ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	Getzner Werkstoffe GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-GET-20230472-IBA1-EN
Issue date	09.01.2025
Valid to	08.01.2030

Sylodyn®, elastomer made of closed-cell PU

Getzner Werkstoffe GmbH

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1. General Information

Getzner Werkstoffe GmbH

Programme holder

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

Declaration number

EPD-GET-20230472-IBA1-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

09.01.2025

Valid to

08.01.2030

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

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

Sylodyn®, elastomer made of closed-cell PU

Owner of the declaration

Getzner Werkstoffe GmbH
Herrenau 5
6706 Bürs
Austria

Declared product / declared unit

1 m² of installed Sylodyn® polyurethane (PU) elastic foam mat, Type "NB" with a thickness of 25 mm.
Other types of the Sylodyn® product series and other thicknesses can be converted using the factors in section 2.1. Other geometries than mats can be converted according to their volume.

Scope:

This Environmental Product Declaration applies to products made from Sylodyn® PU elastic foam manufactured by Getzner Werkstoffe GmbH. These products are mainly used to protect against vibrations and structure-borne noise in the building sector, as a protection layer in railway superstructure and as an elastomer for industrial applications.
The material Sylodyn® is a closed-cell elastomer made of foamed PU, which is produced either as a mat in continuous casting or as a moulded part and can then be further processed by cutting, milling or skiving.
The data within this declaration is based on average values of produced PU elastomers in 2021 by Getzner Werkstoffe GmbH in the production plant in Bürs, Austria, whereby the average of the actual raw material ratios of the Sylodyn® material was taken into account.

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

Dr. Jan Werner,
(Independent verifier)

2. Product

2.1 Product description/Product definition

Sylodyn® PU elastic foam is a closed-cell and factory-made material for the main purpose of vibration isolation, impact noise reduction and as a protection layer.
PUs are plastics that result from a reaction of polyols with isocyanates. Suitable additives create a cell structure with pronounced elastic properties (*Elastomer*).

The appearance of Sylodyn® PU elastic foam can vary in shape, colour and density, whereby this EPD refers to 1 m² of the type Sylodyn® NB in a flat design and 25 mm constant thickness. Other types and thicknesses can be converted using the factors in the table below. Other geometries can be converted according to their volume.

Material	Type	12.5 mm	25 mm
Sylodyn	NB	0.50	1.00*
	NC	0.64	1.29
	ND	0.89	1.77
	NE	1.09	2.17
	NF	1.21	2.41
	HRB HS 3000	1.24	2.49
	HRB HS 6000	1.37	2.74
	HRB HS 12000	1.48	2.96

*Conversion table from reference *) Sylodyn® NB, 25 mm to 12.5 mm thickness and other types*

For the use and application of the product the respective national provisions at the place of use apply, in Germany for example the building codes of the federal states and the corresponding national specifications.

2.2 Application

Products out of Sylodyn® PU elastic foam are used to protect against vibrations and structure-borne noise at buildings, machines and other sensitive objects. Further applications are sound insulation layers between walls, ceilings or other building components and impact noise protection in floors and for stairs even for fitness applications.

In the railway sector, Sylodyn® is used for the protection of noise and vibrations and as an isolation and protection layer in the railway superstructure for components such as rail pads, baseplate pads, sleeper pads, under ballast mats or mass-spring systems.

For industrial applications, Sylodyn® is used to reduce vibrations and noise in all types of machines, systems or devices that cause vibrations and in a wide variety of uses where the elasticity of the material is needed or beneficial.

2.3 Technical Data

The elastic properties are defined by the following parameters:

- Bearing design
- Chosen material type
- Defined thickness and number of layers
- Determined shape factor

Insulation performance can be customized according to the requirements.

Material properties

Values represent the range of available material types at shape factor q = 3. Further details to be found in the according material datasheet.

Name	Value	Unit
Thermal conductivity acc. to EN 12667	0.07 - 0.19	W/(mK)
Static modulus of elasticity	0.75 - 181.00	N/mm²
Dynamic modulus of elasticity acc. to DIN 53513	0.85 - 323.00	N/mm²
Static shear modulus acc. to ISO 1827	0.12 - 4.00	N/mm²
Dynamic shear modulus acc. to ISO 1827	0.17 - 5.30	N/mm²
Min. tensile stress at rupture acc. to ISO 527-3 and ISO 527-5	1.00 - 16.00	N/mm²
Min. tensile elongation at rupture acc. to ISO 527-3 and ISO 527-5	300 - 400	%

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision (no CE-marking).

2.4 Delivery status

Delivered as a mat the product comes in rolls or sheets with the following standard dimensions:

Thickness of single layer: 12.5 mm or 25 mm
Rolls: 1.5 m wide, 5 m long
Sheets: 1.2 m wide, 1.5 m long

Other formats will only be produced infrequently and on request.

The rolls are usually transported in an upright position whereas the sheets are usually stapled horizontally on pallets. The number of products per pallet varies depending on the thickness and product dimensions.

