00E+0	0,00E+0	8,00E-2
Materials for energy recovery	[kg]	0,00E+0	0,00E+0	[1,01E-3]	0,00E+0	0,00E+0	[1,96E-2]	0,00E+0	0,00E+0	2,06E-2
Exported energy	[MJ]	0,00E+0	0,00E+0	4,93E-3	0,00E+0	0,00E+0	[1,17E-1]	0,00E+0	0,00E+0	[1,22E-1]

GWP-GHG indicator

INDICATOR	UNIT	AI	A2	A3	CI	C2	C3	C4	D	TOTAL
GWP-GHG	kg CO2 eq	3,57E+0	1,04E-1	9,02E-1	0,00E+0	2,26E-2	8,17E-3	1,61E-2	-1,19E+0	4,62E+0





Environmental performances Potential environmental impact

SUPERPAN A+V-V 100 mm

INDICATOR	UNIT	A1	A2	A3	CI	C2	C3	C4	D	TOTAL
Global Warming Potential total	kg CO2 eq	8,96E+0	2,60E-1	[1,87E+0]	0,00E+0	4,40E-2	[3,88E-2]	[3,03E-2]	[-2,37E+0]	[1,12E+1]
Global Warming Potential fossil fuels	kg CO2 eq	8,69E+0	2,59E-1	[1,92E+0]	0,00E+0	4,39E-2	[1,28E-2]	2,62E-2	-2,30E+0	[1,10E+1]
Global Warming Potential biogenic	kg CO2 eq	2,67E-1	5,59E-4	-5,24E-2	0,00E+0	[1,05E-4	2,60E-2	4,09E-3	-6,22E-2	2,45E-1
Global Warming Potential land use and land use change	kg CO2 eq	2,03E-3	[7,80E-5]	[5,12E-4]	0,00E+0	[1,49E-5]	[-1,16E-5]	4,73E-6	[-5,73E-3]	2,63E-3]
Depletion potential of the stratospheric ozone layer	kg CFC11 eq 🛛]1,43E-6]	6,03E-8	[1,18E-7]	0,00E+0	[1,00E-8]	[-3,07E-9]	[1,07E-8]	[-4,82E-7]	[1,63E-6]
Acidification potential, Accumulated Exceedence	mol H⁺ eq	4,23E-2	[1,15E-3	1,56E-2	0,00E+0	2,20E-4	-1,54E-4	2,16E-4	-3,12E-2	5,93E-2
Eutrophication potential, fraction of nutrients reaching freshwater end compartment	kg P eq)1,64E-3	[1,69E-5	1,61E-3	0,00E+0	2,97E-6	-9,65E-6	[1,46E-6	-9,04E-4	3,26E-3
Eutrophication potential, fraction of nutrients reaching marine end compartment	kg N eq 🛛	[4,75E-3]	[3,59E-4]	2,53E-3]	[0,00E+0]	[7,67E-5]	[-1,96E-5]	[1,06E-4]	[-3,21E-3]	[7,80E-3]
Eutrophication potential, Accumulated Exceedence	mol N eq 🛛	[4,84E-2]	[3,92E-3]	5,88E-2	[0,00E+0]	8,38E-4	-2,33E-4	8,98E-4	[-1,30E-1]	[1,13E-1]
Formation potential of tropospheric ozone	kg NMVOC eq	1,73E-2	[1,21E-3]	7,88E-3	0,00E+0	2,39E-4	-9,90E-5	2,58E-4	[-1,17E-2]	2,68E-2
Abiotic depletion potential for non fossil resources*	kg Sb eq	4,22E-5	7,33E-7	4,50E-6	0,00E+0	1,59E-7	-8,94E-8	4,27E-8	-8,52E-5	4,76E-5
Abiotic depletion for fossil sources potential*	MJ	1,42E+2	4,00E+0	2,11E+1	0,00E+0	6,69E-1	-8,82E-1	7,14E-1	-5,24E+1	[1,68E+2
Water (user) deprivation potential, deprivation-weighted water	m ³ world eq. depriv.	2,55E+0	1,16E-2	1,09E+1	0,00E+0	1,83E-3	-1,82E-2	2,75E-3	-1,76E+0	1,35E+1

