

# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A1

Owner of the Declaration	Vitrulan Technical Textiles GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-VIT-20220104-IAC1-EN
Issue date	13.04.2022
Valid to	12.04.2027

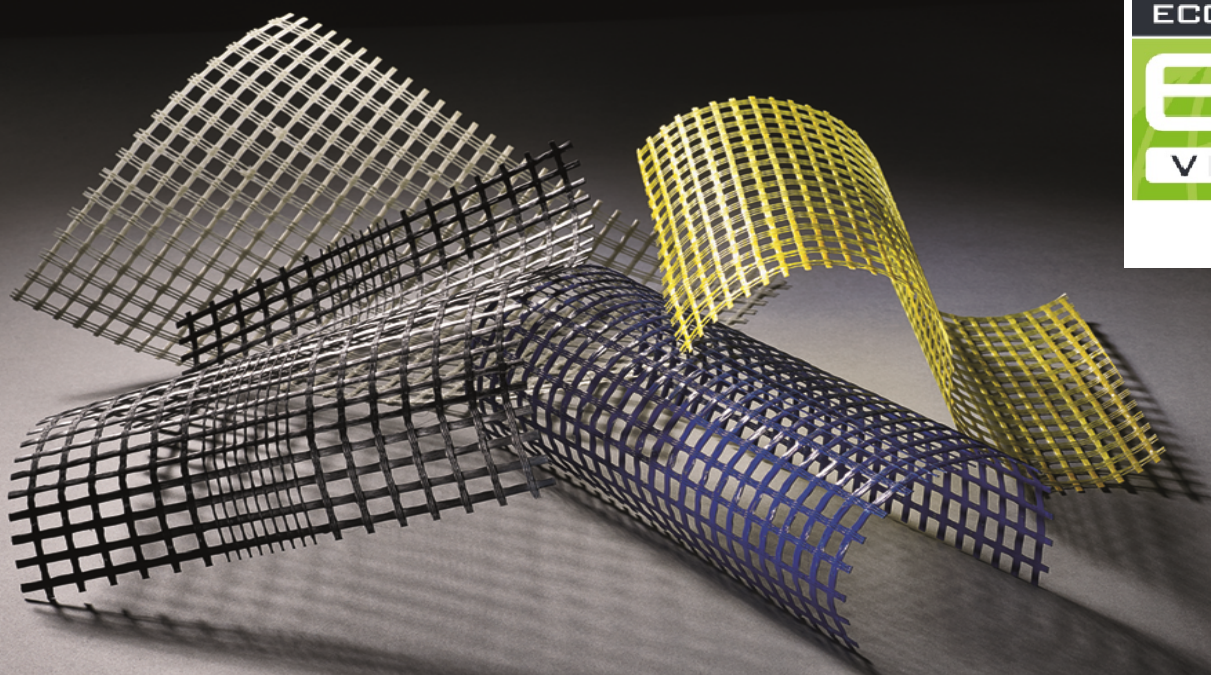
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Vitrulan Technical Textiles GmbH

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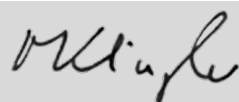
ECO PLATFORM

**EPD**  
VERIFIED





## 1. General Information

Vitrulan Technical Textiles GmbH	Glass Reinforcement Mesh
<b>Programme holder</b> IBU – Institut Bauen und Umwelt e.V. Hegelplatz 1 10117 Berlin Germany	<b>Owner of the declaration</b> Vitrulan Technical Textiles GmbH Haselbach Rögitzstraße 34 96515 Sonneberg Germany
<b>Declaration number</b> EPD-VIT-20220104-IAC1-EN	<b>Declared product / declared unit</b> 1 square metre glass reinforcement mesh with a basis weight of 0.160 kg/m <sup>2</sup> Glass reinforcement mesh is sold in various basis weights. This EPD refers to a representative product.
<b>This declaration is based on the product category rules:</b> Glass Reinforcement Mesh, 11.2017 (PCR checked and approved by the SVR)	<b>Scope:</b> This EPD refers to one square metre glass reinforcement mesh produced by Vitrulan Technical Textiles GmbH, Germany.
<b>Issue date</b> 13.04.2022	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 <i>EN 15804+A1</i> . In the following, the standard will be simplified as <i>EN 15804</i> .
<b>Valid to</b> 12.04.2027	
 Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	<b>Verification</b> The standard <i>EN 15804</i> serves as the core PCR Independent verification of the declaration and data according to <i>ISO 14025:2011</i> <input type="checkbox"/> internally <input checked="" type="checkbox"/> externally
 Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)	 Matthias Klingler (Independent verifier)