2.5 Base materials/Ancillary materials

Sylodyn® PU elastic foam is formed by the chemical reaction of polyol (approx. 64 %) with MDI (Methylene diphenyl diisocyanate, approx. 32 %), adding BDO (butanediol, approx. 4 %) as a chain extender. Water, colourants and catalysts (each < 0.5 %) are added as ancillary materials.

The raw materials used for the production of Sylodyn® PU elastic foam are mainly obtained from crude oil or natural gas, undergoing several production stages. Alternatively, polyols can be produced, in part, from renewable, plant-based raw materials or recycled materials. This is not part of the current LCA.

No substances from the 'Candidate List of Substances of Very High Concern for Authorisation' (*SVHC*) are added to the formulation on purpose, therefore no such substances are being declared.

Under the current Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals (*REACH*) Sylodyn® PU elastic foam is declared as follows:

- Sylodyn® PU elastic foam contains substances listed in the Candidate List for authorization on 17 June 2023 exceeding 0.1 percentage by mass: **no**
- Sylodyn® PU elastic foam contains 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**

2.6 Manufacture

Sylodyn® PU elastic foam is usually produced in a continuous casting process on a belt line. Afterwards, the products are cutted into the desired dimensions. Alternatively, moulds can be used for the casting process with dimensions which are usually matching the finished product.

During manufacturing, *Component A* consisting of polyol with ancillary materials is mixed together with *Component B* consisting of isocyanate (*MDI*) in a mixing head. From there the polyurethane reaction pours onto the transport belt or into the mould, where it foams up in a chemical reaction to the finished product.

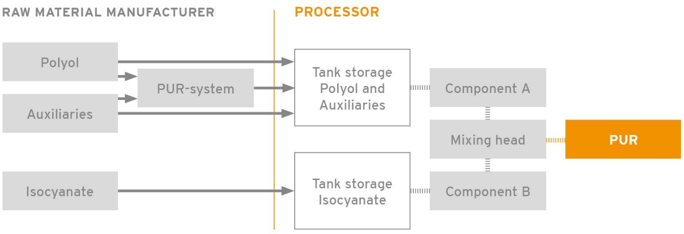


Figure: Manufacturing process from raw materials to the final PU elastic foam

Quality assurance

The declared products are subject to the quality management system according to *ISO 9001* with quality controls on a regular basis. Internal quality assurance is carried out as well as external third-party tests and notified body surveillance on a regular basis.

2.7 Environment and health during manufacturing

Health protection measures that go beyond the legally prescribed safety measures for work protection are not required during the entire manufacturing process. Special environmental protection measures apart from the legal provisions are not required.
Measures for a climate-friendly energy supply during production of Sylodyn® PU elastic foam are:

- The total amount of electrical energy required by the company is generated by the company group's hydroelectric and photovoltaic power plants and fed into the public network. The electricity for production comes from the public network and complies with green electricity principles.
- All water used during the manufacturing process is covered by an on-site groundwater supply.
- Groundwater heat pumps and heat recovery system from the process waste heat is used for heating and cooling.

2.8 Product processing/Installation

Sylodyn® PU elastic foam can be cut, sawed, milled, and abraded with conventional construction tools and portable machines. Elements can be fixed to adjacent components mechanically or by gluing. Alternatively, mats of Sylodyn® PU elastic foam can be laid loosely, e.g. on floors.

Joints of Sylodyn® PU elastic foam are to be glued with polyurethane glue or to be sealed with polyethylene-based tape. Layers of Sylodyn® PU elastic foam can be glued with polyurethane glue if needed.

Elements can be brought to the place of installation with an appropriate transport device or by hand. The chosen dimensions must correspond to the selected transport method. Cutting leftovers can be thermally utilised in waste incineration plants.

2.9 Packaging

Sheets are usually transported on reusable wooden pallets. Recyclable cardboard is used as edge protection and top cover. Rolls are usually transported loose without pallets. Recyclable plastic foil is used to protect against weather.

2.10 Condition of use

Under normal conditions of use, the material does not undergo any substantial changes over its lifetime. Polyurethane has highly mechanical resistance properties and is fully resistant to water and many chemicals used in construction and industry. The material is maintenance-free and the properties are retained with no significant loss of performance.

2.11 Environment and health during use

When used as intended, there are no known associated effects on the environment or health.
Measurements of emissions using testing chambers in accordance with the relevant testing standards (*EN 16516*) showed that the requirements of the French VOC regulations from 2011-04 (*Class A⁺*) are met.
The product is free of carcinogenic, mutagenic and reprotoxic substances (*CMR substances*).

2.12 Reference service life

The service life of Sylodyn® PU elastic foam can realistically be specified as 50 years or more when used properly. The products service life therefore corresponds to the service life of adjoining construction components according to "Service lives of components for life cycle assessment according to BNB" (www.nachhaltigesbauen.de/baustoff-und-gebaeudedaten/nutzungsdauern-von-bauteilen.html) published by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (*BBSR*). For railway applications, the service life is also measured and verified by external laboratories such as the Technical University of Munich. Products showed no significant change of the product properties during service life.