*The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

For the impact category **Climate change - total** a value of $1.12E+01 \text{ kg } \text{CO}_2 \text{ eq.}$ was obtained. Module A1 encompasses the main sources of impact (80.00%), namely: electricity (16.38%), methane and diesel (41.99%), fuels and oils (20.09%) and vitrifiable materials (1.49%). Module A2 has a more limited contribution of 2.32%, while module A3 overall contributes 16.67%. In particular, line processing accounts for 13.62%, packaging for 0.37%, while waste management and other plant consumption contribute a total of 2.66%. Overall, modules C1-C4 contribute 1.01%.

For the impact category **Climate change - fossil**, a value of 1.10E+01 kg CO_2 eq. was obtained. Module A1 encompasses the main sources of impact (79.35%), namely: electricity (14.97%), methane and diesel (42.93%), fuels and oils (19.95%) and vitrifiable materials (1.50%). Module A2 has a more limited contribution of 2.37%, while module A3 contributes a total of 17.52%. In particular, line processing accounts for 13.40%, packaging for 1.40%, while waste management and other plant consumption contribute a total of 2.72%. Overall, modules C1-C4 contribute 0.76%.





For the impact category **Climate change - biogenic** a value of 2.45E-01 kg CO_2 eq. was obtained. Module A1 encompasses the main sources of impact, namely: electricity, vitrifiable materials, fuels and oils, methane and diesel. Module A2 has a more limited contribution. The main sources of impact in module A3 are: line processing, packaging, waste management and other plant consumption.

For the impact category **Climate change - land use and land use change** a value of $2.63E-03 \text{ kg } CO_2 \text{ eq.}$ was obtained. Module A1 encompasses the main sources of impact (77.23%), in particular: electricity (5.69%), methane and diesel (5.61%), fuels and oils (58.45%) and vitrifiable materials (7.48%). Module A2 has a more limited contribution of 2.97%, while module A3 overall contributes 19.50%. In particular, line processing accounts for 8.66%, packaging for 7.46%, while waste management and other plant consumption contribute a total of 3.39%. Overall, modules C1-C4 contribute 0.30%.

For the impact category **Ozone Depletion**, a value of $1.63E-06 \text{ kg CFC}_{11}$ eq. was obtained. Module A1 encompasses the main sources of impact (87.97%), namely: electricity (12.07%), methane and diesel fuel (62.11%), fuels and oils (12.24%) and vitrifiable materials (1.55%). Module A2 has a more limited contribution of 3.71%, while module A3 contributes a total of 7.24%. In particular, line processing accounts for 6.12%, packaging for 0.30%, while waste management and other plant consumption contribute a total of 0.82%. Overall, modules C1-C4 contribute 1.09%.

For the **Acidification** impact category, a value of 5.93E-02 mol H⁺ eq. was obtained. Module A1 encompasses the main sources of impact (71.27%), in particular: electricity (14.4%), methane and diesel (7.03%), fuels and oils (47.54%) and vitrifiable materials (2.26%). Module A2 has a more limited contribution of 1.94%, while module A3 overall contributes 26.32%. In particular, line processing accounts for 23.69%, packaging for 1.14%, while waste management and other plant consumption contribute a total of 1.48%. Overall, modules C1-C4 contribute 0.47%.

For the impact category **Eutrophication aquatic freshwater**, a value of 3.26E-030 kg P eq (equivalent to 9.99E-03kg P043- eq) was obtained. Module A1 encompasses the main sources of impact (50.32%), namely: electricity (15.50%), methane and diesel fuel (1.10%), fuels and oils (31.13%) and vitrifiable materials (2.60%). Module A2 has a more limited contribution of 0.52%, while module A3 contributes a total of 49.32%. In particular, line processing accounts for 6.16%, packaging for 0.90%, while waste management and other plant consumption contribute a total of 42.26%. Overall, modules C1-C4 contribute -0.16%.