## 2. Product

### 2.1 Product description/Product definition

Glass reinforcement mesh involves 2-dimensional mesh structures made of glass fibre threads arranged vertically and horizontally, with a plastic-based non-slip finish.

Depending on the item, the glass reinforcement mesh produced by Vitrulan Technical Textiles GmbH feature basis weights of between 50 and 480 g/m<sup>2</sup>.

(EU) Directive No. 305/2011 (CPR) applies for placing the product on the market in the EU/EFTA (with the exception of Switzerland). The product requires a Declaration of Performance taking consideration of the *ETA -17/1025 Glass mesh* dated 18 September 2019, and CE marking. The respective national regulations apply for usage.

### 2.2 Application

Glass reinforcement mesh is used in:

Exterior areas (external thermal insulation composite systems (ETICS), external plaster mesh, corner profiles, paint reinforcement, geo-textiles)

Interior areas (internal plaster mesh, joint cover strips, paint reinforcement, reinforcement of drywall panels, stabilising ceiling systems, reinforcement of floor coatings and floor heating systems)

### 2.3 Technical Data

The following information refers to typical ETICS glass reinforcement mesh with a basis weight of 160 g/m<sup>2</sup>.



#### Technical construction data

Name	Value	Unit
Basis weight as per EN 12127	160	g/m <sup>2</sup>
Tensile strength as per ISO 13934-1	≥ 2000	N/mm <sup>2</sup>
Elongation on breaking load as per ISO 13934-1	≤ 4	%
Alkali resistance after alkali storage >50% according to test method EAD 040016-00-0404	≥ 50	%

The product's performance values correspond with the Declaration of Performance in terms of its essential properties in accordance with *ETA -17/1025 Glass mesh, dated 18 September 2019*. Voluntary data on the product: database of the Österreichisches Institut für Bautechnik OIB, [www.oib.at](http://www.oib.at) (not a component of CE marking).

#### 2.4 Delivery status

The product's performance values correspond with the Declaration of Performance in terms of its essential properties in accordance with *ETA -17/1025 Glass mesh, dated 18 September 2019*. Voluntary data on the product: database of the Österreichisches Institut für Bautechnik OIB, [www.oib.at](http://www.oib.at) (not a component of CE marking).

#### 2.5 Base materials/Ancillary materials

The glass reinforcement mesh with a finished weight of 0.160 kg/m<sup>2</sup> consists of 0.128 kg/m<sup>2</sup> E or ECR glass (ECR: electric glass corrosion resistant) and 0.032 kg/m<sup>2</sup> plastic coating. This is applied from water-based polymer dispersions based on styrene-butadiene latex, styrene-acrylate or ethylene-vinyl acetate.

Base materials:

Glass (E glass / ECR glass): 80%

Polymers (plastic coating): 20%

1) The product contains substances from the ECHA list of candidates of Substances of Very High Concern (SVHC) (dated 1 March 2022) exceeding 0.1 percentage by mass: **no**

2) The product contains other CMR substances in categories 1A or 1B which are not on the List of Candidates exceeding 0.1% by mass in at least one partial product: **no**

3) 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**

**No** additives such as fire retardants or plasticisers are used.

#### 2.6 Manufacture

The production of glass reinforcement mesh is usually done on a weaving machine. In the process, the threads of the so-called warp beam are fed into the weaving machine in a fixed sequence in the longitudinal direction. In the area of the so-called weft insertion, this group of threads is crossed at right angles with at least one other thread system (cross threads). The surface produced in this way (= raw fabric) is coated with plastic dispersions in a

subsequent processing step on a coating machine, then dried and chemically cross-linked. The manufacturing process is completed by finishing and packaging.