2.13 Extraordinary effects

Fire

The fire performance of Sylodyn® PU elastic foam products is classified as Class E according to *EN 13501-1*.

Class E without additional classification regarding flaming droplets is reached, if there is no ignition of the filter paper. For Class E construction products, no additional classification is provided for smoke development.

In case of fire, Sylodyn® PU elastic foam does not tend to smoulder. When exposed to temperatures higher than 280°C, the material carbonizes without dripping off burning droplets. When burning, sooty products, water vapour, carbon monoxide, carbon dioxide, nitrogen oxides, as well as hydrogen cyanide are formed. The composition of the smoke gas is the same as other nitrogen-containing organic substances.

The toxicity of the combustion gases mainly depends on the amount of burned material in relation to the size of the room in which the gases are distributed. It also depends on the ventilation conditions in the affected area. Corrosive fire effluents do not arise.

Fire protection

Name	Value
Building material class	E
Burning droplets	none
Smoke gas development	-

according to EN 13501-1

Water
Due to the predominant closed-cell structure, products made of Sylodyn® PU elastic foam absorb water only in minimal quantities. When exposed to water (e.g. flood), no soluble substances are emitted (high resistance to hydrolysis). The dynamic properties are fully retained over the entire service life, even with pressurized water (e.g. groundwater).

Mechanical destruction
Products out of Sylodyn® PU elastic foam are extremely resistant to mechanical destruction of any kind. For this reason, they are also perfectly suitable for use under frequently recurring high dynamic loads, such as e.g. in the track bed of heavy-haul railway lines.

2.14 Re-use phase

Products out of Sylodyn® PU elastic foam which are mechanically attached or loosely laid can be easily dismantled. When glued to adjacent components, mechanical separation is required. Undamaged, clean and sorted products can be directly re-used. Otherwise, the products can be transferred to the recycling process. The used standard method is thermal recyling:

- In **thermal recycling**, the waste is used as a substitute fuel in the cement industry. The energy content of the product can be recovered.

Further recycling options are mechanical and chemical recycling:

- In **mechanical recycling**, the used material is processed into granulated products. Cutting and mounting leftovers as well as production waste are mechanically shredded and subsequently pressed into granulated products while adding binding agents.
- In **chemical recycling**, the used material is transformed in a chemical process into a recyclate (mixture of PU-fragments diluted in polyol), which can then be returned to the production cycle.

2.15 Disposal

If not being re-used, production waste and products out of Sylodyn® PU elastic foam which have reached the end of life are usually used as a substitute fuel in the cement industry. During thermal recycling, the energy content of the products can be recovered. Landfilling is not intended. Local governmental legislation must be considered.
The waste disposal code according to the *European Waste Catalogue* (*EWC*) for plastic and rubber is 191204.

2.16 Further information

Please visit www.getzner.com for further information and download materials.

3. LCA: Calculation rules

3.1 Declared Unit

The specified product is SylodynNB 25® from Getzner Werkstoffe GmbH. The specified unit refers to 1 m² of elastic foam and, as it is the best-selling product in the portfolio, Sylodyn NB 25 was selected as the representative product The packaging is also included in the calculation as the product is sold with packaging from Getzner Werkstoffe GmbH. The specified unit is given in [m²] to facilitate communication and conversion to other products in the portfolio with conversion factors.

Declared unit

Name	Value	Unit
Declared unit	1	m^2
Gross density	350	kg/m^3
Grammage	8.75	kg/m^2
Layer thickness	0.025	m
Conversion factor to 1 kg	0,1143	m^2

The composition, application and production method are identical within the portfolio. The conversion to other products is carried out according to their mass on 1m².

Other declared units are allowed if the conversion is shown transparently.

3.2 System boundary

Type of EPD: Cradle to factory gate with options. The following information modules are defined as system boundaries in this study:

Production stage (A1-A3):
- A1, raw material extraction,
- A2, transport to the manufacturer,
- A3, production.

End of life (C1-C4):
- C1, deconstruction/demolition,
- C2, transport,
- C3, waste treatment,
- C4, disposal.

Reuse, recovery and recycling potential (D).

In order to accurately capture the indicators and environmental impacts of the declared unit, a total of eight information modules are considered. The information modules A1 to A3 describe the material provision, the transport to the production site, as well as the production processes of the product itself.

The primary raw materials are sourced from the European Union and Asia. They are transported by truck, rail and ship. The following flow charts illustrate the underlying production process.