A value of 7.80E-03 kg N eq. was obtained for the impact category **Eutrophication aquatic marine**. Module A1 encompasses the main sources of impact (60.86%), namely: electricity (16.99%), methane and diesel fuel (10.06%), fuels and oils (29.47%) and vitrifiable materials (4.33%). Module A2 has a more limited contribution of 4.60%, while module A3 overall contributes 32.45%. In particular, line processing accounts for 27.91%, packaging for 1.68%, while waste management and other plant consumption contribute a total of 2.86%. Overall, modules C1-C4 contribute 2.09%.





A value of 1.13E-01 mol N eq. was obtained for the impact category **Eutrophication terrestrial**. Module A1 encompasses the main sources of impact (42.99%), namely: electricity (12.97%), methane and diesel (7.55%), fuels and oils (19.13%) and vitrifiable materials (3.34%). Module A2 has a more limited contribution of 3.48%, while module A3 contributes a total of 52.20%. In particular, line processing accounts for 48.78%, packaging for 1.20%, while waste management and other plant consumption contribute a total of 2.22%. Overall, modules C1-C4 reduce the impact by 1.33%.

For the impact category **Photochemical ozone formation** a value of 2.68E-02 kg NMVOC eg. was obtained. Module A1

encompasses the main sources of impact (64.62%), namely: electricity (14.88%), methane and diesel (14.03%), fuels and oils (30.71%) and vitrifiable materials (5.00%). Module A2 has a more limited contribution of 4.50%, while module A3 contributes a total of 29.39%. In particular, line processing accounts for 24.14%, packaging for 2.32%, while waste management and other plant consumption contribute a total of 2.94%. Overall, modules C1-C4 contribute 1.48%.

For the impact category **Depletion of abiotic resources minerals and metals**, a value of 4.76E-05 kg Sb eq. was obtained. Module A1 encompasses the main sources of impact (88.76%), namely: electricity (5.03%), methane and diesel (1.19%), fuels and oils (68.66%) and vitrifiable materials (13.89%). Module A2 has a more limited contribution of 1.54%, while module A3 overall contributes 9.47%. In particular, line processing accounts for 10.82%, packaging for 0.62%, while waste management and other plant consumption contribute a total of -1.97%. Overall, modules C1-C4 contribute 0.24%. For the impact category **Depletion of abiotic resources fossil fuels**, a value of 1.68E+02 MJ was obtained. Module A1 encompasses the main sources of impact (84.72%), namely: electricity (17.62%), methane and diesel (43.79%), fuels and oils (21.63%) and vitrifiable materials (1.69%). Module A2 has a more limited contribution of 2.39%, while module A3 overall contributes 12.59%. In particular, line processing accounts for 7.05%, packaging for 2.45%, while waste management and other plant consumption contribute a total of 3.09%. Overall, modules C1-C4 contribute 0.30%.

A value of 1.35E-01 m^3 deprivation was obtained for the impact category **Water use**. Module A1 encompasses the main sources of impact (18.87%), in particular: electricity (1.99%), methane and diesel (0.17%), fuels and oils (15.64%) and vitrifiable materials (1.07%). Module A2 has a more limited contribution of 0.09%, while module A3 overall contributes 81.15%. In particular, line processing accounts for 79.81%, packaging for 0.72%, while waste management and other plant consumption contribute a total of 0.62%. Overall, modules C1-C4 contribute -0.10%.

Gli indicatori Potential incidence of disease due to PM emissions (PM), Potential Human exposure efficiency relative to U235 (IRP), Potential Comparative Toxic Unit for ecosystems (ETP-fw), Potential Comparative Toxic Unit for humans (HTP-c), Potential Comparative Toxic Unit for humans (HTP-nc) e Potential soil quality index (SQP) non vengono dichiarati (ND) nel presente documento.