An energy management system in accordance with *ISO 50001* and a quality management system in accordance with *ISO 9001* are applied.

#### 2.7 Environment and health during manufacturing

Glass reinforcement mesh is manufactured in compliance with the ban on the production and use of biopersistent fibres (*Ordinance on Hazardous Substances*, Annex IV, No. 22) and the ban on placing biopersistent fibres on the market (*Ordinance on the Prohibition of Chemicals*, No. 23 of the Annex to § 1). Care is taken to use resources sparingly at all stages of production.

#### 2.8 Product processing/Installation

Glass reinforcement mesh is manually embedded in commercially available plaster, mortar and levelling compounds and thereby completely enclosed by the matrix. The further processing of glass mesh fabrics in various applications is described in brochures, processing instructions and technical leaflets of the plaster manufacturers or ETIC system suppliers.

The work and environmental protection specifications comprehensively described in the "Instructions for Safe Use" must be observed.

However, no specific protective equipment is required.

#### 2.9 Packaging

Glass fibre mesh is usually delivered in collective boxes of 30 rolls each, avoiding packaging materials as much as possible (no single-roll packaging).

Cardboard and foil used for packaging can be collected separately and recycled.

#### 2.10 Condition of use

Glass reinforcement mesh is usually part of a system and completely embedded in a plaster matrix when in use.

#### 2.11 Environment and health during use

There is no direct interaction in terms of environment and health because the mesh is embedded and enclosed by the matrix.

#### 2.12 Reference service life

No reference service life can be declared for glass reinforcement mesh. The reference table of the BNB (Bewertungssystem Nachhaltiges Bauen – Sustainable Building Evaluation System) lists a service life of 40 years for ETICS.

#### 2.13 Extraordinary effects





## Fire

Glass mesh fabrics are not classified as a singular building material in terms of fire technology. They are always tested as a system, whereby the building material class of the sheathing plaster and the insulation materials used are decisive for the classification. No burning/falling droplets.

## Water

There is no interaction with water, for example as a result of leaching.

## Mechanical destruction

There is no interaction with the environment due to unintentional mechanical destruction.

## 2.14 Re-use phase

It is not possible to separate glass reinforcement mesh and adhering plaster components by type. Therefore, glass reinforcement mesh cannot be reused after de-installation.

## 2.15 Disposal

Glass reinforcement mesh waste generated during installation or de-installation falls under waste code 17 09 04 (Mixed construction and demolition waste) of the EWC.

## 2.16 Further information

Further information can be found on the homepage of Vitrolan Technical Textiles GmbH: [www.vitrolan.com](http://www.vitrolan.com)

# 3. LCA: Calculation rules

## 3.1 Declared Unit

This EPD refers to 1 square metre glass reinforcement mesh with a basis weight of 160 g/m<sup>2</sup>. It concerns a representative product.

### Declared unit

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage (Basis weight)	0.16	kg/m <sup>2</sup>
Layer thickness	0,0005	m

## 3.2 System boundary

Type of EPD: cradle to gate. The following life cycle stages of the glass reinforcement mesh are included in the calculation of the LCA:

### Product stage (A1-A3):

- Module A1: A1 Raw material supply and processing and processing of secondary materials serving as input (e.g. recycling processes)
- Module A2: Transport of all preliminary products to the plant in Haselbach
- Module A3: Provision of energy, auxiliary materials and packaging materials, disposal of production waste, emissions

### Construction process stage (A4, A5)

- A4 Transport to the building site: 100 km  
Transport distance can be adjusted at building level if necessary (e.g. for 50 km actual transport distance: multiplication of the LCA values by a factor of 0.5).
- A5 Installation: only the disposal of packaging, further installation costs are not considered.