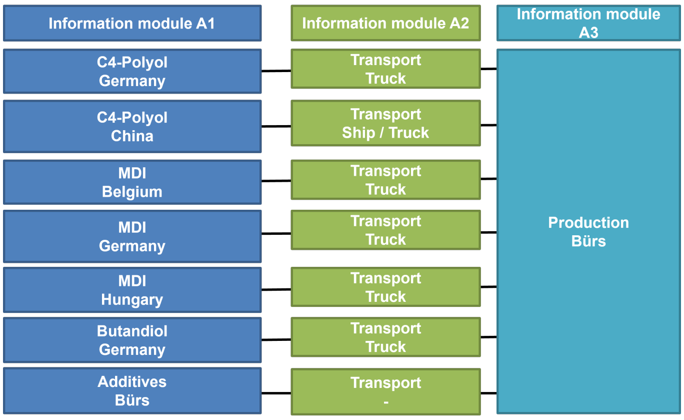


Figure: Information modules A1 to A3 of the product

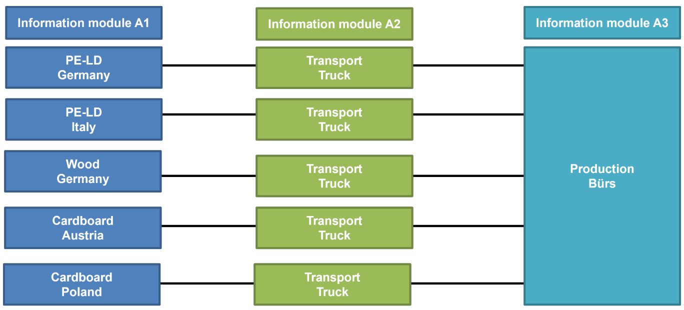


Figure: Information modules A1 to A3 of the packaging

In the information modules C1 to C4, the deconstruction or demolition from the building, the transport to waste disposal, the waste treatment and disposal of the product are recorded. Furthermore, reuse, recovery and recycling potentials are reported in information module D.

3.3 Estimates and assumptions

As there is no AT dataset Green electrecity in the database, the dataset RER: Green electricity grid mix (average power plants) (production mix) Sphera was used.The data set RoW: market for titanium dioxide ecoinvent 3.9.1 is assumed for the additives consisting of catalysts, colorants and water, as the mass fraction is approx. 1% of the declared product, the exact breakdown of the additives is not taken into account. Furthermore, the data set GLO: Excavator, 100 kW, construction Sphera was assumed for the hydraulic excavator. Standard extrusion processes were assumed for the production of the packaging.

3.4 Cut-off criteria

All relevant flows, energy and mass inputs were taken into account.

3.5 Background data

The background data referred to in this study comes from Sphera's LCA (V:10.7.1.28) for Experts database.

3.6 Data quality

Specific data is collected for the Bürs plant in Austria of Getzner Werkstoffe GmbH from 2021. The background data from the LCA for Experts database is from 2023.
The data quality is classified as sufficient.

3.7 Period under review

The input and output flows used in this calculation result from the annual average consumption of the year 2021.

3.8 Geographic Representativeness

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

3.9 Allocation

The elastic foam Sylodyn® is produced in Bürs, Austria. The data for the input and output flows are from 2021, which corresponds to the annual average. The input and output flows used in this calculation were scaled from the annual average to the declared unit.

3.10 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 database referred to in this study is *Sphera MLC*.

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

The biogenic carbon values are not shown in the results because A5 is not declared. The biogenic carbon is disposed of in A3 and is therefore taken into account in a CO² neutral manner.
Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in accompanying packaging	0.2288	kg C
Biogenic carbon content in product	-	kg C

As module A5 is not declared, the disposal of the packaging is not included in the LCA.
The packaging is made up as follows:
PE-LD / flat film 0.0075 kg
PE-LD / wrapping film 0.0075 kg
Wood / pallet 0.4776 kg
Cardboard / corrugated cardboard 0.0614 kg
Cardboard / edge protection 0.0238 kg

End of life (C1-C4)

In information module C1, the demolition of the elastic foam from the building is calculated. The demolition is carried out by means of a hydraulic excavator. The energy consumption is assumed to be 0,0015 kg diesel for the declared unit.

Name	Value	Unit
Collected as mixed construction waste	8.75	kg
Energy recovery	8.75	kg

Thermal and electrical energy is generated through energy recovery in a waste incineration plant. The resulting potential is taken into account in Module C3 through the substitution of thermal and electrical energy. As no landfilling is carried out in this calculation, module C4 is declared as 0.

5. LCA: Results

LCA RESULTS - additional impact categories according to EN 15804+A2-optional are not declared as experience with the indicators is limited.
The PERM value of 10.49568 MJ comes from module A1 of the packaging of wood and paper. As A5 is not declared, PERM is not balanced across all the modules.