Use of resources

INDICATOR	UNIT	A1	A2	A3	C1	C2	C3	C4	D	TOTAL
Use of renewable primary energy excluding resources used as raw materials	[MJ]	2,30E+0	[3,71E-2]	[1,90E+0]	0,00E+0	6,56E-3	[-8,40E-3]	7,62E-3	[-1,26E+0]	[4,24E+0]
Use of renewable primary energy resources used as raw materials	[MJ]	2,02E+0	[1,28E-2]	[1 ,96E+0]	0,00E+0	2,45E-3	[-1,71E-1]	6,41E-3	[-1,79E+0]	3,83E+0
Total use of renewable primary energy	[MJ]	4,32E+0	4,98E-2	3,85E+0	0,00E+0	9,01E-3	[-1,79E-1]	[1,40E-2]	-3,05E+0	8,07E+0
Use of non-renewable primary energy excluding resources used as raw materials	[MJ]	[1,42E+2]	[4,00E+0]	[1,72E+1]	0,00E+0	[6,69E-1]	[-8,82E-1]	[7,14E-1]	[-5,24E+1]	[1,64E+2]
Use of non-renewable primary energy resources used as raw materials	[MJ]	[0,00E+0]	[0,00E+0]	[3,90E+0]	[0,00E+0]	[0,00E+0]	[0,00E+0]	[0,00E+0]	[0,00E+0]	[3,90E+0]
$[{ m Total}\ { m use}\ { m of}\ { m non-renewable}\ { m primary}\ { m energy}\]$	[MJ]	1,42E+2	[4,00E+0]	2,11E+1	0,00E+0	6,69E-1	[-8,82E-1]	[7,14E-1]	[-5,24E+1]	[1,68E+2]
Secondary material	[kg]	0,00E+0	0,00E+0	2,64E-2	[0,00E+0]	[0,00E+0]	0,00E+0	0,00E+0	0,00E+0	2,64E-2
Renewable secondary fuels	[MJ]	0,00E+0	0,00E+0	0,00E+0	0,00E+0	0,00E+0	0,00E+0	0,00E+0	0,00E+0	0,00E+0
Non-renewable secondary fuels	[MJ]	0,00E+0]	0,00E+0	0,00E+0	[0,00E+0]	0,00E+0	0,00E+0	0,00E+0	0,00E+0	0,00E+0
Net use of fresh water	[m ³]	6,88E-2	4,07E-4	2,59E-1	[0,00E+0]	[6,71E-5]	[-3,17E-4]	8,51E-4	[-4,06E-2]	[3,29E-1]

Waste produced and outflows Waste produced

INDICATOR	UNIT	A1	A2	A3	CI	C2	C3	C4	0	TOTAL
Hazardous waste disposed	kg]	1,77E-4	[1,00E-5]	[1,12E-2]	0,00E+0]	[1,74E-6]	[-3,53E-7]	7,88E-7	[-5,92E-5]	[1,14E-2]
Non-hazardous waste disposed	kg]	[1,16E+0]	2,60E-1	2,39E+0 [0,00E+0	[3,21E-2]	2,45E-3	[5,14E+0]	4,26E+0	8,99E+0
Radioactive waste disposed	kg 🛛	2,27E-4	2,74E-5	4,74E-5	0,00E+0	4,58E-6	-1,46E-6	4,86E-6	-7,19E-5	3,10E-4

Outflows

INDICATOR	UNIT	A1 /	A2	A3	C1	C2	C3	C4	D	TOTAL
Components for reuse	kg]	0,00E+0	0,00E+0	[0,00E+0]	0,00E+0]	[0,00E+0]	0,00E+0	0,00E+0	[0,00E+0]	[0,00E+0]
Material for recycling	[kg]	0,00E+0	0,00E+0	1,25E-1	0,00E+0]	3,64E-2	0,00E+0	0,00E+0	0,00E+0]	1,62E-1
Materials for energy recovery	[kg]	0,00E+0	0,00E+0	1,57E-3	0,00E+0	3,03E-2	[0,00E+0]	0,00E+0	0,00E+0]	[3,19E-2]
Exported energy	[MJ]	[0,00E+0]	0,00E+0	[7,63E-3]	0,00E+0	[1,80E-1]	[0,00E+0]	0,00E+0	[0,00E+0]	[1,88E-1]

GWP-GHG indicator

INDICATOR	UNIT	A1 /	A2	A3	C1	C2	C3	C4	D	TOTAL
GWP-GHG	kg CO ₂ eq	8,99E+0	1,48E+0	4,53E-1	4,39E-2	1,26E-2	2,95E-2	-2,34E+0	0,00E+0	8,67E+0





Information on the content of biogenic carbon

The products contain no biogenic carbon, while the content in the packaging is shown in the table below.