### Reuse, recovery or recycling potential (D)

Module D comprises recovery potentials from thermal utilisation of packaging in a waste incineration plant by means of energy substitution.

## 3.3 Estimates and assumptions

For coating and pigment paste, the specific composition was modelled.

Small amounts of C glass fibres (C: chemical) produced by Vitrolan were estimated using the data set for ECR glass fibres; this is a good approximation.

## 3.4 Cut-off criteria

All data from the operating data survey was taken into consideration, i.e. all preliminary products used according to the formula, the thermal and electrical energy used as well as auxiliary materials and waste. Accordingly, it can be assumed that material and energy flows with a share of less than 1 per cent were also considered. No flows that contribute significantly to the environmental impact of the product are knowingly neglected.

## 3.5 Background data

Data sets are available in the *GaBi* database for the preliminary products and for the provision of energy and all other requisite background data (e.g. waste processing, transport processes). The database was last updated in 2021.

## 3.6 Data quality

The data quality can be regarded as good. The primary data has been collated carefully; all relevant energy and material flows have been taken into consideration. Both primary and background data refer to data from 2020.

## 3.7 Period under review

The manufacturing data represents an average over 2020.

## 3.8 Allocation

The production process does not produce any by-products. Accordingly, no allocation is integrated in the software model used.

## 3.9 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.

All background data sets are taken from the latest *GaBi* database CUP 2021.2. The database was last updated in 2021.

#### 4. LCA: Scenarios and additional technical information

The scenarios on which the LCA is based are described in more detail below.

##### Transport to construction site (A4)

Name	Value	Unit
Transport distance	100	km

The scenarios on which the LCA is based are described in more detail below.

##### Construction installation process (A5)

##### Reuse, recovery and recycling potential (D), relevant scenario information

Module D includes the potential benefits of the incineration processes from A5 (incineration of the packaging materials). A waste incineration plant with an R1 value > 0.6 was assumed.

Name	Value	Unit
PE foil	0,0003	kg/m <sup>2</sup>
Cardboard	0,0030	kg/m <sup>2</sup>
Paletts	00039	kg/m <sup>2</sup>

##### Reuse, recovery and recycling potential (D), relevant scenario information

Module D includes the potential benefits of the incineration processes from A5 (incineration of the packaging materials). A waste incineration plant with an R1 value > 0.6 was assumed.



## 5. LCA: Results

In the following, the results of the indicators of impact assessment, resource use, waste and other output flows are presented in relation to 1 m<sup>2</sup> of glass reinforcement mesh with a basis weight of 160 g/m<sup>2</sup>. The LCA results of other basis weights can be calculated approximately by scaling the basis weight. This means multiplying all LCA indicators by the quotient of the new basis weight divided by the declared basis weight.

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

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	MND	MND	X

**RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m<sup>2</sup> glass reinforcement mesh (basis weight 160 g/m<sup>2</sup>)**

Parameter	Unit	A1-A3	A4	A5	D
Global warming potential	[kg CO <sub>2</sub> -Eq.]	5.13E-1	9.88E-4	1.80E-2	-6.19E-3
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	3.64E-13	3.42E-19	5.31E-18	-4.19E-17
Acidification potential of land and water	[kg SO <sub>2</sub> -Eq.]	1.70E-3	2.17E-6	2.03E-6	-5.09E-6
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3</sup> -Eq.]	1.48E-4	5.23E-7	4.60E-7	-8.02E-7
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	1.09E-4	-8.18E-7	1.42E-7	-5.92E-7
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	1.25E-7	8.74E-11	5.77E-11	-5.80E-10
Abiotic depletion potential for fossil resources	[MJ]	8.74E+0	1.33E-2	3.92E-3	-9.37E-2

**RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m<sup>2</sup> glass reinforcement mesh (basis weight 160 g/m<sup>2</sup>)**

Parameter	Unit	A1-A3	A4	A5	D
Renewable primary energy as energy carrier	[MJ]	1.11E+0	7.72E-4	1.46E-1	-6.10E-3
Renewable primary energy resources as material utilization	[MJ]	1.45E-1	0.00E+0	-1.45E-1	0.00E+0
Total use of renewable primary energy resources	[MJ]	1.25E+0	7.72E-4	9.69E-4	-6.10E-3
Non-renewable primary energy as energy carrier	[MJ]	8.66E+0	1.33E-2	6.80E-1	-1.18E-1
Non-renewable primary energy as material utilization	[MJ]	6.76E-1	0.00E+0	-6.76E-1	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	9.34E+0	1.33E-2	4.23E-3	-1.18E-1
Use of secondary material	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of net fresh water	[m <sup>3</sup> ]	1.52E-3	6.86E-7	4.30E-5	-1.32E-5

**RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m<sup>2</sup> glass reinforcement mesh (basis weight 160 g/m<sup>2</sup>)**

Parameter	Unit	A1-A3	A4	A5	D
Hazardous waste disposed	[kg]	4.26E-8	5.56E-13	9.42E-13	-1.82E-11
Non-hazardous waste disposed	[kg]	4.61E-2	2.15E-6	1.20E-4	-2.53E-5
Radioactive waste disposed	[kg]	2.27E-4	1.28E-8	1.19E-7	-9.32E-6
Components for re-use	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	2.25E-2	0.00E+0
Exported thermal energy	[MJ]	0.00E+0	0.00E+0	5.27E-2	0.00E+0

Limitation note 1 – applies to the indicator “Potential impact of exposure to people to U235”:

This impact category mainly addresses the potential impact of low-dose ionising radiation on human health in the nuclear fuel cycle. This does not consider impacts attributable to possible nuclear accidents and occupational exposure, nor to the disposal of radioactive waste in underground facilities. Potential ionising radiation from soil, radon and some building materials is also not measured by this indicator.

Limitation note 2 – applies for the indicators: “Potential for Abiotic Resource Depletion – Non-Fossil Resources”, “Potential for Abiotic Resource Depletion – Fossil Fuels”, “Water Depletion Potential (User)”, “Potential Ecosystem Toxicity Comparison Unit”, “Potential Human Toxicity Comparison Unit – Carcinogenic Effect”, “Potential Human Toxicity Comparison Unit – Non-Carcinogenic Effect”, “Potential Soil Quality Index”.

The results of this environmental impact indicator must be used with caution, as the uncertainties in these results are high or there is only limited experience with the indicator.



## 6. LCA: Interpretation

The production of the preliminary products is of the utmost importance for the results of the Life Cycle Assessment. Especially the production of the glass threads shows a significant influence on almost all environmental categories (except ozone depletion potential).

The production of the coating for the glass threads, a plastic dispersion, also has a certain influence on all indicators considered.

Transport to the factory plays a rather minor role with a mostly negligible influence.

In the production of the glass reinforcement mesh at the factory, the energy used plays a moderately important role. Emissions or the provision of packaging or auxiliary materials, on the other hand, are less important.

## 7. Requisite evidence

In accordance with the PCR, no evidence is required for glass reinforcement mesh.