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	MND	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 Sylodyn® NB 25 mm

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Global Warming Potential total (GWP-total)	kg CO_2 eq	3.66E+01	5.67E-03	1.64E-01	1.87E+01	0	-6.76E+00
Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq	3.64E+01	5.58E-03	1.61E-01	1.87E+01	0	-6.73E+00
Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq	1.06E-01	0	0	6.19E-04	0	-2.95E-02
Global Warming Potential luluc (GWP-luluc)	kg CO_2 eq	1.91E-02	9.12E-05	2.66E-03	3.75E-04	0	-6.16E-04
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC11 eq	2.95E-08	5.47E-16	1.59E-14	1.72E-12	0	-6.1E-11
Acidification potential of land and water (AP)	mol H^+ eq	6.32E-02	2.7E-05	6.19E-04	1.12E-02	0	-7.13E-03
Eutrophication potential aquatic freshwater (EP-freshwater)	kg P eq	4.13E-04	2.32E-08	6.75E-07	5.06E-07	0	-1.14E-05
Eutrophication potential aquatic marine (EP-marine)	kg N eq	1.79E-02	1.27E-05	2.91E-04	5.42E-03	0	-2.17E-03
Eutrophication potential terrestrial (EP-terrestrial)	mol N eq	1.91E-01	1.41E-04	3.26E-03	6.24E-02	0	-2.33E-02
Formation potential of tropospheric ozone photochemical oxidants (POCP)	kg NMVOC eq	9.15E-02	3.61E-05	5.75E-04	1.39E-02	0	-6.14E-03
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb eq	1.37E-05	4.62E-10	1.35E-08	4.34E-08	0	-5.92E-07
Abiotic depletion potential for fossil resources (ADPF)	MJ	7.68E+02	7.08E-02	2.07E+00	5.31E+00	0	-1.2E+02
Water use (WDP)	m^3 world eq deprived	1.58E+00	8.08E-05	2.36E-03	1.85E+00	0	-7.48E-01

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m² Sylodyn® NB 25 mm

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier (PERE)	MJ	1.13E+02	5.99E-03	1.75E-01	1.07E+00	0	-4.09E+01
Renewable primary energy resources as material utilization (PERM)	MJ	1.05E+01	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ	1.24E+02	5.99E-03	1.75E-01	1.07E+00	0	-4.09E+01
Non renewable primary energy as energy carrier (PENRE)	MJ	5.45E+02	7.08E-02	2.07E+00	2.21E+02	0	-1.2E+02
Non renewable primary energy as material utilization (PENRM)	MJ	2.24E+02	0	0	-2.16E+02	0	0
Total use of non renewable primary energy resources (PENRT)	MJ	7.68E+02	7.08E-02	2.07E+00	5.31E+00	0	-1.2E+02
Use of secondary material (SM)	kg	5.47E-01	0	0	0	0	0
Use of renewable secondary fuels (RSF)	MJ	0	0	0	0	0	0
Use of non renewable secondary fuels (NRSF)	MJ	0	0	0	0	0	0
Use of net fresh water (FW)	m^3	1.75E-01	6.72E-06	1.96E-04	4.35E-02	0	-3.14E-02

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m² Sylodyn® NB 25 mm

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed (HWD)	kg	2.43E-07	2.29E-12	6.68E-11	2.23E-09	0	-8.26E-08
Non hazardous waste disposed (NHWD)	kg	5.76E-01	1.1E-05	3.21E-04	9.44E-02	0	-6.32E-02
Radioactive waste disposed (RWD)	kg	5.58E-03	9.16E-08	2.67E-06	1.93E-04	0	-9.03E-03
Components for re-use (CRU)	kg	0	0	0	0	0	0
Materials for recycling (MFR)	kg	0	0	0	0	0	0
Materials for energy recovery (MER)	kg	0	0	0	0	0	0
Exported electrical energy (EEE)	MJ	8.08E+00	0	0	3.34E+01	0	0
Exported thermal energy (EET)	MJ	1.44E+01	0	0	5.97E+01	0	0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m² Sylodyn® NB 25 mm

Parameter	Unit	A1-A3	C1	C2	C3	C4	D
Incidence of disease due to PM emissions (PM)	Disease incidence	ND	ND	ND	ND	ND	ND