Product	Value	Unit
Superpan A⁺ V-V 50 mm	1,97E-02	kgC/UF
Superpan A⁺ V-V 100 mm	3,04E-02	kgC/UF

Additional informations

The results of grey energy, understood as the energy consumption for the production of raw materials and their transport, as well as for the distribution and disposal processes of the finished product, are shown in the table below.

Product	Value	Unit
Superpan A⁺ V-V 50 mm	1,18E+02	MJ
Superpan A⁺ V-V 100 mm	4,54E+01	MJ





Type and source of data

In selecting the data to be used for the LCA study, preference was given to primary data collected at Eurofibre through a measurement campaign carried out between January 2022 and May 2022 at the Marcon (Ve) plant. The primary data cover the period January 2020 - December 2020 and concern:

- the transport of incoming materials for production, as well as auxiliary materials such as oxygen (distance travelled, type of fuel, Euro class of vehicles, load capacity, loading percentage of vehicles);
- waste produced (quantity and type) and raw materials used (quantity and type); The processo f production of the insultating material at Eurofibre (Mass balance and Electric Energy consumption);
- internal transport and operating machinery used at Eurofibre;
- the transport of the waste produced to the destination plant (distance travelled, type of fuel, Euro class of vehicles, load capacity, loading percentage of vehicles);
- consumption of heating oil and natural gas;
- consumption for lighting and compressed air.

In cases where no primary data or models were available for the calculation of such data, secondary data obtained through consultation of internationally recognised databases were used, favouring the use of the most up-todate ones where possible. The secondary data in particular concern:

- vehicle combustion processes: emissions, maintenance, road use, fuel consumption (data sets Ecoinvent version 3.7);
- operating machines: emissions (data sets Ecoinvent 3.7);
- electricity: distribution network, sulphur hexafluoride emissions, losses (data sets Ecoinvent 3.7);
- the outputs of the materials used (data sets Ecoinvent 3.7).

Proxy data are less than 10% as required by the programme rules.

References

- General Programme Instructions of the International EPD® System. Version 4.0
- Construction Products and construction services 2019:14 version 1.1 valid until 2024-12-20
- c-PCR 005 thermal insulation products (EN 16783:2017)
- European Residual Mixes. Results of the calculation of Residual Mixes for the calendar year 2020. AIB, 2021

Standard

- CEN, 2019, EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction works, European Committee for Standardization (CEN), Brussels
- CEN, 2016, PD CEN7TR 16970:2016 Sustainability of construction works – Guidance for the implementation of EN 15804. European Committee for Standardization (CEN), Brussels
- CEN, 2017, EN 16783:2017 Thermal insulation products Product Category Rules (PCR) for factory made and insitu formed products for preparing environmental product declarations, European Committee for Standardization (CEN), Brussels
- ISO 2020a, ISO 14040:2006/Amd 1:2020 Environmental management – Life cycle assessment – Principles and framework – Amendment 1, International Organization for Standardisation (ISO), Ginevra
- ISO 2020b, ISO 14044:2006/Amd 2:2020 Environmental management - Life cycle assessment - Requirements and guidelines - Amendment 2, International Organization for Standardisation (ISO), Ginevra





Internal documents

- Eurofibre, 2021. Catalogo prodotti Edilizia (documento interno)
- Eurofibre, 2020. Gestione della qualità dei dati dell'Inventario di LCA ai fini della realizzazione e dell'aggiornamento delle EPD (procedura interna P08-11)
- Eurofibre, 2020 Studio di Life Cycle Assessment di due isolanti termici per l'edilizia. Rapporto di Terza Parte rev. 01 24/07/2022







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