## 8. References

### Standards

#### ISO 9001

DIN EN ISO 9001:2015-11, Quality Management Systems – Requirements

#### EN 12127

DIN EN 12127: 1997-12, Textiles – Textile fabrics – Determination of mass per unit area using small samples

#### EN 13501-1

DIN EN 13501-1: 2015-05+A1:2009, Classification of construction products and methods by fire performance – Part 1: Classification with the results of tests on reaction to fire of construction products

#### ISO 13934-1

DIN EN ISO 13934-1:2013-08, Textiles – Tensile properties of fabrics – Part 1: Determination of maximum force and elongation at maximum force using the strip method

#### ISO 14025

DIN EN ISO 14025:2011-10, Environmental designations and declarations – Type III Environmental Declarations – Basic principles and procedures

#### EN 15804

EN 15804:2012-04+A1 2013, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

#### ISO 50001

DIN EN ISO 15001: 2018-12, Energy management systems – Requirements with guidance for use

#### EAD 040016-00-0404

EAD 040016-00-0404: 2016-02, Glass fibre mesh for reinforcement of cement-based renderings

### Other literature

#### Chemical Restriction Regulation

Ordinance on Prohibitions and Restrictions on the Placing on the Market and on the Supply of Certain Substances, Mixtures and Products under the

Chemicals Act (Chemicals Prohibition Ordinance - ChemVerbotsV); date of issue: 20 January 2017

#### EWC

European Waste Catalogue – EWC, Ordinance on the European List of Wastes (AVV) dated 10 December 2001 (Federal Gazette No. I, p. 3379), last amended by Article 5, section 22 of the law dated 24 February 2012 (Federal Gazette No. I, p. 212)

#### ETA-17/1025 Glass reinforcement mesh dated 18 September 2019

European Technical Approval, OIB Österreichisches Institut für Bautechnik, ETA database, [www.oib.or.at](http://www.oib.or.at)

#### GaBi

Software & documentation database for comprehensive analysis; Sphera Solutions GmbH, documentation of the GaBi data sets <http://documentation.gabi-software.com/>, 2022

#### Ordinance on Hazard Substances

Ordinance on Protection against Hazardous Substances (Hazardous Substances Ordinance – GefStoffV); date of issue: 26 November 2010

#### IBU 2021

Institut Bauen und Umwelt e.V.: General instructions for the EPD range of Institut Bauen und Umwelt e.V. (IBU), version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021. [www.ibu-epd.com](http://www.ibu-epd.com)

#### PCR: Glass Reinforcement Mesh

Product category rules for building-related products and services from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part B: Requirements on the EPD for glass reinforcement mesh, Institut Bauen und Umwelt e.V., version 1.6, 2017, [www.ibu-epd.com](http://www.ibu-epd.com)

#### PCR, Part A

Product category rules for building-related products and services from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation rules for the Life Cycle Assessment and requirements on the Project Report, in accordance with EN 15804:2012+A1:2013, version 2.0.1, 2021, [www.ibu-epd.com](http://www.ibu-epd.com)



**(EC) Directive No. 1907/2006 REACH**

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**Publisher**

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

Tel +49 (0)30 3087748- 0  
Fax +49 (0)30 3087748- 29  
Mail [info@ibu-epd.com](mailto:info@ibu-epd.com)  
Web [www.ibu-epd.com](http://www.ibu-epd.com)

**Programme holder**

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

Tel +49 (0)30 - 3087748- 0  
Fax +49 (0)30 – 3087748 - 29  
Mail [info@ibu-epd.com](mailto:info@ibu-epd.com)  
Web [www.ibu-epd.com](http://www.ibu-epd.com)

**Author of the Life Cycle  
Assessment**

Sphera Solutions GmbH  
Hauptstraße 111- 113  
70771 Leinfelden-Echterdingen  
Germany

Tel +49 711 341817-0  
Fax +49 711 341817-25  
Mail [info@sphera.com](mailto:info@sphera.com)  
Web [www.sphera.com](http://www.sphera.com)

**Vitrulan**  
Technical Textiles

**Owner of the Declaration**

Vitrulan Technical Textiles GmbH  
Rögitzstraße 34  
96515 Sonneberg  
Germany

Tel +49 (0)36762 890-0  
Fax +49 (0)36762 890-559  
Mail [technical-textiles@vitrulan.com](mailto:technical-textiles@vitrulan.com)  
Web [www.vitrulan.com](http://www.vitrulan.com)