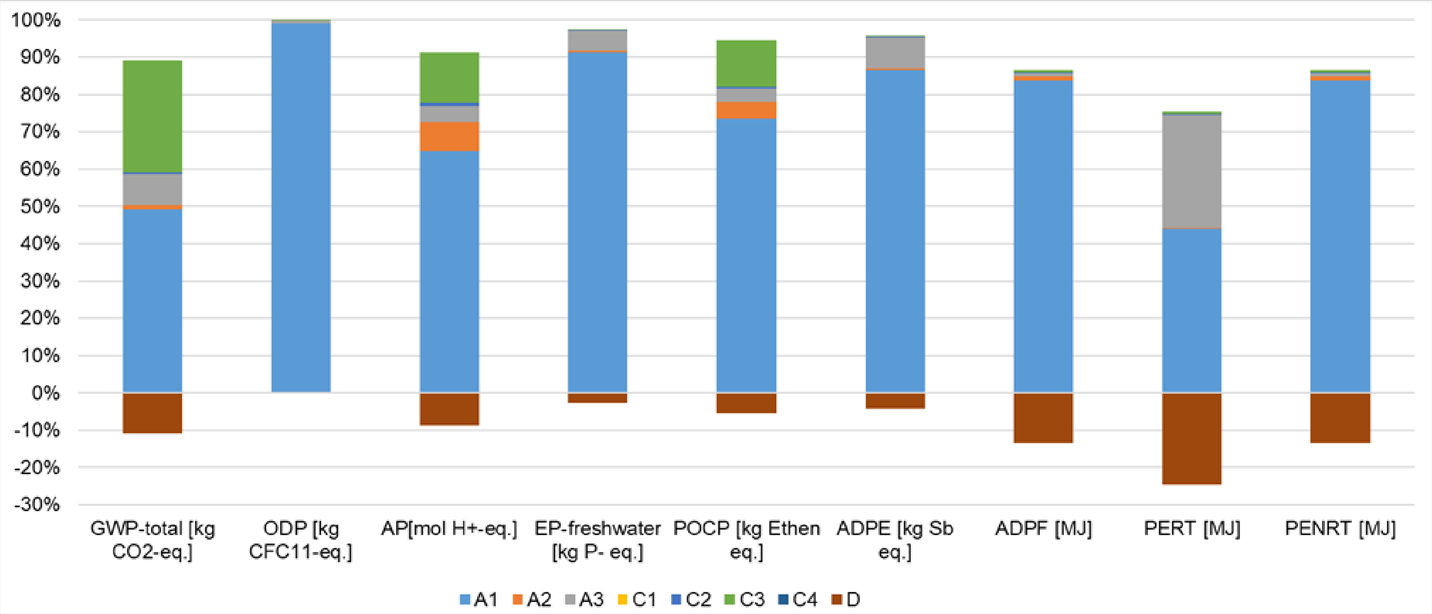
Human exposure efficiency relative to U235 (IR)	kBq U235 eq	ND	ND	ND	ND	ND	ND
Comparative toxic unit for ecosystems (ETP-fw)	CTUe	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (carcinogenic) (HTP-c)	CTUh	ND	ND	ND	ND	ND	ND
Comparative toxic unit for humans (noncarcinogenic) (HTP-nc)	CTUh	ND	ND	ND	ND	ND	ND
Soil quality index (SQP)	SQP	ND	ND	ND	ND	ND	ND

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.

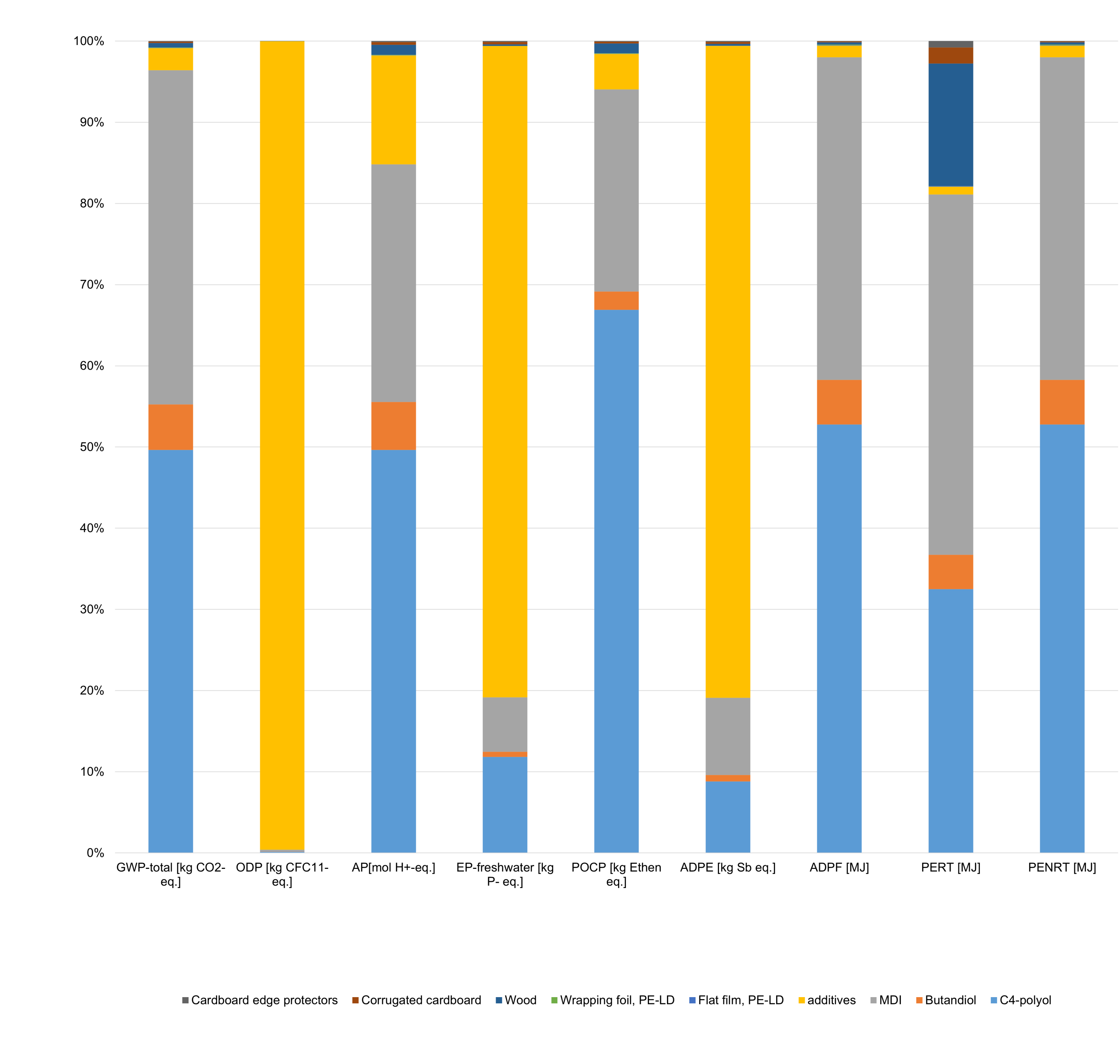
Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit 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.

6. LCA: Interpretation

The dominance analysis shows that the main causes of the environmental impacts and indicators are to be found in information module A1. This shows that for the material provision in the GWP-total approx. 50% and approx. 30% are attributable to the information module C3 through waste treatment and thermal utilization, in relation to all information modules. In the ODP, the proportion of material provision is very clear at approx. 97%. The C3 information module has a share of 15% in the AP and POCP in relation to all information modules.

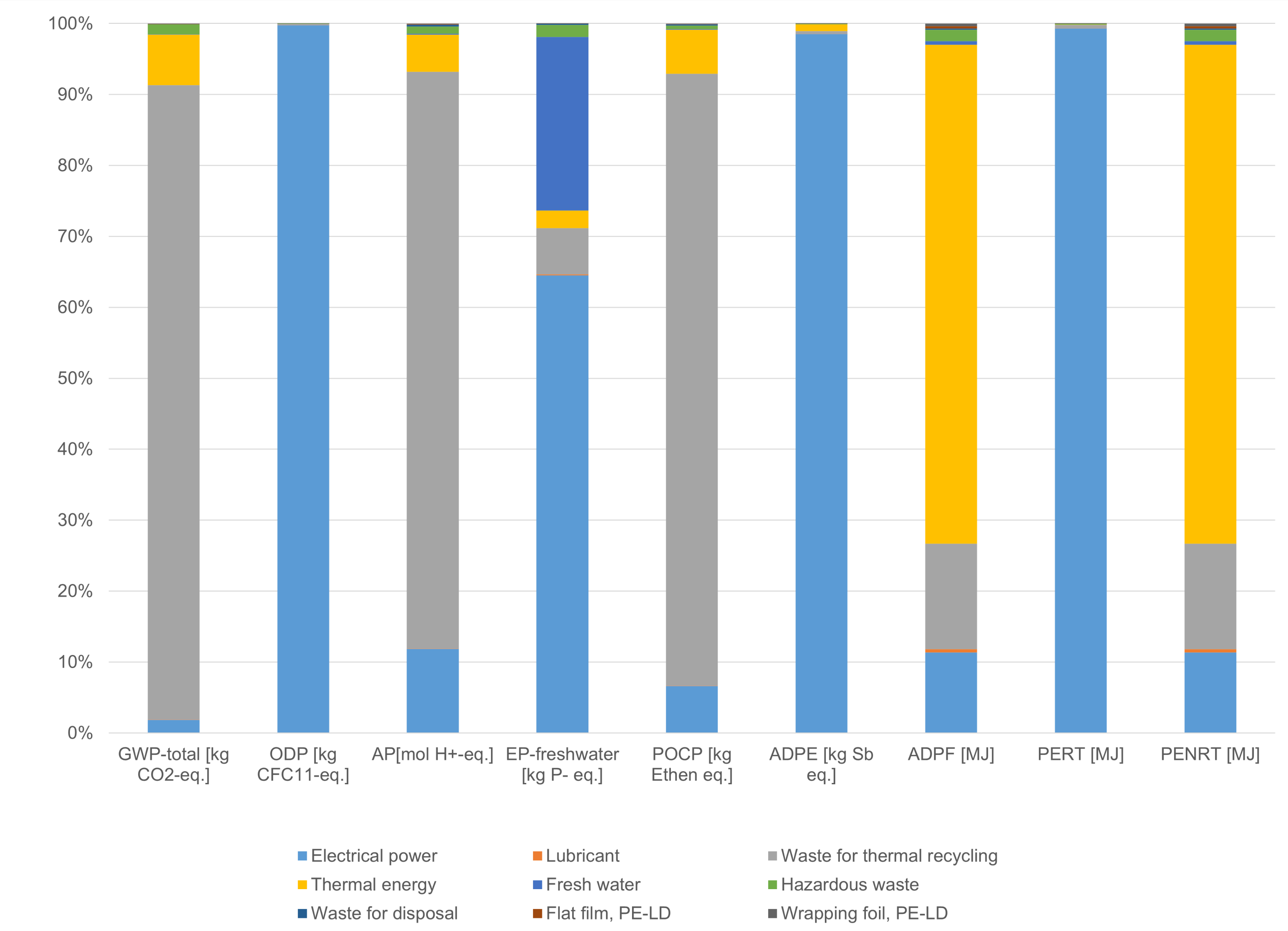


If we look at the material provision in detail, it becomes clear which raw materials make a decisive contribution to the respective environmental impacts and indicators. The C4 polyether polyol accounts for 50% of the total GWP and approx. 67% of the POCP in information module A1. The additives account for approx. 97% of the ODP and approx. 80% of the ADPE in information module A1.



In EP-freshwater, electrical energy accounts for a significant share of 64%.

IIn the information module A3 in production, waste for thermal recovery accounts for approx. 88% of the total GWP share and in the PENRT it is approx. 70% from thermal energy



Thermal utilization in module C3 and the resulting energy credits in module D reduce the GWP by around 10% and the AP by around 9%. Greater savings can be seen in the indicators for the ADPF, PENRT at 12% and PERT at 22%.'

The results can be scaled to other products in the portfolio using the conversion factors.
The impact assessment results in this study only make relative statements

7. Requisite evidence

Sylodyn® PU elastic foam was tested for indoor use regarding potentially harmful emissions.

7.1 VOC emissions
Emission tests using test chamber methods according to *EN 16516* were carried out (SGS Institut Fresenius GmbH, Test report No. 5595889, 2021-12). The results showed that the requirements of the highest class of French VOC regulations from 2011-04 (*Class A+*) are met. No carcinogenic substances have been detected.

VOC overview of results (28 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	< 1000	µg/m3
Sum SVOC (C16 - C22)	not detected	µg/m3
R (dimensionless)	< 1	-
Carcinogenic Substances	not detected	µg/m3

7.2 Formaldehydes
Emission tests using test chamber methods according to *EN 16516* were carried out (*SGS Institut Fresenius GmbH, Test report No. 5595889, 2021-12*). The results showed formaldehyde levels of < 2 µg/m³ after 28 days (*< 10 µg/m³ acc. Class A+ French VOC regulations from 2011-04*).

8. References

DIN 53513
DIN 53513:1990-03, Determination of the viscoelastic properties of elastomers on exposure to forced vibration at non-resonant frequencies.

EN 12667
EN 12667:2001, Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance.

EN 13501
EN 13501-1:2018, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

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

EN 16516
EN 16516:2017+A1:2020, Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air.

ISO 527-3
EN ISO 527-3:2018, Plastics - Determination of tensile properties - Part 3: Test conditions for films and sheets (ISO 527-3:2018)

ISO 527-5
EN ISO 527-5:2021, Plastics - Determination of tensile properties - Part 5: Test conditions for unidirectional fibre-reinforced plastic composites (ISO 527-5:2021).

ISO 1827
ISO 1827:2022-08, Rubber, vulcanized or thermoplastic - Determination of shear modulus and adhesion to rigid plates - Quadruple-shear methods.

ISO 9001
EN ISO 9001:2015, Quality management systems - Requirements (ISO 9001:2015).

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

BBSR
Service life of building components for life cycle analysis according to the assessment system Nachhaltiges Bauen (BNB), Federal Institute for Research on Building, Urban Affairs and Spatial Development, 2017.

EWC
EWC 2014: Commission Decision 2014/955/EU of 18 December 2014 amending Decision2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council, Luxembourg: Official Journal of the European Union, 2014.

French VOC regulation A+ 2011
VOC emissions class labelling (Décret n° 2011-321), Émissions dans l'air intérieur, Class A+, A, B or C, Paris: Ministry of Ecology, Sustainable Development, Transport and Accommodation, 2011.

IBU 2021
Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021
www.ibu-epd.com

Product category rules Part A
Product Category Rules for Building-Related Products and Services - Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report V1.3, Institut Bauen und Umwelt e.V., 08/2022.

Product category rules Part B
Insulating materials made of foam plastics, 01/08/2021

REACH
Regulation (EC) No. 1907/2006 of the European Parliament and of the Council dated 18th December 2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Luxembourg: Official Journal of the European Union, 2006.

Sphera
LCA for Experts: Ganzheitliche Bilanzierung
Leinfelden-Echterdingen; Sphera Solution GmbH (Hrsg.)
Product Sustainability Data Search | Sphera (GaBi)
(04.08.2024)

SVHC
European Chemicals Agency: Candidate List of substances of very high concern for Authorisation (published in accordance with Article 59(10) of the REACH Regulation), Helsinki: European Chemicals Agency, 2023.
echa.europa.eu

Test report No. 5595889
Emissionsuntersuchung mittels Prüfkammerverfahren nach DIN EN 16516 (2018-01) auf VOC und Aldehyde – Prüfung gemäß den Anforderungen AgBB-Schema (2021-06) und Anforderungen der französischen VOC-Verordnung (Beschluss vom 19. April 2011), Dresden: SGS Institut Fresenius GmbH, 2021.

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